KD11-A

KD11-A CPU DIAG
CBQEACO

AH-7690C-MC
FICHE 1 OF 4

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                                        PRODUCT CODE:   AC-7688C-MC
                                        PRODUCT NAME:   CBQEAC0 KD11-A CPU DIAG
                                        PRODUCT DATE:   15 FEB 1980
                                        MAINTAINER:     DIAGNOSTIC ENGINEERING
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1.0 GENERAL PROGRAM INFORMATION

1.1 PROGRAM PURPOSE

''CBQEAC'' IS A DIAGNOSTIC PROGRAM DESIGNED TO DETECT, REPORT, AND IDENTIFY LOGIC FAULTS IN THE KD11-A CENTRAL PROCESSING UNIT OF THE PDP11/40 SYSTEM. IT CONSISTS OF 525(10) INDIVIDUAL TESTS CAREFULLY DESIGNED AND SEQUENCED TO DETECT AND ATTEMPT TO IDENTIFY LOGIC FAULTS AT A MINIMUM HARDWARE/SOFTWARE LEVEL. THESE TESTS ARE PARTITIONED INTO THREE MAJOR SECTIONS AS DESCRIBED BELOW:

A. BASIC INSTRUCTION TESTS (BIT)

THIS SECTION CONSISTS OF A LOGICALLY SEQUENCED SET OF BASIC INSTRUCTION TESTS DESIGNED TO VERIFY THE INTEGRITY OF THOSE INSTRUCTIONS AND LOGIC OPERATIONS USED BY THE UTILITY ROUTINES THAT PROVIDE ERROR LOGGING AND SCOPE LOOPING FACILITIES FOR THE SUBSEQUENT TWO MAJOR SECTIONS. NO UTILITY IS CALLED UNTIL ITS INSTRUCTION COMPLEMENT HAS BEEN VERIFIED. THIS SCHEME ACCOMPLISHES TWO IMPORTANT MAINTENANCE OBJECTIVES: 1)IT MINIMIZES THE POSSIBILITY OF THE ERROR REPORTING ROUTINES CONVEYING AMBIGUOUS ERROR INFORMATION TO THE USER, AND 2)IT MAXIMIZES THE POSSIBILITY THAT THE ERROR WILL BE DETECTED BY A ROUTINE DESIGNED TO IDENTIFY FAILING OPERATIONS RATHER THAN HAVE THE ERROR MANIFEST ITSELF IN A MORE COMPLEX UTILITY ROUTINE THAT IS NOT STRUCTURED TO DIAGNOSE FAULTS.

ANY FAULT DETECTED IN THIS SECTION CAUSES THE PROGRAM TO ''HALT'' WITH THE CONSOLE ADDRESS AND DATA DISPLAYS INDICATING THE FAILING TEST. ADDITIONAL FAULT IDENTIFICATION INFORMATION IS AVAILABLE IN THE PROCESSOR'S GENERAL REGISTERS, PSW, STACK, AND PROGRAM ANNOTATION FOR THE FAILING TEST. A LOCK ON HARD ERROR FEATURE IS EMPLOYED TO PREVENT THE PROGRAM FROM CONTINUING ON ONCE A SOLID ERROR IS DETECTED. DEPRESSING CONTINUE AFTER THE ERROR HALT CAUSES A RETRY OF THE FAILING TEST

B. COMPREHENSIVE INSTRUCTION TESTS (CIT)

THIS SECTION, COMPRISED OF THE BULK OF THE TESTS, CONSISTS OF A LOGICALLY SEQUENCED AND PARTITIONED SET OF INSTRUCTION TESTS DESIGNED TO TEST AND VERIFY ALL THE MICROINSTRUCTION SEQUENCES AND DATA PATH DATA MANIPULATIONS IMPLICIT IN THE DESIGN SPECIFICATION OF THE KD11-A MICROPROGRAM. ALL LOGIC SEQUENCES THAT CAN BE ACTIVATED IN THE PROGRAM ''RUN'' MODE ARE TESTED WITH THE EXCEPTION OF THE SMALL AMOUNT OF LOGIC THAT REQUIRES AN ACTIVE ''DMA'' DEVICE. THIS EXCLUDES THOSE SEQUENCES AND LOGIC FUNCTIONS THAT SUPPORT THE CONSOLE FUNCTIONS (LOAD ADDRESS, DEPOSIT, ETC.). EACH TEST IN THIS SECTION CALLS A ''SCOPE LOOP'' UTILITY THAT FACILITATES USER CONTROL OF TEST SELECTION AND EXECUTION VIA THE CONSOLE SWITCH REGISTER.

UPON DETECTION OF A LOGIC FAULT, EACH TEST IN THIS SECTION CALLS AN "ERROR SERVICE" ROUTINE THAT LOGS THE ERROR AND REPORTS IT AS HARD COPY ON THE CONSOLE TERMINAL DEVICE. THE ERROR SERVICE ROUTINE ALSO FACILITATES USER CONTROL OF THE PROGRAM SEQUENCE VIA CONSOLE SWITCH REGISTER OPTIONS. AFTER REPORTING THE ERROR THE PROGRAM CONTINUES ON IN ITS NORMAL SEQUENCE UNLESS MODIFIED BY THE USER ACTIVATING THE "LOCK ON HARD ERROR" SWITCH OPTION.

C. COMBINED INSTRUCTION EXERCISER (IEX)

THIS SECTION CONSISTS OF A MORE COMPLEX SET OF INSTRUCTION TESTS DESIGNED TO TEST THE INSTRUCTIONS WHEN USED IN VARIOUS COMBINATIONS MANIPULATING VARIABLE DATA PATTERNS. LIKE THE PREVIOUS SECTION, IT CALLS THE "ERROR SERVICE" AND "SCOPE LOOP" UTILITIES TO REPORT ERRORS AND ALLOW USER CONTROL OF TEST EXECUTION.

WHERE AT ALL POSSIBLE THE PROGRAM ANNOTATION ATTEMPTS TO CALL OUT THE MOST PROBABLE FAILURE TO THE FUNCTIONAL LOGIC AREA. EACH TEST OR GROUP OF GENERIC TESTS INCLUDES MICROPROGRAMMING AND LOGIC INFORMATION TO FACILITATE FURTHER ISOLATION OF THE FAULTY COMPONENT THRU THE USE OF ADDITIONAL LOWER LEVEL CHECKS BY THE MAINTENANCE TECHNICIAN USING THE KM-11 MAINTENANCE MODULE OR OSCILLOSCOPE. DETAILED PROCEDURES FOR USING THIS MAINTENANCE INFORMATION IS INCLUDED IN PARA. 6.0.

1.2 SYSTEM REQUIREMENTS

A. HARDWARE REQUIREMENTS

1. PDP11/40 CPU WITH OPERATOR'S CONSOLE
2. 16K OF CORE STORAGE - MF11/U OR EQUIVALENT
3. DL11 ASYNCHRONOUS LINE INTERFACE WITH TERMINAL
4. KW11-L LINE CLOCK (OPTIONAL)

B. SOFTWARE REQUIREMENTS

1. PDP11 ABSOLUTE LOADER PROGRAM FOR PAPER TAPE SYSTEMS
2. XXDP MONITOR FOR DECTAPE,MAGTAPE,CASSETTE, OR DISK SYSTEMS.

1.3 RELATED DOCUMENTS AND STANDARDS

A. PDP11/40 PROCESSOR HANDBOOK
B. PDP11 PERIPHERALS HANDBOOK
C. KD11-A PROCESSOR MAINTENANCE MANUAL
D. PDP11/40 SYSTEM ENGINEERING DRAWINGS
E. DIAGNOSTIC ENGINEERING STANDARDS AND CONVENTIONS
PROGRAMMING PRACTICES - DOC NO. 175-003-009-00

1.4 DIAGNOSTIC HIERARCHY PREREQUISITES

''CBQEAC'' ASSUMES THAT THE HARDCORE VERIFIED BY THE 'BCPT'' (RESIDENT BASIC CPU TEST FOR 1080 SYSTEMS) IS OPERATIONAL. A COPY OF THE 'BCPT'' TEST IS INCLUDED AS PART OF THE LOAD MODULE AND IS RESIDENT IN CORE STARTING AT LOCATION 1000(8) WHENEVER ''CBQEAC'' IS LOADED. AUTOMATIC LINKAGE TO THE START OF ''CBQEAC'' OCCURS IF 'BCPT'' RUNS ERROR FREE. THIS PROVIDES THE USER WITH THE OPTION OF RUNNING 'BCPT'' PRIOR TO EXECUTING ''CBQEAC'' IF HE SUSPECTS A FAULT IN THE ''HARD CORE''.

1.5 FAILURE ASSUMPTIONS

''CBQEAC'' ASSUMES THAT THE STORAGE MEDIUM USED TO STORE THE PROGRAM IS INTACT AND THAT IT CAN BE LOADED INTO CORE. IT ALSO ASSUMES THAT THE BASIC TESTS DESCRIBED IN PARA. 1.4 RUN ERROR FREE AND ANY ASSUMPTIONS MADE BY THESE TESTS IS VALID. (REFER TO MAINDEC-10-DFQMAA FOR A DESCRIPTION OF THE 1080 RESIDENT TESTS)

2.0 OPERATING INSTRUCTIONS

2.1 LOADING AND STARTING PROCEDURES

A. LOADING PROCEDURES

1) PAPER TAPE SYSTEMS

USE THE STANDARD PDP11 ABSOLUTE LOADER PROCEDURES.

2) XXDP SYSTEMS

USE THE STANDARD XXDP MONITOR LOADING PROCEDURES.

B. STARTING PROCEDURES

1. TO RUN ''CBQEAC'' ONLY

A) SET SR = 000200
B) DEPRESS LOAD ADDRESS
C) SET SR = 000000 (NO SWITCH OPTIONS)
D) SET HALT/ENABLE IN THE ENABLE POSITION
E) DEPRESS START
F) REFER TO PARA. 3.0 AND 4.0 FOR NORMAL PROGRAM RESPONSES AND ERROR REPORTS.

2. TO RUN "BCPT" PRIOR TO "CBQEAC"

A) SET THE SR = 1000
B) DEPRESS LOAD ADDRESS
C) SET SR = 000000 (NO SWITCH OPTIONS)
D) SET HALT/ENABLE IN THE ENABLE POSITION
E) DEPRESS START
F) REFER TO PARA. 3.0 AND 4.0 FOR NORMAL PROGRAM RESPONSES AND ERROR REPORTS OR TO THE "BCPT" DOCUMENT IF AN ERROR HALT OCCURS IN THE BCPT SECTION.

C. RESTART PROCEDURES

1. TO INITIALIZE "PASCNT","ERRCNT", AND "PFCNT" TO ZERO

SAME AS IN 2.1(B1) ABOVE

2. TO PRESERVE "PASCNT","ERRCNT", AND "PFCNT"

A) SET SR=003034
B) DEPRESS LOAD ADDRESS
C) SET SR=000000 (NO OPTIONS)
D) SET HALT/ENABLE TO ENABLE POSITION
E) DEPRESS START SWITCH

2.2 SPECIAL ENVIRONMENTS

A. 16K PDP11/40 SYSTEMS

FOR 16K SYSTEMS USING THE "XXDP" PACKAGE YOU WILL BE UNABLE TO USE THE "UPDATE" PROGRAMS TO LOAD,SAVE, UPDATE ETC. SINCE THE SIZE OF "CBQEAC" WILL NOT PERMIT SIMULTANEOUS RESIDENCY OF THE UPDATE PROGRAMS. SUFFICIENT FREE CORE IS AVAILABLE FOR THE "XXDP" MONITOR SO THAT "CBQEAC" CAN BE LOADED BY THE MONITOR.

2.3 PROGRAM OPTIONS

A. SWITCH REGISTER OPTIONS

THE FOLLOWING CONSOLE SWITCH REGISTER OPTIONS ARE ACTIVE UPON ENTERING THE COMPREHENSIVE INSTRUCTION TESTS (CIT) SECTION. (SWITCH OPTION IS ACTIVE WHEN SW IS SET TO A "1")

SW15 HALT ON ERROR. IF ERROR PRINTING IS ENABLED THE HALT OCCURS AFTER THE PRINTOUT. DEPRESSING "CONTINUE" CAUSES THE PROGRAM TO PROCEED ON IN NORMAL SEQUENCE FROM THE POINT OF ERROR.

```
325                                     SW14    CONTINUOUSLY LOOP ON THE CURRENT TEST
```

```
SW13     INHIBIT NORMAL ERROR PRINTOUTS - THIS DOES NOT INCLUDE
         POWER FAIL, BUS ERROR, RSVD INSTR TRAPS, OR MISSED
         TEST PRINTOUTS.

SW12     INHIBIT ALL PRINTOUTS NOT COVERED UNDER SW13. THIS
         INCLUDES I.D., OPTIONS FOUND, ENDPAS, ETC.

SW11     INHIBIT SUB-TEST ITERATIONS. TEST ITERATIONS ARE
         AUTOMATICALLY INHIBITED ON THE FIRST PASS.

SW10     SEARCH FOR AND CONTINUOUSLY LOOP ON THE TEST NUMBER
         SELECTED BY THE CONTENTS OF SW<09:00>. ONLY USE THIS
         OPTION FOR TESTS T0145 THRU T1015 SINCE THE ''SCOPE''
         UTILITY IS NOT ACTIVE UNTIL TEST T0145.

SW09     IF SW10=0 , SW09=1 WILL ACTIVATE THE ''LOCK ON HARD ERROR'' FEATURE.

         IF SW10=1, SW09 BECOMES THE HIGH ORDER BIT IN THE TEST
         NUMBER TO BE SELECTED.

SW<9:0>  USED TO SELECT A PARTICULAR TEST FOR LOOPING IF SW10=1
         THERE IS NO TEST 000 DEFINED.

B. MEMORY LOCATIONS

1. FILLS: THERE IS A LOCATION TAGGED ''FILLS'' THAT IS USED TO
          SPECIFY THE FILL COUNT AND FILL CHARACTER FOR THOSE
          TERMINAL DEVICES REQUIRING THE USE OF FILLERS. THE
          HIGH BYTE CONTAINS THE FILL COUNT AND THE LOW BYTE
          CONTAINS THE FILLER CHARACTER. IT IS PROGRAM LOADED
          AS A 002400(8) TO SPECIFY FIVE NULL CHARACTERS.

2. ITCOUNT: THERE IS A LOCATION TAGGED ''ITCOUNT'' THAT CONTAINS
            THE ITERATION COUNT TO BE USED ON PASSES SUBSEQUENT
            TO PASS 0 TO SPECIFY THE NO. OF SUB-TEST ITERATIONS
            IT IS PROGRAM LOADED TO SPECIFY 32.(10) ITERATIONS.

3. OPTION: THERE IS A LOCATION TAGGED ''OPTION'' THAT IS SET
           UP AUTOMATICALLY BY THE PROGRAM TO INDICATE THE
           PDP11/40 INTERNAL OPTIONS FOUND:

                BIT15=1 KW11-L INSTALLED
                BIT07=1 KT11-D INSTALLED
                BIT02=1 KJ11-A INSTALLED
                BIT01=1 KE11-F INSTALLED
                BIT00=1 KE11-E INSTALLED

           THE PROGRAM USES THE BITS IN ''OPTION'' TO SKIP THOSE
           TESTS THAT ARE OPTION DEPENDENT TO PREVENT REDUNDANT
           ERROR REPORTS.

4. BPTLOC: THERE IS A LOCATION TAGGED ''BPTLOC'' THAT PROVIDES THE
           USER THE MECHANISM FOR SETTING SIXTEEN ''BREAKPOINT
           HALTS'' THROUGHOUT THE PROGRAM. THIS ENABLES RAPIDLY
           ''HOMING IN'' ON THE FAILING TEST IN THOSE CASES WHERE
```

```
382                                     THE FAULT CAUSES A RUNAWAY OR HUNG PROGRAM. REFER TO
383                                     PARA. 4.2 FOR A DETAILED DESCRIPTION OF THE USE OF
384                                     THIS FEATURE.
```

2.4 EXECUTION TIMES

ONE COMPLETE ERROR FREE PASS OF DBQEAA WITH NO TEST ITERATIONS SHOULD TAKE LESS THAN 5 SECONDS. A SUCCESSFUL PASS WILL BE INDICATED BY THE FOLLOWING PRINTOUT ON THE CONSOLE DEVICE:

```
PASCNT = 000001  ERRCNT = 000000
```

WITH ITERATIONS ENABLED A COMPLETE ERROR FREE PASS SHOULD TAKE LESS THAN 2 MINUTES.

3.0 ERROR INFORMATION

3.1 ERROR REPORTING PROCEDURES

A. ERROR MESSAGE FORMATS

1. STANDARD ERROR MESSAGE HEADER

THE FOLLOWING HEADER IS PRINTED ON DETECTION OF THE FIRST ERROR DETECTED AFTER THE BASIC INSTRUCTION TEST SECTION. IT IS ONLY PRINTED ONCE PER PROGRAM PASS.

```
(PC)   (PS)   (SP)   (TEST)   (IR)   DEST   WAS   S/B
(R7)   (PSW)  (R6)   (R0)     (R1)   (R2)   (R3)  (R4)
```

WHERE:

(PC) INDICATES THE CONTENTS OF THE PROGRAM COUNTER AT THE TIME OF THE ERROR CALL. THIS IS NORMALLY AN ADDRESS THAT IS USED TO LOCATE THE ERROR CALL STATEMENT IN THE FAILING TEST.

(PSW) INDICATES THE CONTENTS OF THE PROCESSOR STATUS WORD AT THE TIME OF THE ERROR CALL

(SP) INDICATES THE CONTENTS OF THE STACK POINTER (R6) AT THE TIME OF THE ERROR. (NOTE THAT THE ERROR CALL WILL PUSH THE STACK TWICE)

(R0) INDICATES THE TEST NO. (IN OCTAL) THAT FAILED

(R1) CONTAINS A COPY OF THE TEST INSTRUCTION THIS WILL BE THE FIRST WORD IN THE CASE OF TWO OR THREE WORD INSTRUCTIONS.

(R2) FOR SINGLE AND DOUBLE OPERAND INSTRUCTIONS R2 NORMALLY CONTAINS THE DESTINATION ADDRESS

(R3) FOR SINGLE AND DOUBLE OPERAND INSTRUCTIONS R3 CONTAINS WHAT THE RESULT (DEST. OPERAND) ACTUALLY

441 WAS AFTER THE TEST.

(R4) FOR SINGLE AND DOUBLE OPERAND INSTRUCTIONS R4 CONTAINS WHAT THE RESULT (DEST. OPERAND) SHOULD HAVE BEEN (S/B).

IN SOME CASES THE ERROR INFORMATION MAY DEVIATE FROM THAT DESCRIBED ABOVE BUT THE PROGRAM ANNOTATION FOR THOSE TESTS WILL DESCRIBE THE MEANING OF THOSE ENTRIES THAT HAVE BEEN RE-DEFINED.

THE ERROR CALL STATEMENT MAY BE ENCODED TO PRINT ONLY THE INFORMATION RELATIVE TO THE PARTICULAR FUNCTION BEING TESTED. INTERPRETATION OF THE ERROR CALLS IS AS FOLLOWS:

```
ERROR   PRINTS ALL 8 COLUMNS
ERROR1  PRINT ONLY COLUMN 1
ERROR2  PRINT COLUMNS 1,2
ERROR3  PRINT COLUMNS 1,2,3
ERROR4  PRINT COLUMNS 1,2,3,4
ERROR5  PRINT COLUMNS 1,2,3,4,5
ERROR6  PRINT COLUMNS 1,2,3,4,5,6
ERROR7  PRINT COLUMNS 1,2,3,4,5,6,7
```

2. STANDARD ERROR PRINTOUT

A LINE OF FROM ONE TO EIGHT SIX DIGIT OCTAL NUMBERS THAT LINE UP UNDER THE APPROPRIATE HEADER ENTRY AND HAVE THE MEANINGS DESCRIBED IN THE PREVIOUS SECTION.

3. RESERVED INSTRUCTION TRAP ERROR MESSAGE

ANY RESERVED INSTRUCTION TRAP DETECTED AFTER THE BASIC TESTS RESULTS IN THE FOLLOWING PRINTOUT:

TRAPPED TO 10 PC = XXXXXX

WHERE: XXXXXX IS THE CONTENTS OF THE PROGRAM COUNTER AT THE TIME THE TRAP WAS SPRUNG.

AFTER REPORTING THE ERROR, THE PROGRAM IS RESTARTED FROM THE BEGINNING.

IF A RSVD INSTRUCTION TRAP OCCURS WHILE IN THE PROCESS OF TRYING TO SERVICE A PREVIOUS RSVD INSTRUCTION TRAP OR A BUS ERROR TRAP THE PROGRAM HALTS. A DESCRIPTION OF THIS HALT IS CONTAINED IN PARA. 3.1,B1 BELOW.

IF A RSVD INSTRUCTION TRAP OCCURS PRIOR TO COMPLETION OF THE BASIC INSTRUCTION TEST SECTION THE PROGRAM WILL HALT VIA A TRAPCATCHER IN THE VECTOR. A DESCRIPTION OF THIS HALT IS DESCRIBED IN PARA. 3.1,B2 BELOW.

4. BUS ERROR TRAP ERROR MESSAGE

ANY UNEXPECTED BUS ERROR TRAPS (BUS TIMEOUT, ODD ADDRESS ERROR, ILLEGAL INSTRUCTION, OR STACK OVERFLOW) RESULTS IN THE FOLLOWING PRINTOUT:

TRAPPED TO 4 PC = XXXXXX

WHERE: XXXXXX IS THE CONTENTS OF THE PC AT THE TIME THE TRAP WAS SPRUNG.

AFTER REPORTING THE ERROR THE PROGRAM IS RESTARTED FROM THE BEGINNING.

IF A BUS ERROR TRAP OCCURS WHILE A PREVIOUS BUS ERROR OR RSVD INSTRUCTION IS STILL PENDING THE PROGRAM WILL HALT. A DESCRIPTION OF THE HALT INTERPRETATION IS GIVEN IN PARA. 3.1,B4 BELOW.

IF A BUS ERROR OCCURS PRIOR TO THE COMPLETION OF THE BASIC INSTRUCTION TESTS, THE PROGRAM WILL HALT VIA A TRAPCATCHER IN THE VECTOR. A DESCRIPTION OF THIS HALT IS INCLUDED IN PARA. 3.1,B2 BELOW.

5. POWER FAIL

IF A POWER FAIL CONDITION IS DETECTED, THE FOLLOWING MESSAGE IS PRINTED:

POWER

AFTER PRINTING AN ATTEMPT IS MADE TO RESTART THE PROGRAM AT THE BEGINNING.

EACH POWER FAIL ENCOUNTERED DURING ANY PASS IS COUNTED IN A LOCATION TAGGED "PFCNT". DURING END OF PASS PRINTOUT THIS LOCATION IS QUERIED AND IF FOUND NON-ZERO THE NORMAL ENDPAS MESSAGE IS MODIFIED AS SHOWN BELOW:

PASCNT=XXXXXX ERRCNT=YYYYYY PFCNT=ZZZZZZ

WHERE "ZZZZZZ" GIVES THE TOTAL COUNT OF THE POWER FAILS (IN OCTAL) OCCURRING DURING ANY PROGRAM RUN.

IF THE POWER FAIL IS DETECTED BEFORE COMPLETION OF THE BASIC INSTRUCTION TESTS, THE PROGRAM WILL HALT VIA A TRAP CATCHER IN THE VECTOR. A DESCRIPTION OF THIS HALT IS GIVEN IN PARA. 3.1,B2 BELOW.

6. MISSED TEST MESSAGE

THERE IS A 512 BYTE TABLE TAGGED "STAB1" THAT CONTAINS A BYTE ENTRY THAT CORRESPONDS TO EACH SEQUENTIAL TEST NO.. AFTER THE "MOVB #N,X(R)" INSTRUCTION HAS BEEN VERIFIED IN THE "BIT" SECTION, EACH TEST WILL USE THIS INSTRUCTION TO SET THE BYTE THAT CORRESPONDS TO THAT TEST NO. TO ALL ONES (377) THROUGHOUT THE REMAINDER OF THE "BASIC INSTRUCTION TESTS" SECTION. DURING THE "CIT" AND "IEX" SECTIONS THE TABLE ENTRIES ARE UPDATED BY THE "SCOPE" LOOP UTILITY. DURING END OF PASS SERVICE, A CHECK ROUTINE IS CALLED TO SCAN THE TABLE AND INSURE THAT EACH BYTE IS SET TO ALL ONES (377). ANY ENTRY THAT STILL CONTAINS ZEROES (TABLE IS INITIALIZED TO ZEROES BEFORE BEING USED) MEANS THAT ONE OR MORE TESTS WERE SKIPPED FOR SOME REASON. IF ANY TESTS ARE FOUND "MISSED" THE PRINTOUT SHOWN BELOW IS DISPLAYED:

```
MISSED TEST
XXXXXX
YYYYYY
```

WHERE: XXXXXX AND YYYYYY ARE THE TEST NUMBERS MISSED.

B. ERROR HALTS

1. BASIC INSTRUCTION TESTS (BIT)

ANY ERROR DETECTED IN THE BASIC TESTS CAUSES THE PROGRAM TO HALT WITH THE FOLLOWING INFORMATION DISPLAYED IN THE CONSOLE INDICATORS:

ADDRESS DISPLAY: ADDRESS + 2 OF THE LOCATION CONTAINING THE HALT. THIS IS USED TO LOCATE THE SPECIFIC ERROR CALL IN THE FAILING TEST

DATA DISPLAY: NUMBER OF THE FAILING TEST (IN OCTAL). USING THE SBTTL INDEX THIS MAY BE USED TO LOCATE THE FAILING TEST IN THE LISTING.

EXAMINING THE CONTENTS OF THE CPU'S GENERAL REGISTERS, THE PSW, AND THE STACK WILL PROVIDE ADDITIONAL FAULT IDENTIFICATION INFORMATION.

DEPRESSING "CONTINUE" AFTER THE HALT WILL CAUSE AN AUTOMATIC RETRY OF THE FAILING TEST. IF THE ERROR IS SOLID THE PROGRAM WILL LOCK ON THIS TEST, BUT IF IT IS INTERMITTENT THE PROGRAM WILL CONTINUE ON IN NORMAL SEQUENCE ONCE THE TEST IS SUCCESSFULLY EXECUTED.

TO ESTABLISH A TIGHT SCOPE LOOP ON THE FAILING TEST,
REPLACE THE "HALT" WITH A 400(8). AND DEPRESS "CONTINUE"
THE "400" IS A "BR .+2" WHICH FUNCTIONS AS A NOP. THIS
IS NECESSARY TO PRESERVE THE INTEGRITY OF THE CONDITION
CODE OPERATE INSTRUCTION THAT IS USED AS A SCOPE SYNC.
THIS BUILT IN SYNC FEATURE IS DESCRIBED IN PARA. 6.0.

2. TRAPCATCHER HALTS

THE VECTOR AREA (LOC 000 - 776) IS PROGRAM LOADED WITH
A STANDARD TRAPCATCHER AS SHOWN BELOW:

```
V   / V+2
V+2/ HALT
```

AFTER THE BASIC INSTRUCTION TESTS THE FOLLOWING VECTORS
ARE SET UP TO POINT TO, APPROPRIATE SERVICE ROUTINES:

4/6	BUS ERROR SERVICE
10/12	RSVD INSTRUCTION TRAP SERVICE
20/22	SCOPE LOOP SERVICE
24/26	POWER FAIL SERVICE
30/32	ERROR SERVICE
34/36	PRINT SERVICE

AT THE APPROPRIATE POINTS IN THE COMPREHENSIVE INSTR-
UCTION TESTS THE KW11-L VECTOR (100/102) AND THE DL11
VECTORS (60/62 - 64/66) ARE SET UP TO CHECK INTERRUPTS
FROM THESE DEVICES. ALL OTHER VECTORS REMAIN SET UP TO
"CATCH" UNEXPECTED TRAPS OR INTERRUPTS BY HALTING.

WHEN AN UNEXPECTED TRAP OR INTERRUPT NOT SUPPORTED BY
AN APPROPRIATE SERVICE ROUTINE OCCURS THE CPU HALTS.
WITH THE FOLLOWING INFORMATION DISPLAYED IN THE CONSOLE:

ADDRESS DISPLAY:	V+4 OF THE VECTOR. THIS IS USED TO IDENTIFY THE CAUSE OF THE UNEXPECTED TRAP OR INTERRUPT.
DATA DISPLAY:	TEST NO. OF THE LAST TEST BEING EXECUTED WHEN THE TRAP OR INTERR UPT OCCURRED.

THE LAST ENTRY PUSHED ON THE STACK CAN BE EXAMINED
TO DETERMINE WHERE THE PROGRAM WAS WHEN THE TRAP OR
INTERRUPT WAS SPRUNG. REMEMBER THAT THE "OLD PC" GETS
SAVED ON THE STACK WHEN A TRAP OR INTERRUPT OCCURS.

4. CATASTROPHIC ERROR HALTS

THERE ARE TWO HALTS, ONE IN THE BUS ERROR SERVICE ROU-
TINE AND THE OTHER IN THE RSVD INSTRUCTION TRAP SERVICE
ROUTINE THAT HALT THE PROGRAM IF ONE OF THESE ERRORS
OCCURS WHILE STILL SERVICING A PREVIOUS BUS ERROR

```
659                                     OR RSVD INSTRUCTION TRAP. AFTER THE HALT THE CONSOLE
660                                     DISPLAYS THE FOLLOWING INFORMATION:
```

```
                                        ADDRESS DISPLAY: PC+2 OF THE ERROR HALT. THIS IS USED
                                                         TO IDENTIFY WHICH OF THE TWO TYPES OF
                                                         ERRORS - RSVD OR BUS ERROR.

                                        DATA DISPLAY:    LAST TEST NUMBER BEING EXECUTED WHEN
                                                         THE TRAPS OCCURRED.

                                        THERE IS A SOFTWARE FLAG TAGGED ''CATERR'' THAT MAY BE
                                        EXAMINED TO OBTAIN THE FOLLOWING INFORMATION:

                                        [CATERR] = 000002 TWO SUCCESSIVE BUS ERRORS
                                        [CATERR] = 001000 TWO SUCCESSIVE RSVD INSTR. TRAPS
                                        [CATERR] = 000401 A COMBINATION OF THE TWO. THE
                                                          CONTENTS OF THE ADDRESS DISPLAY
                                                          IDENTIFIES WHICH TYPE OCCURRED LAST.

                                        THE STACK PROVIDES THE FOLLOWING ADDITIONAL INFORMATION:

                                                [SP  ] / PC OF THE 2ND TRAP
                                                [SP+2] / PSW OF THE 2ND TRAP
                                                [SP+4] / PC OF THE 1ST TRAP
                                                [SP+6] / PSW OF THE 1ST TRAP

                                4.0     PERFORMANCE AND PROGRESS REPORTS
                                        --------------------------------

                                4.1     PERFORMANCE REPORTS
                                        -------------------

                                        THERE IS ONLY ONE PERFORMANCE REPORT SUPPLIED BY THE PROGRAM
                                        AND CONSISTS OF A SIMPLE END OF PASS MESSAGE OF THE FORMAT
                                        SHOWN BELOW:

                                                PASCNT = XXXXXX  ERRCNT = YYYYYY

                                                WHERE:  XXXXXX IS THE TOTAL NUMBER OF COMPLETE PASSES
                                                        OF THE ENTIRE PROGRAM (OCTAL)

                                                        YYYYYY IS THE TOTAL ERROR COUNT IN OCTAL WHICH
                                                        IS FROZEN WHEN IT REACHES 177777(8).

                                        THIS PRINTOUT IS MODIFIED TO PRINT THE POWER FAIL COUNT AS
                                        DESCRIBED IN PARA. 3.1,A5 ABOVE IF POWER FAILED DURING A PASS.

                                4.2     PROGRESS REPORTS
                                        ----------------

                                        THERE ARE THREE PROGRESS REPORTS PRINTED THAT REPORT NORMAL
                                        ERROR FREE EXECUTION OF THE PROGRAM.

                                        A. END OF PASS PRINTOUT AS DESCRIBED IN 4.1 ABOVE.

                                        B. PROGRAM IDENTIFICATION MESSAGE AS DESCRIBED BELOW:

                                                CBQEAC PDP11/40 CPU DIAGNOSTIC  VERSION XXX
```

THIS MESSAGE GETS PRINTED THE FIRST TIME THE PROGRAM ENTERS
THE COMPREHENSIVE INSTRUCTION TEST SECTION UNLESS
INHIBITED BY SW12=1. AFTER THE FIRST PASS THIS PRINTOUT
IS AUTOMATICALLY INHIBITED UNLESS THE PROGRAM IS RESTARTED AT 200(8).

C. PDP11/40 OPTIONS FOUND PRINTOUT

AFTER PRINTING THE PROGRAM I.D. MESSAGE, A SUBROUTINE IS
CALLED TO "LOOK FOR" THE 11/40 INTERNAL OPTIONS (KT11-D,
KW11-L,KE11-E,KE11-F,AND KJ11-A). IF ANY OF THESE OPTIONS
ARE FOUND THE FOLLOWING PRINTOUT OCCURS:

PDP11/40 INTERNAL OPTIONS FOUND

XXXX-X

YYYY-Y

WHERE "X" AND "Y" ETC. ARE THE NAMES OF THE OPTIONS.

IF NO OPTIONS ARE FOUND THE FOLLOWING PRINTOUT OCCURS:

PDP11/40 INTERNAL OPTIONS FOUND

NONE FOUND

THE OPTIONS FOUND MESSAGE IS ONLY PRINTED ON THE FIRST PASS
THROUGH THE PROGRAM AND MAY ALSO BE INHIBITED BY SETTING SW12=1.

E. MAINTENANCE BREAKPOINT FEATURE

THERE IS A MANUAL PROGRESS REPORT FEATURE THAT ALLOWS THE USER
TO STEP THROUGH THE PROGRAM, HALTING AFTER EVERY N'TH TEST WITH
PROGRESS INFORMATION DISPLAYED IN THE CONSOLE ADDRESS AND DATA
DISPLAYS. TO ACTIVATE THIS FEATURE THE USER MUST SET THE DESIRED
"BREAKPOINT HALT" BITS IN THE MEMORY LOCATION TAGGED "BPTLOC".
THIS LOCATION PROVIDES SIXTEEN POSSIBLE HALTS DISPERSED EVENLY
THROUGHOUT THE PROGRAM (APPROX. EVERY 32 TESTS). AT EACH CHECK-
POINT THE PROGRAM EXAMINES A PARTICULAR BIT IN "BPTLOC" AND
HALTS IF THE BIT IS SET TO A "1" OTHERWISE IT CONTINUES IN
NORMAL SEQUENCE. AFTER THE HALT DEPRESSING "CONTINUE" WILL CAUSE
RESUMPTION OF NORMAL PROGRAM EXECUTION. SETTING LOCATION "BPTLOC"
TO ALL 1'S (177777) WILL RESULT IN THE FOLLOWING SIXTEEN HALTS
WITH THE INFORMATION SHOWN DISPLAYED IN THE CONSOLE:

[BPTLOC]	DATA DISPLAY TEST NO.	ADDRESS DISPLAY HALT PC+2
BIT00=1	000040	005076
BIT01=1	000077	007460
BIT02=1	000134	012574
BIT03=1	000174	014700
BIT04=1	000234	016434
BIT05=1	000274	021552
BIT06=1	000334	024532
BIT07=1	000374	027532
BIT08=1	000444	033506
BIT09=1	000504	037340
BIT10=1	000544	042222
BIT11=1	000604	045446
BIT12=1	000644	050226
BIT13=1	000704	054400
BIT14=1	000745	061222
BIT15=1	001005	063566

NOTE: IF THE USER DEPOSITED A 000400(8) IN LOCATION 'BPTLOC'' ONLY ONE HALT WOULD OCCUR AND AT THAT TIME THE DATA DISPLAY SHOULD CONTAIN 000444 AND THE ADDRESS DISPLAY SHOULD CONTAIN 033506.

THIS FEATURE IS USEFUL FOR TRACKING DOWN THE TEST THAT CAUSES A 'RUNAWAY'' OR 'HUNG'' PROGRAM.

LOCATION 'BPTLOC'' IS PROGRAM LOADED AS 000000 TO INHIBIT ANY HALTS.

5.0 DEVICE INFORMATION TABLES

5.1 KD11-A MICROPROGRAMMING INFORMATION

A. INTRODUCTION

THE KD11-A PROCESSOR EMPLOYS A MICROPROGRAMMED CONTROL SECTION THAT GENERATES THE PROPER SEQUENCES OF CONTROL SIGNALS REQUIRED TO EXECUTE THE PDP11 INSTRUCTION SET. THE HEART OF THE CONTROL IS A CONTROL STORE THAT CONSISTS OF 256 WORDS OF 56 BITS EACH, STORED IN A READ ONLY MEMORY (ROM). EACH 56 BIT WORD IS CALLED A MICROINSTRUCTION AND IS MICROPROGRAMMED TO PERFORM A UNIQUE ELEMENTARY OPERATION WITHIN THE PROCESSOR. EACH ONE OF THE 56 BITS IS ASSIGNED A PARTICULAR CONTROL FUNCTION THAT MAY BE TURNED 'ON'' OR 'OFF'' DEPENDENT UPON HOW EACH MICROWORD IS PROGRAMMED. TO ACTIVATE A SPECIFIC SET OF CONTROL SIGNALS SIMPLY MEANS READING OUT A SPECIFIC ROM ADDRESS. TO GENERATE A SPECIFIC SEQUENCE OF CONTROL SIGNAL SETS SIMPLY MEANS GENERATING A SPECIFIC ROM ADDRESS SEQUENCE. THE PURPOSE OF THIS SECTION IS TO DESCRIBE THE FUNCTION OF EACH BIT OR GROUP OF BITS (CALLED A FIELD) AND PROVIDE A LIST OF BACKPLANE TEST POINTS WHERE THE STATE OF ANY PARTICULAR BIT CAN BE OBSERVED.

B. MICROINSTRUCTION FORMAT

THIS SECTION LISTS THE FUNCTIONAL DESCRIPTION OF EACH BIT. FOR A MORE DETAILED DESCRIPTION OF THE SPECIFIC ENCODING REFER TO THE PDP11/40 SYSTEM ENGINEERING DRAWINGS, KD11A PROCESSOR (UWORD AND TABLES) SHEET.

BIT NO.	NAME	FUNCTIONAL DESCRIPTION
U<56:55>	CLKL<1:0>	THIS TWO BIT CONTROL FIELD IS USED TO SPECIFY THE CLOCK LENGTH FOR EACH MICROINSTRUCTION. THERE ARE THREE CLOCK LENGTHS POSSIBLE AS DESCRIBED BELOW: (PRT - PULSE REPETITION TIME) U<56:55>=00 OR 01 -CLOCK LENGTH 1 - GENERATES A 'P1'' PULSE WITH PRT=140NSEC U<56:55>=10 -CLOCK LENGTH 2 - GENERATES A 'P2'' PULSE WITH PRT=200NS U<56:55>=11 -CLOCK LENGTH 3 - GENERATES A 'P2'' PULSE FOLLOWED 100 NSEC LATER BY A 'P3'' PULSE. TOTAL PRT=300 NSEC.

```
U<54>          CLKOFF        THIS BIT ALLOWS TURNING OFF THE PRO-
                             CESSOR CLOCK TO STALL PROCESSOR OPERA-
                             TIONS WHILE WAITING FOR SOME INTERNAL
                             OR EXTERNAL RESPONSE.

U<53>          CLKIR         THIS BIT ENABLES CLOCKING NEW DATA
                             INTO THE INSTRUCTION REGISTER.  IT IS
                             ONLY ACTIVE WHEN THE PROCESSOR IS
                             FETCHING A NEW INSTRUCTION.

U<52:51>       WRH,WRL       THESE TWO BITS CONTROL THE WRITING
                             INTO THE PROCESSOR'S GENERAL REGIS-
                             TERS.  THEY PROVIDE THE MECHANISM FOR
                             CONTROLLING WHETHER WE READ, WRITE A
                             16 BIT WORD, OR WRITE AN 8 BIT BYTE AS
                             DESCRIBED BELOW:

                             U<52:51>=00   READ ONLY - INHIBIT
                                           WRITING
                             U<52:51>=01   WRITE ONLY THE LOW
                                           BYTE BITS <7:0>
                             U<52:51>=11   WRITE A FULL 16 BIT
                                           WORD BITS <15:00>

U<50>          CLKB          THIS BIT ALLOWS CLOCKING NEW DATA
                             INTO THE 'B'' REGISTER

                             U<50>=0   HOLD B REGISTER
                             U<50>=1   LOAD B REGISTER

U<49>          CLKD          THIS BIT ALLOWS CLOCKING THE OUTPUT
                             OF THE ''ALU'' INTO THE 'D'' REGISTER.

                             U<49>=0   HOLD D REGISTER
                             U<49>=1   LOAD 'D'' REGISTER

U<48>          CLKBA         THIS BIT ALLOWS CLOCKING THE BUS
                             ADDRESS REGISTER 'BA''

                             U<48>=0   HOLD BA REGISTER
                             U<48>=1   LOAD BA REGISTER

U<47:46>       C1BUS,C0BUS   THIS TWO BIT FIELD SPECIFIES THE
                             TYPE OF DATA TRANSFER BUS CYCLE WHEN
                             U<45> BGBUS IS ACTIVE

                             U<46:47>=00   DATI
                             U<46:47>=01   DATIP
                             U<46:47>=10   DATO
                             U<46:47>=11   DATOB

                             WHEN U<45> IS INACTIVE U<47:46> ARE
                             USED TO CONTROL INTERNAL PROCESSOR
                             LOGIC RELATED TO PRIORITY TRANSFER
                             OF UNIBUS CONTROL
```

```
U<45>          BGBUS          THIS BIT IS USED TO TRIGGER INITIATION
                              OF A UNIBUS DATA TRANSFER BUS CYCLE
                              WHICH RESULTS IN ACTIVATING BUS MSYN:

U<44:41>       DAD<3:0>       THIS FOUR BIT FIELD (DISCRETE ALTER-
                              ATION OF DATA) PROVIDES THE MECHANISM
                              FOR ALTERING THE OPERATION OF THE
                              BASIC CONTROL FUNCTIONS BASED ON
                              CONDITIONS EXISTING WITHIN THE PRO-
                              CESSOR.  IE:  CHECK FOR STACK OVFLW
                              IF PUSHING ON STACK, ALLOW ODD ADDRESS
                              IF BYTE INSTRUCTION, MODIFY ALU OPER-
                              ATION AS A FUNCTION OF THE IR DECODE
                              ETC.

U<40:38>       SPS<2:0>       THIS THREE BIT FIELD CONTROLS LOADING,
                              CLOCKING, AND GATING OF THE PROCESSOR
                              STATUS WORD.

U<37:33>       ALUM,S<3:0>    THESE FIVE BITS CONTROL WHAT OPERATION
                              IS TO BE PERFORMED BY THE PROCESSOR'S
                              ALU.  THE FINAL ALU CONTROL IS SUBJECT
                              TO MODIFICATION BY THE ''DAD'' CODE AS
                              DESCRIBED ABOVE.

U<32:29>       SBC<3:0>       THIS FOUR BIT FIELD IS ENCODED TO
                              SELECT SPECIFIC CONSTANTS THAT MAY
                              BE FED INTO THE ALU'S 'B'' INPUT VIA
                              THE B MUX.  IE: SWR ADDRESS=177570

U<28:27>       SBMH<1:0>      THIS TWO BIT FIELD IS USED TO CONTROL
                              THE HIGH SECTION OF THE B MUX, BITS
                              <15:08> AND DETERMINES WHAT APPEARS
                              AT THE B INPUT TO THE ALU, BIN<15:08>

                              U<28:27>=00  BIN<15:08>=BREG<15:08>
                              U<28:27>=01  BIN<15:08>=BREG07(SEX)
                              U<28:27>=10  BIN<15:08>=BREG<07:00>(BYTE)
                              U<28:27>=11  BIN<15:08>=BCON<15:08>(CONSTANT)

U<26:25>       SBML<1:0>      THIS TWO BIT FIELD IS USED TO CONTROL
                              THE LOW SECTION OF THE B MUX, BITS
                              <07:00>.  AND DETERMINES WHAT APPEARS
                              AT THE B INPUT TO THE ALU.  BIN<07:00>

                              U<26:25>=00  BIN<07:00>=BREG<07:00>
                              U<26:25>=01  BIN<07:00>=BREG<07:00>
                              U<26:25>=10  BIN<07:00=BREG<15:08>(BYTE)
                              U<26:25>=11  BIN<07:00>=BCON<07:00>(CONSTANT)

U<24:23>       SDM<1:0>       THIS TWO BIT FIELD IS USED TO SELECT
                              ONE OF FOUR INPUTS THAT APPEAR AT THE
                              INPUT TO THE ''D'' MUX.

                              U<24:23>=00  DMUX<15:00>=BUS RD<15:00>(REG)
```

```
U<24:23>=01  DMUX<15:00>=BUS D<15-00>(UNIBUS)
U<24:23>=10  DMUX<15:00>=D<15:00>
U<24:23>=11  DMUX<15:00>=D<C>,D<15:01>(SHF RIGHT
```

```
                                        U<22>           SBAM            THIS BIT IS USED TO SELECT THE DATA
                                                                        LOADED INTO THE BA REGISTER

                                                                        U<22>=1  BA<15:00=BUS RD<15:00>(REG)
                                                                        U<22>=0  BA<15:00>=ALU<15:00>

                                                                        BIT 48 (CLKBA) MUST BE ACTIVE TO
                                                                        ALLOW CLOCKING INTO THE BA REGISTER.

                                        U<21:17>        UBF<4:0>        THIS FOUR BIT FIELD (BUT BITS) IS USED
                                                                        TO SPECIFY ONE OF 16 POSSIBLE MICRO-
                                                                        BRANCH TESTS WHICH PROVIDES THE MECHANISM
                                                                        FOR MODIFYING THE ROM ADDRESS SEQUENCE
                                                                        GENERATED BASED ON THE PRESENCE OR
                                                                        ABSENCE OF SPECIFIC CONDITIONS.

                                        U<16:13>        SR<S,D,BA,I>    THESE FOUR BITS ARE USED TO SELECT
                                                                        THE SPECIFIC BITS USED TO ADDRESS A
                                                                        GENERAL REGISTER.

                                                                        SRS =1 USE IR<8:6> SOURCE REG BITS
                                                                        SRD =1 USE IR<2:0> DEST REG BITS
                                                                        SRBA=1 USE BA<3:0> CONSOLE (EXAM + DEP)
                                                                        SRI =1 USE U<12:9> MICROWORD

                                        U<12:09>        RIF<3:0>        THESE FOUR BITS SPECIFY WHICH GENERAL
                                                                        REGISTER TO ACCESS IF "SRI" (U<13>)
                                                                        IS ACTIVE

                                                                        U<12:09>=0000  R0
                                                                        U<12:09>=0001  R1
                                                                        U<12:09>=0001
                                                                        U<12:09>=0001
                                                                        U<12:09>=1111  R17

                                        U<08>           UPF8            THIS BIT IS NOT STORED IN THE ROM BUT
                                                                        IS A SEPARATE CONTROL SIGNAL THAT
                                                                        PROVIDES THE MECHANISM FOR IMPLEMENTING
                                                                        AN EXPANSION ROM WHEN THE EIS/FIS
                                                                        OPTIONS ARE INSTALLED - NOT IN THE
                                                                        BASIC MACHINE.

                                        U<07:00>        UPF<7:0>        THIS EIGHT BUT FIELD (NEXT FIELD) PRO-
                                                                        VIDES A MEANS OF EACH MICROINSTRUCTION
                                                                        TO SPECIFY THE ADDRESS OF THE NEXT
                                                                        MICROWORD TO BE ACCESSED.  THE CONTENTS
                                                                        OF THIS FIELD MAY BE MODIFIED AS A
                                                                        RESULT OF A MICROBRANCH TEST BEFORE
                                                                        BEING LOADED INTO THE ROM ADDRESS
                                                                        REGISTER. (UPP<7:0>.

                                                                        IT IS THE COMBINATION OF THIS FIELD
                                                                        AND THE BUT BITS U<21:17> THAT MAKE
                                                                        IT POSSIBLE TO GENERATE VARIABLE ROM
                                                                        ADDRESS SEQUENCES.
```

THESE 8 BITS ARE UNIQUE IN THAT THEY ARE ACTIVE (1) WHEN 'LOW' IN CONTRAST TO ALL OTHER BITS THAT ARE ACTIVE (1) WHEN HIGH.

IE: UPF<7:0>=01010010 = ADDRESS 255

5.2 MICROWORD CONTROL SIGNAL TEST POINTS

KD11-A MICROWORD CONTROL SIGNALS (SH1 OF 2)

U<N>	PRINT	SIGNAL NAME		ROM	UREG
56	K2-8	CLKL1(1)	H	E38-09	D03N2
56	"	CLKL1(0)	H	"	D03M2
55	"	CLKL0(1)	H	E38-10	D03L2
55	"	CLKL0(1)	H	"	D03R1
54	"	CLKOFF(1)	H	E38-11	D03U2
53	"	CLKIR(1)	H	E38-12	D03T2
52	K2-7	WRH(1)	H	E34-09	D03J2
51	"	WRL(1)	H	E34-10	D03H2
50	"	CLKB(1)	H	E34-11	D03J1
49	"	CLKD(1)	H	E34-12	D03K2
48	"	CLKBA(1)	H	E35-09	D03L1
47	"	C1BUS(1)	H	E35-10	D03K1
46	"	C0BUS(1)	H	E35-11	D03F2
45	"	BGBUS(1)	H	E35-12	D03E2
44	"	DAD3(1)	H	E37-09	D03M1
43	"	DAD2(1)	H	E37-10	D03N1
42	"	DAD1(1)	H	E37-11	D03P1
41	"	DAD0(1)	H	E37-12	D03D2
40	K2-6	SPS2(1)	H	E31-09	C03M2
39	"	SPS1(1)	H	E31-10	D03H1
38	"	SPS0(1)	H	E31-11	D03F1
37	"	SALUM(1)	H	E31-12	D03E1
36	"	SALU3(1)	H	E30-09	C03N2
35	"	SALU2(1)	H	E30-10	C03P2
34	"	SALU1(1)	H	E30-11	C03T2
33	"	SALU0(1)	H	E30-12	C03U2
32	"	SBC3(1)	H	E27-09	C03S2
31	"	SBC2(1)	H	E27-10	C03U2
30	"	SBC1(1)	H	E27-11	C03R2
29	"	SBC0(1)	H	E27-12	D03D1

KD11-A MICROWORD CONTROL SIGNALS (SH2 OF 2)

U<N>	PRINT	SIGNAL NAME		ROM	UREG
28	K2-5	SBMH1(1)	H	E22-09	C03N1
27	"	SBMH0(1)	H	E22-10	C03M1
26	"	SBML1(1)	H	E22-11	C03L1
25	"	SBML0(1)	H	E22-12	C03J1
24	"	SDM1(1)	H	E23-09	C03L2
23	"	SDM0(1)	H	E23-10	C03K2
22	"	SBAM(1)	H	E23-11	C03J2
21	"	UBF4(1)	H	E23-12	C03H2
20	"	UBF3(1)	H	E26-09	C03S1
19	"	UBF2(1)	H	E26-10	C03R1
18	"	UBF1(1)	H	E26-11	C03P1
17	"	UBF0(1)	H	E26-12	C03F2
16	K2-4	SRS(1)	H	E21-09	C03E1
15	"	SRD(1)	H	E21-10	C03D2
14	"	SRBA(1)	H	E21-11	C03E2
13	"	SRI(1)	H	E21-12	C03B1
12	"	RIF3(1)	H	E20-09	B03S1
11	"	RIF2(1)	H	E20-10	B03U1
10	"	RIF1(1)	H	E20-11	B03U2
09	"	RIF0(1)	H	E20-12	B03T2
08	K2-3	BUPP8(1)	H	N/A	B03E2
07	"	BUPP7(1)	H	E14-09	B03J2
06	"	BUPP6(1)	H	E14-10	B03M2
05	"	BUPP5(1)	H	E14-11	B03P2
04	"	BUPP4(1)	H	E14-12	B03R2
03	K2-2	BUPP3(1)	H	E15-09	A03L2
02	"	BUPP2(1)	H	E15-10	A03P2
01	"	BUPP1(1)	H	E15-11	A03S2
00	"	BUPP0(1)	H	E15-12	A03U2

NOTES:

1. THE ROM TEST POINTS CORRESPOND TO THE WORD BEING READ OUT AS DEFINED BY THE CONTENTS OF THE 'UPP''
2. THE UREG TEST POINTS CORRESPOND TO THE WORD BEING EXECUTED AS DEFINED BY THE CONTENTS OF THE 'PUPP''
3. AN 'H'' (HIGH LEVEL) IS OBSERVED IF THE BIT IS PROGRAMMED AS A ''1'' AND A 'L'' (LOW LEVEL) IS OBSERVED IF THE BIT IS PROGRAMMED AS A ''0'' WITH EXCEPTION OF THE 'UPF'' FIELD BITS <7:0> WHEN OBSERVED AT THE OUTPUT OF THE ROM DIRECTLY. IN THIS CASE THE BITS ARE STORED IN 1'S COMPLEMENT FORM.

5.3 KD11-A LOGIC PRINT SUMMARY

THE LOGIC CIRCUIT DESIGN USED TO IMPLEMENT THE KD11-A CPU IS WELL ORGANIZED AND LOGICALLY PARTITIONED INTO FUNCTIONAL AREAS ON THE FIVE MODULES(4 HEX AND 1 QUAD). EACH MODULE IS IDENTIFIED FOR DOCUMENTATION PURPOSES BY A 'KN' NUMBER AS LISTED BELOW AND EACH PRINT APPROPRIATELY ITENTIFIED WITHIN THE PRINT SET:

M7231	DATA PATHS	PRINTS K1-1 THRU K1-9
M7232	UWORD (ROM)	PRINTS K2-1 THRU K2-8
M7233	IR DECODE	PRINTS K3-1 THRU K3-9
M7234	TIMING	PRINTS K4-1 THRU K4-6
M7235	STATUS	PRINTS K5-1 THRU K5-8

THE FIRST PRINT IN EACH SET (KN-1) SHOWS THE PHYSICAL LAYOUT OF THE MODULE AND INCLUDES A COMPONENT PARTS LIST. THE LOGIC PARTITIONING INTO FUNCTIONAL AREAS IS SUMMARIZED IN THE TABLE BELOW:

```
                                        ****** M7231 ******

                                K1-2    DESCRIBES THE LOGIC AREAS THAT SUPPORT THE PRIMARY
                                        DATA PATH FACILITIES FOR BITS<03:00> THAT INCLUDES:

                                                1. UNIBUS DATA RECEIVERS AND DRIVERS
                                                2. REGISTER DATA BUS RECEIVERS
                                                3. 'D'' MULTIPLEXOR
                                                4. 'B'' MULTIPLEXOR
                                                5. 'D'' REGISTER
                                                6. 'B'' REGISTER
                                                7. ARITHMETIC LOGIC UNIT
                                                8. 'BA'' MULTIPLEXOR

                                K1-3    SAME AS THE K1-2 EXCEPT IT SUPPORTS BITS<07:04>

                                K1-4    SAME AS THE K1-2 EXCEP IT SUPPORTS BITS<11:08>

                                K1-5    SAME AS THE K1-2 EXCEPT IT SUPPORTS BITS<15:12>
                                        AND ALSO INCLUDES*

                                                1. ''COUT'' MULTIPLEXOR
                                                2. 'D<C>'' CONTROL FLOP

                                K1-6    DESCRIBES THE LOGIC THAT SUPPORTS:

                                                1. BUS ADDRESS REGISTER (BA)
                                                2. UNIBUS ADDRESS LINE DRIVERS

                                K1-7    DESCRIBES THE IMPLEMENTATION OF:

                                                1. INTERNAL ADDRESS DECODERS
                                                2. 'D'' REGISTER DECODER

                                K1-8    DESCRIBES THE:

                                                1. GENERAL REGESTERS (R00 THRU R17)
                                                2. GENERAL REGISTER ADDRESS SELECTION SWITCHES

                                K1-9    DESCRIBES THE:

                                                1. KY11-D DATA DISPLAY AND SWITCH REGISTER
                                                   INTERFACES
                                                2. CABLE CONNECTOR
```

```
                                        ****** M7232 ******

                                K2-2    DESCRIBES THE:

                                                1. UPP REGISTER BITS<03:00>
                                                2. PUPP REGISTER BITS<03:00>
                                                3. MICROBRANCH CONTROL ''OR'' GATES BITS<03:00>

                                K2-3    DESCRIBES THE:

                                                1. UPP REGISTER BITS<08:04>
                                                2. PUPP REGISTER BITS<08:04>
                                                3. MICROBRANCH CONTROL ''OR'' GATES BITS<07:04>

                                K2-4    DESCRIBES THE:

                                                1. ROM U<16:09>
                                                2. UREG <16:09>

                                K2-5    DESCRIBES THE:

                                                1. ROM U <28:17>
                                                2. UREG <28:17>

                                K2-6    DESCRIBES THE:

                                                1. ROM U <40:29>
                                                2. UREG <40:29>

                                K2-7    DESCRIBES THE:

                                                1. ROM U <52:41>
                                                2. UREG <52:41>

                                K2-8    DESCRIBES THE:

                                                1. ROM U <56:53>
                                                2. UREG <56:53>
                                                3. EXPANSION ROM CONNECTORS
```

```
                                        ****** M7233 ******

                                K3-2    DESCRIBES THE:

                                                1. BUT MULTIPLEXOR

                                K3-3    DESCRIBES THE:

                                                1. INSTRUCTION REGISTER
                                                2. IR DECODERS

                                K3-4    DESCRIBES THE:

                                                1. IR DECODERS
                                                2. ''OVLAP'' DECODER

                                K3-5    DESCRIBES THE:

                                                1. MICRO BRANCH CONTROL LOGIC

                                K3-6    DESCRIBES THE*

                                                1. IR DECODERS (DISCRETE)

                                K3-7    DESCRIBES THE:

                                                1. MICROBRANCH CONTROL LOGIC

                                K3-8    DESCRIBES THE:

                                                1. ''COUT'' MUX CONTROL LOGIC
                                                2. AUX ALU CONTROL MULTIPLEXORS
                                                3. ''CIN'' GENERATION LOGIC

                                K3-9    DESCRIBES THE:

                                                1. ''C'' AND 'V'' BIT CONTROL LOGIC
```

```
                                        ****** M7234 ******

                                K4-2    DESCRIBES THE:

                                                1. CPU CLOCK WITH ASYNCHRONOUS CONTROL LOGIC
                                                2. PRIMARY REGISTER TIMING LOGIC FOR:

                                                        A. UPP AND PUPP REGISTERS
                                                        B. U REGISTER
                                                        C. INSTRUCTION REGISTER
                                                        D. B, D, AND BA REGISTERS
                                                        E. GENERAL REGISTERS - WRITE TIMING

                                K4-3    DESCRIBES THE:

                                                1. JAMUPP CONTROL LOGIC AND TIMING

                                K4-4    DESCRIBES THE:

                                                1. UNIBUS DATA TRANSFER CONTROL LOGIC

                                K4-5    DESCRIBES THE:

                                                1. BUS PRIORITY TRANSFER CONTROL LOGIC

                                K4-6    DESCRIBES THE:

                                                1. PRIORITY ARBITRATION LOGIC FOR 'BR'S''
                                                2. BUS TIMEOUT AND NO SACK TIMEOUT CONTROL
```

```
                                        ****** M7235 ******

                                K5-2    DESCRIBES THE:

                                                1. PROCESSOR STATUS REGISTER
                                                2. PSW CONTROL
                                                3. PSW BUS DRIVERS (UNIBUS AND RD BUS)

                                K5-3    DESCRIBES THE:

                                                1. BRANCH INSTRUCTION DECODERS
                                                2. 'BUT'' DECODER (WORKING BUTS)

                                K5-4    DESCRIBES THE:

                                                1. MISCELLANEOUS HISTORY AND CONTROL FLOPS

                                K5-5    DESCRIBES THE:

                                                1. 'B'' CONSTANTS GENERACTOR
                                                2. TRAP VECTOR ADDRESS GENERATOR

                                K5-6    DESCRIBES THE:

                                                1. CONSOLE CONTROL SWITCH INTERFACE

                                K5-7    DESCRIBES THE:

                                                1. CONSOLE INTERFACE CABLE CONNECTIONS

                                K5-8    DESCRIBES THE:

                                                1. POWER FAIL/AUTO RESTART CONTROL LOGIC
```

6.0 MAINTENANCE PROCEDURES

6.1 INTRODUCTION

THE PROCEDURES OUTLINED IN THIS SECTION ASSUME THAT 'DBQEAA'' CAN BE LOADED INTO CORE AND STARTED. IF THE FAILURE MODE PREVENTS PROGRAM LOADING OR AFFECTS NORMAL POWER UP AND CONSOLE OPERATIONS, THE TECHNICIAN MUST REVERT TO THE MANUAL DEBUG AND CHECKOUT PROCEDURES CONTAINED IN THE 'BCPT'' DOCUMENT.

THE FIVE MODULLS THAT COMPRISE THE KD11-A CENTRAL PROCESSING UNIT OF AN 11/40 SYSTEM CAN BE VIEWED AS CONSISTING OF TWO MAJOR INTERRACTING AND INTERDEPENDENT LOGIC AREAS AS DEPICT- BELOW:

```
                                        DATA IN ****
                                                 *
                                                 *
                                                 V
          **************            *****************
          *            *            *               *
          * CONTROL    *>>>>>>>>>>>>>*    DATA       *
          *  SECTION   *<<<<<<<<<<<<<*     PATHS     *
          *            *            *               *
          **************            *****************
                                                 *
                                                 *
                                                 ***>DATA OUT
```

THE DATA PATHS CONSIST OF A LOGICALLY INTERCONNECTED GROUP OF STATIC DATA FACILITIES (REGISTERS, MULTIPLEXORS, ALU'S ETC.) REQUIRED TO TEMPORARILY STORE, MODIFY, AND TRANSFER DATA ITEMS (16 BIT WORDS OR 8 BIT BYTES) ACCORDING TO THE DESIGN SPECIFICATIONS FOR THE PDP11.

THE CONTROL SECTION SUPPLIES PREDEFINED SEQUENCES OF CONTROL SIGNAL SETS TO ACTIVATE THE REQUIRED DATA FACILITIES WITHIN THE DATA PATHS. IN THE KD11-A THESE CONTROL SIGNAL SETS ARE STORED IN A READ ONLY MEMORY (ROM) AND GENERATED BY READING OUT A UNIQUE SEQUENCE OF ROM WORDS FOR EACH OPERATION TO BE PERFORMED.

THE SEQUENCE GENERATED BY THE CONTROL SECTION IS VARIABLE AND DEPENDENT UPON THE INSTRUCTION OR LOGIC OPERATION BEING EXECUTED. THERE ARE HUNDREDS OF THESE SEQUENCES POSS- IBLE DEPENDENT UPON OF THE PROGRAM CODING.

'DBQEAA'' IS DESIGNED TO GENERATE ALL POSSIBLE MICROINSTRUCTION SEQUENCES AND COMBINATIONS OF DATA AND CONTROL SIGNALS. THE INDIVIDUAL TESTS ARE LOGICALLY SEQUENCED AND STRUCTURED TO DETECT AND ISOLATE PARTICULAR MICROPROGRAM SEQUENCES THAT ARE FAULTY.

6.2 MICROPROGRAMMING / LOGIC INFORMATION

ALL OF THE TESTS DESIGNED TO TEST AND VERIFY A SPECIFIC INSTRUCTION OR LOGIC OPERATION CONTAIN A MAINTENANCE HEADER IN THE LISTING AT THE BEGINNING OF THE TEST. THIS HEADER PROVIDES THE TECHNICIAN WITH DETAILED MICROPROGRAMMING AND LOGIC INFORMATION RELATIVE TO THE INSTRUCTION OR LOGIC OPERATION BEING TESTED. THIS SECTION OF THE DOCUMENT DESCRIBES THE FORMAT AND CONTENT OF THIS INFORMATION AND SUGGESTS WAYS THAT THE TECHNICIAN MAY USE IT TO ISOLATE FAULTS TO THE FAILING MODULE OR IC.

INFORMATION FORMAT:

THE MAINTENANCE HEADER SHOWN BELOW IS FOR THE TEST THAT VERIFIES THE OPERATION OF THE INSTRUCTION:

```
'DECB   1(SP)''
```

WHERE: 1)THE INITIAL CONTENTS OF THE STACK WORD IS 000000
2)THE DEC (DECREMENT) MODIFIES THIS TO 177400 (DEC ODD BYTE)

HEADER:

```
;MICROPROGRAMMING / LOGIC INFORMATION

;ROM SEQ:       [166,261,262,267,237,270,222,253,075,374,375,
                016] FC 1,3,9,8

;ACT BUTS:      37[004]100,166 / 17[166]262,262 / 33[266]220,237
                34[237]220,222 / 16[374]016,016

;EXEC:          [222]ALUC=LHHHH :[375] D=177400

;CODES:         [253]SPS=1, [275]SPS=3 / N:C = 1000

;SYNC:          B05J2  (-)  T = 4.0 USEC

;KEY SIG:       K3-3 DM=6 L / K3-4 DEC L / K3-6 BYTE INSTR H
                K3-7 ODD BYTE L
```

1) ROM SEQ ENTRIES:

THIS LISTS THE ROM ADDRESS SEQUENCE THAT MUST BE GENERATED TO PROPERLY EXECUTE THE INSTRUCTION. IT BEGINS WITH THE FIRST ROM WORD AFTER FETCH AND INCLUDES ALL MICROWORDS UP TO THE BEGINNING OF THE NEXT FETCH. THIS IS THE SEQUENCE THE TECHNICIAN SHOULD OBSERVE WHEN CLOCKING THE ROM USING THE KM-11 MAINTENANCE MODULE. IT ALSO INCLUDES A LIST OF THE FLOW CHART NUMBERS TO REFER TO TO OBTAIN THE DETAILS OF EACH MICROWORD.

2) ACT BUTS (ACTIVE MICROBRANCH TESTS) ENTRIES:

THIS IS A LIST OF ONE OR MORE ENTRIES THAT INDICATE
ALL THE MICROBRANCHES THAT OCCUR DURING THE SEQUENCE.
EACH ENTRY CONSISTS OF FOUR OCTAL NUMBERS AND EACH
SEPARATE ENTRY IS DELIMITED BY A "/". THE NO.S ARE
INTERPRETED AS FOLLOWS:

A) THE FIRST NO. IS THE OCTAL CODE OF THE
BUT (UBF <4:0> FIELD)
B) THE SECOND NO. (IN BRACKETS) INDICATES
THE ADDRESS OF THE WORD CONTAINING THE BUT
C) THE THIRD NO. INDICATES THE ENCODING OF THE
NEXT FIELD (UPF <7:0>). THIS IS THE BASE
ADDRESS THAT MAY OR MAY NOT BE MODIFIED BY
THE MICROBRANCH TEST.
D) THE FOURTH NO. INDICATES THE RESULT OF THE
MICROBRANCH MODIFICATION. BY COMPARING THIS
NO. WITH THE NEXT FIELD IT IS POSSIBLE TO
DETERMINE WHICH MICROBRANCH CONTROL SIGNALS
MUST BE ASSERTED TO OBTAIN THE PROPER ROM
SEQUENCE.

THE KEY TO GENERATING THE PROPER MICROINSTRUCTION
SEQUENCE IS WHAT THE "BUT" DOES TO GENERATE THE
MICROBRANCH CONTROL SIGNALS (K3-2 BUBC<5:0>).
FROM THE "ACT BUTS" INFORMATION THE TECHNICIAN CAN
QUICKLY DETERMINE WHICH OF THESE SIGNALS MUST BE
ACTIVE TO GENERATE THE PROPER ROM SEQUENCE.

FOR EXAMPLE THE ENTRY: 37[004]100,166

INDICATES THAT THE BUT37 IN LOC 004 MUST MODIFY THE
ROM ADDRESS IN SUCH A WAY THAT THE 100 (NEXT FIELD)
GETS CHANGED TO A 166. THIS MEANS THAT WE MUST SOME-
HOW "OR" IN A 066 WITH THE BASE ADDRESS OF 100. THIS
IS DONE BY GENERATING THE FOLLOWING CONTROL SIGNALS:

K3-2 BUBC5, BUBC4, BUBC2, AND BUBC1

ALL OF THESE SIGNALS CAN BE OBSERVED AT THE OUTPUT
OF THE "BUT MUX" ON THE K3-2 PRINT. IT IS IMPORTANT
THAT THEY BE OBSERVED WHEN THE PUPP=004 WHIC IS
THE WORD CONTAINING THE BUT37.

SINCE OVER 50% OF THE LOGIC FAULTS THAT CAN OCCUR
IN THE KD11-A WILL MANIFEST THEMSELVES BY CAUSING
AN INCORRECT ROM SEQUENCE TO BE GENERATED, THIS
INFORMATION PROVIDES THE TECHNICIAN WITH A CONVENIENT
STARTING POINT TO PROCEED TO ISOLATE THE FAULTY COMP-
ONENT.

3) EXEC ENTRIES:

THESE ENTRIES DESCRIBE TWO IMPORTANT MICROWORDS.

A) THE WORD THAT EXECUTES THE INSTRUCTION

```
1502
1503                                    B) THE WORD WHERE THE RESULT MAY BE OBSERVED
                                           IN THE DATA DISPLAY ON THE CONSOLE
```

THE FIRST ENTRY INCLUDES A ROM ADDRESS THAT CONTAINS THE MICROINSTRUCTION THAT EXECUTES THE INSTRUCTION AND INCLUDES THE REQUIRED STATE OF THE ALU CONTROL SIGNALS TO PERFORM THE CORRECT OPERATION ON THE DATA AS DESCRIBED BELOW:

ALUC = ALU M,S<3:0> = LHHHH

WHICH MEANS THE LOGIC LEVELS SHOWN BELOW MUST EXIST:

K3-8 ALUM L
K3-8 ALUS3 H
K3-8 ALUS2 H
K3-8 ALUS1 H
K3-8 ALUS0 H

THE SECOND ENTRY SPECIFIES THE ROM ADDRESS WHERE THE RESULT IS DISPLAYED IN THE CONSOLE DATA DISPLAY. IN THE EXAMPLE SHOWN WITH THE ROM AT PUPP=375 THE DATA DISPLAY ON THE CONSOLE SHOULD CONTAIN A 177400.

4) CODES ENTRIES:

THIS ENTRY SPECIFIES THE SPS CODES USED TO ALTER THE FLAGS AND THE ROM WORDS THAT CONTAIN THESE CODES. WHERE APPLICABLE IT ALSO SPECIFIES HOW THE CODES SHOULD APPEAR AFTER THE INSTRUCTION. IN THE EXAMPLE:

N:C = 1000 MEANS THE THE 'N' BIT IS SET AND THE 'Z','V', AND 'C' BITS ARE CLEAR.

5) SYNC ENTRIES:

THIS INFORMATION CONTAINS A BACKBOARD PIN NO. THAT MAY BE USED TO SYNC DURING A SCOPE LOOP, THE SCOPE TRIGGER SLOPE (-) TRAILING EDGE TO USE, AND THE APPROXIMATE SETTING OF THE HORIZONTAL SWEEP LENGTH. THIS INSURES THAT WHEN LOOPING ON A TEST, ONLY THE AREA OF INTEREST (THE TEST INSTRUCTION) IS DISPLAYED. THIS MINIMIZES THE POSSIBILITY OF LOOKING AT SIGNALS AT THE 'WRONG TIME'.

6) KEY SIGNALS:

THIS ENTRY CONTAINS A LIST OF UNIQUE SIGNALS THAT MUST BE ACTIVATED TO PROPERLY EXECUTE THE OPERATION UNDER TEST. THIS ALSO HELPS TO POINT THE TECHNICIAN TO THE KEY FUNCTIONAL AREAS OF LOGIC IN THE PRINT SETS.

6.3 KM11 MAINTENANCE MODULE

A. PURPOSE

THE KM11 MAINTENANCE MODULE OPTION PROVIDES THE TECH-

NICIAN WITH A MECHANISM FOR SINGLE CLOCKING THE KD11-A MICRO-
PROGRAM. IT ALLOWS HIM TO VERIFY THAT THE PROPER ROM SEQUENCES

ARE BEING GENERATED AND ALSO TO "FREEZE" THE ROM AT ANY ADDRESS AND CHECK THE CONTROL AND DATA PATH SIGNALS THAT SHOULD BE ACTIVE FOR THE PARTICULAR MICROWORD BEING INVESTIGATED.

B. BASIC COMPONENTS

1. W130 — SINGLE HEIGHT MODULE THAT CONTAINS THE INDICATOR DRIVERS FO THE W131 AND ALSO DOUBLES AS A MODULE EXTENDER FOR THE W131. WHEN INSTALLED IT PLUGS INTO SLOT "F1" IN THE KD11-A BACKPLANE WHICH IS PREWIRED TO ACCEPT THE KM11.

2. W131 — SINGLE HEIGHT MODULE THAT CONTAINS THE INDICATOR LAMPS AND CONTROL SWITCHES WITH FILTERS. IT PLUGS INTO THE W130 WHEN INSTALLED.

3. KD11-A OVERLAY (5509081-0-12)

A PLASTIC ETCHED OVERLAY THAT DEFINES THE INDICATORS AND SWITCHES ON THE W131.

C. INDICATORS

PUPP<08:00> — NINE INDICATOR LAMPS THAT DISPLAY THE CONTENTS OF THE PUPP (PAST MICROPROGRAM POINTER). THEY INDICATE THE ADDRESS OF THE MICROWORD THAT IS CURRENTLY STORED IN THE "UREG" (THIS WORD IS EXECUTED ON THE NEXT CLOCK PULSE)

BUPP<08:00> — NINE INDICATOR LAMPS THAT DISPLAY THE CONTENTS OF THE "UPP" (MICROPROGRAM POINTER).THEY INDICATE THE ADDRESS OF THE MICROWORD THAT IS CURRENTLY BEING READ OUT OF THE ROM. THIS MICROWORD IS LOADED INTO THE UREG ON THE NEXT CLOCK AND THE CONTENTS OF THE UPP GETS TRANSFERRED INTO THE PUPP.

<T,N:C> — FIVE INDICATORS THAT DISPLAY THE STATE OF THE FOLLOWING PSW FLAGS:

"T" BIT
"N" BIT
"Z" BIT
"V" BIT
"C" BIT

MSYN — A SINGLE INDICATOR THAT DISPLAYS THE STATE OF BUS MASTER SYNC.

SSYN — A SINGLE INDICATOR THAT DISPLAYS THE STATE OF BUS SLAVE SYNC.

NOTE:

THE STATE OF ALL INDICATOR LAMPS IS DEFINED AS FOLLOWS:

```
1618
1619                                                    'ON'   (1), ASSERTED, ACTIVE
1620                                                    'OFF'  (0), NEGATED, INACTIVE
```

D. SWITCHES

MCLK ENAB — WHEN ACTIVE THIS SWITCH DISABLES THE INTERNAL PROCESSOR CLOCK AND ALLOWS TOGGLING A MAINT ENTANCE CLOCK USING THE 'MCLK'' SWITCH.

MCLK — WHEN ACTIVATED (ON-OFF SEQUENCE) THIS SWITCH GENERATES ONE CLOCK PULSE TO THE KD11-A.

MSTOP — WHEN ACTIVE THIS SWITCH ENABLES TURNING OFF THE PROCESSOR CLOCK WHEN THE CONTENTS OF BUPP<8:0> MATCHES THE ADDRESS CONTAINED IN SR<8:0> IN THE CONSOLE SWITCH REGISTER. WHEN THE CLOCK STOPS, THE CONTENTS OF THE ROM ADDRESS SELECTED BY SR<8:0> IS STORED IN THE 'UREG'' AND THE ADDRESS ITSELF CONTAINED IN THE 'PUPP''.

NOTE:

ALL SWITCHES ARE INACTIVE WHEN POSITIONED TOWARD THE INDICATOR DISPLAY ON THE W131. AN ''ARROW'' ETCHED ON THE OVERLAY SIGNIFIES THE DIRECTION OF THE ACTIVE POSITION.

E. TYPICAL OPERATING PROCEDURES

1. INSTALLATION

A) TURN OFF ALL POWER TO THE KD11-A
B) SLIDE OUT THE KD11-A FROM THE CABINET
C) OPEN THE HINGED COVER ON THE LEFT SIDE
D) PLUG THE W130 INTO SLOT F1
E) PLUG THE W131 INTO THE W130 (WITH OVERLAY ATTACHED)

*********CAUTION*********

INSURE THAT THE HINGED COVER IS SECURED PROPERLY TO PREVENT IT FROM SWINGING FORWARD AND SHORTING THE PRINTED CIRCUIT ETCH ON THE BACK OF THE W131.

D) PLACE ALL THREE SWITCHES ON THE W131 TO 'OFF''
E) TURN ON THE KD11-A POWER AND LOAD AND START THE ''DBKDAA'' DIAGNOSTIC.

2. OPERATION

A) ESTABLISH A SCOPE LOOP ON THE FAILING TEST
B) CONSULT THE LISTING FOR THAT TEST TO DETERMINE IF THE SCOPE SYNC INSTRUCTION IS A SET OR CLEAR CONDITION CODES AND SET UP SR<8:0> ON THE CONSOLE AS FOLLOWS:

SET CODES SR<8:0> = 352
CLR CODES SR<8:0> = 351

```
C) PLACE THE 'MSTOP'' SWITCH IN THE ACTIVE POSITION.
   THE CLOCK SHOULD STOP AND FREEZE THE ROM WITH THE
   ADDRESS OF THE FIRST MICROWORD USED TO FETCH THE
   TARGET INSTRUCTION CONTAINED IN THE 'UPP'' REG.
```

D) PLACE THE 'MCLK ENAB'' SWITCH ON AND THE 'MSTOP''
SWITCH OFF.

E) NOW YOU ARE READY TO ''TOGGLE'' THROUGH THE ROM
SEQUENCE FOR THE TEST INSTRUCTION USING THE 'MCLK''
SWITCH TO LOCATE AND ISOLATE THE FAILING MICROWORD.
EACH TIME THE 'MCLK'' SWITCH IS TOGGLED THE CONTENTS
OF THE 'BUPP'' AND 'PUPP'' INDICATORS SHOULD CHANGE
TO INDICATE THE ROM SEQUENCE BEING GENERATED.
COMPARE THIS SEQUENCE WITH THE CORRECT SEQUENCE
INDICATED BY THE MAINTENANCE HEADER INCLUDED IN THE
PROGRAM LISTING.

6.4 UPP MATCH MAINTENANCE FEATURE

THERE IS A VALUABLE HARDWARE MAINTENANCE AID BUILT INTO THE KD11-A LOGIC THAT PROVIDES THE TECHNICIAN WITH A METHOD OF ANALYZING THE ROM SEQUENCES BEING GENERATED. IT IS CONTAINED ON THE K1 MODULE AND CONSISTS OF A COMPARATOR CIRCUIT (K1-9 PRINT) THAT ALLOWS TWO UNIQUE LOGIC SIGNALS TO BE GENERATED AS A FUNCTION OF THE ROM ADDRESS CONTAINED IN THE 'UPP'' AND THE SETTING OF THE CONSOLE SWITCH REGISTER SR<8:0>.

```
                    **************
SR<8:> ---->*  MATCH      *---> UPP MATCH H
            *  CIRCUIT    *
BUPP<8:0>-->*             *---> P MATCH L
                    **************
```

UPP MATCH H — THIS SIGNAL IS ASSERTED WHENEVER A MATCH OCCURS BETWEEN THE CONTENTS OF THE 'UPP'' AND THE CONTENTS OF SR<8:0>. IT CAN BE OBSERVED ON BACKPLANE PIN C04L2 AND IS USEFUL FOR DETERMINING IF AND WHEN A SPECIFIC ROM WORD IS ACCESSED DURING A PARTICULAR ROM SEQUENCE. IT MAY BE USED AS A SCOPE SYNC TRIGGER OR AS A REFERENCE SIGNAL FOR INVESTIGATING ADDITIONAL CONTROL SIGNALS THAT SHOULD OCCUR DURING A SPECIFIC MICROWORD.

P MATCH L — THIS SIGNAL WORKS IN CONJUNCTION WITH THE 'MSTOP'' SWITCH ON THE KM11 MAINTENANCE MODULE TO STOP THE CLOCK AND ''FREEZE'' THE ROM AT A SPECIFIC ROM ADDRESS. AS DESCRIBED IN PARA. 6.3 (E2), IT IS USEFUL FOR INITIALLY STOPPING THE ROM AT THE CORRECT POINT PRIOR TO SINGLE CLOCKING ROM SEQUENCES.

7.0 FLOW CHARTS

7.1 FUNCTIONAL FLOW

```
                 ******************
                 * BASIC          *
>>>>>>>>>>>>>>>* INSTRUCTION    *
I                * TESTS (BIT)    *
I                ******************
I                        I
I                        I
I                        I
I                ******************
I                * COMPREHENSIVE *
I                * INSTRUCTION   *
I                * TESTS (CIT)   *>>>>>>>V
I                ******************       V
I                        I                V
I                        I                V
I                        I                V
I                ******************       V
I                * COMBINED       *       V
I                * INSTRUCTION    *       V
I                * EXERCISER(IEX)*>>>>>>>V
I                ******************       V
I                        I                V
I                        I                V
I                        I                V
I                ******************       V
I                * END OF PASS    *       V
I                * SERVICE        *>>>>>>>V
I                ******************       V
I                        I                V
I                        I                V
I<<<<<<<<<<<<<<<<<<<<<<<<                  V
                                 ******************
                                 *                *
                                 *  UTILITIES     *
                                 *                *
                                 ******************
```

7.2 SUB-FUNCTIONAL FLOWS

A. BASIC INSTRUCTION TESTS SECTION

```
                    ******************
                    * "BIT" STARTUP *
                    * SET UP STACK  *
                    * POINTER AND   *
                    * INIT FLAGS AND*
                    * COUNTERS.     *
                    ******************
                           I
                           I
T0001-T0006
**********************************
* SIX BASIC TESTS TO VERIFY THE *
* BNE,BEQ, AND BPL INSTRUCTIONS *
* FOR BOTH THE "1" AND "0" STATE*
* OF THE "Z" AND "N" FLAGS.     *
**********************************
                           I
T0007-T0017                I
**********************************
* NINE BASIC TESTS OF THE MOV,  *
* CMP, AND MOVB INSTRUCTIONS AS *
* THEY ARE USED TO CLEAR THE    *
* MISSED TEST TABLE.            *
**********************************
                           I
**********************************
* ROUTINE TO CLEAR THE MISSED   *
* TEST TABLE - BEGIN FLAGGING   *
* EACH TEST ENTERED STARTING    *
* WITH T0020                    *
**********************************
                           I
T0020-T0035                I
**********************************
* FOURTEEN BASIC TESTS OF THE   *
* SINGLE OPERAND INSTRUCTIONS IN*
* THE FORMATS USED BY THE       *
* UTILITIES (TST,COM,INC,DEC,CLR*
* AND ASL/ROL)                  *
**********************************
                           I
T0036-T0041                I
**********************************
* FOUR BASIC TESTS OF THE TSTB  *
* INSTRUCTION FOR BOTH EVEN AND *
* ODD ADDRESSES.                *
**********************************
                           I
T0042                      I
**********************************
* BASIC TEST OF THE DECB INSTR- *
```

```
                                        * UCTION IN ADDRESS MODE 6      *
                                        * USING THE STACK POINTER.       *
                                        ***********************************
                                                        I
```

```
                                        I
                                T0043-T0062     I
                                ***********************************
                                * SIXTEEN BASIC TESTS TO VERIFY *
                                * THE MOVE INSTRUCTION IN THOSE *
                                * FORMATS USED BY THE UTILITIES *
                                ***********************************
                                        I
                                T00063-T0066    I
                                ***********************************
                                * FOUR BASIC TESTS OF THE COMP- *
                                * ARE INSTRUCTION IN THOSE FORM-*
                                * ATS USED BY THE UTILITIES     *
                                ***********************************
                                        I
                                T0067-T0074     I
                                ***********************************
                                * SIX BASIC TESTS OF THE LOGIC  *
                                * INSTRUCTIONS (BIS,BIC,BIT) AS *
                                * USED BY THE UTILITIES.        *
                                ***********************************
                                        I
                                T0075-T0076     I
                                ***********************************
                                * TWO BASIC TESTS OF THE ADD    *
                                * INSTRUCTIONS AS IT IS USED BY *
                                * THE UTILITIES.                *
                                ***********************************
                                        I
                                T0077-T0103     I
                                ***********************************
                                * FOUR BASIC TESTS OF THE CMPB  *
                                * INSTRUCTIONS USING BOTH EVEN  *
                                * AND ODD ADDRESSES.            *
                                ***********************************
                                        I
                                T0104-T0123     I
                                ***********************************
                                * SIXTEEN BASIC TESTS OF THE    *
                                * MOVB INSTRUCTION USING BOTH   *
                                * EVEN AND ODD ADDRESSES AND IN *
                                * ALL ADDRESS MODES USED BY THE *
                                * THE UTILITIES.                *
                                ***********************************
                                        I
                                T0124-T0125     I
                                ***********************************
                                * TWO TESTS TO VERIFY THE BASIC *
                                * RTS/JSR INSTRUCTIONS AS USED  *
                                * IN THE UTILITIES.             *
                                ***********************************
                                        I
                                T0126-T0127     I
                                ***********************************
                                * TWO BASIC TESTS OF THE RTI    *
                                * INSTRUCTION.                  *
```

```
1894                                    **********************************
1895                                                   I
1896
```

```
                                                  .
                                                  I
                                                  I
                                        T0130-T0137
                                        ***********************************
                                        * EIGHT BASIC TESTS OF THE VAR- *
                                        * IOUS TRAP TYPE INSTRUCTIONS   *
                                        * TO VERIFY THAT THE UTILITIES  *
                                        * CAN BE CALLED VIA THE TRAP    *
                                        * MECHANISM. (IOT,TRAP,EMT, AND *
                                        * RSVD INSTR AND BUS TIMEOUT    *
                                        * TRAPS)                        *
                                        ***********************************
                                                  I
                                                  I
                                        T0140-T0144
                                        ***********************************
                                        * FIVE BASIC TESTS TO VERIFY THE*
                                        * DL11 INTERFACE USED TO REPORT *
                                        * ERRORS. THE MAINTENANCE MODE  *
                                        * FEATURE IS USED TO TURNAROUND *
                                        * AND CHECK AN ALL 1'S ALL 0'S  *
                                        * SEQUENCE.                     *
                                        ***********************************
                                                  I
                                                  I
                                              ********************
                                              * ENTER THE ''CIT'' *
                                              *     SECTION      *
                                              ********************
```

B. COMPREHENSIVE INSTRUCTION TESTS SECTION

```
                    ******************
                    * FROM 'BIT' SEC*
                    ******************
                           I
                           I
        ***********************************
        * START-UP ROUTINE FOR THE 'CIT'*
        * (COMPREHENSIVE INSTRUCTION    *
        * TESTS SECTION). THE FOLLOWING:*
        * FUNCTIONS ARE PERFORMED:      *
        *   1) SET UP REQUIRED VECTORS  *
        *   2) CALL SUBROUTINE TO SET   *
        *      BITS IN 'OPTION' TO IND- *
        *      ICATE INTERNAL OPTIONS   *
        *      FOUND.                   *
        *   3) PRINT PROGRAM NAME       *
        *   4) PRINT OPTIONS FOUND      *
        *   5) CLEAR THE PSW AND INIT-  *
        *      THE 'SCOPE LOOP' RETURN  *
        ***********************************
                           I
        T0145-T0146        I
        ***********************************
        * TWO QUICK VERIFY TESTS OF THE *
        * BASIC CONDITIONAL BRANCHES    *
        * (BMI,BEQ,BVS,BCS) FOR BOTH    *
        * THE '1' AND '0' STATE OF THE  *
        * PERTINENT PSW FLAG.           *
        ***********************************
                           I
        T0147-T0223        I
        ***********************************
        * FORTY-FIVE LOGICALLY SEQUENCED*
        * TESTS TO VERIFY ALL THE BRANCH*
        * INSTRUCTIONS FOR ALL PERTIN-  *
        * ENT COMBINATIONS OF THE PSW   *
        * FLAGS. THESE TESTS FOCUS ON   *
        * THE BRANCH MICROROUTINES ON   *
        * FLOW CHART 7 AND THE BRANCH   *
        * INSTR DECISION LOGIC ON THE   *
        * K5-3 PRINT.                   *
        ***********************************
                           I
        T0224-T0227        I
        ***********************************
        * THESE FOUR TESTS VERIFY THE   *
        * SXT INSTR. IN MODE 0. THEY    *
        * FOCUS ON THE (SXT*DM0) MICRO- *
        * ROUTINE ON FLOW CHART 8       *
        ***********************************
                           I
```

```
T0230-T0233      I
                 ************************************
                 * THESE FOUR TESTS VERIFY THE      *
                 * SXT INSTR. IN MODE 1 AND 2.      *
                 * THEY FOCUS ON THE (SXT*-DMO)     *
                 * MICROROUTINE ON FLOW CHART 8     *
                 * AND THE BUT33 IN ROM LOCATIONS*
                 * 260 AND 266 ON FLOW CHART 3      *
                 ************************************
                                  I
T0234-T0235      I
                 ************************************
                 * TWO TESTS TO VERIFY THE SWAB     *
                 * INSTR. IN MODE 0. THEY FOCUS     *
                 * ON THE (SWAB*DMO) MICROROUTINE*
                 * ON FLOW CHART 7.                 *
                 ************************************
                                  I
T0236-T0237      I
                 ************************************
                 * TWO TESTS TO VERIFY THE SWAB     *
                 * INSTR. IN MODE 1. THEY FOCUS     *
                 * ON THE (SWAB) MICROROUTINE ON    *
                 * FLOW CHART 9                     *
                 ************************************
                                  I
T0240-T0243      I
                 ************************************
                 * FOUR TESTS TO VERIFY THE NEG     *
                 * INSTR. IN MODE 0 THAT FOCUS ON*
                 * THE (SOPMORE*DMO*NEG) MICRO-*
                 * ROUTINE ON FLOW CHART 7.         *
                 ************************************
                                  I
T0244-T0247      I
                 ************************************
                 * FOUR TESTS TO VERIFY THE NEG     *
                 * INSTRUCTION IN MODE 1 THAT       *
                 * FOCUS ON THE [(SWAB+SOPMORE)     *
                 * *-DMO*NEG] MICROROUTINE ON       *
                 * FLOW CHART 9.                    *
                 ************************************
                                  I
T0250-T0273      I
                 ************************************
                 * TWENTY TESTS THAT VERIFY THE     *
                 * ROR/ASR INSTRUCTIONS THAT        *
                 *FOCUS ON THE (ROTSHF) MICRO-     *
                 * ROUTINES ON FLOW CHART 9. BOTH*
                 * WORD AND BYTE OPERATIONS ARE     *
                 * TESTED FOR BOTH EVEN AND ODD     *
                 * ADDRESSES.                       *
                 ************************************
                                  I
```

```
T0274-T0323      I
**********************************
* TWENTY FOUR TESTS THAT VERIFY *
* ALL SINGLE OPR. INSTR. OTHER  *
* THAN SXT,SWAB,NEG,ASR,ROR, OR *
* JMP. THEY FOCUS ON THE MODE 0 *
* CASE AND THE MICROROUTINE     *
* (SOPMORE*DMO*-NEG) ON FLOW    *
* CHART 7.                      *
**********************************
                 I
T0324-T0353      I
**********************************
* TWENTY FOUR TESTS SIMILAR TO  *
* THE PREVIOUS GROUP EXCEPT     *
* THEY HANDLE THE NON MODE 0    *
* CASE FOCUSING ON THE (SOPMORE *
* +SWAB)*-NEG*-DMO MICROROUTINE *
* ON FLOW CHART 9               *
**********************************
                 I
T0354-T0370      I
**********************************
* THIRTEEN TESTS USING THE CLR  *
* AND NEG INSTRUCTIONS TO VERIFY*
* THE BYTE MICROROUTINES THAT   *
* SUPPORT SINGLE OPERAND INSTR- *
* UCTIONS FOR BOTH EVEN AND ODD *
* ADDRESS CASES.                *
**********************************
                 I
T0371-T0417      I
**********************************
* TWENTY THREE TESTS THAT USE   *
* THE ADD INSTRUCTION TO VERIFY *
* THE SOURCE AND DESTINATION    *
* MICROBRANCHES ON FLOW CHARTS  *
* 2 AND 3.                      *
**********************************
                 I
T0420-T0427      I
**********************************
* EIGHT TESTS THAT VERIFY THE   *
* XOR INSTRUCTION FOR BOTH THE  *
* MODE 0 AND 1 CASES.           *
**********************************
                 I
T0430-T0444      I
**********************************
* THIRTEEN TESTS THAT VERIFY THE*
* MICROWORDS UNIQUE TO THE SUB- *
* TRACT INSTR. FOCUSING ON ROM  *
* LOCATIONS 363,370, AND 365.   *
**********************************
                 I
```

```
T0445-T0452     I
*********************************
* SIX TESTS USING THE NEG INSTR-*
* TO VERIFY FETCH TO DESTINATION*
* MICROBRANCHES FOR SINGLE OPER-*
* ERAND INSTRUCTIONS USING DM2  *
* THRU DM7.                     *
*********************************
                I
T0453-T0536     I
*********************************
* FIFTY TWO MOVE INSTRUCTION    *
* TESTS THAT FOCUS ON ALL THE   *
* POSSIBLE MOV MICROINSTRUCTION *
* SEQUENCES ON FLOW CHART 4 AND *
* ALL MICRBRANCHES ENTERING AND *
* EXITING THIS SHEET.           *
*********************************
                I
T0537-T0602     I
*********************************
* THIRTY SIX TESTS THAT VERIFY  *
* THE BIS,BIC,BIT, AND CMP INSTR*
* UCTIONS IN ALL SOURCE AND DEST*
* MODE COMBINATIONS FOR WORD OPS*
*********************************
                I
T0603-T0616     I
*********************************
* TWELVE TESTS THAT USE THE BIS *
* INSTRUCTION TO VERIFY THE     *
* BYTE MICROROUTINES THAT SUPP- *
* DOUBLE OPERAND INSTRUCTIONS   *
* FOR BOTH THE EVEN AND ODD CASE*
*********************************
                I
T0617-T0634     I
*********************************
* FOURTEEN TESTS THAT VERIFY THE*
* JMP MICROUTINES ON FLOW CHART *
* 5 AND ALL MICROBRANCHES WITH- *
* WITHIN THESE ROUTINES.        *
*********************************
                I
T0635-T0647     I
*********************************
* TEN TESTS TO VERIFY THE JSR   *
* MICROUTINE ON FLOW CHART 5 AND*
* ALL MICROBRANCHES INTO THIS   *
* ROUTINE.                      *
*********************************
                I
T0647-T0654     I
*********************************
* SIX TESTS TO VERIFY THE SOB   *
* INSTRUCTION FOCUSING ON THE   *
```

```
                                        * MICROROUTINES ON FLOW CHART 7 *
                                        * BOTH THE BRANCH AND NO BRANCH *
                                        * CASES ARE TESTED.             *
                                        ***********************************
```

```
                                        T0655-T0656     I
                                        ***********************************
                                        * TWO TESTS TO VERIFY THE RTS     *
                                        * MICROROUTINE ON FLOW CHART 6    *
                                        ***********************************
                                                        I
                                        T0657-T0660     I
                                        ***********************************
                                        * TWO TESTS TO VERIFY THE RTT     *
                                        * MICROROUTINE ON FLOW CHART 6    *
                                        ***********************************
                                                        I
                                        T0661-T0662     I
                                        ***********************************
                                        * TWO TESTS TO VERIFY THE MARK    *
                                        * MICROROUTINE ON FLOW CHART 5    *
                                        ***********************************
                                                        I
                                        T0663-T0667     I
                                        ***********************************
                                        * FIVE TESTS TO VERIFY THE INT-   *
                                        * EGRITY OF THE KW11-L LINE       *
                                        * CLOCK OPTION. THESE TESTS ARE   *
                                        * SKIPPED IF THE KW11-L IS NOT    *
                                        * INSTALLED.                      *
                                        ***********************************
                                                        I
                                        T0670-T0673     I
                                        ***********************************
                                        * FOUR TESTS THAT VERIFY THE      *
                                        * RESET AND WAIT INSTRUCTIONS     *
                                        * THAT FOCUS ON THE SERVICE MIC-  *
                                        * ROROUTINE ON FLOW CHART 10 AND  *
                                        * THE RESET MICROROUTINE ON FLOW  *
                                        * CHART 6.                        *
                                        ***********************************
                                                        I
                                        T0674-T0715     I
                                        ***********************************
                                        * EIGHTEEN TESTS THAT VERIFY THE  *
                                        * PRIORITY ARBITRATION LOGIC      *
                                        * FOR BR REQUESTS. THEY FOCUS     *
                                        * ON THE SERVICE AND TRAP MICRO-  *
                                        * ROUTINES ON FLOW CHARTS 10 AND  *
                                        * 6. SEVERAL OF THESE TESTS MAY   *
                                        * BE SKIPPED IF THE KW11-L IS     *
                                        * NOT INSTALLED.                  *
                                        ***********************************
                                                        I
                                                        I
                                                ******************
                                                * GO TO ''IEX''   *
                                                *   SECTION      *
                                                ******************
```

```
                    C. COMBINED INSTRUCTION EXERCISER TEST SECTION

                                  ******************
                                  * ''IEX'' ENTRY    *
                                  ******************
                                          I
                         T0716            I
                         ************************************
                         * TEST TO VERIFY THAT THE 'BPT'' *
                         * INSTRUCTION CAUSES A TRAP TO   *
                         * THE VECTOR AT LOC. 14          *
                         ************************************
                                          I
                         T0717-T0734      I
                         ************************************
                         * FOURTEEN TESTS TO VERIFY THAT  *
                         * THE STACK OVERFLOW (BOTH RED   *
                         * AND YELLOW ZONE) MECHANISM AND*
                         * THE ODD ADDRESS TRAP MECHANISM*
                         *FUNCTION PROPERLY FOR ALL CASES*
                         * OF ODD ADDR. ERRORS AND STACK  *
                         * OVERFLOW.                      *
                         ************************************
                                          I
                         T0735-T0736      I
                         ************************************
                         * TWO TESTS TO VERIFY THAT THE   *
                         * JMP AND JSR CAUSE AN ILLEGAL   *
                         * INSTRUCTION TRAP TO THE VECTOR*
                         * AT LOCATION 4 WHEN ENCODED IN  *
                         * ADDRESS MODE 0.                *
                         ************************************
                                          I
                         T0737-T0740      I
                         ************************************
                         * TWO TESTS TO VERIFY THE BUS    *
                         * TIMEOUT AND ''T'' BIT TRAP     *
                         * MECHANISM.                     *
                         ************************************
                                          I
                         T0741-T0743      I
                         ************************************
                         * THREE TESTS TO VERIFY THAT A   *
                         * ''RED'' ZONE TRAP IS SPRUNG IF *
                         * AN ATTEMPT IS MADE TO PUSH     *
                         * INTO THE PSW,SR, OR SLR USING  *
                         * R6. T0743 IS CONDITIONAL ON    *
                         * WETHER THE KJ11-A OPTION IS    *
                         * INSTALLED OR NOT.              *
                         ************************************
                                          I
```

```
                                        T0744-T0754     I
                                        ***********************************
                                        * NINE TESTS TO VERIFY THAT A     *
                                        * RSVD INSTRUCTION TRAP IS SPRU-*
                                        * NG FOR ALL CASES OF RESERVED    *
                                        * OPERATION CODES.                *
                                        ***********************************
                                                        I
                                        T0755-T1007     I
                                        ***********************************
                                        * TWENTY SEVEN TESTS THAT USE     *
                                        * THE "T" BIT TRAP TO VERIFY      *
                                        * THAT ALL MICROWORDS ENCODED     *
                                        * WITH A "BUT SERVICE" CAUSE      *
                                        * A MICROBRANCH TO THE SERVICE    *
                                        * MICROROUTINE.           *
                                        ***********************************
                                                        I
                                        T1010-T1015     I
                                        ***********************************
                                        * SIX ALU/DATA PATH TESTS THAT    *
                                        * VERIFY THE ALU OPERATION FOR    *
                                        * ALL POSSIBLE BIT INPUT COMBIN-*
                                        * ATIONS FOR THE ADD,SUB,AND,OR,*
                                        * AND LOGICAL FUNCTIONS USING     *
                                        * THE ADD,SUB,BIS,BIC,INC,AND     *
                                        * DEC INSTRUCTIONS IN VARIOUS     *
                                        * COMBINATIONS.                   *
                                        ***********************************
                                                        I
                                                        I
                                                ******************
                                                * GO TO END OF    *
                                                * PASS SERVICE    *
                                                ******************
```

7.3 FUNCTIONAL TEST FLOWS

A. BASIC INSTRUCTION TEST STRUCTURE

```
                                  **************
                              TN: *            *
                                  * TEST       *
                                  * SETUP      *
                     >>>>>>>>RN:  *            *
                     I            **************
                     I                  I
                     I                  I
                     I                  I
                     I            **************
                     I            * TEST       *
                     I        IN: *INSTRUCTION*
                     I            *            *
                     I            **************
                     I                  I
                     I                  I
                     I            **************
                     I            *  VERIFY    *
                     I            **************
                     I              I       I
                     I              I       I
                CONTINUE        ERROR   NO ERROR
                     I              I       I
                     I              I       I
                     I          *********   I
                     I      EN: * HALT  *   I
                     I          *********   I
                     I              I       I
                     I<<<<<<<<<<<<<<        I
                                            I
                                 **************
                                 * GO TO NEXT*
                                 *   TEST     *
                                 **************
```

NOTES:

1) THE TEST ENTRY IS ALWAYS TAGGED 'TN' WHERE 'N' IS THE TEST NO. IN OCTAL.
2) THE TEST INSTRUCTION IS ALWAYS TAGGED 'IN'.
3) THE ERROR HALT IS ALWAYS TAGGED 'EN'.
4) THE RETURN POINT FOR LOOPING IS ALWAYS TAGGED 'RN'.
5) IF MORE THAN ONE VERIFICATION IS MADE IN A SINGLE TFST THE ENTRIES TO SUBSEQUENT CHECKS ARE TAGGED 'AN', 'BN', ETC.
6) IF MORE THAN ONE ERROR HALT IS INCLUDED, SUBSEQUENT ERROR HALTS ARE TAGGED: 'E1N', 'E2N', E3N', ETC.
7) WHEN AN ERROR HALT OCCURS THE CONSOLE ADDRESS AND DATA DISPLAYS CONVEY THE FOLLOWING INFORMATION:

```
                                        ADDRESS DISPLAY:        ADDRESS + 2 OF THE
                                                                LOCATION CONTAINING
                                                                THE ''HALT''

                                        DATA DISPLAY:           TEST NUMBER

                                    8) TO ESTABLISH A CONTINUOUS SCOPE LOOP THE HALT INSTRUCTION
                                       MUST BE REPLACED WITH A ''000400'' (BR .+2) BEFORE
                                       DEPRESSING ''CONTINUE''.
```

B. COMPREHENSIVE INSTRUCTION TEST STRUCTURE

```
                                 *****************
                        ON-1:    *     SCOPE     *>>>>>>>>>>>>>>>>
                                 *****************                I
                                                                  I
                                                                  I
                                                                  I
                                 *****************                I
                           TN:   *               *<<<<<<<<        I
                                 *  TEST SET-UP  *       I        I
                     >>>>>>>>>>>>RN: *               *       I        I
                     I           *****************       I        I
                     I                   I               I        I
                     I                   I               I        I
                     I           *****************       I        I
                     I        IN: * TEST INSTRUCT.*      I        I
                     I           *****************     LOOP       I
                     I                   I               I     (IOT)
                     I                   I               I        I
                     I           *****************       I        I
                     I           *  VERIFICATION *       I<<<     I
                     I           *****************          I     I
                     I              I       I               I     I
                     I              I       I>>>>           I     I
                     I            FAULT        I           I     I
                     I              I     NO FAULT     *****************
                     I           ********       I        *  SCOPE LOOP   *
                     I        EN: *ERRORX*       I        *    UTILITY    *
                     I           ********       I        *****************
                  SW09=1            I           I                I    I
                     I              I           I                I    I
                     I            (EMT)         I                I    I
                     I              I           I                I    I
                     I           <<<<           I                I    I
                     I           I              I                I    I
                     I        ******************I                I    I
                     I<<<<<<<* ERROR SERVICE *  I                I    I
                              *   ROUTINE     *  I                I    I
                     I<<<<<<<*               *  I                I    I
                     I        ******************I                I    I
                  SW15=1      I              I                I    I
                     I        I>> SW13=1 >>>>I                I    I
                 *********    I              I                I    I
                 * HALT  *    I              I                I  NO LOOP
                 *********  SW13=0           I                I    I
                     AA(CONT)   BB(CONT)      CC(CONT)        DD   EE(CONT)
```

```
                    AA(CONT)        BB(CONT)        CC(CONT)        DD    EE(CONT)
                    I               I               I               I     I
                    I               I               I               I     I
                    I       *****************       I               I     I
                    I       * OTA AND PRINT *       I               I     I
                    I       *  ROUTINES     *       I               I     I
                    I       *****************       I              (IOT)  I
                 DEPRESS                            I               I     I
                CONTINUE                            I               I     I
                    I                               I               I     I
                    I>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>                 I     I
                                            I                       I     I
                                            I                       I     I
                                    *****************               I     I
                          ON:       *    SCOPE      *>>>>>>>>>>>>>>>>     I
                                    *****************                     I
                                                                          I
                                            <<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<
                                            I
                                    *****************
                        TN+1:       *  TEST SET-UP  *
                                    *  FOR NEXT TEST*

          LOOP = [SW14=1]+[ITCOUNT NOT ZERO)*PASCNT>0]+[SW10=1*(R0)=TST#]

          NO LOOP = [SW14=0*ITCOUNT=0] + [PASCNT=0]
```

7.4 CORE MEMORY MAP

```
000000  ********************************
        *          VECTOR AREA         *
        * (ALL UNUSED VECTORS LOADED   *
        *  WITH STANDARD PDP11 TRAP-   *
        *    CATCHER)                  *
        *                              *
        ********************************
000200  *  MOV  #3000,PC               *
        ********************************
        *                              *
        *   PROCESSOR STACK AREA       *
        *                              *
001000  ********************************
        *            'BCPT''           *
        *   (BASIC CENTRAL PROCESSOR   *
        *    TESTS)                    *
        ********************************
003000  *  'BIT'' START-UP CODE         *
        ********************************
T0001:  *                              *
        *            'BIT''            *
        *                              *
        *  BASIC INSTRUCTION TESTS     *
        *       (100[10] TESTS)        *
        *                              *
        ********************************
CITST:  *                              *
        *   ''CIT'' INITIALIZATION     *
        *                              *
        ********************************
T0145:  *                              *
        *           ''CIT''            *
        *                              *
        *  COMPREHENSIVE INSTRUCTION   *
        *          TESTS               *
        *      (360[10] TESTS)         *
        *                              *
        ********************************
T0715:  *                              *
        *           ''IEX''            *
        *                              *
        *  COMBINED INSTRUCTION        *
        *    EXERCISER TESTS           *
        *      (65[10] TESTS)          *
        *                              *
        ********************************
ENDPS:  *                              *
        *      END OF PASS SERVICE     *
        *                              *
        ********************************
        *                              *
        *  UTILITIES AND MISCELLANEOUS *
```

```
                                        *   SUBROUTINES                 *
                                        *                               *
                                        *********************************
```

```
                                        ********************************
                                OPTION: *                              *
                                        *  CONSTANTS, FLAGS, AND       *
                                        *   VARIABLES                  *
                                        *                              *
                                        ********************************
                                BELL:   *                              *
                                        *     ASCII MESSAGES           *
                                        *                              *
                                        *                              *
                                        ********************************
                                OBUF:   *                              *
                                        *  COMMON DATA STRUCTURES      *
                                        *                              *
                                        *                              *
                                        ********************************
```

8.0 SUB-TITLE INDEX OF TESTS

REFER TO THE TABLE OF CONTENTS IN THE LISTING FOR A DETAILED SUB-TITLE INDEX OF TESTS. THIS TABLE LISTS ALL TESTS SEQUENTIALLY BY TEST NO. WITH A BRIEF DESCRIPTION OF THE FUNCTION OF EACH TEST. THE LEFT HAND COLUMN CONTAINS LINE NUMBERS THAT FACILITATE RAPIDLY LOCATING ANY PARTICULAR TEST WITHIN THE LISTING.

HISTORY FILE FOR KD11-A CPU DIAG

9.0 PURPOSE

9.1 THE PURPOSE OF THIS FILE IS TO MAINTAIN A CONTINUOUS HISTORY OF WHAT HAPPENS TO THE PROGRAM AND ITS SUPPORTING DOCUMENTS THROUGHOUT THE LIFETIME OF THE PROGRAM. ANYONE MAKING ANY CHANGES IN THE PROGRAM OR ITS DOCUMENTS WILL UPDATE THIS FILE TO ACCURATELY DESCRIBE WHAT WAS CHANGED, WHY IT WAS CHANGED, THE DATE OF THE CHANGE, AND THE NAME OF THE PERSON MAKING THE CHANGE. OTHER USEFUL DATA SUCH AS THE NAME OF THE USER REPORTING ANY PROBLEMS AND A DESCRIPTION OF THE PROBLEM SHOULD ALSO BE INCLUDED.

9.2 ENTRIES

(1) DATE: 08-APR-75
NAME: ED CROWLEY, DIAGNOSTIC ENGINEERING, MARLBORO
ENTRY: REVISION A (1ST RELEASE) RELEASED ON THIS DATE.

****

(2) DATE: 05-AUG-75
NAME: ED CROWLEY, DIAGNOSTIC ENGINEERING, MARLBORO
ENTRY: REVISION B WAS CREATED TO CORRECT A PROGRAM PROBLEM THAT CAUSED AN UNWANTED ERROR HALT AT TEST 0144 IF THE PROGRAM WAS AUTO-STARTED BY THE ''XXDP'' MONITOR.

THE CODE SHOWN BELOW WAS ADDED TO TEST 0140 TO STALL EXECUTION OF THE DL11 BASIC TTY TESTS UNTIL THE DL11 INTERFACE HAD SETTLED DOWN AFTER USE BY THE ''XXDP'' MONITOR.

```
        CLR     MBUF0           ;INIT COUNTER
1$:     DEC     MBUF0           ;COUNT THE TIMER
        BNE     1$              ;BR IF NO TIMEOUT
```

THE UPDATED VERSION IS SCHEDULED TO BE RELEASED ON

21-AUGUST-1975 AS MD-11-DBQEAB.

```
2564
2565
2566                    ************************************************************************
```

```
                                        (3)     DATE:   15 FEB 80
                                                NAME:   LEN LORANGER, DIAGNOSTIC ENGINEERING, MAYNARD
                                                ENTRY:  REVISION C WAS CREATED TO MAKE THE ASSEMBLY PROCEDURE
                                                        COMPATIBLE WITH ALL THE OTHER DIAGNOSTICS.  THE FILES
                                                        WERE NOT CHANGED OTHERWISE AND SHOULD NOT AFFECT THE
                                                        OPERATION OF THE DIAGNOSTIC.

                                        @
                                        .ENABLE ABS

        000000                          .=0

                                        ; ***********************************************************************
                                                        .SBTTL STANDARD PDP11 'TRAP CATCHER'
                                        ; ***********************************************************************

                                        ;WHEN THE PROGRAM IS LOADED, LOCATIONS 000000-000776 (VECTOR AREA)
                                        ;GET LOADED WITH THE STANDARD PDP11 'TRAP CATCHER'. THE FIRST WORD
                                        ;IN EACH VECTOR (NEW PC) IS SET UP TO POINT TO THE SECOND WORD WHICH
                                        ;CONTAINS A 'HALT' INSTRUCTION. ANY UNEXPECTED TRAP OR INTERRUPT
                                        ;DIRECTED TO A VECTOR THAT HAS NOT BEEN INITIALIZED BY THE PROGRAM TO
                                        ;POINT TO AN APPROPRIATE SERVICE ROUTINE WILL CAUSE THE PROGRAM TO HALT.
                                        ;AFTER THE HALT THE FOLLOWING ERROR INFORMATION IS AVAILABLE FOR
                                        ;DETAILED ERROR ANALYSIS BY THE SERVICE TECHNICIAN:

                                                ;ADDRESS DISPLAY-       V+4 - WHERE 'V' IS THE VECTOR THE
                                                                        ;TRAP OR INTR. TRAPPED TO.

                                                ;DATA DISPLAY-          NUMBER OF THE TEST BEING EXECUTED WHEN
                                                                        ;THE TRAP WAS SPRUNG.

                                                ;CONTENTS OF THE SP-    MEMORY ADDRESS CONTAINING THE CONTENTS
                                                                        ;OF THE PC WHEN THE TRAP WAS SPRUNG

                                        ;'TRAP CATCHER' HALTS ARE CONSIDERED TO BE CATASTROPHIC ERRORS THAT
                                        ;NORMALLY PRECLUDE CONTINUING ON IN THE PROGRAM FROM THE POINT OF THE
                                        ;ERROR. THE PROGRAM MUST BE RESTARTED OR PROPER MODIFICATIONS MADE
                                        ;BASED ON THE ANALYSIS OF THE ERROR INFORMATION.

        000000  000002                          .+2
        000002  000000                          HALT

                                        ;AFTER EXECUTION OF THE BASIC INSTRUCTION TESTS AND BEFORE THE COM-
                                        ;PREHENSIVE INSTRUCTION TESTS, THE VECTOR BELOW IS SET UP TO POINT
                                        ;TO THE BUS ERROR SERVICE ROUTINE AT 'BERR:' WITH A PRIORITY OF 7

        000004  000006                          .+2
        000006  000000                          HALT

                                        ;AFTER EXECUTION OF THE BASIC INSTRUCTION TESTS AND BEFORE THE COM-
                                        ;PREHENSIVE INSTRUCTION TESTS, THE VECTOR BELOW IS SET UP TO POINT
                                        ;TO THE RSVD INSTR. TRAP SERVICE ROUTINE AT 'RSERR:' WITH A PRIORITY OF 7

        000010  000012                          .+2
```

```
000012  000000                  HALT
000014  000016                  .+2
000016  000000                  HALT

                        ;AFTER EXECUTION OF THE BASIC INSTRUCTION TESTS AND BEFORE THE COM-
                        ;PREHENSIVE INSTRUCTION TESTS, THE VECTOR BELOW IS SET UP TO POINT
                        ;TO THE SCOPE  SERVICE ROUTINE AT "SCOPEB:" WITH A PRIORITY OF 0

000020  000022                  .+2
000022  000000                  HALT

                        ;AFTER EXECUTION OF THE BASIC INSTRUCTION TESTS AND BEFORE THE COM-
                        ;PREHENSIVE INSTRUCTION TESTS, THE VECTOR BELOW IS SET UP TO POINT
                        ;TO THE POWER FAIL SERVICE ROUTINE AT "PDWN:" WITH A PRIORITY OF 7

000024  000026                  .+2
000026  000000                  HALT

                        ;AFTER EXECUTION OF THE BASIC INSTRUCTION TESTS AND BEFORE THE COM-
                        ;PREHENSIVE INSTRUCTION TESTS, THE VECTOR BELOW IS SET UP TO POINT
                        ;TO THE  ERROR SERVICE ROUTINE AT "ERRB:" WITH A PRIORITY OF 0

000030  000032                  .+2
000032  000000                  HALT

                        ;AFTER EXECUTION OF THE BASIC INSTRUCTION TESTS AND BEFORE THE COM-
                        ;PREHENSIVE INSTRUCTION TESTS, THE VECTOR BELOW IS SET UP TO POINT
                        ;TO THE PRINT SERVICE ROUTINE AT "PRINT:" WITH A PRIORITY OF 0

000034  000036                  .+2
000036  000000                  HALT
000040  000042                  .+2
000042  000000                  HALT
000044  000046                  .+2
000046  000000                  HALT
000050  000052                  .+2
000052  000000                  HALT
000054  000056                  .+2
000056  000000                  HALT
000060  000062                  .+2
000062  000000                  HALT
000064  000066                  .+2
000066  000000                  HALT
000070  000072                  .+2
000072  000000                  HALT
000074  000076                  .+2
000076  000000                  HALT
000100  000102                  .+2
000102  000000                  HALT
000104  000106                  .+2
000106  000000                  HALT
000110  000112                  .+2
000112  000000                  HALT
000114  000116                  .+2
000116  000000                  HALT
000120  000122                  .+2
```

```
000122  000000                  HALT
000124  000126                  .+2
000126  000000                  HALT
000130  000132                  .+2
000132  000000                  HALT
000134  000136                  .+2
000136  000000                  HALT
000140  000142                  .+2
000142  000000                  HALT
000144  000146                  .+2
000146  000000                  HALT
000150  000152                  .+2
000152  000000                  HALT
000154  000156                  .+2
000156  000000                  HALT
000160  000162                  .+2
000162  000000                  HALT
000164  000166                  .+2
000166  000000                  HALT
000170  000172                  .+2
000172  000000                  HALT
000174  000176                  .+2
000176  000000                  HALT
000200  012707  003000          MOV     #3000,PC        ;GO START UP AT LOC. 3000
000204  000206                  .+2
000206  000000                  HALT
000210  000212                  .+2
000212  000000                  HALT
000214  000216                  .+2
000216  000000                  HALT
000220  000222                  .+2
000222  000000                  HALT
000224  000226                  .+2
000226  000000                  HALT
000230  000232                  .+2
000232  000000                  HALT
000234  000236                  .+2
000236  000000                  HALT
000240  000242                  .+2
000242  000000                  HALT
000244  000246                  .+2
000246  000000                  HALT
000250  000252                  .+2
000252  000000                  HALT
000254  000256                  .+2
000256  000000                  HALT
000260  000262                  .+2
000262  000000                  HALT
000264  000266                  .+2
000266  000000                  HALT
000270  000272                  .+2
000272  000000                  HALT
000274  000276                  .+2
000276  000000                  HALT
000300  000302                  .+2
000302  000000                  HALT
```

```
000304  000306          .+2
000306  000000          HALT
000310  000312          .+2
000312  000000          HALT
000314  000316          .+2
000316  000000          HALT
000320  000322          .+2
000322  000000          HALT
000324  000326          .+2
000326  000000          HALT
000330  000332          .+2
000332  000000          HALT
000334  000336          .+2
000336  000000          HALT
000340  000342          .+2
000342  000000          HALT
000344  000346          .+2
000346  000000          HALT
000350  000352          .+2
000352  000000          HALT
000354  000356          .+2
000356  000000          HALT
000360  000362          .+2
000362  000000          HALT
000364  000366          .+2
000366  000000          HALT
000370  000372          .+2
000372  000000          HALT
000374  000376          .+2
000376  000000          HALT
000400  000402          .+2
000402  000000          HALT
000404  000406          .+2
000406  000000          HALT
000410  000412          .+2
000412  000000          HALT
000414  000416          .+2
000416  000000          HALT
000420  000422          .+2
000422  000000          HALT
000424  000426          .+2
000426  000000          HALT
000430  000432          .+2
000432  000000          HALT
000434  000436          .+2
000436  000000          HALT
000440  000442          .+2
000442  000000          HALT
000444  000446          .+2
000446  000000          HALT
000450  000452          .+2
000452  000000          HALT
000454  000456          .+2
000456  000000          HALT
000460  000462          .+2
000462  000000          HALT
```

```
000464  000466          .+2
000466  000000          HALT
000470  000472          .+2
000472  000000          HALT
000474  000476          .+2
000476  000000          HALT
000500  000502          .+2
000502  000000          HALT
000504  000506          .+2
000506  000000          HALT
000510  000512          .+2
000512  000000          HALT
000514  000516          .+2
000516  000000          HALT
000520  000522          .+2
000522  000000          HALT
000524  000526          .+2
000526  000000          HALT
000530  000532          .+2
000532  000000          HALT
000534  000536          .+2
000536  000000          HALT
000540  000542          .+2
000542  000000          HALT
000544  000546          .+2
000546  000000          HALT
000550  000552          .+2
000552  000000          HALT
000554  000556          .+2
000556  000000          HALT
000560  000562          .+2
000562  000000          HALT
000564  000566          .+2
000566  000000          HALT
000570  000572          .+2
000572  000000          HALT
000574  000576          .+2
000576  000000          HALT
000600  000602          .+2
000602  000000          HALT
000604  000606          .+2
000606  000000          HALT
000610  000612          .+2
000612  000000          HALT
000614  000616          .+2
000616  000000          HALT
000620  000622          .+2
000622  000000          HALT
000624  000626          .+2
000626  000000          HALT
000630  000632          .+2
000632  000000          HALT
000634  000636          .+2
000636  000000          HALT
000640  000642          .+2
000642  000000          HALT
```

```
000644  000646          .+2
000646  000000          HALT
000650  000652          .+2
000652  000000          HALT
000654  000656          .+2
000656  000000          HALT
000660  000662          .+2
000662  000000          HALT
000664  000666          .+2
000666  000000          HALT
000670  000672          .+2
000672  000000          HALT
000674  000676          .+2
000676  000000          HALT
000700  000702          .+2
000702  000000          HALT
000704  000706          .+2
000706  000000          HALT
000710  000712          .+2
000712  000000          HALT
000714  000716          .+2
000716  000000          HALT
000720  000722          .+2
000722  000000          HALT
000724  000726          .+2
000726  000000          HALT
000730  000732          .+2
000732  000000          HALT
000734  000736          .+2
000736  000000          HALT
000740  000742          .+2
000742  000000          HALT
000744  000746          .+2
000746  000000          HALT
000750  000752          .+2
000752  000000          HALT
000754  000756          .+2
000756  000000          HALT
000760  000762          .+2
000762  000000          HALT
000764  000766          .+2
000766  000000          HALT
000770  000772          .+2
000772  000000          HALT
000774  000776          .+2
000776  000000          HALT
```

```
                                ; ***********************************************************************
                                                ;PROGRAM DEFINITIONS
                                ; ***********************************************************************

                                        ;GENERAL REGISTER DEFINITIONS

        000000                          R0 = %0
        000001                          R1 = %1
        000002                          R2 = %2
        000003                          R3 = %3
        000004                          R4 = %4
        000005                          R5 = %5
        000006                          SP = %6
        000007                          PC = %7

                                        ;DEFINITIONS FOR KD11-A PROCESSOR STATUS WORD AND CONSOLE SWITCH REGISTER

        177570                          SR = 177570             ;CONSOLE SWITCH REG. ADDR
        177776                          PSW = 177776            ;PROCESSOR STATUS REG. ADDR

                                        ;DEFINITIONS FOR CONSOLE SWITCH REG. - BIT POSITIONS

        100000                          SW15 = 100000
        040000                          SW14 = 040000
        020000                          SW13 = 020000
        010000                          SW12 = 010000
        004000                          SW11 = 004000
        002000                          SW10 = 002000
        001000                          SW09 = 001000

                                        ;IOT USED TO CALL "SCOPE" LOOP UTILITY

        000004                          SCOPE = IOT

                                        ;EMT USED TO CALL "ERROR" SERVICE ROUTINE

        104000                          ERROR=EMT               ;PRINT 8 COLUMNS
        104001                          ERROR1 = EMT+1          ;PRINT COLUMN 1 ONLY
        104002                          ERROR2=EMT+2            ;PRINT COLUMNS 1 AND 2
        104003                          ERROR3 = EMT+3          ;PRINT COLUMNS 1,2,3
        104004                          ERROR4 = EMT+4          ;PRINT COLUMNS 1,2,3,4
        104005                          ERROR5 = EMT+5          ;PRINT COLUMNS 1,2,3,4,5
        104006                          ERROR6 = EMT+6          ;PRINT COLUMNS 1,2,3,4,5,6
        104007                          ERROR7 = EMT+7          ;PRINT COLUMNS 1,2,3,4,5,6,7

                                        ;TRAP USED TO CALL THE PRINT UTILITY

        104400                          TYPE = TRAP

        177546                          LKCSR=  177546          ;KW11-L LINE CLOCK ADDRESS

                                        ;ADDRESS ASSIGNMENTS FOR DL11 CONSOLE TERMINAL INTERFACE

        177560                          RCSR=177560             ;RCVR. CONTROL / STATUS REG. ADDRESS
        177562                          RDBR = 177562           ;RECEIVER DATA BUFFER REG. ADDR.
```

```
177564                  XCSR = 177564          ;TRANSMITTER CONTROL / STATUS REG. ADDR
177566                  XDBR = 177566          ;TRANSMIT DATA BUFFER REG. ADDR.
001000          .=1000

001000                  STACKL=001000          ;TOP OF STACK FOR LOWER TESTS
```

```
                                        ;/////////////////////
                                        ;  "BCPT" TESTS      /
                                        ;/////////////////////

                        ; ***********************************************************************
                                .SBTTL BT001 "BR" TEST -POSITIVE OFFSET
                        ; ***********************************************************************

                        ;MICROPROGRAMMING / LOGIC INFORMATION

                        ;ROM SEQ:       [111,340,341,016] FC 1,7

                        ;ACT BUTS:      37[004]100,111 / 16[340]016,016

                        ;EXEC:          [341]ALUC=LHLLH :[016]D=001004

                        ;CODES:         N/A     /       N:C=0000

                        ;SYNC:          N/A     T=1.76 USEC

                        ;KEY SIG:       K5-3 BR INSTR L / K5-3 TRUE BR L / K3-3 SM=0 L / K3-3 IR(14:12)=0 L

001000  000401          BT001:  BR      BT002           ;TEST THE BR FORWARD

001002  000000          E001:   HALT                    ;BR FAILED TO LOAD PC PROPERLY
```

```
                                ; ***********************************************************************
                                        .SBTTL BT002 "BR" TEST - NEGATIVE OFFSET
                                ; ***********************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,341,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111 / 16[340]016,016

                                ;EXEC:          [341]ALUC=LHLLH :[016]D=001006

                                ;CODES:         N/A     /       N:C=0000

                                ;SYNC:          N/A     T=1.76 USEC

                                ;KEY SIG:       K5-3 BR INSTR L / K5-3 TRUE BR L / K3-3 SM=0 L / K3-3 IR(14:12)=0 L

  001004  000402                BT002:  BR      I002            ;GO TO TEST INSTRUCTION

  001006  000403                A002:   BR      BT003           ;GO TO NEXT TEST

  001010  000000                EX002:  HALT                    ;JUST IN CASE

  001012  000775                I002:   BR      A002            ;TEST THE BR - NEG. OFFSET

  001014  000000                E2002:  HALT                    ;BR FAILED WITH NEG. OFFSET
```

```
                                ; ************************************************************************
                                        .SBTTL BT003 'BASIC COND. BR'' TEST - FLAGS CLEARED
                                ; ************************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION (BMI,BEQ,BVS)

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,110 / 16[110]016,016

                                ;EXEC:          NO BRANCH

                                ;CODES:         N/A     /       N:C=0000

                                ;SYNC:          N/A     T=1.4 USEC

                                ;KEY SIG:       K5-3 BR INSTR L / (BMI)K3-3 SM=0 L / (BEQ)K3-3 SM=1 L / (BVS)K3-3 SM=2 L
                                                ; (BMI,BVS)K3-4 IR15 L

  001016  100403                BT003:  BMI     E003            ;BR IF 'N'' SET
  001020  001402                        BEQ     E003            ;BR IF 'Z'' SET
  001022  102401                        BVS     E003            ;BR IF 'V'' SET
  001024  103002                        BCC     BT004           ;BR IF ''C'' CLEAR

  001026  000000                E003:   HALT                    ;ERROR - ONE OF THE ABOVE BR'S FAILED
                                                                ;OR THE FLAGS FAILED TO CLEAR ON 'START''
  001030  000772                        BR      BT003           ;LOCK ON HARD ERROR
```

```
                                ; ***********************************************************************
                                        .SBTTL BT004 "SCC AND COND. BR'S" TEST - FLAGS SET
                                ; ***********************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION (SCC)

                                ;ROM SEQ:       [117,352,016] FC 1,7

                                ;ACT BUTS:      37[004]100,117 / 16[117]016,016

                                ;EXEC:          [117]ALUC=HHLHH,[352]ALUC=HHHHL :[016]D=000017

                                ;CODES:         [352]SPS=3      /       N:C=1111

                                ;SYNC:          B05J2   (+)     T=1.72 USEC

                                ;KEY SIG:       K3-6 CC INSTR H / K3-6 I1K0(CINSTR) L / K3-3 IR04(1) H

  001032  000277                BT004:  SCC                     ;MAKE N:C=1111

  001034  100003                I004:   BPL     E004            ;BR IF "N" FAILED TO SET
  001036  001002                        BNE     E004            ;BR IF "Z" FAILED TO SET
  001040  102001                        BVC     E004            ;BR IF "V" FAILED TO SET
  001042  103402                        BCS     BT005           ;BR IF "C" SET OK

  001044  000000                E004:   HALT                    ;ERROR - ONE OF THE ABOVE BR'S FAILED
                                                                ;OR THA SCC FAILED TO SET ALL THE FLAGS
  001046  000771                        BR      BT004           ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                        .SBTTL BT005 "CCC AND COND. BR'S" TEST - FLAGS CLEARED
                                ; ************************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION (CCC)

                                ;ROM SEQ:       [116,350,351,016] FC 1,7

                                ;ACT BUTS:      37[004]100,116 / 16[350]016,016

                                ;EXEC:          [116,351]ALUC=HHLHH,[350]ALUC=HLHLH     :[016]D=000000

                                ;CODES:         [351]SPS=3      /       N:C=0000

                                ;SYNC:          B05J2   (+)     T=2.02 USEC

                                ;KEY SIG:       K3-6 CC INSTR H

001050  000257                  BT005:  CCC                     ;MAKE N:C=0000

001052  100403                  I005:   BMI     E005            ;BR IF "N" STILL SET
001054  001402                          BEQ     E005            ;BR IF "Z" STILL SET
001056  102401                          BVS     E005            ;BR IF "V" STILL SET
001060  103002                          BCC     BT006           ;BR IF "C" GOT CLEARED

001062  000000                  E005:   HALT                    ;ERROR - ONE OF THE ABOVE BR'S FAILED
                                                                ;OR THE CCC FAILED TO CLEAR ALL FLAGS
001064  000771                          BR      BT005           ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                        .SBTTL BT006 "CLR  %R" TEST - SETS THE "Z" BIT
                                ; ************************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION

                                ;ROM SEQ:       [104,373,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001

                                ;EXEC:          [104]ALUC=HLLHH :[373]D=000000

                                ;CODES:         [373]SPS=1,[360]SPS=3   /       N:C=0100

                                ;SYNC:          B05J2   (-)     T=1 USEC

                                ;KEY SIG:       K3-4 CLR L / K3-3 DM=0 L / K3-4 OVLAP INSTR H

 001066  000257                 BT006:  CCC                     ;MAKE N:C=0000

 001070  005000                 I006:   CLR     R0              ;TEST THE CLR - IT SHOULD SET "Z"

 001072  001402                         BEQ     BT007           ;BR IF CLR SET "Z"

 001074  000000                 E006:   HALT                    ;ERROR - CLR FAILED TO SET "Z"
 001076  000773                         BR      BT006           ;LOCK ON HARD ERROR
```

```
                                ; ***********************************************************************
                                        .SBTTL BT007 "TST  %R" TEST - USING THE CLR
                                ; ***********************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION

                                ;ROM SEQ:       [104,373,362,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,104 / 31[104]360,362 / 27[373]000,001

                                ;EXEC:          [104]ALUC=LLLLL :[373]D=000000

                                ;CODES:         [373]SPS=1,[362]SPS=3   /       N:C=0100

                                ;SYNC:          B05J2   (-)     T=1 USEC

                                ;KEY SIG:       K3-3 DM=0 L / K3-4 TST L / K3-4 OVLAP INSTR H

 001100  005000                 BT007:  CLR     R0              ;MAKE [R0] = 000000
 001102  000257                         CCC                     ;MAKE N:C=0000

 001104  005700                 I007:   TST     R0              ;TEST THE TST - IT SHOULD SET "Z"

 001106  001402                         BEQ     BT010           ;BR IF "Z" SET OK

 001110  000000                 E007:   HALT                    ;ERROR - CLR FAILED TO LOAD R0 WITH
                                                                ;ALL ZEROES OR TST FAILED
 001112  000772                         BR      BT007           ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                        .SBTTL BT010 "COM  %R" TEST - SHOULD SET "N" AND "C"
                                ; ************************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION

                                ;ROM SEQ:       [104,373,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001

                                ;EXEC:          [104]ALUC=HLLLL :[373]D=177777

                                ;CODES:         [373]SPS=1,[360]SPS=3   /       N:C=1001

                                ;SYNC:          B05J2   (-)     T=1 USEC

                                ;KEY SIG:       K3-4 COM L / K3-3 DM=0 L / K3-4 OVLAP INSTR H

 001114  005000                 BT010:  CLR     R0              ;MAKE [R0] = 000000
 001116  000257                         CCC                     ;MAKE N:C=0000

 001120  005100                 J010:   COM     R0              ;TEST THE COM - [R0] S/B = 177777

 001122  100001                         BPL     E010            ;BR IF "N" FAILED TO SET
 001124  103402                         BCS     BT011           ;BR IF "C" SET OK

 001126  000000                 E010:   HALT                    ;ERROR - COM FAILED
 001130  000771                         BR      BT010           ;LOCK ON HARD ERROR
```

```
                                ; ***********************************************************************
                                        .SBTTL BT011 "COM  %R AND ADC  %R" TEST
                                ; ***********************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION (COM  %0)

                                ;ROM SEQ:       [104,373,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001

                                ;EXEC:          [104]ALUC=HLLLL :[373]D=177777
                                ;                          (ADC) :[373]D=000000


                                ;CODES:         [373]SPS=1,[360]SPS=3   /       N:C=1001
                                ;                                       (ADC)   N:C=0101

                                ;SYNC:          B05J2   (-)     T=1 USEC

                                ;KEY SIG:       K3-3 DM=0 L / K3-4 COM L / K3-4 OVLAP INSTR H
                                ;       (ADC)   K3-3 DM=0 L / K3-4 ADC L / K3-4 OVLAP INSTR H / K3-8 CIN00 L

001132  005000                  BT011:  CLR     R0              ;MAKE [R0] = 000000
001134  000257                          CCC                     ;MAKE N:C=0000

001136  005100                  I011:   COM     R0              ;TEST THE COM - [R0] S/B = 177777
001140  005500                          ADC     R0              ;TEST THE ADC - [R0] S/B = 000000

001142  001001                          BNE     E011            ;BR IF "Z" DID NOT SET
001144  103402                          BCS     BT012           ;BR IF "C" SET OK

001146  000000                  E011:   HALT                    ;ERROR - COM OR ADC FAILED
001150  000770                          BR      BT011           ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                        .SBTTL BT012 "MOV  #N,R" TEST WITH N=177777,[R]=000000
                                ; ************************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION

                                ;ROM SEQ:       [172,257,200,125,375,016] FC 1,4,8

                                ;ACT BUTS:      37[004]100,172 / 22[172]200,200 / 16[125]016,016

                                ;EXEC:          [200]ALUC=LLLLL :[125]D=177777

                                ;CODES:         [125]SPS=3      /       N:C=1000

                                ;SYNC:          B05J2   (-)     T= 2.3 USEC

                                ;KEY SIG:       K3-3 MOV L / K3-3 SM=2 L / K3-3 DM=0 L

001152  005000                  BT012:  CLR     R0              ;MAKE [R0] = 000000
001154  000257                          CCC                     ;MAKE N:C=0000

001156  012700  177777          I012:   MOV     #-1,R0          ;TEST THE MOV - [R0] S/B = 177777

001162  005100                          COM     R0              ;MAKE [R0] = 000000
001164  001402                          BEQ     BT013           ;BR IF "Z" SET

001166  000000                  E012:   HALT                    ;ERROR - MOV FAILED TO LOAD R0 WITH ALL 1'S
001170  000770                          BR      BT012           ;LOCK ON HARD ERROR
```

```
                                ; ***********************************************************************
                                        .SBTTL BT013 'MOV  #N,R'' TEST WITH N=000000,[R]=177777
                                ; ***********************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION

                                ;ROM SEQ:       [142,240,250,160,204,000] FC 1,4,8

                                ;ACT BUTS:      37[004]100,142 / 35[240]120,160 / 20[160]000,000

                                ;EXEC:          [160]ALUC=LLLLL :[204]D=000000

                                ;CODES:         [204]SPS=3      /       N:C=0100

                                ;SYNC:          B05J2   (-)     T=2.3 USEC

                                ;KEY SIG:       K3-3 MOV L / K3-3 SM=2 L / K3-3 DM=0 L

001172  005000                  BT013:  CLR     R0              ;MAKE [R0] = 000000
001174  005100                          COM     R0              ;MAKE [R0] = 177777
001176  000257                          CCC                     ;SCOPE SYNC

001200  012700  000000          I013:   MOV     #0,R0           ;TEST THE MOV - [R0] S/B = 000000

001204  005100                          COM     R0              ;MAKE [R0] = 177777, SET ''C''
001206  005500                          ADC     R0              ;MAKE [R0] = 000000
001210  001402                          BEQ     BT014           ;BR IF ''Z'' GOT SET

001212  000000                  E013:   HALT                    ;ERROR - MOV FAILED TO CLEAR R0
001214  000766                          BR      BT013           ;LOCK ON HARD ERROR
```

```
                                ; ***********************************************************************
                                        .SBTTL BT014 "CLR  (R)" TEST - [R] = 177776
                                ; ***********************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016

                                ;EXEC:          [220]ALUC=HLLHH :[211]D=000000

                                ;CODES:         [211]SPS=1,[367]SPS=3   /       N:C=0000

                                ;SYNC:          B05J2   (-)     T=2.6 USEC

                                ;KEY SIG:       K3-4 CLR L / K3-3 DM=1 L

001216  012706  001000          BT014:  MOV     #STACKL,SP      ;SET UP STACK POINTER
001222  012700  177776                  MOV     #PSW,R0         ;R0 POINTS TO PSW
001226  000277                          SCC                     ;MAKE [PSW] = 017

001230  005010                  I014:   CLR     (R0)            ;TEST THE CLR - IT SHOULD CLEAR PSW

001232  001002                          BNE     BT015           ;BR IF CLR MADE "Z" = 0 - IT SHOULD

001234  000000                  E014:   HALT                    ;ERROR- CLR FAILED TO CLEAR FSW
001236  000767                          BR      BT014           ;LOCK ON HARD ERROR
```

```
                                ; ***********************************************************************
                                        .SBTTL BT015 ''CLR  (R)+'' TEST - [R] = 177776
                                ; ***********************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION

                                ;ROM SEQ:       [162,260,267,220,211,367,375,016] FC 1,3,9,8

                                ;ACT BUTS:      37[004]100,162 / 33[260]220,220 / 16[367]016,016

                                ;EXEC:          [220]ALUC=HLLHH :[211]D=000000

                                ;CODES:         [211]SPS=1,[367]SPS=3   /       N:C=0000

                                ;SYNC:          B05J2   (-)     T=2.6 USEC

                                ;KEY SIG:       K3-4 CLR L / K3-3 DM=2 L / K5-5 BCON (1+2) H

001240  012700  177776          BT015:  MOV     #PSW,R0         ;R0 POINTS TO PSW
001244  000277                          SCC                     ;MAKE [PSW] = 017

001246  005020                  I015:   CLR     (R0)+           ;TEST THE CLR - IT SHOULD CLEAR PSW

001250  001002                          BNE     A015            ;BR IF CLR MADE ''Z'' = 0 - IT SHOULD

001252  000000                  E1015A: HALT                    ;ERROR- CLR FAILED TO CLEAR PSW
001254  000771                          BR      BT015           ;LOCK ON HARD ERROR

001256  005700                  A015:   TST     R0              ;AUTO INC SHOULD ZERO R0

001260  001402                          BEQ     BT016           ;BR IF IT DID

001262  000000                  E2015:  HALT                    ;ERROR - AUTOINC. FAILED
001264  000765                          BR      BT015           ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                        .SBTTL BT016 ''COM  (R)'' TEST - [R] = 177776
                                ; ************************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016

                                ;EXEC:          [220]ALUC=HLLLL :[211]D=000357

                                ;CODES:         [211]SPS=1,[367]SPS=3   /       N:C=1111

                                ;SYNC:          B05J2   (-)     T=1.8 USEC

                                ;KEY SIG:       K3-4 COM L / K3-3 DM=1 L

001266  012700  177776          BT016:  MOV     #PSW,R0         ;R0 POINTS TO PSW
001272  000257                          CCC                     ;MAKE [PSW] = 000

001274  005110                  I016:   COM     (R0)            ;TEST THE COM - [PSW] S/B = 357

001276  100003                          BPL     E016            ;N:C=1111 ?
001300  001002                          BNE     E016
001302  102001                          BVC     E016
001304  103402                          BCS     BT017

001306  000000                  E016:   HALT                    ;ERROR - COM FAILED TO MAKE [PSW] = 357
001310  000766                          BR      BT016           ;LOCK ON HARD ERROR
```

```
                                ; ***********************************************************************
                                        .SBTTL BT017 ''COM  (R0)+'' TEST - [R0] = 177776
                                ; ***********************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION

                                ;ROM SEQ:       [162,160,267,220,211,367,375,016] FC 1,3,9,8

                                ;ACT BUTS:      37[004]100,162 / 33[260]220,220 / 16[367]016,016

                                ;EXEC:          [220]ALUC=HLLLL :[211]D=000357

                                ;CODES:         [211]SPS=1,[367]SPS=3  /        N:C=1111

                                ;SYNC:          B05J2   (-)     T=2 USEC

                                ;KEY SIG:       K3-4 COM L / K3-3 DM=2 L / K5-5 BCON(1+2) H

001312  012700  177776          BT017:  MOV     #PSW,R0         ;R0 POINTS TO PSW
001316  005010                          CLR     (R0)            ;MAKE [PSW] = 000
001320  000257                          CCC                     ;SCOPE SYNC

001322  005120                  I017:   COM     (R0)+           ;TEST THE COM - [PSW] S/B = 357

001324  100003                          BPL     E1017           ;N:C = 1111 ?
001326  001002                          BNE     E1017
001330  102001                          BVC     E1017
001332  103402                          BCS     A017

001334  000000                  E1017:  HALT                    ;COM FAILED TO SET ALL FLAGS
001336  000765                          BR      BT017           ;LOCK ON HARD ERROR

001340  005100                  A017:   COM     R0              ;SHOULD MAKE [R0] = 177777
001342  005500                          ADC     R0              ;SHOULD MAKE [R0] = 000000
001344  001402                          BEQ     BT020

001346  000000                  E2017:  HALT                    ;ERROR - COM FAILED TO AUTO INC. R0
001350  000760                          BR      BT017           ;LOCK ON HARD ERROR
```

```
                                ; ***********************************************************************
                                        .SBTTL BT020 "MOV  RA,RB" TEST - WITH [RA]=177777,[RB]=000000
                                ; ***********************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION

                                ;ROM SEQ:       [170,204,001] FC 1,4,8

                                ;ACT BUTS:      37[004]100,170 / 20[170]000,001

                                ;EXEC:          [170]ALUC=LLLLL :[204]D=177777

                                ;CODES:         [204]SPS=3      /       N:C=1000

                                ;SYNC:          B05J2   (-)     T=1 USEC

                                ;KEY SIG:       K3-3 MOV L / K3-3 SM=0 L / K3-3 DM=0 L / K3-4 OVLAP INSTR H

001352  005000                  BT020:  CLR     R0              ;MAKE [R0]=000000
001354  005001                          CLR     R1              ;MAKE [R1]=000000
001356  005101                          COM     R1              ;MAKE [R1]=0207777
001360  000257                          CCC                     ;SCOPE SYNC

001362  010100                  I020:   MOV     R1,R0           ;TEST THE MOV

001364  100402                          BMI     A020            ;BR IF "N" GOT SET

001366  000000                  E1020:  HALT                    ;ERROR-MOV FAILED TO SET "N"
001370  000770                          BR      BT020           ;LOCK ON HARD ERROR

001372  005100                  A020:   COM     R0              ;[R0] SHOULD GO TO 000000
001374  001402                          BEQ     BT021           ;BR IF IT DID

001376  000000                  E2020:  HALT                    ;ERROR-MOV FAILED TO LOAD R0 WITH 1'S
001400  000764                          BR      BT020           ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                        .SBTTL BT021 'MOV  RA,RB'' TEST WITH [RA]=000000,[RB]=177777
                                ; ************************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION

                                ;ROM SEQ:       [170,204,001] FC 1,4,8

                                ;ACT BUTS:      37[004]100,170 / 20[170]000,001

                                ;EXEC:          [170]ALUC=LLLLL :[204]D=000000

                                ;CODES:         [204]SPS=3      /       N:C=0100

                                ;SYNC:          B05J2   (-)     T=1 USEC

                                ;KEY SIG:       K3-3 MOV L / K3-3 SM=0 L / K3-3 DM=0 L / K3-4 OVLAP INSTR H

001402  005000                  BT021.  CLR     R0              ;MAKE [R0]=000000
001404  005100                          COM     R0              ;MAKE [R0]=177777
001406  005001                          CLR     R1              ;MAKE [R1]=000000
001410  000257                          CCC                     ;SCOPE SYNC

001412  010100                  I021:   MOV     R1,R0           ;TEST THE MOV

001414  001402                          BEQ     A021            ;BR IF 'Z'' GOT SET

001416  000000                  E1021:  HALT                    ;MOV FAILED TO SET 'Z''
001420  000770                          BR      BT021           ;LOCK ON HARD ERROR

001422  005100                  A021:   COM     R0              ;SHOULD MAKE [R0]=177777 AND SET ''C''
001424  005500                          ADC     R0              ;SHOULD MAKE [R0]=000000
001426  001402                          BEQ     BT022           ;BR IF 'Z'' SET

001430  000000                  E2021:  HALT                    ;MOV FAILED TO ZERO R0
001432  000763                          BR      BT021           ;LOCK ON HARD ERROR
```

```
                                ; ***********************************************************************
                                        .SBTTL BT022 'MOV  #N,@#A'' TEST WITH N=17,A=177776
                                ; ***********************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION


                                ;ROM SEQ:       [142,240,250,173,207,210,200,125,375,016] FC 1,2,4,8

                                ;ACT BUTS:      37[004]100,142 / 35[240]120,173 / 22[207]200,200 / 16[125]016,016

                                ;EXEC:          [200]ALUC=LLLLL :[125]D=000017

                                ;CODES:         [125]SPS=3      /       N:C=1111

                                ;SYNC:          B05J2   (-)     T=4 USEC

                                ;KEY SIG:       K3-3 MOV L / K3-3 SM=2 L / K3-3 DM=3 L / K5-5 BC01 H
                                                ; K5-5 BCON(1+2) H

001434  000257                  BT022:  CCC                     ;MAKE [PSW]=000

001436  012737  000017  177776  I022:   MOV     #17,@#PSW       ;TEST THE MOV

001444  100003                          BPL     E022            ;N:C=1111
001446  001002                          BNE     E022
001450  102001                          BVC     E022
001452  103402                          BCS     BT023

001454  000000                  E022:   HALT                    ;MOV FAILED TO LOAD PSW
001456  000766                          BR      BT022           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL BT023 'MOV  RA,(RB)+'' TEST WITH [RA]=17,[RB]=177776
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING / LOGIC INFORMATION

                                        ;ROM SEQ:       [172,257,201,125,375,016] FC 1,4,8

                                        ;ACT BUTS:      37[004]100,172 / 22[172]200,201 / 16[125]016,016

                                        ;EXEC:          [201]ALUC=LLLLL :[125]D=000017

                                        ;CODES:         [125]SPS=3      /       N:C=1111

                                        ;SYNC:          B05J2   (-)     T=2.42 USEC

                                        ;KEY SIG:       K3-3 MOV L / K3-3 SM=0 L / K3-3 DM=2 L / K5-5 BCON(1+2) H

001460  012700  177776                  BT023:  MOV     #PSW,R0         ;R0 POINTS TO PSW
001464  012701  000017                          MOV     #17,R1          ;[SOURCE]=017
001470  005010                                  CLR     (R0)            ;MAKE [PSW]=000
001472  000257                                  CCC                     ;SCOPE SYNC

001474  010120                          I023:   MOV     R1,(R0)+        ;TEST THE MOV

001476  100003                                  BPL     E1023           ;N:C = 1111 ?
001500  001002                                  BNE     E1023
001502  102001                                  BVC     E1023
001504  103402                                  BCS     A023

001506  000000                          E1023:  HALT                    ;MOV FAILED TO LOAD PSW
001510  000763                                  BR      BT023           ;LOCK ON HARD ERROR

001512  005100                          A023:   COM     R0              ;SHOULD MAKE [R0]=177777
001514  005500                                  ADC     R0              ;SHOULD MAKE [R0]=000000
001516  001402                                  BEQ     BT024           ;BR IF IT DID

001520  000000                          E0232:  HALT                    ;MOV FAILED TO AUTO INC. R0
001522  000756                                  BR      BT023           ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                        .SBTTL BT024 ''CMP  #N,@#A'' TEST WITH N=(A)
                                ; ************************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION

                                ;ROM SEQ:       [142,240,250,163,264,265,266,267,225,367,375,016] FC 1,2,3,8

                                ;ACT BUTS:      37[004]100,142 / 35[240]120,163 / 33[266]220,225 / 16[367]016,016

                                ;EXEC:          [225]ALUC=LLHHL :[367]D=000000

                                ;CODES:         [367]SPS=3      /       N:C=0100

                                ;SYNC:          B05J2   (-)     T=5.2 USEC

                                ;KEY SIG:       K3-3 CMP L / K3-3 SM=2 L / K3-3 DM=3 L / K3-8 CIN00 L
                                                ; K4-4 ALLOW CLK L / K5-5 BC01 H

001524  012700  177776          BT024:  MOV     #PSW,R0         ;R0 POINTS TO PSW
001530  005010                          CLR     (R0)            ;MAKE [PSW]=000
001532  000273                          273                     ;MAKE N:C=1011

001534  022737  000013  177776  I024:   CMP     #13,@#PSW       ;TEST THE CMP

001542  001402                          BEQ     BT025           ;BR IF ''Z'' GOT SET

001544  000000                  E024:   HALT                    ;CMP FAILED TO SET ''Z''
001546  000766                          BR      BT024           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL BT025 ''CMP  #N,@#A'' WITH N >  (A)
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING / LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,163,264,265,266,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,163 / 33[266]220,225 / 16[367]016,016

                                        ;EXEC:          [225]ALUC=LLHHL :[367]D=177761

                                        ;CODES:         [367]SPS=3      /       N:C=1001

                                        ;SYNC:          B05J2   (-)     T=5.2 USEC

                                        ;KEY SIG:       K3-3 CMP L / K3-3 SM=2 L / K3-3 DM=3 L / K3-8 CINOO L
                                                        ; K4-4 ALLOW CLK L / K5-5 BC01 H

001550  000257                          BT025:  CCC                     ;MAKE [PSW]=000

001552  022737  000017  177776          I025:   CMP     #17,@#PSW       ;TEST THE CMP

001560  001401                                  BEQ     E025            ;BR IF ''Z'' GOT SET
001562  000402                                  BR      BT026           ;GO TO NEXT TEST

001564  000000                          E025:   HALT                    ;CMP FAILED TO CLEAR ''Z''
001566  000770                                  BR      BT025           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL BT026 ''CMP  #N,@#A'' WITH N <  (A)
                                        ; ***********************************************************************

                                        ;MIC  PROGRAMMING / LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,163,264,265,266,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BITS:      37[004]100,142 / 35[240]120,163 / 33[266]220,225 / 16[367]016,016

                                        ;EXEC:          [225]ALUC=LLHHL :[367]D=177761

                                        ;CODES:         [367]SPS=3      /       N:C=1001

                                        ;SYNC:          B05J2   (-)     T=5.2 USEC

                                        ;KEY SIG:       K3-3 CMP L / K3-3 SM=2 L / K3-3 DM=3 L / K3-8 CINOO L
                                                        ; K4-4 ALLOW CLK L / K5-5 BC01 H

001570  000277                          BT026:  SCC                     ;MAKE [PSW]=017

001572  022737  000000  177776          I026:   CMP     #0,@#PSW        ;TEST THE CMP

001600  001401                                  BEQ     E026            ;BR IF ''Z'' GOT SET
001602  000402                                  BR      BT027           ;GO TO NEXT TEST

001604  000000                          E026:   HALT                    ;CMP FAILED TO CLEAR ''Z''
001606  000770                                  BR      BT026           ;LOCK ON HARD ERROR
```

```
                                ; ***********************************************************************
                                        .SBTTL BT027 ''CMP  R,#N'' TEST WITH [R]=N
                                ; ***********************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION

                                ;ROM SEQ:       [162,260,267,224,367,375,016] FC 1,3,8

                                ;ACT BUTS:      37[004]100,162 / 33[260]220,224 / 16[367]016,016

                                ;EXEC:          [224]ALUC=LLHHL :[367]D=000000

                                ;CODES:         [367]SPS=3      /       N:C=0100

                                ;SYNC:          B05J2   (-)     T=2.6 USEC

                                ;KEY SIG:       K3-3 CMP L / K3-3 SM=0 L / K3-3 DM=2 L / K3-8 CIN00 L
                                                ; K4-4 ALLOW CLK L

001610  012700  177777          BT027:  MOV     #-1,R0          ;MAKE [R0]=177777
001614  000257                          CCC                     ;N:C=0000

001616  020027  177777          I027:   CMP     R0,#-1          ;TEST THE CMP

001622  001402                          BEQ     BT030           ;BR IF CMP SET ''Z''

001624  000000                  E027:   HALT                    ;CMP FAILED
001626  000770                          BR      BT027           ;LOCK ON HARD ERROR
```

```
                                ; ***********************************************************************
                                        .SBTTL BT030 ''CMP  R,#N'' TEST WITH [R] > N
                                ; ***********************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION

                                ;ROM SEQ:       [162,260,267,224,367,375,016] FC 1,3,8

                                ;ACT BUTS:      37[004]100,162 / 33[260]220,224 / 16[367]016,016

                                ;EXEC:          [224]ALUC=LLHHL :[367]D=000002

                                ;CODES:         [367]SPS=3      /       N:C=0001

                                ;SYNC:          B05J2   (-)     T=2.6 USEC

                                ;KEY SIG:       K3-3 CMP L / K3-3 SM=0 L / K3-3 DM=2 L / K3-8 CIN00 L
                                                ; K4-4 ALLOW CLK L

001630  012700  000001          BT030:  MOV     #1,R0           ;MAKE [R0]=000001
001634  000264                          SEZ                     ;SET THE ''Z'' BIT

001636  020027  177777          I030:   CMP     R0,#-1          ;TEST THE CMP

001642  001002                          BNE     BT031           ;BR IF CMP CLEARED ''Z''

001644  000000                  E030:   HALT                    ;CMP FAILED
001646  000770                          BR      BT030           ;LOCK ON HARD ERROR
```

```
                                ; ***********************************************************************
                                        .SBTTL BT031 ''CMP  R,#N'' TEST WITH [R] < N
                                ; ***********************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION

                                ;ROM SEQ:       [162,260,267,224,367,375,016] FC 1,3,8

                                ;ACT BUTS:      37[004]100,162 / 33[260]220,224 / 16[367]016,016

                                ;EXEC:          [224]ALUC=LLHHL :[367]D=177762

                                ;CODES:         [367]SPS=3      /       N:C=1001

                                ;SYNC:          B05J2   (-)     T=2.6 USEC

                                ;KEY SIG:       K3-3 CMP L / K3-3 SM=0 L / K3-3 DM=2 L / K3-8 CIN00 L
                                                ; K4-4 ALLOW CLK L

001650  012700  000001          BT031:  MOV     #1,R0           ;MAKE [R0] = 000001
001654  000264                          SEZ                     ;SET THE ''Z'' BIT

001656  020027  000017          I031:   CMP     R0,#17          ;TEST THE CMP

001662  001002                          BNE     BT032           ;BR IF CMP CLEARED ''Z''

001664  000000                  E031:   HALT                    ;CMP FAILED TO SET ''Z''
001666  000770                          BR      BT031           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL BT032 ''CMP  (RA)+,RB'' TEST WITH [SOURCE]=[RB]
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING / LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,120,371,362,000] FC 1,2,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,120 / 31[120]360,362 / 27[371]016,016

                                        ;EXEC:          [371]ALUC=LLHHL :[362]D=000000

                                        ;CODES:         [362]SPS=3      /       N:C=0100

                                        ;SYNC:          B05J2   (-)     T=2.5 USEC

                                        ;KEY SIG:       K3-3 CMP L / K3-3 SM=2 L / K3-3 DM=0 L / K5-5 BCON(1+2) H
                                                        ; K3-8 CINOO L

001670  012700  177776          BT032:  MOV     #PSW,R0         ;R0 POINTS TO PSW
001674  012737  000340  177776          MOV     #340,@#PSW      ;MAKE [PSW]=340
001702  012701  000340                  MOV     #340,R1         ;MAKE [DEST]=340
001706  000257                          CCC                     ;N:C=0000

001710  022001                  I032:   CMP     (R0)+,R1        ;TEST THE CMP

001712  001402                          BEQ     A032            ;BR IF ''Z'' GOT SET

001714  000000                  E1032:  HALT                    ;CMP FAILED TO ACCESS PSW
001716  000764                          BR      BT032           ;LOCK ON HARD ERROR

001720  005100                  A032:   COM     R0              ;MAKE [R0]=177777
001722  005500                          ADC     R0              ;MAKE [R0]=000000
001724  001402                          BEQ     BT033           ;BR IF ''Z'' SET

001726  000000                  E2032:  HALT                    ;CMP FAILED TO AUTO INC. R0
001730  000757                          BR      BT032           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL BT033 ''CMP  (RA)+,RB'' TEST WITH [SOURCE]>[RB]
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING / LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,120,371,362,000] FC 1,2,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,120 / 31[120]360,362 / 27[371]016,016

                                        ;EXEC:          [371]ALUC=LLHHL :[362]D=000010

                                        ;CODES:         [362]SPS=3      /       N:C=0000

                                        ;SYNC:          B05J2   (-)     T=2.5 USEC

                                        ;KEY SIG:       K3-3 CMP L / K3-3 SM=2 L / K3-3 DM=0 L / K5-5 BCON(1+2) H
                                                        ; K3-8 CINOO L

001732  012700  177776          BT033:  MOV     #PSW,R0         ;R0 POINTS TO PSW
001736  012737  000340  177776          MOV     #340,@#PSW      ;MAKE [PSW]=340
001744  012701  000330                  MOV     #330,R1         ;MAKE [DEST]=330
001750  000264                          SEZ                     ;SET THE 'Z'' BIT

001752  022001                  I033:   CMP     (R0)+,R1        ;TEST THE CMP

001754  001002                          BNE     A033            ;BR IF 'Z'' GOT CLEARED

001756  000000                  E1033:  HALT                    ;CMP FAILED TO ACCESS PSW
001760  000764                          BR      BT033           ;LOCK ON HARD ERROR

001762  005100                  A033:   COM     R0              ;MAKE [R0]=177777
001764  005500                          ADC     R0              ;MAKE [R0]=000000
001766  001402                          BEQ     BT034           ;BR IF 'Z'' SET

001770  000000                  E2033:  HALT                    ;CMP FAILED TO AUTO INC. R0
001772  000757                          BR      BT033           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL BT034 ''CMP  (RA)+,RB'' TEST WITH [SOURCE]<[RB]
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING / LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,120,371,362,000] FC 1,2,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,120 / 31[120]360,362 / 27[371]016,016

                                        ;EXEC:          [371]ALUC=LLHHL :[362]D=177770

                                        ;CODES:         [362]SPS=3      /       N:C=1001

                                        ;SYNC:          B05J2   (-)     T=2.5 USEC

                                        ;KEY SIG:       K3-3 CMP L / K3-3 SM=2 L / K3-3 DM=0 L / K5-5 BCON(1+2) H
                                                        ; K3-8 CINOO L

001774  012700  177776          BT034:  MOV     #PSW,R0         ;R0 POINTS TO PSW
002000  012737  000330  177776          MOV     #330,@#PSW      ;MAKE [PSW]=330
002006  012701  000340                  MOV     #340,R1         ;MAKE [DEST]=340
002012  000264                          SEZ                     ;SET THE ''Z'' BIT

002014  022001                  I034:   CMP     (R0)+,R1        ;TEST THE CMP

002016  001002                          BNE     A034            ;BR IF ''Z'' GOT CLEARED

002020  000000                  E1034:  HALT                    ;CMP FAILED TO ACCESS PSW
002022  000764                          BR      BT034           ;LOCK ON HARD ERROR

002024  005100                  A034:   COM     R0              ;MAKE [R0]=177777
002026  005500                          ADC     R0              ;MAKE [R0]=000000
002030  001402                          BEQ     BT035           ;BR IF ''Z'' SET

002032  000000                  E2034:  HALT                    ;CMP FAILED TO AUTO INC. R0
002034  000757                          BR      BT034           ;LOCK ON HARD ERROR
```

```
                                ; ***********************************************************************
                                        .SBTTL BT035 ''CMP  RA,RB'' TEST WITH [RA] = [RB]
                                ; ***********************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION

                                ;ROM SEQ:       [102,364,362,001] FC 1,8

                                ;ACT BUTS:      37[004]100,102 / 31[102]360,362 / 27[364]000,001

                                ;EXEC:          [364]ALUC=LLHHL :[362]D=000000

                                ;CODES:         [362]SPS=3      /       N:C=0100

                                ;SYNC:          B05J2   (-)     T=1 USEC

                                ;KEY SIG:       K3-3 CMP L / K3-3 SM=0 L / K3-3 DM=0 L / K3-4 OVLAP INSTR H
                                                ; K3-8 CIN00 L

002036  012700  125252          BT035:  MOV     #125252,R0      ;MAKE [R0] = 125252
002042  010001                          MOV     R0,R1           ;MAKE [R1] = 125252
002044  000257                          CCC                     ;SCOPE SYNC

002046  020100                  I035:   CMP     R1,R0           ;TEST THE CMP

002050  001402                          BEQ     BT036           ;BR IF ''Z'' GOT SET

002052  000000                  E035:   HALT                    ;ERROR - CMP FAILED TO SET ''Z''
002054  000770                          BR      BT035           ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                        .SBTTL BT036 "CMP  RA,RB" TEST WITH [RA] < [RB]
                                ; ************************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION

                                ;ROM SEQ:       [102,364,362,001] FC 1,8

                                ;ACT BUTS:      37[004]100,102 / 31[102]360,362 / 27[364]000,001

                                ;EXEC:          [364]ALUC=LLHHL :[362]D=152526

                                ;CODES:         [362]SPS=3      /       N:C=1001

                                ;SYNC:          B05J2   (-)     T=1 USEC

                                ;KEY SIG:       K3-3 CMP L / K3-3 SM=0 L / K3-3 DM=0 L / K3-4 OVLAP INSTR H
                                                ; K3-8 CIN00 L

002056  012700  025252          BT036:  MOV     #25252,R0       ;MAKE [R0] = 25252
002062  005001                          CLR     R1              ;MAKE [R1] = 000000
002064  000264                          SEZ                     ;SCOPE SYNC - SET "Z"

002066  020100                  I036:   CMP     R1,R0           ;TEST THE CMP

002070  001002                          BNE     BT037           ;BR IF "Z" GOT  CLEARED

002072  000000                  E036:   HALT                    ;ERROR - CMP FAILED TO SET "Z"
002074  000770                          BR      BT036           ;LOCK ON HARD ERROR
```

```
                                ; ***********************************************************************
                                        .SBTTL BT037 ''CMP  RA,RB'' TEST WITH [RA] > [RB]
                                ; ***********************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION

                                ;ROM SEQ:       [102,364,362,001] FC 1,8

                                ;ACT BUTS:      37[004]100,102 / 31[102]360,362 / 27[364]000,001

                                ;EXEC:          [364]ALUC=LLHHL :[362]D=000017

                                ;CODES:         [362]SPS=3      /       N:C=0000

                                ;SYNC:          B05J2   (-)     T=1 USEC

                                ;KEY SIG:       K3-3 CMP L / K3-3 SM=0 L / K3-3 DM=0 L / K3-4 OVLAP INSTR H
                                                ; K3-8 CIN00 L

002076  005000                  BT037:  CLR     R0              ;MAKE [R0] = 000000
002100  012701  000017                  MOV     #17,R1          ;MAKE [R1] = 000017
002104  000264                          SEZ                     ;SCOPE SYNC - SET ''Z''

002106  020100                  I037:   CMP     R1,R0           ;TEST THE CMP

002110  001002                          BNE     BT040           ;BR IF ''Z'' GOT CLEARED

002112  000000                  E037:   HALT                    ;ERROR - CMP FAILED TO SET ''Z''
002114  000770                          BR      BT037           ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                        .SBTTL BT040 "MOV  (RA),RB" TEST WITH [SOURCE]=[RB]=17
                                ; ************************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION

                                ;ROM SEQ:       [141,247,250,160,204,000] FC 1,2,4,8

                                ;ACT BUTS:      37[004]100,141 / 35[247]120,160 / 20[160]000,000

                                ;EXEC:          [160]ALUC=LLLLL :[204]D=000017

                                ;CODES:         [204]SPS=3      /       N:C=0001

                                ;SYNC:          B05J2   (-)     T=2.3 USEC

                                ;KEY SIG:       K3-3 MOV L / K3-3 SM=1 L / K3-3 DM=0 L

002116  012700  177776          BT040:  MOV     #PSW,R0         ;R0 POINTS TO PSW
002122  005010                          CLR     (R0)            ;MAKE [PSW]=000
002124  005001                          CLR     R1              ;MAKE [R1]=000000
002126  000277                          SCC                     ;MAKE N:C=1111

002130  011001                  I040:   MOV     (R0),R1         ;TEST THE MOV

002132  020127  000017                  CMP     R1,#17          ;DID R1 GET LOADED WITH 000017 ?
002136  001402                          BEQ     BT041           ;BR IF YES

002140  000000                  E040:   HALT                    ;MOV FAILED TO LOAD R1
002142  000765                          BR      BT040           ;LOCK ON HARD ERROR
```

```
                                ; ***********************************************************************
                                        .SBTTL BT041 'MOV  (RA)+,RB'' TEST WITH [SOURCE]=[RB]=17
                                ; ***********************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION

                                ;ROM SEQ:       [141,247,250,160,204,000] FC 1,2,4,8

                                ;ACT BUTS:      37[004]100,141 / 35[247]120,160 / 20[160]000,000

                                ;EXEC:          [160]ALUC=LLLLL :[204]D=000017

                                ;CODES:         [204]SPS=3      /       N:C=0001

                                ;SYNC:          B05J2   (-)     T=2.3 USEC

                                ;KEY SIG:       K3-3 MOV L / K3-3 SM=1 L / K3-3 DM=0 L

002144  012700  177776          BT041:  MOV     #PSW,R0         ;R0 POINTS TO PSW
002150  005010                          CLR     (R0)            ;MAKE [PSW]=000
002152  005001                          CLR     R1              ;MAKE [R1]=000000
002154  000277                          SCC                     ;MAKE N:C=1111

002156  012001                  I041:   MOV     (R0)+,R1                ;TEST THE MOV

002160  020127  000017                  CMP     R1,#17          ;DID R1 GET LOADED WITH 000017 ?
002164  001402                          BEQ     A041            ;BR IF YES

002166  000000                  E1041:  HALT                    ;MOV FAILED TO LOAD R1
002170  000765                          BR      BT041           ;LOCK ON HARD ERROR

002172  005100                  A041:   COM     R0              ;[R0] SHOULD GO TO 177777
002174  005500                          ADC     R0              ;[R0] SHOULD GO TO 000000
002176  001402                          BEQ     BT042           ;BR IF ''Z'' GOT SET

002200  000000                  E2041:  HALT                    ;MOV FAILED TO AUTO INC. R0
002202  000760                          BR      BT041           ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                        .SBTTL BT042 'XOR  RA,RB'' TEST WITH [RA] = [RB] = 000000
                                ; ************************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION

                                ;ROM SEQ:       [102,364,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,102 / 31[102]360,360 / 27[364]000,001

                                ;EXEC:          [364]ALUC=HLHHL :[360]D=000000

                                ;CODES:         [360]SPS=3      /       N:C=0100

                                ;SYNC:          B05J2   (-)     T=1 USEC

                                ;KEY SIG:       K3-3 DM=0 L / K3-3 IR(08:06)=1 L / K3-5 XOR L / K3-4 OVLAP INSTR H


002204  005000                  BT042:  CLR     R0              ;MAKE [R0] = 000000
002206  005001                          CLR     R1              ;MAKE [R1] = 000000
002210  000257                          CCC                     ;SCOPE SYNC

002212  074100                  I042:   XOR     R1,R0           ;TEST THE XOR

002214  005700                          TST     R0              ;RESULT = 000000 ?
002216  001402                          BEQ     BT043           ;BR IF YES

002220  000000                  E042:   HALT                    ;XOR FAILED
002222  000770                          BR      BT042
```

```
                                ; ************************************************************************
                                        .SBTTL BT043 "XOR  RA,RB" TEST WITH [RA] = [RB] = 177777
                                ; ************************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION

                                ;ROM SEQ:       [102,364,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,102 / 31[102]360,360 / 27[364]000,001

                                ;EXEC:          [364]ALUC=HLHHL :[360]D=000000

                                ;CODES:         [360]SPS=3      /       N:C=0100

                                ;SYNC:          B05J2   (-)     T=1 USEC

                                ;KEY SIG:       K3-3 DM=0 L / K3-3 IR(08:06)=1 L / K3-5 XOR L / K3-4 OVLAP INSTR H

002224  005000                  BT043:  CLR     R0              ;MAKE [R0] = 177777
002226  005100                          COM     R0
002230  010001                          MOV     R0,R1           ;MAKE [R1] = 177777
002232  000257                          CCC                     ;SCOPE SYNC

002234  074100                  I043:   XOR     R1,R0           ;TEST THE XOR

002236  005700                          TST     R0              ;RESULT = 000000 ?
002240  001402                          BEQ     BT044   ;BR IF YES

002242  000000                  E043:   HALT                    ;XOR FAILED
002244  000767                          BR      BT043           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL BT044 'XOR  RA,RB' TEST WITH [RB]=052525,[RA]=125252
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING / LOGIC INFORMATION

                                        ;ROM SEQ:       [102,364,360,001] FC 1,7,8

                                        ;ACT BUTS:      37[004]100,102 / 31[102]360,360 / 27[364]000,001

                                        ;EXEC:          [364]ALUC=HLHHL :[360]D=177777

                                        ;CODES:         [360]SPS=3      /       N:C=1000

                                        ;SYNC:          B05J2   (-)     T=1 USEC

                                        ;KEY SIG:       K3-3 DM=0 L / K3-3 IR(08:06)=1 L / K3-5 XOR L / K3-4 OVLAP INSTR H

 002246  012701  125252                 BT044:  MOV     #125252,R1      ;MAKE [R1]=125252
 002252  012700  052525                         MOV     #052525,R0      ;MAKE [R0]=052525
 002256  000257                                 CCC                     ;SCOPE SYNC

 002260  074100                         I044:   XOR     R1,R0           ;TEST THE XOR

 002262  020027  177777                         CMP     R0,#-1          ;RESULT = 177777 ?
 002266  001402                                 BEQ     BT045           ;BR IF YES

 002270  000000                         E044:   HALT                    ;XOR FAILED
 002272  000400                                 BR      BT045           ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                        .SBTTL BT045 "XOR  RA,RB" TEST WITH [RA]=052525,[RB]=125252
                                ; ************************************************************************

                                ;MICROPROGRAMMING / LOGIC INFORMATION

                                ;ROM SEQ:       [102,364,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,102 / 31[102]360,360 / 27[364]000,001

                                ;EXEC:          [364]ALUC=HLHHL :[360]D=177777

                                ;CODES:         [360]SPS=3      /       N:C=1000

                                ;SYNC:          B05J2   (-)     T=1 USEC

                                ;KEY SIG:       K3-3 DM=0 L / K3-3 IR(08:06)=1 L / K3-5 XOR L / K3-4 OVLAP INSTR H

002274  012700  125252          BT045:  MOV     #125252,R0      ;MAKE [R0]=125252
002300  012701  052525                  MOV     #052525,R1      ;MAKE [R1]=052525
002304  000257                          CCC                     ;SCOPE SYNC

002306  074100                  I045:   XOR     R1,R0           ;TEST THE XOR

002310  020027  177777                  CMP     R0,#-1          ;RESULT = 177777 ?
002314  001402                          BEQ     BT046           ;BR IF YES

002316  000000                  E045:   HALT                    ;XOR FAILED
002320  000765                          BR      BT045           ;LOCK ON HARD ERROR
```

```
                                ; ***********************************************************************
                                        .SBTTL BT046 GPR ADDRESS INTERRACTION TEST
                                ; ***********************************************************************

002322  012700  125252          BT046:  MOV     #125252,R0      ;[R0] = 125252
002326  010001                          MOV     R0,R1
002330  005101                          COM     R1              ;[R1] = 052525
002332  010102                          MOV     R1,R2
002334  005102                          COM     R2              ;[R2] = 125252
002336  010203                          MOV     R2,R3
002340  005103                          COM     R3              ;[R3] = 052525
002342  010304                          MOV     R3,R4
002344  005104                          COM     R4              ;[R4] = 125252
002346  010405                          MOV     R4,R5
002350  005105                          COM     R5              ;[R5] = 052525

002352  074100                  I046:   XOR     R1,R0           ;[R0] S/B = 177777
002354  074200                          XOR     R2,R0           ;[R0] S/B = 125252
002356  074300                          XOR     R3,R0           ;[R0] S/B = 177777
002360  074400                          XOR     R4,R0           ;[R0]  S/B = 125252
002362  074500                          XOR     R5,R0           ;[R0]  S/B = 177777
002364  005100                          COM     R0              ;[R0] S/B = 000000

002366  001402                          BEQ     A046            ;BR IF [R0] WAS 000000

002370  000000                  E1046:  HALT                    ;GPR ADDRESSING PROBLEM
002372  000753                          BR      BT046           ;LOCK ON HARD ERROR

002374  020627  001000          A046:   CMP     SP,#STACKL      ;DID R6 GET DISTURBED
002400  001577                          BEQ     INIT            ;BR IF NOT

002402  000000                  E2046:  HALT                    ;R6 ADDRESS PROBLEM
002404  000746                          BR      BT046           ;LOCK ON HARD ERROR

        003000                  .=3000
```

```
                                ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                                ;          /  /  /  /  /  / BASIC INSTRUCTION TESTS /  /  /  /  /  /
                                ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

003000  012706  001000          INIT:   MOV     #BT001,SP       ;SET UP THE STACK POINTER
003004  012737  000001  066662          MOV     #1,@#ICOUNT     ;NO ITERATIONS ON INITIAL PASS
003012  012737  000001  066664          MOV     #1,@#ITCNT
003020  012701  066666                  MOV     #ERRCNT,R1      ;SET UP TO INIT. COUNTERS AND FLAGS
003024  005021                  1$:     CLR     (R1)+           ;CLEAR ONE WORD
003026  020127  066724                  CMP     R1,#ONCE+2      ;CLEARED ALL FLAGS AND COUNTERS?
003032  001374                          BNE     1$              ;BR IF NOT
003034  012706  001000          BEGIN:  MOV     #BT001,SP       ;SET UP THE STACK POINTER

                                ; ***********************************************************************
                                        .SBTTL T0001 BASIC 'BNE'' TEST WITH Z=0
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,341,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111 / 16[340]016,016

                                ;EXEC:          [341]ALUC = LHLLH  :[016] D = #T0002

                                ;CODES:         N / A

                                ;SYNC:          B05J2  (-)      /       T= 1.8 USEC

                                ;KEY SIG:       K5-3 FALSE BR L  /  K5-3 BR INSTR L

003040  012700  000001          T0001:  MOV     #0001,R0                ;LOAD R0 WITH TEST NO.
003044  000257                  R0001:  CCC                     ;MAKE Z=0

003046  001002                  I0001:  BNE     T0002           ;TEST THE BNE - IT SHOULD BR

003050  000000                  E0001:  HALT                    ;BNE FAILED TO LOAD PC
003052  000774                          BR      R0001           ;LOCK ON HARD ERROR
```

```
                                ; ***********************************************************************
                                        .SBTTL T0002 BASIC 'BNE'' TEST WITH Z=1
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [110,347,016]FC 1,7

                                ;ACT BUTS:      37[004]100,110 / 16[110]016,016

                                ;EXEC:          NO-OP=[016] D= #I0002

                                ;CODES:         N / A

                                ;SYNC:          B05J2 (-)       /       T= 1.4 USEC

                                ;KEY SIG:       K5-3 BR INSTR L

003054  012700  000002          T0002:  MOV     #0002,R0                ;LOAD R0 WITH TEST NO.
003060  000264                  R0002:  SEZ                     ;SET THE ''Z'' BIT

003062  001001                  I0002:  BNE     E0002           ;TEST THE BNE - IT SHOULD NOT BR

003064  000402                          BR      T0003           ;GO TO NEXT TEST

003066  000000                  E0002:  HALT                    ;BNE BRANCHED WITH Z=1
003070  000773                          BR      R0002           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0003 BASIC 'BEQ'' TEST WITH Z=1
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [111,340,341,016] FC 1,7

                                        ;ACT BUTS:      37[004]100,111 / 16[340]16,16

                                        ;EXEC:          [341]ALUC=LHLLH :[016]D=#T0004

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2 (-)       /       T= 1.8 USEC

                                        ;KEY SIG:       K5-3 FALSE BRL  /  K5-3 BR INSTRL

003072  012700  000003                  T0003:  MOV     #0003,R0                ;LOAD R0 WITH THE TEST NO.
003076  000264                          R0003:  SEZ                     ;MAKE Z=1

003100  001402                          I0003:  BEQ     T0004           ;TEST THE BEQ - IT SHOULD BR

003102  000000                          E0003:  HALT                    ;BEQ FAILED TO LOAD THE PC
003104  000774                                  BR      R0003           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0004 BASIC 'BEQ' TEST WITH Z=0
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [110,347,016] FC 1,7

                                        ;ACT BUTS:      37[004]100,110 / 16[110]016,016

                                        ;EXEC:          NO-OP=[016] D= #I0004

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2 (-)       /       T= 1.4 USEC

                                        ;KEY SIG:       K5-3 BR INSTR L

003106  012700  000004                  T0004:  MOV     #0004,R0        ;LOAD R0 WITH THE TEST NO.
003112  000257                          R0004:  CCC                     ;MAKE Z=0

003114  001401                          I0004:  BEQ     E0004           ;TEST THE BEQ - IT SHOULD NOT BR

003116  000402                                  BR      T0005           ;GO TO NEXT TEST

003120  000000                          E0004:  HALT                    ;BEQ BRANCHED WITH Z=0
003122  000773                                  BR      R0004           ;LOCK ON HARD ERROR
```

```
                                ; ***********************************************************************
                                        .SBTTL T0005 BASIC "BPL" TEST WITH N=1
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,110 / 16[110]16,16

                                ;EXEC:          NO-OP=[016] D=#I0005

                                ;CODES:         N / A

                                ;SYNC:          B05J2 (-)       /       T= 1.4 USEC

                                ;KEY SIG:       K5-3 BR INSTR L

003124  012700  000005          T0005:  MOV     #0005,R0                ;LOAD R0 WITH TEST NO.
003130  005037  177776          R0005:  CLR     @#PSW           ;CLEAR THE PSW
003134  000270                          SEN                     ;MAKE N=1

003136  100001                  I0005:  BPL     E0005           ;TEST THE BPL - IT SHOULDN'T BR

003140  000402                          BR      T0006           ;GO TO NEXT TEST

003142  000000                  E0005:  HALT                    ;BPL BRANCHED WITH N=1
003144  000771                          BR      R0005           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0006 BASIC 'BPL'' TEST WITH N=0
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [111,340,341,016] FC 1,7

                                        ;ACT BUTS:      37[004]100,111 / 16[340]16,16

                                        ;EXEC:          [341]ALUC LHLLH :[016]D=#T0007

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2 (-)       /       T= 1.8 USEC

                                        ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 FALSE BR L

003146  012700  000006                  T0006:  MOV     #0006,R0        ;LOAD R0 WITH TEST NO.
003152  005037  177776                  R0006:  CLR     @#PSW           ;CLEAR THE PSW
003156  000257                                  CCC                     ;SCOPE SYNC

003160  100002                          I0006:  BPL     T0007           ;TEST THE BPL - IT SHOULD BR

003162  000000                          E0006:  HALT                    ;BPL FAILED TO LOAD THE PC
003164  000772                                  BR      R0006           ;LOCK ON HARD ERROR
```

```
                                ; ***********************************************************************
                                        .SBTTL T0007 BASIC 'MOV  (RA),RB'' TEST - (RA)=177776
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [141,247,250,160,204,000] FC 1,2,4,8

                                ;ACT BUTS:      37[004]100,141  /  35[247]120,160  /  20[160]000,000

                                ;EXEC:          [160]ALUC=LLLLL :[204]D=000017

                                ;CODES:         [204]SPS=3       /      N:C=0000

                                ;SYNC:          B05J2   (-)      T=2.25 USEC

                                ;KEY SIG:       K3-3 MOV L  /  K3-3 SM=1 L  /  K3-3 DM=0 L

003166  012700  000007          T0007:  MOV     #0007,R0                ;LOAD R0 WITH TEST NO.
003172  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
003176  012705  177776                  MOV     #PSW,R5         ;SOURCE ADDR = 177776
003202  012704  000017                  MOV     #17,R4          ;RESULT S / B=000017
003206  005015                  R0007:  CLR     (R5)            ;MAKE [PSW]=000
003210  005003                          CLR     R3              ;[DEST] = 000000
003212  000277                          SCC                     ;MAKE [PSW]=017

003214  011503                  I0007:  MOV     (R5),R3         ;TEST THE MOV

003216  020403                          CMP     R4,R3           ;CORRECT RESULT ?
003220  001402                          BEQ     T0010           ;BR IF YES

003222  000000                  E0007:  HALT                    ;ERROR-MOV FAILED
003224  000770                          BR      R0007           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0010 BASIC "CMP  RA,(RB)" TEST - [RA] = [DEST]
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,8

                                        ;ACT BUTS:      37[004]100,161  /  33[266]220,224  /  16[367]016,016

                                        ;EXEC:          [224]ALUC=LLHHL :[367]D=000000

                                        ;CODES:         [367]SPS=3       /      N:C=0100

                                        ;SYNC:          B05J2   (-)      T=2.6 USEC

                                        ;KEY SIG:       K3-3 CMP L  /  K3-3 SM=0 L  /  K3-3 DM=1 L  /  K4-4 ALLOW CLK L
                                                        ;  K3-8 CINOO L

003226  012700  000010          T0010:  MOV     #0010,R0                ;LOAD R0 WITH TEST NO.
003232  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
003236  012704  125252                  MOV     #125252,R4      ;RESULT S / B = 125252
003242  012737  125252  067560  R0010:  MOV     #125252,@#MBUF0 ;MAKE [DEST] = 125252
003250  000257                          CCC                     ;MAKE N:C=0000

003252  020412                  I0010:  CMP     R4,(R2)         ;TEST THE CMP

003254  001403                          BEQ     T0011           ;BR IF "Z" GOT SET

003256  011203                          MOV     (R2),R3         ;GET THE WAS DATA
003260  000000                  E0010:  HALT                    ;ERROR - CMP FAILED TO SET "Z"
003262  000767                          BR      R0010           ;LOCK ON HARD ERROR
```

```
                                ; ************************************************************************
                                        .SBTTL T0011 BASIC ''CMP  RA,(RB)'' TEST - [RA] NOT EQUAL TO  [DEST]
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,8

                                ;ACT BUTS:      37[004]100,161  /  33[266]220,224  /  16[367]016,016

                                ;EXEC:          [224]ALUC=LLHHL :[367]D=177777

                                ;CODES:         [367]SPS=3       /      N:C=1001

                                ;SYNC:          B05J2   (-)      T=2.6 USEC

                                ;KEY SIG:       K3-3 CMP L  /  K3-3 SM=0 L  /  K3-3 DM=1 L  /  K4-4 ALLOW CLK L
                                                ;  K3-8 CIN00 L

003264  012700  000011          T0011:  MOV     #0011,R0                ;LOAD R0 WITH TEST NO.
003270  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
003274  012704  000001                  MOV     #1,R4           ;RESULT S / B = 000001
003300  012737  000000  067560  R0011:  MOV     #0,@#MBUF0      ;MAKE [DEST] = 000000
003306  000264                          SEZ                     ;MAKE N:C=0100

003310  020412                  I0011:  CMP     R4,(R2)         ;TEST THE CMP

003312  001003                          BNE     T0012           ;BR IF ''Z'' GOT CLEARED

003314  011203                          MOV     (R2),R3         ;GET THE WAS DATA
003316  000000                  E0011:  HALT                    ;ERROR - CMP FAILED TO CLR ''Z''
003320  000767                          BR      R0011           ;LOCK ON HARD ERROR
```

```
                                ; ***********************************************************************
                                        .SBTTL T0012 BASIC ''CMP #N,R'' TEST - N = [R]
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [142,240,250,120,371,362,000] FC 1,2,8

                                ;ACT BUTS:      37[004]100,142 / 35[240]120,120 / 27[371]000,000

                                ;EXEC:          [371]ALUC=LLHHL :[362]D=125252

                                ;CODES:         [362] SPS=3  /  N:C=

                                ;SYNC:          B05J2 (-)       /       T= 2.5 USEC

                                ;KEY SIG:       K3-3 CMPL  /  K3-3 DM=0L  /  K3-6 BYTE INSTR H

003322  012700  000012          T0012:  MOV     #0012,R0                ;LOAD R0 WITH TEST NO.
003326  012704  125252                  MOV     #125252,R4      ;RESULT S / B = 125252
003332  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
003336  010403                  R0012:  MOV     R4,R3           ;[DEST] = 125252
003340  000257                          CCC                     ;SCOPE SYNC

003342  022703  125252          I0012:  CMP     #125252,R3      ;TEST THE CMP

003346  001402                          BEQ     A0012           ;BR IF N = [R]

003350  000000                  E10012: HALT                    ;CMP FAILED
003352  000771                          BR      R0012           ;LOCK ON HARD ERROR


003354  020403                  A0012:  CMP     R4,R3           ;DID CMP ALTER [DEST]?
003356  001402                          BEQ     T0013           ;BR IF NO

003360  000000                  E20012: HALT                    ;CMP DELIVERED A RESULT
003362  000765                          BR      R0012           ;LOCK ON HARD ERROR
```

```
                                ; ***********************************************************************
                                        .SBTTL T0013 BASIC ''CMP #N,R'' TEST - N NOT EQUAL TO [R]
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [142,240,250,120,371,362,000] FC 1,2,8

                                ;ACT BUTS:      37[004]100,142 / 35[240]120,120 / 27[371]000,000

                                ;EXEC:          [371]ALUC=LLHHL :[362]D=177777

                                ;CODES:         [362] SPS=3  /  N:C=1001

                                ;SYNC:          B05J2 (-)       T=2.5 USEC

                                ;KEY SIG:       K3-3 CMPL  /  K3-3 DM=0L  /  K3-6 BYTE INSTR H  /  K3-8 CIN00 L

003364  012700  000013         T0013:  MOV     #0013,R0                ;LOAD R0 WITH TEST NO.
003370  005004                         CLR     R4              ;RESULT S / B = 000000
003372  012702  177703                 MOV     #177703,R2      ;DEST ADDR = R3
003376  010403                 R0013:  MOV     R4,R3           ;[DEST] = 125252
003400  000264                         SEZ                     ;SCOPE SYNC

003402  022703  000001         I0013:  CMP     #1,R3           ;TEST THE CMP

003406  001002                         BNE     A0013           ;BR IF N NOT EQUAL TO [R]

003410  000000                 E10013: HALT                    ;CMP FAILED
003412  000771                         BR      R0013           ;LOCK ON HARD ERROR

003414  020403                 A0013:  CMP     R4,R3           ;DID CMP ALTER [DEST]?
003416  001402                         BEQ     T0014           ;BR IF NO

003420  000000                 E20013: HALT                    ;CMP DELIVERED A RESULT
003422  000765                         BR      R0013           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0014 BASIC ''MOV  RA,(RB)'' TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [171,257,201,125,375,016] FC 1,4,8

                                        ;ACT BUTS:      37[004]100,171  /  22[171]200,201  /  16[125]016,016

                                        ;EXEC:          [201]ALUC=LLLLL :[125]D=177777

                                        ;CODES:         [125]SPS=3       /      N:C=1000

                                        ;SYNC:          B05J2   (-)      T=2.42 USEC

                                        ;KEY SIG:       K3-3 MOV L  /  K3-3 SM=0 L  /  K3-3 DM=1 L

003424  012700  000014                  T0014:  MOV     #0014,R0                ;LOAD R0 WITH TEST NO.
003430  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR=MBUF0
003434  012704  177777                          MOV     #-1,R4          ;RESULT S / B = 177777
003440  005012                          R0014:  CLR     (R2)            ;MAKE [DEST] = 000000
003442  000257                                  CCC                     ;SCOPE SYNC - N:C=0000

003444  010412                          I0014:  MOV     R4,(R2)         ;TEST THE MOV

003446  020412                                  CMP     R4,(R2)         ;RESULT CORRECT ?
003450  001403                                  BEQ     T0015           ;BR IF  YES

003452  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
003454  000000                          E0014:  HALT                    ;ERROR - MOV FAILED
003456  000770                                  BR      R0014           ;LOCK ON HARD ERROR
```

```
                                ; ***********************************************************************
                                        .SBTTL T0015 BASIC 'MOV #N,(R)' TEST
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ        [142,240,250,171,257,200,125,375,016] FC 1,2,4,8

                                ;ACT BUTS:      37[004]100,142  /  35[240]120,171  /  22[171]200,200  /  16[125]016,016

                                ;EXEC:          [200]ALUC=LLLLL :[125]D=177777

                                ;CODES:         [125]SPS=3       /      N:C=1000

                                ;SYNC:          B05J2   (-)      T=3.26 USEC

                                ;KEY SIG:       K3-3 MOV L  /  K3-3 SM=2 L  /  K3-3 DM=1 L  /  K5-5 BCON(1+2) H

003460  012700  000015          T0015:  MOV     #0015,R0                ;LOAD R0 WITH TEST NO.
003464  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
003470  012704  177777                  MOV     #-1,R4          ;RESULT S / B = 177777
003474  005012                  R0015:  CLR     (R2)            ;MAKE [DEST] = 000000
003476  000257                          CCC                     ;SCOPE SYNC

003500  012712  177777          I0015:  MOV     #-1,(R2)        ;TEST THE MOV

003504  020412                          CMP     R4,(R2)         ;RESULT OK ?
003506  001403                          BEQ     T0016           ;BR IF YES

003510  011203                          MOV     (R2),R3 ;GET THE WAS DATA
003512  000000                  E0015:  HALT                    ;ERROR - MOV FAILED
003514  000767                          BR      R0015           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0016 BASIC 'MOVB #N,X(R)'' TEST - DEST EVEN
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,177,206,212,202,205,125,375,016] FC 1,2,4

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,177 / 17[177]212,212 / 21[206]200,202
                                                        ; / 16[125]016,016

                                        ;EXEC:          [205]ALUC=LLLLL :[125]D=001001

                                        ;CODES:         [125] SPS=3  /  N:C=0000

                                        ;SYNC:          B05J2 (-)       /       T= 4.2 USEC

                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=6L  /  K3-5 DOPL  /  K3-6 BYTE INSTR H

003516  012700  000016                  T0016:  MOV     #0016,R0                ;LOAD R0 WITH TEST NO.
003522  012704  177401                          MOV     #177401,R4      ;RESULT S / B = 177401
003526  012702  067564                          MOV     #MBUF1,R2       ;DEST ADDR = MBUF1
003532  012705  067560                          MOV     #MBUF0,R5       ;BASE DEST ADDR = MBUF0
003536  012712  177777                  R0016:  MOV     #-1,(R2)        ;[DEST] = 177777
003542  000257                                  CCC                     ;SCOPE SYNC

003544  112765  000001  000004          I0016:  MOVB    #1,4(R5)        ;TEST THE MOVB

003552  020412                                  CMP     R4,(R2)         ;RESULT OK?
003554  001403                                  BEQ     T0017           ;BR IF YES

003556  011203                                  MOV     (R2),R3         ;GET WAS DATA
003560  000000                          E0016:  HALT                    ;MOVB DELIVERED WRONG RESULT
003562  000765                                  BR      R0016           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0017 BASIC 'MOVB #N,X(R)'' TEST - DEST ODD
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,177,206,212,202,205,125,375,016] FC 1,2,4

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,177 / 17[177]212,212 / 21[206]200,202
                                                        ; / 16[125]016,016

                                        ;EXEC:          [205]ALUC=LLLLL :[125]D=001001

                                        ;CODES:         [125] SPS=3  /  N:C=0000

                                        ;SYNC:          B05J2 (-)       /       T= 4.2 USEC

                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=6L  /  K3-5 DOPL  /  K3-6 BYTE INSTR H

003564  012700  000017                  T0017:  MOV     #0017,R0                ;LOAD R0 WITH TEST NO.
003570  012704  000777                          MOV     #777,R4         ;RESULT S / B = 777
003574  012702  067564                          MOV     #MBUF1,R2       ;DEST ADDR = MBUF1
003600  012705  067560                          MOV     #MBUF0,R5       ;BASE DEST ADDR = MBUF0
003604  012712  177777                  R0017:  MOV     #-1,(R2)        ;[DEST] = 177777
003610  000257                                  CCC                     ;SCOPE SYNC

003612  112765  000001  000005          I0017:  MOVB    #1,5(R5)        ;TEST THE MOVB

003620  020412                                  CMP     R4,(R2)         ;RESULT OK?
003622  001403                                  BEQ     CLMT            ;BR IF YES

003624  011203                                  MOV     (R2),R3         ;GET WAS DATA
003626  000000                          E0017:  HALT                    ;MOVB DELIVERED WRONG RESULT
003630  000765                                  BR      R0017           ;LOCK ON HARD ERROR

                                        ;THIS ROUTINE CLEARS THE 512 BYTE MISSED TEST STATUS TABLE

003632  012701  070140                  CLMT:   MOV     #STAB1,R1       ;R1 POINTS TO BEGINNING OF TABLE
003636  012702  071162                          MOV     #STAB2,R2       ;R2 POINTS TO END OF TABLE
003642  012721  000000                  MT:     MOV     #0,(R1)+        ;CLEAR ONE WORD
003646  020102                                  CMP     R1,R2           ;AT END OF TABLE ?
003650  001374                                  BNE     MT              ;BR IF NOT AT END
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0020 BASIC 'TST  @#A'' TEST WITH [A]>0
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [163,264,265,266,267,220,211,367,376,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,163 / 33[266]220,220 / 16[367]016,016

                                        ;EXEC:          [220]ALUC LLLLL :[211]D=377

                                        ;CODES:         [367]SPS=3  /  N:C=0000

                                        ;SYNC:          B05J2 (-)       /       T= 2.8 USEC

                                        ;KEY SIG:       K3-4 TSTL  /  K3-3 DM=3L

003652  012700  000020                  T0020:  MOV     #0020,R0                ;LOAD R0 WITH TEST NO.
003656  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
003664  012703  066704                          MOV     #FIRST,R3       ;R3 POINTS TO LOCATION THAT STORES NO OF FIRST TEST
003670  010013                                  MOV     R0,(R3)         ;SAVE FIRST TEST NO. CHECKED
003672  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
003676  012704  000377                          MOV     #377,R4         ;RESULT S / B = 377 (NO CHANGE)
003702  010412                          R0020:  MOV     R4,(R2)         ;[DEST] = 377
003704  000257                                  CCC                     ;SCOPE SYNC

003706  005737  067560                  I0020:  TST     @#MBUF0         ;TEST THE TST

003712  001401                                  BEQ     E0020           ;BR IF 'Z'' SET - IT SHOULDN'T BE
003714  100002                                  BPL     T0021           ;BR IF 'N'' CLEAR - IT SHOULD BE

003716  000000                          E0020:  HALT                    ;TST FAILED TO ALTER CODES PROPERLY
003720  000770                                  BR      R0020           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0021 BASIC "TST @#A" TEST WITH [A] < 0
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [163,264,265,266,267,220,211,367,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,163  /  33[266]220,220  /  16[367]016,016

                                        ;EXEC:          [220]ALUC=LLLLL :[211]D=100000

                                        ;CODES:         [367]SP=3  /  N:C=1000

                                        ;SYNC:          B05J2 (-)       /       T= 2.8 USEC

                                        ;KEY SIG:       K3-4 TSTL  /  K3-3 DM=3L  /  K5-2 PS(N)(1)H

003722  012700  000021                  T0021:  MOV     #0021,R0                ;LOAD R0 WITH TEST NO.
003726  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
003734  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
003740  012704  100000                          MOV     #100000,R4      ;MAKE S / B = 100000
003744  010412                          R0021:  MOV     R4,(R2)         ;MAKE [DEST] = 100000
003746  000257                                  CCC                     ;SCOPE SYNC

003750  005737  067560                  I0021:  TST     @#MBUF0         ;TEST THE TST

003754  001401                                  BEQ     E10021          ;BR IF "Z" SET - IT SHOULDN'T BE
003756  100402                                  BMI     A0021           ;BR IF "N" SET - IT SHOULD BE

003760  000000                          E10021: HALT                    ;TST FAILED TO ALTER CODES PROPERLY
003762  000770                                  BR      R0021           ;LOCK ON HARD ERROR
003764  020412                          A0021:  CMP     R4,(R2)         ;DID TST DISTURB [DEST] ?
003766  001403                                  BEQ     T0022           ;BR IF NOT

003770  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
003772  000000                          E20021: HALT                    ;TST DELIVERED A RESULT
003774  000763                                  BR      R0021           ;LOCK ON HARD ERROR
```

```
                                ; ***********************************************************************
                                        .SBTTL T0022 BASIC "TST @#A" WITH [A] = 0
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [163,264,265,266,267,220,211,367,375,016] FC 1,3,9,8

                                ;ACT BUTS:      37[004]100,163 / 33[266]220,220 / 16[367]016,016

                                ;EXEC:          [220]ALUC=LLLLL :[211]D=000000

                                ;CODES:         [367]SPS=3  /  N:C=0100

                                ;SYNC:          B05J2 (-)       /       T=2.8 USEC

                                ;KEY SIG:       K3-4 TSTL  /  K3-3 DM=3L  /  K5-2 PS(Z)(1)H

003776  012700  000022          T0022:  MOV     #0022,R0                ;LOAD R0 WITH TEST NO.
004002  112760  000377  070140          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
004010  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
004014  005004                          CLR     R4              ;RESULT S / B = 0 (IT SHOULDN'T CHANGE
004016  005012                  R0022:  CLR     (R2)            ;[DEST] = 0
004020  000257                          CCC                     ;SCOPE SYNC - Z=0

004022  005737  067560          I0022:  TST     @#MBUF0         ;TEST THE TST

004026  001402                          BEQ     A0022           ;BR IF TST SET "Z"

004030  000000                  E10022: HALT                    ;TST FAILED TO SET "Z"
004032  000771                          BR      R0022           ;LOCK ON HARD ERROR

004034  020412                  A0022:  CMP     R4,(R2)         ;[DEST] STILL = 000000
004036  001403                          BEQ     T0023           ;BR IF YES

004040  011203                          MOV     (R2),R3         ;GET THE WAS DATA
004042  000000                  E20022: HALT                    ;TST ALTERED THE [DEST]
004044  000764                          BR      R0022           ;LOCK ON HARD ERROR
```

```
                                ; ***********************************************************************
                                        .SBTTL T0023 BASIC "TST  (R)+" TEST
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [162,260,267,220,211,367,375,016] FC 1,3,8,9

                                ;ACT BUTS:      37[004]100,162 / 33[260]220,220 / 16[367]016,016

                                ;EXEC:          [220]ALUC=LLLLL :[211]D=000000

                                ;CODES:         [367] SPS=3  /  N:C=0100

                                ;SYNC:          B05J2 (-)       /       T= 1.84 USEC

                                ;KEY SIG:       K3-4 TSTL  /  K3-3 DM=2L  /  K5-2 PS(Z)(1)H

004046  012700  000023          T0023:  MOV     #0023,R0                ;LOAD R0 WITH TEST NO.
004052  112760  000377  070140          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
004060  012702  067560                  MOV     #MBUF0,R2       ;INITIAL DEST ADDR = MBUF0
004064  005004                          CLR     R4              ;RESULT S / B = 0 (NO CHANGE)
004066  005012                  R0023:  CLR     (R2)            ;MAKE [DEST] = 000000
004070  000257                          CCC                     ;SCOPE SYNC

004072  005722                  I0023:  TST     (R2)+           ;TEST THE TST

004074  001402                          BEQ     A0023           ;BR IF "Z" SET - IT SHOULD BE

004076  000000                  E10023: HALT                    ;TST FAILED TO SET "Z"
004100  000772                          BR      R0023           ;LOCK ON HARD ERROR

004102  022702  067562          A0023:  CMP     #MBUF0+2,R2     ;DID REG. GET AUTO-INCREMENTED ?
004106  001402                          BEQ     T0024           ;BR IF YES

004110  000000                  E20023: HALT                    ;TST FAILED TO UPDATE REGISTER
004112  000765                          BR      R0023           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0024 BASIC "TST -(R)" TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [164,260,267,220,211,367,375,016]

                                        ;ACT BUTS:      37[004]100,164 / 33[260]220,220 / 16[367]016,016

                                        ;EXEC:          [220]ALUC=LLLLL :[211]D=125252

                                        ;CODES:         [367] SPS=3  /  N:C=0000

                                        ;SYNC:          B05J2 (-)       /       T= 1.84 USEC

                                        ;KEY SIG:       K3-4 TSTL  /  K3-3 DM=4

004114  012700  000024                  T0024:  MOV     #0024,R0                ;LOAD R0 WITH TEST NO.
004120  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
004126  012702  067576                          MOV     #DWTA+6,R2      ;DEST ADDR = DWTA+6
004132  012704  000377                          MOV     #377,R4         ;RESULT S / B = 377
004136  012705  067600                  R0024:  MOV     #DWTA+10,R5     ;BASE DEST ADDR = DWTA+10
004142  000270                                  SEN                     ;SCOPE SYNC

004144  005745                          I0024:  TST     -(R5)           ;TEST THE TST

004146  100002                                  BPL     A0024           ;BR IF "N" CLEAR

004150  000000                          E10024: HALT                    ;TST FAILED TO CLEAR "N"
004152  000771                                  BR      R0024           ;LOCK ON HARD ERROR

004154  020502                          A0024:  CMP     R5,R2           ;DID DEST REG GET DECREMENTED?
004156  001402                                  BEQ     B0024           ;BR IF YES

004160  000000                          E20024: HALT                    ;ERROR - TST FAILED TO UPDATE DEST REG
004162  000765                                  BR      R0024           ;LOCK ON HARD ERROR

004164  020412                          B0024:  CMP     R4,(R2)         ;DID TST ALTER [DEST]?
004166  001404                                  BEQ     T0025           ;BR IF NOT

                                                MOV     (R2),R3         ;GET WAS DATA
004170  011203                          E30024: HALT                    ;TST ALTERED [DEST]
004172  000000                                  MOV     R4,(R2)         ;RESTORE [DEST]
004174  010412                                  BR      R0024           ;LOCK ON HARD ERROR
004176  000757
```

```
                                        ; ***************************************************************
                                                .SBTTL T0025 BASIC "COM @#A" TEST
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [163,264,265,266,267,220,211,267,375,016] FC 1,3,9,8

                                        ;ACT BUS:       37[004]100,163  /  33[266]220,220  /  16 [367]016,016

                                        ;EXEC:          [220]ALUC=HLLLL :[211]D=177777

                                        ;CODES:         [367] SPS=3  /  N:C=1001

                                        ;SYNC:          B05J2 (-)       /       T= 2.8 USEC

                                        ;KEY SIG:       K3-4 COM L  /  K3-3 DM=3L  /  K5-2 PS(N)(1)H  /  K5-2 PS(C)(1)H

004200  012700  000025                  T0025:  MOV     #0025,R0                ;LOAD R0 WITH TEST NO.
004204  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
004212  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
004216  005004                                  CLR     R4              ;RESULT S / B = 177777
004220  005104                                  COM     R4
004222  005012                          R0025:  CLR     (R2)            ;MAKE [DEST] = 000000
004224  000257                                  CCC                     ;SCOPE SYNC

004226  005137  067560                  I0025:  COM     @#MBUF0 ;TEST THE COM

004232  020412                                  CMP     R4,(R2)         ;RESULT = 177777 ??
004234  001403                                  BEQ     T0026           ;BR IF YES

004236  011203                          E0025:  MOV     (R2),R3         ;GET THE WAS DATA
004240  000000                                  HALT                    ;COM DELIVERED THE WRONG RESULT
004242  000767                                  BR      R0025
```

```
                                        ; ***************************************************************
                                                .SBTTL T0026 BASIC ''INC  @#A'' TEST
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [163,264,265,266,267,220,211,367,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,163 / 33[266]220,220 / 16[367]016,016

                                        ;EXEC:          [220]ALUC=LLLLL :[211]D=100

                                        ;CODES:         [367] SPS=3  /  N:C=0000

                                        ;SYNC:          B05J2 (-)       /       T= 2.8 USEC

                                        ;KEY SIG:       K3-4 INC L  /  K3-3 DM=3L  /  K3-8 CIN 00 L

004244  012700  000026                  T0026:  MOV     #0026,R0                ;LOAD R0 WITH TEST NO.
004250  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
004256  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
004262  012704  000100                          MOV     #100,R4         ;RESULT S / B = 100
004266  012712  000077                  R0026:  MOV     #77,(R2)        ;[DEST] = 77
004272  000257                                  CCC                     ;SCOPE SYNC

004274  005237  067560                  I0026:  INC     @#MBUF0         ;TEST THE INC

004300  020412                                  CMP     R4,(R2)         ;DID RESULT = 100 ??
004302  001403                                  BEQ     T0027           ;BR IF YES

004304  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
004306  000000                  E0026:  HALT                            ;INC DELIVERED WRONG RESULT
004310  000766                          BR      R0026                   ;LOCK ON HARD ERROR
```

```
                                        ; ***************************************************************
                                                .SBTTL T0027 BASIC "DEC  RN" TEST
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [104,373,360,001] FC 1,7,8

                                        ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001

                                        ;EXEC:          [104]ALUC=LHHHH :[373]D=000000

                                        ;CODES:         [367] SPS=3  /  N:C=0100

                                        ;SYNC:          B05J2 (-)       /       T= 1 USEC

                                        ;KEY SIG:       K3-4 DEC L  /  K3-4 OVLAP INSTR H  /  K3-3 DM=0L  /  K5-2 PS(Z)(1)H

004312  012700  000027                  T0027:  MOV     #0027,R0                ;LOAD R0 WITH TEST NO.
004316  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
004324  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
004330  005004                                  CLR     R4              ;RESULT S / B = 000000
004332  012703  000001                  R0027:  MOV     #1,R3           ;[DEST0030
004336  000257                                  CCC                     ;SCOPE SYNC

004340  005303                          I0027:  DEC     R3              ;TEST THE DEC

004342  005703                                  TST     R3              ;RESULT = 000000 ??
004344  001402                                  BEQ     T0030           ;BR IF YES

004346  000000                          E0027:  HALT                    ;DEC DELIVERED THE WRONG RESULT
004350  000770                                  BR      R0027           ;LOCK ON HARD ERROR
```

```
                                        ; ***************************************************************
                                                .SBTTL T0030 BASIC 'DEC @#A' TEST
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING / LOGIC INFORMATION

                                        ;ROM SEQ:       [163,264,265,266,267,220,211,367,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,163 / 33[266]220,220 / 16[367]016,016

                                        ;EXEC:          [220]ALUC=LHHHH :[211]D=177777

                                        ;CODES:         [367] SPS=3 / N:C=1000

                                        ;SYNC:          B05J2 (-)       /       T=2.8 USEC

                                        ;KEY SIG:       K3-4 DEC L / K3-3 DM=3L / K5-2 PS(N)(1)H

004352  012700  000030                  T0030:  MOV     #0030,R0                ;LOAD R0 WITH TEST NO.
004356  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
004364  012704  177777                          MOV     #-1,R4          ;RESULT S / B = 177777
004370  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
004374  005012                          R0030:  CLR     (R2)            ;MAKE [DEST] = 000000
004376  000257                                  CCC                     ;SCOPE SYNC

004400  005337  067560                  I0030:  DEC     @#MBUF0         ;TEST THE DEC

004404  020412                                  CMP     R4,(R2)         ;DID RESULT = 177777 ??
004406  001403                                  BEQ     T0031           ;BR IF YES

004410  011203                                  MOV     (R2),R3         ;[R3] = WAS DATA
004412  000000                          E0030:  HALT                    ;DEC DELIVERED WRONG RESULT
004414  000767                                  BR      R0030           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0031 BASIC "CLR X(R)" TESTS
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [167,261,262,266,267,220,211,367,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,167 / 17[167]262,262 / 33[266]220,220 / 16[367]016,016

                                        ;EXEC:          [220]ALUC HLLHH :[211]D=000000

                                        ;CODES:         [367] SPS=3  /  N:C=0100

                                        ;SYNC:          B05J2 (-)       /       T= 2.5 USEC

                                        ;KEY SIG:       K3-3 DM=6L  /  K3-4 CLRL

004416  012700  000031                  T0031:  MOV     #0031,R0                ;LOAD R0 WITH TEST NO.
004422  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
004430  012702  067562                          MOV     #MBUF0+2,R2     ;DEST ADDR = MBUF0+2
004434  005004                                  CLR     R4              ;RESULT S / B = 000000
004436  012705  067560                  R0031:  MOV     #MBUF0,R5       ;BASE DEST ADDR = MBUF0
004442  012712  177777                          MOV     #-1,(R2)        ;[DEST] = 177777
004446  000257                                  CCC                     ;SCOPE SYNC

004450  005065  000002                  I0031:  CLR     2(R5)           ;TEST THE CLR

004454  020412                                  CMP     R4,(R2)         ;RESULT = 0?
004456  001403                                  BEQ     T0032           ;BR IF YES

004460  011203                                  MOV     (R2),R3         ;GET WAS DATA
004462  000000                          E0031:  HALT                    ;CLR FAILED TO ZERO [DEST]
004464  000764                                  BR      R0031           ;LOCK ON HARD ERROR.
```

```
                                ; ***********************************************************************
                                        .SBTTL T0032 BASIC ''ASL  RN'' TEST WITH [DEST]=125252 AND C(0)
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [104,373,360,000] FC 1,7,8

                                ;ACT BUTS:      37[004]160,104 / 31[104]360,360 / 27[373]000,000

                                ;EXEC:          [104]ALUC=LHHLL :[373]D=52524

                                ;CODES:         [360] SPS=3  /  N:C=0001

                                ;SYNC:          B05J2 (-)       /       T= 1 USEC

                                ;KEY SIG:       K3-5 ROTSHF H  /  K3-3 SM=6L  /  K5-2 PS (C)(1)H

004466  012700  000032          T0032:  MOV     #0032,R0                ;LOAD R0 WITH TEST NO.
004472  112760  000377  070140          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
004500  012704  052524                  MOV     #52524,R4       ;RESULT S / B = 52524
004504  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
004510  012703  125252          R0032:  MOV     #125252,R3      ;MAKE [DEST] = 125252
004514  000257                          CCC                     ;MAKE C=0

004516  006303                  I0032:  ASL     R3              ;TEST THE ASL - IT SHOULD SET ''C''

004520  103402                          BCS     A0032           ;BR IF ''C'' GOT SET

004522  000000                  E10032: HALT                    ;ASL FAILED TO SET ''C'' BIT
004524  000771                          BR      R0032           ;LOCK ON HRD ERROR

004526  020403                  A0032:  CMP     R4,R3           ;WAS RESULT = 52524 ??
004530  001402                          BEQ     T0033           ;BR IF YES

004532  000000                  E20032: HALT                    ;ASL DELIVERED THE WRONG RESULT
004534  000765                          BR      R0032           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0033 BASIC ''ASL  RN'' TEST WITH [DEST]=052525 AND C(1)
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [104,373,360,000] FC 1,7,8]

                                        ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,000

                                        ;EXEC:          [104]ALUC=LHHLL :[373]D=125252

                                        ;CODES:         [360] SPS=3  /  N:C=1000

                                        ;SYNC:          B05J2 (-)       /       T= 1 USEC

                                        ;KEY SIG:       K3-5 ROTSHF H  /  K3-3 SM=6L  /  K5-2 PS(N)(1)H

004536  012700  000033                  T0033:  MOV     #0033,R0                ;LOAD R0 WITH TEST NO.
004542  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
004550  012704  125252                          MOV     #125252,R4      ;RESULT S / B = 125252
004554  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
004560  012703  052525                  R0033:  MOV     #052525,R3      ;MAKE [DEST] = 052525
004564  000261                                  SEC                     ;MAKE C=1

004566  006303                          I0033:  ASL     R3              ;TEST THE ASL - IT SHOULD CLR ''C''

004570  103002                                  BCC     A0033           ;BR IF ''C'' GOT CLEARED

004572  000000                          E10033: HALT                    ;ASL FAILED TO CLEAR ''C''
004574  000771                                  BR      R0033           ;LOCK ON HARD ERROR

004576  020403                          A0033:  CMP     R4,R3           ;RESULT = 125252 ??
004600  001402                                  BEQ     T0034           ;BR IF YES

004602  000000                          E20033: HALT                    ;ASL DELIVERED WRONG REULT
004604  000765                                  BR      R0033           ;LOCK ON HARD ERROR
```

```
                                        ; *****************************************************************
                                                .SBTTL T0034 BASIC ''ROL  RN'' TEST WITH [DEST]=125252 AND C(0)
                                        ; *****************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [104,373,360,000] FC 1,7,8

                                        ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,000

                                        ;EXEC:          [104]ALUC=LHHLL :[373]D=052524

                                        ;CODES:         [360] SPS=3  /  N:C=0001

                                        ;SYNC:          B05J2 (-)       /       T= 1 USEC

                                        ;KEY SIG:       K3-5 ROTSHF H  /  K3-3 SM=6L  /  K5-2 PS(C)(1)H

004606  012700  000034                  T0034:  MOV     #0034,R0                ;LOAD R0 WITH TEST NO.
004612  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
004620  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
004624  012704  052524                          MOV     #052524,R4      ;RESULT S / B = 052524
004630  012703  125252                  R0034:  MOV     #125252,R3      ;MAKE [DEST] = 125252
004634  000257                                  CCC                     ;MAKE C=0

004636  006103                          I0034:  ROL     R3              ;TEST THE ROL - IT SHOULD SET C

004640  103402                                  BCS     A0034           ;BR IF ''C'' GOT SET

004642  000000                          E10034: HALT                    ;ROL FAILED TO SET ''C''
004644  000771                                  BR      R0034           ;LOCK ON HARD ERROR

004646  020403                          A0034:  CMP     R4,R3           ;RESULT = 052524 ??
004650  001402                                  BEQ     T0035           ;BR IF YES

004652  000000                          E20034: HALT                    ;ROL DELIVERED WRONG RESULT
004654  000765                                  BR      R0034           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0035 BASIC 'ROL  RN' TEST WITH [DEST]=052524 AND C(1)
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [104,373,360,000] FC 1,7,8

                                        ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,000

                                        ;EXEC:          [104]ALUC=LHHLL :[373]D=125251

                                        ;CODES:         [360] SPS=3  /  N:C=1000

                                        ;SYNC:          B05J2 (-)       /       T= 1 USEC

                                        ;KEY SIG:       K3-5 ROTSHF H  /  K3-3 SM=6L  /  K5-2 PS(N)(1)H

004656  012700  000035                  T0035:  MOV     #0035,R0                ;LOAD R0 WITH TEST NO.
004662  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
004670  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
004674  012704  125251                          MOV     #125251,R4      ;RESULT S / B = 125251
004700  012703  052524                  R0035:  MOV     #052524,R3      ;MAKE [DEST] = 052524
004704  000261                                  SEC                     ;MAKE C=1

004706  006103                          I0035:  ROL     R3              ;TEST THE ROL - IT SHOULD CLEAR C

004710  103002                                  BCC     A0035           ;BR IF ''C'' IS CLEAR

004712  000000                          E10035: HALT                    ;ROL FAILED TO CLEAR ''C''
004714  000771                                  BR      R0035           ;LOCK ON HARD ERROR

004716  020403                          A0035:  CMP     R4,R3           ;RESULT = 125251 ??
004720  001402                                  BEQ     T0036           ;BR IF YES

004722  000000                          E20035: HALT                    ;ROL DELIVERED WRONG RESULT
004724  000765                                  BR      R0035           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0036 BASIS 'TSTB (R)' TEST - EVEN ADDRESS
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016

                                        ;EXEC:          [220]ALUC=LLLLL :[211]D=000377

                                        ;CODES:         [367] SPS=3  /  N:C=1000

                                        ;SYNC:          B05J2 (-)       /       T= 1.8 USEC

                                        ;KEY SIG:       K3-4 TSTL  /  K3-3 DM=1L  /  K5-2 PS(N)(1)H  /  K3-6 BYTE INSTR H

004726  012700  000036                  T0036:  MOV     #0036,R0                ;LOAD R0 WITH TEST NO.
004732  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
004740  012702  067576                          MOV     #DWTA+6,R2      ;DEST ADDR = DWTA+6
004744  012704  000377                          MOV     #377,R4         ;RESULT S / B = 377
004750  000257                          R0036:  CCC                     ;SCOPE SYNC

004752  105712                          I0036:  TSTB    (R2)            ;TEST THE TSTB

004754  100402                                  BMI     A0036           ;BR IF 'N' SET - IT SHOULD BE

004756  000000                          E10036: HALT                    ;TSTB FAILED TO SET 'N'
004760  000773                                  BR      R0036           ;LOCK ON HARD ERROR

004762  020412                          A0036:  CMP     R4,(R2)         ;DID TSTB DISTURB [DEST]
004764  001404                                  BEQ     T0037           ;BR IF NOT

004766  011203                                  MOV     (R2),R3         ;GET WAS DATA
004770  000000                          E20036: HALT                    ;TSTB ALTERED [DEST]
004772  010412                                  MOV     R4,(R2)         ;RESTORE [DEST]
004774  000765                                  BR      R0036           ;LOCK ON HARD EROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0037 BASIS 'TSTB (R)' TEST - ODD ADDRESS
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,237,270,222,253,075,374,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,237 / 34[237]220,222 / 16[374]016,016

                                        ;EXEC:          [222]ALUC=LLLLL :[253]D=000377

                                        ;CODES:         [075] SPS=3  /  N:C=1000

                                        ;SYNC:          B05J2 (-)       /       T= 1.9 USEC

                                        ;KEY SIG:       K3-4 TSTL  /  K3-3 DM=1L  /  K5-2 PS(N)(1)H  /  K3-6 BYTE INSTR H

004776  012700  000037                  T0037:  MOV     #0037,R0                ;LOAD R0 WITH TEST NO.
005002  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
005010  012702  070122                          MOV     #DWTB+6,R2      ;DEST ADDR = DWTB+6
005014  012704  177401                          MOV     #177401,R4      ;RESULT S / B = 177401
005020  012703  070123                          MOV     #DWTB+7,R3      ;DEST ADDR USED = DWTB+7
005024  000257                          R0037:  CCC                     ;SCOPE SYNC

005026  105713                          I0037:  TSTB    (R3)            ;TEST THE TSTB

005030  100402                                  BMI     A0037           ;BR IF 'N' SET - IT SHOULD BE

005032  000000                          E10037: HALT                    ;TSTB FAILED TO SET 'N'
005034  000773                                  BR      R0037           ;LOCK ON HARD ERROR

005036  020412                          A0037:  CMP     R4,(R2)         ;DID TSTB DISTURB [DEST]
005040  001404                                  BEQ     T0040           ;BR IF NOT

005042  011203                                  MOV     (R2),R3         ;GET WAS DATA
005044  000000                          E20037: HALT                    ;TSTB ALTERED [DEST]
005046  010412                                  MOV     R4,(R2)         ;RESTORE [DEST]
005050  000765                                  BR      R0037           ;LOCK ON HARD EROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0040 BASIC 'TSTB @#A' TEST - EVEN ADDRESS
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [163,264,265,266,267,225,367,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,163 / 33[266]220,220 / 16[367]016,016

                                        ;EXEC:          [220]ALUC=LLLLL :[211]D=177400

                                        ;CODES:         [075] SPS=3  /  N:C=0100

                                        ;SYNC:          B05J2 (-)       /       T= 2.8 USEC

                                        ;KEY SIG:       K3-4 TSTL  /  K3-3 [^M=3L  /  K5-2 PS(Z)(1)H  /  K3-6 BYTE INSTR H

005052  012700  000040                  T0040:  MOV     #0040,R0                ;LOAD R0 WITH TEST NO.
005056  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
005064  032737  000001  066642                  BIT     #1,@#BPTLOC     ;BREAKPOINT HALT SET ??
005072  001401                                  BEQ     .+4             ;BR IF NOT
005074  000000                                  HALT                    ;BREAK - DEPRESS CONTINUE TO RESTART
005076  012702  067574                          MOV     #DWTA+4,R2      ;DEST ADDR = DWTA+4
005102  012704  177400                          MOV     #177400,R4      ;RESULT S / B = 177400
005106  000257                          R0040:  CCC                     ;SCOPE SYNC

005110  105737  067574                  I0040:  TSTB    @#DWTA+4        ;TEST THE TSTB

005114  001402                                  BEQ     A0040           ;BR IF 'Z' SET - IT SHOULD BE

005116  000000                          E10040: HALT                    ;TSTB FAILED TO SET 'Z'
005120  000772                                  BR      R0040           ;LOCK ON HARD ERROR

005122  020412                          A0040:  CMP     R4,(R2)         ;DID TSTB DISTURB [DEST]?
005124  001404                                  BEQ     T0041           ;BR IF NOT

005126  011203                                  MOV     (R2),R3         ;GET WAS DATA
005130  000000                          E20040: HALT                    ;TSTB ALTERED [DEST]
005132  010412                                  MOV     R4,(R2)         ;RESTORE [DEST]
005134  000764                                  BR      R0040           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0041 BASIC "TSTB @#A" TEST - ODD ADDRESS
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [163,264,265,266,267,237,270,222,253,075,374,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,163 / 33[266]220,237 / 34[237]220,222 / 16[374]016,016

                                        ;EXEC:          [222]ALUC=LLLLL :[253]D=000377

                                        ;CODES:         [075] SPS=3  /  N:C=0100

                                        ;SYNC:          B05J2 (-)       /       T= 2.8 USEC

                                        ;KEY SIG:       K3-4 TSTL  /  K3-3 DM=3L  /  K5-2 PS(Z)(1)H  /  K3-6 BYTE INSTR H

005136  012700  000041                  T0041:  MOV     #0041,R0                ;LOAD R0 WITH TEST NO.
005142  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
005150  012702  067576                          MOV     #DWTA+6,R2      ;DEST ADDR = DWTA+6
005154  012704  000377                          MOV     #377,R4         ;RESULT S / B = 377
005160  000257                          R0041:  CCC                     ;SCOPE SYNC

005162  105737  067577                  I0041:  TSTB    @#DWTA+7        ;TEST THE TSTB

005166  001402                                  BEQ     A0041           ;BR IF "Z" SET - IT SHOULD BE

005170  000000                          E10041: HALT                    ;TSTB FAILED TO SET "Z"
005172  000772                                  BR      R0041           ;LOCK ON HARD ERROR

005174  020412                          A0041:  CMP     R4,(R2)         ;DID TSTB DISTURB [DEST]?
005176  001404                                  BEQ     T0042           ;BR IF NOT

005200  011203                                  MOV     (R2),R3         ;GET WAS DATA
005202  000000                          E20041: HALT                    ;TSTB ALTERED [DEST]
005204  010412                                  MOV     R4,(R2)         ;RESTORE [DEST]
005206  000764                                  BR      R0041           ;LOCK ON HARD ERROR
```

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                                ; ***********************************************************************
                                        .SBTTL T0042 BASIC 'DECB 1(SP)''
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [167,261,262,266,267,237,270,222,253,075,374,375,016] FC 1,3,9,8

                                ;ACT BUTS:      37[004]100,167 / 33[266]220,237 / 34[237]220,222 / 16[374]016,016

                                ;EXEC:          [222]ALUC=LHHHH :[253]D=177400

                                ;CODES:         [075] SPS=3  /  N:C=1000

                                ;SYNC:          B05J2 (-)       /       T= 2.8 USEC

                                ;KEY SIG:       K3-4 DEC L  /  K3-3 DM=6L  /  K5-2 PS(N)(1)H  /  K3-6 BYTE INSTR H

005210  012700  000042          T0042:  MOV     #0042,R0                ;LOAD R0 WITH TEST NO.
005214  112760  000377  070140          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
005222  010605                          MOV     SP,R5           ;SAVE SP
005224  012704  177400                  MOV     #177400,R4      ;RESULT S / B = 177400
005230  010506                  R0042:  MOV     R5,SP
005232  012746  000000                  MOV     #0,-(SP)        ;[DEST] = 000000
005236  000257                          CCC                     ;SCOPE SYNC

005240  105366  000001          I0042:  DECB    1(SP)           ;TEST THE DECB

005244  020416                          CMP     R4,(SP)         ;RESULT = 177400?
005246  001405                          BEQ     A0042           ;BR IF YES

005250  011603                          MOV     (SP),R3         ;GET WAS DATA
005252  010602                          MOV     SP,R2           ;GENERATE DEST ADDR IN R2
005254  005202                          INC     R2
005256  000000                  E0042:  HALT                    ;ERROR - DECB FAILED
005260  000763                          BR      R0042           ;LOCK ON HARD ERROR

005262  010506                  A0042:  MOV     R5,SP           ;RESET THE SP
```

```
                                ; ***********************************************************************
                                        .SBTTL T0043 BASIC 'MOV @#A,R' TEST
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [143,245,246,247,250,160,204,000] FC 1,2,4

                                ;ACT BUTS:      37[004]100,143 / 35[247]120,160 / 20[160]000,000

                                ;EXEC:          [160]ALUC=LLLLL :[204]D=#DWTA

                                ;CODES:         [204] SPS=3  /  N:C=0000

                                ;SYNC:          B05J2 (-)       /       T= 3.2 USEC

                                ;KEY SIG:       K3-3 MOV L  /  K3-3 DM=0L  /  K3-5 DOPL

005264  012700  000043          T0043:  MOV     #0043,R0                ;LOAD R0 WITH TEST NO.
005270  112760  000377  070140          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
005276  012702  177703                  MOV     #177703,R2      ;DEST ADDR = 3
005302  012704  067570                  MOV     #DWTA,R4        ;RESUTL S / B = #DWTA
005306  005003                  R0043:  CLR     R3              ;[DEST] = 000000
005310  000257                          CCC                     ;SCOPE SYNC

005312  013703  067544          I0043:  MOV     @#ATA,R3        ;TEST THE MOV

005316  020403                          CMP     R4,R3           ;RESULT = DWTA?
005320  001402                          BEQ     T0044           ;BR IF YES

005322  000000                  E0043:  HALT                    ;MOV FAILED TO DELIVER CORRECT RESULT
005324  000770                          BR      R0043           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0044 BASIC 'MOV #N,X(R)'' TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,177,206,212,200,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,177 / 17[177]212,212 / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125]D=125252

                                        ;CODES:         [125] SPS=3  /  N:C=0000

                                        ;SYNC:          B05J2 (-)       /       T= 4 USEC

                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=0  /  K3-5 DOPL

005326  012700  000044                  T0044:  MOV     #0044,R0                ;LOAD R0 WITH TEST NO.
005332  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
005340  012702  067562                          MOV     #MBUF0+2,R2     ;DEST ADDR = MBUF0+2
005344  012704  125252                          MOV     #125252,R4      ;RESULT S / B = 125252
005350  012703  067560                  R0044:  MOV     #MBUF0,R3       ;[R3] = BASE DEST ADDR
005354  005012                                  CLR     (R2)            ;[DEST] = 000000
005356  000257                                  CCC                     ;SCOPE SYNC

005360  012763  125252  000002          I0044:  MOV     #125252,2(R3)   ;TEST THE MOV

005366  020412                                  CMP     R4,(R2)         ;RESULT OK?
005370  001403                                  BEQ     T0045           ;BR IF YES

005372  011203                                  MOV     (R2),R3         ;GET WAS DATA
005374  000000                          E0044:  HALT                    ;MOV DELIVERED WRONG RESULT

005376  000764                                  BR      R0044           ;LOCK ON HARD ERROR
```

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                                        ; ***********************************************************************
                                                .SBTTL T0045 BASIC 'MOV #N,(R)'' TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,171,257,200,125,375,016] FC 1,2,4

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,171 / 22[171]200,200 / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125]D=125252

                                        ;CODES:         [125] SPS=3  /  N:C=1000

                                        ;SYNC:          B05J2 (-)       /       T= 2.3 USEC

                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=1L  /  K3-5 DOPL  /  K5-2 PS (N)(1)H

005400  012700  000045          T0045:  MOV     #0045,R0                ;LOAD R0 WITH TEST NO.
005404  112760  000377  070140          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
005412  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
005416  012704  125252                  MOV     #125252,R4      ;RESULT S / B = 125252
005422  010203                  R0045:  MOV     R2,R3           ;R3 GETS DEST ADDR
005424  005013                          CLR     (R3)            ;[DEST] = 000000
005426  000257                          CCC                     ;SCOPE SYNC

005430  012713  125252          I0045:  MOV     #125252,(R3)    ;TEST THE MOV

005434  020412                          CMP     R4,(R2)         ;RESULT OK?
005436  001403                          BEQ     T0046           ;BR IF YES

005440  011203                          MOV     (R2),R3         ;GET WAS DATA
005442  000000                  E0045:  HALT                    ;MOV DELIVERED WRONG RESULT
005444  000766                          BR      R0045           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0046 BASIC 'MOV (RA)+,RB' TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,160,204,000] FC 1,2,4

                                        ;ACT BUTS:      37[004]100,142 /  35[240]120,160 / 20[160]000,000

                                        ;EXEC:          [160]ALUC=LLLLL :[204]D=#DWTA

                                        ;CODES:         [204] SPS=3  /  N:C=0000

                                        ;SYNC:          B05J2 (-)       /       T= 2.3 USEC

                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=0L  /  K3-5 DOPL

005446  012700  000046                  T0046:  MOV     #0046,R0                ;LOAD R0 WITH TEST NO.
005452  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
005460  012704  067570                          MOV     #DWTA,R4        ;RESULT S / B = #DWTA
005464  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
005470  012705  067544                  R0046:  MOV     #ATA,R5         ;SRC ADDR = ATA
005474  005003                                  CLR     R3              ;[DEST] = 000000
005476  000257                                  CCC                     ;SCOPE SYNC

005500  012503                          I0046:  MOV     (R5)+,R3        ;TEST THE MOV

005502  020403                                  CMP     R4,R3           ;RESULT OK?
005504  000402                                  BR      A0046           ;BR IF YES

005506  000000                          E10046: HALT                    ;MOV DELIVERED WRONG RESULT
005510  000767                                  BR      R0046           ;LOCK ON HARD ERROR

005512  022705  067546                  A0046:  CMP     #ATA+2,R5       ;DID SRC REG GET INCREMENTED?
005516  001402                                  BEQ     T0047           ;BR IF YES

005520  000000                          E20046: HALT                    ;MOV FAILED TO UPDATE SRC. REG.
005522  000762                                  BR      R0046           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0047 BASIC 'MOV  @#A,@#B''
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [143,245,256,247,250,173,207,210,200,125,375,016] FC 1,2,4

                                        ;ACT BUTS:      37[004]100,143 / 35[247]120,173 / 22[207]200,200 / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125]D=#DWTA

                                        ;CODES:         [125] SPS=3  /  N:C=0000

                                        ;SYNC:          B05J2 (-)       /       T= 5 USEC

                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 SM=3L  /  K3-3 DM=3L

005524  012700  000047          T0047:  MOV     #0047,R0                ;LOAD R0 WITH TEST NO.
005530  112760  000377  070140          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
005536  012702  067564                  MOV     #MBUF1,R2       ;DEST ADDR = MBUF1
005542  012704  067570                  MOV     #DWTA,R4        ;RESULT S / B = #DWTA
005546  005012                  R0047:  CLR     (R2)            ;MAKE [DEST] = 000000
005550  000257                          CCC                     ;SCOPE SYNC

005552  013737  067544  067564  I0047:  MOV     @#ATA,@#MBUF1   ;TEST THE MOV
005560  020412                          CMP     R4,(R2)         ;DID RESULT = #DWTA ?
005562  001403                          BEQ     T0050           ;BR IF YES

005564  011203                          MOV     (R2),R3         ;GET THE WAS DATA
005566  000000                  E0047:  HALT                    ;MOV DELIVERED THE WRONG RESULT
005570  000766                          BR      R0047           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0050 BASIC 'MOV   X(R),PC'' TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [146,241,242,247,250,160,204,000] FC 1,2,4

                                        ;ACT BUTS:      37[004]100,146 / 35[247]120,160 / 20[160]000,000

                                        ;EXEC:          [160]ALUC=LLLLL :[204]D=#T077

                                        ;CODES:         [204] SPS=3  /  N:C=0000

                                        ;SYNC:          B05J2 (-)       /       T= 4 USEC

                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 SM=6L  /  K3-3 DM=0L  /  K3-4 IR (02:00)=7L

005572  012700  000050                  T0050:  MOV     #0050,R0                ;LOAD R0 WITH TEST NO.
005576  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
005604  012705  005612                  R0050:  MOV     #I0050,R5       ;[R5] = I0050 (BASE ADDRESS)
005610  000257                                  CCC                     ;SCOPE SYNC

005612  016507  000010                  I0050:  MOV     A0050-I0050(R5),PC      ;TEST THE MOV - GO TO A0050

005616  000000                          E0050:  HALT                    ;MOV FAILED TO LOAD THE PC
005620  000771                                  BR      R0050           ;LOCK ON HARD ERROR

005622  005624                          A0050:    T0051                         ;POINTER TO NEXT TEST
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0051 BASIC 'MOV  @#A,(R)'' TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [143,245,246,247,250,171,257,200,125,375,016] FC 1,2,4

                                        ;ACT BUTS:      37[004]100,143 / 35[247]120,171 / 22[171]200,200 / 16[125]016,016

                                        ;EXEC:  [200]ALUC=LLLLL :[125]D=051300

                                        ;CODES: [125] SPS=3  /  N:C=0000

                                        ;SYNC:          B05J2 (-)       /       T= 4.2 USEC

                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 SM=3L  /  K3-3 DM=1L

005624  012700  000051                  T0051:  MOV     #0051,R0                ;LOAD R0 WITH TEST NO.
005630  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
005636  012704  067570                          MOV     #DWTA,R4        ;RESULT S / B = #DWTA
005642  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
005646  005012                          R0051:  CLR     (R2)            ;MAKE [DEST]=000000
005650  000257                                  CCC                     ;SCOPE SYNC - Z=0

005652  013712  067544                  I0051:  MOV     @#ATA,(R2)      ;TEST THE MOV

005656  020412                                  CMP     R4,(R2)         ;DID RESULT = #DWTA ??
005660  001403                                  BEQ     T0052           ;BR IF YES

005662  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
005664  000000                          E0051:  HALT                    ;MOV DELIVERED WRONG RESULT
005666  000767                                  BR      R0051           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0052 BASIC 'MOV  X(RA),RB'' TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [146,241,242,247,250,160,204,000] FC 1,2,4

                                        ;ACT BUTS:      37[004]100,146 / 35[247]120,160 / 20[160]000,000

                                        ;EXEC:          [160]ALUC=LLLLL :[204]D=#DBTA

                                        ;CODES:         [204] SPS=3  /  N:C=0000

                                        ;SYNC:          B05J2 (-)       /       T= 3 USEC

                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 SM=6L  /  K3-3 DM=0L

005670  012700  000052                  T0052:  MOV     #0052,R0                ;LOAD R0 WITH TEST NO.
005674  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
005702  012704  070130                          MOV     #DBTA,R4        ;RESULT S / B = #DBTA
005706  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
005712  012705  067544                          MOV     #ATA,R5         ;[R5] = BASE ADDR FOR SOURCE (ATA)
005716  005003                          R0052:  CLR     R3              ;MAKE [DEST] = 000000
005720  000257                                  CCC                     ;SCOPE SYNC

005722  016503  000004                  I0052.  MOV     4(R5),R3        ;TEST THE MOV

005726  020403                                  CMP     R4,R3           ;RESULT = #DBTA ??
005730  001402                                  BEQ     T0053           ;BR IF YES

005732  000000                          E0052:  HALT                    ;MOV DELIVERED WRONG RESULT
005734  000770                                  BR      R0052           ;LOCK ON HARD ERROR
```

```
                                ; ***************************************************************
                                        .SBTTL T0053 BASIC 'MOV  RA,-(RB)'' TEST
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [174,257,201,125,375,016] FC 1,4

                                ;ACT BUTS:      37[004]100,174 / 22[174]200,201 / 16[125]016,016

                                ;EXEC:          [201]ALUC=LLLLL :[125]D=125252

                                ;CODES:         [125] SPS=3  /  N:C=1000

                                ;SYNC:          B05J2 (-)       /       T= 1.8 USEC

                                ;KEY SIG:       K-3 MOVL  /  K3-3 SM=0L  /  K3-3 DM=4L  /  K5-2 PS(N)(1)H

 005736  012700  000053         T0053:  MOV     #0053,R0                ;LOAD R0 WITH TEST NO.
 005742  112760  000377  070140         MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
 005750  012702  067560                 MOV     #MBUF0,R2       ;FINAL DEST ADDR = MBUF0
 005754  012704  125252                 MOV     #125252,R4      ;RESULT S / B = 125252
 005760  012705  067562         R0053:  MOV     #MBUF0+2,R5     ;INITIAL DEST ADDR = TEMP2 + 2
 005764  005012                         CLR     (R2)            ;MAKE [DEST] = 000000
 005766  000257                         CCC                     ;SCOPE SYNC

 005770  010445                 I0053:  MOV     R4,-(R5)        ;TEST THE MOV

 005772  020412                         CMP     R4,(R2)         ;RESULT = 125252
 005774  001403                         BEQ     A0053           ;BR IF YES

 005776  011203                         MOV     (R2),R3         ;GET THE S / B DATA
 006000  000000                 E10053: HALT                    ;MOV DELIVERED THE WRONG ESULT
 006002  000766                         BR      R0053           ;LOCK ON HARD ERROR

 006004  020205                 A0053:  CMP     R2,R5           ;DID REGISTER GET DECREMENTED ?
 006006  001402                         BEQ     T0054           ;BR IF YES

 006010  000000                 E20053: HALT                    ;MOV FAILED TO UPDATE REGISTER
 006012  000762                         BR      R0053           ;LOCK ON HARD ERROR
```

```
                                        ; ***************************************************************
                                                .SBTTL T0054 BASIC 'MOV   @#A,-(R)'' TEST
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [143,245,246,247,250,174,200,125,375,016] FC 1,2,4

                                        ;ACT BUTS:      37[004]100,143 / 35[247]120,174 / 22[174]200,200 / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125]D=#DWTA

                                        ;CODES:         [125] SPS=3  /  N:C=0100

                                        ;SYNC:          B05J2 (-)       /       T= 4.2 USEC

                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 SM=3L  /  K3-3 DM=4L  /  K5-2 PS(Z)(1)H

006014  012700  000054                  T0054:  MOV     #0054,R0                ;LOAD R0 WITH TEST NO.
006020  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
006026  012704  067570                          MOV     #DWTA,R4        ;RESULT S / B = #DWTA
006032  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
006036  012705  067562                  R0054:  MOV     #MBUF0+2,R5     ;INITIAL DEST ADDR = MBUF0+2
006042  005012                                  CLR     (R2)            ;MAKE [DEST] = 000000
006044  000257                                  CCC                     ;SCOPE SYNC

006046  013745  067544                  I0054:  MOV     @#ATA,-(R5)     ;TEST THE MOV

006052  020412                                  CMP     R4,(R2)         ;RESULT = 000000
006054  001403                                  BEQ     A0054           ;BR IF YES

006056  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
006060  000000                  E10054: HALT                            ;MOV DELIVERED THE WRONG RESULT
006062  000765                          BR      R0054                   ;LOCK ON HARD ERROR

006064  020502                  A0054:  CMP     R5,R2           ;DID DEST REG GET DECREMENTED ??
006066  001402                          BEQ     T0055           ;BR IF YES

006070  000000                  E20054: HALT                            ;MOV FAILED TO UPDATE REGISTER
006072  000761                          BR      R0054           ;LOCK ON HARD ERROR
```

```
                                ; ***********************************************************************
                                        .SBTTL T0055 BASIC 'MOV  (R),@#A'' TEST
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [141,247,250,173,210,200,125,375,016]  FC 1,2,4

                                ;ACT BUTS:      37[004]100,141 / 35[247]120,173 / 22[207]200,200 / 16[125]016,016

                                ;EXEC:          [200]ALUC=LLLLL :[125]D=#DWTA

                                ;CODES:         [125] SPS=3  /  N:C=0100

                                ;SYNC:          B05J2 (-)       /       T= 4 USEC

                                ;KEY SIG:       K3-3 MOVL  /  K3-3 SM=1L  /  K3-3 DM=3L  /  K5-2 PS(Z)(1)H

006074  012700  000055          T0055:  MOV     #0055,R0                ;LOAD R0 WITH TEST NO.
006100  112760  000377  070140          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
006106  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
006112  012704  067570                  MOV     #DWTA,R4        ;RESULT S / B = #DWTA
006116  012705  067544                  MOV     #ATA,R5         ;SOURCE ADDR = ATA
006122  005012                  R0055:  CLR     (R2)            ;MAKE [DEST] = 000000
006124  000257                          CCC                     ;SCOPE SYNC

006126  011537  067560          I0055:  MOV     (R5),@#MBUF0    ;TEST THE MOV

006132  020412                          CMP     R4,(R2)         ;RESULT = #DWTA ??
006134  001403                          BEQ     T0056           ;BR IF YES

006136  011203                          MOV     (R2),R3         ;GET THE WAS DATA
006140  000000                  E0055:  HALT                    ;MOV DELIVERED THE WRONG RESULT
006142  000767                          BR      R0055           ;LOCK ON HARD ERROR
```

```
                                        ; ***************************************************************
                                                .SBTTL T0056 BASIC 'MOV  -(R),@#A'' TEST
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [144,240,250,173,207,210,200,125,375,016] FC 1,2,4

                                        ;ACT BUTS:      37[004]100,144 / 35[240]120,173 / 22[207]200,200 / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125]D=#DWTA

                                        ;CODES:         [125] SPS=3  /  N:C=0100

                                        ;SYNC:          B05J2 (-)       /       T= 4 USEC

                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 SM=4L  /  K3-3 DM=3L  /  K5-2 PS(Z)(1)H

006144  012700  000056          T0056:  MOV     #0056,R0                ;LOAD R0 WITH TEST NO.
006150  112760  000377  070140          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
006156  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
006162  012704  067570                  MOV     #DWTA,R4        ;RESULT S / B = #DWTA
006166  012705  067546          R0056:  MOV     #ATA+2,R5       ;INITIAL SOURCE ADDR = ATA+2
006172  005012                          CLR     (R2)            ;MAKE [DEST] = 000000
006174  000257                          CCC                     ;SCOPE SYNC

006176  014537  067560          I0056:  MOV     -(R5),@#MBUF0   ;TEST THE MOV

006202  020412                          CMP     R4,(R2)         ;RESULT = #DWTA ?
006204  001403                          BEQ     A0056           ;BR IF YES

006206  011203                          MOV     (R2),R3         ;GET THE WAS DATA
006210  000000          E10056: HALT                            ;MOV DELIVERED THE WRONG RESULT
006212  000765                          BR      R0056           ;LOCK ON HARD ERROR

006214  022705  067544          A0056:  CMP     #ATA,R5         ;DID THE SRC REG GET DECREMENTED ?
006220  001402                          BEQ     T0057           ;BR IF YES

006222  000000          E20056: HALT                            ;MOV FAILED TO UPDATE SOURCE REG
006224  000760                          BR      R0056           ;LOCK ON HARD ERROR
```

```
                                        ; ***************************************************************
                                                .SBTTL T0057 BASIC 'MOV   (RA),RB'' TEST
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,160,204,000] FC 1,2,4

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,160 / 20[160]000,000

                                        ;EXEC:          [160]ALUC=LLLLL :[204]D=#DWTA

                                        ;CODES:         [204] SPS=3  /  N:C=0100

                                        ;SYNC:          B05J2 (-)       /       T= 1.8 USEC

                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 SM=2L  /  K3-3 DM=0L  /  K5-2 PS(Z)(1)H

006226  012700  000057                  T0057:  MOV     #0057,R0                ;LOAD R0 WITH TEST NO.
006232  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
006240  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
006244  012704  067570                          MOV     #DWTA,R4        ;RESULT S / B = #DWTA
006250  012705  067544                  R0057:  MOV     #ATA,R5         ;INITIAL SOURCE ADDR = ATA
006254  005003                                  CLR     R3              ;MAKE [DEST] = 000000
006256  000257                                  CCC                     ;SCOPE SYNC

006260  012503                          I0057:  MOV     (R5)+,R3        ;TEST THE MOV

006262  020403                                  CMP     R4,R3           ;RESULT = #DWTA ?
006264  001402                                  BEQ     A0057           ;BR IF YES

006266  000000                          E10057: HALT                    ;MOV DELIVERED WRONG RESULT
006270  000767                                  BR      R0057           ;LOCK ON HARD ERROR

006272  022705  067546                  A0057:  CMP     #ATA+2,R5       ;DID SOURCE REG GET INCREMENTED
006276  001402                                  BEQ     T0060           ;BR IF YES

006300  000000                          E20057: HALT                    ;MOV FAILED TO UPDATE SOURCE REGISTER
006302  000762                                  BR      R0057           ;LOCK ON HARD ERROR
```

```
                                        ; ***************************************************************
                                                .SBTTL T0060 BASIC 'MOV   X(RA),RB'' TEST
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [146,241,242,247,250,160,204,000] FC 1,2,4

                                        ;ACT BUTS:      37[004]100,146 / 35[247]120,160 / 20[160]000,000

                                        ;EXEC:          [160]ALUC=LLLLL :[204]D=#DWTB

                                        ;CODES:         [204] SPS=3  /  N:C=0100

                                        ;SYNC:          B05J2 (-)       /       T= 2.5 USEC

                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 SM=6L  /  K3-3 DM=0L  /  K5-2 PS(Z)(1)H

006304  012700  000060                  T0060:  MOV     #0060,R0                ;LOAD R0 WITH TEST NO.
006310  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
006316  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
006322  012704  070114                          MOV     #DWTB,R4        ;RESULT S / B = #DWTB
006326  012705  067544                          MOV     #ATA,R5         ;BASE SOURCE ADDR = ATA
006332  005003                          R0060:  CLR     R3              ;MAKE [DEST] = 000000
006334  000257                                  CCC                     ;SCOPE SYNC

006336  016503  000002                  I0060:  MOV     2(R5),R3        ;TEST THE MOV

006342  020403                                  CMP     R4,R3           ;RESULT = #DWTB ?
006344  001402                                  BEQ     T0061           ;BR IF YES

006346  000000                          E0060:  HALT                    ;MOV FAILED TO DELIVER CORRECT RESULT
006350  000770                                  BR      R0060           ;LOCK ON HARD ERROR
```

```
                                        ; ***************************************************************
                                                .SBTTL T0061 BASIC 'MOV   @X(RA),RB'' TEST
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [147,243,244,245,246,247,250,160,204,000] FC 1,2,4

                                        ;ACT BUTS:      37[004]100,147 / 35[247]120,160 / 20[160]000,000

                                        ;EXEC:          [160]ALUC=LLLLL :[204]D=177777

                                        ;CODES:         [204] SPS=3  /  N:C=1000

                                        ;SYNC:          B05J2 (-)       /       T= 3.4 USEC

                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 SM=7L  /  K3-3 DM=0L  /  K5-2 PS(N)(1)H

006352  012700  000061          T0061:  MOV     #0061,R0                ;LOAD R0 WITH TEST NO.
006356  112760  000377  070140          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
006364  005004                          CLR     R4              ;RESULT S / B = 177777
006366  005104                          COM     R4
006370  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
006374  012737  067572  067562          MOV     #DWTA+2,@#MBUF0+2 ;SET UP ADDRESS TABLE MBUF0
006402  012705  067560                  MOV     #MBUF0,R5       ;BASE ADDRESS IN R5
006406  005003                  R0061:  CLR     R3              ;MAKE [DEST] = 000000
006410  000257                          CCC                     ;SCOPE SYNC

006412  017503  000002          I0061:  MOV     @2(R5),R3       ;TEST THE MOV

006416  020403                          CMP     R4,R3           ;RESULT = 177777
006420  001402                          BEQ     T0062           ;BR IF YES

006422  000000                  E0061:  HALT                    ;MOV DELIVERED THE WRONG RESULT
006424  000770                          BR      R0061           ;LOCK ON HARD ERROR
```

```
                                ; ***********************************************************************
                                        .SBTTL T0062 BASIC 'MOV  (R)+,X(R)'' TEST
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [142,240,250,177,206,212,200,125,375,016] FC 1,2,4

                                ;ACT BUTS:      37[004]100,142 / 35[240]120,177 / 17[177]212,212 / 21[206]200,200
                                                ; / 16[125]016,016

                                ;EXEC:          [200]ALUC=LLLLL :[125]D=125252

                                ;CODES:         [125] SPS=3  /  N:C=1000

                                ;SYNC:          B05J2 (-)       /       T= 4 USEC

                                ;KEY SIG:       K3-3 MOVL  /  K3-3 SM=2L  /  K3-3 DM=6L  /  K5-2 PS(N)(1)H

006426  012700  000062          T0062:  MOV     #0062,R0                ;LOAD R0 WITH TEST NO.
006432  112760  000377  070140          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
006440  012704  125252                  MOV     #125252,R4      ;RESULT S / B = 125252
006444  012702  067566                  MOV     #MBUF1+2,R2     ;FINAL DEST ADDR = MBUF1+2
006450  010437  067560                  MOV     R4,@#MBUF0      ;SOURCE OPERAND = 125252
006454  012705  067560          R0062:  MOV     #MBUF0,R5       ;[R5] = INITIAL SRC ADDR = MBUF0
006460  005012                          CLR     (R2)            ;MAKE [DEST] = 000000
006462  000257                          CCC                     ;SCOPE SYNC

006464  012565  000004          I0062:  MOV     (R5)+,4(R5)     ;TEST THE MOV

006470  020412                          CMP     R4,(R2)         ;RESULT = 125252 ?
006472  001403                          BEQ     A0062           ;BR IF YES

006474  011203                          MOV     (R2),R3         ;GET THE WAS DATA
006476  000000          E10062: HALT                            ;MOV    DELIVERED WRONG RESULT
006500  000765                          BR      R0062           ;LOCK ON HARD ERROR

006502  022705  067562          A0062:  CMP     #MBUF0+2,R5     ;DID REGISTER GET INCREMENTED ?
006506  001402                          BEQ     T0063           ;BR IF YES

006510  000000          E20062: HALT                            ;MOV FAILED TO UPDATE REGISTER
006512  000760                          BR      R0062           ;LOCK ON HARD ERROR
```

```
                                ; ***************************************************************
                                        .SBTTL T0063 BASIC ''CMP  R,@#A'' TEST WITH [R] = [A]
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [163,264,265,266,267,224,367,375,016] FC 1,3,8

                                ;ACT BUTS:      37[004]100,163 / 33[266]220,224 / 16[367]016,016

                                ;EXEC:          [224]ALUC=LLHHL :[367]D=125252

                                ;CODES:         [367] SPS=3  /  N:C=1100

                                ;SYNC:          B05J2 (-)       /       T= 3.5 USEC

                                ;KEY SIG:       K3-3 CMP L  /  K3-3 SM=0L  /  K3-3 DM=3L  /  K5-2 PS(Z)(1)H
                                                ;  K3-8 BTI + CMP + TST H

006514  012700  000063          T0063:  MOV     #0063,R0                ;LOAD R0 WITH TEST NO.
006520  112760  000377  070140          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
006526  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
006532  012704  125252                  MOV     #125252,R4      ;RESULT S / B = 125252
006536  010405                  R0063:  MOV     R4,R5           ;[R5] = SOURCE OP = 125252
006540  010412                          MOV     R4,(R2)         ;MAKE [DEST] = 125252
006542  000257                          CCC                     ;SCOPE SYNC

006544  020537  067560          I0063:  CMP     R5,@#MBUF0      ;TEST THE CMP

006550  001402                          BEQ     A0063           ;BR IF ''Z'' WAS SET - IT SHOULD BE

006552  000000                  E10063: HALT                    ;CMP FAILED TO SET ''Z''
006554  000770                          BR      R0063           ;LOCK ON HARD ERROR

006556  020412                  A0063:  CMP     R4,(R2)         ;IS RESULT STILL = 125252 ?
006560  001403                          BEQ     T0064           ;BR IF YES

006562  011203                          MOV     (R2),R3         ;GET THE WAS DATA
006564  000000                  E20063: HALT                    ;CMP ALTERED [DEST]
006566  000763                          BR      R0063           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0064 BASIC ''CMP  R,@#A'' WITH [R] NOT EQUAL TO [A]
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [163,264,266,267,224,367,375,016] FC 1,3,8

                                        ;ACT BUTS:      37[004]100,163 / 33[266]220,224 / 16[367]016,016

                                        ;EXEC:          [224]ALUC=LLHHL :[367]D=052526

                                        ;CODES:         [367] SPS=3  /  N:C=1000

                                        ;SYNC:          B05J2 (-)       /       T= 3.5 USEC

                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 SM=0L  /  K3-3 DM=3L  /  K3-8 BIT+CMP+TSTH

006570  012700  000064                  T0064:  MOV     #0064,R0                ;LOAD R0 WITH TEST NO.
006574  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
006602  012702  067560                           MOV    #MBUF0,R2       ;DEST ADDR = MBUF0
006606  012704  125252                          MOV     #125252,R4      ;MAKE RESULT S / B = 125252
006612  005005                          R0064:  CLR     R5              ;[R5] = SOURCE OP = 000000
006614  010412                                  MOV     R4,(R2)         ;MAKE [DEST] = 125252
006616  000277                                  SCC                     ;SCOPE SYNC - MAKE Z=1

006620  020537  067560                  I0064:  CMP     R5,@#MBUF0      ;TEST THE CMP

006624  001002                                  BNE     T0065           ;BR IF Z=0 - IT SHOULD BE

006626  000000                          E0064:  HALT                    ;CMP FAILED TO CLEAR ''Z''
006630  000770                                  BR      R0064           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0065 BASIC ''CMP  #N,@#A'' TEST WITH [A] = N
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,163,264,265,266,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,163 / 33[266]220,225 / 16[367]016,016

                                        ;EXEC:          [225]ALUC=LLHHL :[367]D=000000

                                        ;CODES:         [367] SPS=3  /  N:C=0100

                                        ;SYNC:          B05J2 (-)       /       T= 4.3 USEC

                                        ;KEY SIG:       K3-3 CMPL  /  K3-3 SM=2L  /  K3-3 DM=3L  /  K5-2 PS(Z)(1)H
                                                        ;  K3-8 BIT+CMP+TSTH

006632  012700  000065          T0065:  MOV     #0065,R0                ;LOAD R0 WITH TEST NO.
006636  112760  000377  070140          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
006644  012704  125252                  MOV     #125252,R4      ;RESULT S / B = 125252
006650  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
006654  010412                  R0065:  MOV     R4,(R2)         ;MAKE [DEST] = 125252
006656  000257                          CCC                     ;SCOPE SYNC - Z=0

006660  022737  125252  067560  I0065:  CMP     #125252,@#MBUF0 ;TEST THE CMP

006666  001402                          BEQ     T0066           ;BR IF Z=1 - IT SHOULD BE

006670  000000                  E0065:  HALT                    ;CMP FAILED TO SET ''Z''
006672  000770                          BR      R0065           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0066 BASIC ''CMP  #N,@#A'' TEST WITH [A] NOT EQUAL TO #N
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,163,264,265,266,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,163 / 33[266]220,225 / 16[367]016,016

                                        ;EXEC:          [225]ALUC=LLHHL :[367]D=125252

                                        ;CODES:         [367] SPS=3  /  N:C=1000

                                        ;SYNC:          B05J2 (-)        /        T= 4.3 USEC

                                        ;KEY SIG:       K3-3 CMPL  /  K3-3 SM=2L  /  K3-3 DM=3L  /  K5-2 PS(N)(1)H
                                                        ;  K3-8 BIT+CMP+TSTH

006674  012700  000066          T0066:  MOV     #0066,R0                ;LOAD R0 WITH TEST NO.
006700  112760  000377  070140          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
006706  012704  125252                  MOV     #125252,R4      ;RESULT S / B=125252
006712  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
006716  005012                  R0066:  CLR     (R2)            ;MAKE [DEST] = 000000
006720  000277                          SCC                     ;SCOPE SYNC - Z=1

006722  022737  125252  067560  I0066:  CMP     #125252,@#MBUF0 ;TEST THE CMP

006730  001002                          BNE     T0067           ;BR IF Z=0 - IT SHOULD BE

006732  000000                  E0066:  HALT                    ;CMP FAILED TO CLEAR ''Z''
006734  000770                          BR      R0066           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0067 BASIC ''BIS #N,@#A'' TEST - N=177777,[A]=000000
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,163,264,265,266,267,225,367,375,016] FC 1,3,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,163 / 33[266]220,225 / 16[367]016,016

                                        ;EXEC:          [225]ALUC LLLLH :[367]D=177777

                                        ;CODES:         [367] SPS=3  /  N:C=1000

                                        ;SYNC:          B05J2 (-)       /       T= 4.3 USEC

                                        ;KEY SIG:       K3-5 DOPL  /  K3-3 DM=3L  /  K3-3 BIS L

006736  012700  000067                  T0067:  MOV     #0067,R0                ;LOAD R0 WITH TEST NO.
006742  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
006750  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
006754  012704  177777                          MOV     #-1,R4          ;RESULT S / B = 177777
006760  005012                          R0067:  CLR     (R2)            ;[DEST] = 000000
006762  000257                                  CCC                     ;SCOPE SYNC

006764  052737  177777  067560          I0067:  BIS     #-1,@#MBUF0     ;TEST THE BIS

006772  020412                                  CMP     R4,(R2)         ;RESULT OK?
006774  001403                                  BEQ     T0070           ;BR IF YES

006776  011203                                  MOV     (R2),R3         ;GET WAS DATA
007000  000000                          E0067:  HALT                    ;BIS FAILED TO SET ALL BITS IN BITFLG
007002  000766                                  BR      R0067           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0070 BASIC 'BIC  #N,@#A'' TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,163,264,265,266,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,163 / 33[266]220,225 / 16[367]016,016

                                        ;EXEC:          [225]ALUC=HLLHL :[367]D=000077

                                        ;CODES:         [367] SPS=3  /  N:C=0000

                                        ;SYNC:          B05J2 (-)       /       T= 4.3 USEC

                                        ;KEY SIG:       K3-3 BICL  /  K3-3 SM=2L  /  K3-3 DM=3L

007004  012700  000070                  T0070:  MOV     #0070,R0                ;LOAD R0 WITH TEST NO.
007010  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
007016  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
007022  012704  000077                          MOV     #77,R4          ;RESULT S / B = 77
007026  012712  177777                  R0070:  MOV     #-1,(R2)        ;MAKE [DEST] = 177777
007032  000257                                  CCC                     ;SCOPE SYNC

007034  042737  177700  067560          I0070:  BIC     #177700,@#MBUF0 ;TEST THE BIC

007042  020412                                  CMP     R4,(R2)         ;DID RESULT = 77 ?
007044  001403                                  BEQ     T0071           ;BR IF YES

007046  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
007050  000000                          E0070:  HALT                    ;BIC DELIVERED THE WRONG RESULT
007052  000765                                  BR      R0070           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0071 BASIC 'BIC #N,R'' TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,120,371,360,000] FC 1,2,8

                                        ;ACT BUTS:      35[240]120,120 / 31[120]360,360 / 27[371]000,000

                                        ;EXEC:          [371]ALUC HLLHL :[360]D=377

                                        ;CODES:         [360] SPS=3  /  N:C=0000

                                        ;SYNC:          B05J2 (-)       /       T= 4.3 USEC

                                        ;KEY SIG:       K3-5 DOPL  /  K3-3 DM=0L  /  K3-3 BIC L

 007054  012700  000071                 T0071:  MOV     #0071,R0                ;LOAD R0 WITH TEST NO.
 007060  112760  000377  070140                 MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
 007066  012704  000377                         MOV     #377,R4         ;RESULT S / B = 377
 007072  012702  177703                         MOV     #177703,R2      ;DEST ADDR = R3
 007076  005003                         R0071:  CLR     R3              ;[DEST] = 177777
 007100  005103                                 COM     R3
 007102  000257                                 CCC                     ;SCOPE SYNC

 007104  042703  177400                 I0071:  BIC     #177400,R3      ;TEST THE BIC

 007110  020304                                 CMP     R3,R4           ;RESULT OK?
 007112  001402                                 BEQ     T0072           ;BR IF YES

 007114  000000                         E0071:  HALT                    ;BIC FAILED TO CLEAR HI-BYTE
 007116  000767                                 BR      R0071           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0072 BASIC 'BIC #N,2(SP)'' TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,167,261,262,266,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,142 / 35[250]120,167 / 17[167]262,262 / 33[266]220,225
                                                        ; / 16[367]016,016

                                        ;EXEC:          [225]ALUC HLLHL :[367]D=357

                                        ;CODES:         [367] SPS=3  /  N:C=0000

                                        ;SYNC:          B05J2 (-)       /       T= 3.3 USEC

                                        ;KEY SIG:       K3-5 DOPL  /  K3-3 DM=6  /  K3-3 BIC L

007120  012700  000072                  T0072:  MOV     #0072,R0                ;LOAD R0 WITH TEST NO.
007124  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
007132  012704  000357                          MOV     #357,R4         ;RESULT S / B = 357
007136  010605                                  MOV     SP,R5           ;SAVE SP
007140  010506                          R0072:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
007142  012746  000377                          MOV     #377,-(SP)      ;[DEST] = 377 PUT ON STACK
007146  005746                                  TST     -(SP)           ;DECREMENT SP
007150  000257                                  CCC                     ;SCOPE SYNC

007152  042766  000020  000002          I0072:  BIC     #20,2(SP)       ;TEST THE BIC - CLEAR BIT 4

007160  010602                                  MOV     SP,R2           ;[R2] = DEST ADDR
007162  005722                                  TST     (R2)+
007164  020412                                  CMP     R4,(R2)         ;RESULT = 357?
007166  001403                                  BEQ     A0072           ;BR IF YES

007170  011203                                  MOV     (R2),R3         ;GET WAS DATA
007172  000000                          E0072:  HALT                    ;BIC FAILED TO CLR BIT2 OF DEST
007174  000761                                  BR      R0072           ;LOCK ON HARD ERROR

007176  010506                          A0072:  MOV     R5,SP
```

```
                                        ; *********************************************************************
                                                .SBTTL T0073 BASIC 'BIT  #N,@#A' WITH BIT SET IN 'A'
                                        ; *********************************************************************

                                        ;MICRO PROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,163,264,265,266,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,163 / 33[266]220,225 / 16[367]016,016

                                        ;EXEC:          [225]ALUC=HHLHH :[367]D=040000

                                        ;CODES:         [367] SPS=3  /  N:C=0000

                                        ;SYNC:          B05J2 (-)       /       T= 4.3 USEC

                                        ;KEY SIG:       K3-3 BITL  /  K3-3 SM=2L  /  K3-3 DM=3L  /  K3-8 BIT+CMP+TSTH

007200  012700  000073                  T0073:  MOV     #0073,R0                ;LOAD R0 WITH TEST NO.
007204  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
007212  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
007216  012704  040000                          MOV     #40000,R4       ;RESULT S / B = 40000
007222  010412                          R0073:  MOV     R4,(R2)         ;MAKE [DEST] = 40000
007224  000277                                  SCC                     ;SCOPE SYNC - Z=1

007226  032737  040000  067560          I0073:  BIT     #40000,@#MBUF0  ;TEST THE BIT

007234  001002                                  BNE     T0074           ;BR IF Z=0 - IT SHOULD BE

007236  000000                          E0073:  HALT                    ;BIT FAILED TO CLEAR 'Z'
007240  000770                                  BR      R0073           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0074 BASIC 'BIT  #N,@#A'' WITH BIT CLEAR IN ''A''
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,163,264,265,266,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,163 / 33[266]220,225 / 16[367]016,016

                                        ;EXEC:          [225]ALUC=HHLHH :[367]D=000000

                                        ;CODES:         [367] SPS=3  /  N:C=0100

                                        ;SYNC:          B05J2 (-)       /       T= 4.3 USEC

                                        ;KEY SIG:       K3-3 BITL  /  K3-3 SM=2L  /  K3-3 DM=3L  /  K3-8 BIT+CMP+TSTH
                                                        ;  K5-2 PS(Z)(1)H

007242  012700  000074          T0074:  MOV     #0074,R0                ;LOAD R0 WITH TEST NO.
007246  112760  000377  070140          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
007254  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
007260  005004                          CLR     R4              ;RESULT S / B = 000000
007262  005012                  R0074:  CLR     (R2)            ;MAKE [DEST] = 000000
007264  000257                          CCC                     ;SCOPE SYNC - Z=0

007266  032737  040000  067560  I0074:  BIT     #40000,@#MBUF0  ;TEST THE BIT

007274  001402                          BEQ     A0074           ;BR IF Z=1 - IT SHOULD BE

007276  000000                  E10074: HALT                    ;BIT FAILED TO SET ''Z''
007300  000770                          BR      R0074           ;LOCK ON HARD ERROR

007302  020412                  A0074:  CMP     R4,(R2)         ;DID BIT DELIVER A RESULT
007304  001403                          BEQ     T0075           ;BR IF NOT

007306  011203                          MOV     (R2),R3         ;GET THE WAS DATA
007310  000000                  E20074: HALT                    ;BIT DISTURBED THE [DEST]
007312  000763                          BR      R0074           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0075 BASIC ''ADD  #N,(R) '' TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,161,266,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,161 / 33[266]220,225 / 16[367]016,016

                                        ;EXEC:          [225]ALUC=LHLLH :[367]D=000004

                                        ;CODES:         [367] SPS=3  /  N:C=0000

                                        ;SYNC:          B05J2 (-)       /       T=3.4 USEC

                                        ;KEY SIG:       K3-3 ADD+SUBL  /  K3-3 SM=2L  /  K3-3 DM=1L

007314  012700  000075                  T0075:  MOV     #0075,R0                ;LOAD R0 WITH TEST NO.
007320  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
007326  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
007332  012704  000004                          MOV     #4,R4           ;RESULT S / B = 4
007336  012712  000002                  R0075:  MOV     #2,(R2)         ;MAKE [DEST] = 2
007342  000257                                  CCC                     ;SCOPE SYNC

007344  062712  000002                  I0075:  ADD     #2,(R2) ;TEST THE ADD

007350  020412                                  CMP     R4,(R2)         ;RESULT = 4 ?
007352  001403                                  BEQ     T0076           ;BR IF YES

007354  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
007356  000000                          E0075:  HALT                    ;ADD DELIVERED THE WRONG RESULT
007360  000766                                  BR      R0075           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0076 BASIC ''ADD  #N,X(R)'' TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,167,261,262,266,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,167 / 17[167]262,262 / 33[266]220,225
                                                        ; / 16[367]016,016

                                        ;EXEC:          [225]ALUC=LHLLH :[367]D=000004

                                        ;CODES:         [367] SPS=3  /  N:C=0000

                                        ;SYNC:          B05J2 (-)        /        T= 3.4 USEC

                                        ;KEY SIG:       K3-3 ADD+SUBL  /  K3-3 SM=2L  /  K3-3 DM=6L

007362  012700  000076                  T0076:  MOV     #0076,R0                ;LOAD R0 WITH TEST NO.
007366  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
007374  012704  000002                          MOV     #2,R4           ;RESULT S / B = 4
007400  012702  067562                          MOV     #MBUF0+2,R2     ;DEST ADDR = MBUF0 + 2
007404  012705  067560                  R0076:  MOV     #MBUF0,R5       ;BASE DEST ADDR = MBUF0
007410  005012                                  CLR     (R2)            ;MAKE [DEST] = 000000
007412  000257                                  CCC                     ;SCOPE SYNC

007414  062765  000002  000002          I0076:  ADD     #2,2(R5)        ;TEST THE ADD

007422  020412                                  CMP     R4,(R2)         ;RESULT = 4 ?
007424  001403                                  BEQ     T0077           ;BR IF YES

007426  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
007430  000000                          E0076:  HALT                    ;ADD DELIVERED THE WRONG RESULT
007432  000764                                  BR      R0076           ;LOOP ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0077 BASIC ''CMPB #N,(SP)+'' TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,162,260,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,162 / 33[260]220,225 / 16[367]016,016

                                        ;EXEC:          [225]ALUC=LLHHL :[367]D=177400

                                        ;CODES:         [367] SPS=3  /  N:C=0100

                                        ;SYNC:          B05J2 (-)       /       T= 4 USEC

                                        ;KEY SIG:       K3-3 CMPL  /  K3-3 DM=2L  /  K3-6 BYTE INSTR H

007434  012700  000077                  T0077:  MOV     #0077,R0                ;LOAD R0 WITH TEST NO.
007440  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
007446  032737  000002  066642                  BIT     #2,@#BPTLOC     ;BREAKPOINT HALT SET ??
007454  001401                                  BEQ     .+4             ;BR IF NOT
007456  000000                                  HALT                    ;BREAK - DEPRESS CONTINUE TO RESTART
007460  012704  177400                          MOV     #177400,R4      ;RESULT S / B = 177400
007464  010605                                  MOV     SP,R5           ;SAVE SP
007466  010602                                  MOV     SP,R2           ;SET UP DEST ADDR
007470  005742                                  TST     -(R2)           ;R2 CONTAINS DEST ADDR
007472  010506                          R0077:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP

007474  010446                                  MOV     R4,-(SP)        ;MAKE [DEST] = 177400
007476  000257                                  CCC                     ;SCOPE SYNC - ''Z'' = 0

007500  122726  000000                  I0077:  CMPB    #0,(SP)+        ;TEST THE CMPB

007504  001403                                  BEQ     A0077           ;BR IF ''Z'' SET - IT SHOULD BE

007506  011203                                  MOV     (R2),R3         ;GET WAS DATA
007510  000000                          E10077: HALT                    ;CMPB FAILED TO SET ''Z''
007512  000767                                  BR      R0077           ;LOCK ON HARD ERROR

007514  020506                          A0077:  CMP     R5,SP           ;DID SP GET UPDATED BY 2?
007516  001402                                  BEQ     B0077           ;BR IF YES

007520  000000                          E20077: HALT                    ;CMPB FAILED TO UPDATE SP PROPERLY
007522  000763                                  BR      R0077           ;LOCK ON HARD ERROR

007524  020412                          B0077:  CMP     R4,(R2)         ;[DEST] ALTERED?
007526  001403                                  BEQ     T0100           ;BR IF NOT

007530  011203                                  MOV     (R2),R3         ;GET WAS DATA
007532  000000                          E30077: HALT                    ;CMPB MODIFIED [DEST]
007534  000756                                  BR      R0077           ;LOCK ON HARD ERROR.
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0100 BASIC ''CMPB (RA)+,(RB)+'' - SRC AND DEST EVEN
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,162,260,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,162 / 33[260]220,225 / 16[367]016,016

                                        ;EXEC:          [225]ALUC=LLHHL :[326]D=177400

                                        ;CODES:         [367] SPS=3  /  N:C=0100

                                        ;SYNC:          B05J2 (-)       /       T= 4.5 USEC

                                        ;KEY SIG:       K3-3 CMPL  /  K3-3 DM=2L  /  K3-6 BYTE INSTR H

007536  012700  000100                  T0100:  MOV     #0100,R0                ;LOAD R0 WITH TEST NO.
007542  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
007550  012704  177777                          MOV     #-1,R4          ;RESULT S / B = 177777
007554  012702  067572                          MOV     #DWTA+2,R2      ;DEST ADDR = DWTA+2
007560  012705  067576                  R0100:  MOV     #DWTA+6,R5      ;SRC ADDR = DWTA+6
007564  010203                                  MOV     R2,R3           ;R3 GETS DEST ADDR
007566  000257                                  CCC                     ;SCOPE SYNC

007570  122523                          I0100:  CMPB    (R5)+,(R3)+     ;TEST THE CMPB

007572  001402                                  BEQ     A0100           ;BR IF ''Z'' = 1 - IT SHOULD BE

007574  000000                          E10100: HALT                    ;CMPB FAILED TO SET ''Z''
007576  000770                                  BR      R0100           ;LOCK ON HARD ERROR

007600  022703  067573                  A0100:  CMP     #DWTA+3,R3      ;DID DEST REG GET UPDATED?
007604  001402                                  BEQ     B0100           ;BR IF YES

007606  000000                          E20100: HALT                    ;CMPB FAILED TO UPDATE DEST REG
007610  000763                                  BR      R0100           ;LOCK ON HARD ERROR

007612  022705  067577                  B0100:  CMP     #DWTA+7,R5      ;DID SRC REG GET UPDATED?
007616  001402                                  BEQ     C0100           ;BR IF YES

007620  000000                          E30100: HALT                    ;CMPB FAILED TO UPDATE SRC REG
007622  000756                                  BR      R0100           ;LOCK ON HARD ERROR

007624  020412                          C0100:  CMP     R4,(R2)         ;DID [DEST] GET ALTERED?
007626  001404                                  BEQ     T0101           ;BR IF NOT

007630  011203                                  MOV     (R2),R3         ;GET WAS DATA
007632  000000                          E40100: HALT                    ;CMPB DELIVERED A RESULT
007634  010412                                  MOV     R4,(R2)         ;RESTORE [DEST]
007636  000750                                  BR      R0100           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0101 BASIC ''CMPB (RA)+,(RB)+'' - SRC AND DEST ODD
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,137,251,162,260,267,237,270,231,254,074,366,375,016] FC 1,2

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,137 / 36[137]120,162 / 33[260]220,237
                                                        ; / 34[237]220,231 / 16[366]016,016

                                        ;EXEC:          [231]ALUC=LLHHL :[254]D=000000

                                        ;CODES:         [074] SPS=3  /  N:C=0100

                                        ;SYNC:          B05J2 (-)       /       T= 4.5 USEC

                                        ;KEY SIG:       K3-3 CMPL  /  K3-3 DM=2L  /  K3-6 BYTE INSTR H

007640  012700  000101                  T0101:  MOV     #0101,R0                ;LOAD R0 WITH TEST NO.
007644  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
007652  012704  177777                          MOV     #-1,R4          ;RESULT S / B = 177777
007656  012702  067572                          MOV     #DWTA+2,R2      ;DEST ADDR = DWTA+2
007662  012705  067575                  R0101:  MOV     #DWTA+5,R5      ;SRC ADDR = DWTA+5
007666  012703  067573                          MOV     #DWTA+3,R3      ;R3 GETS DEST ADDR+1
007672  000257                                  CCC                     ;SCOPE SYNC

007674  122523                          I0101:  CMPB    (R5)+,(R3)+     ;TEST THE CMPB

007676  001402                                  BEQ     A0101           ;BR IF ''Z'' = 1 - IT SHOULD BE

007700  000000                          E10101: HALT                    ;CMPB FAILED TO SET ''Z''
007702  000767                                  BR      R0101           ;LOCK ON HARD ERROR

007704  022703  067574                  A0101:  CMP     #DWTA+4,R3      ;DID DEST REG GET UPDATED?
007710  001402                                  BEQ     B0101           ;BR IF YES

007712  000000                          E20101: HALT                    ;CMPB FAILED TO UPDATE DEST REG
007714  000762                                  BR      R0101           ;LOCK ON HARD ERROR

007716  022705  067576                  B0101:  CMP     #DWTA+6,R5      ;DID SRC REG GET UPDATED?
007722  001402                                  BEQ     C0101           ;BR IF YES

007724  000000                          E30101: HALT                    ;CMPB FAILED TO UPDATE SRC REG
007726  000755                                  BR      R0101           ;LOCK ON HARD ERROR

007730  020412                          C0101:  CMP     R4,(R2)         ;DID [DEST] GET ALTERED?
007732  001404                                  BEQ     T0102           ;BR IF NOT

007734  011203                                  MOV     (R2),R3         ;GET WAS DATA
007736  000000                          E40101: HALT                    ;CMPB DELIVERED A RESULT
007740  010412                                  MOV     R4,(R2)         ;RESTORE [DEST]
007742  000747                                  BR      R0101           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0102 BASIC ''CMPB (RA)+,(RB)+'' - SRC / EVEN,DEST / ODD
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,162,260,267,237,270,231,254,074,366,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,162 / 33[260]220,237 / 34[237]220,231
                                                        ; / 16[366]016,016

                                        ;EXEC:          [231]ALUC=LLHHL :[367]D=000400

                                        ;CODES:         [074] SPS=3  /  N:C=0100

                                        ;SYNC:          B05J2 (-)       /       T= 4.5 USEC

                                        ;KEY SIG:       K3-3 CMPL  /  K3-3 DM=2  /  K3-6 BYTE INSTR H

007744  012700  000102                  T0102:  MOV     #0102,R0                ;LOAD R0 WITH TEST NO.
007750  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
007756  012704  177400                          MOV     #177400,R4      ;RESULT S / B = 177400
007762  012702  067574                          MOV     #DWTA+4,R2      ;DEST ADDR = DWTA+4
007766  012705  067576                  R0102:  MOV     #DWTA+6,R5      ;SRC ADDR = DWTA+6
007772  012703  067575                          MOV     #DWTA+5,R3      ;R3 GETS DEST ADDR
007776  000257                                  CCC                     ;SCOPE SYNC

010000  122523                          I0102:  CMPB    (R5)+,(R3)+     ;TEST THE CMPB

010002  001402                                  BEQ     A0102           ;BR IF ''Z'' = 1 - IT SHOULD BE

010004  000000                          E10102: HALT                    ;CMPB FAILED TO SET ''Z''
010006  000767                                  BR      R0102           ;LOCK ON HARD ERROR

010010  022703  067576                  A0102:  CMP     #DWTA+6,R3      ;DID DEST REG GET UPDATED?
010014  001402                                  BEQ     B0102           ;BR IF YES

010016  000000                          E20102: HALT                    ;CMPB FAILED TO UPDATE DEST REG
010020  000762                                  BR      R0102           ;LOCK ON HARD ERROR

010022  022705  067577                  B0102:  CMP     #DWTA+7,R5      ;DID SRC REG GET UPDATED?
010026  001402                                  BEQ     C0102           ;BR IF YES

010030  000000                          E30102: HALT                    ;CMPB FAILED TO UPDATE SRC REG
010032  000755                                  BR      R0102           ;LOCK ON HARD ERROR

010034  020412                          C0102:  CMP     R4,(R2)         ;DID [DEST] GET ALTERED?
010036  001404                                  BEQ     T0103           ;BR IF NOT

010040  011203                                  MOV     (R2),R3         ;GET WAS DATA
010042  000000                          E40102: HALT                    ;CMPB DELIVERED A RESULT
010044  010412                                  MOV     R4,(R2)         ;RESTORE [DEST]
010046  000747                                  BR      R0102           ;LOCK ON HARD ERROR
```

```
                                        ; ************************************************************************
                                                .SBTTL T0103 BASIC ''CMPB (RA)+,(RB)+'' - SRC / ODD,DEST / EVEN
                                        ; ************************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,137,251,162,260,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,137 / 36[137]120,162 / 33[260]220,225
                                                        ; / 16[367]016,016

                                        ;EXEC:          [225]ALUC=LLHHL :[367]D=000000

                                        ;CODES:         [367] SPS=3  /  N:C=0100

                                        ;SYNC:          B05J2 (-)       /       T= 4.5 USEC

                                        ;KEY SIG:       K3-3 CMPL  /  K3-3 DM=2  /  K3-6 BYTE INSTR H

010050  012700  000103                  T0103:  MOV     #0103,R0                ;LOAD R0 WITH TEST NO.
010054  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
010062  012704  177777                          MOV     #-1,R4          ;RESULT S / B = 177777
010066  012702  067572                          MOV     #DWTA+2,R2      ;DEST ADDR = DWTA+2
010072  012705  067575                  R0103:  MOV     #DWTA+5,R5      ;SRC ADDR = DWTA+5
010076  010203                                  MOV     R2,R3           ;R3 GETS DEST ADDR
010100  000257                                  CCC                     ;SCOPE SYNC

010102  122523                          I0103:  CMPB    (R5)+,(R3)+     ;TEST THE CMPB

010104  001402                                  BEQ     A0103           ;BR IF ''Z'' = 1 - IT SHOULD BE

010106  000000                          E10103: HALT                    ;CMPB FAILED TO SET ''Z''
010110  000770                                  BR      R0103           ;LOCK ON HARD ERROR

010112  022703  067573                  A0103:  CMP     #DWTA+3,R3      ;DID DEST REG GET UPDATED?
010116  001402                                  BEQ     B0103           ;BR IF YES

010120  000000                          E20103: HALT                    ;CMPB FAILED TO UPDATE DEST REG
010122  000763                                  BR      R0103           ;LOCK ON HARD ERROR

010124  022705  067576                  B0103:  CMP     #DWTA+6,R5      ;DID SRC REG GET UPDATED?
010130  001402                                  BEQ     C0103           ;BR IF YES

010132  000000                          E30103: HALT                    ;CMPB FAILED TO UPDATE SRC REG
010134  000756                                  BR      R0103           ;LOCK ON HARD ERROR

010136  020412                          C0103:  CMP     R4,(R2)         ;DID [DEST] GET ALTERED?
010140  001404                                  BEQ     T0104           ;BR IF NOT

010142  011203                                  MOV     (R2),R3         ;GET WAS DATA
010144  000000                          E40103: HALT                    ;CMPB DELIVERED A RESULT
010146  010412                                  MOV     R4,(R2)         ;RESTORE [DEST]
010150  000750                                  BR      R0103           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0104 BASIC ''MOVB (RA)+,X(RB) - SRC EVEN / DEST EVEN
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,177,206,212,202,205,125,375,016] FC 1,2,4

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,177 / 17[177]212,212 / 21[206]200,202
                                                        ; / 16[125]016,016

                                        ;EXEC:          [205]ALUC=LLLLL :[125]D=000000

                                        ;CODES:         [125] SPS=3  /  N:C=0100

                                        ;SYNC:          B05J2 (-)       /       T=4.5 USEC

                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=6L  /  K3-5 DOPL  /  K5-? PS(Z)(1)H
                                                        ;  K3-6 BYTE INSTR H

010152  012700  000104          T0104:  MOV     #0104,R0                ;LOAD R0 WITH TEST NO.
010156  112760  000377  070140          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
010164  012702  067564                  MOV     #MBUF1,R2       ;DEST ADDR = MBUF1
010170  012703  067560                  MOV     #MBUF0,R3       ;BASE DEST ADDR = MBUF0
010174  012704  177400                  MOV     #177400,R4      ;RESULT S / B = 177400
010200  012705  070130          R0104:  MOV     #DBTA,R5        ;SRC ADDR = DBTA
010204  012712  177777                  MOV     #-1,(R2)        ;[DEST] = 177777
010210  000257                          CCC                     ;SCOPE SYNC

010212  112563  000004          I0104:  MOVB    (R5)+,4(R3)     ;TEST THE MOVB

010216  020412                          CMP     R4,(R2)         ;RESULT OK?
010220  001403                          BEQ     A0104           ;BR IF YES

010222  011203                          MOV     (R2),R3         ;GET WAS DATA
010224  000000          E10104: HALT                            ;MOV DELIVERED WRONG RESULT
010226  000764                          BR      R0104           ;LOCK ON HARD ERROR

010230  022705  070131          A0104:  CMP     #DBTA+1,R5      ;DID SRC REG GET INCREMENTED BY +1
010234  001402                          BEQ     T0105           ;BR IF YES

010236  000000          E20104: HALT                            ;MOVB FAILED TO UPDATE SRC REG
010240  000757                          BR      R0104           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0105 BASIC 'MOVB (RA)+,X(RB) - SRC ODD / DEST ODD
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,137,251,177,206,212,202,205,125,375,016] FC 1,2,4

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,137 / 36[137]120,177 / 17[177]212,212
                                                        ; / 21[206]200,202 / 16[125]016,016

                                        ;EXEC:          [205]ALUC=LLLLL :[125]D=177777

                                        ;CODES:         [125] SPS=3  /  N:C=1000

                                        ;SYNC:          B05J2 (-)       /       T=4.5 USEC

                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=6L  /  K3-5 DOPL  /  K5-2 PS (N)(1) H
                                                        ;  K3-6 BYTE INSTR H

010242  012700  000105                  T0105:  MOV     #0105,R0                ;LOAD R0 WITH TEST NO.
010246  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
010254  012702  067564                          MOV     #MBUF1,R2       ;DEST ADDR = MBUF1
010260  012703  067560                          MOV     #MBUF0,R3       ;BASE DEST ADDR = MBUF0
010264  012704  000777                          MOV     #777,R4         ;RESULT S / B = 777
010270  012705  070135                  R0105:  MOV     #DBTB+1,R5      ;SRC ADDR = DBTB+1
010274  012712  177777                          MOV     #-1,(R2)        ;[DEST] = 177777
010300  000257                                  CCC                     ;SCOPE SYNC

010302  112563  000005                  I0105:  MOVB    (R5)+,5(R3)     ;TEST THE MOVB

010306  020412                                  CMP     R4,(R2)         ;RESULT OK?
010310  001403                                  BEQ     A0105           ;BR IF YES

010312  011203                                  MOV     (R2),R3         ;GET WAS DATA
010314  000000                          E10105: HALT                    ;MOV DELIVERED WRONG RESULT
010316  000764                                  BR      R0105           ;LOCK ON HARD ERROR

010320  022705  070136                  A0105:  CMP     #DBTB+2,R5      ;DID SRC REG GET INCREMENTED BY +1
010324  001402                                  BEQ     T0106           ;BR IF YES

010326  000000                          E20105: HALT                    ;MOVB FAILED TO UPDATE SRC REG
010330  000757                                  BR      R0105           ;LOCK ON HARD ERROR
```

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                                        ; ***********************************************************************
                                                .SBTTL T0106 BASIC 'MOVB (RA)+,X(RB) - SRC EVEN / DEST ODD
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,177,206,212,202,205,125,375,016] FC 1,2,4

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,177 / 17[177]212,212 / 21[206]200,202
                                                        ; / 16[125]016,016

                                        ;EXEC:          [205]ALUC=LLLLL :[125]D=177777

                                        ;CODES:         [125] SPS=3  /  N:C=1000

                                        ;SYNC:          B05J2 (-)       /       T=4.5 USEC

                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=6L  /  K3-5 DOPL  /  K5-2 PS (N)(1) H
                                                        ;  K3-6 BYTE INSTR

010332  012700  000106                  T0106:  MOV     #0106,R0                ;LOAD R0 WITH TEST NO.
010336  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
010344  012702  067564                          MOV     #MBUF1,R2       ;DEST ADDR = MBUF1
010350  012703  067560                          MOV     #MBUF0,R3       ;BASE DEST ADDR = MBUF0
010354  012704  000377                          MOV     #377,R4         ;RESULT S / B = 377
010360  012705  070130                  R0106:  MOV     #DBTA,R5        ;SRC ADDR = DBTA
010364  012712  177777                          MOV     #-1,(R2)        ;[DEST] = 177777
010370  000257                                  CCC                     ;SCOPE SYNC

010372  112563  000005                  I0106:  MOVB    (R5)+,5(R3)     ;TEST THE MOVB

010376  020412                                  CMP     R4,(R2)         ;RESULT OK?
010400  001403                                  BEQ     A0106           ;BR IF YES

010402  011203                                  MOV     (R2),R3         ;GET WAS DATA
010404  000000                          E10106: HALT                    ;MOV DELIVERED WRONG RESULT
010406  000764                                  BR      R0106           ;LOCK ON HARD ERROR

010410  022705  070131                  A0106:  CMP     #DBTA+1,R5      ;DID SRC REG GET INCREMENTED BY +1
010414  001402                                  BEQ     T0107           ;BR IF YES

010416  000000                          E20106: HALT                    ;MOVB FAILED TO UPDATE SRC REG
010420  000757                                  BR      R0106           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0107 BASIC 'MOVB (RA)+,X(RB) - SRC ODD / DEST EVEN
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,137,251,177,206,212 202,205,125,375,016] FC 1,2,4

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,137 / 36[137]120,177 / 17[177]212,212
                                                        ; / 21[206]200,202 / 16[125]016,016

                                        ;EXEC:          [205]ALUC=LLLLL :[125]D=001001

                                        ;CODES:         [125] SPS=3  /  N:C=0000

                                        ;SYNC:          B05J2 (-)       /       T=4.5 USEC

                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=6L  /  K3-5 DOPL  /  K3-6 BYTE INSTR H

010422  012700  000107                  T0107:  MOV     #0107,R0                ;LOAD R0 WITH TEST NO.
010426  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
010434  012702  067564                          MOV     #MBUF1,R2       ;DEST ADDR = MBUF1
010440  012703  067560                          MOV     #MBUF0,R3       ;BASE DEST ADDR = MBUF0
010444  012704  177401                          MOV     #177401,R4      ;RESULT S / B = 177401
010450  012705  070135                  R0107:  MOV     #DBTB+1,R5      ;SRC ADDR = DBTB+1
010454  012712  177777                          MOV     #-1,(R2)        ;[DEST] = 177777
010460  000257                                  CCC                     ;SCOPE SYNC

010462  112563  000004                  I0107:  MOVB    (R5)+,4(R3)     ;TEST THE MOVB

010466  020412                                  CMP     R4,(R2)         ;RESULT OK?
010470  001403                                  BEQ     A0107           ;BR IF YES

010472  011203                                  MOV     (R2),R3         ;GET WAS DATA
010474  000000                          E10107: HALT                    ;MOV DELIVERED WRONG RESULT
010476  000764                                  BR      R0107           ;LOCK ON HARD ERROR

010500  022705  070136                  A0107:  CMP     #DBTB+2,R5      ;DID SRC REG GET INCREMENTED BY +1
010504  001402                                  BEQ     T0110           ;BR IF YES

010506  000000                          E20107: HALT                    ;MOVB FAILED TO UPDATE SRC REG
010510  000757                                  BR      R0107           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0110 BASIC 'MOVB 2(RA),(RB)+'' TEST - SRC EVEN / DEST EVEN
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [146,241,242,247,250,172,257,202,205,125,375,016] FC 1,2,4

                                        ;ACT BUTS:      37[004]100,146 / 35[247]120,172 / 22[172]200,202 / 16[125]016,016

                                        ;EXEC:          [205]ALUC=LLLLL :[125]D=001001

                                        ;CODES:         [125] SPS=3  /  N:C=0000

                                        ;SYNC:          B05J2 (-)       /       T=4.2 USEC

                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=2L  /  K3-5 DOPL  /  K3-6 BYTE INSTR H

010512  012700  000110                  T0110:  MOV     #0110,R0                ;LOAD R0 WITH TEST NO.
010516  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
010524  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
010530  012704  177401                          MOV     #177401,R4      ;RESULT S / B = 177401
010534  012705  070114                          MOV     #DWTB,R5        ;SRC ADDR = DWTB
010540  010203                          R0110:  MOV     R2,R3           ;R3 GETS DEST ADDR
010542  012713  177777                          MOV     #-1,(R3)        ;[DEST] = 177400
010546  000257                                  CCC                     ;SCOPE SYNC

010550  116523  000002                  I0110:  MOVB    2(R5),(R3)+     ;TEST THE MOVB

010554  020412                                  CMP     R4,(R2)         ;RESULT OK?
010556  001403                                  BEQ     A0110           ;BR IF YES

010560  011203                                  MOV     (R2),R3         ;GET WAS DATA
010562  000000                          E10110: HALT                    ;MOVB DELIVERED WRONG RESULT
010564  000765                                  BR      R0110           ;LOCK ON HARD ERROR

010566  022703  067561                  A0110:  CMP     #MBUF0+1,R3     ;DID DEST REG GET INCREMENTED?
010572  001402                                  BEQ     T0111           ;BR IF YES

010574  000000                          E20110: HALT                    ;MOVB FAILED TO AUTO INCREMENT DEST REG
010576  000760                                  BR      R0110           ;LOCK ON HARD ERROR
```

```
                                        ; ************************************************************************
                                                .SBTTL T0111 BASIC 'MOVB 2(RA),(RB)+" TEST - SRC ODD / DEST EVEN
                                        ; ************************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [146,241,242,247,250,137,251,172,257,202,205,125,375,016] FC 1,2,4

                                        ;ACT BUTS:      37[004]100,146 / 35[247]120,137 / 36[137]120,172 / 22[172]200,202
                                                        ; / 16[125]016,016

                                        ;EXEC:          [205]ALUC=LLLLL :[125]D=001001

                                        ;CODES:         [125] SPS=3  / N:C=0000

                                        ;SYNC:          B05J2 (-)       /       T=4.2 USEC

                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=2L  /  K3-5 DOPL  /  K3-6 BYTE INSTR H

010600  012700  000111                  T0111:  MOV     #0111,R0                ;LOAD R0 WITH TEST NO.
010604  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
010612  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
010616  012704  177401                          MOV     #177401,R4      ;RESULT S / B = 177401
010622  012705  070134                          MOV     #DBTB,R5        ;SRC ADDR = DBTB
010626  010203                          R0111:  MOV     R2,R3           ;R3 GETS DEST ADDR
010630  012713  177777                          MOV     #-1,(R3)        ;[DEST] = 177777
010634  000257                                  CCC                     ;SCOPE SYNC

010636  116523  000001                  I0111:  MOVB    1(R5),(R3)+     ;TEST THE MOVB

010642  020412                                  CMP     R4,(R2)         ;RESULT OK?
010644  001403                                  BEQ     A0111           ;BR IF YES

010646  011203                                  MOV     (R2),R3         ;GET WAS DATA
010650  000000                          E10111: HALT                    ;MOVB DELIVERED WRONG RESULT
010652  000765                                  BR      R0111           ;LOCK ON HARD ERROR

010654  022703  067561                  A0111:  CMP     #MBUF0+1,R3     ;DID DEST REG GET INCREMENTED?
010660  001402                                  BEQ     T0112           ;BR IF YES

010662  000000                          E20111: HALT                    ;MOVB FAILED TO AUTO INCREMENT DEST REG
010664  000760                                  BR      R0111           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0112 BASIC 'MOVB 2(RA),(RB)+'' TEST - SRC EVEN / DEST ODD
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [146,241,242,247,250,172,257,202,205,125,375,016] FC 1,2,4

                                        ;ACT BUTS:      37[004]100,146 / 35[247]120,172 / 22[172]200,202 / 16[125]016,016

                                        ;EXEC:          [205]ALUC=LLLLL :[125]D=001001

                                        ;CODES:         [125] SPS=3  /  N:C=0000

                                        ;SYNC:          B05J2 (-)       /       T=4.2 USEC

                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=2L  /  K3-5 DOPL  /  K3-6 BYTE INSTR H

010666  012700  000112                  T0112:  MOV     #0112,R0                ;LOAD R0 WITH TEST NO.
010672  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
010700  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
010704  012704  000777                          MOV     #777,R4         ;RESULT S / B = 777
010710  012705  070114                          MOV     #DWTB,R5        ;SRC ADDR = DWTB
010714  012703  067561          R0112:  MOV     #MBUF0+1,R3     ;R3 GETS DEST ADDR
010720  012712  177777                          MOV     #-1,(R2)        ;[DEST] = 177777
010724  000257                                  CCC                     ;SCOPE SYNC

010726  116523  000002          I0112:  MOVB    2(R5),(R3)+     ;TEST THE MOVB

010732  020412                          CMP     R4,(R2)         ;RESULT OK?
010734  001403                          BEQ     A0112           ;BR IF YES

010736  011203                          MOV     (R2),R3         ;GET WAS DATA
010740  000000          E10112: HALT                            ;MOVB DELIVERED WRONG RESULT
010742  000764                          BR      R0112           ;LOCK ON HARD ERROR

010744  022703  067562          A0112:  CMP     #MBUF0+2,R3     ;DID DEST REG GET INCREMENTED?
010750  001402                          BEQ     T0113           ;BR IF YES

010752  000000          E20112: HALT                            ;MOVB FAILED TO AUTO INCREMENT DEST REG
010754  000757                          BR      R0112           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0113 BASIC 'MOVB 2(RA),(RB)+'' TEST - SRC ODD / DEST ODD
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [146,241,242,247,250,137,251,172,257,202,205,125,375,016] FC 1,2,4

                                        ;ACT BUTS:      37[004]100,146 / 35[247]120,137 / 36[137]120,172 / 22[172]200,202
                                                        ; / 16[125]016,016

                                        ;EXEC:          [205]ALUC=LLLLL :[125]D=001001

                                        ;CODES:         [125] SPS=3  /  N:C=0000

                                        ;SYNC:          B05J2 (-)       /       T=4.2 USEC

                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=2L  /  K3-5 DOPL  /  K3-6 BYTE INSTR H

010756  012700  000113                  T0113:  MOV     #0113,R0                ;LOAD R0 WITH TEST NO.
010762  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
010770  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
010774  012704  000777                          MOV     #777,R4         ;RESULT S / B = 777
011000  012705  070134                          MOV     #DBTB,R5        ;SRC ADDR = DBTB
011004  012703  067561                  R0113:  MOV     #MBUF0+1,R3     ;R3 GETS DEST ADDR = MBUF0+1
011010  012712  177777                          MOV     #-1,(R2)        ;[DEST] = 177777
011014  000257                                  CCC                     ;SCOPE SYNC

011016  116523  000001                  I0113:  MOVB    1(R5),(R3)+     ;TEST THE MOVB

011022  020412                                  CMP     R4,(R2)         ;RESULT OK?
011024  001403                                  BEQ     A0113           ;BR IF YES

011026  011203                                  MOV     (R2),R3         ;GET WAS DATA
011030  000000                          E10113: HALT                    ;MOVB DELIVERED WRONG RESULT
011032  000764                                  BR      R0113           ;LOCK ON HARD ERROR

011034  022703  067562                  A0113:  CMP     #MBUF0+2,R3     ;DID DEST REG GET INCREMENTED?
011040  001402                                  BEQ     T0114           ;BR IF YES

011042  000000                          E20113: HALT                    ;MOVB FAILED TO AUTO INCREMENT DEST REG
011044  000757                                  BR      R0113           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0114 BASIC 'MOVB -(RA),RB'' TEST - SRC EVEN ADDR
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [144,240,250,160,204,003,204,000] FC 1,2,4

                                        ;ACT BUTS:      37[004]100,144 / 35[240]120,160 / 20[160]000,003 / 27[003]000,000

                                        ;EXEC:          [003]ALUC=LLLLL :[204]D=177777

                                        ;CODES:         [204] SPS=3  /  N:C=1000

                                        ;SYNC:          B05J2 (-)        /        T=2 USEC

                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=0L  /  K3-5 DOPL  /  K3-6 BYTE INSTR
                                                        ;  K5-2 PS (N)(1)H

011046  012700  000114                  T0114:  MOV     #0114,R0                ;LOAD R0 WITH TEST NO.
011052  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
011060  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
011064  012704  177777                          MOV     #-1,R4          ;RESULT S / B = 177777
011070  012705  067577                  R0114:  MOV     #DWTA+7,R5      ;SRC ADDR = DWTA+7
011074  005003                                  CLR     R3              ;[DEST] = 000000
011076  000257                                  CCC                     ;SCOPE SYNC

011100  114503                          I0114:  MOVB    -(R5),R3        ;TEST THE MOVB

011102  020403                                  CMP     R4,R3           ;RESULT OK?
011104  001402                                  BEQ     A0114           ;BR IF YES

011106  000000                          E10114: HALT                    ;MOVB FAILED - WRONG RESULT
011110  000767                                  BR      R0114           ;LOCK ON HARD ERROR

011112  022705  067576                  A0114:  CMP     #DWTA+6,R5      ;SRC REG GET DECREMENTED?
011116  001402                                  BEQ     T0115           ;BR IF YES

011120  000000                          E20114: HALT                    ;MOVB FAILED TO UPDATE SRC REG
011122  000762                                  BR      R0114           ;LOCK ON HARD ERROR
```

```
                                        ; ************************************************************************
                                                .SBTTL T0115 BASIC 'MOVB -(RA),RB'' TEST - SRC ODD ADDR
                                        ; ************************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [144,240,250,137,251,160,204,003,204,000] FC 1,2,4

                                        ;ACT BUTS:      37[004]100,144 / 35[240]120,137 / 36[137]120,160 / 20[160]000,003
                                                        ; / 27[003]000,000

                                        ;EXEC:          [003]ALUC=LLLLL :[204]D=177777

                                        ;CODES:         [204] SPS=3  /  N:C=1000

                                        ;SYNC:          B05J2 (-)       /       T= 2 USEC

                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=0L  /  K3-5 DOPL  /  K3-6 BYTE INSTR H
                                                        ;  K5-2 PS(N)(1)H

011124  012700  000115                  T0115:  MOV     #0115,R0                ;LOAD R0 WITH TEST NO.
011130  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
011136  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
011142  012704  177777                          MOV     #-1,R4          ;RESULT S / B = 177777
011146  012705  067576                  R0115:  MOV     #DWTA+6,R5      ;SRC ADDR = DWTA+6
011152  005003                                  CLR     R3              ;[DEST] = 000000
011154  000257                                  CCC                     ;SCOPE SYNC

011156  114503                          I0115:  MOVB    -(R5),R3        ;TEST THE MOVB

011160  020403                                  CMP     R4,R3           ;RESULT OK?
011162  001402                                  BEQ     A0115           ;BR IF YES

011164  000000                          E10115: HALT                    ;MOVB FAILED - WRONG RESULT
011166  000767                                  BR      R0115           ;LOCK ON HARD ERROR

011170  022705  067575                  A0115:  CMP     #DWTA+5,R5      ;SRC REG GET DECREMENTED?
011174  001402                                  BEQ     T0116           ;BR IF YES

011176  000000                          E20115: HALT                    ;MOVB FAILED TO UPDATE SRC REG
011200  000762                                  BR      R0115           ;LOCK ON HARD ERROR
```

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                                        ; ***********************************************************************
                                                .SBTTL T0116 BASIC 'MOVB (RA)+,-(SP)'' TEST - SRC ADDR EVEN
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,174,257,202,205,125,375,016] FC 1,2,4

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,174 / 22[174]200,202 / 16[125]016,016

                                        ;EXEC:          [205]ALUC=LLLLL :[125]D=000000

                                        ;CODES:         [125] SPS=3  /  N:C=0100

                                        ;SYNC:          B05J2 (-)       /       T= 3.3 USEC

                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=4L  /  K3-5 DOPL  /  K3-6 BYTE INSTR H
                                                        ;  K5-2 PS(Z)(1)H

011202  012700  000116                  T0116:  MOV     #0116,R0                ;LOAD R0 WITH TEST NO.
011206  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
011214  010605                                  MOV     SP,R5           ;SAVE SP
011216  012704  177400                          MOV     #177400,R4      ;RESULT S / B = 177400
011222  010506                          R0116:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
011224  012703  070130                          MOV     #DBTA,R3        ;SRC ADDR = DBTA
011230  012746  177777                          MOV     #-1,-(SP)       ;[DEST] = 177777
011234  010602                                  MOV     SP,R2           ;R2 GETS DEST ADDR
011236  005726                                  TST     (SP)+           ;RESET SP
011240  000257                                  CCC                     ;SCOPE SYNC

011242  112346                          I0116:  MOVB    (R3)+,-(SP)     ;TEST THE MOVB

011244  022703  070131                          CMP     #DBTA+1,R3      ;DID MOVB INCREMENT SRC REG?
011250  001402                                  BEQ     A0116           ;BR IF YES

011252  000000                          E0116:  HALT                    ;MOVB FAILED TO UPDATE SRC REG
011254  000762                                  BR      R0116           ;LOCK ON HARD ERROR

011256  020412                          A0116:  CMP     R4,(R2)         ;RESULT OK?
011260  001403                                  BEQ     B0116           ;BR IF YES

011262  011203                                  MOV     (R2),R3         ;GET WAS DATA
011264  000000                          E10116: HALT                    ;MOVB FAILED TO DELIVER CORRECT RESULT
011266  000755                                  BR      R0116           ;LOCK ON HARD ERROR

011270  020206                          B0116:  CMP     R2,SP           ;DID SP GET PUSHED BY 2 ?
011272  001402                                  BEQ     C0116           ;BR IF YES

011274  000000                          E20116: HALT                    ;MOVB FAILED TO PUSH SP PROPERLY
011276  000751                                  BR      R0116           ;LOCK ON HARD ERROR

011300  010506                          C0116:  MOV     R5,SP           ;RESET SP IN CASE OF ERROR
```

```
                                ; ************************************************************************
                                        .SBTTL T0117 BASIC 'MOVB (RA)+,-(SP)'' TEST - SRC ADDR ODD
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [142,240,250,137,251,174,257,202,205,125,375,016] FC 1,2,4

                                ;ACT BUTS:      37[004]100,142 / 35[240]120,137 / 36[137]120,174 / 22[174]200,202
                                                ; / 16[125]016,016

                                ;EXEC:          [205]ALUC=LLLLL :[125]D=000000

                                ;CODES:         [125] SPS=3  /  N:C=0100

                                ;SYNC:          B05J2 (-)        /        T= 3.3 USEC

                                ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=4L  /  K3-5 DOPL  /  K3-6 BYTE INSTR H
                                                ;  K5-2 PS(Z)(1)H

011302  012700  000117          T0117:  MOV     #0117,R0                ;LOAD R0 WITH TEST NO.
011306  112760  000377  070140          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
011314  010605                          MOV     SP,R5           ;SAVE SP
011316  012704  177400                  MOV     #177400,R4      ;RESULT S / B = 177400
011322  010506                  R0117:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
011324  012703  070117                  MOV     #DWTB+3,R3      ;SRC ADDR = DWTB+3
011330  012746  177777                  MOV     #-1,-(SP)       ;[DEST] = 177777
011334  010602                          MOV     SP,R2           ;R2 GETS DEST ADDR
011336  005726                          TST     (SP)+           ;RESET SP
011340  000257                          CCC                     ;SCOPE SYNC

011342  112346                  I0117:  MOVB    (R3)+,-(SP)     ;TEST THE MOVB

011344  022703  070120                  CMP     #DWTB+4,R3      ;DID MOVB INCREMENT SRC REG?
011350  001402                          BEQ     A0117           ;BR IF YES

011352  000000                  E0117:  HALT                    ;MOVB FAILED TO UPDATE SRC REG
011354  000762                          BR      R0117           ;LOCK ON HARD ERROR

011356  020412                  A0117:  CMP     R4,(R2)         ;RESULT OK?
011360  001403                          BEQ     B0117           ;BR IF YES

011362  011203                          MOV     (R2),R3         ;GET WAS DATA
011364  000000                  E10117: HALT                    ;MOVB FAILED TO DELIVER CORRECT RESULT
011366  000755                          BR      R0117           ;LOCK ON HARD ERROR

011370  020206                  B0117:  CMP     R2,SP           ;DID SP GET PUSHED BY 2
011372  001402                          BEQ     C0117           ;BR IF YES

011374  000000                  E20117: HALT                    ;MOVB FAILED TO PUSH SP
011376  000751                          BR      R0117           ;LOCK ON HARD ERROR

011400  010506                  C0117:  MOV     R5,SP           ;RESET SP IN CASE OF ERROR
```

```
                                ; ************************************************************************
                                        .SBTTL T0120 BASIC 'MOVB X(R),@#A'' TEST - SRC EVEN / DEST EVEN
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [146,241,242,247,250,173,207,210,202,205,125,375,016] FC 1,2,4

                                ;ACT BUTS:      37[004]100,146 / 35[247]120,173 / 22[207]200,202 / 16[125]016,016

                                ;EXEC:          [205]ALUC=LLLLL :[125]D=001001

                                ;CODES:         [125] SPS=3  /  N:C=0000

                                ;SYNC:          B05J2 (-)       /       T= 4.7 USEC

                                ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=3L  /  K3-5 DOPL  /  K3-6 BYTE INSTR H

011402  012700  000120          T0120:  MOV     #0120,R0                ;LOAD R0 WITH TEST NO.
011406  112760  000377  070140          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
011414  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
011420  012704  000001                  MOV     #1,R4           ;RESULT S / B = 1
011424  012705  070114                  MOV     #DWTB,R5        ;BASE SRC ADDR = DWTB
011430  005012                  R0120:  CLR     (R2)            ;[DEST] = 000000
011432  000257                          CCC                     ;SCOPE SYNC

011434  116537  000006  067560  I0120:  MOVB    6(R5),@#MBUF0   ;TEST THE MOVB

011442  020412                          CMP     R4,(R2)         ;RESULT OK?
011444  001403                          BEQ     T0121           ;BR IF YES

011446  011203                          MOV     (R2),R3         ;GET WAS DATA
011450  000000                  E0120:  HALT                    ;MOVB DELIVERED WRONG RESULT
011452  000766                          BR      R0120           ;LOCK ON HARD ERRROR
```

```
                                ; ***********************************************************************
                                        .SBTTL T0121 BASIC 'MOVB X(R),@#A'' TEST - SRC ODD / DEST EVEN
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [146,241,242,247,250,137,251,173,207,210,202,205,125,375,016] FC 1,2,4

                                ;ACT BUTS:      37[004]100,146 / 35[247]120,137 / 22[207]200,202 / 16[125]016,016

                                ;EXEC:          [205]ALUC=LLLLL :[125]D=001001

                                ;CODES:         [125] SPS=3  /  N:C=0000

                                ;SYNC:          B05J2 (-)       /       T= 4.7 USEC

                                ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=3  /  K3-5 DOPL  /  K3-6 BYTE INSTR H

011454  012700  000121          T0121:  MOV     #0121,R0                ;LOAD R0 WITH TEST NO.
011460  112760  000377  070140          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
011466  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
011472  012704  000001                  MOV     #1,R4           ;RESULT S / B = 1
011476  012705  070134                  MOV     #DBTB,R5        ;BASE SRC ADDR = DBTB
011502  005012                  R0121:  CLR     (R2)            ;[DEST] = 000000
011504  000257                          CCC                     ;SCOPE SYNC

011506  116537  000001  067560  I0121:  MOVB    1(R5),@#MBUF0   ;TEST THE MOVB

011514  020412                          CMP     R4,(R2)         ;RESULT OK?
011516  001403                          BEQ     T0122           ;BR IF YES

011520  011203                          MOV     (R2),R3         ;GET WAS DATA
011522  000000                  E0121:  HALT                    ;MOVB DELIVERED WRONG RESULT
011524  000766                          BR      R0121           ;LOCK ON HARD ERRROR
```

```
                                ; ***************************************************************************
                                        .SBTTL T0122 BASIC 'MOVB X(R),@#A'' TEST - SRC EVEN / DEST ODD
                                ; ***************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [146,241,242,247,250,173,207,210,202,205,125,375,016] FC 1,2,4

                                ;ACT BUTS:      37[004]100,146 / 35[247]120,177 / 21[206]200,202 / 16[125]016,016

                                ;EXEC:          [205]ALUC=LLLLL :[125]D=000401

                                ;CODES:         [125] SPS=3  /  N:C=0000

                                ;SYNC:          B05J2 (-)        /        T= 4.7 USEC

                                ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=3L  /  K3-5 DOPL  /  K3-6 BYTE INSTR H

011526  012700  000122          T0122:  MOV     #0122,R0                ;LOAD R0 WITH TEST NO.
011532  112760  000377  070140          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
011540  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
011544  012704  000400                  MOV     #400,R4         ;RESULT S / B = 400
011550  012705  070114                  MOV     #DWTB,R5        ;BASE SRC ADDR = DWTB
011554  005012                  R0122:  CLR     (R2)            ;[DEST] = 000000
011556  000257                          CCC                     ;SCOPE SYNC

011560  116537  000006  067561  I0122:  MOVB    6(R5),@#MBUF0+1 ;TEST THE MOVB

011566  020412                          CMP     R4,(R2)         ;RESULT OK?
011570  001403                          BEQ     T0123           ;BR IF YES

011572  011203                          MOV     (R2),R3         ;GET WAS DATA
011574  000000                  E0122:  HALT                    ;MOVB DELIVERED WRONG RESULT
011576  000766                          BR      R0122           ;LOCK ON HARD ERRROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0123 BASIC 'MOVB X(R),@#A'' TEST - SRC ODD / DEST ODD
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [146,241,242,247,250,137,251,173,207,210,202,205,125,375,016] FC 1,2,4

                                        ;ACT BUTS:      37[004]100,146 / 35[247]120,137 / 36[137]120,173 / 22[207]200,202
                                                        ; / 16[125]016,016

                                        ;EXEC:          [205]ALUC=LLLLL :[125]D=001001

                                        ;CODES:         [125] SPS=3  /  N:C=0000

                                        ;SYNC:          B05J2 (-)       /       T= 4.7 USEC

                                        ;KEY SIG:       K3-3 MOVL  /  K3-3 DM=3L  /  K3-5 DOPL  /  K3-6 BYTE INSTR H

011600  012700  000123                  T0123:  MOV     #0123,R0                ;LOAD R0 WITH TEST NO.
011604  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
011612  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
011616  012704  000400                          MOV     #400,R4         ;RESULT S / B = 400
011622  012705  070134                          MOV     #DBTB,R5        ;BASE SRC ADDR = DBTB
011626  005012                          R0123:  CLR     (R2)            ;[DEST] = 000000
011630  000257                                  CCC                     ;SCOPE SYNC

011632  116537  000001  067561          I0123:  MOVB    1(R5),@#MBUF0+1 ;TEST THE MOVB

011640  020412                                  CMP     R4,(R2)         ;RESULT OK?
011642  001403                                  BEQ     T0124           ;BR IF YES

011644  011203                                  MOV     (R2),R3         ;GET WAS DATA
011646  000000                          E0123:  HALT                    ;MOVB DELIVERED WRONG RESULT
011650  000766                                  BR      R0123           ;LOCK ON HARD ERRROR
```

```
                                ; ***********************************************************************
                                        .SBTTL T0124 BASIC 'RTS  PC" TEST
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [124,323,324,325,016] FC 1,6

                                ;ACT BUTS:      37[004]100,124 / 16[324]016,016

                                ;EXEC:          N / A

                                ;CODES:         N / A

                                ;SYNC:          B05J2 (-)       /       T= 2.5 USEC

                                ;KEY SIG:       K3-6 RTSL

011652  012700  000124          T0124:  MOV     #0124,R0                ;LOAD R0 WITH TEST NO.
011656  112760  000377  070140          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
011664  010605                          MOV     SP,R5           ;SAVE THE ORIGINAL SP
011666  010506                  R0124:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
011670  012746  011704                  MOV     #A0124,-(SP)    ;PUSH NEW PC ON STACK
011674  000257                          CCC                     ;SCOPE SYNC

011676  000207                  I0124:  RTS     PC              ;TEST THE RTS - GO TO A0124

011700  000000                  E10124: HALT                    ;RTS FAILED TO LOAD PC
011702  000771                          BR      R0124           ;LOCK ON HARD ERROR

011704  020605                  A0124:  CMP     SP,R5           ;DID SP GET POPPED ?
011706  001402                          BEQ     T0125           ;BR IF YES

011710  000000                  E20124: HALT                    ;RTS FAILED TO UPDATE SP
011712  000765                          BR      R0124           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0125 BASIC "JSR  PC,@#A" TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [153,303,307,310,311,312,306,313,016] FC 1,5

                                        ;ACT BUTS:      37[004]100,153 / 15[153]306,307 / 16[306]016,016

                                        ;EXEC:          N / A

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2 (-)       /       T= 3.5 USEC

                                        ;KEY SIG:       K3-5 JMP+JSRH  /  K3-3 DM=3L

011714  012700  000125                  T0125:  MOV     #0125,R0                ;LOAD R0 WITH TEST NO.
011720  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
011726  010605                                  MOV     SP,R5           ;SAVE ORIGINAL SP
011730  010506                          R0125:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
011732  000257                                  CCC                     ;SCOPE SYNC

011734  004737  011744                  I0125:  JSR     PC,@#A0125      ;TEST THE JSR - GO TO A0125

011740  000000                          E10125: HALT                    ;JSR FAILED TO LOAD PC
011742  000772                                  BR      R0125           ;LOCK ON HARD ERROR

011744  022726  011740                  A0125:  CMP     #E10125,(SP)+   ;DID JSR SAVE OLD PC ON STACK ?
011750  001402                                  BEQ     T0126           ;BR IF YES


011752  000000                          E20125: HALT                    ;JSR FAILED TO SAVE OLD PC
011754  000765                                  BR      R0125           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0126 BASIC "RTI" TEST - N:C=0000
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [101,320,321,322,017,015,013] FC 6,10

                                        ;ACT BUTS:      37[004]100,101 / 26[017]010,013

                                        ;EXEC:          N / A

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2 (-)       /       T= 3 USEC

                                        ;KEY SIG:       K3-6 RTI+RTTL

011756  012700  000126                  T0126:  MOV     #0126,R0                ;LOAD R0 WITH TEST NO.
011762  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
011770  010605                                  MOV     SP,R5           ;SAVE THE SP
011772  010506                          R0126:  MOV     R5,SP           ;RESET THE SP FOR ERROR LOOP
011774  012746  000357                          MOV     #357,-(SP)      ;NEW PSW = 357
012000  012746  012020                          MOV     #A0126,-(SP)    ;NEW PC = A0126
012004  005037  177776                          CLR     @#PSW           ;MAKE [PSW] = 000
012010  000257                                  CCC                     ;MAKE N:C=0000

012012  000002                          I0126:  RTI                     ;TEST THE RTI - GO TO A0126

012014  000000                          E10126: HALT                    ;RTI FAILED TO LOAD PC
012016  000765                                  BR      R0126           ;LOOP ON HARD ERROR

012020  013702  177776                  A0126:  MOV     @#PSW,R2        ;SAVE THE [PSW] IN R2
012024  022702  000357                          CMP     #357,R2         ;WAS [PSW] = 357 ?
012030  001404                                  BEQ     B0126           ;BR IF YES

012032  010237  177776                          MOV     R2,@#PSW        ;RESTORE THE ERROR PSW
012036  000000                          E20126: HALT                    ;RTI FAILED TO LOAD PSW
012040  000754                                  BR      R0126           ;LOCK ON HARD ERROR

012042  020605                          B0126:  CMP     SP,R5           ;DID SP GET UPDATED OK ?
012044  001402                                  BEQ     T0127           ;BR IF YES

012046  000000                          E30126: HALT                    ;RTI FAILED TO UPDATE THE SP
012050  000750                                  BR      R0126           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0127 BASIC "RTI" TEST WITH N:C=1111
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [101,320,321,322,017,015,013] FC 6,10

                                        ;ACT BUTS:      37[004]100,101 / 26[017]010,013

                                        ;EXEC:          N / A

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2 (-)       /       T= 3 USEC

                                        ;KEY SIG:       K3-6 RTI+RTTL

012052  012700  000127                  T0127:  MOV     #0127,R0                ;LOAD R0 WITH TEST NO.
012056  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
012064  010605                                  MOV     SP,R5           ;SAVE THE SP IN R5
012066  010506                          R0127:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
012070  005046                                  CLR     -(SP)           ;NEW PSW = 000000
012072  012746  012110                          MOV     #A0127,-(SP)    ;NEW PC = A0127
012076  012737  000357  177776                  MOV     #357,@#PSW      ;MAKE OLD PSW = 357
012104  000240                                  NOP                     ;SCOPE SYNC

012106  000002                          I0127:  RTI                     ;TEST THE RTI - GO TO A0127

012110  013702  177776                  A0127:  MOV     @#PSW,R2        ;GET THE PSW
012114  022702  000000                          CMP     #0,R2           ;WAS [PSW]=000
012120  001404                                  BEQ     T0130           ;BR IF YES

012122  010237  177776                          MOV     R2,@#PSW        ;RESTORE ERROR PSW
012126  000000                          E0127:  HALT                    ;RTI FAILED TO CLEAR PSW
012130  000756                                  BR      R0127           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0130 BASIC "IOT" TEST -VERIFY LOADING PSW WITH 357
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [126,007,115,326,327,113,330,331,77,140,332,333,123,015,013] FC 1,6,10

                                        ;ACT BUTS:      37[004]100,126 / 04[140]REG EXAM / 01[332]122,123 / 03[333]REG DEP
                                                        ; / 26[123]010,013

                                        ;EXEC:          N / A

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2 (-)       /       T= 6 USEC

                                        ;KEY SIG:       K3-6 TRAP INSTR L

012132  012700  000130                  T0130:  MOV     #0130,R0                ;LOAD R0 WITH TEST NO.
012136  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
012144  010605                                  MOV     SP,R5           ;SAVE THE SP
012146  010506                          R0130:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
012150  012737  012206  000020                  MOV     #A0130,@#20     ;SET UP IOT VECTOR
012156  012737  000357  000022                  MOV     #357,@#22
012164  012766  177777  177776                  MOV     #-1,-2(SP)      ;IOT SHOULD CHANGE -1 TO 0
012172  005037  177776                          CLR     @#PSW           ;MAKE [PSW] = 000
012176  000257                                  CCC                     ;SCOPE SYNC

012200  000004                          I0130:  IOT                     ;TEST THE IOT

012202  000000                          E10130: HALT                    ;IOT FAILED TO LOAD PC
012204  000760                                  BR      R0130           ;LOCK ON HARD ERROR

012206  013702  177776                  A0130:  MOV     @#PSW,R2        ;GET THE PSW
012212  022702  000357                          CMP     #357,R2         ;DID IOT LOAD A 357 ?
012216  001404                                  BEQ     B0130           ;BR IF YES

012220  010237  177776                          MOV     R2,@#PSW        ;RESTORE ERROR PSW
012224  000000                          E20130: HALT                    ;IOT FAILED TO LOAD PSW
012226  000747                                  BR      R0130           ;LOCK ON HARD ERROR

012230  022726  012202                  B0130:  CMP     #E10130,(SP)+   ;DID IOT SAVE OLD PC ?
012234  001404                                  BEQ     C0130           ;BR IF YES

012236  010237  177776                          MOV     R2,@#PSW        ;RESTORE ERROR PSW
012242  000000                          E30130: HALT                    ;IOT FAILED TO SAVE OLD PC
012244  000740                                  BR      R0130           ;LOCK ON HARD ERROR

012246  005726                          C0130:  TST     (SP)+           ;DID IOT SAVE OLD PSW ?
012250  001404                                  BEQ     T0131           ;BR IF YES

012252  010237  177776                          MOV     R2,@#PSW        ;RESTORE ERROR PSW
012256  000000                          E40130: HALT                    ;IOT FAILED TO SAVE OLD PSW
012260  000732                                  BR      R0130           ;LOCK ON HARD ERROR
```

7526

```
                                ; ***********************************************************************
                                        .SBTTL T0131 BASIC "IOT" TEST - VERIFY LINKAGE TO SCOPE SERVICE
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [126,007,115,326,327,113,330,331,77,140,332,333,123,015,013] FC 1,6,10

                                ;ACT BUTS:      37[004]100,126 / 04[140]REG EXAM / 01[332]122,123 / 03[333]REG DEP
                                                ; / 26[123]010,013

                                ;EXEC:          N / A

                                ;CODES:         N / A

                                ;SYNC           B05J2 (-)       /       T= 6 USEC

                                ;KEY SIG:       K3-6 TRAP INSTR L

012262  012700  000131          T0131:  MOV     #0131,R0                ;LOAD R0 WITH TEST NO.
012266  112760  000377  070140          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
012274  010605                          MOV     SP,R5           ;SAVE SP
012276  010506                  R0131:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
012300  005037  066702                  CLR     @#SCOFLG        ;TRAP SERVICE WILL COM "SCOFLG"
012304  012737  065260  000020          MOV     #SCOPEA,@#20    ;SET UP IOT VECTOR
012312  005037  000022                  CLR     @#22
012316  000257                          CCC                     ;SCOPE SYNC

012320  000004                  I0131:  SCOPE                   ;TEST THE IOT

012322  005137  066702                  COM     @#SCOFLG        ;SCOFLG SHOULD BECOME 000000
012326  001402                          BEQ     A0131           ;BR IF IT DID

012330  000000                  E0131:  HALT                    ;IOT FAILED TO LINK TO SCOPE SERVICE
012332  000761                          BR      R0131           ;LOCK ON HARD ERROR

012334  010506                  A0131:  MOV     R5,SP           ;RESET SP IN CASE OF ERROR
```

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                                ; ***********************************************************************
                                        .SBTTL T0132 BASIC "IOT" TEST -VERIFY LOADING PSW WITH 357
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [126,007,115,326,327,113,330,331,77,140,332,333,123,015,013] FC 1,6,10

                                ;ACT BUTS:      37[004]100,126 / 04[140]REG EXAM / 01[332]122,123 / 03[333]REG DEP
                                                ; / 26[123]010,013

                                ;EXEC:          N / A

                                ;CODES:         N / A

                                ;SYNC:          B05J2 (-)       /       T= 6 USEC

                                ;KEY SIG:       K3-6 TRAP INSTR L

012336  012700  000132          T0132:  MOV     #0132,R0                ;LOAD R0 WITH TEST NO.
012342  112760  000377  070140          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
012350  010605                          MOV     SP,R5           ;SAVE THE SP
012352  010506                  R0132:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
012354  012737  012412  000020          MOV     #A0132,@#20     ;SET UP IOT VECTOR
012362  012737  000357  000022          MOV     #357,@#22
012370  012766  177777  177776          MOV     #-1,-2(SP)      ;IOT SHOULD CHANGE -1 TO 0
012376  005037  177776                  CLR     @#PSW           ;MAKE [PSW] = 000
012402  000257                          CCC                     ;SCOPE SYNC

012404  000004                  I0132:  IOT                     ;TEST THE IOT

012406  000000                  E10132: HALT                    ;IOT FAILED TO LOAD PC
012410  000760                          BR      R0132           ;LOCK ON HARD ERROR

012412  013702  177776          A0132:  MOV     @#PSW,R2        ;GET THE PSW
012416  022702  000357                  CMP     #357,R2         ;DID IOT LOAD A 357 ?
012422  001404                          BEQ     B0132           ;BR IF YES

012424  010237  177776                  MOV     R2,@#PSW        ;RESTORE ERROR PSW
012430  000000                  E20132: HALT                    ;IOT FAILED TO LOAD PSW
012432  000747                          BR      R0132           ;LOCK ON HARD ERROR

012434  022726  012406          B0132:  CMP     #E10132,(SP)+   ;DID IOT SAVE OLD PC ?
012440  001404                          BEQ     C0132           ;BR IF YES

012442  010237  177776                  MOV     R2,@#PSW        ;RESTORE ERROR PSW
012446  000000                  E30132: HALT                    ;IOT FAILED TO SAVE OLD PC
012450  000740                          BR      R0132           ;LOCK ON HARD ERROR

012452  005726                  C0132:  TST     (SP)+           ;DID IOT SAVE OLD PSW ?
012454  001404                          BEQ     T0133           ;BR IF YES

012456  010237  177776                  MOV     R2,@#PSW        ;RESTORE ERROR PSW
012462  000000                  E40132: HALT                    ;IOT FAILED TO SAVE OLD PSW
012464  000732                          BR      R0132           ;LOCK ON HARD ERROR
```

7620

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                                        ; ***********************************************************************
                                                .SBTTL T0133 BASIC IOT TEST - VERIFY LOADING PSW WITH 000
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [126,007,115,326,327,113,330,331,77,140,323,333,123,015,013] FC 1,6,10

                                        ;ACT BUTS:      37[004]100,126 / 04[140]REG EXAM / 01[332]122,123 / 03[333]REG DEP
                                                        ; / 26[123]010,013

                                        ;EXEC:          N / A

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2 (-)       /       T= 6 USEC

                                        ;KEY SIG:       K3-6 TRAP INSTR L

012466  012700  000133          T0133:  MOV     #0133,R0                ;LOAD R0 WITH TEST NO.
012472  112700  000377  070140          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
012500  010605                          MOV     SP,R5           ;SAVE THE SP
012502  010506                  R0133:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
012504  012737  012530  000020          MOV     #A0133,@#20     ;SET UP IOT VECTOR
012512  005037  000022                  CLR     @#22            ;
012516  012737  000340  177776          MOV     #340,@#PSW      ;MAKE [PSW] = 340
012524  000277                          SCC                     ;MAKE N:C=1111

012526  000004                  I0133:  IOT                     ;TEST THE IOT

012530  013702  177776          A0133:  MOV     @#PSW,R2        ;GET THE [PSW]
012534  001404                          BEQ     B0133           ;BR IF [PSW] = 000

012536  010237  177776                  MOV     R2,@#PSW        ;RESTORE THE ERROR PSW
012542  000000                  E0133:  HALT                    ;IOT FAILED TO CLEAR THE PSW
012544  000756                          BR      R0133           ;LOCK ON HARD ERROR

012546  010506                  B0133:  MOV     R5,SP           ;RESET THE SP BEFORE CONTINUING
```

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                                        ; ***********************************************************************
                                                .SBTTL T0134 BASIC "TRAP" TEST - LINKAGE TO PRINT ROUTINE
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [126,007,115,326,327,113,330,331,77,140,332,333,123,015,013] FC 1,6,10

                                        ;ACT BUTS:      37[004]100,126 / 04[140]REG EXAM / 01[332]122,123 / 03[333]REG DEP
                                                        ; / 26[123]010,013

                                        ;EXEC:          N / A

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2 (-)       /       T= 6 USEC

                                        ;KEY SIG:       K3-6 TRAP INSTR L

012550  012700  000134                  T0134:  MOV     #0134,R0                ;LOAD R0 WITH TEST NO.
012554  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
012562  032737  000004  066642                  BIT     #4,@#BPTLOC     ;BREAKPOINT HALT SET ??
012570  001401                                  BEQ     .+4             ;BR IF NOT
012572  000000                                  HALT                    ;BREAK - DEPRESS CONTINUE TO RESTART
012574  010605                                  MOV     SP,R5           ;SAVE THE SP
012576  010506                          R0134:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
012600  012737  066042  000034                  MOV     #PRINA,@#34     ;SET UP THE "TRAP" VECTOR
012606  005037  000036                          CLR     @#36
012612  005037  066674                          CLR     @#PRIFLG        ;INITIALIZE TEST FLAG
012616  000257                                  CCC                     ;SCOPE SYNC

012620  104400                          I0134:  TYPE                    ;TEST THE TRAP

012622  005137  066674                          COM     @#PRIFLG        ;SHOULD MAKE [PRIFLG] = 000000
012626  001402                                  BEQ     T0135           ;BR IF IT DID

012630  000000                          E0134:  HALT                    ;TRAP FAILED TO LINK TO PRINT SERV.
012632  000761                                  BR      R0134           ;LOCK ON HARD ERROR
```

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                                        ; ***********************************************************************
                                                .SBTTL T0135 BASIC "EMT" TEST - LINKAGE TO ERROR SERVICE
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [126,007,115,326,327,113,330,331,077,140,332,333,123,015,013] FC 1,6,10

                                        ;ACT BUTS:      37[004]100,126 / 04[140]REG EXAM / 01[332]122,123 / 03[333]REG DEP
                                                        ; / 26[123]010,013

                                        ;EXEC:          N / A

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2 (-)       /       T= 6 USEC

                                        ;KEY SIG:       K3-6 TRAP INSTR L

012634  012700  000135          T0135:  MOV     #0135,R0                ;LOAD R0 WITH TEST NO.
012640  112760  000377  070140          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
012646  010605                          MOV     SP,R5           ;SAVE THE SP
012650  010506                  R0135:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
012652  012737  065400  000030          MOV     #ERRA,@#30      ;SET UP THE EMT VECTOR
012660  005037  000032                  CLR     @#32
012664  005037  066676                  CLR     @#ERRFLG        ;EMT SERVICE WILL COM [ERRFLG]
012670  000257                          CCC                     ;SCOPE SYNC

012672  104000                  I0135:  ERROR                   ;TEST THE EMT

012674  005137  066676                  COM     @#ERRFLG        ;DID EMT SERV. COM ERRFLG?
012700  001402                          BEQ     T0136           ;BR IF YES

012702  000000                  E0135:  HALT                    ;EMT DID NOT LINK PROPERLY
012704  000761                          BR      R0135           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0136 BASIC TEST OF RSVD INSTR. TRAP LINKAGE
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [100,126,007,115,327,113,330,331,077,140,332,333,123,015,013] FC 1,6,10

                                        ;ACT BUTS:      37[004]100,100 / 04[140]REG EXAM / 01[332]122,123 / 03[333]REG DEP
                                                        ; / 26[123]010,013

                                        ;EXEC:          N / A

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2 (-)       /       T= 6 USEC

                                        ;KEY SIG:       K3-6 RSVD INSTR L

012706  012700  000136          T0136:  MOV     #0136,R0                ;LOAD R0 WITH TEST NO.
012712  112760  000377  070140          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
012720  013701  012752                  MOV     @#I0136,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
012724  010605                          MOV     SP,R5           ;SAVE THE SP
012726  012737  065042  000010          MOV     #RSVTST,@#10    ;SET UP RSVD INSTR. TRAP VECTOR
012734  012737  000340  000012          MOV     #340,@#12
012742  010506                  R0136:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
012744  005037  066712                  CLR     @#RSVFLG        ;INITIALIZE TEST FLAG THAT WILL GET
                                                                ;COMPLEMENTED BY TRAP SERVICE
012750  000257                          CCC                     ;SCOPE SYNC

012752  177777                  I0136:  177777                  ;FORCE RSVD INSTR. TRAP

012754  005137  066712                  COM     @#RSVFLG                ;TEST FLAG SHOULD GO TO 000000
012760  001402                          BEQ     A0136           ;BR IF TRAP SPRUNG

012762  000000                  E0136:  HALT                    ;RSVD INSTR. TRAP FAILED
012764  000750                          BR      T0136           ;LOCK ON HARD ERROR

012766  012737  065050  000010  A0136:  MOV     #RSERR,@#10     ;SET UP RSVD INSTR TRAP VECTOR TO POINT
012774  012737  000340  000012          MOV     #340,@#12       ;TO ERROR SERVICE ROUTINE
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0137 BASIC TEST OF BUS TIMEOUT TRAP LINKAGE
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [150,007,115,326,327,113,330,331,077,140,332,333,123,015,013] FC 1,6,10

                                        ;ACT BUTS:      37[004]100,126 / 04[140]REG EXAM / 01[332]122,123 / 03[333]REG DEP
                                                        ; / 26[123]010,013

                                        ;EXEC:          N / A

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2 (-)       /       T= 6 USEC

                                        ;KEY SIG:       K4-6 NOSACK(1)L

013002  012700  000137          T0137:  MOV     #0137,R0                ;LOAD R0 WITH TEST NO.
013006  112760  000377  070140          MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
013014  013701  013046                  MOV     @#I0137,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
013020  010605                          MOV     SP,R5           ;SAVE THE SP
013022  012737  065152  000004          MOV     #BETST,@#4      ;SET UP THE BUS ERROR VECTOR
013030  012737  000340  000006          MOV     #340,@#6
013036  010506                  R0137:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
013040  005037  066714                  CLR     @#BERFLG        ;INITIALIZE TEST FLAG THAT WILL GET
                                                                ;COMPLEMENTED BY TRAP SERVICE
013044  000257                          CCC                     ;SCOPE SYNC

013046  005737  177700          I0137:  TST     @#177700        ;FORCE BUS TIMEOUT USING R0 ADDR.

013052  005137  066714                  COM     @#BERFLG        ;TEST FLAG SHOULD GO TO 000000
013056  001402                          BEQ     T0140           ;BR IF TRAP SPRUNG

013060  000000                  E0137:  HALT                    ;BUS ERROR FAILED TO SPRING TRAP
013062  000747                          BR      T0137           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0140 BASIC TEST FOR ACCESSING DL11 REGISTERS
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [162,260,267,220,211,367,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,162 / 33[260]220,220 / 16[367]016,016

                                        ;EXEC:          [220]ALUC=LLLLL :[211]D=N / A

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2 (-)

                                        ;KEY SIG:       K3-8 BIT+CMP+TSTH  /  K3-3 DM=2L

013064  012700  000140                  T0140:  MOV     #0140,R0                ;LOAD R0 WITH TEST NO.
013070  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
013076  005067  054456                          CLR     MBUF0           ;INIT STALL COUNTER
013102  005367  054452                  1$:     DEC     MBUF0           ;COUNT THE TIMER
013106  001375                                  BNE     1$              ;BR IF NO TIMEOUT
013110  012737  013150  000004                  MOV     #E0140,@#4      ;SET UP BUS TIMEOUT VECTOR
013116  012737  000340  000006                  MOV     #340,@#6
013124  010605                                  MOV     SP,R5           ;SAVE TH SP
013126  010506                          R0140:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
013130  012702  177560                          MOV     #RCSR,R2        ;[R2] = STARTING DL11 ADDR.
013134  000257                                  CCC                     ;SCOPE SYNC

013136  005722                          I0140:  TST     (R2)+           ;REFERENCE DL11 - RCSR
013140  005722                                  TST     (R2)+           ;REFERENCE DL11 - RDBR
013142  005722                                  TST     (R2)+           ;REFERENCE DL11 - XCSR
013144  005712                                  TST     (R2)            ;REFERENCE DL11 - XDBR

013146  000403                                  BR      A0140           ;GO TO NEXT TEST

013150  005742                          E0140:  TST     -(R2)           ;BAD ADDRESS IN R2
013152  000000                                  HALT                    ;ONE OF DL11 ADDR'S CAUSED TIME OUT
013154  000764                                  BR      R0140           ;LOCK ON HARD ERROR

013156  012737  065160  000004          A0140:  MOV     #BERR,@#4       ;SET UP BUS ERROR VECTOR TO POINT
013164  012737  000340  000006                  MOV     #340,@#6        ;TO ERROR SERVICE ROUTINE
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0141 BASIC TEST OF DL11 - XCSR - READY(1)
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016

                                        ;EXEC:          [224]ALUC=LLHHL :[367]D=000000

                                        ;CODES:         [367] SPS=3  /  N:C=0100

                                        ;SYNC:          B05J2 (-)

                                        ;KEY SIG:       K3-3 SM=0L  /  K3-3 DM=1L  /  K5-2 PS(Z)(1)H  /  K3-8 BIT+CMP+TSTH

013172  012700  000141                  T0141:  MOV     #0141,R0                ;LOAD R0 WITH TEST NO.
013176  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
013204  012702  177564                          MOV     #XCSR,R2        ;DEST ADDR = XCSR
013210  012704  000200                          MOV     #200,R4         ;RESULT S / B = 200
013214  005012                          R0141:  CLR     (R2)            ;CLEAR [DEST]
013216  012701  000000                          MOV     #0,R1           ;SET UP TIMEOUT COUNTER
013222  000257                                  CCC                     ;SCOPE SYNC

013224  020412                          I0141:  CMP     R4,(R2)         ;TEST READY BIT - IT SHOULD BE SET

013226  001405                                  BEQ     T0142           ;BR IF IT WAS
013230  005301                                  DEC     R1              ;TICK-TOCK GOES THE TIMER
013232  001374                                  BNE     I0141           ;BR IF NOT A TIMEOUT

013234  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
013236  000000                          E0141:  HALT                    ;READY BIT IN XCSR FAILED ON A (0)
013240  000765                                  BR      R0141           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0142 BASIC TEST OF DL11 - XCSR - MAINT BIT (0)
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016

                                        ;EXEC:          [224]ALUC=LLHHL :[367]D=000000

                                        ;CODES:         [367] SPS=3  /  N:C=0100

                                        ;SYNC:          B05J2 (-)

                                        ;KEY SIG:       K3-3 SM=0L  /  K3-3 DM=1L  /  K5-2 PS(2)(1)H  /  K3-8 BIT+CMP+TSTH

013242  012700  000142                  T0142:  MOV     #0142,R0                ;LOAD R0 WITH TEST NO.
013246  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
013254  012702  177564                          MOV     #XCSR,R2        ;DEST ADDR = XCSR
013260  012704  000200                          MOV     #200,R4         ;RESULT S / B = 200
013264  005012                          R0142:  CLR     (R2)            ;CLEAR MAINT. BIT
013266  000257                                  CCC                     ;SCOPE SYNC

013270  020412                          I0142:  CMP     R4,(R2)         ;TEST MAINT(0)

013272  001403                                  BEQ     T0143           ;BR IF MAINT BIT CLEAR

013274  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
013276  000000                          E0142:  HALT                    ;CAN'T CLEAR MAINT BIT
013300  000771                                  BR      R0142           ;LOCK ON HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0143 BASIC TEST OF DL11 XCSR - MAINT BIT = 1
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016

                                        ;EXEC:          [224]SLUC=LLHHL :[367]D=000000

                                        ;CODES:         [367] SPS=3  /  N:C=0100

                                        ;SYNC:          B05J2 (-)

                                        ;KEY SIG:       K3-3 SM=0L  /  K3-3 DM=1L  /  K5-2 PS(Z)(1)H  /  K3-8 BIT+CMP+TSTH

013302  012700  000143                  T0143:  MOV     #0143,R0                ;LOAD R0 WITH TEST NO.
013306  112760  000377  070140                  MOVB    #377,STAB1(R0)  ;SET FLAG FOR THIS TEST IN MISSED TABLE
013314  012702  177564                          MOV     #XCSR,R2        ;DEST ADDR = XCSR
013320  012704  000204                          MOV     #204,R4         ;RESULT S / B = 204
013324  012712  000004                  R0143:  MOV     #4,(R2)         ;SET THE MAINT. BIT
013330  000257                                  CCC                     ;SCOPE SYNC

013332  020412                          I0143:  CMP     R4,(R2)         ;TEST MAINT.(1)

013334  001403                                  BEQ     T0144           ;BR IF IT WAS

013336  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
013340  000000                          E0143:  HALT                    ;CAN'T SET MAINT BIT IN XCSR
013342  000770                                  BR      R0143           ;LOCK O HARD ERROR
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0144 BASIC DL11 OUT / IN ECHO TEST (MAINT MODE)
                                        ; ***********************************************************************


                                        ;THIS ROUTINE USES THE MAINTENANCE MODE FEATURE OF THE DL11 TO
                                        ;TURN AROUND A STRING OF 8 CHARACTERS TO THE DL11. THIS STRING CONSISTS
                                        ;OF ALTERNATING NULL / DELETE CHARS WHICH ARE NON PRINTING. THE 8 CHARS
                                        ;ARE OUTPUT THEN READ BACK INTO A CORE BUFFER AND THEN THE INPUT AND
                                        ;OUTPUT CORE BUFFERS ARE CHECKED FOR EQUIVALENCE. IF AN ERROR IS DET-
                                        ;ECTED DURING THE COMPARISON THE ROUTINE HALTS WITH THE WAS AND S / B
                                        ;DATA IN R3 AND R4 RESPECTFULLY. A TIMER IS EMPLOYED TO PREVENT THE
                                        ;TEST FROM HANGING IF RECEIVER DONE DOES NOT RESPOND.

013344  012700  000144                  T0144:  MOV     #0144,R0                ;LOAD R0 WITH TEST NO.
013350  112760  000377  070140                  MOVB    #377,STAB1(R0)          ;SET FLAG FOR THIS TEST IN MISSED TABLE
013356  012702  177560                          MOV     #RCSR,R2                ;R2 POINTS TO DL11 - START ADDR
013362  105762  000002                          TSTB    2(R2)                   ;REFERENCE DL11 INPUT DATA BUFFER TWICE
013366  105762  000002                          TSTB    2(R2)                   ;TO FLUSH RCVR "DONE" BIT
013372  012703  067534                          MOV     #IBUF,R3                ;R3 POINTS TO CORE INPUT BUFFER
013376  012704  067524                          MOV     #OBUF,R4                ;R4 POINTS TO CORE OUTPUT BUFFER
013402  012705  000010                          MOV     #10,R5                  ;R5 WILL COUNT 8 CHARS OUTPUT
013406  012762  000004  000004                  MOV     #4,4(R2)                ;TURN ON MAINT MODE

013414  012701  000000                  1$:     MOV     #0,R1                   ;R1 USED AS TIMEOUT COUNTER
013420  112462  000006                          MOVB    (R4)+,6(R2)             ;LOAD OUTPUT BUFFER IN DL11
013424  105712                          2$:     TSTB    (R2)                    ;RECEIVER DONE SET ?
013426  100404                                  BMI     3$                      ;BR IF YES
013430  005301                                  DEC     R1                      ;COUNT THE TIMER
013432  001374                                  BNE     2$                      ;BR IF NO TIMEOUT

013434  000000                                  HALT                            ;DL11 FAILED TO RESPOND IN TIME
013436  000742                                  BR      T0144                   ;LOCK ON HARD ERROR

013440  116223  000002                  3$:     MOVB    2(R2),(R3)+             ;READ THE DL11 INPUT BUFFER INTO CORE
013444  005305                                  DEC     R5                      ;COUNT ONE CHAR
013446  001362                                  BNE     1$                      ;BR IF NOT DONE 8 CHARS

013450  005062  000004                          CLR     4(R2)                   ;TURN OFF MAINT. MODE
013454  012705  000010                          MOV     #10,R5                  ;RESET CHAR COUNTER
013460  012703  067534                          MOV     #IBUF,R3                ;RESET INBUF POINTER
013464  012704  067524                          MOV     #OBUF,R4                ;RESET OUTBUF POINTER

013470  122324                          4$:     CMPB    (R3)+,(R4)+             ;INPUT = OUTPUT ??
013472  001003                                  BNE     5$                      ;BR IF NOT
013474  005305                                  DEC     R5                      ;COUNT ONE CHECKED
013476  001374                                  BNE     4$                      ;BR UNTIL 8 DONE
013500  000410                                  BR      CITST                   ;GO TO NEXT TEST

013502  114303                          5$:     MOVB    -(R3),R3                ;WAS DATA IN R3 [BITS 7:0]
013504  114404                                  MOVB    -(R4),R4                ;S / B DATA IN R4 [BITS 7:0]
013506  042703  177400                          BIC     #177400,R3              ;STRIP OFF BITS <15:08>
013512  042704  177400                          BIC     #177400,R4              ;  "            "
013516  000000                                  HALT                            ;RECEIVED DATA NOT EQUAL TO OUTPUT DATA
013520  000711                                  BR      T0144                   ;LOCK ON HARD ERROR
```

8015
8016

```
                                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                                        ;/////////////COMPREHENSIVE INSTRUCTION TESTS//////////////////////
                                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

013522  012737  065266  000020  CITST:  MOV     #SCOPEB,@#20    ;SET UP IOT VECTOR
013530  005037  000022                  CLR     @#22
013534  012737  065406  000030          MOV     #ERRB,@#30      ;SET UP EMT VECTOR
013542  012737  000340  000032          MOV     #340,@#32
013550  012737  066050  000034          MOV     #PRINT,@#34     ;SET UP TRAP VECTOR
013556  012737  000340  000036          MOV     #340,@#36
013564  012737  064706  000024          MOV     #PDWN,@#24      ;SET UP POWER FAIL VECTOR
013572  012737  000340  000026          MOV     #340,@#26
013600  032737  010000  177570          BIT     #SW12,@#SR      ;INHIBIT PRINTING INTRO. I.D. MESSAGE
013606  001007                          BNE     1$              ;BR IF YES
013610  005737  066722                  TST     @#ONCE          ;FIRST TIME INTO "CIT" TESTS ?
013614  001004                          BNE     1$              ;BR IF NOT - PRINT ID ONLY ONCE
013616  005137  066722                  COM     @#ONCE          ;SET FLAG TO INHIBIT PRINTING AGAIN
013622  104400                          TYPE                    ;IDENTIFY THIS PROGRAM
013624  067212                          IDENT1                  ;ADDR OF THE ID MESSAGE
013626  004737  066210          1$:     JSR     PC,@#TSTOP4     ;GO TEST FOR 11/40 OPTIONS
013632  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY TO LEVEL 000
013636  012737  013636  066654  2$:     MOV     #2$,@#RETURN    ;INITIALIZE SCOPE LOOP RETURN
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0145 QUICK VERIFY TEST FOR BMI,BEQ,BVS,BCS-FLG=0
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING   /   LOGIC INFORMATION

                                        ;ROM SEQ:       [110,347,016] FC 1,7

                                        ;ACT BUTS:      37[004]100,110   /   16[110]016,016

                                        ;EXEC:          N  /  A

                                        ;CODES:         N  /  A

                                        ;SYNC:          B05J2  (-)  T = 1.5 USEC

                                        ;KEY SIG:       K5-3 BR INSTR L   /   K3-5 BUBC3(BUT37) H

013644  012700  000145                  T0145:  MOV     #0145,R0                ;LOAD R0 WITH TEST NO.
013650  013701  013656                          MOV     @#I0145,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
013654  000257                          R0145:  CCC                     ;CLEAR ALL FLAGS

013656  001404                          I0145:  BEQ     E0145           ;NO BR SHOULD OCCUR-FLAG=0
013660  100403                                  BMI     E0145           ;NO BR SHOULD OCCUR-FLAG=0
013662  102402                                  BVS     E0145           ;NO BR SHOULD OCCUR-FLAG=0
013664  103401                                  BCS     E0145           ;NO BR SHOULD OCCUR-FLAG=0
013666  000402                                  BR      00145           ;GO CALL SCOPE

013670  104005                          E0145:  ERROR5                  ;ONE OF ABOVE BR'S FAILED
013672  013654                                  R0145                   ;ERROR LOOP RETURN

013674  000004                          00145:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0146 QUICK VERIFY TEST FOR BMI,BEQ,BVS,BCS-FLAG=1
                                ; ***********************************************************************

                                ;MICROPROGRAMMING   /   LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,341,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111  /  16[340]016,016

                                ;EXEC:          [341]ALUC=LHLLH :[016]D=#I20146 OR #I30146 OR #I40146 OR #O0146 DEPENDEN

                                ;CODES:         N  /  A

                                ;SYNC:          B05J2 (-) T = 2 USEC

                                ;KEY SIG:       K5-3 BR INSTR L   /   K5-3 TRUE BR L   /   K3-5 BUBC3(BUT37) H   /   K3-

013676  012700  000146          T0146:  MOV     #0146,R0                ;LOAD R0 WITH TEST NO.
013702  013701  013710                  MOV     @#I10146,R1     ;LOAD R1 WITH TEST INSTRUCTION WORD

013706  000277                  R0146:  SCC                     ;MAKE N:C = 1111

013710  001402                  I10146: BEQ     I20146          ;TEST THE BEQ-IT SHOULD BR

013712  104005                  E10146: ERROR5                  ;BEQ FAILED
013714  013706                          R0146                   ;ERROR LOOP RETURN

013716  100402                  I20146: BMI     I30146          ;TEST THE BMI-IT SHOULD BR

013720  104005                  E20146: ERROR5                  ;BMI FAILED
013722  013706                          R0146                   ;ERROR LOOP RETURN

013724  102402                  I30146: BVS     I40146          ;TEST THE BVS-IT SHOULD BR

013726  104005                  E30146: ERROR5                  ;BVS FAILED
013730  013706                          R0146                   ;ERROR LOOP RETURN

013732  103402                  I40146: BCS     O0146           ;TEST THE BCS-IT SHOULD BR

013734  104005                  E40146: ERROR5                  ;BCS FAILED
013736  013706                          R0146                   ;ERROR LOOP RETURN

013740  000004                   O0146: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                        .SBTTL T0147 BNE TEST WITH Z=1
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,110 / 16[110]016,016

                                ;EXEC:          N / A

                                ;CODES:         N / A

                                ;SYNC:          B05J2 (-) T = 1.5 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K3-5 BUBC3(BUT37) H

013742  012700  000147          T0147:  MOV     #0147,R0                ;LOAD R0 WITH TEST NO.
013746  013701  013754                  MOV     @#I0147,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

013752  000264                  R0147:  SEZ                     ;MAKE Z=1

013754  001001                  I0147:  BNE     E0147           ;TEST THE BNE-IT SHOULDN'T BR
013756  000402                          BR      O0147           ;GO TO SCOPE EXIT

013760  104005                  E0147:  ERROR5                  ;BNE FAILED
013762  013752                          R0147                   ;ERROR LOOP RETURN

013764  000004                   O0147: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                        .SBTTL T0150 BNE TEST WITH Z=0
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,341,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111 / 16[340]016,016

                                ;EXEC:          [016] D = #00150

                                ;CODES:         N / A

                                ;SYNC:          B05J2 (-) T = 1.8 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 FALSE BR L  /  K3-3 SM=1L

013766  012700  000150          T0150:  MOV     #0150,R0                ;LOAD R0 WITH TEST NO.
013772  013701  014000                  MOV     @#I0150,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

013776  000244                  R0150:  CLZ                     ;MAKE Z=0
014000  001002                  I0150:  BNE     00150           ;TEST THE BNE-IT SHOULD BR
014002  104005                  E0150:  ERROR5                  ;BNE FAILED
014004  013776                          R0150                   ;ERROR LOOP RETURN
014006  000004                   00150: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0151 BPL TEST WITH N=1
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,110 / 16[110]016,016

                                ;EXEC:          NO BRANCH

                                ;CODES:         N / A

                                ;SYNC:          B05J2 (-) T= 1.4 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=0L  /  K3-4 IR15 L

014010  012700  000151          T0151:  MOV     #0151,R0                ;LOAD R0 WITH TEST NO.
014014  013701  014022                  MOV     @#I0151,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

014020  000270                  R0151:  SEN                     ;MAKE N=1

014022  100001                  I0151:  BPL     E0151           ;TEST THE BPL-IT SHOULDN'T BR
014024  000402                          BR      O0151           ;GO TO SCOPE EXIT

014026  104005                  E0151:  ERROR5                  ;BPL FAILED
014030  014020                          R0151                   ;ERROR LOOP RETURN

014032  000004                  O0151:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                        .SBTTL T0152 BPL TEST WITH N=0
                                ; ***************************************************************

                                ;MICROPROGRAMMING   /   LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,341,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111  /  16[340]016,016

                                ;EXEC:          [016] D = #00152

                                ;CODES:         N  /  A

                                ;SYNC:          B05J2 (-) T = 1.8 USEC

                                ;KEY SIG:       K5-3 BR INSTR L   /   K5-3 FALSE BR L   /   K3-3 SM=0L   /   K3-4 IR15 L

014034  012700  000152          T0152:  MOV     #0152,R0                ;LOAD R0 WITH TEST NO.
014040  013701  014046                  MOV     @#I0152,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

014044  000250                  R0152:  CLN                     ;MAKE N=0

014046  100002                  I0152:  BPL     00152           ;TEST THE BPL-IT SHOULD BR

014050  104005                  E0152:  ERROR5                  ;BPL FAILED
014052  014044                          R0152                   ;ERROR LOOP RETURN

014054  000004                   00152: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***************************************************************
                                                .SBTTL T0153 BVC TEST WITH V=1
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING   /   LOGIC INFORMATION

                                        ;ROM SEQ:       [110,347,016] FC 1,7

                                        ;ACT BUTS:      37[004]100,110  /  16[110]016,016

                                        ;EXEC:          NO BRANCH

                                        ;CODES:         N  /  A

                                        ;SYNC:          B05J2 (-) T = 1.4 USEC

                                        ;KEY SIG:       K5-3 BR INSTR L   /   K3-3 SM=2L   /   K3-4 IR15 L

014056  012700  000153                  T0153:  MOV     #0153,R0                ;LOAD R0 WITH TEST NO.
014062  013701  014070                          MOV     @#I0153,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

014066  000262                          R0153:  SEV                     ;MAKE V=1

014070  102001                          I0153:  BVC     E0153           ;TEST THE BVC-IT SHOULDN'T BR
014072  000402                                  BR      O0153           ;GO TO SCOPE EXIT

014074  104005                          E0153:  ERROR5                  ;BVC FAILED
014076  014066                                  R0153                   ;ERROR LOOP RETURN

014100  000004                           O0153: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                        .SBTTL T0154 BVC TEST WITH V=0
                                ; ***************************************************************

                                ;MICROPROGRAMMING   /   LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,341,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111  /  16[340]016,016

                                ;EXEC:          [016] D = #00154

                                ;CODES:         N  /  A

                                ;SYNC:          B05J2 (-) T = 1.8 USEC

                                ;KEY SIG:       K5-3 BR INSTR L   /   KK5-3 FALSE BR L   /   K3-3 SM-2L   /   K3-4 IR15


                                ;CODES:         N  /  A
014102  012700  000154          T0154:  MOV     #0154,R0                ;LOAD R0 WITH TEST NO.
014106  013701  014114                  MOV     @#I0154,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

014112  000242                  R0154:  CLV                     ;MAKE V=0

014114  102002                  I0154:  BVC     00154           ;TEST THE BVC-IT SHOULD BR

014116  104005                  E0154:  ERROR5                  ;BVC FAILED
014120  014112                          R0154                   ;ERROR LOOP RETURN

014122  000004                   00154: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                        .SBTTL T0155 BCC TEST WITH C=1
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,110 / 16[110]016,016

                                ;EXEC:          NO BRANCH

                                ;CODES:         N / A

                                ;SYNC:          B05J2 (-) T = 1.4 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=3L  /  K3-4 IR15 L

014124  012700  000155          T0155:  MOV     #0155,R0                ;LOAD R0 WITH TEST NO.
014130  013701  014136                  MOV     @#I0155,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

014134  000261                  R0155:  SEC                     ;MAKE C=1

014136  103001                  I0155:  BCC     E0155           ;TEST THE BCC, IT SHOULDN'T BR
014140  000402                          BR      O0155           ;GO TO SCOPE EXIT

014142  104005                  E0155:  ERROR5                  ;BCC FAILED
014144  014134                          R0155                   ;ERROR LOOP RETURN

014146  000004                  O0155:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***************************************************************
                                                .SBTTL T0156 BCC TEST WITH C=0
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [111,340,341,016] FC 1,7

                                        ;ACT BUTS:      37[004]100,111 / 16[340]016,016

                                        ;EXEC:          [016] D = #00156

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2 (-) T = 1.8 USEC

                                        ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 FALSE BR L  /  K3-3 SM=3L  /  K3-4 IR15 L


014150  012700  000156                  T0156:  MOV     #0156,R0                ;LOAD R0 WITH TEST NO.
014154  013701  014162                          MOV     @#I0156,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

014160  000241                          R0156:  CLC                     ;MAKE C=0

014162  103002                          I0156:  BCC     00156           ;TEST THE BCC-IT SHOULD BR

014164  104005                          E0156:  ERROR5                  ;BCC FAILED
014166  014160                                  R0156                   ;ERROR LOOP RETURN

014170  000004                           00156: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0157 VERIFY NO BRANCH MICROROUTINE DOES NOT CLR FLAGS
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,110 / 16[110]016,016

                                ;EXEC:          NO BRANCH

                                ;CODES:         N:C = 1111      (NO CHANGE)

                                ;SYNC:          B05J2 (-) T = 1.4 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=3L  /  K3-4 IR15 L

014172  012700  000157          T0157:  MOV     #0157,R0                ;LOAD R0 WITH TEST NO.
014176  013701  014204                  MOV     @#I0157,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

014202  000277                  R0157:  SCC                     ;MAKE N:C = 1111

014204  103007                  I0157:  BCC     E0157           ;TEST THE BCC-IT SHOULDN'T BR

014206  013702  177776                  MOV     @#PSW,R2        ;GET WAS FLAGS
014212  022702  000017                  CMP     #17,R2          ;N:C = 1111?
014216  001404                          BEQ     00157           ;BR IF YES

014220  010237  177776                  MOV     R2,@#PSW        ;RESTORE N:C

014224  104005                  E0157:  ERROR5                  ;NO, BRANCH MICROROUTINE ALTERED CODES
014226  014202                          R0157                   ;ERROR LOOP RETURN

014230  000004                  00157:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0160 VERIFY BRANCH MICROROUTINE DOES NOT CLR FLAGS
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [111,340,341,016] FC 1,7

                                        ;ACT BUTS:      37[004]100,111 / 16[340]016,016

                                        ;EXEC:          [016] D = #A0160

                                        ;CODES:         N:C = 1111      (NO CHANGE)

                                        ;SYNC:          B05J2 (-) T = 1.8 USEC

                                        ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 TRUE BR  /  K3-3 SM=0L  /  K3-3 IR(14:12) = 0 L

014232  012700  000160                  T0160:  MOV     #0160,R0                ;LOAD R0 WITH TEST NO.
014236  013701  014244                          MOV     @#I0160,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

014242  000277                          R0160:  SCC                     ;MAKE N:C = 1111

014244  000402                          I0160:  BR      A0160           ;TEST THE BR

014246  104005                          E10160: ERROR5                  ;JUST IN CASE THE BR DIDN'T WORK
014250  014242                                  R0160                   ;ERROR LOOP RETURN

014252  013702  177776                  A0160:  MOV     @#PSW,R2        ;GET THE FLAGS
014256  022702  000017                          CMP     #17,R2          ;N:C = 1111?
014262  001404                                  BEQ     00160           ;BR IF YES

014264  010237  177776                          MOV     R2,@#PSW        ;RESTORE FLAGS

014270  104005                          E20160: ERROR5                  ;BRANCH MICROROUTINE ALTERED CODES
014272  014242                                  R0160                   ;ERROR LOOP RETURN

014274  000004                          00160:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0161 VERIFY NO BRANCH MICROROUTINE DOES NOT SET FLAGS
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,110 / 16[110]016,016

                                ;EXEC:          NO BRANCH

                                ;CODES:         N:C = 0000      (NO CHANGE)

                                ;SYNC:          B05J2 (-) T = 1.4 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=3L  /  K3-4 IR15 L

014276  012700  000161          T0161:  MOV     #0161,R0                ;LOAD R0 WITH TEST NO.
014302  013701  014310                  MOV     @#I0161,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

014306  000257                  R0161:  CCC                     ;MAKE N:C = 0000

014310  103406                  I0161:  BCS     E0161           ;TEST THE BCS-IT SHOULDN'T BR

014312  013702  177776                  MOV     @#PSW,R2        ;GET FLAGS
014316  005702                          TST     R2              ;N:C = 0000
014320  001404                          BEQ     00161           ;BR IF YES

014322  010237  177776                  MOV     R2,@#PSW        ;RESTORE FLAGS

014326  104005                  E0161:  ERROR5                  ;NO BRANCH MICROROUTINE-ALTERED CODES
014330  014306                          R0161                   ;ERROR LOOP RETURN

014332  000004                  00161:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0162 VERIFY BRANCH MICROROUTINE DOES NOT SET FLAGS
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,341,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111 / 16[340]016,016

                                ;EXEC:          [016] D = #A0162

                                ;CODES:         N:C = 0000      (NO CHANGE)

                                ;SYNC:          B05J2 (-) T = 1.8 USEC

                                ;KEY SIG:       K5-3 BIT INSTR L  /  K5-3 TRUE BR L  /  K3-3 SM=0L  /  K3-4 IR(14:12)=0

014334  012700  000162          T0162:  MOV     #0162,R0                ;LOAD R0 WITH TEST NO.
014340  013701  014346                  MOV     @#I0162,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

014344  000257                  R0162:  CCC                     ;MAKE N:C = 0000

014346  000402                  I0162:  BR      A0162           ;TEST THE BR

014350  104005                  E10162: ERROR5                  ;JUST IN CASE THE BR DIDN'T WORK
014352  014344                          R0162                   ;ERROR LOOP RETURN

014354  013702  177776          A0162:  MOV     @#PSW,R2        ;GET FLAGS
014360  005702                          TST     R2              ;N:C = 0000
014362  001404                          BEQ     00162           ;BR IF YES

014364  010237  177776                  MOV     R2,@#PSW        ;RESTORE FLAGS

014370  104005                  E20162: ERROR5                  ;BRANCH MICROROUTINE ALTERED CODES.
014372  014344                          R0162                   ;ERROR LOOP RETURN

014374  000004                  00162:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0163 BGE TEST WITH N,V = 00
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,341,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111 / 16[340]016,016

                                ;EXEC:          [016] D = #00163

                                ;CODES:         N:C = 0000

                                ;SYNC:          B05J2 (-) T = 1.8 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 FALSE BR L  /  K3-3 SM=2L

014376  012700  000163          T0163:  MOV     #0163,R0                ;LOAD R0 WITH TEST NO.
014402  013701  014410                  MOV     @#I0163,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

014406  000257                  R0163:  CCC                     ;MAKE N:C = 0000

014410  002002                  I0163:  BGE     00163           ;TEST THE BGE-IT SHOULD BR

014412  104005                  E0163:  ERROR5                  ;BGE FAILED
014414  014406                          R0163                   ;ERROR LOOP RETURN

014416  000004                   00163: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0164 BGE TEST WITH N,V = 01
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [110,347,016] FC 1,7

                                        ;ACT BUTS:      37[004]100,110 / 16[110]016,016

                                        ;EXEC:          NO BRANCH

                                        ;CODES:         N:C = 0010

                                        ;SYNC:          B05J2 (-) T = 1.4 USEC

                                        ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=2L  /  K3-3 IR(14:12)=0 L

014420  012700  000164                  T0164:  MOV     #0164,R0                ;LOAD R0 WITH TEST NO.
014424  013701  014434                          MOV     @#I0164,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

014430  000257                          R0164:  CCC                     ;CLEAR FLAGS
014432  000262                                  SEV                     ;MAKE N,V = 01

014434  002001                          I0164:  BGE     E0164           ;TEST THE BGE-IT SHOULDN'T BR
014436  000402                                  BR      00164           ;GO TO SCOPE EXIT

014440  104005                          E0164:  ERROR5                  ;BGE FAILED
014442  014430                                  R0164                   ;ERROR LOOP RETURN
014444  000004                           00164: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                        .SBTTL T0165 BGE TEST WITH N,V = 10
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,110 / 16[110]016,016

                                ;EXEC:          NO BRANCH

                                ;CODES:         N:C = 1000

                                ;SYNC:          B05J2 (-) T = 1.4 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=2L

014446  012700  000165          T0165:  MOV     #0165,R0                ;LOAD R0 WITH TEST NO.
014452  013701  014462                  MOV     @#I0165,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

014456  000257                  R0165:  CCC                     ;CLEAR FLAGS
014460  000270                          SEN                     ;MAKE N,V = 10

014462  002001                  I0165:  BGE     E0165           ;TEST THE BGE-IT SHOULDN'T BR
014464  000402                          BR      00165           ;GO TO SCOPE EXIT

014466  104005                  E0165:  ERROR5                  ;BGE FAILED
014470  014456                          R0165                   ;ERROR LOOP RETURN

014472  000004                  00165:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0166 BGE TEST WITH N,V = 11
                                ; ***********************************************************************

                                ;MICROPROGRAMMING   /   LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,341,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111  /  16[340]016,016

                                ;EXEC:          [016] D = #00166

                                ;CODES:         N:C = 1010

                                ;SYNC:          B05J2 (-) T = 1.8 USEC

                                ;KEY SIG:       K5-3 BR INSTR L   /   K5-3 FALSE BR L   /   K3-3 SM=2L   /   K3-3 IR(14:

014474  012700  000166          T0166:  MOV     #0166,R0                ;LOAD R0 WITH TEST NO.
014500  013701  014510                  MOV     @#I0166,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

014504  000257                  R0166:  CCC                     ;CLEAR FLAGS
014506  000272                          272                     ;MAKE N,V = 11

014510  002002                  I0166:  BGE     00166           ;TEST THE BGE-IT SHOULD BR

014512  104005                  E0166:  ERROR5                  ;BGE FAILED
014514  014504                          R0166                   ;ERROR LOOP RETURN

014516  000004                   00166: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                        .SBTTL T0167 BLT TEST WITH N,V = 00
                                ; ***************************************************************

                                ;MICROPROGRAMMING   /   LOGIC INFORMATION

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,110  /  16[110]016,016

                                ;EXEC:          NO BRANCH

                                ;CODES:         N:C = 0000

                                ;SYNC:          B05J2 (-) T = 1.4 USEC

                                ;KEY SIG:       K5-3 BR INSTR L   /   K3-3 SM=2L

014520  012700  000167          T0167:  MOV     #0167,R0                ;LOAD R0 WITH TEST NO.
014524  013701  014532                  MOV     @#I0167,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

014530  000257                  R0167:  CCC                     ;CLEAR FLAGS

014532  002401                  I0167:  BLT     E0167           ;TEST THE BLT-IT SHOULDN'T BR
014534  000402                          BR      O0167           ;GO TO SCOPE EXIT

014536  104005                  E0167:  ERROR5                  ;BLT FAILED
014540  014530                          R0167                   ;ERROR LOOP RETURN

014542  000004                   O0167: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                        .SBTTL T0170 BLT TEST WITH N,V = 01
                                ; ***************************************************************

                                ;MICROPROGRAMMING   /   LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,341,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111  /  16[340]016,016

                                ;EXEC:          [016] D = #00170

                                ;CODES:         N:C = 0010

                                ;SYNC:          B05J2 (-) T = 1.8 USEC

                                ;KEY SIG:       K5-3 BR INSTR L   /   K5-3 TRUE BR L   /   K3-3 SM=2L   /   K3-3 IR(14:1

014544  012700  000170          T0170:  MOV     #0170,R0                ;LOAD R0 WITH TEST NO.
014550  013701  014560                  MOV     @#I0170,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

014554  000257                  R0170:  CCC                     ;CLEAR FLAGS
014556  000262                          SEV                     ;MAKE N,V = 01

014560  002402                  I0170:  BLT     00170           ;TEST THE BLT-IT SHOULD BR

014562  104005                  E0170:  ERROR5                  ;BLT FAILED
014564  014554                          R0170                   ;ERROR LOOP RETURN

014566  000004                   00170: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                        .SBTTL T0171 BLT TEST WITH N,V = 10
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,341,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111 / 16[340]016,016

                                ;EXEC:          [016] D = #00171

                                ;CODES:         N:C = 1000

                                ;SYNC:          B05J2 (-) T = 1.8 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=2L  /  K5-3 TRUE L

014570  012700  000171          T0171:  MOV     #0171,R0                ;LOAD R0 WITH TEST NO.
014574  013701  014604                  MOV     @#I0171,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

014600  000257                  R0171:  CCC                     ;CLEAR FLAGS
014602  000270                          SEN                     ;SET N - N,V = 10

014604  002402                  I0171:  BLT     00171           ;TEST THE BLT-IT SHOULD BR

014606  104005                  E0171:  ERROR5                  ;BLT FAILED
014610  014600                          R0171                   ;ERROR LOOP RETURN

014612  000004                   00171: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                        .SBTTL T0172 BLT TEST WITH N,V = 11
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,110 / 16[110]016,016

                                ;EXEC:          NO BRANCH

                                ;CODES:         N:C = 1010

                                ;SYNC:          B05J2 (-) T = 1.4 USEC

                                ;KEY SIG:       K5-3 BR INSTR I.  /  K3-3 SM=2L  /  K3-3 IR(14:12)=0 L

014614  012700  000172          T0172:  MOV     #0172,R0                ;LOAD R0 WITH TEST NO.
014620  013701  014630                  MOV     @#I0172,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

014624  000257                  R0172:  CCC                     ;CLEAR FLAGS
014626  000272                          272                     ;MAKE N,V = 11

014630  002401                  I0172:  BLT     E0172           ;TEST THE BLT-IT SHOULDN'T BR
014632  000402                          BR      00172           ;GO TO SCOPE EXIT

014634  104005                  E0172:  ERROR5                  ;BLT FAILED
014636  014624                          R0172                   ;ERROR LOOP RETURN

014640  000004                  00172:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0173 BGT TEST WITH Z = 1 AND N,V = 01
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,110 / 16[110]016,016

                                ;EXEC:          NO BRANCH

                                ;CODES:         N:C = 0110

                                ;SYNC:          B05J2 (-) T = 1.4 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=3L

014642  012700  000173          T0173:  MOV     #0173,R0                ;LOAD R0 WITH TEST NO.
014646  013701  014656                  MOV     @#I0173,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

014652  000257                  R0173:  CCC                     ;CLEAR FLAGS
014654  000266                          266                     ;SET Z AND V

014656  003001                  I0173:  BGT     E0173           ;TEST THE BGT-IT SHOULDN'T BR
014660  000402                          BR      00173           ;GO TO SCOPE EXIT

014662  104005                  E0173:  ERROR5                  ;BGT FAILED
014664  014652                          R0173                   ;ERROR LOOP RETURN

014666  000004                   00173: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***************************************************************
                                                .SBTTL T0174 BGT TEST WITH Z = 0 AND N,V = 01
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [110,347,016] FC 1,7

                                        ;ACT BUTS:      37[004]100,110 / 16[110]016,016

                                        ;EXEC:          NO BRANCH

                                        ;CODES:         N:C = 0010

                                        ;SYNC:          B05J2 (-) T = 1.4 USEC

                                        ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=3L  /  K3-3 IR(14:12)=0 L

014670  012700  000174                  T0174:  MOV     #0174,R0                ;LOAD R0 WITH TEST NO.
014674  013701  014716                          MOV     @#I0174,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

014700  032737  000010  066642                  BIT     #10,@#BPTLOC    ;BREAKPOINT HALT SET ??
014706  001401                                  BEQ     .+4             ;BR IF NOT
014710  000000                                  HALT                    ;BREAK - DEPRESS CONTINUE TO RESTART
014712  000257                          R0174:  CCC                     ;CLEAR FLAGS
014714  000262                                  SEV                     ;SET V

014716  003001                          I0174:  BGT     E0174           ;TEST THE BGT-IT SHOULD NOT BR
014720  000402                                  BR      00174           ;GO TO SCOPE LOOP EXIT

014722  104005                          E0174:  ERROR5                  ;BGT FAILED
014724  014712                                  R0174                   ;ERROR LOOP RETURN

014726  000004                          00174:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ******************************************************************
                                        .SBTTL T0175 BGT TEST WITH Z = 1 AND N,V = 00
                                ; ******************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,110 / 16[110]016,016

                                ;EXEC:          NO BRANCH

                                ;CODES:         N:C = 0100

                                ;SYNC:          B05J2 (-) T = 1.4 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=3L

014730  012700  000175          T0175:  MOV     #0175,R0                ;LOAD R0 WITH TEST NO.
014734  013701  014744                  MOV     @#I0175,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

014740  000257                  R0175:  CCC                     ;CLEAR FLAGS
014742  000264                          SEZ                     ;SET Z

014744  003001                  I0175:  BGT     E0175           ;TEST THE BGT-IT SHOULD NOT BR
014746  000402                          BR      O0175           ;GO TO SCOPE LOOP EXIT

014750  104005                  E0175:  ERROR5                  ;BGT FAILED
014752  014740                          R0175                   ;ERROR LOOP RETURN

014754  000004                   O0175: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0176 BGT TEST WITH Z = 0 AND N,V = 00
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111 / 16[340]016,016

                                ;EXEC:          [016] D = #00176

                                ;CODE           N:C = 0000

                                ;SYNC:          B05J2 (-) T = 1.8 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 FALSE BR L  /  K3-3 SM=3L  /  K3-3 IR(14:12)=0

014756  012700  000176          T0176:  MOV     #0176,R0                ;LOAD R0 WITH TEST NO.
014762  013701  014770                  MOV     @#I0176,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

014766  000257                  R0176:  CCC                     ;CLEAR FLAGS

014770  003002                  I0176:  BGT     00176           ;TEST THE BGT - IT SHOULD BR

014772  104005                  E0176:  ERROR5                  ;BGT FAILED
014774  014766                          R0176                   ;ERROR LOOP RETURN

014776  000004                  00176:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0177 BGT TEST WITH Z = 1 AND N,V = 01
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,110 / 16[110]016,016

                                ;EXEC:          NO BRANCH

                                ;CODES:         N:C = 0110

                                ;SYNC:          B05J2 (-) T = 1.4 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=3L

015000  012700  000177          T0177:  MOV     #0177,R0                ;LOAD R0 WITH TEST NO.
015004  013701  015014                  MOV     @#I0177,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015010  000257                  R0177:  CCC                     ;CLEAR FLAGS
015012  000266                          266                     ;MAKE N,V = 01 AND Z = 1

015014  003001                  I0177:  BGT     E0177           ;TEST THE BGT-IT SHOULDN'T BR
015016  000402                          BR      00177           ;GO TO SCOPE EXIT

015020  104005                  E0177:  ERROR5                  ;BGT FAILED
015022  015010                          R0177                   ;ERROR LOOP RETURN

015024  000004                  00177:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                        .SBTTL T0200 BGT TEST WITH Z = 1 AND N,V = 10
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,110 / 16[110]016,016

                                ;EXEC:          NO BRANCH

                                ;CODES:         N:C = 1100

                                ;SYNC:          B05J2 (-) T = 1.4 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=3L  /  K3-3 IR(14:12)=0 L

015026  012700  000200          T0200:  MOV     #0200,R0                ;LOAD R0 WITH TEST NO.
015032  013701  015042                  MOV     @#I0200,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015036  000257                  R0200:  CCC                     ;CLEAR FLAGS
015040  000274                          274                     ;MAKE Z = 1 AND N,V = 10

015042  003001                  I0200:  BGT     E0200           ;TEST THE BLT-IT SHOULDN'T BR
015044  000402                          BR      O0200           ;GO TO SCOPE EXIT

015046  104005                  E0200:  ERROR5                  ;BLT FAILED
015050  015036                          R0200                   ;ERROR LOOP RETURN

015052  000004                  O0200:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                        .SBTTL T0201 BGT TEST WITH Z = 1 AND N,V = 11
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,110 / 16[110]016,016

                                ;EXEC:          NO BRANCH

                                ;CODES:         N:C = 1110

                                ;SYNC:          B05J2 (-) T = 1.4 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=3L

015054  012700  000201          T0201:  MOV     #0201,R0                ;LOAD R0 WITH TEST NO.
015060  013701  015070                  MOV     @#I0201,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015064  000257                  R0201:  CCC                     ;CLEAR FLAGS
015066  000276                          276                     ;MAKE Z = 1 AND N,V = 11

015070  003001                  I0201:  BGT     E0201           ;TEST THE BGT-IT SHOULD NOT BR
015072  000402                          BR      O0201           ;GO TO SCOPE EXIT

015074  104005                  E0201:  ERROR5                  ;BLT FAILED
015076  015064                          R0201                   ;ERROR LOOP RETURN

015100  000004                  O0201:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0202 BGT TEST WITH Z=0 AND N,V=11
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,341,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111 / 16[340]016,016

                                ;EXEC:          [016] D = #00202

                                ;CODES:         N:C = 1010

                                ;SYNC:          B05J2 (-) T = 1.8 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 FALSE BR L  /  K3-3 SM=3L  /  K3-3 IR(14:12)=0

015102  012700  000202          T0202:  MOV     #0202,R0                ;LOAD R0 WITH TEST NO.
015106  013701  015116                  MOV     @#I0202,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015112  000257                  R0202:  CCC                     ;CLEAR FLAGS
015114  000272                          272                     ;MAKE N:C=1010

015116  003002                  I0202:  BGT     00202           ;TEST THE BGT - IT SHOULD BR

015120  104005                  E0202:  ERROR5                  ;BGT FAILED
015122  015112                          R0202                   ;ERROR LOOP RETURN

015124  000004                  00202:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0203 BLE TEST WITH Z = 0, AND N,V = 00
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,110 / 16[110]016,016

                                ;EXEC:          NO BRANCH

                                ;CODES:         N:C = 0000

                                ;SYNC:          B05J2 (-) T = 1.4 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=3L

015126  012700  000203          T0203:  MOV     #0203,R0                ;LOAD R0 WITH TEST NO.
015132  013701  015140                  MOV     @#I0203,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015136  000257                  R0203:  CCC                     ;CLEAR FLAGS

015140  003401                  I0203:  BLE     E0203           ;TEST THE BLE-IT SHOULDN'T BR
015142  000402                          BR      00203           ;GO TO SCOPE EXIT

015144  104005                  E0203:  ERROR5                  ;BLE FAILED
015146  015136                          R0203                   ;ERROR LOOP RETURN

015150  000004                   00203: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0204 BLE TEST WITH Z = 1 AND N,V = 00
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,341,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111 / 16[340]016,016

                                ;EXEC:          [016] D = #00204

                                ;CODES:         N:C = 0100

                                ;SYNC:          B05J2 (-) T = 1.8 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 TRUE BR L  /  K3-3 SM=3L  /  K3-3 IR(14:12)=0 L

015152  012700  000204          T0204:  MOV     #0204,R0                ;LOAD R0 WITH TEST NO.
015156  013701  015166                  MOV     @#I0204,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015162  000257                  R0204:  CCC                     ;CLEAR FLAGS
015164  000264                          SEZ                     ;SET Z = 1

015166  003402                  I0204:  BLE     00204           ;TEST THE BLE-IT SHOULD BR

015170  104005                  E0204:  ERROR5                  ;BLE FAILED
015172  015162                          R0204                   ;ERROR LOOP RETURN

015174  000004                   00204: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0205 BLE TEST WITH Z = 0 AND N,V = 01
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,341,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111 / 16[340]016,016

                                ;EXEC:          [016] D = #00205

                                ;CODES:         N:C = 0010

                                ;SYNC:          B05J2 (-) T = 1.8 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 TRUE BR L  /  K3-3 SM=3L  /  K5-2 PS(V)(1)H

015176  012700  000205          T0205:  MOV     #0205,R0                ;LOAD R0 WITH TEST NO.
015202  013701  015212                  MOV     @#I0205,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015206  000257                  R0205:  CCC                     ;CLEAR FLAGS
015210  000262                          SEV                     ;MAKE Z = 0 AND N,V = 01

015212  003402                  I0205:  BLE     O0205           ;TEST THE BLE-IT SHOULD BR

015214  104005                  E0205:  ERROR5                  ;BLE FAILED
015216  015206                          R0205                   ;ERROR LOOP RETURN

015220  000004                  O0205:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                        .SBTTL T0206 BLE TEST WITH Z = 0 AND N,V = 10
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,341,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111 / 16[340]016,016

                                ;EXEC:          [016] D = #00206

                                ;CODES:         N:C = 1000

                                ;SYNC:          B05J2 (-) T = 1.8 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 TRUE BR L  /  K3-3 SM=3L  /  K3-3 IR(14:12)=0 L
                                                ;  K5-2 PS(N)(1)H

015222  012700  000206          T0206:  MOV     #0206,R0                ;LOAD R0 WITH TEST NO.
015226  013701  015236                  MOV     @#I0206,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015232  000257                  R0206:  CCC                     ;CLEAR FLAGS
015234  000270                          SEN                     ;MAKE Z = 0 AND N,V = 10

015236  003402                  I0206:  BLE     00206           ;TEST THE BLE-IT SHOULD BR

015240  104005                  E0206:  ERROR5                  ;BLE FAILED
015242  015232                          R0206                   ;ERROR LOOP RETURN

015244  000004                   00206: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0207 BLE TEST WITH Z = 0 AND N,V = 11
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,110 / 16[110]016,016

                                ;EXEC:          NO BRANCH

                                ;CODES:         N:C = 1010

                                ;SYNC:          B05J2 (-) T = 1.4 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=3L

015246  012700  000207          T0207:  MOV     #0207,R0                ;LOAD R0 WITH TEST NO.
015252  013701  015262                  MOV     @#I0207,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015256  000257                  R0207:  CCC                     ;CLEAR FLAGS
015260  000272                          272                     ;MAKE Z = 0 AND N,V = 11

015262  003401                  I0207:  BLE     E0207           ;TEST THE BLE-IT SHOULDN'T BR
015264  000402                          BR      00207           ;GO TO SCOPE EXIT

015266  104005                  E0207:  ERROR5                  ;BLE FAILED
015270  015256                          R0207                   ;ERROR LOOP RETURN

015272  000004                  00207:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***************************************************************
                                                .SBTTL T0210 BHI TEST WITH Z,C = 00
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [111,340,341,016] FC 1,7

                                        ;ACT BUTS:      37[004]100,111 / 16[340]016,016

                                        ;EXEC:          [016] D = #00210

                                        ;CODES:         N:C = 0000

                                        ;SYNC:          B05J2 (-) T = 1.8 USEC

                                        ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 FALSE BR L  /  K3-3 SM=1L  /  K3-4 IR15 L

015274  012700  000210                  T0210:  MOV     #0210,R0                ;LOAD R0 WITH TEST NO.
015300  013701  015306                          MOV     @#I0210,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015304  000257                          R0210:  CCC                     ;MAKE Z,C = 00

015306  101002                          I0210:  BHI     00210           ;TEST THE BHI-IT SHOULD BR

015310  104005                          E0210:  ERROR5                  ;BHI FAILED
015312  015304                                  R0210                   ;ERROR LOOP RETURN

015314  000004                           00210: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0211 BHI TEST WITH Z,C = 01
                                ; ***********************************************************************

                                ;MICROPROGRAMMING   /   LOGIC INFORMATION

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,110  /  16[110]016,016

                                ;EXEC:          NO BRANCH

                                ;CODES:         N:C = 0001

                                ;SYNC:          B05J2 (-) T = 1.4 USEC

                                ;KEY SIG:       K5-3 BR INSTR L   /   K3-3 SM=1L   /   K3-4 IR15 L

015316  012700  000211          T0211:  MOV     #0211,R0                ;LOAD R0 WITH TEST NO.
015322  013701  015332                  MOV     @#I0211,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015326  000257                  R0211:  CCC                     ;CLEAR FLAGS
015330  000261                          SEC                     ;MAKE Z,C = 01

015332  101001                  I0211:  BHI     E0211           ;TEST THE BHI-IT SHOULD NOT BR
015334  000402                          BR      00211           ;GO TO SCOPE EXIT

015336  104005                  E0211:  ERROR5                  ;BHI FAILED
015340  015326                          R0211                   ;ERROR LOOP RETURN

015342  000004                   00211: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***************************************************************
                                                .SBTTL T0212 BHI TEST WITH Z,C = 10
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING   /   LOGIC INFORMATION

                                        ;ROM SEQ:       [110,347,016] FC 1,7

                                        ;ACT BUTS:      37[004]100,110  /  16[110]016,016

                                        ;EXEC:          NO BRANCH

                                        ;CODES:         N:C = 0100

                                        ;SYNC:          B05J2 (-) T = 1.4 USEC

                                        ;KEY SIG:       K5-3 BR INSTR L   /   K3-3 SM=1L   /   K3-4 IR15 L

015344  012700  000212                  T0212:  MOV     #0212,R0                ;LOAD R0 WITH TEST NO.
015350  013701  015360                          MOV     @#I0212,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015354  000257                          R0212:  CCC                     ;CLEAR FLAGS
015356  000264                                  SEZ                     ;MAKE Z,C = 10

015360  101001                          I0212:  BHI     E0212           ;TEST THE BHI-IT SHOULD NOT BR
015362  000402                                  BR      O0212           ;GO TO SCOPE EXIT

015364  104005                          E0212:  ERROR5                  ;BHI FAILED
015366  015354                                  R0212                   ;ERROR LOOP RETURN

015370  000004                           O0212: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0213 BHI TEST WITH Z,C = 11
                                ; ***********************************************************************

                                ;MICROPROGRAMMING   /   LOGIC INFORMATION

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,110  /  16[110]016,016

                                ;EXEC:          NO BRANCH

                                ;CODES:         N:C = 0101

                                ;SYNC:          B05J2 (-) T = 1.4 USEC

                                ;KEY SIG:       K5-3 BR INSTR L   /   K3-3 SM=1L   /   K3-4 IR15 L

015372  012700  000213          T0213:  MOV     #0213,R0                ;LOAD R0 WITH TEST NO.
015376  013701  015406                  MOV     @#I0213,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015402  000257                  R0213:  CCC                     ;CLEAR FLAGS
015404  000265                          265                     ;MAKE Z,C = 11

015406  101001                  I0213:  BHI     E0213           ;TEST THE BHI-IT SHOULDN'T BR
015410  000402                          BR      00213           ;GO TO SCOPE EXIT


015412  104005                  E0213:  ERROR5                  ;BHI FAILED
015414  015402                          R0213                   ;ERROR LOOP RETURN

015416  000004                   00213: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0214 BLOS TEST WITH Z,C = 00
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [110,347,016] FC 1,7

                                        ;ACT BUTS:      37[004]100,110 / 16[110]016,016

                                        ;EXEC:          NO BRANCH

                                        ;CODES:         N:C = 0000

                                        ;SYNC:          B05J2 (-) T = 1.4 USEC

                                        ;KEY SIG:       K5-3 BR INSTR H  /  K3-3 SM=3L  /  K3-4 IR15 L

015420  012700  000214                  T0214:  MOV     #0214,R0                ;LOAD R0 WITH TEST NO.
015424  013701  015432                          MOV     @#I0214,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015430  000257                          R0214:  CCC                     ;MAKE Z,C = 00

015432  101401                          I0214:  BLOS    E0214           ;TEST THE BLOS-IT SHOULDN'T BR
015434  000402                                  BR      O0214           ;GO TO SCOPE EXIT

015436  104005                          E0214:  ERROR5                  ;BLOS FAILED
015440  015430                                  R0214                   ;ERROR LOOP RETURN

015442  000004                           O0214: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***************************************************************
                                                .SBTTL T0215 BLOS TEST WITH Z,C = 01
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [111,340,341,016] FC 1,7

                                        ;ACT BUTS:      37[004]100,111 / 16[340]016,016

                                        ;EXEC:          [016] D = #00215

                                        ;CODES:         N:C = 0001

                                        ;SYNC:          B05J2 (-) T = 1.8 USEC

                                        ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 TRUE BR L  /  K3-3 SM=1L  /  K3-4 IR15 L
                                                        ;  K5-2 PS(C)(1)L

015444  012700  000215                  T0215:  MOV     #0215,R0                ;LOAD R0 WITH TEST NO.
015450  013701  015460                          MOV     @#I0215,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015454  000257                          R0215:  CCC                     ;CLEAR FLAGS
015456  000261                                  SEC                     ;MAKE Z,C = 01

015460  101402                          I0215:  BLOS    O0215           ;TEST THE BLOS-IT SHOULD BR

015462  104005                          E0215:  ERROR5                  ;BLOS FAILED
015464  015454                                  R0215                   ;ERROR LOOP RETURN

015466  000004                           O0215: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0216 BLOS TEST WITH Z,C = 10
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,341,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111 / 16[340]016,016

                                ;EXEC:          [016] D = #00216

                                ;CODES:         N:C = 0100

                                ;SYNC:          B05J2 (-) T = 1.8 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 TRUE BR L  /  K3-3 SM=1L  /  K3-4 IR15 L
                                                ;  K5-2 PS(Z)(1)L

015470  012700  000216          T0216: MOV      #0216,R0                ;LOAD R0 WITH TEST NO.
015474  013701  015504                 MOV      @#I0216,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015500  000257                  R0216: CCC                      ;CLEAR FLAGS
015502  000264                         SEZ                      ;MAKE Z,C = 10

015504  101402                  I0216: BLOS     00216           ;TEST THE BLOS-IT SHOULD BR

015506  104005                  E0216: ERROR5                   ;BLOS FAILED
015510  015500                         R0216                    ;ERROR LOOP RETURN

015512  000004                  00216: SCOPE                    ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                        .SBTTL T0217 BLOS TEST WITH Z,C = 11
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,341,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111 / 16[340]016,016

                                ;EXEC:          [016] D = #00217

                                ;CODES:         N:C = 0101

                                ;SYNC:          B05J2 (-) T = 1.8 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 TRUE BR L  /  K3-3 SM=1L  /  K3-4 IR15 L
                                                ;  K5-2 PS(C)(1)L

015514  012700  000217          T0217:  MOV     #0217,R0                ;LOAD R0 WITH TEST NO.
015520  013701  015530                  MOV     @#I0217,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015524  000257                  R0217:  CCC                     ;CLEAR FLAGS
015526  000265                          265                     ;MAKE Z,C = 11

015530  101402                  I0217:  BLOS    00217           ;TEST THE BLOS-IT SHOULD BR

015532  104005                  E0217:  ERROR5                  ;BLOS FAILED
015534  015524                          R0217                   ;ERROR LOOP RETURN

015536  000004                   00217: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                        .SBTTL T0220 BHIS TEST WITH C = 0
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,341,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111 / 16[340]016,016

                                ;EXEC:          [016] D = #00220

                                ;CODES:         N:C = 0000

                                ;SYNC:          B05J2 (-)  T = 1.8 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 FALSE BR L  /  K3-3 SM=3L  /  K3-4 IR15 L

015540  012700  000220          T0220:  MOV     #0220,R0                ;LOAD R0 WITH TEST NO.
015544  013701  015552                  MOV     @#I0220,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015550  000257                  R0220:  CCC                     ;CLEAR FLAGS

015552  103002                  I0220:  BHIS    00220           ;TEST THE BHIS-IT SHOULD BR

015554  104000                  E0220:  ERROR                   ;BHIS FAILED
015556  015550                          R0220                   ;ERROR LOOP RETURN

015560  000004                   00220: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***************************************************************
                                                .SBTTL T0221 BHIS TEST WITH C = 1
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [110,347,016] FC 1,7

                                        ;ACT BUTS:      37[004]100,110 / 16[110]016,016

                                        ;EXEC:          NO BRANCH

                                        ;CODES:         N:C = 0001

                                        ;SYNC:          B05J2 (-) T = 1.4 USEC

                                        ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=3L  /  K3-4 IR15 L

015562  012700  000221                  T0221:  MOV     #0221,R0                ;LOAD R0 WITH TEST NO.
015566  013701  015576                          MOV     @#I0221,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015572  000257                          R0221:  CCC                     ;CLEAR FLAGS
015574  000261                                  SEC                     ;MAKE C = 1

015576  103001                          I0221:  BHIS    E0221           ;TEST THE BHIS-IT SHOULDN'T BR
015600  000402                                  BR      O0221           ;GO TO SCOPE EXIT

015602  104000                          E0221:  ERROR                   ;BHIS FAILED
015604  015572                                  R0221                   ;ERROR LOOP RETURN

015606  000004                           O0221: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0222 BLO TEST WITH C = 0
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [110,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111 / 16[110]016,016

                                ;EXEC:          NO BRANCH

                                ;CODES:         N:C = 0000

                                ;SYNC:          B05J2 (-) T = 1.4 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K3-3 SM=3L  /  K3-4 IR15 L

015610  012700  000222          T0222:  MOV     #0222,R0                ;LOAD R0 WITH TEST NO.
015614  013701  015622                  MOV     @#I0222,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015620  000257                  R0222:  CCC                     ;CLEAR FLAGS

015622  103401                  I0222:  BLO     E0222           ;TEST THE BLO-IT SHOULDN'T BR
015624  000402                          BR      O0222           ;GO TO SCOPE EXIT

015626  104005                  E0222:  ERROR5                  ;BLO FAILED
015630  015620                          R0222                   ;ERROR LOOP RETURN

015632  000004                   O0222: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                        .SBTTL T0223 BLO TEST WITH C = 1
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [111,340,341,016] FC 1,7

                                ;ACT BUTS:      37[004]100,111 / 16[340]016,016

                                ;EXEC:          [016] D = #00223

                                ;CODES:         N:C = 0001

                                ;SYNC:          B05J2 (-) T = 1.8 USEC

                                ;KEY SIG:       K5-3 BR INSTR L  /  K5-3 TRUE BR L  /  K5-2 PS(C)(1)H  /  K3-3 SM=3L
                                                ;  K3-4 IR15 L

015634  012700  000223          T0223:  MOV     #0223,R0                ;LOAD R0 WITH TEST NO.
015640  013701  015650                  MOV     @#I0223,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015644  000257                  R0223:  CCC                     ;CLEAR FLAGS
015646  000261                          SEC                     ;MAKE C = 1

015650  103402                  I0223:  BLO     00223           ;TEST THE BLO-IT SHOULD BR

015652  104005                  E0223:  ERROR5                  ;BLO FAILED
015654  015644                          R0223                   ;ERROR LOOP RETURN

015656  000004                   00223: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0224 SXT MODE 0 TEST WITH N = 0 AND C = 1
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [132,360,001] FC 1,8

                                        ;ACT BUTS:      37[004]100,132 / 27[132]000,001

                                        ;EXEC:          [132]ALUC=HLLHH :[360] D = 000000

                                        ;CODES:         [360] SPS=3  /  N:C = 0101

                                        ;SYNC:          B05J2 (-) T = 1 USEC

                                        ;KEY SIG:       K3-3 DM=OL  /  K3-4 ONLAP INSTR H  /  K3-5 SXT L  /  K3-8 ALUM H

015660  012700  000224                  T0224:  MOV     #0224,R0                ;LOAD R0 WITH TEST NO.
015664  013701  015706                          MOV     @#I0224,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
015670  005004                                  CLR     R4              ;RESULT S / B = 0
015672  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
015676  012703  177777                  R0224:  MOV     #-1,R3          ;INITAL DEST. OP = 177777
015702  000257                                  CCC                     ;CLEAR CODES
015704  000263                                  263                     ;N:C = 0011

015706  006703                          I0224:  SXT     R3              ;TEST THE SXT

015710  100403                                  BMI     E10224
015712  001002                                  BNE     E10224          ;DID SXT MAKE N:C = 0101?
015714  102401                                  BVS     E10224
015716  103402                                  BCS     A0224

015720  104000                          E10224: ERROR                   ;SXT FAILED TO ALTER CODES PROPERLY
015722  015676                                  R0224                   ;ERROR LOOP RETURN

015724  005703                          A0224:  TST     R3              ;DID RESULT = 0?
015726  001402                                  BEQ     O0224           ;BR IF IT DID

015730  104000                          E20224: ERROR                   ;SXT DELIVERED WRONG RESULT TO R3
015732  015676                                  R0224                   ;ERROR LOOP RETURN

015734  000004                           O0224: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0225 SXT MODE 0 TEST WITH N = 0 AND C = 0
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [132,360,001] FC 1,8

                                        ;ACT BUTS:      37[004]100,132 / 27[132]000,001

                                        ;EXEC:          [132]ALUC=HLLHH :[360] D = 000000

                                        ;CODES:         [360] SPS=3  /  N:C = 0100

                                        ;SYNC:          B05J2 (-) T = 1 USEC

                                        ;KEY SIG:       K3-3 DM=0L  /  K3-4 OVLAP INSTR H  /  K3-5 SXT L  /  K3-8 ALUM H

015736  012700  000225                  T0225:  MOV     #0225,R0                ;LOAD R0 WITH TEST NO.
015742  013701  015762                          MOV     @#I0225,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

015746  005004                                  CLR     R4              ;RESULT S / B = 0
015750  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
015754  012703  177777                  R0225:  MOV     #-1,R3          ;INITIAL DEST OP = 177777
015760  000257                                  CCC                     ;CLEAR N:C

015762  006703                          I0225:  SXT     R3              ;TEST THE SXT
015764  103002                                  BCC     00225           ;BR IF "C" STILL CLEAR

015766  104000                          E0225:  ERROR                   ;SXT AFFECTED "C" BIT
015770  015754                                  R0225                   ;ERROR LOOP RETURN

015772  000004                          00225:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***************************************************************
                                                .SBTTL T0226 SXT MODE 0 TEST WITH N = 1 AND C = 1
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [132,360,001] FC 1,8

                                        ;ACT BUTS:      37[004]100,132 / 27[132]000,001

                                        ;EXEC:          [132]ALUC=LLLHH :[360] D = 177777

                                        ;CODES:         [360] SPS=3  /  N:C = 1001

                                        ;SYNC:          B05J2 (-) T = 1 USEC

                                        ;KEY SIG:       K3-3 DM=OL  /  K3-4 OVLAP INSTR H  /  K3-5 SXT L  /  K5-2 PS(N)(1)H

015774  012700  000226                  T0226:  MOV     #0226,R0                ;LOAD R0 WITH TEST NO.
016000  013701  016020                          MOV     @#I0226,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

016004  012704  177777                          MOV     #-1,R4          ;RESULT S / B = 177777
016010  012703  177703                          MOV     #177703,R3      ;DEST ADDR = 177703
016014  005003                          R0226:  CLR     R3              ;INITIAL DEST OP = 0
016016  000277                                  SCC                     ;MAKE N:C = 1111

016020  006703                          I0226:  SXT     R3              ;TEST THE SXT

016022  100003                                  BPL     E10226
016024  001402                                  BEQ     E10226          ;N:C = 1001?
016026  102401                                  BVS     E10226
016030  103402                                  BCS     A0226

016032  104000                          E10226: ERROR                   ;SXT FAILED TO ALTER CODES PROPERLY
016034  016014                                  R0226                   ;ERROR LOOP RETURN

016036  010305                          A0226:  MOV     R3,R5           ;GET RESULT
016040  005105                                  COM     R5              ;COMPLEMENT IT-SHOULD GO TO 0
016042  001402                                  BEQ     O0226           ;BR IF RESULT OF SXT = 1

016044  104000                          E20226: ERROR                   ;SXT DELIVERED WRONG RESULT.
016046  016014                                  R0226                   ;ERROR LOOP RETURN

016050  000004                           O0226: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; *****************************************************************
                                                .SBTTL T0227 SXT MODE 0 TEST WITH N = 1 AND C = 0
                                        ; *****************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [132,360,001] FC 1,8

                                        ;ACT BUTS:      37[004]100,132 / 27[132]000,001

                                        ;EXEC:          [132]ALUC=LLLHH :[360] D = 177777

                                        ;CODES:         [360] SPS=3  /  N:C = 1000

                                        ;SYNC:          B05J2 (-)  T = 1 USEC

                                        ;KEY SIG:       K3-3 DM = OL  /  K3-4 OVLAP INSTR H  /  K5-2 PS(N)(1) H

016052  012700  000227                  T0227:  MOV     #0227,R0                ;LOAD R0 WITH TEST NO.
016056  013701  016100                          MOV     @#I0227,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

016062  012704  177777                          MOV     #-1,R4          ;RESULT S / B = 177777
016066  012702  177703                          MOV     #177703,R2      ;DEST ADDR = 177703
016072  005003                          R0227:  CLR     R3              ;INITIAL DEST OP = 0
016074  000257                                  CCC                     ;CLEAR FLAGS
016076  000276                                  276                     ;MAKE N:C = 1110

016100  006703                          I0227:  SXT     R3              ;TEST THE SXT
016102  103002                                  BCC     O0227           ;BR IF ''C'' UNAFFECTED

016104  104000                          E0227:  ERROR                   ;SXT SET ''C'' BIT
016106  016072                                  R0227                   ;ERROR LOOP RETURN

016110  000004                          O0227:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0230 SXT MODE 1 AND 2 TEST WITH N = 0 AND C = 1
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:(DM1)  [161,266,267,234,367,375,016] FC 1,3,8
                                        ;       :(DM2)  [162,260,267,234,367,375,016] FC 1,3,8

                                        ;ACT BUTS:(DM1) 37[004]100,161 / 33[266]220,234 / 16[367]016,016
                                        ;       :(DM2)  37[004]100,162 / 33[260]220,234 / 16[367]016,016

                                        ;EXEC:          [234]ALUC=HLLHH :[367] D = 000000

                                        ;CODES:         [367] SPS=3  /  N:C = 0101

                                        ;SYNC:          B05J2 (-) T = 2.5 USEC

                                        ;KEY SIG:       K3-3 DM=1L  /  K3-5 SXT L  /  K3-8 ALUM H

016112  012700  000230                  T0230:  MOV     #0230,R0                ;LOAD R0 WITH TEST NO.
016116  013701  016140                          MOV     @#I10230,R1     ;LOAD R1 WITH TEST INSTRUCTION WORD

016122  012702  067560                          MOV     #MBUF0,R2       ;R2 POINTS TO DEST OP
016126  005004                                  CLR     R4              ;RESULT S / B = 0
016130  012712  177777                  R10230: MOV     #-1,(R2)        ;INITIAL [DEST] = 177777
016134  000257                                  CCC                     ;CLEAR CODES
016136  000263                                  263                     ;MAKE N:C = 0011

016140  006712                          I10230: SXT     (R2)            ;TEST THE SXT - DM1

016142  100403                                  BMI     E10230
016144  001002                                  BNE     E10230          ;N:C = 0101
016146  102401                                  BVS     E10230
016150  103402                                  BCS     A0230

016152  104000                          E10230: ERROR                   ;SXT FAILED TO ALTER CODES PROPERLY
016154  016130                                  R10230                  ;ERROR LOOP RETURN

016156  005712                          A0230:  TST     (R2)            ;DID RESULT = 0?
016160  001402                                  BEQ     R20230          ;BR IF YES

016162  104000                          E20230: ERROR                   ;SXT SHOULD HAVE ZEROED [DEST]
016164  016130                                  R10230                  ;ERROR LOOP RETURN

016166  012702  067560                  R20230: MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
016172  013701  016206                          MOV     @#I20230,R1     ;LOAD R1 WITH TEST INSTR WORD
016176  012712  177777                          MOV     #-1,(R2)        ;INITIAL [DEST] = 177777
016202  000257                                  CCC                     ;CLEAR CODES
016204  000263                                  263                     ;MAKE N:C = 0011

016206  006722                          I20230: SXT     (R2)+           ;TEST SXT - DM2

016210  100403                                  BMI     E30230          ;N:C = 0101 ?
016212  001002                                  BNE     E30230
016214  102401                                  BVS     E30230
```

```
016216  103402                          BCS     B0230

016220  104000                  E30230: ERROR                   ;SXT FAILED TO ALTER CODES PROPERLY
016222  016166                          R20230                  ;ERROR LOOP RETURN ADDRESS

016224  005737  067560          B0230:  TST     @#MBUF0         ;DID RESULT GET ZEROED ?
016230  001402                          BEQ     C0230           ;BR IF YES

016232  104000                  E40230: ERROR                   ;SXT FAILED TO ZERO [DEST]
016234  016166                          R20230                  ;ERROR LOOP RETURN ADDRESS

016236  020227  067562          C0230:  CMP     R2,#MBUF0+2     ;WAS IT REALLY MODE 2 ?
016242  001402                          BEQ     O0230           ;BR IF YES

016244  104000                  E50230: ERROR                   ;SXT FAILED TO AUTO INCREMENT
016246  016166                          R20230                  ;ERROR LOOP RETURN ADDRESS

016250  000004                  O0230:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0231 SXT MODE 1 TEST WITH N = 0 AND C = 0
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,234,367,375,016] FC 1,3,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,234 / 16[367]016,016

                                        ;EXEC:          [234]ALUC=HLLHH :[367] D = 000000

                                        ;CODES:         [367] SPS=3  /  N:C = 0100

                                        ;SYNC:          B05J2 (-) T = 2.5 USEC

                                        ;KEY SIG:       K3-3 DM=1L  /  K3-5 SXT L  /  K3-8 ALUM H

016252  012700  000231                  T0231:  MOV     #0231,R0                ;LOAD R0 WITH TEST NO.
016256  013701  016276                          MOV     @#I0231,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

016262  005004                                  CLR     R4              ;RESULT S / B = 0
016264  012702  067560                          MOV     #MBUF0,R2       ;R2 POINTS TO DEST OP
016270  012712  177777                  R0231:  MOV     #-1,(R2)        ;INITIAL [DEST] = 177777
016274  000257                                  CCC                     ;CLEAR ''C'' BIT

016276  006712                          I0231:  SXT     (R2)            ;TEST THE SXT
016300  103002                                  BCC     00231           ;BR IF ''C'' UNDISTURBED

016302  104000                          E0231:  ERROR                   ;SXT SET THE ''C'' BIT
016304  016270                                  R0231                   ;ERROR LOOP RETURN

016306  000004                           00231: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0232 SXT MODE 1 TEST WITH N = 1 AND C = 1
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,234,367,375,016] FC 1,3,8

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,234 / 16[367]016,016

                                ;EXEC:          [234]ALUC=LLLHH :[367] D = 177777

                                ;CODES:         [367] SPS=3  /  N:C =1001

                                ;SYNC:          B05J2 (-) T = 2.5 USEC

                                ;KEY SIG:       K3-3 DM=1L  /  K3-5 SXT L  /  K5-2 PS(N)(1)H

016310  012700  000232          T0232:  MOV     #0232,R0                ;LOAD R0 WITH TEST NO.
016314  013701  016334                  MOV     @#I0232,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

016320  012704  177777                  MOV     #-1,R4          ;RESULT S / B = 177777
016324  012702  067560                  MOV     #MBUF0,R2       ;R2 POINTS TO DEST OP
016330  005012                  R0232:  CLR     (R2)            ;INITIAL [DEST] = 0
016332  000277                          SCC                     ;MAKE N:C = 1111

016334  006712                  I0232:  SXT     (R2)            ;TEST THE SXT

016336  100003                          BPL     E10232
016340  001402                          BEQ     E10232          ;N:C = 1001?
016342  102401                          BVS     E10232
016344  103402                          BCS     A0232

016346  104000                  E10232: ERROR                   ;SXT FAILED TO ALTER CODES PROPERLY
016350  016330                          R0232                   ;ERROR LOOP RETURN

016352  021204                  A0232:  CMP     (R2),R4         ;RESULT = 177777?
016354  001402                          BEQ     00232           ;BR IF YES

016356  104000                  E20232: ERROR                   ;SXT DELIVERED WRONG RESULT
016360  016330                          R0232                   ;ERROR LOOP RETURN

016362  000004                  00232:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0233 SXT MODE 1 TEST WITH N = 1 AND C = 0
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,234,367,375,016] FC 1,3,8

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,234 / 16[367]016,016

                                ;EXEC:          [234]ALUC=LLLHH :[367] D = 177777

                                ;CODES:         [367] SPS=3  /  N:C = 1000

                                ;SYNC:          B05J2 (-) T = 2.5 USEC

                                ;KEY SIG:       K3-3 DM=1L  /  K3-5 SXT L  /  K5-2 PS(N)(1)H

016364  012700  000233          T0233:  MOV     #0233,R0                ;LOAD R0 WITH TEST NO.
016370  013701  016412                  MOV     @#I0233,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

016374  012704  177777                  MOV     #-1,R4          ;RESULT S / B = 177777
016400  012702  067560                  MOV     #MBUF0,R2       ;R2 POINTS TO DEST OP
016404  005012                  R0233:  CLR     (R2)            ;INITIAL [DEST] = 0
016406  000257                          CCC                     ;CLEAR FLAGS
016410  000276                          276                     ;MAKE N:C = 1110

016412  006712                  I0233:  SXT     (R2)            ;TEST THE SXT
016414  103002                          BCC     00233           ;BR IF ''C'' UNAFFECTED

016416  104000                  E0233:  ERROR                   ;SXT SET THE ''C'' BIT
016420  016404                          R0233                   ;ERROR LOOP RETURN

016422  000004                  00233:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***************************************************************
                                                .SBTTL T0234 SWAB MODE 0 TEST WITH POS. RESULT
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [134,135,360,001] FC 1,7,8

                                        ;ACT BUTS:      37[004]100,134 / 27[135]000,001

                                        ;EXEC:          [135]ALUC=HHLHL :[360] D = 177400

                                        ;CODES:         [360] SPS=3  /  N:C = 0100

                                        ;SYNC:          B05J2 (-) T = 1 USEC

                                        ;KEY SIG:       K2-5 SBML1 (1) H  /  K2-5 SMBL0 (1) L  /  K2-5 SBMH1 (1) H
                                                        ;  /  K2-5 SBMH0 (1) L  /  K3-3 DM=0L  /  K3-5 SWAB H  /  K3-4 OVLAP INS

016424  012700  000234          T0234:  MOV     #0234,R0                ;LOAD R0 WITH TEST NO.
016430  013701  016466                  MOV     @#I0234,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

016434  032737  000020  066642          BIT     #20,@#BPTLOC    ;BREAKPOINT HALT SET ??
016442  001401                          BEQ     .+4             ;BR IF NOT
016444  000000                          HALT                    ;BREAK - DEPRESS CONTINUE TO RESTART
016446  012704  177400                  MOV     #177400,R4      ;RESULT S / B = 177400
016452  012702  177703                  MOV     #177703,R2      ;DEST ADDR = 177703
016456  012703  000377          R0234:  MOV     #377,R3         ;INITIAL DEST OP = 377
016462  000257                          CCC                     ;CLEAR FLAGS
016464  000273                          273                     ;MAKE N:C = 1011

016466  000303                  I0234:  SWAB    R3              ;TEST THE SWAB

016470  100403                          BMI     E10234
016472  001002                          BNE     E10234          ;N:C = 0100
016474  102401                          BVS     E10234
016476  103002                          BCC     A0234

016500  104000                  E10234: ERROR                   ;SWAB FAILED TO ALTER CODES PROPERLY
016502  016456                          R0234                   ;ERROR LOOP RETURN

016504  020403                  A0234:  CMP     R4,R3           ;CORRECT RESULT?
016506  001402                          BEQ     O0234           ;BR IF YES

016510  104000                  E20234: ERROR                   ;SWAB DELIVERED WRONG RESULT
016512  016456                          R0234                   ;ERROR LOOP RETURN

016514  000004                  O0234:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                        .SBTTL T0235 SWAB MODE 0 TEST WITH NEG. RESULT
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [134,135,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,134 / 27[135]000,001

                                ;EXEC:          [135]ALUC=HHLHL :[360] D = 000377

                                ;CODES:         [360] SPS=3   /   N:C = 1000

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K2-5 SBML1 (1) H   /   K2-5 SBML0 (1) L   /   K2-5 SBMH1 (1) H
                                                ;   /   K2-5 SBMH0 (1) L   /   K3-3 DM=0L   /   K3-5 SWAB H   /   K3-4 0

016516  012700  000235          T0235:  MOV     #0235,R0                ;LOAD R0 WITH TEST NO.
016522  013701  016546                  MOV     @#I0235,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

016526  012704  000377                  MOV     #377,R4         ;RESULT S  /  B = 377
016532  012702  177703                  MOV     #177703,R2      ;DEST ADDR = 177703
016536  012703  177400          R0235:  MOV     #177400,R3      ;INITIAL DEST OP = 177400
016542  000257                          CCC                     ;CLEAR FLAGS
016544  000267                          267                     ;MAKE N:C = 0111

016546  000303                  I0235:  SWAB    R3              ;TEST THE SWAB

016550  100003                          BPL     E10235
016552  001402                          BEQ     E10235          ;DID SWAB MAKE N:C = 1000
016554  102401                          BVS     E10235
016556  103002                          BCC     A0235

016560  104000                  E10235: ERROR                   ;SWAB FAILED TO ALTER CODES PROPERLY
016562  016536                          R0235                   ;ERROR LOOP RETURN

016564  020403                  A0235:  CMP     R4,R3           ;DID SWAB DELIVER CORRECT RESULT?
016566  001402                          BEQ     00235           ;BR IF OK

016570  104000                  E20235: ERROR                   ;SWAB DELIVERED WRONG RESULT
016572  016536                          R0235                   ;ERROR LOOP RETURN

016574  000004                  00235:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0236 SWAB MODE 1 AND 2 TEST WITH POS. RESULT
                                ; ***********************************************************************

                                ;MICROPROGRAMMING   /   LOGIC INFORMATION

                                ;ROM SEQ:(DM1)  [161,266,267,236,367,375,016] FC 1,3,9,8
                                ;       :(DM2)  [162,260,267,236,367,375,016] FC 1,3,9,8

                                ;ACT BUTS:(DM1) 37[004]100,161  /  33[266]220,236  /  16[367]016,016
                                ;         (DM2) 37[004]100,162  /  33[260]220,236  /  16[367]016,016

                                ;EXEC:          [236]ALUC=HHLHL :[367] D = 177400

                                ;CODES:         [367] SPS=3   /   N:C = 0100

                                ;SYNC:          B05J2 (-) T = 2 USEC

                                ;KEY SIG:       K2-5 SBML1 (1) H   /   K2-5 SBML0 (1) L   /   K2-5 SBMH1 (1) H   /   K2-
                                                ;   K3-3 DM=1L   /   K3-5 SWAB H

016576  012700  000236          T0236:  MOV     #0236,R0                ;LOAD R0 WITH TEST NO.
016602  013701  016626                  MOV     @#I10236,R1     ;LOAD R1 WITH TEST INSTRUCTION WORD

016606  012704  177400                  MOV     #177400,R4      ;RESULT S  /  B = 177400
016612  012702  067560                  MOV     #MBUF0,R2       ;R2 POINTS TO DEST OP
016616  012712  000377          R10236: MOV     #377,(R2)       ;SET UP DEST OP = 377
016622  000257                          CCC                     ;CLEAR FLAGS
016624  000273                          273                     ;MAKE N:C = 1011

016626  000312                  I10236: SWAB    (R2)            ;TEST THE SWAB - DM1

016630  100403                          BMI     E10236
016632  001002                          BNE     E10236          ;N:C = 0100
016634  102401                          BVS     E10236
016636  103002                          BCC     A0236

016640  104000                  E10236: ERROR                   ;SWAB FAILED TO ALTER CODES PROPERLY
016642  016616                          R10236                  ;ERROR LOOP RETURN

016644  020412                  A0236:  CMP     R4,(R2)         ;CORRECT RESULT?
016646  001402                          BEQ     R20236          ;BR IF OK

016650  104000                  E20236: ERROR                   ;SWAB DELIVERED WRONG RESULT
016652  016616                          R10236                  ;ERROR LOOP RETURN

016654  013701  016674          R20236: MOV     @#I20236,R1     ;LOAD R1 WITH TEST INSTR. WORD
016660  012702  067560                  MOV     #MBUF0,R2       ;R2 POINTS TO DEST OP
016664  012712  000377                  MOV     #377,(R2)       ;[DEST] = 000377
016670  000257                          CCC                     ;CLEAR FLAGS
016672  000273                          273                     ;MAKE N:C = 1011

016674  000322                  I20236: SWAB    (R2)+           ;TEST THE SWAB - DM2

016676  100403                          BMI     E30236          ;N:C = 0100
016700  001002                          BNE     E30236
```

```
016702  102401                          BVS     E30236
016704  103002                          BCC     B0236

016706  104000                  E30236: ERROR                   ;SWAB FAILED TO SET CODES PROPERLY
016710  016654                          R20236                  ;ERROR LOOP RETURN ADDRESS

016712  020437  067560          B0236:  CMP     R4,@#MBUF0      ;CORRECT RESULT ?
016716  001402                          BEQ     C0236           ;BR IF YES

016720  104000                  E40236: ERROR                   ;SWAB DELIVERED THE WRONG RESULT
016722  016654                          R20236                  ;ERROR LOOP RETURN ADDRESS

016724  020227  067562          C0236:  CMP     R2,#MBUF0+2     ;DID AUTO INCREMENT OCCUR ?
016730  001402                          BEQ     00236           ;BR IF YES

016732  104000                  E50236: ERROR                   ;SWAB FAILED TO AUTO INC REG.
016734  016654                          R20236                  ;ERROR LOOP RETURN ADDRESS

016736  000004                   00236: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0237 SWAB MODE 1 TEST WITH NEG. RESULT
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,236,367,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,134 / 33[266]220,236 / 16[367]016,016

                                        ;EXEC:          [236]ALUC=HHLHL :[367] D = 000377

                                        ;CODES:         [367] SPS=3  /  N:C = 1000

                                        ;SYNC:          B05J2 (-) T = 2 USEC

                                        ;KEY SIG:       K2-5 SBML1 (1) H  /  K2-5 SBML0 (1) L  /  K2-5 SBMH2 (1) H  /  K2-5 SBMH
                                                        ;  K3-3 DM=1L  /  K3-5 SWAB H

016740 . 012700  000237                 T0237:  MOV     #0237,R0                ;LOAD R0 WITH TEST NO.
016744   013701  016770                         MOV     @#I0237,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

016750   012704  000377                         MOV     #377,R4         ;RESULT S / B = 377
016754   012702  067560                         MOV     #MBUF0,R2       ;R2 POINTS TO DEST OP
016760   012712  177400                 R0237:  MOV     #177400,(R2)    ;SET UP DEST. OP = 177400
016764   000257                                 CCC                     ;CLEAR FLAGS
016766   000267                                 267                     ;MAKE N:C = 0111

016770   000312                         I0237:  SWAB    (R2)            ;TEST THE SWAB

016772   100003                                 BPL     E10237
016774   001402                                 BEQ     E10237          ;N:C = 1000?
016776   102401                                 BVS     E10237
017000   103002                                 BCC     A0237

017002   104000                         E10237: ERROR                   ;SWAB FAILED TO ALTER CODES PROPERLY
017004   016760                                 R0237                   ;ERROR LOOP RETURN

017006   020412                         A0237:  CMP     R4,(R2)         ;CORRECT RESULT?
017010   001402                                 BEQ     O0237           ;BR IF YES

017012   104000                         E20237: ERROR                   ;SWAB DELIVERED WRONG RESULT
017014   016760                                 R0237                   ;ERROR LOOP RETURN

017016   000004                         O0237:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                ; ***************************************************************
                                        .SBTTL T0240 NEG MODE 0 TEST : [DEST] = 0
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [105,372,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,105 / 31[105]360,360 / 27[372]000,001

                                ;EXEC:          [372]ALUC=LLHHL :[360] D = 000000

                                ;CODES:         [360] SPS=3  /  N:C = 0100

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K3-8 CIN00 L  /  K3-3 DM=0L  /  K3-4 NEG L  /  K3-4 OVLAP INSTR H

017020  012700  000240          T0240:  MOV     #0240,R0                ;LOAD R0 WITH TEST NO.
017024  013701  017044                  MOV     @#I0240,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

017030  012702  177703                  MOV     #177703,R2      ;DEST ADDR = 177703
017034  005004                          CLR     R4              ;RESULT S / B = 0
017036  005003                  R0240:  CLR     R3              ;INITIAL [DEST] = 0
017040  000257                          CCC                     ;CLEAR FLAGS
017042  000273                          273                     ;MAKE N:C = 1011

017044  005403                  I0240:  NEG     R3              ;TEST THE NEG

017046  100403                          BMI     E10240
017050  001002                          BNE     E10240          ;N:C = 0100 ONLY 'Z' SET?
017052  102401                          BVS     E10240
017054  103002                          BCC     A0240

017056  104000                  E10240: ERROR                   ;NEG FAILED TO ALTER CODES PROPERLY
017060  017036                          R0240                   ;ERROR LOOP RETURN

017062  020304                  A0240:  CMP     R3,R4           ;WAS RESULT = 0
017064  001402                          BEQ     O0240           ;BR IF YES

017066  104000                  E20240: ERROR                   ;NEG DELIVERED WRONG RESULT
017070  017036                          R0240                   ;ERROR LOOP RETURN

017072  000004                   O0240: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0241 NEG MODE 0 TEST : [DEST] > 0
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [105,372,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,105 / 31[105]360,360 / 27[372]000,001

                                ;EXEC:          [372]ALUC=LLHHL :[360] D = 177776

                                ;CODES:         [360] SPS=3  /  N:C = 1001

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K3-8 CIN00 L  /  K3-3 DM=0L  /  K3-4 NEG L  /  K3-4 OVLAP INSTR H

017074  012700  000241          T0241:  MOV     #0241,R0                ;LOAD R0 WITH TEST NO.
017100  013701  017124                  MOV     @#I0241,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

017104  012702  177703                  MOV     #177703,R2      ;DEST ADDR = 177703
017110  012704  177776                  MOV     #-2,R4          ;RESULT S / B = 177776
017114  012703  000002          R0241:  MOV     #2,R3           ;INITIAL [DEST] = 2
017120  000257                          CCC                     ;CLEAR FLAGS
017122  000266                          266                     ;MAKE N:C = 0110

017124  005403                  I0241:  NEG     R3              ;TEST THE NEG

017126  100003                          BPL     E10241
017130  001402                          BEQ     E10241          ;DID N:C = 1001?
017132  102401                          BVS     E10241
017134  103402                          BCS     A0241

017136  104000                  E10241: ERROR                   ;NEGATE FAILED TO ALTER CODES PROPERLY
017140  017114                          R0241                   ;ERROR LOOP RETURN

017142  020304                  A0241:  CMP     R3,R4           ;CORRECT RESULT?
017144  001402                          BEQ     O0241           ;BR IF YES

017146  104000                  E20241: ERROR                   ;NEG DELIVERED WRONG RESULT
017150  017114                          R0241                   ;ERROR LOOP RETURN

017152  000004                  O0241:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                ; ***********************************************************************
                                        .SBTTL T0242 NEG MODE 0 TEST : [DEST] < 0
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [105,372,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,105 / 31[105]360,360 / 27[372]000,001

                                ;EXEC:          [372]ALUC=LLHHL :[360] D = 000002

                                ;CODES:         [360] SPS=3  /  N:C = 0001

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K3-8 CIN00 L  /  K3-3 DM=0L  /  K3-4 NEG L  /  K3-4 OVLAP INSTR H

017154  012700  000242          T0242:  MOV     #0242,R0                ;LOAD R0 WITH TEST NO.
017160  013701  017204                  MOV     @#I0242,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

017164  012702  177703                  MOV     #177703,R2      ;DEST ADDR = 177703
017170  012704  000002                  MOV     #2,R4           ;RESULT S / B = 2
017174  012703  177776          R0242:  MOV     #-2,R3          ;INITIAL [DEST] = 177776
017200  000257                          CCC                     ;CLEAR FLAGS
017202  000276                          276                     ;MAKE N:C = 1110

017204  005403                  I0242:  NEG     R3              ;TEST THE NEG

017206  100403                          BMI     E10242
017210  001402                          BEQ     E10242          ;N:C = 0001?
017212  102401                          BVS     E10242
017214  103402                          BCS     A0242

017216  104000                  E10242: ERROR                   ;NEG FAILED TO ALTER CODES PROPERLY
017220  017174                          R0242                   ;ERROR LOOP RETURN

017222  020304                  A0242:  CMP     R3,R4           ;RESULT = 2?
017224  001402                          BEQ     O0242           ;BR IF YES

017226  104000                  E20242: ERROR                   ;NEG DELIVERED WRONG RESULT
017230  017174                          R0242                   ;ERROR LOOP RETURN

017232  000004                  O0242:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0243 NEG MODE 0 TEST : [DEST] = 100000 (8)
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [105,372,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,105 / 31[105]360,360 / 27[372]000,001

                                ;EXEC:          [372]ALUC=LLHHL :[360] D = 100000

                                ;CODES:         [360] SPS=3  /  N:C = 1011

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K3-8 CIN00 L  /  K3-3 DM=0L  /  K3-4 NEG L  /  K3-4 OVLAP INSTR H

017234  012700  000243          T0243:  MOV     #0243,R0                ;LOAD R0 WITH TEST NO.
017240  013701  017262                  MOV     @#I0243,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

017244  012702  177703                  MOV     #177703,R2      ;DEST ADDR = 177703
017250  012704  100000                  MOV     #100000,R4      ;RESULT S / B = 100000
017254  010403                  R0243:  MOV     R4,R3           ;INITIAL [DEST] = 100000
017256  000257                          CCC                     ;CLEAR FLAGS
017260  000264                          SEZ                     ;MAKE N:C = 01000

017262  005403                  I0243:  NEG     R3              ;TEST THE NEG

017264  100003                          BPL     E10243
017266  001402                          BEQ     E10243          ;N:C = 1011?
017270  102001                          BVC     E10243
017272  103402                          BCS     A0243

017274  104000                  E10243: ERROR                   ;NEG FAILED TO ALTER CODES PROPERLY
017276  017254                          R0243                   ;ERROR LOOP RETURN

017300  020304                  A0243:  CMP     R3,R4           ;RESULT STILL 100000?
017302  001402                          BEQ     00243           ;BR IF YES

017304  104000                  E20243: ERROR                   ;NEG DELIVERED WRONG RESULT
017306  017254                          R0243                   ;ERROR LOOP RETURN

017310  000004                  00243:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***************************************************************
                                                .SBTTL T0244 NEG MODE 1 TEST : [DEST] = 0
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,221,367,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,221 / 16[367]016,016

                                        ;EXEC:          [221]ALUC=LLHHL :[367] D = 000000

                                        ;CODES:         [367] SPS=3  /  N:C = 0100

                                        ;SYNC:          B05J2 (-) T = 2 USEC

                                        ;KEY SIG:       K3-8 CIN00 L  /  K3-3 DM=1L  /  K3-4 NEG L

017312  012700  000244                  T0244:  MOV     #0244,R0                ;LOAD R0 WITH TEST NO.
017316  013701  017336                          MOV     @#I0244,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

017322  012702  067560                          MOV     #MBUF0,R2       ;R2 POINTS TO DEST OP
017326  005004                                  CLR     R4              ;RESULT S / B = 0
017330  005012                          R0244:  CLR     (R2)            ;INITIAL [DEST] = 0
017332  000257                                  CCC                     ;CLEAR FLAGS
017334  000273                                  273                     ;MAKE N:C = 1011

017336  005412                          I0244:  NEG     (R2)            ;TEST THE NEG

017340  100403                                  BMI     E10244
017342  001002                                  BNE     E10244          ;N:C = 0100?
017344  102401                                  BVS     E10244
017346  103002                                  BCC     A0244

017350  104000                          E10244: ERROR                   ;NEG FAILED TO ALTER CODES PROPERLY
017352  017330                                  R0244                   ;ERROR LOOP RETURN

017354  021204                          A0244:  CMP     (R2),R4         ;RESULT = 0?
017356  001402                                  BEQ     O0244           ;BR IF YES

017360  104000                          E20244: ERROR                   ;NEG DELIVERED WRONG RESULT
017362  017330                                  R0244                   ;ERROR LOOP RETURN

017364  000004                           O0244: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                ; ***************************************************************
                                        .SBTTL T0245 NEG MODE 1  TEST : [DEST] > 0
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,221,367,375,016] FC 1,3,9,8

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,221 / 16[367]016,016

                                ;EXEC:          [221]ALUC=LLHHL :[367] D = 177776

                                ;CODES:         [367] SPS=3  /  N:C = 1001

                                ;SYNC:          B05J2 (-)  T = 2 USEC

                                ;KEY SIG:       K3-8 CIN00 L  /  K3-3 DM=1L  /  K3-4 NEG L

017366  012700  000245          T0245:  MOV     #0245,R0                ;LOAD R0 WITH TEST NO.
017372  013701  017416                  MOV     @#I0245,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

017376  012702  067560                  MOV     #MBUF0,R2       ;R2 POINTS TO DEST OP
017402  012704  177776                  MOV     #-2,R4          ;RESULT S / B = 177776
017406  012712  000002          R0245:  MOV     #2,(R2)         ;INITIAL [DEST] = 2
017412  000257                          CCC                     ;CLEAR FLAGS
017414  000266                          266                     ;MAKE N:C = 0110

017416  005412                  I0245:  NEG     (2)             ;TEST THE NEG

017420  100003                          BPL     E10245
017422  001402                          BEQ     E10245          ;N:C = 1001?
017424  102401                          BVS     E10245
017426  103402                          BCS     A0245

017430  104000                  E10245: ERROR                   ;NEG FAILED TO ALTER CODES PROPERLY
017432  017406                          R0245                   ;ERROR LOOP RETURN

017434  021204                  A0245:  CMP     (R2),R4         ;CORRECT RESULT?
017436  001402                          BEQ     00245           ;BR IF YES

017440  104000                  E20245: ERROR                   ;NEG DELIVERED WRONG RESULT
017442  017406                          R0245                   ;ERROR LOOP RETURN

017444  000004                  00245:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                        .SBTTL T0246 NEG MODE 1 TEST : [DEST] < 0
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,221,367,375,016] FC 1,3,9,8

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,221 / 16[367]016,016

                                ;EXEC:          [221]ALUC=LLHHL :[367] D = 000002

                                ;CODES:         [367] SPS=3  /. N:C = 0001

                                ;SYNC:          B05J2 (-) T = 2 USEC

                                ;KEY SIG:       K3-8 CIN00 L  /  K3-3 DM=1L  /  K3-4 NEG L

017446  012700  000246          T0246:  MOV     #0246,R0                ;LOAD R0 WITH TEST NO.
017452  013701  017476                  MOV     @#I0246,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

017456  012702  067560                  MOV     #MBUF0,R2       ;R2 POINTS TO DEST OP
017462  012704  000002                  MOV     #2,R4           ;RESULT S / B = 2
017466  012712  177776          R0246:  MOV     #-2,(R2)        ;INITIAL [DEST] = 177776
017472  000257                          CCC                     ;CLEAR FLAGS
017474  000276                          276                     ;MAKE N:C = 1110

017476  005412                  I0246:  NEG     (R2)            ;TEST THE NEG

017500  100403                          BMI     E10246
017502  001402                          BEQ     E10246          ;N:C = 0001?
017504  102401                          BVS     E10246
017506  103402                          BCS     A0246

017510  104000                  E10246: ERROR                   ;NEG FAILED TO ALTER CODES PROPERLY
017512  017466                          R0246                   ;ERROR LOOP RETURN

017514  021204                  A0246:  CMP     (R2),R4         ;CORRECT RESULT = 2?
017516  001402                          BEQ     00246           ;BR IF YES

017520  104000                  E20246: ERROR                   ;NEG DELIVERED WRONG RESULT
017522  017466                          R0246                   ;ERROR LOOP RETURN

017524  000004                   00246: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0247 NEG MODE 1 TEST: [DEST] = 100000 (8)
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,221,367,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,221 / 16[367]016,016

                                        ;EXEC:          [221]ALUC=LLHHL :[367] D = 100000

                                        ;CODES:         [367] SPS=3  /  N:C = 1011

                                        ;SYNC:          B05J2 (-) T = 2 USEC

                                        ;KEY SIG:       K3-8 CIN00 L  /  K3-3 DM=1L  /  K3-4 NEG L

017526  012700  000247                  T0247:  MOV     #0247,R0                ;LOAD R0 WITH TEST NO.
017532  013701  017554                          MOV     @#I0247,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

017536  012702  067560                          MOV     #MBUF0,R2       ;R2 POINTS TO DEST OP
017542  012704  100000                          MOV     #100000,R4      ;RESULT S / B = 100000
017546  010412                          R0247:  MOV     R4,(R2)         ;INITIAL [DEST] = 100000
017550  000257                                  CCC                     ;CLEAR FLAGS
017552  000264                                  SEZ                     ;MAKE N:Z = 0100

017554  005412                          I0247:  NEG     (R2)            ;TEST THE NEG

017556  100003                                  BPL     E10247
017560  001402                                  BEQ     E10247          ;N:C = 1011?
017562  102001                                  BVC     E10247
017564  103402                                  BCS     A0247

017566  104000                          E10247: ERROR                   ;NEG FAILED TO ALTER CODES PROPERLY
017570  017546                                  R0247                   ;ERROR LOOP RETURN

017572  021204                          A0247:  CMP     (R2),R4         ;CORRECT RESULT = 100000?
017574  001402                                  BEQ     O0247           ;BR IF YES

017576  104000                          E20247: ERROR                   ;NEG DELIVERED WRONG RESULT
017600  017546                                  R0247                   ;ERROR LOOP RETURN

017602  000004                          O0247:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0250 ROR TEST - DM0 - <N:C> = 1110
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [106,271,274,001] FC 1,9

                                ;ACT BUTS:      37[004]100,106 / 27[271]000,001

                                ;EXEC:          [106]ALUC=LLLLL :[271] D = 052525

                                ;CODES:         [106] SPS=1, [274] SPS=2  /  N:C = 0000

                                ;SYNC:          B05J2 (-) T = 1.25 USEC

                                ;KEY SIG:       K2-5 SDM1 (1) H  /  K2-5 SDM0 (1) H  /  K3-3 DM=0L  /  K3-4 OVLAP INSTR
                                                ;  K3-8 ROT (R)L  /  K3-8 ROTSHF (R)H

017604  012700  000250          T0250:  MOV     #0250,R0                ;LOAD R0 WITH TEST NO.
017610  013701  017634                  MOV     @#I0250,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
017614  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
017620  012704  052525                  MOV     #52525,R4       ;RESULT S / B = 52525
017624  012703  125252          R0250:  MOV     #125252,R3      ;[DEST] = 125252
017630  000257                          CCC                     ;CLEAR FLAGS
017632  000276                          276                     ;N:C = 1111

017634  006003                  I0250:  ROR     R3              ;TEST THE ROR

017636  100403                          BMI     E10250          ;N:C = 0000 ?
017640  001402                          BEQ     E10250
017642  102401                          BVS     E10250
017644  103002                          BCC     A0250

017646  104005                  E10250: ERROR5                  ;ROR FAILED TO ALTER CODES PROPERLY
017650  017624                          R0250                   ;ERROR LOOP RETURN ADDRESS

017652  020403                  A0250:  CMP     R4,R3           ;CORRECT RESULT ?
017654  001402                          BEQ     00250           ;BR IF YES

017656  104000                  E20250: ERROR                   ;ROR DELIVERED THE WRONG RESULT
017660  017624                          R0250                   ;ERROR LOOP RETURN

017662  000004                  00250:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0251 ROR TEST - DM0 - <N:C> = 1000
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [106,271,274,001] FC 1,9

                                        ;ACT BUTS:      37[004]100,106 / 27[271]000,001

                                        ;EXEC:          [106]ALUC=LLLLL :[271] D = 000000

                                        ;CODES:         [106] SPS=1, [274] SPS=2  /  N:C = 0111

                                        ;SYNC:          B05J2 (-) T = 1.25 USEC

                                        ;KEY SIG:       K2-5 SDM1 (1) H  /  K2-5 SDM0 (1) H  /  K3-3 DM=0L  /  K3-8 ROT (R)H
                                                        ;  K3-8 ROTSHF (R)H  /  K3-4 OVLAP INSTR H

017664  012700  000251          T0251:  MOV     #0251,R0                ;LOAD R0 WITH TEST NO.
017670  013701  017712                  MOV     @#I0251,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
017674  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
017700  005004                          CLR     R4              ;RESULT S / B = 000000
017702  012703  000001          R0251:  MOV     #1,R3           ;[DEST] = 1
017706  000257                          CCC                     ;CLEAR FLAGS
017710  000270                          SEN                     ;N:C = 1000

017712  006003                  I0251:  ROR     R3              ;TEST THE ROR

017714  100403                          BMI     E10251          ;N:C = 0111 ?
017716  001002                          BNE     E10251
017720  102001                          BVC     E10251
017722  103402                          BCS     A0251

017724  104005                  E10251: ERROR5                  ;ROR FAILED TO ALTER CODES PROPERLY
017726  017702                          R0251                   ;ERROR LOOP RETURN ADDRESS

017730  020403                  A0251:  CMP     R4,R3           ;CORRECT RESULT ?
017732  001402                          BEQ     00251           ;BR IF YES

017734  104000                  E20251: ERROR                   ;ROR DELIVERED THE WRONG RESULT
017736  017702                          R0251                   ;ERROR LOOP RETURN

017740  000004                  00251:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0252 ROR TEST - DM0 - <N:C> = 0111
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [106,271,274,001] FC 1,9

                                ;ACT BUTS:      37[004]100,106 / 27[271]000,001

                                ;EXEC:          [106]ALUC=LLLLL :[271] D = 125252

                                ;CODES:         [106] SPS=1, [274] SPS=2  /  N:C = 1001

                                ;SYNC:          B05J2 (-) T = 1.25 USEC

                                ;KEY SIG:       K1-5 D(C)(1) H  /  K2-5 SDM1 (1) H  /  K2-5 SDM0 (1) H  /  K3-8 ROT (R)
                                                ;  /  K3-8 ROTSHF (R)H  /  K3-3 DM=0L  /  K3-4 OVLAP INSTR H

017742  012700  000252          T0252:  MOV     #0252,R0                ;LOAD R0 WITH TEST NO.
017746  013701  017772                  MOV     @#I0252,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
017752  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
017756  012704  125252                  MOV     #125252,R4      ;RESULT S / B = 125252
017762  012703  052525          R0252:  MOV     #52525,R3       ;[DEST] = 052525
017766  000257                          CCC                     ;CLEAR FLAGS
017770  000267                          267                     ;N:C = 0111

017772  006003                  I0252:  ROR     R3              ;TEST THE ROR

017774  100003                          BPL     E10252          ;N:C = 1001 ?
017776  001402                          BEQ     E10252
020000  102401                          BVS     E10252
020002  103402                          BCS     A0252

020004  104005                  E10252: ERROR5                  ;ROR FAILED TO ALTER CODES PROPERLY
020006  017762                          R0252                   ;ERROR LOOP RETURN ADDRESS

020010  020403                  A0252:  CMP     R4,R3           ;CORRECT RESULT ?
020012  001402                          BEQ     00252           ;BR IF YES

020014  104000                  E20252: ERROR                   ;ROR DELIVERED THE WRONG RESULT
020016  017762                          R0252                   ;ERROR LOOP RETURN

020020  000004                  00252:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0253 ASR TEST - DM0 - <N:C> = 1000
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [106,271,274,001] FC 1,9

                                ;ACT BUTS:      37[004]100,106 / 27[271]000,001

                                ;EXEC:          [106]ALUC=LLLLL :[271] D = 000000

                                ;CODES:         [106] SPS=1, [274] SPS=2  /  N:C = 0111

                                ;SYNC:          B05J2 (-) T = 1.25 USEC

                                ;KEY SIG:       K2-5 SDM1 (1) H  /  K2-5 SDM0 (1) H  /  K3-3 DM=0L  /  K3-8 SHF (R)L
                                                ;  K3-8 ROTSHF (R)H  /  K3-4 OVLAP INSTR H

020022  012700  000253          T0253:  MOV     #0253,R0                ;LOAD R0 WITH TEST NO.
020026  013701  020050                  MOV     @#10253,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
020032  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
020036  005004                          CLR     R4              ;RESULT S / B = 000000
020040  012703  000001          R0253:  MOV     #1,R3           ;[DEST] = 1
020044  000257                          CCC                     ;CLEAR FLAGS
020046  000270                          SEN                     ;N:C = 1000

020050  006003                  I0253:  ROR     R3              ;TEST THE ROR

020052  100403                          BMI     E10253          ;N:C = 0111 ?
020054  001002                          BNE     E10253
020056  102001                          BVC     E10253
020060  103402                          BCS     A0253

020062  104005                  E10253: ERROR5                  ;ROR FAILED TO ALTER CODES PROPERLY
020064  020040                          R0253                   ;ERROR LOOP RETURN ADDRESS

020066  020403                  A0253:  CMP     R4,R3           ;CORRECT RESULT ?
020070  001402                          BEQ     O0253           ;BR IF YES

020072  104000                  E20253: ERROR                   ;ROR DELIVERED THE WRONG RESULT
020074  020040                          R0253                   ;ERROR LOOP RETURN

020076  000004                  O0253:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0254 ASR TEST - DM0 - <N:C> = 0101
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [106,271,274,001] FC 1,9

                                        ;ACT BUTS:      37[004]100,106 / 27[271]000,001

                                        ;EXEC:          [106]ALUC=LLLLL :[271] D = 152525

                                        ;CODES:         [106] SPS=1, [274] SPS=2  /  N:C = 1010

                                        ;SYNC:          B05J2 (-) T = 1.25 USEC

                                        ;KEY SIG:       K2-5 SDM1 (1) H  /  K2-5 SDM0 (1) H  /  K3-3 DM=0L  /  K1-5 D(C)(1)H
                                                        ;  /  K3-4 OVLAP INSTR H  /  K3-8 SHF (R)L  /  K3-8 ROTSHF (R) H

020100  012700  000254          T0254:  MOV     #0254,R0                ;LOAD R0 WITH TEST NO.
020104  013701  020130                  MOV     @#I0254,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
020110  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
020114  012704  152525                  MOV     #152525,R4      ;RESULT S / B = 152525
020120  012703  125252          R0254:  MOV     #125252,R3      ;[DEST] = 125252
020124  000257                          CCC                     ;CLEAR FLAGS
020126  000265                          265                     ;N:C = 0101

020130  006003                  I0254:  ROR     R3              ;TEST THE ROR

020132  100003                          BPL     E10254          ;N:C = 1010 ?
020134  001402                          BEQ     E10254
020136  102001                          BVC     E10254
020140  103002                          BCC     A0254

020142  104005                  E10254: ERROR5                  ;ROR FAILED TO ALTER CODES PROPERLY
020144  020120                          R0254                   ;ERROR LOOP RETURN ADDRESS

020146  020403                  A0254:  CMP     R4,R3           ;CORRECT RESULT ?
020150  001402                          BEQ     O0254           ;BR IF YES

020152  104000                  E20254: ERROR                   ;ROR DELIVERED THE WRONG RESULT
020154  020120                          R0254                   ;ERROR LOOP RETURN

020156  000004                  O0254:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                ; ************************************************************************
                                        .SBTTL T0255 ASR TEST - DM0 - <N:C> = 1100
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [106,271,274,001] FC 1,9

                                ;ACT BUTS:      37[004]100,106 / 27[271]000,001

                                ;EXEC:          [106]ALUC=LLLLL :[271] D = 025252

                                ;CODES:         [106] SPS=1, [274] SPS=2  /  N:C = 0011

                                ;SYNC:          B05J2 (-) T = 1.25 USEC

                                ;KEY SIG:       K2-5 SDM1 (1) H  /  K2-5 SDM0 (1) H  /  K3-3 DM=0L  /  K3-8 SHF (R)L
                                                ;  K3-8 ROTSHF (R)H  /  K3-4 OVLAP INSTR H

020160  012700  000255          T0255:  MOV     #0255,R0                ;LOAD R0 WITH TEST NO.
020164  013701  020210                  MOV     @#I0255,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
020170  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
020174  012704  025252                  MOV     #25252,R4       ;RESULT S / B = 25252
020200  012703  052525          R0255:  MOV     #52525,R3       ;[DEST] = 52525
020204  000257                          CCC                     ;CLEAR FLAGS
020206  000274                          274                     ;N:C = 1100

020210  006003                  .I0255: ROR     R3              ;TEST THE ROR

020212  100403                          BMI     E10255          ;N:C = 0011 ?
020214  001402                          BEQ     E10255
020216  102001                          BVC     E10255
020220  103402                          BCS     A0255

020222  104005                  E10255: ERROR5                  ;ROR FAILED TO ALTER CODES PROPERLY
020224  020200                          R0255                   ;ERROR LOOP RETURN ADDRESS

020226  020403                  A0255:  CMP     R4,R3           ;CORRECT RESULT ?
020230  001402                          BEQ     00255           ;BR IF YES

020232  104000                  E20255: ERROR                   ;ROR DELIVERED THE WRONG RESULT
020234  020200                          R0255                   ;ERROR LOOP RETURN

020236  000004                  00255:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0256 ROR TEST - DM1 - <N:C> = 1110
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,232,275,277,376,016] FC 1,3,9

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,232 / 16[277]016,016

                                ;EXEC:          [232]ALUC=HHLHL :[275] D = 052525

                                ;CODES:         [232] SPS=1, [277] SPS=2  /  N:C = 0000

                                ;SYNC:          B05J2 (-) T = 2 USEC

                                ;KEY SIG:       K3-3 DM=1L  /  K3-6 ROTSHF L  /  K3-8 ROT (R) L  /  K3-8 ROTSHF (R) L
                                                ;  K2-5 SDM1 (1) H  /  K2-5 SDM0 (1) L

020240  012700  000256          T0256:  MOV     #0256,R0                ;LOAD R0 WITH TEST NO.
020244  013701  020270                  MOV     @#I0256,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
020250  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
020254  012704  052525                  MOV     #52525,R4       ;RESULT S / B = 52525
020260  012712  125252          R0256:  MOV     #125252,(R2)    ;[DEST] = 125252
020264  000257                          CCC                     ;CLEAR FLAGS
020266  000276                          276                     ;N:C = 1110

020270  006012                  I0256:  ROR     (R2)            ;TEST THE ROR

020272  100403                          BMI     E10256          ;N:C = 0000 ?
020274  001402                          BEQ     E10256
020276  102401                          BVS     E10256
020300  103002                          BCC     A0256

020302  104005                  E10256: ERROR5                  ;ROR FAILED TO ALTER CODES PROPERLY
020304  020260                          R0256                   ;ERROR LOOP RETURN

020306  020412                  A0256:  CMP     R4,(R2)         ;CORRECT RESULT ?
020310  001403                          BEQ     00256           ;BR IF YES

020312  011203                          MOV     (R2),R3         ;GET THE WAS DATA
020314  104000                  E20256: ERROR                   ;ROR DELIVERED WRONG RESULT
020316  020260                          R0256                   ;ERROR LOOP RETURN ADDRESS

020320  000004                  00256:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0257 ROR TEST - DM1 - <N:C> = 1000
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,232,275,277,376,016] FC 1,3,9

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,232 / 16[277]016,016

                                        ;EXEC:          [232]ALUC=HHLHL :[275] D = 000000

                                        ;CODES:         [232] SPS=1, [277] SPS=2  /  N:C = 0111

                                        ;SYNC:          B05J2 (-) T = 2 USEC

                                        ;KEY SIG:       K3-3 DM=1L  /  K3-6 ROTSHF L  /  K3-8 ROT (R) L  /  K3-8 ROTSHF (R) L
                                                        ;  K2-5 SDM1 (1) H  /  K2-5 SDM0 (1) L

020322  012700  000257          T0257:  MOV     #0257,R0                ;LOAD R0 WITH TEST NO.
020326  013701  020350                  MOV     @#I0257,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
020332  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
020336  005004                          CLR     R4              ;RESULT S / B = 000000
020340  012712  000001          R0257:  MOV     #1,(R2)         ;[DEST] = 1
020344  000257                          CCC                     ;CLEAR FLAGS
020346  000270                          SEN                     ;N:C = 1000

020350  006012                  I0257:  ROR     (R2)            ;TEST THE ROR

020352  100403                          BMI     E10257          ;N:C = 0111 ?
020354  001002                          BNE     E10257
020356  102001                          BVC     E10257
020360  103402                          BCS     A0257

020362  104005                  E10257: ERROR5                  ;ROR FAILED TO ALTER CODES PROPERLY
020364  020340                          R0257                   ;ERROR LOOP RETURN

020366  020412                  A0257:  CMP     R4,(R2)         ;CORRECT RESULT ?
020370  001403                          BEQ     00257           ;BR IF YES

020372  011203                          MOV     (R2),R3         ;GET THE WAS DATA
020374  104000                  E20257: ERROR                   ;ROR DELIVERED WRONG RESULT
020376  020340                          R0257                   ;ERROR LOOP RETURN ADDRESS

020400  000004                  00257:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0260 ROR TEST - DM1 - <N:C> = 0111
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,232,275,277,376,016] FC 1,3,9

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,232 / 16[277]016,016

                                        ;EXEC:          [232]ALUC=HHLHL :[275] D = 125252

                                        ;CODES:         [232] SPS=1, [277] SPS=2  /  N:C = 1001

                                        ;SYNC:          B05J2 (-) T = 2 USEC

                                        ;KEY SIG:       K3-3 DM=1L  /  K3-6 ROTSHF L  /  K3-8 ROT (R) L  /  K3-8 ROTSHF (R) L
                                                        ;  /  K2-5 SDM1 (1) H  /  K2-5 SDM0 (1) L  /  K1-5 D(C)(1) H

020402  012700  000260          T0260:  MOV     #0260,R0                ;LOAD R0 WITH TEST NO.
020406  013701  020432                  MOV     @#I0260,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
020412  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
020416  012704  125252                  MOV     #125252,R4      ;RESULT S / B = 125252
020422  012712  052525          R0260:  MOV     #52525,(R2)     ;[DEST] = 52525
020426  000257                          CCC                     ;CLEAR FLAGS
020430  000267                          267                     ;N:C = 0111

020432  006012                  I0260:  ROR     (R2)            ;TEST THE ROR

020434  100003                          BPL     E10260          ;N:C = 1001 ?
020436  001402                          BEQ     E10260
020440  102401                          BVS     E10260
020442  103402                          BCS     A0260

020444  104005                  E10260: ERROR5                  ;ROR FAILED TO ALTER CODES PROPERLY
020446  020422                          R0260                   ;ERROR LOOP RETURN

020450  020412                  A0260:  CMP     R4,(R2)         ;CORRECT RESULT ?
020452  001403                          BEQ     00260           ;BR IF YES

020454  011203                          MOV     (R2),R3         ;GET THE WAS DATA
020456  104000                  E20260: ERROR                   ;ROR DELIVERED WRONG RESULT
020460  020422                          R0260                   ;ERROR LOOP RETURN ADDRESS

020462  000004                  00260:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0261 ASR TEST - DM1 - <N:C> = 1000
                                ; ***********************************************************************

                                ;MICROPROGRAMMING   /   LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,232,275,277,376,016] FC 1,3,9

                                ;ACT BUTS:      37[004]100,161  /  33[266]220,232  /  16[277]016,016

                                ;EXEC:          [232]ALUC=HHLHL :[275] D = 000000

                                ;CODES:         [232] SPS=1, [277] SPS=2   /   N:C = 0111

                                ;SYNC:          B05J2 (-) T = 2 USEC

                                ;KEY SIG:       K3-3 DM=1L   /   K3-6 ROTSHF L   /   K3-8 SHF (R) L   /   K3-8 ROTSHF (R
                                                ;   K2-5 SDM1 (1) H   /   K2-5 SDM0 (1) L

020464  012700  000261          T0261:  MOV     #0261,R0                ;LOAD R0 WITH TEST NO.
020470  013701  020512                  MOV     @#I0261,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
020474  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
020500  005004                          CLR     R4              ;RESULT S  /  B = 000000
020502  012712  000001          R0261:  MOV     #1,(R2)         ;[DEST] = 1
020506  000257                          CCC                     ;CLEAR FLAGS
020510  000270                          SEN                     ;N:C = 1000

020512  006012                  I0261:  ROR     (R2)            ;TEST THE ROR

020514  100403                          BMI     E10261          ;N:C = 0111 ?
020516  001002                          BNE     E10261
020520  102001                          BVC     E10261
020522  103402                          BCS     A0261

020524  104005                  E10261: ERROR5                  ;ROR FAILED TO ALTER CODES PROPERLY
020526  020502                          R0261                   ;ERROR LOOP RETURN

020530  020412                  A0261:  CMP     R4,(R2)         ;CORRECT RESULT ?
020532  001403                          BEQ     O0261           ;BR IF YES

020534  011203                          MOV     (R2),R3         ;GET THE WAS DATA
020536  104000                  E20261: ERROR                   ;ROR DELIVERED WRONG RESULT
020540  020502                          R0261                   ;ERROR LOOP RETURN ADDRESS

020542  000004                  O0261:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0262 ASR TEST - DM1 - <N:C> = 1100
                                ; ***********************************************************************

                                ;MICROPROGRAMMING   /   LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,232,275,277,376,016] FC 1,3,9

                                ;ACT BUTS:      37[004]100,161  /  33[266]220,232  /  16[277]016,016

                                ;EXEC:          [232]ALUC=HHLHL :[275] D= 025252

                                ;CODES:         [232] SPS=1, [277] SPS=2   /   N:C = 0011

                                ;SYNC:          B05J2 (-) T = 2 USEC

                                ;KEY SIG:       K3-3 DM=1L   /   K3-6 ROTSHF L   /   K3-8 SHF (R) L   /   K3-8 ROTSHF (R
                                                ;   K2-5 SDM1(1) H   /   K2-5 SDM0 (1) L

020544  012700  000262          T0262:  MOV     #0262,R0                ;LOAD R0 WITH TEST NO.
020550  013701  020574                  MOV     @#I0262,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
020554  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
020560  012704  025252                  MOV     #25252,R4       ;RESULT S  /  B = 25252
020564  012712  052525          R0262:  MOV     #52525,(R2)     ;[DEST] = 52525
020570  000257                          CCC                     ;CLEAR FLAGS
020572  000274                          274                     ;N:C = 1100

020574  006012                  I0262:  ROR     (R2)            ;TEST THE ROR

020576  100403                          BMI     E10262          ;N:C = 0011 ?
020600  001402                          BEQ     E10262
020602  102001                          BVC     E10262
020604  103402                          BCS     A0262

020606  104005                  E10262: ERROR5                  ;ROR FAILED TO ALTER CODES PROPERLY
020610  020564                          R0262                   ;ERROR LOOP RETURN

020612  020412                  A0262:  CMP     R4,(R2)         ;CORRECT RESULT ?
020614  001403                          BEQ     O0262           ;BR IF YES

020616  011203                          MOV     (R2),R3         ;GET THE WAS DATA
020620  104000                  E20262: ERROR                   ;ROR DELIVERED WRONG RESULT
020622  020564                          R0262                   ;ERROR LOOP RETURN ADDRESS

020624  000004                  O0262:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0263 ASR TEST - DM1 - <N:C> = 0101
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,232,275,277,376,016] FC 1,3,9

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,232 / 16[277]016,016

                                ;EXEC:          [232]ALUC=HHLHL :[275] D= 152525

                                ;CODES:         [232] SPS=1, [277] SPS=2  /  N:C = 1010

                                ;SYNC:          B05J2 (-) T = 2 USEC

                                ;KEY SIG:       K3-3 DM=1L  /  K3-6 ROTSHF L  /  K3-8 SHF (R) L  /  K3-8 ROTSHF (R) L
                                                ;  /  K2-5 SDM1 (1) H  /  K2-5 SDM0 (1) L  /  K1-5 D(C)(1) H

020626  012700  000263          T0263:  MOV     #0263,R0                ;LOAD R0 WITH TEST NO.
020632  013701  020656                  MOV     @#I0263,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
020636  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
020642  012704  152525                  MOV     #152525,R4      ;RESULT S / B = 152525
020646  012712  125252          R0263:  MOV     #125252,(R2)    ;[DEST] = 125252
020652  000257                          CCC                     ;CLEAR FLAGS
020654  000265                          265                     ;N:C = 0101

020656  006012                  I0263:  ROR     (R2)            ;TEST THE ROR

020660  100003                          BPL     E10263          ;N:C = 1010 ?
020662  001402                          BEQ     E10263
020664  102001                          BVC     E10263
020666  103002                          BCC     A0263

020670  104005                  E10263: ERROR5                  ;ROR FAILED TO ALTER CODES PROPERLY
020672  020646                          R0263                   ;ERROR LOOP RETURN

020674  020412                  A0263:  CMP     R4,(R2)         ;CORRECT RESULT ?
020676  001403                          BEQ     00263           ;BR IF YES

020700  011203                          MOV     (R2),R3         ;GET THE WAS DATA
020702  104000                  E20263: ERROR                   ;ROR DELIVERED WRONG RESULT
020704  020646                          R0263                   ;ERROR LOOP RETURN ADDRESS

020706  000004                  00263:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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                                ; ***********************************************************************
                                        .SBTTL T0264 RORB TEST - DM2 - EVEN ADDRESS
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [162,260,267,233,276,277,376,016] FC 1,3,9

                                ;ACT BUTS:      37[004]100,162 / 33[260]220,233 / 16[277]016,016

                                ;EXEC:          [233] DMUX SHIFT RIGHT :[277] D = 077777

                                ;CODES:         [233] SPS=1, [277] SPS=2  /  N:C = 0000

                                ;SYNC:          B05J2 (-) T = 2.4 USEC

                                ;KEY SIG:       K3-6 BYTE INSTR H  /  K1-5 D(C)(1) H

020710  012700  000264          T0264:  MOV     #0264,R0                ;LOAD R0 WITH TEST NO.
020714  013701  020740                  MOV     @#I0264,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
020720  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
020724  012704  000177                  MOV     #177,R4         ;RESULT S / B = 177
020730  010203                  R0264:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
020732  012712  000377                  MOV     #377,(R2)       ;[DEST] = 377
020736  000257                          CCC                     ;SCOPE SYNC ''C'' = 0

020740  106023                  I0264:  RORB    (R3)+           ;TEST THE RORB

020742  103402                          BCS     A0264           ;BR IF ROR SET ''C''

020744  104005                  E10264: ERROR5                  ;ROR FAILED TO SET ''C''
020746  020730                          R0264                   ;ERROR LOOP RETURN ADDRESS

020750  022703  067561          A0264:  CMP     #MBUF0+1,R3     ;DID DEST REG GET INCREMENTED ?
020754  001402                          BEQ     B0264           ;BR IF YES

020756  104005                  E20264: ERROR5                  ;RORB FAILED TO UPDATE DEST REG
020760  020730                          R0264                   ;ERROR LOOP RETURN ADDRESS

020762  020412                  B0264:  CMP     R4,(R2)         ;CORRECT RESULT ?
020764  001403                          BEQ     00264           ;BR IF YES

020766  011203                          MOV     (R2),R3         ;GET THE WAS DATA
020770  104000                  E30264: ERROR                   ;RORB DELIVERED WRONG RESULT
020772  020730                          R0264                   ;ERROR LOOP RETURN ADDRESS

020774  000004                  00264:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                ; ***********************************************************************
                                        .SBTTL T0265 RORB TEST - DM1 - EVEN ADDRESS
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,233,276,277,376,016] FC 1,3,9

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,233 / 16[277]016,016

                                ;EXEC:          [233] DMUX SHIFT RIGHT :[277] D = 077777

                                ;CODES:         [233] SPS=1, [277] SPS=  /  N:C = 1010

                                ;SYNC:          B05J2 (-) T = 2.4 USEC

                                ;KEY SIG:       K3-6 BYTE INSTR H  /  K1-5 D(C)(1) H

020776  012700  000265          T0265:  MOV     #0265,R0                ;LOAD R0 WITH TEST NO.
021002  013701  021030                  MOV     @#I0265,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
021006  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
021012  012704  000377                  MOV     #377,R4         ;RESULT S / B = 377
021016  010203                  R0265:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
021020  012712  000376                  MOV     #376,(R2)       ;[DEST] = 376
021024  000257                          CCC                     ;CLEAR FLAGS
021026  000261                          SEC                     ;SCOPE SYNC - SET ''C''

021030  106013                  I0265:  RORB    (R3)            ;TEST THE RORB

021032  103002                          BCC     A0265           ;BR IF ''C'' CLR - IT SHOULD BE

021034  104005                  E10265: ERROR5                  ;RORB FAILED TO CLR ''C''
021036  021016                          R0265                   ;ERROR LOOP RETURN ADDRESS

021040  020412                  A0265:  CMP     R4,(R2)         ;CORRECT RESULT ?
021042  001403                          BEQ     O0265           ;BR IF YES

021044  011203                          MOV     (R2),R3         ;GET THE WAS DATA
021046  104000                  E20265: ERROR                   ;RORB DELIVERED WRONG RESULT
021050  021016                          R0265                   ;ERROR LOOP RETURN ADDRESS

021052  000004                  O0265:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0266 RORB TEST - DM2 - ODD ADDRESS
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [162,260,267,237,270,233,276,277,376,016] FC 1,3,9

                                        ;ACT BUTS:      37[004]100,162 / 33[260]220,237 / 34[237]220,233 / 16[277]016,016

                                        ;EXEC:          [233] DMUX SHIFT RIGHT : [277] D = 77577

                                        ;CODES:         [233] SPS=1, [277] SPS=3  /  N:C = 0011

                                        ;SYNC:          B05J2 (-) T = 2.8 USEC

                                        ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-7 ODD BYTE H  /  K1-6 BA00(1) H

021054  012700  000266                  T0266:  MOV     #0266,R0                ;LOAD R0 WITH TEST NO.
021060  013701  021110                          MOV     @#I0266,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
021064  012702  067561                          MOV     #MBUF0+1,R2     ;DEST ADDR = MBUF0+1
021070  012704  077777                          MOV     #77777,R4       ;RESULT S / B = 77777
021074  012705  067560                          MOV     #MBUF0,R5       ;POINT R5 TO CHECK RESULT
021100  010203                          R0266:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
021102  012715  177777                          MOV     #-1,(R5)        ;[DEST] = 177777
021106  000257                                  CCC                     ;SCOPE SYNC - "C" =0

021110  106023                          I0266:  RORB    (R3)+           ;TEST THE RORB

021112  103402                                  BCS     A0266           ;BR IF "C" IS SET - IT SHOULD BE

021114  104005                          E10266: ERROR5                  ;RORB FAILED TO SET "C"
021116  021100                                  R0266                   ;ERROR LOOP RETURN ADDRESS

021120  022703  067562                  A0266:  CMP     #MBUF0+2,R3     ;DID DEST REG GET INCREMENTED ?
021124  001402                                  BEQ     B0266           ;BR IF YES

021126  104005                          E20266: ERROR5                  ;RORB FAILED TO UPDATE DEST REG
021130  021100                                  R0266                   ;ERROR LOOP RETURN ADDRESS

021132  020415                          B0266:  CMP     R4,(R5)         ;CORRECT RESULT ?
021134  001403                                  BEQ     00266           ;BR IF YES

021136  011503                                  MOV     (R5),R3         ;GET THE WAS DATA
021140  104000                          E30266: ERROR                   ;RORB DELIVERED WRONG RESULT
021142  021100                                  R0266                   ;ERROR LOOP RETURN ADDRESS

021144  000004                          00266:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                ; ***********************************************************************
                                        .SBTTL T0267 RORB TEST - DM1 - ODD ADDRESS
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,237,270,233,276,277,376,016] FC 1,3,9

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,237 / 34[237]220,233 / 16[277]016,016

                                ;EXEC:           [233] DMUX SHIFT RIGHT :[277] D = 177777

                                ;CODES:         [233] SPS=1, [277] SPS=2  /  N:C - 1010

                                ;SYNC:          B05J2 (-) T = 2.8 USEC

                                ;KEY SIG:       K1-5 D(C)(1) H  /  K3-6 BYTE INSTR H  /  K3-7 ODD BYTE H  /  K1-6 BA00(1

021146  012700  000267          T0267:  MOV     #0267,R0                ;LOAD R0 WITH TEST NO.
021152  013701  021202                  MOV     @#I0267,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
021156  012702  067561                  MOV     #MBUF0+1,R2     ;DEST ADDR = MBUF0+1
021162  012704  177777                  MOV     #-1,R4          ;RESULT S / B = 177777
021166  012705  067560                  MOV     #MBUF0,R5       ;POINT R5 TO CHECK RESULT
021172  010203          R0267:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
021174  012715  177377                  MOV     #177377,(R5)    ;[DEST] = 177377
021200  000261                          SEC                     ;SCOPE SYNC - SET "C"

021202  106023          I0267:  RORB    (R3)+           ;TEST THE RORB

021204  103002                          BCC     A0267           ;BR IF "C" CLEAR - IT SHOULD BE

021206  104005          E10267: ERROR5                  ;RORB FAILED TO CLEAR "C"
021210  021172                  R0267                   ;ERROR LOOP RETURN ADDRESS

021212  020415          A0267:  CMP     R4,(R5)         ;CORRECT RESULT ?
021214  001403                  BEQ     00267           ;BR IF YES

021216  011503                  MOV     (R5),R3         ;GET THE WAS DATA
021220  104000          E20267: ERROR                   ;RORB DELIVERED WRONG RESULT
021222  021172                  R0267                   ;ERROR LOOP RETURN ADDRESS

021224  000004          00267:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0270 ASRB TEST - DM2 - ODD ADDRESS
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [162,260,267,237,270,233,276,277,376,016] FC 1,3,9

                                        ;ACT BUTS:      37[004]100,162 / 33[260]220,237 / 34[237]220,233 / 16[277]016,016

                                        ;EXEC:          [233] DMUX SHIFT RIGHT :[277] D = 000000

                                        ;CODES:         [233] SPS=1, [277] SPS=2  /  N:C = 0111

                                        ;SYNC:          B05J2 (-) T = 2.8 USEC

                                        ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-7 ODD BYTE H  /  K1-6 BA00(1) H

021226  012700  000270                  T0270:  MOV     #0270,R0                ;LOAD R0 WITH TEST NO.
021232  013701  021262                          MOV     @#I0270,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

021236  012702  067561                          MOV     #MBUF0+1,R2     ;DEST ADDR = MBUF0+1
021242  012704  000377                          MOV     #377,R4         ;RESULT S / B = 377
021246  012705  067560                          MOV     #MBUF0,R5       ;POINT R5 TO CHECK RESULT
021252  010203                          R0270:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
021254  012715  000777                          MOV     #777,(R5)       ;[DEST] = 777
021260  000257                                  CCC                     ;SCOPE SYNC ''C'' = 0

021262  106223                          I0270:  ASRB    (R3)+           ;TEST THE ASRB

021264  103402                                  BCS     A0270           ;BR IF CARRY SET - IT SHOULD BE

021266  104005                          E10270: ERROR5                  ;ASRB FAILED TO SET THE CARRY
021270  021252                                  R0270                   ;ERROR LOOP RETURN ADDRESS

021272  022703  067562                  A0270:  CMP     #MBUF0+2,R3     ;DID DEST REG GET INCREMENTED ?
021276  001402                                  BEQ     B0270           ;BR IF YES

021300  104005                          E20270: ERROR5                  ;ASRB FAILED TO UPDATE DEST REG
021302  021252                                  R0270                   ;ERROR LOOP RETURN ADDRESS

021304  020415                          B0270:  CMP     R4,(R5)         ;CORRECT RESULT ?
021306  001403                                  BEQ     00270           ;BR IF YES

021310  011503                                  MOV     (R5),R3         ;GET THE WAS DATA
021312  104000                          E30270: ERROR                   ;ASRB DELIVERED WRONG RESULT
021314  021252                                  R0270                   ;ERROR LOOP RETURN ADDRESS

021316  000004                          00270:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ************************************************************************
                                        .SBTTL T0271 ASRB TEST - DM1 - ODD ADDRESS
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,237,270,233,276,277,376,016] FC 1,3,9

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,237 / 34[237]220,233 / 16[277]016,016

                                ;EXEC:          [233] DMUX SHIFT RIGHT :[277] D = 140300

                                ;CODES:         [233] SPS=1, [277] SPS=2  /  N:C = 1010

                                ;SYNC:          B05J2 (-) T = 2.8 USEC

                                ;KEY SIG:       K1-5 D(C)(1) H  /  K3-6 BYTE INSTR H  /  K3-7 ODD BYTE H  /  K1-6 BA00(1

021320  012700  000271          T0271:  MOV     #0271,R0                ;LOAD R0 WITH TEST NO.
021324  013701  021354                  MOV     @#I0271,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
021330  012702  067561                  MOV     #MBUF0+1,R2     ;DEST ADDR = MBUF0+1
021334  012704  140377                  MOV     #140377,R4      ;RESULT S / B = 140377
021340  012705  067560                  MOV     #MBUF0,R5       ;POINT R5 TO CHECK RESULT
021344  010203                  R0271:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
021346  012715  100377                  MOV     #100377,(R5)    ;[DEST] = 100377
021352  000261                          SEC                     ;SCOPE SYNC - ''C'' = 1

021354  106213                  I0271:  ASRB    (R3)            ;TEST THE ASRB

021356  103002                          BCC     A0271           ;BR IF CARRY CLEAR - IT SHOULD BE

021360  104005                  E10271: ERROR5                  ;ASRB FAILED TO CLEAR THE CARRY
021362  021344                          R0271                   ;ERROR LOOP RETURN ADDRESS

021364  020415                  A0271:  CMP     R4,(R5)         ;CORRECT RESULT ?
021366  001403                          BEQ     O0271           ;BR IF YES

021370  011503                          MOV     (R5),R3         ;GET THE WAS DATA
021372  104000                  E20271: ERROR                   ;ASRB DELIVERED WRONG RESULT
021374  021344                          R0271                   ;ERROR LOOP RETURN ADDRESS

021376  000004                  O0271:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0272 ASRB TEST - DM2 - EVEN ADDRESS
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [162,260,267,233,276,277,376,016] FC 1,3,9

                                        ;ACT BUTS:      37[004]100,162 / 33[260]220,233 / 16[277]016,016

                                        ;EXEC:          [233] DMUX SHIFT RIGHT :[277] D =

                                        ;CODES:         [233] SPS=1, [277] SPS=2  /  N:C =

                                        ;SYNC:          B05J2 (-) T = 2.8 USEC

                                        ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 DM=2L

021400  012700  000272                  T0272:  MOV     #0272,R0                ;LOAD R0 WITH TEST NO.
021404  013701  021430                          MOV     @#I0272,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
021410  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
021414  012704  000077                          MOV     #77,R4          ;RESULT S / B = 77
021420  010203                          R0272:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
021422  012712  000177                          MOV     #177,(R2)       ;[DEST] = 177
021426  000257                                  CCC                     ;SCOPE SYNC - ''C'' = 0

021430  106223                          I0272:  ASRB    (R3)+           ;TEST THE ASRB

021432  103402                                  BCS     A0272           ;BR IF ''C'' = 1 - IT SHOULD BE

021434  104005                          E10272: ERROR5                  ;ASRB FAILED TO SET ''C''
021436  021420                                  R0272                   ;ERROR LOOP RETURN ADDRESS

021440  022703  067561                  A0272:  CMP     #MBUF0+1,R3     ;DID DEST REG GET INCREMENTED ?
021444  001402                                  BEQ     B0272           ;BR IF YES

021446  104005                          E20272: ERROR5                  ;ASRB FAILED TO UPDATE DEST REG
021450  021420                                  R0272                   ;ERROR LOOP RETURN ADDRESS

021452  020412                          B0272:  CMP     R4,(R2)         ;CORRECT RESULT ?
021454  001403                                  BEQ     00272           ;BR IF YES

021456  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
021460  104000                          E30272: ERROR                   ;ASRB DELIVERED WRONG RESULT
021462  021420                                  R0272                   ;ERROR LOOP RETURN ADDRESS

021464  000004                          00272:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0273 ASRB TEST - DM1 - EVEN ADDRESS
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,233,276,277,376,016] FC 1,3,9

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,233 / 16[277]016,016

                                ;EXEC:          [233] DMUX SHIFT RIGHT :[277] D = 141703

                                ;CODES:         [233] SPS=1, [277] SPS=2  /  N:C = 1010

                                ;SYNC:          B05J2 (-) T = 2.4 USEC

                                ;KEY SIG:       K1-5 D(C)(1) H  /  K3-6 BYTE INSTR H

021466  012700  000273          T0273:  MOV     #0273,R0                ;LOAD R0 WITH TEST NO.
021472  013701  021516                  MOV     @#I0273,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
021476  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
021502  012704  000303                  MOV     #303,R4         ;RESULT S / B = 303
021506  010203                  R0273:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
021510  012712  000206                  MOV     #206,(R2)       ;[DEST] = 206
021514  000261                          SEC                     ;SCOPE SYNC - ''C'' = 1

021516  106213                  I0273:  ASRB    (R3)            ;TEST THE CLRASRB

021520  103002                          BCC     A0273           ;BR IF CARRY CLEAR - ITSHOULD BE

021522  104005                  E10273: ERROR5                  ;ASRB FAILED TO CLEAR THE CARRY
021524  021506                          R0273                   ;ERROR LOOP RETURN ADDRESS

021526  020412                  A0273:  CMP     R4,(R2)         ;CORRECT RESULT ?
021530  001403                          BEQ     O0273           ;BR IF YES

021532  011203                          MOV     (R2),R3         ;GET THE WAS DATA
021534  104000                  E20273: ERROR                   ;ASRB DELIVERED WRONG RESULT
021536  021506                          R0273                   ;ERROR LOOP RETURN ADDRESS

021540  000004                  O0273:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0274 TST DM0 TEST - <N:C> = 1011
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [104,373,362,001] FC 1,7,8

                                        ;ACT BUTS:      37[004]100,104 / 31[104]360,362 / 27[373]000,001

                                        ;EXEC:          [104]ALUC=LLLLL :[373] D = 000000

                                        ;CODES:         [373] SPS=1, [362] SPS=2  /  N:C = 0100

                                        ;SYNC:          B05J2 (-) T = 1 USEC

                                        ;KEY SIG:       K3-3 DM=0L  /  K1-7 D(15:00)=0 H  /  K3-4 TST L  /  K3-4 OVLAP INSTR H

021542  012700  000274                  T0274:  MOV     #0274,R0                ;LOAD R0 WITH TEST NO.
021546  013701  021600                          MOV     @#I0274,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
021552  032737  000040  066642                  BIT     #40,@#BPTLOC    ;BREAKPOINT HALT SET ??
021560  001401                                  BEQ     .+4             ;BR IF NOT
021562  000000                                  HALT                    ;BREAK - DEPRESS CONTINUE TO RESTART
021564  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
021570  005004                                  CLR     R4              ;RESULT S / B = 000000
021572  005003                          R0274:  CLR     R3              ;[DEST] = 000000
021574  000257                                  CCC                     ;CLEAR CODES
021576  000273                                  273                     ;N:C=1011

021600  005703                          I0274:  TST     R3              ;TEST THE TST

021602  100403                                  BMI     E10274          ;N:C = 0100 ?
021604  001002                                  BNE     E10274
021606  102401                                  BVS     E10274
021610  103002                                  BCC     A0274

021612  104005                          E10274: ERROR5                  ;TST FAILED TO ALTER CODES PROPERLY
021614  021572                                  R0274                   ;ERROR LOOP RETURN

021616  020403                          A0274:  CMP     R4,R3           ;RESULT OK ?
021620  001402                                  BEQ     O0274           ;BR IF YES

021622  104000                          E20274: ERROR                   ;TST ALTERED THE [DEST]
021624  021572                                  R0274                   ;ERROR LOOP RETURN

021626  000004                          O0274:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0275 TST DM0 TEST - <N:C> = 0100
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [104,373,362,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,104 / 31[104]360,362 / 27[373]000,001

                                ;EXEC:          [104]ALUC=LLLLL :[373] D = 177777

                                ;CODES:         [373] SPS=1, [362] SPS=3  /  N:C = 1000

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K3-3 DM=0L  /  K3-4 OVLAP INSTR H  /  K3-4 TST L

021630  012700  000275          T0275:  MOV     #0275,R0                ;LOAD R0 WITH TEST NO.
021634  013701  021656                  MOV     @#I0275,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
021640  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
021644  005004                          CLR     R4
021646  005104                          COM     R4              ;RESULT S / B = 177777
021650  010403                  R0275:  MOV     R4,R3           ;[DEST] = 177777
021652  000257                          CCC                     ;CLEAR CODES
021654  000264                          264                     ;N:C=0100

021656  005703                  I0275:  TST     R3              ;TEST THE TST

021660  100003                          BPL     E10275          ;N:C = 1000 ?
021662  001402                          BEQ     E10275
021664  102401                          BVS     E10275
021666  103002                          BCC     A0275

021670  104005                  E10275: ERROR5                  ;TST FAILED TO ALTER CODES PROPERLY
021672  021650                          R0275                   ;ERROR LOOP RETURN

021674  020403                  A0275:  CMP     R4,R3           ;RESULT OK ?
021676  001402                          BEQ     00275           ;BR IF YES

021700  104000                  E20275: ERROR                   ;TST ALTERED THE [DEST]
021702  021650                          R0275                   ;ERROR LOOP RETURN

021704  000004                  00275:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0276 CLR DMO TEST - <N:C> = 1011
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [104,373,360,001] FC 1,7,8

                                        ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001

                                        ;EXEC:          [104]ALUC=HLLHH :[373] D = 000000

                                        ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 0100

                                        ;SYNC:          B05J2 (-) T = 1 USEC

                                        ;KEY SIG:       K3-3 DM=OL  /  K3-4 OVLAP INSTR H  /  K3-4 CLR L

021706  012700  000276                  T0276:  MOV     #0276,R0                ;LOAD R0 WITH TEST NO.
021712  013701  021734                          MOV     @#I0276,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
021716  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
021722  005004                                  CLR     R4              ;RESULT S / B = 000000
021724  012703  177777                  R0276:  MOV     #-1,R3          ;[DEST] = 177777
021730  000257                                  CCC                     ;CLEAR CODES
021732  000273                                  273                     ;N:C = 1011

021734  005003                          I0276:  CLR     R3              ;TEST THE CLR

021736  100403                                  BMI     E10276          ;N:C = 0100 ?
021740  001002                                  BNE     E10276
021742  102401                                  BVS     E10276
021744  103002                                  BCC     A0276

021746  104005                          E10276: ERROR5                  ;CLR FAILED TO ALTER THE CODES PROPERLY
021750  021724                                  R0276                   ;ERROR LOOP RETURN
021752  020403                          A0276:  CMP     R4,R3           ;RESULT OK ?
021754  001402                                  BEQ     O0276           ;BR IF YES

021756  104000                          E20276: ERROR                   ;CLR DELIVERED THE WRONG RESULT
021760  021724                                  R0276                   ;ERROR LOOP RETURN

021762  000004                          O0276:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0277 CLR DM0 TEST - <N:C> = 0000
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [104,373,360,001] FC 1,7,8

                                        ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001

                                        ;EXEC:          [104]ALUC=HLLHH :[373] D = 000000

                                        ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 0100

                                        ;SYNC:          B05J2 (-) T = 1 USEC

                                        ;KEY SIG:       K3-3 DM=0L  /  K3-4 OVLAP INSTR H  /  K3-4 CLR L

021764  012700  000277                  T0277:  MOV     #0277,R0                ;LOAD R0 WITH TEST NO.
021770  013701  022010                          MOV     @#I0277,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
021774  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
022000  005004                                  CLR     R4              ;RESULT S / B = 000000
022002  012703  177777                  R0277:  MOV     #-1,R3          ;[DEST] = 177777
022006  000257                                  CCC                     ;CLEAR CODES

022010  005003                          I0277:  CLR     R3              ;TEST THE CLR

022012  100403                                  BMI     E10277          ;N:C = 0100 ?
022014  001002                                  BNE     E10277
022016  102401                                  BVS     E10277
022020  103002                                  BCC     A0277

022022  104005                          E10277: ERROR5                  ;CLR FAILED TO ALTER THE CODES PROPERLY
022024  022002                                  R0277                   ;ERROR LOOP RETURN
022026  020403                          A0277:  CMP     R4,R3           ;RESULT OK ?
022030  001402                                  BEQ     O0277           ;BR IF YES

022032  104000                          E20277: ERROR                   ;CLR DELIVERED THE WRONG RESULT
022034  022002                                  R0277                   ;ERROR LOOP RETURN

022036  000004                          O0277:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0300 COM DMO TEST - <N:C> = 0110
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [104,373,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001

                                ;EXEC:          [104]ALUC=HLLLL :[373] D = 125252

                                ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 1001

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K3-3 DM=OL  /  K3-4 OVLAP INSTR H  /  K3-4 COM L .

022040  012700  000300          T0300:  MOV     #0300,R0                ;LOAD R0 WITH TEST NO.
022044  013701  022070                  MOV     @#I0300,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
022050  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
022054  012704  125252                  MOV     #125252,R4      ;RESULT S / B = 125252
022060  012703  052525          R0300:  MOV     #52525,R3       ;[DEST] = 52525
022064  000257                          CCC                     ;CLEAR CODES
022066  000266                          266                     ;N:C = 0110

022070  005103                  I0300:  COM     R3              ;TEST THE COM

022072  100003                          BPL     E10300          ;N:C = 1001 ?
022074  001402                          BEQ     E10300
022076  102401                          BVS     E10300
022100  103402                          BCS     A0300

022102  104005                  E10300: ERROR5                  ;COM FAILED TO ALTER THE CODES PROPERLY
022104  022060                          R0300                   ;ERROR LOOP RETURN
022106  020403                  A0300:  CMP     R4,R3           ;RESULT OK ?
022110  001402                          BEQ     00300           ;BR IF YES

022112  104000                  E20300: ERROR                   ;COM DELIVERED THE WRONG RESULT
022114  022060                          R0300                   ;ERROR LOOP RETURN

022116  000004                  00300:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0301 COM DMO TEST - <N:C> = 1001
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [104,373,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001

                                ;EXEC:          [104]ALUC=HLLLL :[373] D = 000000

                                ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C =0101

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K3-3 DM=OL  /  K3-4 OVLAP INSTR H  /  K3-4 COM L

022120  012700  000301          T0301:  MOV     #0301,R0                ;LOAD R0 WITH TEST NO.
022124  013701  022146                  MOV     @#I0301,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
022130  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
022134  005004                          CLR     R4              ;RESULT S / B = 000000
022136  012703  177777          R0301:  MOV     #-1,R3          ;[DEST] = 177777
022142  000257                          CCC                     ;CLEAR CODES
022144  000271                          271                     ;N:C = 1001

022146  005103                  I0301:  COM     R3              ;TEST THE COM

022150  100403                          BMI     E10301          ;N:C = 0101 ?
022152  001002                          BNE     E10301
022154  102401                          BVS     E10301
022156  103402                          BCS     A0301

022160  104005                  E10301: ERROR5                  ;COM FAILED TO ALTER THE CODES PROPERLY
022162  022136                          R0301                   ;ERROR LOOP RETURN
022164  020403                  A0301:  CMP     R4,R3           ;RESULT OK ?
022166  001402                          BEQ     00301           ;BR IF YES

022170  104000                  E20301: ERROR                   ;COM DELIVERED THE WRONG RESULT
022172  022136                          R0301                   ;ERROR LOOP RETURN

022174  000004                  00301:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0302 INC DMO TEST - <N:C> = 1011
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [104,373,360,001] FC 1,7,8

                                        ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001

                                        ;EXEC:          [104]ALUC=LLLLL :[373] D = 000000

                                        ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 0101

                                        ;SYNC:          B05J2 (-) T = 1 USEC

                                        ;KEY SIG:       K3-8 CIN00 L  /  K3-3 DM=0L  /  K3-4 OVLAP INSTR H  /  K3-4 INC L

022176  012700  000302                  T0302:  MOV     #0302,R0                ;LOAD R0 WITH TEST NO.
022202  013701  022224                          MOV     @#I0302,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
022206  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
022212  005004                                  CLR     R4              ;RESULT S / B = 000000
022214  012703  177777                  R0302:  MOV     #-1,R3          ;[DEST] = 177777
022220  000257                                  CCC                     ;CLEAR CODES
022222  000273                                  273                     ;N:C = 1011

022224  005203                          I0302:  INC     R3              ;TEST THE INC

022226  100403                                  BMI     E10302          ;N:C = 0101 ?
022230  001002                                  BNE     E10302
022232  102401                                  BVS     E10302
022234  103402                                  BCS     A0302

022236  104005                          E10302: ERROR5                  ;INC FAILED TO ALTER THE CODES PROPERLY
022240  022214                                  R0302                   ;ERROR LOOP RETURN
022242  020403                          A0302:  CMP     R4,R3           ;RESULT OK ?
022244  001402                                  BEQ     00302           ;BR IF YES

022246  104000                          E20302: ERROR                   ;INC DELIVERED THE WRONG RESULT
022250  022214                                  R0302                   ;ERROR LOOP RETURN

022252  000004                          00302:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0303 INC DMO TEST - <N:C> = 0100
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [104,373,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001

                                ;EXEC:          [104]ALUC=LLLLL :[373] D = 100000

                                ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 1010

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K3-8 CIN00 L  /  K3-3 DM=0L  /  K3-4 INC L  /  K3-4 OVLAP INSTR H

022254  012700  000303          T0303:  MOV     #0303,R0                ;LOAD R0 WITH TEST NO.
022260  013701  022304                  MOV     @#I0303,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
022264  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
022270  012704  100000                  MOV     #100000,R4      ;RESULT S / B = 100000
022274  012703  077777          R0303:  MOV     #77777,R3       ;[DEST] = 77777
022300  000257                          CCC                     ;CLEAR CODES
022302  000264                          264                     ;N:C = 0100

022304  005203                  I0303:  INC     R3              ;TEST THE INC

022306  100003                          BPL     E10303          ;N:C = 1010 ?
022310  001402                          BEQ     E10303
022312  102001                          BVC     E10303
022314  103002                          BCC     A0303

022316  104005                  E10303: ERROR5                  ;INC FAILED TO ALTER THE CODES PROPERLY
022320  022274                          R0303                   ;ERROR LOOP RETURN
022322  020403                  A0303:  CMP     R4,R3           ;RESULT OK ?
022324  001402                          BEQ     O0303           ;BR IF YES

022326  104000                  E20303: ERROR                   ;INC DELIVERED THE WRONG RESULT
022330  022274                          R0303                   ;ERROR LOOP RETURN

022332  000004                  O0303:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; *****************************************************************
                                                .SBTTL T0304 DEC DMO TEST - <N:C> = 1011
                                        ; *****************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [104,373,360,001] FC 1,7,8

                                        ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001

                                        ;EXEC:          [104]ALUC=LHHHH :[373] D = 000000

                                        ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 0101

                                        ;SYNC:          B05J2 (-) T = 1 USEC

                                        ;KEY SIG:       K3-3 DM=OL  /  K3-4 OVLAP INSTR H  /  K3-4 DEC L

022334  012700  000304                  T0304:  MOV     #0304,R0                ;LOAD R0 WITH TEST NO.
022340  013701  022362                          MOV     @#I0304,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
022344  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
022350  005004                                  CLR     R4              ;RESULT S / B = 000000
022352  012703  000001                  R0304:  MOV     #1,R3           ;[DEST] = 1
022356  000257                                  CCC                     ;CLEAR CODES
022360  000273                                  273                     ;N:C = 1011

022362  005303                          I0304:  DEC     R3              ;TEST THE DEC

022364  100403                                  BMI     E10304          ;N:C = 0101 ?
022366  001002                                  BNE     E10304
022370  102401                                  BVS     E10304
022372  103402                                  BCS     A0304

022374  104005                          E10304: ERROR5                  ;DEC FAILED TO ALTER THE CODES PROPERLY
022376  022352                                  R0304                   ;ERROR LOOP RETURN
022400  020403                          A0304:  CMP     R4,R3           ;RESULT OK ?
022402  001402                                  BEQ     00304           ;BR IF YES

022404  104000                          E20304: ERROR                   ;DEC DELIVERED THE WRONG RESULT
022406  022352                                  R0304                   ;ERROR LOOP RETURN

022410  000004                          00304:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0305 DEC DMO TEST - <N:C> = 1100
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [104,373,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001

                                ;EXEC:          [104]ALUC=LHHHH :[373] D = 77777

                                ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 0010

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K3-3 DM=OL  /  K3-4 OVLAP INSTR H  /  K3-4 DEC L

022412  012700  000305          T0305:  MOV     #0305,R0                ;LOAD R0 WITH TEST NO.
022416  013701  022442                  MOV     @#I0305,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
022422  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
022426  012704  077777                  MOV     #77777,R4       ;RESULT S / B = 77777
022432  012703  100000          R0305:  MOV     #100000,R3      ;[DEST] = 100000
022436  000257                          CCC                     ;CLEAR CODES
022440  000274                          274                     ;N:C = 1100

022442  005303                  I0305:  DEC     R3              ;TEST THE DEC

022444  100403                          BMI     E10305          ;N:C = 0010 ?
022446  001402                          BEQ     E10305
022450  102001                          BVC     E10305
022452  103002                          BCC     A0305

022454  104005                  E10305: ERROR5                  ;DEC FAILED TO ALTER THE CODES PROPERLY
022456  022432                          R0305                   ;ERROR LOOP RETURN
022460  020403                  A0305:  CMP     R4,R3           ;RESULT OK ?
022462  001402                          BEQ     00305           ;BR IF YES

022464  104000                  E20305: ERROR                   ;DEC DELIVERED THE WRONG RESULT
022466  022432                          R0305                   ;ERROR LOOP RETURN

022470  000004                  00305:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0306 DEC DMO TEST - <N:C> = 0000
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [104,373,360,001] FC 1,7,8

                                        ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001

                                        ;EXEC:          [104]ALUC=LHHHH :[373] D = 177777

                                        ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 1000

                                        ;SYNC:          B05J2 (-) T = 1 USEC

                                        ;KEY SIG:       K3-3 DM=0L  /  K3-4 OVLAP INSTR H  /  K3-4 DEC L

022472  012700  000306                  T0306:  MOV     #0306,R0                ;LOAD R0 WITH TEST NO.
022476  013701  022516                          MOV     @#I0306,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
022502  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
022506  012704  177777                          MOV     #-1,R4          ;RESULT S / B = 177777
022512  005003                          R0306:  CLR     R3              ;[DEST] = 000000
022514  000257                                  CCC                     ;CLEAR CODES

022516  005303                          I0306:  DEC     R3              ;TEST THE DEC

022520  100003                                  BPL     E10306          ;N:C = 1000 ?
022522  001402                                  BEQ     E10306
022524  102401                                  BVS     E10306
022526  103002                                  BCC     A0306

022530  104005                          E10306: ERROR5                  ;DEC FAILED TO ALTER THE CODES PROPERLY
022532  022512                                  R0306                   ;ERROR LOOP RETURN
022534  020403                          A0306:  CMP     R4,R3           ;RESULT OK ?
022536  001402                                  BEQ     00306           ;BR IF YES

022540  104000                          E20306: ERROR                   ;DEC DELIVERED THE WRONG RESULT
022542  022512                                  R0306                   ;ERROR LOOP RETURN

022544  000004                          00306:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0307 ASL DMO TEST - <N:C> = 1000
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [104,373,360,001] FC 1,7,8

                                        ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001

                                        ;EXEC:          [104]ALUC=LHHLL :[373] D = 000000

                                        ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = C111

                                        ;SYNC:          B05J2 (-) T = 1 USEC

                                        ;KEY SIG:       K3-3 DM=OL  /  K3-4 OVLAP INSTR H  /  K3-6 ROTSHF (L) L  /  K3-5 ROTSHF

022546  012700  000307                  T0307:  MOV     #0307,R0                ;LOAD R0 WITH TEST NO.
022552  013701  022574                          MOV     @#I0307,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
022556  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
022562  005004                                  CLR     R4              ;RESULT S / B = 000000
022564  012703  100000                  R0307:  MOV     #100000,R3      ;[DEST] = 100000
022570  000257                                  CCC                     ;CLEAR CODES
022572  000270                                  SEN                     ;N:C = 1000

022574  006303                          I0307:  ASL     R3              ;TEST THE ASL

022576  100403                                  BMI     E10307          ;N:C = 0111 ?
022600  001002                                  BNE     E10307
022602  102001                                  BVC     E10307
022604  103402                                  BCS     A0307

022606  104005                          E10307: ERROR5                  ;ASL FAILED TO ALTER THE CODES PROPERLY
022610  022564                                  R0307                   ;ERROR LOOP RETURN
022612  020403                          A0307:  CMP     R4,R3           ;RESULT OK ?
022614  001402                                  BEQ     O0307           ;BR IF YES

022616  104000                          E20307: ERROR                   ;ASL DELIVERED THE WRONG RESULT
022620  022564                                  R0307                   ;ERROR LOOP RETURN

022622  000004                          O0307:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0310 ASL DMO TEST - <N:C> = 0101
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [104,373,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001

                                ;EXEC:          [104]ALUC=LHHLL :[373] D = 100000

                                ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 1010

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K3-3 DM=OL  /  K3-4 OVLAP INSTR H  /  K3-6 ROTSHF (L) L  /  K3-5 ROTSHF

022624  012700  000310          T0310:  MOV     #0310,R0                ;LOAD R0 WITH TEST NO.
022630  013701  022654                  MOV     @#I0310,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
022634  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
022640  012704  100000                  MOV     #100000,R4      ;RESULT S / B = 100000
022644  012703  040000          R0310:  MOV     #40000,R3       ;[DEST] = 40000
022650  000257                          CCC                     ;CLEAR CODES
022652  000265                          265                     ;N:C = 0101

022654  006303                  I0310:  ASL     R3              ;TEST THE ASL

022656  100003                          BPL     E10310          ;N:C = 1010 ?
022660  001402                          BEQ     E10310
022662  102001                          BVC     E10310
022664  103002                          BCC     A0310

022666  104005                  E10310: ERROR5                  ;ASL FAILED TO ALTER THE CODES PROPERLY
022670  022644                          R0310                   ;ERROR LOOP RETURN
022672  020403                  A0310:  CMP     R4,R3           ;RESULT OK ?
022674  001402                          BEQ     00310           ;BR IF YES

022676  104000                  E20310: ERROR                   ;ASL DELIVERED THE WRONG RESULT
022700  022644                          R0310                   ;ERROR LOOP RETURN

022702  000004                  00310:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0311 ASL DMO TEST - <N:C> = 0010
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING   /   LOGIC INFORMATION

                                        ;ROM SEQ:       [104,373,360,001] FC 1,7,8

                                        ;ACT BUTS:      37[004]100,104  /  31[104]360,360  /  27[373]000,001

                                        ;EXEC:          [104]ALUC=LHHLL :[373] D = 000000

                                        ;CODES:         [373] SPS=1, [360] SPS=3   /   N:C = 0100

                                        ;SYNC:          B05J2 (-) T = 1 USEC

                                        ;KEY SIG:       K3-3 DM=OL   /   K3-4 OVLAP INSTR H   /   K3-6 ROTSHF (L) L   /   K3-5 R

022704  012700  000311                  T0311:  MOV     #0311,R0                ;LOAD R0 WITH TEST NO.
022710  013701  022730                          MOV     @#I0311,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
022714  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
022720  005004                                  CLR     R4              ;RESULT S  /  B = 000000
022722  005003                          R0311:  CLR     R3              ;[DEST] = 000000
022724  000257                                  CCC                     ;CLEAR CODES
022726  000262                                  SEV                     ;N:C = 0010

022730  006303                          I0311:  ASL     R3              ;TEST THE ASL

022732  100403                                  BMI     E10311          ;N:C = 0100 ?
022734  001002                                  BNE     E10311
022736  102401                                  BVS     E10311
022740  103002                                  BCC     A0311

022742  104005                          E10311: ERROR5                  ;ASL FAILED TO ALTER THE CODES PROPERLY
022744  022722                                  R0311                   ;ERROR LOOP RETURN
022746  020403                          A0311:  CMP     R4,R3           ;RESULT OK ?
022750  001402                                  BEQ     O0311           ;BR IF YES

022752  104000                          E20311: ERROR                   ;ASL DELIVERED THE WRONG RESULT
022754  022722                                  R0311                   ;ERROR LOOP RETURN

022756  000004                          O0311:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0312 ROL DMO TEST - <N:C> = 1101
                                ; ***********************************************************************

                                ;MICROPROGRAMMING   /   LOGIC INFORMATION

                                ;ROM SEQ:       [104,373,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,104  /  31[104]360,360  /  27[373]000,001

                                ;EXEC:          [104]ALUC=LHHLL :[373] D = 052525

                                ;CODES:         [373] SPS=1, [360] SPS=3   /   N:C = 0011

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K3-3 DM=OL   /   K3-4 OVLAP INSTR H   /   K3-6 ROTSHF (L) L   /   K3-5 R
                                                ;   K3-8 ROT (L) H

022760  012700  000312          T0312:  MOV     #0312,R0                ;LOAD R0 WITH TEST NO.
022764  013701  023010                  MOV     @#I0312,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
022770  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
022774  012704  052525                  MOV     #52525,R4       ;RESULT S  /  B = 52525
023000  012703  125252          R0312:  MOV     #125252,R3      ;[DEST] = 125252
023004  000257                          CCC                     ;CLEAR CODES
023006  000275                          275                     ;N:C = 1101

023010  006103                  I0312:  ROL     R3              ;TEST THE ROL

023012  100403                          BMI     E10312          ;N:C = 0011 ?
023014  001402                          BEQ     E10312
023016  102001                          BVC     E10312
023020  103402                          BCS     A0312

023022  104005                  E10312: ERROR5                  ;ROL FAILED TO ALTER THE CODES PROPERLY
023024  023000                          R0312                   ;ERROR LOOP RETURN
023026  020403                  A0312:  CMP     R4,R3           ;RESULT OK ?
023030  001402                          BEQ     O0312           ;BR IF YES

023032  104000                  E20312: ERROR                   ;ROL DELIVERED THE WRONG RESULT
023034  023000                          R0312                   ;ERROR LOOP RETURN

023036  000004                  O0312:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0313 ROL DMO TEST - <N:C> = 0101
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING   /   LOGIC INFORMATION

                                        ;ROM SEQ:       [104,373,360,001] FC 1,7,8

                                        ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001

                                        ;EXEC:          [104]ALUC=LHHLL :[373] D = 125252

                                        ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 1010

                                        ;SYNC:          B05J2 (-) T = 1 USEC

                                        ;KEY SIG:       K3-3 DM=0L  /  K3-4 OVLAP INSTR H  /  K3-6 ROTSHF (L) L  /  K3-5 ROTSHF
                                                        ;  K3-8 ROT (L) H

023040  012700  000313                  T0313:  MOV     #0313,R0                ;LOAD R0 WITH TEST NO.
023044  013701  023070                          MOV     @#I0313,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
023050  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
023054  012704  125253                          MOV     #125253,R4      ;RESULT S / B = 125253
023060  012703  052525                  R0313:  MOV     #52525,R3       ;[DEST] = 52525
023064  000257                                  CCC                     ;CLEAR CODES
023066  000265                                  265                     ;N:C = 0101

023070  006103                          I0313:  ROL     R3              ;TEST THE ROL

023072  100003                                  BPL     E10313          ;N:C = 1010 ?
023074  001402                                  BEQ     E10313
023076  102001                                  BVC     E10313
023100  103002                                  BCC     A0313

023102  104005                          E10313: ERROR5                  ;ROL FAILED TO ALTER THE CODES PROPERLY
023104  023060                                  R0313                   ;ERROR LOOP RETURN
023106  020403                          A0313:  CMP     R4,R3           ;RESULT OK ?
023110  001402                                  BEQ     O0313           ;BR IF YES

023112  104000                          E20313: ERROR                   ;ROL DELIVERED THE WRONG RESULT
023114  023060                                  R0313                   ;ERROR LOOP RETURN

023116  000004                          O0313:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0314 ROL DMO TEST - <N:C> = 0010
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [104,373,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001

                                ;EXEC:          [104]ALUC=LHHLL :[373] D = 000000

                                ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 0100

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K3-3 DM=OL  /  K3-4 OVLAP INSTR H  /  K3-6 ROTSHF (L) L  /  K3-5 ROTSHF
                                                ;  K3-8 ROT (L) H

023120  012700  000314          T0314:  MOV     #0314,R0                ;LOAD R0 WITH TEST NO.
023124  013701  023144                  MOV     @#I0314,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
023130  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
023134  005004                          CLR     R4              ;RESULT S / B = 000000
023136  005003                  R0314:  CLR     R3              ;[DEST] = 000000
023140  000257                          CCC                     ;CLEAR CODES
023142  000262                          SEV                     ;N:C = 0010

023144  006103                  I0314:  ROL     R3              ;TEST THE ROL

023146  100403                          BMI     E10314          ;N:C = 0100 ?
023150  001002                          BNE     E10314
023152  102401                          BVS     E10314
023154  103002                          BCC     A0314

023156  104005                  E10314: ERROR5                  ;ROL FAILED TO ALTER THE CODES PROPERLY
023160  023136                          R0314                   ;ERROR LOOP RETURN
023162  020403                  A0314:  CMP     R4,R3           ;RESULT OK ?
023164  001402                          BEQ     O0314           ;BR IF YES

023166  104000                  E20314: ERROR                   ;ROL DELIVERED THE WRONG RESULT
023170  023136                          R0314                   ;ERROR LOOP RETURN

023172  000004                  O0314:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0315 ADC DMO TEST - <N:C> = 0101
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [104,373,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001

                                ;EXEC:          [104]ALUC=LLLLL :[373] D = 100000

                                ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 1010

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K3-8 CIN00 L  /  K3-3 DM=0L  /  K3-4 OVLAP INSTR H  /  K3-4 ADC L

023174  012700  000315          T0315:  MOV     #0315,R0                ;LOAD R0 WITH TEST NO.
023200  013701  023224                  MOV     @#I0315,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
023204  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
023210  012704  100000                  MOV     #100000,R4      ;RESULT S / B = 100000
023214  012703  077777          R0315:  MOV     #77777,R3       ;[DEST] = 77777
023220  000257                          CCC                     ;CLEAR CODES
023222  000265                          265                     ;N:C = 0101

023224  005503                  I0315:  ADC     R3              ;TEST THE ADC

023226  100003                          BPL     E10315          ;N:C = 1010 ?
023230  001402                          BEQ     E10315
023232  102001                          BVC     E10315
023234  103002                          BCC     A0315

023236  104005                  E10315: ERROR5                  ;ADC FAILED TO ALTER THE CODES PROPERLY
023240  023214                          R0315                   ;ERROR LOOP RETURN
023242  020403                  A0315:  CMP     R4,R3           ;RESULT OK ?
023244  001402                          BEQ     00315           ;BR IF YES

023246  104000                  E20315: ERROR                   ;ADC DELIVERED THE WRONG RESULT
023250  023214                          R0315                   ;ERROR LOOP RETURN

023252  000004                  00315:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0316 ADC DMO TEST - <N:C> = 1011
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [104,373,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001

                                ;EXEC:          [104]ALUC=LLLLL :[373] D = 000000

                                ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 0101

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K3-8 CINOO L  /  K3-3 DM=OL  /  K3-4 OVLAP INSTR H  /  K3-4 ADC L

023254  012700  000316          T0316:  MOV     #0316,R0                ;LOAD R0 WITH TEST NO.
023260  013701  023302                  MOV     @#I0316,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
023264  012702  177703                  MOV     #177703,R2 ,    ;DEST ADDR = R3
023270  005004                          CLR     R4              ;RESULT S / B = 000000
023272  012703  177777          R0316:  MOV     #-1,R3          ;[DEST] = 177777
023276  000257                          CCC                     ;CLEAR CODES
023300  000273                          273                     ;N:C = 1011

023302  005503                  I0316:  ADC     R3              ;TEST THE ADC

023304  100403                          BMI     E10316          ;N:C = 0101 ?
023306  001002                          BNE     E10316
023310  102401                          BVS     E10316
023312  103402                          BCS     A0316

023314  104005                  E10316: ERROR5                  ;ADC FAILED TO ALTER THE CODES PROPERLY
023316  023272                          R0316                   ;ERROR LOOP RETURN
023320  020403                  A0316:  CMP     R4,R3           ;RESULT OK ?
023322  001402                          BEQ     00316           ;BR IF YES


023324  104000                  E20316: ERROR                   ;ADC DELIVERED THE WRONG RESULT
023326  023272                          R0316                   ;ERROR LOOP RETURN

023330  000004                  00316:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0317 ADC DMO TEST - <N:C> = 1010
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [104,373,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001

                                ;EXEC:          [104]ALUC=LLLLL :[373] D = 177777

                                ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 1000

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:         /  K3-3 DM=OL  /  K3-4 OVLAP INSTR H  /  K3-4 ADC L

023332  012700  000317          T0317:  MOV     #0317,R0                ;LOAD R0 WITH TEST NO.
023336  013701  023362                  MOV     @#I0317,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
023342  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
023346  012704  177777                  MOV     #-1,R4          ;RESULT S / B = 177777
023352  012703  177777          R0317:  MOV     #-1,R3          ;[DEST] = 177777
023356  000257                          CCC                     ;CLEAR CODES
023360  000272                          272                     ;N:C = 1010

023362  005503                  I0317:  ADC     R3              ;TEST THE ADC

023364  100003                          BPL     E10317          ;N:C = 1000 ?
023366  001402                          BEQ     E10317
023370  102401                          BVS     E10317
023372  103002                          BCC     A0317

023374  104005                  E10317: ERROR5                  ;ADC FAILED TO ALTER THE CODES PROPERLY
023376  023352                          R0317                   ;ERROR LOOP RETURN
023400  020403                  A0317:  CMP     R4,R3           ;RESULT OK ?
023402  001402                          BEQ     00317           ;BR IF YES

023404  104000                  E20317: ERROR                   ;ADC DELIVERED THE WRONG RESULT
023406  023352                          R0317                   ;ERROR LOOP RETURN

023410  000004                  00317:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0320 SBC DMO TEST - <N:C> = 1011
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [104,373,360,001] FC 1,7,8

                                        ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001

                                        ;EXEC:          [104]ALUC=LHHHH :[373] D = 000000

                                        ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 0100

                                        ;SYNC:          B05J2 (-) T = 1 USEC

                                        ;KEY SIG:       K3-3 DM=OL  /  K3-4 OVLAP INSTR H  /  K3-4 SBC L

023412  012700  000320                  T0320:  MOV     #0320,R0                ;LOAD R0 WITH TEST NO.
023416  013701  023440                          MOV     @#I0320,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
023422  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
023426  005004                                  CLR     R4              ;RESULT S / B = 000000
023430  012703  000001                  R0320:  MOV     #1,R3           ;[DEST0321
023434  000257                                  CCC                     ;CLEAR CODES
023436  000273                                  273                     ;N:C = 1011

023440  005603                          I0320:  SBC     R3              ;TEST THE SBC

023442  100403                                  BMI     E10320          ;N:C = 0100 ?
023444  001002                                  BNE     E10320
023446  102401                                  BVS     E10320
023450  103002                                  BCC     A0320

023452  104005                          E10320: ERROR5                  ;SBC FAILED TO ALTER THE CODES PROPERLY
023454  023430                                  R0320                   ;ERROR LOOP RETURN
023456  020403                          A0320:  CMP     R4,R3           ;RESULT OK ?
023460  001402                                  BEQ     00320           ;BR IF YES

023462  104000                          E20320: ERROR                   ;SBC DELIVERED THE WRONG RESULT
023464  023430                                  R0320                   ;ERROR LOOP RETURN

023466  000004                          00320:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0321 SBC DMO TEST - <N:C> = 0101
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [104,373,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001

                                ;EXEC:          [104]ALUC=LHHHH :[373] D = 077777

                                ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 0010

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K3-3 DM=OL  /  K3-4 OVLAP INSTR H  /  K3-4 SBC L

 023470  012700  000321         T0321:  MOV     #0321,R0                ;LOAD R0 WITH TEST NO.
 023474  013701  023520                 MOV     @#I0321,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
 023500  012702  177703                 MOV     #177703,R2      ;DEST ADDR = R3
 023504  012704  077777                 MOV     #077777,R4      ;RESULT S / B = 077777
 023510  012703  100000         R0321:  MOV     #100000,R3      ;[DEST] = 100000
 023514  000257                         CCC                     ;CLEAR CODES
 023516  000265                         265                     ;N:C = 0101

 023520  005603                 I0321:  SBC     R3              ;TEST THE SBC

 023522  100403                         BMI     E10321          ;N:C = 0010 ?
 023524  001402                         BEQ     E10321
 023526  102001                         BVC     E10321
 023530  103002                         BCC     A0321

 023532  104005                 E10321: ERROR5                  ;SBC FAILED TO ALTER THE CODES PROPERLY
 023534  023510                         R0321                   ;ERROR LOOP RETURN
 023536  020403                 A0321:  CMP     R4,R3           ;RESULT OK ?
 023540  001402                         BEQ     O0321           ;BR IF YES

 023542  104000                 E20321: ERROR                   ;SBC DELIVERED THE WRONG RESULT
 023544  023510                         R0321                   ;ERROR LOOP RETURN

 023546  000004                 O0321:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0322 SBC DMO TEST - <N:C> = 1110
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [104,373,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001

                                ;EXEC:          [104]ALUC=LLLLL :[373] D = 000001

                                ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C = 0000

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K3-3 DM=OL  /  K3-4 OVLAP INSTR H  /  K3-4 SBC L

023550  012700  000322          T0322:  MOV     #0322,R0                ;LOAD R0 WITH TEST NO.
023554  013701  023600                  MOV     @#I0322,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
023560  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
023564  012704  000001                  MOV     #1,R4           ;RESULT S / B = 1
023570  012703  000001          R0322:  MOV     #1,R3           ;[DEST] = 1
023574  000257                          CCC                     ;CLEAR CODES
023576  000276                          276                     ;N:C = 1110

023600  005603                  I0322:  SBC     R3              ;TEST THE SBC

023602  100403                          BMI     E10322          ;N:C = 0000 ?
023604  001402                          BEQ     E10322
023606  102401                          BVS     E10322
023610  103002                          BCC     A0322

023612  104005                  E10322: ERROR5                  ;SBC FAILED TO ALTER THE CODES PROPERLY
023614  023570                          R0322                   ;ERROR LOOP RETURN
023616  020403                  A0322:  CMP     R4,R3           ;RESULT OK ?
023620  001402                          BEQ     O0322           ;BR IF YES

023622  104000                  E20322: ERROR                   ;SBC DELIVERED THE WRONG RESULT
023624  023570                          R0322                   ;ERROR LOOP RETURN

023626  000004                  O0322:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0323 SBC DM0 TEST - <N:C> = 0111
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [104,373,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,104 / 31[104]360,360 / 27[373]000,001

                                ;EXEC:          [104]ALUC=LHHHH :[373] D = 177777

                                ;CODES:         [373] SPS=1, [360] SPS=3  /  N:C 1001

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K3-3 DM=0L  /  K3-4 OVLAP INSTR H  /  K3-4 SBC L

023630  012700  000323          T0323:  MOV     #0323,R0                ;LOAD R0 WITH TEST NO.
023634  013701  023656                  MOV     @#I0323,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
023640  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
023644  012704  177777                  MOV     #-1,R4          ;RESULT S / B = 177777
023650  005003                  R0323:  CLR     R3              ;[DEST] = 000000
023652  000257                          CCC                     ;CLEAR CODES
023654  000267                          267                     ;N:C = 0111

023656  005603                  I0323:  SBC     R3              ;TEST THE SBC

023660  100003                          BPL     E10323          ;N:C = 1001 ?
023662  001402                          BEQ     E10323
023664  102401                          BVS     E10323
023666  103402                          BCS     A0323

023670  104005                  E10323: ERROR5                  ;SBC FAILED TO ALTER THE CODES PROPERLY
023672  023650                          R0323                   ;ERROR LOOP RETURN
023674  020403                  A0323:  CMP     R4,R3           ;RESULT OK ?
023676  001402                          BEQ     00323           ;BR IF YES

023700  104000                  E20323: ERROR                   ;SBC DELIVERED THE WRONG RESULT
023702  023650                          R0323                   ;ERROR LOOP RETURN ADDRESS

023704  000004                  00323:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0324 TST DM1 TEST - <N:C> = 1011
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016

                                ;EXEC:          [220]ALUC=LLLLL :[211] D = 000000

                                ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 0100

                                ;SYNC:          B05J2 (-) T = 2 USEC

                                ;KEY SIG:       K3-3 DM=1L  / K3-4 TST L  /  K1-7 D(15:00)=0 H

023706  012700  000324          T0324:  MOV     #0324,R0                ;LOAD R0 WITH TEST NO.
023712  013701  023732                  MOV     @#I0324,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
023716  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
023722  005004                          CLR     R4              ;RESULT S / B = 000000
023724  005012          R0324:  CLR     (R2)            ;[DEST] = 000000
023726  000257                          CCC                     ;CLEAR CODES
023730  000273                          273                     ;N:C=1011

023732  005712          I0324:  TST     (R2)            ;TEST THE TST

023734  100403                          BMI     E10324          ;N:C = 0100 ?
023736  001002                          BNE     E10324
023740  102401                          BVS     E10324
023742  103002                          BCC     A0324

023744  104005          E10324: ERROR5                  ;TST FAILED TO ALTER CODES PROPERLY
023746  023724                          R0324           ;ERROR LOOP RETURN

023750  020412          A0324:  CMP     R4,(R2)         ;RESULT OK ?
023752  001403                          BEQ     O0324           ;BR IF YES

023754  011203                          MOV     (R2),R3         ;GET THE WAS DATA
023756  104000          E20324: ERROR                   ;TST ALTERED THE [DEST]
023760  023724                          R0324           ;ERROR LOOP RETURN

023762  000004          O0324:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0325 TST DM1 TEST - <N:C> = 0100
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016

                                        ;EXEC:          [220]ALUC=LLLLL :[211] D = 177777

                                        ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 1000

                                        ;SYNC:          B05J2 (-) T = 2 USEC

                                        ;KEY SIG:       K3-3 DM=1L  /  K3-4 TST L

023764  012700  000325                  T0325:  MOV     #0325,R0                ;LOAD R0 WITH TEST NO.
023770  013701  024014                          MOV     @#I0325,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
023774  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
024000  005004                                  CLR     R4
024002  005104                                  COM     R4              ;RESULT S / B = 177777
024004  012712  177777                  R0325:  MOV     #-1,(R2)        ;[DEST] = 177777
024010  000257                                  CCC                     ;CLEAR CODES
024012  000264                                  264                     ;N:C=0100

024014  005712                          I0325:  TST     (R2)            ;TEST THE TST

024016  100003                                  BPL     E10325          ;N:C = 1000 ?
024020  001402                                  BEQ     E10325
024022  102401                                  BVS     E10325
024024  103002                                  BCC     A0325

024026  104005                          E10325: ERROR5                  ;TST FAILED TO ALTER CODES PROPERLY
024030  024004                                  R0325                   ;ERROR LOOP RETURN

024032  020412                          A0325:  CMP     R4,(R2)         ;RESULT OK ?
024034  001403                                  BEQ     O0325           ;BR IF YES

024036  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
024040  104000                          E20325: ERROR                   ;TST ALTERED THE [DEST]
024042  024004                                  R0325                   ;ERROR LOOP RETURN

024044  000004                          O0325:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0326 CLR DM1 TEST - <N:C> = 1011
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016

                                        ;EXEC:          [220]ALUC=HLLHH :[211] D = 000000

                                        ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 0100

                                        ;SYNC:          B05J2 (-) T = 2 USEC

                                        ;KEY SIG:       K3-3 DM=1L  /  K3-4 CLR L

024046  012700  000326                  T0326:  MOV     #0326,R0                ;LOAD R0 WITH TEST NO.
024052  013701  024074                          MOV     @#I0326,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
024056  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
024062  005004                                  CLR     R4              ;RESULT S / B = 000000
024064  012712  177777                  R0326:  MOV     #-1,(R2)        ;[DEST] = 177777
024070  000257                                  CCC                     ;CLEAR CODES
024072  000273                                  273                     ;N:C = 1011

024074  005012                          I0326:  CLR     (R2)            ;TEST THE CLR

024076  100403                                  BMI     E10326          ;N:C = 0100 ?
024100  001002                                  BNE     E10326
024102  102401                                  BVS     E10326
024104  103002                                  BCC     A0326

024106  104005                          E10326: ERROR5                  ;CLR FAILED TO ALTER THE CODES PROPERLY
024110  024064                                  R0326                   ;ERROR LOOP RETURN
024112  020412                          A0326:  CMP     R4,(R2)         ;RESULT OK ?
024114  001403                                  BEQ     00326           ;BR IF YES

024116  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
024120  104000                          E20326: ERROR                   ;CLR DELIVERED THE WRONG RESULT
024122  024064                                  R0326                   ;ERROR LOOP RETURN

024124  000004                          00326:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0327 CLR DM2 TEST - <N:C> = 0000
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016

                                        ;EXEC:          [220]ALUC=HLLHH :[211] D = 000000

                                        ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 0100

                                        ;SYNC:          B05J2 (-) T = 2 USEC

                                        ;KEY SIG:       K3-3 DM=1L  /  K3-4 CLR L

024126  012700  000327                  T0327:  MOV     #0327,R0                ;LOAD R0 WITH TEST NO.
024132  013701  024152                          MOV     @#I0327,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
024136  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
024142  005004                                  CLR     R4              ;RESULT S / B = 000000
024144  013712  067572                  R0327:  MOV     @#DWTA+2,(R2)   ;[DEST] = 177777
024150  000257                                  CCC                     ;CLEAR CODES

024152  005022                          I0327:  CLR     (R2)+           ;TEST THE CLR

024154  100403                                  BMI     E10327          ;N:C = 0100 ?
024156  001002                                  BNE     E10327
024160  102401                                  BVS     E10327
024162  103002                                  BCC     A0327

024164  104005                          E10327: ERROR5                  ;CLR FAILED TO ALTER THE CODES PROPERLY
024166  024144                                  R0327                   ;ERROR LOOP RETURN
024170  022702  067562                  A0327:  CMP     #MBUF0+2,R2     ;DID CLR INCREMENT DEST REG
024174  001402                                  BEQ     B0327           ;BR IF YES

024176  104005                          E20327: ERROR5                  ;CLR FAILED TO UPDATE DEST REG
024200  024144                                  R0327                   ;ERROR LOOP RETURN

024202  020442                          B0327:  CMP     R4,-(R2)                ;RESULT OK ?
024204  001403                                  BEQ     00327           ;BR IF YES

024206  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
024210  104000                          E30327: ERROR                   ;CLR DELIVERED THE WRONG RESULT
024212  024144                                  R0327                   ;ERROR LOOP RETURN

024214  000004                          00327:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0330 COM DM1 TEST - <N:C> = 0110
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016

                                        ;EXEC:          [220]ALUC=HLLLL :[211] D = 125252

                                        ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C=1001

                                        ;SYNC:          B05J2 (-) T = 2 USEC

                                        ;KEY SIG:       K3-3 DM=1L  /  K3-4 COM L

 024216  012700  000330                 T0330:  MOV     #0330,R0                ;LOAD R0 WITH TEST NO.
 024222  013701  024246                         MOV     @#I0330,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
 024226  012702  067560                         MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
 024232  012704  125252                         MOV     #125252,R4      ;RESULT S / B = 125252
 024236  012712  052525                 R0330:  MOV     #52525,(R2)     ;[DEST] = 52525
 024242  000257                                 CCC                     ;CLEAR CODES
 024244  000266                                 266                     ;N:C = 0110

 024246  005112                         I0330:  COM     (R2)            ;TEST THE CLR

 024250  100003                                 BPL     E10330          ;N:C = 1001 ?
 024252  001402                                 BEQ     E10330
 024254  102401                                 BVS     E10330
 024256  103402                                 BCS     A0330

 024260  104005                         E10330: ERROR5                  ;COM FAILED TO ALTER THE CODES PROPERLY
 024262  024236                                 R0330                   ;ERROR LOOP RETURN
 024264  020412                         A0330:  CMP     R4,(R2)         ;RESULT OK ?
 024266  001403                                 FEQ     O0330           ;BR IF YES

 024270  011203                                 MOV     (R2),R3         ;GET THE WAS DATA
 024272  104000                         E20330: ERROR                   ;COM DELIVERED THE WRONG RESULT
 024274  024236                                 R0330                   ;ERROR LOOP RETURN

 024276  000004                         O0330:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0331 COM DM1 TEST - <N:C> = 1001
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016

                                ;EXEC:          [220]ALUC=HLLLL :[211] D = 000000

                                ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 0101

                                ;SYNC:          B05J2 (-) T = 2 USEC

                                ;KEY SIG:       K3-3 DM=1L  /  K3-4 COM L

024300  012700  000331          T0331:  MOV     #0331,R0                ;LOAD R0 WITH TEST NO.
024304  013701  024326                  MOV     @#I0331,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
024310  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
024314  005004                          CLR     R4              ;RESULT S / B = 000000
024316  012712  177777          R0331:  MOV     #-1,(R2)        ;[DEST] = 177777
024322  000257                          CCC                     ;CLEAR CODES
024324  000271                          271                     ;N:C = 1001

024326  005112                  I0331:  COM     (R2)            ;TEST THE COM

024330  100403                          BMI     E10331          ;N:C = 0101 ?
024332  001002                          BNE     E10331
024334  102401                          BVS     E10331
024336  103402                          BCS     A0331

024340  104005                  E10331: ERROR5                  ;COM FAILED TO ALTER THE CODES PROPERLY
024342  024316                          R0331                   ;ERROR LOOP RETURN
024344  020412                  A0331:  CMP     R4,(R2)         ;RESULT OK ?
024346  001403                          BEQ     O0331           ;BR IF YES

024350  011203                          MOV     (R2),R3         ;GET THE WAS DATA
024352  104000                  E20331: ERROR                   ;COM DELIVERED THE WRONG RESULT
024354  024316                          R0331                   ;ERROR LOOP RETURN

024356  000004                  O0331:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0332 INC DM1 TEST - <N:C> = 1011
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,220,211,367,275,016] FC 1,3,9,8

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016

                                ;EXEC:          [220]ALUC=LLLLL :[211] D = 000000

                                ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 0101

                                ;SYNC:          B05J2 (-) T = 2 USEC

                                ;KEY SIG:       K3-3 DM=1L  /  K3-4 INC L  /  K3-8 CIN00 L

024360  012700  000332          T0332:  MOV     #0332,R0                ;LOAD R0 WITH TEST NO.
024364  013701  024406                  MOV     @#I0332,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
024370  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
024374  005004                          CLR     R4              ;RESULT S / B = 000000
024376  012712  177777          R0332:  MOV     #-1,(R2)                ;[DEST] = 177777
024402  000257                          CCC                     ;CLEAR CODES
024404  000273                          273                     ;N:C = 1011

024406  005212                  I0332:  INC     (R2)            ;TEST THE INC

024410  100403                          BMI     E10332          ;N:C = 0101 ?
024412  001002                          BNE     E10332
024414  102401                          BVS     E10332
024416  103402                          BCS     A0332

024420  104005                  E10332: ERROR5                  ;INC FAILED TO ALTER THE CODES PROPERLY
024422  024376                          R0332                   ;ERROR LOOP RETURN
024424  020412                  A0332:  CMP     R4,(R2)         ;RESULT OK ?
024426  001403                          BEQ     00332           ;BR IF YES

024430  011203                          MOV     (R2),R3         ;GET THE WAS DATA
024432  104000                  E20332: ERROR                   ;INC DELIVERED THE WRONG RESULT
024434  024376                          R0332                   ;ERROR LOOP RETURN

024436  000004                  00332:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0333 INC DM1 TEST - <N:C> = 0100
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016

                                        ;EXEC:          [220]ALUC=LLLLL :[211] D = 100000

                                        ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 1010

                                        ;SYNC:          B05J2 (-) T = 2 USEC

                                        ;KEY SIG:       K3-3 DM=1L  /  K3-4 INC L  /  K3-8 CIN00 L

024440  012700  000333                  T0333:  MOV     #0333,R0                ;LOAD R0 WITH TEST NO.
024444  013701  024470                          MOV     @#I0333,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
024450  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
024454  012704  100000                          MOV     #100000,R4      ;RESULT S / B = 100000
024460  012712  077777                  R0333:  MOV     #77777,(R2)     ;[DEST] = 77777
024464  000257                                  CCC                     ;CLEAR CODES
024466  000264                                  264                     ;N:C = 0100

024470  005212                          I0333:  INC     (R2)            ;TEST THE INC

024472  100003                                  BPL     E10333          ;N:C = 1010 ?
024474  001402                                  BEQ     E10333
024476  102001                                  BVC     E10333
024500  103002                                  BCC     A0333

024502  104005                          E10333: ERROR5                  ;INC FAILED TO ALTER THE CODES PROPERLY
024504  024460                                  R0333                   ;ERROR LOOP RETURN
024506  020412                          A0333:  CMP     R4,(R2)         ;RESULT OK ?
024510  001403                                  BEQ     00333           ;BR IF YES

024512  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
024514  104000                          E20333: ERROR                   ;INC DELIVERED THE WRONG RESULT
024516  024460                                  R0333                   ;ERROR LOOP RETURN

024520  000004                          00333:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0334 DEC DM1 TEST - <N:C> = 1011
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016

                                        ;EXEC:          [220]ALUC=LHHHH :[211] D = 000000

                                        ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 0101

                                        ;SYNC:          B05J2 (-) T = 2 USEC

                                        ;KEY SIG:       K3-3 DM=1L  /  K3-4 DEC L

024522  012700  000334          T0334:  MOV     #0334,R0                ;LOAD R0 WITH TEST NO.
024526  013701  024562                  MOV     @#I0334,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
024532  032737  000100  066642          BIT     #100,@#BPTLOC   ;BREAKPOINT HALT SET
024540  001401                          BEQ     .+4             ;BR IF NOT
024542  000000                          HALT                    ;BREAK-DEPRESS CONTINUE TO RESTART
024544  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
024550  005004                          CLR     R4              ;RESULT S / B = 000000
024552  012712  000001          R0334:  MOV     #1,(R2)         ;[DEST] = 1
024556  000257                          CCC                     ;CLEAR CODES
024560  000273                          273                     ;N:C = 1011

024562  005312                  I0334:  DEC     (R2)            ;TEST THE DEC

024564  100403                          BMI     E10334          ;N:C = 0101 ?
024566  001002                          BNE     E10334
024570  102401                          BVS     E10334
024572  103402                          BCS     A0334

024574  104005                  E10334: ERROR5                  ;DEC FAILED TO ALTER THE CODES PROPERLY
024576  024552                          R0334                   ;ERROR LOOP RETURN
024600  020412                  A0334:  CMP     R4,(R2)         ;RESULT OK ?
024602  001403                          BEQ     00334           ;BR IF YES

024604  011203                          MOV     (R2),R3         ;GET THE WAS DATA
024606  104000                  E20334: ERROR                   ;DEC DELIVERED THE WRONG RESULT
024610  024552                          R0334                   ;ERROR LOOP RETURN

024612  000004                  00334:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0335 DEC DM1 TEST - <N:C> = 1100
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016

                                        ;EXEC:          [220]ALUC=LHHHH :[211] D = 77777

                                        ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 0010

                                        ;SYNC:          B05J2 (-) T = 2 USEC

                                        ;KEY SIG:       K3-3 DM=1L  /  K3-4 DEC L

024614  012700  000335                  T0335:  MOV     #0335,R0                ;LOAD R0 WITH TEST NO.
024620  013701  024644                          MOV     @#I0335,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
024624  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
024630  012704  077777                          MOV     #77777,R4       ;RESULT S / B = 77777
024634  012712  100000                  R0335:  MOV     #100000,(R2)    ;[DEST] = 100000
024640  000257                                  CCC                     ;CLEAR CODES
024642  000274                                  274                     ;N:C = 1100

024644  005312                          I0335:  DEC     (R2)            ;TEST THE DEC

024646  100403                                  BMI     E10335          ;N:C = 0010 ?
024650  001402                                  BEQ     E10335
024652  102001                                  BVC     E10335
024654  103002                                  BCC     A0335

024656  104005                          E10335: ERROR5                  ;DEC FAILED TO ALTER THE CODES PROPERLY
024660  024634                                  R0335                   ;ERROR LOOP RETURN
024662  020412                          A0335:  CMP     R4,(R2)         ;RESULT OK ?
024664  001403                                  BEQ     O0335           ;BR IF YES

024666  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
024670  104000                          E20335: ERROR                   ;DEC DELIVERED THE WRONG RESULT
024672  024634                                  R0335                   ;ERROR LOOP RETURN

024674  000004                          O0335:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0336 DEC DM1 TEST - <N:C> = 0000
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016

                                ;EXEC:          [220]ALUC=LHHHH :[211] D = 177777

                                ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C 1000

                                ;SYNC:          B05J2 (-) T = 2 USEC

                                ;KEY SIG:       K3-3 DM=1L  /  K3-4 DEC L

024676  012700  000336          T0336:  MOV     #0336,R0                ;LOAD R0 WITH TEST NO.
024702  013701  024722                  MOV     @#I0336,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
024706  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
024712  012704  177777                  MOV     #-1,R4          ;RESULT S / B = 177777
024716  005012                  R0336:  CLR     (R2)            ;[DEST] = 000000
024720  000257                          CCC                     ;CLEAR CODES

024722  005312                  I0336:  DEC     (R2)            ;TEST THE DEC

024724  100003                          BPL     E10336          ;N:C = 1000 ?
024726  001402                          BEQ     E10336
024730  102401                          BVS     E10336
024732  103002                          BCC     A0336

024734  104005                  E10336: ERROR5                  ;DEC FAILED TO ALTER THE CODES PROPERLY
024736  024716                          R0336                   ;ERROR LOOP RETURN
024740  020412                  A0336:  CMP     R4,(R2)         ;RESULT OK ?
024742  001403                          BEQ     00336           ;BR IF YES

024744  011203                          MOV     (R2),R3         ;GET THE WAS DATA
024746  104000                  E20336: ERROR                   ;DEC DELIVERED THE WRONG RESULT
024750  024716                          R0336                   ;ERROR LOOP RETURN

024752  000004                  00336:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0337 ASL DM1 TEST - <N:C> = 1000
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016

                                        ;EXEC:          [220]ALUC=LHHLL :[211] D = 000000

                                        ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 0111

                                        ;SYNC:          B05J2 (-) T = 2 USEC

                                        ;KEY SIG:       K3-3 DM=1L  /  K3-6 ROTSHF (L) L  /  K3-5 ROTSHF H

024754  012700  000337                  T0337:  MOV     #0337,R0                ;LOAD R0 WITH TEST NO.
024760  013701  025002                          MOV     @#I0337,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
024764  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
024770  005004                                  CLR     R4              ;RESULT S / B = 000000
024772  012712  100000                  R0337:  MOV     #100000,(R2)    ;[DEST] = 100000
024776  000257                                  CCC                     ;CLEAR CODES
025000  000270                                  SEN                     ;N:C = 1000

025002  006312                          I0337:  ASL     (R2)            ;TEST THE ASL

025004  100403                                  BMI     E10337          ;N:C = 0111 ?
025006  001002                                  BNE     E10337
025010  102001                                  BVC     E10337
025012  103402                                  BCS     A0337

025014  104005                          E10337: ERROR5                  ;ASL FAILED TO ALTER THE CODES PROPERLY
025016  024772                                  R0337                   ;ERROR LOOP RETURN
025020  020412                          A0337:  CMP     R4,(R2)         ;RESULT OK ?
025022  001403                                  BEQ     O0337           ;BR IF YES

025024  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
025026  104000                          E20337: ERROR                   ;ASL DELIVERED THE WRONG RESULT
025030  024772                                  R0337                   ;ERROR LOOP RETURN

025032  000004                          O0337:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0340 ASL DM1 TEST - <N:C> = 0101
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016

                                        ;EXEC:          [220]ALUC=LHHLL :[211] D = 100000

                                        ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 1010

                                        ;SYNC:          B05J2 (-) T = 2 USEC

                                        ;KEY SIG:       K3-3 DM=1L  /  K3-6 ROTSHF (L) L  /  K3-5 ROTSHF H

025034  012700  000340                  T0340:  MOV     #0340,R0                ;LOAD R0 WITH TEST NO.
025040  013701  025064                          MOV     @#I0340,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
025044  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
025050  012704  100000                          MOV     #100000,R4      ;RESULT S / B = 100000
025054  012712  040000                  R0340:  MOV     #40000,(R2)     ;[DEST] = 40000
025060  000257                                  CCC                     ;CLEAR CODES
025062  000265                                  265                     ;N:C = 0101

025064  006312                          I0340:  ASL     (R2)            ;TEST THE ASL

025066  100003                                  BPL     E10340          ;N:C = 1010 ?
025070  001402                                  BEQ     E10340
025072  102001                                  BVC     E10340
025074  103002                                  BCC     A0340

025076  104005                          E10340: ERROR5                  ;ASL FAILED TO ALTER THE CODES PROPERLY
025100  025054                                  R0340                   ;ERROR LOOP RETURN
025102  020412                          A0340:  CMP     R4,(R2)         ;RESULT OK ?
025104  001403                                  BEQ     O0340           ;BR IF YES

025106  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
025110  104000                          E20340: ERROR                   ;ASL DELIVERED THE WRONG RESULT
025112  025054                                  R0340                   ;ERROR LOOP RETURN

025114  000004                          O0340:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ************************************************************************
                                        .SBTTL T0341 ASL DM1 TEST - <N:C> = 0010
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016

                                ;EXEC:          [220]ALUC=LHHLL :[211] D = 000000

                                ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 0100

                                ;SYNC:          B05J2 (-) T = 2 USEC

                                ;KEY SIG:       K3-3 DM=1L  /  K3-6 ROTSHF (L) L  /  K3-5 ROTSHF F

025116  012700  000341          T0341:  MOV     #0341,R0                ;LOAD R0 WITH TEST NO.
025122  013701  025142                  MOV     @#I0341,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
025126  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
025132  005004                          CLR     R4              ;RESULT S / B = 000000
025134  005012          R0341:  CLR     (R2)            ;[DEST] = 000000
025136  000257                  CCC                     ;CLEAR CODES
025140  000262                  SEV                     ;N:C = 0010

025142  006312          I0341:  ASL     (R2)            ;TEST THE ASL

025144  100403                  BMI     E10341          ;N:C = 0100 ?
025146  001002                  BNE     E10341
025150  102401                  BVS     E10341
025152  103002                  BCC     A0341

025154  104005          E10341: ERROR5                  ;ASL FAILED TO ALTER THE CODES PROPERLY
025156  025134                  R0341                   ;ERROR LOOP RETURN
025160  020412          A0341:  CMP     R4,(R2)         ;RESULT OK ?
025162  001403                  BEQ     00341           ;BR IF YES

025164  011203                  MOV     (R2),R3         ;GET THE WAS DATA
025166  104000          E20341: ERROR                   ;ASL DELIVERED THE WRONG RESULT
025170  025134                  R0341                   ;ERROR LOOP RETURN

025172  000004          00341:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ************************************************************************
                                        .SBTTL T0342 ROL DM1 TEST - <N:C> = 1101
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016

                                ;EXEC:          [220]ALUC=LHHLL :[211] D = 052525

                                ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 0011

                                ;SYNC:          B05J2 (-) T = 2 USEC

                                ;KEY SIG:       K3-3 DM=1L  /  K3-6 ROTSHF (L) L  /  K3-5 ROTSHF H  /  K3-8 ROT (L) H

025174  012700  000342          T0342:  MOV     #0342,R0                ;LOAD R0 WITH TEST NO.
025200  013701  025224                  MOV     @#I0342,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
025204  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
025210  012704  052525                  MOV     #52525,R4       ;RESULT S / B = 52525
025214  012712  125252          R0342:  MOV     #125252,(R2)    ;[DEST] = 125252
025220  000257                          CCC                     ;CLEAR CODES
025222  000275                          275                     ;N:C = 1101

025224  006112                  I0342:  ROL     (R2)            ;TEST THE ROL

025226  100403                          BMI     E10342          ;N:C = 0011 ?
025230  001402                          BEQ     E10342
025232  102001                          BVC     E10342
025234  103402                          BCS     A0342

025236  104005                  E10342: ERROR5                  ;ROL FAILED TO ALTER THE CODES PROPERLY
025240  025214                          R0342                   ;ERROR LOOP RETURN
025242  020412                  A0342:  CMP     R4,(R2)         ;RESULT OK ?
025244  001403                          BEQ     00342           ;BR IF YES

025246  011203                          MOV     (R2),R3         ;GET THE WAS DATA
025250  104000                  E20342: ERROR                   ;ROL DELIVERED THE WRONG RESULT
025252  025214                          R0342                   ;ERROR LOOP RETURN

025254  000004                  00342:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0343 ROL DM1 TEST - <N:C> = 0101
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,220,211,367,075,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016

                                        ;EXEC:          [220]ALUC=LHHLL :[211] D = 125253

                                        ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 1010

                                        ;SYNC:          B05J2 (-) T = 2 USEC

                                        ;KEY SIG:       K3-3 DM=1L  /  K3-6 ROTSHF (L) L  /  K3-5 ROTSHF H  /  K3-8 ROT (L) H

025256  012700  000343                  T0343:  MOV     #0343,R0                ;LOAD R0 WITH TEST NO.
025262  013701  025306                          MOV     @#I0343,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
025266  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
025272  012704  125253                          MOV     #125253,R4      ;RESULT S / B = 125253
025276  012712  052525                  R0343:  MOV     #52525,(R2)     ;[DEST] = 52525
025302  000257                                  CCC                     ;CLEAR CODES
025304  000265                                  265                     ;N:C = 0101

025306  006112                          I0343:  ROL     (R2)            ;TEST THE ROL

025310  100003                                  BPL     E10343          ;N:C = 1010 ?
025312  001402                                  BEQ     E10343
025314  102001                                  BVC     E10343
025316  103002                                  BCC     A0343

025320  104005                          E10343: ERROR5                  ;ROL FAILED TO ALTER THE CODES PROPERLY
025322  025276                                  R0343                   ;ERROR LOOP RETURN
025324  020412                          A0343:  CMP     R4,(R2)         ;RESULT OK ?
025326  001403                                  BEQ     00343           ;BR IF YES

025330  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
025332  104000                          E20343: ERROR                   ;ROL DELIVERED THE WRONG RESULT
025334  025276                                  R0343                   ;ERROR LOOP RETURN

025336  000004                          00343:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ************************************************************************
                                                .SBTTL T0344 ROL DM1 TEST - <N:C> = 0010
                                        ; ************************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016

                                        ;EXEC:          [220]ALUC=LHHLL :[211] D = 000000

                                        ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C =0100

                                        ;SYNC:          B05J2 (-) T = 2 USEC

                                        ;KEY SIG:       K3-3 DM=1L  /  K3-6 ROTSHF (L) L  /  K3-5 ROTSHF H  /  K3-8 ROT (L) H

025340  012700  000344                  T0344:  MOV     #0344,R0                ;LOAD R0 WITH TEST NO.
025344  013701  025364                          MOV     @#I0344,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
025350  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
025354  005004                                  CLR     R4              ;RESULT S / B = 000000
025356  005012                          R0344:  CLR     (R2)            ;[DEST] = 000000
025360  000257                                  CCC                     ;CLEAR CODES
025362  000262                                  SEV                     ;N:C = 0010

025364  006112                          I0344:  ROL     (R2)            ;TEST THE ROL

025366  100403                                  BMI     E10344          ;N:C = 0100 ?
025370  001002                                  BNE     E10344
025372  102401                                  BVS     E10344
025374  103002                                  BCC     A0344

025376  104005                          E10344: ERROR5                  ;ROL FAILED TO ALTER THE CODES PROPERLY
025400  025356                                  R0344                   ;ERROR LOOP RETURN
025402  020412                          A0344:  CMP     R4,(R2)         ;RESULT OK ?
025404  001403                                  BEQ     O0344           ;BR IF YES

025406  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
025410  104000                          E20344: ERROR                   ;ROL DELIVERED THE WRONG RESULT
025412  025356                                  R0344                   ;ERROR LOOP RETURN

025414  000004                          O0344:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0345 ADC DM1 TEST - <N:C> = 0101
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016

                                ;EXEC:          [220]ALUC=LLLLL :[211] D = 100000

                                ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C =1010

                                ;SYNC:          B05J2 (-) T = 2 USEC

                                ;KEY SIG:       K3-8 CIN00 L  /  K3-3 DM=1L  /  K3-4 ADC L

025416  012700  000345          T0345:  MOV     #0345,R0                ;LOAD R0 WITH TEST NO.
025422  013701  025446                  MOV     @#I0345,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
025426  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
025432  012704  100000                  MOV     #100000,R4      ;RESULT S / B = 100000
025436  012712  077777          R0345:  MOV     #77777,(R2)     ;[DEST] = 77777
025442  000257                          CCC                     ;CLEAR CODES
025444  000265                          265                     ;N:C = 0101

025446  005512                  I0345:  ADC     (R2)            ;TEST THE ADC

025450  100003                          BPL     E10345          ;N:C = 1010 ?
025452  001402                          BEQ     E10345
025454  102001                          BVC     E10345
025456  103002                          BCC     A0345

025460  104005                  E10345: ERROR5                  ;ADC FAILED TO ALTER THE CODES PROPERLY
025462  025436                          R0345                   ;ERROR LOOP RETURN
025464  020412                  A0345:  CMP     R4,(R2)         ;RESULT OK ?
025466  001403                          BEQ     O0345           ;BR IF YES

025470  011203                          MOV     (R2),R3         ;GET THE WAS DATA
025472  104000                  E20345: ERROR                   ;ADC DELIVERED THE WRONG RESULT
025474  025436                          R0345                   ;ERROR LOOP RETURN

025476  000004                  O0345:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ************************************************************************
                                        .SBTTL T0346 ADC DM1 TEST - <N:C> = 1011
                                ; ************************************************************************

                                ;MICROPROGRAMMING   /   LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8

                                ;ACT BUTS:      37[004]100,161  /  33[266]220,220  /  16[367]016,016

                                ;EXEC:          [220]ALUC=LHHLL :[211] D = 000000

                                ;CODES:         [211] SPS=1, [367] SPS=3   /   N:C = 0101

                                ;SYNC:          B05J2 (-) T = 2 USEC

                                ;KEY SIG:       K3-8 CIN00 L   /   K3-3 DM=1L   /   K3-4 ADC L

025500  012700  000346          T0346:  MOV     #0346,R0                ;LOAD R0 WITH TEST NO.
025504  013701  025526                  MOV     @#I0346,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
025510  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
025514  005004                          CLR     R4              ;RESULT S  /  B = 000000
025516  012712  177777          R0346:  MOV     #-1,(R2)        ;[DEST] = 177777
025522  000257                          CCC                     ;CLEAR CODES
025524  000273                          273                     ;N:C = 1011

025526  005512                  I0346:  ADC     (R2)            ;TEST THE ADC

025530  100403                          BMI     E10346          ;N:C = 0101 ?
025532  001002                          BNE     E10346
025534  102401                          BVS     E10346
025536  103402                          BCS     A0346

025540  104005                  E10346: ERROR5                  ;ADC FAILED TO ALTER THE CODES PROPERLY
025542  025516                          R0346                   ;ERROR LOOP RETURN
025544  020412                  A0346:  CMP     R4,(R2)         ;RESULT OK ?
025546  001403                          BEQ     00346           ;BR IF YES

025550  011203                          MOV     (R2),R3         ;GET THE WAS DATA
025552  104000                  E20346: ERROR                   ;ADC DELIVERED THE WRONG RESULT
025554  025516                          R0346                   ;ERROR LOOP RETURN

025556  000004                  00346:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                ; ***********************************************************************
                                        .SBTTL T0347 ADC DM1 TEST - <N:C> = 1010
                                ; ***********************************************************************

                                ;MICROPROGRAMMING   /   LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8

                                ;ACT BUTS:      37[004]100,161  /  33[266]220,220  /  16[367]016,016

                                ;EXEC:          [220]ALUC=LHHLL :[211] D = 177777

                                ;CODES:         [211] SPS=1, [367] SPS=3   /   N:C = 1000

                                ;SYNC:          B05J2 (-) T = 2 USEC

                                ;KEY SIG:           /   K3-3 DM=1   /   K3-4 ADC L

025560  012700  000347          T0347:  MOV     #0347,R0                ;LOAD R0 WITH TEST NO.
025564  013701  025610                  MOV     @#I0347,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
025570  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
025574  012704  177777                  MOV     #-1,R4          ;RESULT S  /  B = 177777
025600  012712  177777          R0347:  MOV     #-1,(R2)        ;[DEST] = 177777
025604  000257                          CCC                     ;CLEAR CODES
025606  000272                          272                     ;N:C = 1010

025610  005512                  I0347:  ADC     (R2)            ;TEST THE ADC

                                        BPL     E10347          ;N:C = 1000 ?
025612  100003                          BEQ     E10347
025614  001402                          BVS     E10347
025616  102401                          BCC     A0347
025620  103002

025622  104005                  E10347: ERROR5                  ;ADC FAILED TO ALTER THE CODES PROPERLY
025624  025600                          R0347                   ;ERROR LOOP RETURN
025626  020412                  A0347:  CMP     R4,(R2)         ;RESULT OK ?
025630  001403                          BEQ     00347           ;BR IF YES

025632  011203                          MOV     (R2),R3         ;GET THE WAS DATA
025634  104000                  E20347: ERROR                   ;ADC DELIVERED THE WRONG RESULT
025636  025600                          R0347                   ;ERROR LOOP RETURN

025640  000004                  00347:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0350 SBC DM1 TEST - <N:C> = 1011
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016

                                        ;EXEC:          [220]ALUC=LHHHH :[211] D = 000000

                                        ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 0100

                                        ;SYNC:          B05J2 (-) T = 2 USEC

                                        ;KEY SIG:       K3-3 DM=1L  /  K3-4 SBC L

025642  012700  000350                  T0350:  MOV     #0350,R0                ;LOAD R0 WITH TEST NO.
025646  013701  025670                          MOV     @#I0350,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
025652  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
025656  005004                                  CLR     R4              ;RESULT S / B = 000000
025660  012712  000001                  R0350:  MOV     #1,(R2)         ;[DEST0351
025664  000257                                  CCC                     ;CLEAR CODES
025666  000273                                  273                     ;N:C = 1011

025670  005612                          I0350:  SBC     (R2)            ;TEST THE SBC

025672  100403                                  BMI     E10350          ;N:C = 0100 ?
025674  001002                                  BNE     E10350
025676  102401                                  BVS     E10350
025700  103002                                  BCC     A0350

025702  104005                          E10350: ERROR5                  ;SBC FAILED TO ALTER THE CODES PROPERLY
025704  025660                                  R0350                   ;ERROR LOOP RETURN
025706  020412                          A0350:  CMP     R4,(R2)         ;RESULT OK ?
025710  001403                                  BEQ     00350           ;BR IF YES

025712  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
025714  104000                          E20350: ERROR                   ;SBC DELIVERED THE WRONG RESULT
025716  025660                                  R0350                   ;ERROR LOOP RETURN

025720  000004                          00350:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ************************************************************************
                                        .SBTTL T0351 SBC DM1 TEST - <N:C> = 0101
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016

                                ;EXEC:          [220]ALUC=LHHLL :[211] D = 077777

                                ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 0010

                                ;SYNC:          B05J2 (-) T = 2 USEC

                                ;KEY SIG:       K3-3 DM=1L  /  K3-4 SBC L

025722  012700  000351          T0351:  MOV     #0351,R0                ;LOAD R0 WITH TEST NO.
025726  013701  025752                  MOV     @#I0351,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
025732  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
025736  012704  077777                  MOV     #077777,R4      ;RESULT S / B = 077777
025742  012712  100000          R0351:  MOV     #100000,(R2)    ;[DEST] = 100000
025746  000257                          CCC                     ;CLEAR CODES
025750  000265                          265                     ;N:C = 0101

025752  005612                  I0351:  SBC     (R2)            ;TEST THE SBC

025754  100403                          BMI     E10351          ;N:C = 0010 ?
025756  001402                          BEQ     E10351
025760  102001                          BVC     E10351
025762  103002                          BCC     A0351

025764  104005                  E10351: ERROR5                  ;SBC FAILED TO ALTER THE CODES PROPERLY
025766  025742                          R0351                   ;ERROR LOOP RETURN
025770  020412                  A0351:  CMP     R4,(R2)         ;RESULT OK ?
025772  001403                          BEQ     00351           ;BR IF YES

025774  011203                          MOV     (R2),R3         ;GET THE WAS DATA
025776  104000                  E20351: ERROR                   ;SBC DELIVERED THE WRONG RESULT
026000  025742                          R0351                   ;ERROR LOOP RETURN

026002  000004                  00351:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0352 SBC DM1 TEST - <N:C> = 1110
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016

                                        ;EXEC:          [220]ALUC=LLLLL :[211] D = 000001

                                        ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C 0001

                                        ;SYNC:          B05J2 (-) T = 0001

                                        ;KEY SIG:       K3-3 DM=1L  /  K3-4 SBC L

026004  012700  000352                  T0352:  MOV     #0352,R0                ;LOAD R0 WITH TEST NO.
026010  013701  026034                          MOV     @#I0352,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
026014  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
026020  012704  000001                          MOV     #1,R4           ;RESULT S / B = 1
026024  012712  000001                  R0352:  MOV     #1,(R2)         ;[DEST] = 1
026030  000257                                  CCC                     ;CLEAR CODES
026032  000276                                  276                     ;N:C = 1110

026034  005612                          I0352:  SBC     (R2)            ;TEST THE SBC

026036  100403                                  BMI     E10352          ;N:C = 0000 ?
026040  001402                                  BEQ     E10352
026042  102401                                  BVS     E10352
026044  103002                                  BCC     A0352

026046  104005                          E10352: ERROR5                  ;SBC FAILED TO ALTER THE CODES PROPERLY
026050  026024                                  R0352                   ;ERROR LOOP RETURN
026052  020412                          A0352:  CMP     R4,(R2)         ;RESULT OK ?
026054  001403                                  BEQ     00352           ;BR IF YES

                                                MOV     (R2),R3         ;GET THE WAS DATA
026056  011203                          E20352: ERROR                   ;SBC DELIVERED THE WRONG RESULT
026060  104000                                  R0352                   ;ERROR LOOP RETURN
026062  026024

026064  000004                          00352:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0353 SBC DM1 TEST - <N:C> = 0111
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016

                                        ;EXEC:          [220]ALUC=LHHLL :[211] D = 177777

                                        ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 1001

                                        ;SYNC:          B05J2 (-) T = 2 USEC

                                        ;KEY SIG:       K3-3 DM=1L  /  K3-4 SBC L

026066  012700  000353                  T0353:  MOV     #0353,R0                ;LOAD R0 WITH TEST NO.
026072  013701  026114                          MOV     @#I0353,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
026076  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
026102  012704  177777                          MOV     #-1,R4          ;RESULT S / B = 177777
026106  005012                          R0353:  CLR     (R2)            ;[DEST] = 000000
026110  000257                                  CCC                     ;CLEAR CODES
026112  000267                                  267                     ;N:C = 0111

026114  005612                          I0353:  SBC     (R2)            ;TEST THE SBC

026116  100003                                  BPL     E10353          ;N:C = 1001 ?
026120  001402                                  BEQ     E10353
026122  102401                                  BVS     E10353
026124  103402                                  BCS     A0353

026126  104005                          E10353: ERROR5                  ;SBC FAILED TO ALTER THE CODES PROPERLY
026130  026106                                  R0353                   ;ERROR LOOP RETURN
026132  020412                          A0353:  CMP     R4,(R2)         ;RESULT OK ?
026134  001403                                  BEQ     O0353           ;BR IF YES

026136  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
026140  104000                          E20353: ERROR                   ;SBC DELIVERED THE WRONG RESULT
026142  026106                                  R0353                   ;ERROR LOOP RETURN

026144  000004                          O0353:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0354 NEGB - MODE 0 TEST - <N:C> = 0110
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [105,372,361,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,105  /  31[105]360,361  /  27[372]000,001

                                ;EXEC:          [372]ALUC=LLHHL :[361]D= 000376

                                ;CODES:         [361]SPS=3       /      N:C=1001

                                ;SYNC:          B05J2   (-)      T= 1 USEC

                                ;KEY SIG:       K3-4 NEG L  /  K3-4 OVLAP INSTR H  /  K3-8 CIN00 L
                                                ;K3-3 DM=0 L  /  K3-6 BYTE INSTR H

026146  012700  000354          T0354:  MOV     #0354,R0                ;LOAD R0 WITH TEST NO.
026152  013701  026176                  MOV     @#I0354,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
026156  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
026162  012704  177776                  MOV     #177776,R4      ;RESULT S / B = 376 (LO BYTE)
026166  012703  177402          R0354:  MOV     #177402,R3      ;[DEST] = 177402
026172  000257                          CCC                     ;CLEAR FLAGS
026174  000266                          266                     ;N:C = 0110

026176  105403                  I0354:  NEGB    R3              ;TEST THE NEGB

026200  100003                          BPL     E10354          ;N:C = 1001
026202  001402                          BEQ     E10354
026204  102401                          BVS     E10354
026206  103402                          BCS     A0354

026210  104000                  E10354: ERROR                   ;NEGB FAILED TO ALTER CODES PROPERLY
026212  026166                          R0354                   ;ERROR LOOP RETURN ADDRESS

026214  020403                  A0354:  CMP     R4,R3           ;CORRECT RESULT ?
026216  001402                          BEQ     00354           ;BR IF YES

026220  104000                  E20354: ERROR                   ;NEGB DELIVERED THE WRONG RESULT
026222  026166                          R0354                   ;ERROR LOOP RETURN ADDRESS

026224  000004                  00354:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0355 NEGB - MODE 0 TEST - <N:C> = 0011
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [105,372,361,001] FC 1,7,8

                                        ;ACT BUTS:      37[004]100,105  /  31[105]360,361  /  27[372]000,001

                                        ;EXEC:          [372]ALUC=LLHHL :[361]D=000400

                                        ;CODES:         [361]SPS=3       /      N:C=0100

                                        ;SYNC:          B05J2   (-)      T= 1 USEC

                                        ;KEY SIG:       K3-4 NEG L  /  K3-4 OVLAP INSTR H  /  K3-8 CIN00 L
                                                        ;K3-3 DM=0 L  /  K3-6 BYTE INSTR H

026226  012700  000355                  T0355:  MOV     #0355,R0                ;LOAD R0 WITH TEST NO.
026232  013701  026256                          MOV     @#I0355,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
026236  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
026242  012704  177400                          MOV     #177400,R4      ;RESULT S / B = 000 (LO BYTE)
026246  012703  177400                  R0355:  MOV     #177400,R3      ;[DEST] = 177400
026252  000257                                  CCC                     ;CLEAR FLAGS
026254  000263                                  263                     ;N:C = 0011

026256  105403                          I0355:  NEGB    R3              ;TEST THE NEGB

026260  100403                                  BMI     E10355          ;N:C = 0100
026262  001002                                  BNE     E10355
026264  102401                                  BVS     E10355
026266  103002                                  BCC     A0355

026270  104000                          E10355: ERROR                   ;NEGB FAILED TO ALTER CODES PROPERLY
026272  026246                                  R0355                   ;ERROR LOOP RETURN ADDRESS

026274  020403                          A0355:  CMP     R4,R3           ;CORRECT RESULT ?
026276  001402                                  BEQ     00355           ;BR IF YES

026300  104000                          E20355: ERROR                   ;NEGB DELIVERED THE WRONG RESULT
026302  026246                                  R0355                   ;ERROR LOOP RETURN ADDRESS

026304  000004                          00355:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0356 NEGB - MODE 0 TEST - <N:C> = 1101
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [105,372,361,001] FC 1,7,8

                                        ;ACT BUTS:      37[004]100,105  /  31[105]360,361  /  27[372]000,001

                                        ;EXEC:          [372]ALUC=LLHHL :[361]D=000200

                                        ;CODES:         [361]SPS=3       /      N:C=1011

                                        ;SYNC:          B05J2   (-)      T= 1 USEC

                                        ;KEY SIG:       K3-4 NEG L  /  K3-4 OVLAP INSTR H  /  K3-8 CIN00 L
                                                        ;K3-3 DM=0 L  /  K3-6 BYTE INSTR H

026306  012700  000356                  T0356:  MOV     #0356,R0                ;LOAD R0 WITH TEST NO.
026312  013701  026336                          MOV     @#I0356,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
026316  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
026322  012704  177600                          MOV     #177600,R4      ;RESULT S / B = 200 (LO BYTE)
026326  012703  177600                  R0356:  MOV     #177600,R3      ;[DEST] = 177600
026332  000257                                  CCC                     ;CLEAR FLAGS
026334  000275                                  275                     ;N:C = 1101

026336  105403                          I0356:  NEGB    R3              ;TEST THE NEGB

026340  100003                                  BPL     E10356          ;N:C = 1011
026342  001402                                  BEQ     E10356
026344  102001                                  BVC     E10356
026346  103402                                  BCS     A0356

026350  104000                          E10356: ERROR                   ;NEGB FAILED TO ALTER CODES PROPERLY
026352  026326                                  R0356                   ;ERROR LOOP RETURN ADDRESS

026354  020403                          A0356:  CMP     R4,R3           ;CORRECT RESULT ?
026356  001402                                  BEQ     00356           ;BR IF YES

026360  104000                          E20356: ERROR                   ;NEGB DELIVERED THE WRONG RESULT
026362  026326                                  R0356                   ;ERROR LOOP RETURN ADDRESS

026364  000004                          00356:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0357 CLRB - MODE 0 TEST - <N:C> = 1011
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [104,373,361,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,104  /  31[105]360,361  /  27[372]000,001

                                ;EXEC:          [104]ALUC=HLLHH :[373]D=000000

                                ;CODES:         [373]SPS=1,[361]SPS=3    /      N:C=0100

                                ;SYNC:          B05J2   (-)     T= 1 USEC

                                ;KEY SIG:       K3-4 CLR L  /  K3-6 BYTE INSTR H  /  K3-4 OVLAP INSTR H  /  K3-3 DM=0 L

026366  012700  000357          T0357:  MOV     #0357,R0                ;LOAD R0 WITH TEST NO.
026372  013701  026416                  MOV     @#I0357,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
026376  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
026402  012704  177400                  MOV     #177400,R4      ;RESULT S / B = 000 (LO BYTE)
026406  012703  177777          R0357:  MOV     #-1,R3          ;[DEST] = 177777
026412  000257                          CCC                     ;CLEAR FLAGS
026414  000273                          273                     ;N:C = 1011

026416  105003                  I0357:  CLRB    R3              ;TEST THE CLRB

026420  100403                          BMI     E10357          ;N:C = 0100 ?
026422  001002                          BNE     E10357
026424  102401                          BVS     E10357
026426  103002                          BCC     A0357

026430  104000                  E10357: ERROR                   ;CLRB FAILED TO SET CODES PROPERLY
026432  026406                          R0357                   ;ERROR LOOP RETURN ADDRESS

026434  020403                  A0357:  CMP     R4,R3           ;RESULT CORRECT ?
026436  001402                          BEQ     O0357           ;BR IF YES

026440  104000                  E20357: ERROR                   ;CLRB DELIVERED THE WRONG RESULT
026442  026406                          R0357                   ;ERROR LOOP RETURN ADDRESS

026444  000004                  O0357:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0360 CLRB - MODE 0 TEST - <N:C> = 0100
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [104,373,361,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,104  /  31[360,361  /  27[373]000,001

                                ;EXEC:          [104]ALUC=HLLHH :[373]D=000000

                                ;CODES:         [373]SPS=1,[361]SPS=3    /      N:C=0100

                                ;SYNC:          B05J2   (-)      T= 1 USEC

                                ;KEY SIG:       K3-4 CLR L  /  K3-4 OVLAP INSTR H  /  K3-6 BYTE INSTR H  /  K3-8 CIN00 L
                                                ;  K3-3 DM=0 L

026446  012700  000360          T0360:  MOV     #0360,R0                ;LOAD R0 WITH TEST NO.
026452  013701  026476                  MOV     @#I0360,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
026456  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
026462  012704  177400                  MOV     #177400,R4      ;RESULT S / B = 000 (LO BYTE)
026466  012703  177777          R0360:  MOV     #-1,R3          ;[DEST] = 177777
026472  000257                          CCC                     ;CLEAR FLAGS
026474  000264                          SEZ                     ;N:C = 0100

026476  105003                  I0360:  CLRB    R3              ;TEST THE CLRB

026500  100403                          BMI     E10360          ;N:C = 0100 ?
026502  001002                          BNE     E10360
026504  102401                          BVS     E10360
026506  103002                          BCC     A0360

026510  104000                  E10360: ERROR                   ;CLRB FAILED TO SET CODES PROPERLY
026512  026466                          R0360                   ;ERROR LOOP RETURN ADDRESS

026514  020403                  A0360:  CMP     R4,R3           ;RESULT CORRECT ?
026516  001402                          BEQ     00360           ;BR IF YES

026520  104000                  E20360: ERROR                   ;CLRB DELIVERED THE WRONG RESULT
026522  026466                          R0360                   ;ERROR LOOP RETURN ADDRESS

026524  000004                  00360:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                ; ************************************************************************
                                        .SBTTL T0361 CLRB TEST - DM2 - ODD ADDRESS
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [162,260,267,237,270,222,253,075,374,375,016] FC 1,3,9,8

                                ;ACT BUTS:      37[004]100,162 / 33[260]220,237 / 34[237]220,222 / 16[374]016,016

                                ;EXEC:          [222]ALUC=HLLHH :[375] D = 000000

                                ;CODES:         [253] SP=1, [075] SP=3  /  N:C = 0100

                                ;SYNC:          B05J2 (-) T = 1.9 USEC

                                ;KEY SIG:       K3-6 BYTE INSTR H  /  K1-6 BA00(1) H  /  K3-7 ODD BYTE H  /  K3-3 DM=2L

026526  012700  000361          T0361:  MOV     #0361,R0                ;LOAD R0 WITH TEST NO.
026532  013701  026562                  MOV     @#I0361,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
026536  012702  067561                  MOV     #MBUF0+1,R2     ;DEST ADDR = MBUF0+1
026542  012704  000377                  MOV     #377,R4         ;RESULT S / B = 377
026546  012705  067560                  MOV     #MBUF0,R5       ;POINT R5 TO CHECK RESULT
026552  010203                  R0361:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
026554  012715  177777                  MOV     #-1,(R5)        ;[DEST] = 177777
026560  000257                          CCC                     ;SCOPE SYNC

026562  105023                  I0361:  CLRB    (R3)+           ;TEST THE CLRB

026564  022703  067562                  CMP     #MBUF0+2,R3     ;DID DEST REG GET INCREMENTED ?
026570  001402                          BEQ     A0361           ;BR IF YES

026572  104005                  E10361: ERROR5                  ;CLRB FAILED TO UPDATE DEST REG
026574  026552                          R0361                   ;ERROR LOOP RETURN ADDRESS

026576  020415                  A0361:  CMP     R4,(R5)         ;CORRECT RESULT ?
026600  001403                          BEQ     00361           ;BR IF YES

026602  011503                          MOV     (R5),R3         ;GET THE WAS DATA
026604  104000                  E20361: ERROR                   ;CLRB DELIVERED WRONG RESULT
026606  026552                          R0361                   ;ERROR LOOP RETURN ADDRESS

026610  000004                  00361:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ************************************************************************
                                        .SBTTL T0362 CLRB TEST - DM1 - ODD ADDRESS
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,237,270,222,253,075,374,375,016] FC 1,3,9,8

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,237 / 34[237]220,222 / 16[374]016,016

                                ;EXEC:          [222]ALUC=HLLHH :[375] D = 000000

                                ;CODES:         [253] SPS=1, [075] SPS=3  /  N:C = 0100

                                ;SYNC:          B05J2 (-) T = 1.9 USEC

                                ;KEY SIG:       K3-6 BYTE INSTR H  /  K1-6 BA00 (1) H  /  K3-7 ODD BYTE H  /  K3-3 DM=2L

026612  012700  000362          T0362:  MOV     #0362,R0                ;LOAD R0 WITH TEST NO.
026616  013701  026646                  MOV     @#I0362,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
026622  012702  067561                  MOV     #MBUF0+1,R2     ;DEST ADDR = MBUF0+1
026626  012704  000377                  MOV     #377,R4         ;RESULT S / B = 377
026632  012705  067560                  MOV     #MBUF0,R5       ;POINT R5 TO CHECK RESULT
026636  010203                  R0362:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
026640  012715  177777                  MOV     #-1,(R5)        ;[DEST] = 177777
026644  000257                          CCC                     ;SCOPE SYNC

026646  105013                  I0362:  CLRB    (R3)            ;TEST THE CLRB

026650  020415                          CMP     R4,(R5)         ;CORRECT RESULT ?
026652  001403                          BEQ     00362           ;BR IF YES

026654  011503                          MOV     (R5),R3         ;GET THE WAS DATA
026656  104000                  E0362:  ERROR                   ;CLRB DELIVERED WRONG RESULT
026660  026636                          R0362                   ;ERROR LOOP RETURN ADDRESS

026662  000004                  00362:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0363 CLRB TEST - DM2 - EVEN ADDRESS
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [162,260,267,220,211,367,375,016] FC 1,3,9,8

                                ;ACT BUTS:      37[004]100,162 / 33[260]220,220 / 16[367]016,016

                                ;EXEC:          [220]ALUC=HLLHH :[211] D = 000000

                                ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 0100

                                ;SYNC:          B05J2 (-) T = 1.9 USEC

                                ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 DM=1L  /  K3-4 CLR L

026664  012700  000363          T0363:  MOV     #0363,R0                ;LOAD R0 WITH TEST NO.
026670  013701  026714                  MOV     @#I0363,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
026674  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
026700  012704  177400                  MOV     #177400,R4      ;RESULT S / B = 177400
026704  010203                  R0363:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
026706  012712  177777                  MOV     #-1,(R2)        ;[DEST] = 177777
026712  000257                          CCC                     ;SCOPE SYNC

026714  105023                  I0363:  CLRB    (R3)+           ;TEST THE CLRB

026716  022703  067561                  CMP     #MBUF0+1,R3     ;DID DEST REG GET INCREMENTED ?
026722  001402                          BEQ     A0363           ;BR IF YES

026724  104005                  E10363: ERROR5                  ;CLRB FAILED TO UPDATE DEST REG
026726  026704                          R0363                   ;ERROR LOOP RETURN ADDRESS

026730  020412                  A0363:  CMP     R4,(R2)         ;CORRECT RESULT ?
026732  001403                          BEQ     00363           ;BR IF YES

026734  011203                          MOV     (R2),R3         ;GET THE WAS DATA
026736  104000                  E20363: ERROR                   ;CLRB DELIVERED WRONG RESULT
026740  026704                          R0363                   ;ERROR LOOP RETURN ADDRESS

026742  000004                  00363:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0364 CLRB TEST - DM1 - EVEN ADDRESS
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,220,211,367,375,016] FC 1,3,9,8

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,220 / 16[367]016,016

                                ;EXEC:          [220]ALUC=HLLHH :[367] D = 000000

                                ;CODES:         [211] SPS=1, [367] SPS=3  /  N:C = 0100

                                ;SYNC:          B05J2 (-) T = 1.8 USEC

                                ;KEY SIG:       K3-6 BYTE INSTR H

026744  012700  000364          T0364:  MOV     #0364,R0                ;LOAD R0 WITH TEST NO.
026750  013701  026774                  MOV     @#I0364,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
026754  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
026760  012704  177400                  MOV     #177400,R4      ;RESULT S / B = 177400
026764  010203                  R0364:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
026766  012712  177777                  MOV     #-1,(R[illegible]       ;[DEST] = 177777
026772  000257                          CCC                     ;SCOPE SYNC

026774  105013                  I0364:  CLRB    (R3)            ;TEST THE CLRB

026776  020412                          CMP     R4,(R2)         ;CORRECT RESULT ?
027000  001403                          BEQ     00364           ;BR IF YES

027002  011203                          MOV     (R2),R3         ;GET THE WAS DATA
027004  104000                  E0364:  ERROR                   ;CLRB DELIVERED WRONG RESULT
027006  026764                          R0364                   ;ERROR LOOP RETURN ADDRESS

027010  000004                  00364:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0365 NEGB TEST - DM2 - ODD ADDRESS
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [162,260,267,237,270,223,253,075,374,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,162 / 33[260]220,237 / 34[237]220,223 / 16[374]016,016

                                        ;EXEC:          [223]ALUC=LLHHL :[375] D = 000400

                                        ;CODES:         [253] SPS=1, [075] SPS=3  /  N:C = 0001

                                        ;SYNC:          B05J2 (-) T = 1.9 USEC

                                        ;KEY SIG:       K3-6 BYTE INSTR H  /  K1-6 BA00(1) H  /  K3-7 ODD BYTE H  /  K3-8 CIN00

027012  012700  000365                  T0365:  MOV     #0365,R0                ;LOAD R0 WITH TEST NO.
027016  013701  027046                          MOV     @#I0365,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
027022  012702  067561                          MOV     #MBUF0+1,R2     ;DEST ADDR = MBUF0+1
027026  012704  000777                          MOV     #777,R4         ;RESULT S / B = 777
027032  012705  067560                          MOV     #MBUF0,R5       ;POINT R5 TO CHECK RESULT
027036  010203                          R0365:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
027040  012715  177777                          MOV     #-1,(R5)        ;[DEST] = 177777
027044  000257                                  CCC                     ;SCOPE SYNC

027046  105423                          I0365:  NEGB    (R3)+           ;TEST THE NEGB

027050  022703  067562                          CMP     #MBUF0+2,R3     ;DID DEST REG GET INCREMENTED ?
027054  001402                                  BEQ     A0365           ;BR IF YES

027056  104005                          E10365: ERROR5                  ;NEGB FAILED TO UPDATE DEST REG
027060  027036                                  R0365                   ;ERROR LOOP RETURN ADDRESS

027062  020415                          A0365:  CMP     R4,(R5)         ;CORRECT RESULT ?
027064  001403                                  BEQ     00365           ;BR IF YES

027066  011503                                  MOV     (R5),R3         ;GET THE WAS DATA
027070  104000                          E20365: ERROR                   ;NEGB DELIVERED WRONG RESULT
027072  027036                                  R0365                   ;ERROR LOOP RETURN ADDRESS

027074  000004                          00365:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ************************************************************************
                                        .SBTTL T0366 NEGB TEST - DM1 - ODD ADDRESS
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,237,270,223,253,075,374,375,016] FC 1,3,9,8

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,237 / 34[237]220,223 / 16[374]016,016

                                ;EXEC:          [223]ALUC=LLHHL :[375] D = 000400

                                ;CODES:         [253] SPS=1, [075] SPS=3  /  N:C = 0001

                                ;SYNC:          B05J2 (-) T = 1.9 USEC

                                ;KEY SIG:       K3-6 BYTE INSTR H  /  K1-6 BA00 (1) H  /  K3-7 ODD BYTE H  /  K3-8 CIN00

027076  012700  000366          T0366:  MOV     #0366,R0                ;LOAD R0 WITH TEST NO.
027102  013701  027132                  MOV     @#I0366,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
027106  012702  067561                  MOV     #MBUF0+1,R2     ;DEST ADDR = MBUF0+1
027112  012704  000777                  MOV     #777,R4         ;RESULT S / B = 777
027116  012705  067560                  MOV     #MBUF0,R5       ;POINT R5 TO CHECK RESULT
027122  010203                  R0366:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
027124  012715  177777                  MOV     #-1,(R5)        ;[DEST] = 177777
027130  000257                          CCC                     ;SCOPE SYNC

027132  105413                  I0366:  NEGB    (R3)            ;TEST THE NEGB

027134  020415                          CMP     R4,(R5)         ;CORRECT RESULT ?
027136  001403                          BEQ     00366           ;BR IF YES

027140  011503                          MOV     (R5),R3         ;GET THE WAS DATA
027142  104000                  E0366:  ERROR                   ;NEGB DELIVERED WRONG RESULT
027144  027122                          R0366                   ;ERROR LOOP RETURN ADDRESS

027146  000004                  00366:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0367 NEGB TEST - DM2 - EVEN ADDRESS
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [162,260,267,221,367,375,016] FC 1,3,9,8

                                ;ACT BUTS:      37[004]100,162 / 33[260]220,221 / 16[367]016,016

                                ;EXEC:          [221]ALUC=LLHHL :[367] D = 000001

                                ;CODES:         [367] SPS=3  /  N:C = 0001

                                ;SYNC:          B05J2 (-) T = 1.8 USEC

                                ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-8 CIN00 L  /  K3-4 NEG L  /  K3-3 DM=2L

027150  012700  000367          T0367:  MOV     #0367,R0                ;LOAD R0 WITH TEST NO.
027154  013701  027200                  MOV     @#I0367,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
027160  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
027164  012704  177401                  MOV     #177401,R4      ;RESULT S / B = 177401
027170  010203                  R0367:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
027172  012712  177777                  MOV     #-1,(R2)        ;[DEST] = 177777
027176  000257                          CCC                     ;SCOPE SYNC

027200  105423                  I0367:  NEGB    (R3)+           ;TEST THE NEGB

027202  022703  067561                  CMP     #MBUF0+1,R3     ;DID DEST REG GET INCREMENTED ?
027206  001402                          BEQ     A0367           ;BR IF YES

027210  104005                  E10367: ERROR5                  ;NEGB FAILED TO UPDATE DEST REG
027212  027170                          R0367                   ;ERROR LOOP RETURN ADDRESS

027214  020412                  A0367:  CMP     R4,(R2)         ;CORRECT RESULT ?
027216  001403                          BEQ     00367           ;BR IF YES

027220  011203                          MOV     (R2),R3         ;GET THE WAS DATA
027222  104000                  E20367: ERROR                   ;NEGB DELIVERED WRONG RESULT
027224  027170                          R0367                   ;ERROR LOOP RETURN ADDRESS

027226  000004                  00367:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0370 NEGB TEST - DM1 - EVEN ADDRESS
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,221,367,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,221 / 16[367]016,016

                                        ;EXEC:          [221]ALUC=LLHHL :[367] D = 000001

                                        ;CODES:         [367] SPS=3  /  N:C = 0001

                                        ;SYNC:          B05J2 (-) T = 1.8 USEC

                                        ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-8 CIN00 L  /  K3-4 NEG L  /  K3-3 DM=2L

 027230  012700  000370                 T0370:  MOV     #0370,R0                ;LOAD R0 WITH TEST NO.
 027234  013701  027260                         MOV     @#I0370,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
 027240  012702  067560                         MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
 027244  012704  177401                         MOV     #177401,R4      ;RESULT S / B = 177401
 027250  010203                         R0370:  MOV     R2,R3           ;R3 CONTAINS DEST ADDR
 027252  012712  177777                         MOV     #-1,(R2)        ;[DEST] = 177777
 027256  000257                                 CCC                     ;SCOPE SYNC

 027260  105413                         I0370:  NEGB    (R3)            ;TEST THE NEGB

 027262  020412                                 CMP     R4,(R2)         ;CORRECT RESULT ?
 027264  001403                                 BEQ     00370           ;BR IF YES

 027266  011203                                 MOV     (R2),R3         ;GET THE WAS DATA
 027270  104000                         E0370:  ERROR                   ;NEGB DELIVERED WRONG RESULT
 027272  027250                                 R0370                   ;ERROR LOOP RETURN ADDRESS

 027274  000004                         00370:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0371 ADD TEST - SM0,DM0 - <N:C> = 1010
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [102,364,300,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,102 / 31[102]360,360 / 27[364]000,001

                                ;EXEC:          [364]ALUC=LHLLH :[360] D = 000000

                                ;CODES:         [360] SPS=3  /  N:C = 0101

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=0L  /  K3-3 DM=0L

027276  012700  000371          T0371:  MOV     #0371,R0                ;LOAD R0 WITH TEST NO.
027302  013701  027330                  MOV     @#I0371,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
027306  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
027312  005004                          CLR     R4              ;RESULT S / B = 000000
027314  012705  177777                  MOV     #-1,R5          ;SRC OPR = 177777
027320  012703  000001          R0371:  MOV     #+1,R3          ;[DEST0372
027324  000257                          CCC                     ;CLEAR FLAGS
027326  000272                          272                     ;N:C = 1010

027330  060503                  I0371:  ADD     R5,R3           ;TEST THE ADD

027332  100403                          BMI     E10371          ;N:C = 0101
027334  001002                          BNE     E10371
027336  102401                          BVS     E10371
027340  103402                          BCS     A0371

027342  104005                  E10371: ERROR5                  ;ADD FAILED TO ALTER CODES PROPERLY
027344  027320                          R0371                   ;ERROR LOOP RETURN ADDRESS

027346  020403                  A0371:  CMP     R4,R3           ;CORRECT RESULT ?
027350  001402                          BEQ     00371           ;BR IF YES

027352  104000                  E20371: ERROR                   ;ADD DELIVERED THE WRONG RESULT
027354  027320                          R0371                   ;ERROR LOOP RETURN ADDRESS

027356  000004                  00371:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0372 ADD TEST - SM0,DM0 - <N:C> = 0101
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [102,364,360,001] FC 1,7,8

                                        ;ACT BUTS:      37[004]100,102 / 31[102]360,360 / 27[364]000,001

                                        ;EXEC:          [364]ALUC=LHLLH :[360] D = 100006

                                        ;CODES:         [360] SPS=3  /  N:C = 1010

                                        ;SYNC:          B05J2 (-) T = 1 USEC

                                        ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=0L  /  K3-3 DM=0L

027360  012700  000372                  T0372:  MOV     #0372,R0                ;LOAD R0 WITH TEST NO.
027364  013701  027414                          MOV     @#I0372,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
027370  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
027374  012704  100006                          MOV     #100006,R4      ;RESULT S / B = 100006
027400  012705  077777                          MOV     #77777,R5       ;SRC OPR = 77777
027404  012703  000007                  R0372:  MOV     #7,R3           ;[DEST] = 7
027410  000257                                  CCC                     ;CLEAR FLAGS
027412  000265                                  265                     ;N:C = 0101

027414  060503                          I0372:  ADD     R5,R3           ;TEST THE ADD

027416  100003                                  BPL     E10372          ;N:C = 1010
027420  001402                                  BEQ     E10372
027422  102001                                  BVC     E10372
027424  103002                                  BCC     A0372

027426  104005                          E10372: ERROR5                  ;ADD FAILED TO ALTER CODES PROPERLY
027430  027404                                  R0372                   ;ERROR LOOP RETURN ADDRESS

027432  020403                          A0372:  CMP     R4,R3           ;CORRECT RESULT ?
027434  001402                                  BEQ     O0372           ;BR IF YES

027436  104000                          E20372: ERROR                   ;ADD DELIVERED THE WRONG RESULT
027440  027404                                  R0372                   ;ERROR LOOP RETURN ADDRESS

027442  000004                          O0372:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0373 ADD SM1,DM0 TEST
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [141,247,250,120,371,360,000] FC 1,2,8

                                ;ACT BUTS:      37[004]100,141 / 35[247]120,120 / 31[120]360,360 / 27[371]000,000

                                ;EXEC:          [371]ALUC=LHLLH :[360] D = #DWTA

                                ;CODES:         [360] SPS=3

                                ;SYNC:          B05J2 (-) T = 2 USEC

                                ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 DM=0L  / K3-3 SM=1L

027444  012700  000373          T0373:  MOV     #0373,R0                ;LOAD R0 WITH THE TEST NO.
027450  013701  027474                  MOV     @#I0373 R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
027454  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
027460  012704  067570                  MOV     #DWTA,R4        ;RESULT S / B = #DWTA
027464  012705  067544          R0373:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
027470  005003                          CLR     R3              ;[DEST] = 0
027472  000257                          CCC                     ;SCOPE SYNC

027474  061503                  I0373:  ADD     (R5),R3         ;TEST THE ADD - SM1,DM0

027476  020403                          CMP     R4,R3           ;RESULT = #DWTA?
027500  001402                          BEQ     A0373           ;BR IF YES

027502  104000                  E10373: ERROR                   ;ADD DELIVERED WRONG RESULT
027504  027464                          R0373                   ;ERROR LOOP RETURN

027506  022705  067544          A0373:  CMP     #ATA,R5         ;DID ADD CHANGE REG.
027512  001402                          BEQ     00373           ;BR IF NOT

027514  104005                  E20373: ERROR5                  ;REG GOT MODIFIED
027516  027464                          R0373                   ;ERROR LOOP RETURN

027520  000004                  00373:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0374 ADD SM2,DM0 TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,120,371,360,000] FC 1,2,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,120 / 31[120]360,360 / 27[371]000,000

                                        ;EXEC:          [371]ALUC=LHLLH :[360] D = #DWTA

                                        ;CODES:         [360] SPS=3

                                        ;SYNC:          B05J2 (-) T = USEC

                                        ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 DM=0L  /  K3-3 SM=2L  /  K5-5 BCON (1+2) H

027522  012700  000374          T0374:  MOV     #0374,R0                ;LOAD R0 WITH THE TEST NO.
027526  013701  027564                  MOV     @#I0374,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
027532  032737  000200  066642          BIT     #200,@#BPTLOC   ;BREAKPOINT HALT SET ??
027540  001401                          BEQ     .+4             ;BR IF NOT
027542  000000                          HALT                    ;BREAK- DEPRESS CONTINUE TO RESTART
027544  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
027550  012704  067570                  MOV     #DWTA,R4        ;RESULT S / B = #DWTA
027554  012705  067544          R0374:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
027560  005003                          CLR     R3              ;[DEST] = 0
027562  000257                          CCC                     ;SCOPE SYNC

027564  062503                  I0374:  ADD     (R5)+,R3        ;TEST THE ADD - SM2,DM0

027566  020403                          CMP     R4,R3           ;RESULT = #DWTA
027570  001402                          BEQ     A0374           ;BR IF YES

027572  104000                  E10374: ERROR                   ;ADD DELIVERED WRONG RESULT
027574  027554                          R0374                   ;ERROR LOOP RETURN

027576  022705  067546          A0374:  CMP     #ATA+2,R5       ;DID ADD AUTO INCREMENT SOURCE REG?
027602  001402                          BEQ     O0374           ;BR IF YES

027604  104005                  E20374: ERROR5                  ;ADD FAILED TO UPDATE SOURCE REG.
027606  027554                          R0374                   ;ERROR LOOP RETURN

027610  000004                  O0374:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0375 ADD SM3,DM0 TEST
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [143,245,246,247,250,120,371,360,000] FC 1,2,8

                                ;ACT BUTS:      37[004]100,143 / 35[247]120,120 / 31[120]360,360 / 27[371]000,000

                                ;EXEC:          [371]ALUC=LHLLH :[360] D = #DWTA

                                ;CODES:         [360] SPS=3

                                ;SYNC:          B05J2 (-) T = 2.75 USEC

                                ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 DM=0L  /  K3-3 SM=2L  /  K5-5 BC01 H

027612  012700  000375          T0375:  MOV     #0375,R0                ;LOAD R0 WITH THE TEST NO.
027616  013701  027646                  MOV     @#I0375,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
027622  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
027626  012704  067570                  MOV     #DWTA,R4        ;RESULT S / B = #DWTA
027632  012705  067554          R0375:  MOV     #ATA+10,R5      ;R5 POINTS TO SOURCE ADDR
027636  010437  067560                  MOV     R4,@#MBUF0      ;[SOURCE] = #DWTA
027642  005003                          CLR     R3              ;[DEST] = 0
027644  000257                          CCC                     ;SCOPE SYNC

027646  063503                  I0375:  ADD     @(R5)+,R3       ;TEST THE ADD - SM3,DM0

027650  020437  067560                  CMP     R4,@#MBUF0      ;RESULT = #DWTA?
027654  001402                          BEQ     A0375           ;BR IF YES

027656  104000                  E10375: ERROR                   ;ADD DELIVERED WRONG RESULT
027660  027632                          R0375                   ;ERROR LOOP RETURN

027662  022705  067556          A0375:  CMP     #ATA+12,R5      ;DID ADD AUTO INCREMENT SOURCE REG?
027666  001402                          BEQ     00375           ;BR IF YES

027670  104005                  E20375: ERROR5                  ;ADD FAILED TO UPDATE SOURCE REG.
027672  027632                          R0375                   ;ERROR LOOP RETURN

027674  000004                  00375:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0376 ADD SM4,DMO TEST
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [144,240,250,120,371,360,000] FC 1,2,8

                                ;ACT BUTS:      37[004]100,144 / 35[240]120,120 / 31[120]360,360 / 27[371]000,000

                                ;EXEC:          [371]ALUC=LHLLH :[360] D = #DWTA

                                ;CODES:         [360] SPS=3

                                ;SYNC:          B05J2 (-) T = 2 USEC

                                ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 DM=0L  /  K3-3 SM=4L  /  K5-5 BCON (1+2) H

027676  012700  000376          T0376:  MOV     #0376,R0                ;LOAD R0 WITH THE TEST NO.
027702  013701  027726                  MOV     @#I0376,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
027706  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
027712  012704  067570                  MOV     #DWTA,R4        ;RESULT S / B = #DWTA
027716  012705  067546          R0376:  MOV     #ATA+2,R5       ;SOURCE ADDR = ATA
027722  005003                          CLR     R3              ;[DEST] = 0
027724  000257                          CCC                     ;SCOPE SYNC

027726  064503                  I0376:  ADD     -(R5),R3        ;TEST THE ADD - SM4,DMO

027730  020403                          CMP     R4,R3           ;RESULT = #DWTA?
027732  001402                          BEQ     A0376           ;BR IF YES

027734  104000                  E10376: ERROR                   ;ADD DELIVERED WRONG RESULT
027736  027716                          R0376                   ;ERROR LOOP RETURN

027740  022705  067544          A0376:  CMP     #ATA,R5         ;DID SOURCE REG GET DECREMENTED?
027744  001402                          BEQ     00376           ;BR IF YES

027746  104005                  E20376: ERROR5                  ;ADD FAILED TO UPDATE SOURCE REG
027750  027716                          R0376                   ;ERROR LOOP RETURN

027752  000004                  00376:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0377 ADD SM5,DMO TEST
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [145,245,246,247,250,120,371,360,000] FC 1,2,8

                                ;ACT BUTS:      37[004]100,145 / 35[247]120,120 / 31[120]360,360 / 27[371]000,000

                                ;EXEC:          [371]ALUC=LHLLH :[360] D = #DWTA

                                ;CODES:         [360] SPS=3

                                ;SYNC:          B05J2 (-) T = 2.75 USEC

                                ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 DM=0L  /  K3-3 SM=5L  /  K5-5 BC01 H

027754  012700  000377          T0377:  MOV     #0377,R0                ;LOAD R0 WITH THE TEST NO.
027760  013701  030010                  MOV     @#I0377,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
027764  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
027770  012704  067570                  MOV     #DWTA,R4        ;RESULT S / B = #DWTA
027774  012705  067556          R0377:  MOV     #ATA+12,R5      ;R5 POINTS TO SOURCE ADDR
030000  010437  067560                  MOV     R4,@#MBUF0      ;[SOURCE] = #DWTA
030004  005003                          CLR     R3              ;[DEST] = 0
030006  000257                          CCC                     ;SCOPE SYNC

030010  065503                  I0377:  ADD     @-(R5),R3       ;TEST THE ADD - SM5,DMO

030012  020437  067560                  CMP     R4,@#MBUF0      ;RESULT = #DWTA?
030016  001402                          BEQ     A0377           ;BR IF YES

030020  104000                  E10377: ERROR                   ;ADD DELIVERED WRONG RESULT
030022  027774                          R0377                   ;ERROR LOOP RETURN

030024  022705  067554          A0377:  CMP     #ATA+10,R5      ;DID ADD DECREMENT SOURCE REG?
030030  001402                          BEQ     O0377           ;BR IF YES

030032  104005                  E20377: ERROR5                  ;ADD FAILED TO UPDATE SOURCE REG.
030034  027774                          R0377                   ;ERROR LOOP RETURN

030036  000004                  O0377:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                ; ***********************************************************************
                                        .SBTTL T0400 ADD SM6,DM0 TEST
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [146,241,242,247,250,120,371,360,000] FC 1,2,8

                                ;ACT BUTS:      37[004]100,146 / 35[247]120,120 / 31[120]360,360 / 27[371]000,000

                                ;EXEC:          [371]ALUC=LHLLH :[360] D = #MBUF0

                                ;CODES:         [360] SPS=3

                                ;SYNC:          B05J2 (-) T = 2.5 USEC

                                ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 DM=0L  /  K3-3 SM=6L  /  K3-4 OVLAP CYCLE L

030040  012700  000400          T0400:  MOV     #0400,R0                ;LOAD R0 WITH THE TEST NO.
030044  013701  030070                  MOV     @#I0400,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
030050  012703  177703                  MOV     #177703,R3      ;DEST ADDR = R3
030054  012704  067560                  MOV     #MBUF0,R4       ;RESULT S / B = MBUF0
030060  012705  067544          R0400:  MOV     #ATA,R5         ;BASE SOURCE ADDR = ATA
030064  005003                          CLR     R3              ;[DEST] = 0
030066  000257                          CCC                     ;SCOPE SYNC

030070  066503  000010          I0400:  ADD     10(R5),R3       ;TEST THE ADD - SM6,DM0

030074  020403                          CMP     R4,R3           ;RESULT =MBUF0?
030076  001402                          BEQ     00400           ;BR IF YES

030100  104000                  E0400:  ERROR                   ;ADD DELIVERED WRONG RESULT
030102  030060                          R0400                   ;ERROR LOOP RETURN

030104  000004                  00400:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0401 ADD SM7,DM0 TEST
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [147,243,244,245,246,247,250,120,371,360,000] FC 1,2,8

                                ;ACT BUTS:      37[004]100,147 / 35[247]120,120 / 31[120]360,360 / 27[371]000,000

                                ;EXEC:          [371]ALUC=LHLLH :[360] D = #DWTA

                                ;CODES:         [360] SPS=3

                                ;SYNC:          B05J2 (-) T = 3.5 USEC

                                ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 DM=0L  /  K3-3 SM=7L  /  K3-4 OVLAP CYCLE L

030106  012700  000401          T0401:  MOV     #0401,R0                ;LOAD R0 WITH THE TEST NO.
030112  013701  030142                  MOV     @#I0401,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
030116  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
030122  012704  067570                  MOV     #DWTA,R4        ;RESULT S / B = #DWTA
030126  012705  067544          R0401:  MOV     #ATA,R5         ;BASE SOURCE ADDR = ATA
030132  010437  067560                  MOV     R4,@#MBUF0      ;[SOURCE] = #DWTA
030136  005003                          CLR     R3              ;[DEST] = 0
030140  000257                          CCC                     ;SCOPE SYNC

030142  067503  000010          I0401:  ADD     @10(R5),R3      ;TEST THE ADD - SM7,DM0

030146  020403                          CMP     R4,R3           ;RESULT = #DWTA?
030150  001402                          BEQ     00401           ;BR IF YES

030152  104000                  E0401:  ERROR                   ;ADD DELIVERED WRONG RESULT
030154  030126                          R0401                   ;ERROR LOOP RETURN

030156  000004                  00401:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0402 ADD SM1,DM1 TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,161,266,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,141 / 35[247]120,161 / 33[266]220,225 / 16[367]016,016

                                        ;EXEC:          [225]ALUC=LHLLH :[367] D = #DWTA

                                        ;CODES:         [367] SPS=3

                                        ;SYNC:          B05J2 (-) T = 2.6 USEC

                                        ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 DM=1L  /  K3-3 SM=1L

030160  012700  000402                  T0402:  MOV     #0402,R0                ;LOAD R0 WITH THE TEST NO.
030164  013701  030210                          MOV     @#I0402,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
030170  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
030174  012704  067570                          MOV     #DWTA,R4        ;RESULT S / B = #DWTA
030200  012705  067544                  R0402:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
030204  005012                                  CLR     (R2)            ;[DEST] = 0
030206  000257                                  CCC                     ;SCOPE SYNC

030210  061512                          I0402:  ADD     (R5),(R2)       ;TEST THE ADD - SM1,DM1

030212  020412                                  CMP     R4,(R2)         ;RESULT = #DWTA?
030214  001403                                  BEQ     00402           ;BR IF YES

030216  011203                                  MOV     (R2),R3         ;GET WAS DATA
030220  104000                          E0402:  ERROR                   ;ADD DELIVERED WRONG RESULT
030222  030200                                  R0402                   ;ERROR LOOP RETURN

030224  000004                          00402:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ************************************************************************
                                        .SBTTL T0403 ADD SM2,DM1 TEST
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [142,240,250,161,266,267,225,367,375,016] FC 1,2,3,8

                                ;ACT BUTS:      37[004]100,142 / 35[240]120,161 / 35[266]220,225 / 16[367]016,016

                                ;EXEC:          [225]ALUC=LHLLH :[367] D = #DWTA

                                ;CODES:         [367] SPS=3

                                ;SYNC:          B05J2  (-) T = 2.7 USEC

                                ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=1L  /  K3-3 DM=1L

030226  012700  000403          T0403:  MOV     #0403,R0                ;LOAD R0 WITH THE TEST NO.
030232  013701  030256                  MOV     @#I0403,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
030236  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
030242  012704  067570                  MOV     #DWTA,R4        ;RESULT S / B = #DWTA
030246  012705  067544          R0403:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
030252  005012                          CLR     (R2)            ;[DEST] = 0
030254  000257                          CCC                     ;SCOPE SYNC

030256  062512                  I0403:  ADD     (R5)+,(R2)      ;TEST THE ADD - SM2,DM1

030260  020412                          CMP     R4,(R2)         ;RESULT = #DWTA?
030262  001403                          BEQ     00403           ;BR IF YES

030264  011203                          MOV     (R2),R3         ;GET WAS DATA
030266  104000                  E0403:  ERROR                   ;ADD DELIVERED WRONG RESULT
030270  030246                          R0403                   ;ERROR LOOP RETURN

030272  000004                  00403:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0404 ADD SM1,DM2 TEST
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [141,247,250,162,260,267,225,367,375,016] FC 1,2,3,8

                                ;ACT BUTS:      37[004]100,141 / 35[247]120,162 / 33[260]220,225 / 16[367]016,016

                                ;EXEC:          [225]ALUC=LHLLH :[367] D = #DWTA

                                ;CODES:         [367] SPS=3

                                ;SYNC:          B05J2 (-) T = 2.7 USEC

                                ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 DM=2L  /  K3-3 SM=1L

 030274  012700  000404         T0404:  MOV     #0404,R0                ;LOAD R0 WITH THE TEST NO.
 030300  013701  030326                 MOV     @#I0404,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
 030304  012702  067560                 MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
 030310  012704  067570                 MOV     #DWTA,R4        ;RESULT S / B = #DWTA
 030314  012705  067544         R0404:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
 030320  010203                         MOV     R2,R3           ;[R3] = DEST ADDR
 030322  005012                         CLR     (R2)            ;[DEST] = 0
 030324  000257                         CCC                     ;SCOPE SYNC

 030326  061523                 I0404:  ADD     (R5),(R3)+      ;TEST THE ADD - SM1,DM2

 030330  020412                         CMP     R4,(R2)         ;RESULT = #DWTA?
 030332  001407                         BEQ     A0404           ;BR IF YES

 030334  010337  067564                 MOV     R3,@#MBUF1      ;SAVE UPDATED DEST ADDR
 030340  011203                         MOV     (R2),R3         ;GET WAS DATA
 030342  104000                 E10404: ERROR                   ;ADD DELIVERED WRONG RESULT
 030344  030314                         R0404                   ;ERROR LOOP RETURN

 030346  013703  067564                 MOV     @#MBUF1,R3      ;RESTORE UPDATED DEST ADDR
 030352  022703  067562         A0404:  CMP     #MBUF0+2,R3     ;DID ADD INCREMENT DEST REG
 030356  001402                         BEQ     00404           ;BR IF YES

 030360  104005                 E20404: ERROR5                  ;ADD FAILED TO UPDATE DEST REG
 030362  030314                         R0404                   ;ERROR LOOP RETURN

 030364  000004                 00404:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0405 ADD SM2,DM2 TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,162,260,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,162 / 33[260]220,225 / 16[367]016,016

                                        ;EXEC:          [225]ALUC=LHLLH :[367] D = #DWTA

                                        ;CODES:         [367] SPS=3

                                        ;SYNC:          B05J2 (-) T = 2.7 USEC

                                        ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=2L  /  K3-3 DM=2L

030366  012700  000405                  T0405:  MOV     #0405,R0                ;LOAD R0 WITH THE TEST NO.
030372  013701  030420                          MOV     @#I0405,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
030376  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
030402  012704  067570                          MOV     #DWTA,R4        ;RESULT S / B = #DWTA
030406  012705  067544                  R0405:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
030412  010203                                  MOV     R2,R3           ;[R3] = DEST ADDR
030414  005012                                  CLR     (R2)            ;[DEST] = 0
030416  000257                                  CCC                     ;SCOPE SYNC

030420  062523                          I0405:  ADD     (R5)+,(R3)+     ;TEST THE ADD - SM2,DM2

030422  020412                                  CMP     R4,(R2)         ;RESULT = #DWTA
030424  001407                                  BEQ     A0405           ;BR IF YES

030426  010337  067564                          MOV     R3,@#MBUF1      ;SAVE UPDATED DEST ADDR
030432  011203                                  MOV     (R2),R3         ;GET WAS DATA
030434  104000                          E10405: ERROR                   ;ADD DELIVERED WRONG RESULT
030436  030406                                  R0405                   ;ERROR LOOP RETURN

030440  013703  067564                          MOV     @#MBUF1,R3      ;RESTORE UPDATED DEST ADDR
030444  022703  067562                  A0405:  CMP     #MBUF0+2,R3     ;DID ADD INCREMENT DEST REG?
030450  001402                                  BEQ     00405           ;BR IF YES

030452  104005                          E20405: ERROR5                  ;ADD FAILED TO UPDATE DEST REG
030454  030406                                  R0405                   ;ERROR LOOP RETURN

030456  000004                          00405:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0406 ADD SM1,DM3 TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,163,264,265,266,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,141 / 35[247]120,163 / 33[266]220,225 / 16[367]016,016

                                        ;EXEC:          [225]ALUC=LHLLH :[367] D = #DWTA

                                        ;CODES:         [367] SPS=3

                                        ;SYNC:          B05J2 (-) T = 4.5 USEC

                                        ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=1L  /  K3-3 DM=3L

030460  012700  000406                  T0406:  MOV     #0406,R0                ;LOAD R0 WITH THE TEST NO.
030464  013701  030514                          MOV     @#I0406,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
030470  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
030474  012704  067570                          MOV     #DWTA,R4        ;RESULT S / B = #DWTA
030500  012705  067544                  R0406:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
030504  012703  067554                          MOV     #ATA+10,R3      ;[R3] = ADDR OF DEST ADDR
030510  005012                                  CLR     (R2)            ;[DEST] = 0
030512  000257                                  CCC                     ;SCOPE SYNC

030514  061533                          I0406:  ADD     (R5),@(R3)+     ;TEST THE ADD - SM1,DM3

030516  020412                                  CMP     R4,(R2)         ;RESULT = #DWTA?
030520  001407                                  BEQ     A0406           ;BR IF YES

030522  010337  067564                          MOV     R3,@#MBUF1      ;SAVE R3
030526  011203                                  MOV     (R2),R3         ;GET WAS DATA
030530  104000                          E10406: ERROR                   ;ADD DELIVERED WRONG RESULT
030532  030500                                  R0406                   ;ERROR LOOP RETURN

030534  013703  067564                          MOV     @#MBUF1,R3      ;RESTORE R3
030540  022703  067556                  A0406:  CMP     #ATA+12,R3      ;DID ADD INCREMENT DEST REG
030544  001402                                  BEQ     00406           ;BR IF YES

030546  104005                          E20406: ERROR5                  ;ADD FAILED TO UPDATE DEST REG
030550  030500                                  R0406                   ;ERROR LOOP RETURN

030552  000004                          00406:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                ; ***********************************************************************
                                        .SBTTL T0407 ADD SM2,DM3 TEST
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [142,240,250,163,264,265,266,267,225,367,375,016] FC 1,2,3,8

                                ;ACT BUTS:      37[004]100,142 / 35[240]120,163 / 33[266]220,225 / 16[367]016,016

                                ;EXEC:          [225]ALUC=LHLLH :[367] D = #DWTA

                                ;CODES:         [367] SPS=3

                                ;SYNC:          B05J2 (-) T = 3.6 USEC

                                ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=2L  /  K3-3 DM=3L

030554  012700  000407          T0407:  MOV     #0407,R0                ;LOAD R0 WITH THE TEST NO.
030560  013701  030610                  MOV     @#I0407,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
030564  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
030570  012704  067570                  MOV     #DWTA,R4        ;RESULT S / B = #DWTA
030574  012705  067544          R0407:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
030600  012703  067554                  MOV     #ATA+10,R3      ;[R3] = ADDR OF DEST ADDR
030604  005012                          CLR     (R2)            ;[DEST] = 0
030606  000257                          CCC                     ;SCOPE SYNC

030610  062533                  I0407:  ADD     (R5)+,@(R3)+    ;TEST THE ADD - SM2,DM3

030612  020412                          CMP     R4,(R2)         ;RESULT = #DWTA?
030614  001407                          BEQ     A0407           ;BR IF YES

030616  010337  067564                  MOV     R3,@#MBUF1      ;SAVE R3
030622  011203                          MOV     (R2),R3         ;GET WAS DATA
030624  104000                  E10407: ERROR                   ;ADD DELIVERED WRONG RESULT
030626  030574                          R0407                   ;ERROR LOOP RETURN

030630  013703  067564                  MOV     @#MBUF1,R3      ;RESTORE R3
030634  022703  067556          A0407:  CMP     #ATA+12,R3      ;DID ADD INCREMENT DEST REG
030640  001402                          BEQ     O0407           ;BR IF YES

030642  104005                  E20407: ERROR5                  ;ADD FAILED TO UPDATE DEST REG
030644  030574                          R0407                   ;ERROR LOOP RETURN

030646  000004                  O0407:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0410 ADD SM1,DM4 TEST
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [141,247,250,164,260,267,225,367,375,016] FC 1,2,3,8

                                ;ACT BUTS:      37[004]100,141 / 35[247]120,164 / 33[260]220,225 / 16[367]016,016

                                ;EXEC:          [225]ALUC=LHLLH :[367] D = #DWTA

                                ;CODES:         [367] SPS=3

                                ;SYNC:          B05J2 (-) T = 2.6 USEC

                                ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=1L  /  K3-3 DM=4L

030650  012700  000410          T0410:  MOV     #0410,R0                ;LOAD R0 WITH THE TEST NO.
030654  013701  030704                  MOV     @#I0410,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
030660  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
030664  012704  067570                  MOV     #DWTA,R4        ;RESULT S / B = #DWTA
030670  012705  067544          R0410:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
030674  012703  067562                  MOV     #MBUF0+2,R3     ;R3 POINTS TO DEST ADDR +2
030700  005012                          CLR     (R2)            ;[DEST] = 0
030702  000257                          CCC                     ;SCOPE SYNC

030704  061543                  I0410:  ADD     (R5),-(R3)      ;TEST THE ADD - SM1,DM4

030706  020412                          CMP     R4,(R2)         ;RESULT = #DWTA?
030710  001407                          BEQ     A0410           ;BR IF YES

030712  010337  067564                  MOV     R3,@#MBUF1      ;SAVE R3
030716  011203                          MOV     (R2),R3         ;GET WAS DATA
030720  104000                  E10410: ERROR                   ;ADD DELIVERED WRONG RESULT
030722  030670                          R0410                   ;ERROR LOOP RETURN

030724  013703  067564                  MOV     @#MBUF1,R3      ;RESTORE R3
030730  020302                  A0410:  CMP     R3,R2           ;DID ADD INCREMENT DEST REG?
030732  001402                          BEQ     00410           ;BR IF YES

030734  104005                  E20410: ERROR5                  ;ADD FAILED TO UPDATE DEST REG.
030736  030670                          R0410                   ;ERROR LOOP RETURN

030740  000004                  00410:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0411 ADD SM2,DM4 TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,164,260,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,164 / 33[260]220,225 / 16[367]016,016

                                        ;EXEC:          [225]ALUC=LHLLH :[367] D = #DWTA

                                        ;CODES:         [367] SPS=3

                                        ;SYNC:          B05J2 (-) T = 2.6 USEC

                                        ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM0=2L  /  K3-3 DM=4L

030742  012700  000411                  T0411:  MOV     #0411,R0                ;LOAD R0 WITH THE TEST NO.
030746  013701  030776                          MOV     @#I0411,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
030752  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
030756  012704  067570                          MOV     #DWTA,R4        ;RESULT S / B = #DWTA
030762  012705  067544                  R0411:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
030766  012703  067562                          MOV     #MBUF0+2,R3     ;R3 POINTS TO DEST ADDR +2
030772  005012                                  CLR     (R2)            ;[DEST] = 0
030774  000257                                  CCC                     ;SCOPE SYNC

030776  061543                          I0411:  ADD     (R5),-(R3)      ;TEST THE ADD - SM2,DM4

031000  020412                                  CMP     R4,(R2)         ;RESULT = #DWTA?
031002  001407                                  BEQ     A0411           ;BR IF YES

031004  010337  067564                          MOV     R3,@#MBUF1      ;SAVE R3
031010  011203                                  MOV     (R2),R3         ;GET WAS DATA
031012  104000                          E10411: ERROR                   ;ADD DELIVERED WRONG RESULT
031014  030762                                  R0411                   ;ERROR LOOP RETURN

031016  013703  067564                          MOV     @#MBUF1,R3      ;RESTORE R3
031022  020302                          A0411:  CMP     R3,R2           ;DID ADD INCREMENT DEST REG?
031024  001402                                  BEQ     O0411           ;BR IF YES

031026  104005                          E20411: ERROR5                  ;ADD FAILED TO UPDATE DEST REG.
031030  030762                                  R0411                   ;ERROR LOOP RETURN

031032  000004                          O0411:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0412 ADD SM1,DM5 TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,165,264,265,266,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,141 / 35[247]120,165 / 33[266]220,225 / 16[367]016,016

                                        ;EXEC:          [225]ALUC=LHLLH :[367] D = #DWTA

                                        ;CODES:         [367] SPS=3

                                        ;SYNC:          B05J2 (-) T = 3.6 USEC

                                        ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=1L  /  K3-3 DM=5L

031034  012700  000412                  T0412:  MOV     #0412,R0                ;LOAD R0 WITH THE TEST NO.
031040  013701  031070                          MOV     @#I0412,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
031044  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
031050  012704  067570                          MOV     #DWTA,R4        ;RESULT S / B = #DWTA
031054  012705  067544                  R0412:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
031060  012703  067556                          MOV     #ATA+12,R3      ;R3 CONTAINS ADDR OF DEST ADDR PLUS 2
031064  005012                                  CLR     (R2)            ;[DEST] = 0
031066  000257                                  CCC                     ;SCOPE SYNC

031070  061553                          I0412:  ADD     (R5),@-(R3)     ;TEST THE ADD - SM1,DM5

031072  020412                                  CMP     R4,(R2)         ;RESULT = #DWTA?
031074  001407                                  BEQ     A0412           ;BR IF YES

031076  010337  067564                          MOV     R3,@#MBUF1      ;SAVE R3
031102  011203                                  MOV     (R2),R3         ;GET WAS DATA
031104  104000                          E10412: ERROR                   ;ADD DELIVERED WRONG RESULT
031106  031054                                  R0412                   ;ERROR LOOP RETURN

031110  013703  067564                          MOV     @#MBUF1,R3      ;RESTORE R3
031114  022703  067554                  A0412:  CMP     #ATA+10,R3      ;DID ADD DECREMENT DEST REG?
031120  001402                                  BEQ     00412           ;BR IF YES

031122  104005                          E20412: ERROR5                  ;ADD FAILED TO UPDATE DEST REG.
031124  031054                                  R0412                   ;ERROR LOOP RETURN

031126  000004                          00412:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0413 ADD SM2,DM5 TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,165,264,265,266,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,165 / 33[266]220,225 / 16[367]016,016

                                        ;EXEC:          [225]ALUC=LHLLH :[367] D = #DWTA

                                        ;CODES:         [367] SPS = 3

                                        ;SYNC:          B05J2 (-) T = 3.6 USEC

                                        ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=2L  /  K3-3 DM=5L

031130  012700  000413                  T0413:  MOV     #0413,R0                ;LOAD R0 WITH THE TEST NO.
031134  013701  031164                          MOV     @#I0413,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
031140  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
031144  012704  067570                          MOV     #DWTA,R4        ;RESULT S / B = #DWTA
031150  012705  067544                  R0413:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
031154  012703  067556                          MOV     #ATA+12,R3      ;R3 CONTAINS ADDR OF DEST ADDR PLUS 2
031160  005012                                  CLR     (R2)            ;[DEST] = 0
031162  000257                                  CCC                     ;SCOPE SYNC

031164  062553                          I0413:  ADD     (R5)+,@-(R3)    ;TEST THE ADD - SM2,DM5

031166  020412                                  CMP     R4,(R2)         ;RESULT = #DWTA?
031170  001407                                  BEQ     A0413           ;BR IF YES

031172  010337  067564                          MOV     R3,@#MBUF1      ;SAVE R3
031176  011203                                  MOV     (R2),R3         ;GET WAS DATA
031200  104000                          E10413: ERROR                   ;ADD DELIVERED WRONG RESULT
031202  031150                                  R0413                   ;ERROR LOOP RETURN

031204  013703  067564                          MOV     @#MBUF1,R3      ;RESTORE R3
031210  022703  067554                  A0413:  CMP     #ATA+10,R3      ;DID ADD DECREMENT DEST REG?
031214  001402                                  BEQ     O0413           ;BR IF YES

031216  104005                          E20413: ERROR5                  ;ADD FAILED TO UPDATE DEST REG
031220  031150                                  R0413                   ;ERROR LOOP RETURN

031222  000004                          O0413:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0414 ADD SM1,DM6 TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,167,261,262,266,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,141 / 35[247]120,167 / 17[167]262,262 / 33[266]220,225
                                                        ; / 16[367]016,016

                                        ;EXEC:          [225]ALUC=LHLLH :[367] D = #DWTA

                                        ;CODES:         [367] SPS=3

                                        ;SYNC:          B05J2 (-) T = 3.25 USEC

                                        ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=1L  /  K3-3 DM=6L

031224  012700  000414                  T0414:  MOV     #0414,R0                ;LOAD R0 WITH THE TEST NO.
031230  013701  031260                          MOV     @#I0414,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
031234  012702  067564                          MOV     #MBUF0+4,R2     ;DEST ADDR = MBUF0+4
031240  012704  067570                          MOV     #DWTA,R4        ;RESULT S / B = #DWTA
031244  012705  067544                  R0414:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
031250  012703  067560                          MOV     #MBUF0,R3       ;[R3] = BASE DEST ADDR
031254  005012                                  CLR     (R2)            ;[DEST] = 0
031256  000257                                  CCC                     ;SCOPE SYNC

031260  061563  000004                  I0414:  ADD     (R5),4(R3)      ;TEST THE ADD - SM1,DM6

031264  020412                                  CMP     R4,(R2)         ;RESULT = #DWTA?
031266  001403                                  BEQ     00414           ;BR IF YES

031270  011203                                  MOV     (R2),R3         ;GET WAS DATA
031272  104000                          E0414:  ERROR                   ;ADD DELIVERED WRONG RESULT
031274  031244                                  R0414                   ;ERROR LOOP RETURN

031276  000004                          00414:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                ; ***********************************************************************
                                        .SBTTL T0415 ADD SM2,DM6 TEST
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [142,240,250,167,261,262,266,267,225,367,375,016] FC 1,2,3,8

                                ;ACT BUTS:      37[004]100,142 / 35[240]120,167 / 17[167]262,262 / 33[266]220,225
                                                ; / 16[367]016,016

                                ;EXEC:          [225]ALUC=LHLLH :[367] D = #DWTA

                                ;CODES:         [367] SPS=3

                                ;SYNC:          B05J2 (-) T = 3.25 USEC

                                ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=2L  /  K3-3 DM=6L

031300  012700  000415          T0415:  MOV     #0415,R0                ;LOAD R0 WITH THE TEST NO.
031304  013701  031334                  MOV     @#I0415,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
031310  012702  067564                  MOV     #MBUF0+4,R2     ;DEST ADDR = MBUF0+4
031314  012704  067570                  MOV     #DWTA,R4        ;RESULT S / B = #DWTA
031320  012705  067544          R0415:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
031324  012703  067560                  MOV     #MBUF0,R3       ;[R3] = BASE DEST ADDR
031330  005012                          CLR     (R2)            ;[DEST] = 0
031332  000257                          CCC                     ;SCOPE SYNC

031334  062563  000004          I0415:  ADD     (R5)+,4(R3)     ;TEST THE ADD - SM2,DM6

031340  020412                          CMP     R4,(R2)         ;RESULT = #DWTA?
031342  001403                          BEQ     00415           ;BR IF YES

031344  011203                          MOV     (R2),R3         ;GET WAS DATA
031346  104000          E0415:  ERROR                           ;ADD DELIVERED WRONG RESULT
031350  031320                  R0415                           ;ERROR LOOP RETURN

031352  000004          00415:  SCOPE                           ;CALL SCOPE LOOP UTILITY
```

```
                                ; ************************************************************************
                                        .SBTTL T0416 ADD SM1,DM7 TEST
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [141,247,250,167,261,263,264,265,266,267,225,367,375,016] FC 1,2,3,8

                                ;ACT BUTS:      37[004]100,141 / 35[247]120,167 / 17[167]262,263 / 33[266]220,225
                                                ; / 16[367]016,016

                                ;EXEC:          [225]ALUC=LHLLH :[367] D = #DWTA

                                ;CODES:         [367] SPS=3

                                ;SYNC:          B05J2 (-) T = 4.25 USEC

                                ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=1L  /  K3-3 DM=7L

031354  012700  000416          T0416:  MOV     #0416,R0                ;LOAD R0 WITH THE TEST NO.
031360  013701  031406                  MOV     @#I0416,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
031364  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
031370  012704  067570                  MOV     #DWTA,R4        ;RESULT S / B = #DWTA
031374  012705  067544          R0416:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
031400  010503                          MOV     R5,R3           ;BASE DEST ADDR = ATA
031402  005012                          CLR     (R2)            ;[DEST] = 0
031404  000257                          CCC                     ;SCOPE SYNC

031406  061573  000010          I0416:  ADD     (R5),@10(R3)    ;TEST THE ADD - SM1+DM7

031412  020412                          CMP     R4,(R2)         ;RESULT = #DWTA?
031414  001403                          BEQ     00416           ;BR IF YES

031416  011203                          MOV     (R2),R3         ;GET WAS DATA
031420  104000                  E0416:  ERROR                   ;ADD DELIVERED WRONG RESULT
031422  031374                          R0416                   ;ERROR LOOP RETURN

031424  000004                  00416:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0417 ADD SM2,DM7 TEST
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [142,240,250,167,261,263,264,265,266,267,225,367,375,016] FC 1,2,3,8

                                ;ACT BUTS:      37[004]100,142 / 35[240]120,167 / 17[167]262,263 / 33[266]220,225
                                                ; / 16[367]016,016

                                ;EXEC:          [225]ALUC=LHLLH :[367] D = #DWTA

                                ;CODES:         [367] SPS=3

                                ;SYNC:          B05J2 (-) T = 4.25 USEC

                                ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=2L  /  K3-3 DM=7L

031426  012700  000417          T0417:  MOV     #0417,R0                ;LOAD R0 WITH THE TEST NO.
031432  013701  031460                  MOV     @#I0417,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
031436  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
031442  012704  067570                  MOV     #DWTA,R4        ;RESULT S / B = #DWTA
031446  012705  067544          R0417:  MOV     #ATA,R5         ;SOURCE ADDR = ATA
031452  010503                          MOV     R5,R3           ;BASE DEST ADDR = ATA
031454  005012                          CLR     (R2)            ;[DEST] = 0
031456  000257                          CCC                     ;SCOPE SYNC

031460  062573  000010          I0417:  ADD     (R5)+,@10(R3)   ;TEST THE ADD - SM2,DM7

031464  020412                          CMP     R4,(R2)         ;RESULT = #DWTA?
031466  001403                          BEQ     00417           ;BR IF YES

031470  011203                          MOV     (R2),R3         ;GET WAS DATA
031472  104000          E0417:  ERROR                           ;ADD DELIVERED WRONG RESULT
031474  031446                  R0417                           ;ERROR LOOP RETURN

031476  000004          00417:  SCOPE                           ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0420 "XOR RA,RB" TEST - A=B=000000 N:C=1010
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [102,364,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,102 / 31[102]360,360 / 27[364]000,001

                                ;EXEC:          [364]ALUC=HLHHL :[360]D=000000

                                ;CODES:         [360] SPS=3  /  N:C=0100

                                ;SYNC:          B05J2 (-)       /       T=1 USEC

                                ;KEY SIG:       K3-5 XOR L  /  K3-3 DM=0 L / K3-4 OVLAP INSTR H

031500  012700  000420          T0420:  MOV     #0420,R0                ;LOAD R0 WITH TEST NO.
031504  013701  031524                  MOV     @#I0420,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
031510  005004                          CLR     R4              ;RESULT AND MASK = 000000
031512  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
031516  005003                  R0420:  CLR     R3              ;[DEST] = 000000
031520  000257                          CCC                     ;SCOPE SYNC
031522  000272                          272                     ;MAKE N:C=1010

031524  074403                  I0420:  XOR     R4,R3           ;TEST THE XOR

031526  100403                          BMI     E10420          ;N:C=0100 ??
031530  001002                          BNE     E10420
031532  102401                          BVS     E10420
031534  103002                          BCC     A0420

031536  104000                  E10420: ERROR                   ;XOR FAILED TO SET FLAGS PROPERLY
031540  031516                          R0420                   ;ERROR LOOP RETURN ADDRESS

031542  020403                  A0420:  CMP     R4,R3           ;RESULT CORRECT?
031544  001402                          BEQ     O0420           ;BR IF YES

031546  104000                  E20420: ERROR                   ;XOR DELIVERED THE WRONG RESULT
031550  031516                          R0420                   ;ERROR LOOP RETURN ADDRESS

031552  000004                  O0420:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0421 "XOR RA,RB" TEST - A=B=177777 N:C=0101
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [102,364,360,001] FC 1,7,8

                                        ;ACT BUTS:      37[004]100,102 / 31[102]360,360 / 27[364]000,001

                                        ;EXEC:          [364]ALUC=HLHHL :[360]D=000000

                                        ;CODES:         [360] SPS=3  /  N:C=0101

                                        ;SYNC:          B05J2 (-)       /       T=1 USEC

                                        ;KEY SIG:       K3-5 XOR L  /  K3-3 DM=0 L / K3-4 OVLAP INSTR H

031554  012700  000421                  T0421:  MOV     #0421,R0                ;LOAD R0 WITH TEST NO.
031560  013701  031604                          MOV     @#I0421,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
031564  005004                                  CLR     R4              ;RESULT  = 000000
031566  012705  177777                          MOV     #-1,R5          ;MASK = 177777
031572  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
031576  010503                          R0421:  MOV     R5,R3           ;[DEST]=177777
031600  000257                                  CCC                     ;SCOPE SYNC
031602  000265                                  265                     ;MAKE N:C=0101

031604  074503                          I0421:  XOR     R5,R3           ;TEST THE XOR

031606  100403                                  BMI     E10421          ;N:C=0101 ??
031610  001002                                  BNE     E10421
031612  102401                                  BVS     E10421
031614  103402                                  BCS     A0421

031616  104000                          E10421: ERROR                   ;XOR FAILED TO SET FLAGS PROPERLY
031620  031576                                  R0421                   ;ERROR LOOP RETURN ADDRESS

031622  020403                          A0421:  CMP     R4,R3           ;RESULT CORRECT?
031624  001402                                  BEQ     O0421           ;BR IF YES

031626  104000                          E20421: ERROR                   ;XOR DELIVERED THE WRONG RESULT
031630  031576                                  R0421                   ;ERROR LOOP RETURN ADDRESS

031632  000004                          O0421:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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                                ; ***********************************************************************
                                        .SBTTL T0422 "XOR RA,RB" TEST - A=125252,B=052525 N:C=0110
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [102,364,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,102 / 31[102]360,360 / 27[364]000,001

                                ;EXEC:          [364]ALUC=HLHHL :[360]D=177777

                                ;CODES:         [360] SPS=3  /  N:C=1000

                                ;SYNC:          B05J2 (-)       /       T=1 USEC

                                ;KEY SIG:       K3-5 XOR L  /  K3-3 DM=0 L / K3-4 OVLAP INSTR H

031634  012700  000422          T0422:  MOV     #0422,R0                ;LOAD R0 WITH TEST NO.
031640  013701  031670                  MOV     @#I0422,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
031644  012704  177777                  MOV     #-1,R4          ;RESULT S/B = 177777
031650  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
031654  012705  125252                  MOV     #125252,R5      ;MASK=125252
031660  012703  052525          R0422:  MOV     #052525,R3      ;[DEST] = 052525
031664  000257                          CCC                     ;SCOPE SYNC
031666  000266                          266                     ;MAKE N:C=0110

031670  074503                  I0422:  XOR     R5,R3           ;TEST THE XOR

031672  100003                          BPL     E10422          ;N:C=1000 ??
031674  001402                          BEQ     E10422
031676  102401                          BVS     E10422
031700  103002                          BCC     A0422

031702  104000                  E10422: ERROR                   ;XOR FAILED TO SET FLAGS PROPERLY
031704  031660                          R0422                   ;ERROR LOOP RETURN ADDRESS

031706  020403                  A0422:  CMP     R4,R3           ;RESULT CORRECT?
031710  001402                          BEQ     O0422           ;BR IF YES

031712  104000                  E20422: ERROR                   ;XOR DELIVERED THE WRONG RESULT
031714  031660                          R0422                   ;ERROR LOOP RETURN ADDRESS

031716  000004                  O0422:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0423 'XOR RA,RB'' TEST - A=052525,B=125252 N:C=1001
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [102,364,360,001] FC 1,7,8

                                        ;ACT BUTS:      37[004]100,102 / 31[102]360,360 / 27[364]000,001

                                        ;EXEC:          [364]ALUC=HLHHL :[360]D=000000

                                        ;CODES:         [360] SPS=3  /  N:C=1001

                                        ;SYNC:          B05J2 (-)       /       T=1 USEC

                                        ;KEY SIG:       K3-5 XOR L  /  K3-3 DM=0 L / K3-4 OVLAP INSTR H

031720  012700  000423                  T0423:  MOV     #0423,R0                ;LOAD R0 WITH TEST NO.
031724  013701  031754                          MOV     @#I0423,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
031730  012704  177777                          MOV     #-1,R4          ;RESULT S/B = 177777
031734  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
031740  012705  052525                          MOV     #52525,R5       ;MASK=052525
031744  012703  125252                  R0423:  MOV     #125252,R3      ;[DEST] = 125252
031750  000257                                  CCC                     ;SCOPE SYNC
031752  000271                                  271                     ;MAKE N:C=1001

031754  074503                          I0423:  XOR     R5,R3           ;TEST THE XOR

031756  100003                                  BPL     E10423          ;N:C=1001 ??
031760  001402                                  BEQ     E10423
031762  102401                                  BVS     E10423
031764  103402                                  BCS     A0423

031766  104000                          E10423: ERROR                   ;XOR FAILED TO SET FLAGS PROPERLY
031770  031744                                  R0423                   ;ERROR LOOP RETURN ADDRESS

031772  020403                          A0423:  CMP     R4,R3           ;RESULT CORRECT?
031774  001402                                  BEQ     O0423           ;BR IF YES

031776  104000                          E20423: ERROR                   ;XOR DELIVERED THE WRONG RESULT
032000  031744                                  R0423                   ;ERROR LOOP RETURN ADDRESS

032002  000004                          O0423:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0424 "XOR RA,(RB)" TEST - A=B=000000 N:C=1010
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016

                                        ;EXEC:          [224]ALUC=HLHHL :[367]D=000000

                                        ;CODES:         [367] SPS=3  /  N:C=0100

                                        ;SYNC:          B05J2 (-)       /       T=2.6 USEC

                                        ;KEY SIG:       K3-5 XOR L  /  K3-3 DM=1L

032004  012700  000424                  T0424:  MOV     #0424,R0                ;LOAD R0 WITH TEST NO.
032010  013701  032032                          MOV     @#I0424,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
032014  005004                                  CLR     R4              ;RESULT S / B = 000000
032016  005005                                  CLR     R5              ;MASK = 000000
032020  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
032024  005012                          R0424:  CLR     (R2)            ;[DEST] = 000000
032026  000257                                  CCC                     ;SCOPE SYNC
032030  000272                                  272                     ;MAKE N:C=1010

032032  074512                          I0424:  XOR     R5,(R2)         ;TEST THE XOR

032034  100403                                  BMI     E10424          ;N:C = 0100 ??
032036  001002                                  BNE     E10424
032040  102401                                  BVS     E10424
032042  103002                                  BCC     A0424

032044  104000                          E10424: ERROR                   ;XOR FAILED TO ALTER CODES PROPERLY
032046  032024                                  R0424                   ;ERROR LOOP RETURN ADDRESS

032050  020412                          A0424:  CMP     R4,(R2)         ;RESULT CORRECT?
032052  001403                                  BEQ     O0424           ;BR IF YES

032054  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
032056  104000                          E20424: ERROR                   ;XOR DELIVERED THE WRONG RESULT
032060  032024                                  R0424                   ;ERROR LOOP RETURN ADDRESS

032062  000004                          O0424:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0425 "XOR RA,(RB)" TEST - A=B=177777 N:C=0101
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016

                                        ;EXEC:          [224]ALUC=HLHHL :[367]D=000000

                                        ;CODES:         [367] SPS=3  /  N:C=0101

                                        ;SYNC:          B05J2 (-)       /       T=2.6 USEC

                                        ;KEY SIG:       K3-5 XOR L  /  K3-3 DM=1L

032064  012700  000425                  T0425:  MOV     #0425,R0                ;LOAD R0 WITH TEST NO.
032070  013701  032116                          MOV     @#I0425,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
032074  005004                                  CLR     R4              ;RESULT S / B = 000000
032076  012705  177777                          MOV     #-1,R5          ;MASK = 177777
032102  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
032106  012712  177777                  R0425:  MOV     #-1,(R2)        ;[DEST] = 177777
032112  000257                                  CCC                     ;SCOPE SYNC
032114  000265                                  265                     ;MAKE N:C=0101

032116  074512                          I0425:  XOR     R5,(R2)         ;TEST THE XOR

032120  100403                                  BMI     E10425          ;N:C = 0101 ??
032122  001002                                  BNE     E10425
032124  102401                                  BVS     E10425
032126  103402                                  BCS     A0425

032130  104000                          E10425: ERROR                   ;XOR FAILED TO ALTER CODES PROPERLY
032132  032106                                  R0425                   ;ERROR LOOP RETURN ADDRESS

032134  020412                          A0425:  CMP     R4,(R2)         ;RESULT CORRECT?
032136  001403                                  BEQ     O0425           ;BR IF YES

032140  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
032142  104000                          E20425: ERROR                   ;XOR DELIVERED THE WRONG RESULT
032144  032106                                  R0425                   ;ERROR LOOP RETURN ADDRESS

032146  000004                          O0425:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0426 'XOR RA,(RB)'' TEST - A=125252,B=052525 N:C=0110
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016

                                        ;EXEC:          [224]ALUC=HLHHL :[367]D=00177777

                                        ;CODES:         [367] SPS=3  /  N:C=1000

                                        ;SYNC:          B05J2 (-)       /       T=2.6 USEC

                                        ;KEY SIG:       K3-5 XOR L  /  K3-3 DM=1L

032150  012700  000426                  T0426:  MOV     #0426,R0                ;LOAD R0 WITH TEST NO.
032154  013701  032204                          MOV     @#I0426,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
032160  012704  177777                          MOV     #-1,R4          ;RESULT S/B = 177777
032164  012705  125252                          MOV     #125252,R5      ;MASK = 125252
032170  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
032174  012712  052525                  R0426:  MOV     #052525,(R2)    ;[DEST] = 052525
032200  000257                                  CCC                     ;SCOPE SYNC
032202  000266                                  266                     ;MAKE N:C=0110

032204  074512                          I0426:  XOR     R5,(R2)         ;TEST THE XOR

032206  100003                                  BPL     E10426          ;N:C = 1000 ??
032210  001402                                  BEQ     E10426
032212  102401                                  BVS     E10426
032214  103002                                  BCC     A0426

032216  104000                          E10426: ERROR                   ;XOR FAILED TO ALTER CODES PROPERLY
032220  032174                                  R0426                   ;ERROR LOOP RETURN ADDRESS

032222  020412                          A0426:  CMP     R4,(R2)         ;RESULT CORRECT?
032224  001403                                  BEQ     00426           ;BR IF YES

032226  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
032230  104000                          E20426: ERROR                   ;XOR DELIVERED THE WRONG RESULT
032232  032174                                  R0426                   ;ERROR LOOP RETURN ADDRESS

032234  000004                          00426:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0427 "XOR RA,(RB)" TEST - A=052525,B=125252 N:C=1001
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016

                                        ;EXEC:          [224]ALUC=HLHHL :[367]D=177777

                                        ;CODES:         [367] SPS=3  /  N:C=1001

                                        ;SYNC:          B05J2 (-)       /       T=2.6 USEC

                                        ;KEY SIG:       K3-5 XOR L  /  K3-3 DM=1L

032236  012700  000427                  T0427:  MOV     #0427,R0                ;LOAD R0 WITH TEST NO.
032242  013701  032272                          MOV     @#I0427,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
032246  012704  177777                          MOV     #-1,R4          ;RESULT S/B = 177777
032252  012705  052525                          MOV     #52525,R5       ;MASK = 052525
032256  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
032262  012712  125252                  R0427:  MOV     #125252,(R2)    ;[DEST] = 125252
032266  000257                                  CCC                     ;SCOPE SYNC
032270  000271                                  271                     ;MAKE N:C=1001

032272  074512                          I0427:  XOR     R5,(R2)         ;TEST THE XOR

032274  100003                                  BPL     E10427          ;N:C = 1001 ??
032276  001402                                  BEQ     E10427
032300  102401                                  BVS     E10427
032302  103402                                  BCS     A0427

032304  104000                          E10427: ERROR                   ;XOR FAILED TO ALTER CODES PROPERLY
032306  032262                                  R0427                   ;ERROR LOOP RETURN ADDRESS

032310  020412                          A0427:  CMP     R4,(R2)         ;RESULT CORRECT?
032312  001403                                  BEQ     O0427           ;BR IF YES

032314  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
032316  104000                          E20427: ERROR                   ;XOR DELIVERED THE WRONG RESULT
032320  032262                                  R0427                   ;ERROR LOOP RETURN ADDRESS

032322  000004                          O0427:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***************************************************************
                                                .SBTTL T0430 SUB TEST SM0,DM0 - (SRC) = (DEST) = +,+
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [103,363,360,001] FC 1,7,8

                                        ;ACT BUTS:      37[004]100,103 / 27[363]000,001

                                        ;EXEC:          [363]ALUC=LLHHL :[360] D = 000000

                                        ;CODES:         [360] SPS=3  /  N:C = 0100

                                        ;SYNC:          B05J2 (-) T = 1 USEC

                                        ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 DM=0L  /  K3-3 SM=0L  /  K3-4 OVLAP INSTR H
                                                        ;  K3-8 CIN00 L

032324  012700  000430          T0430:  MOV     #0430,R0                ;LOAD R0 WITH TEST NO.
032330  013701  032354                  MOV     @#I0430,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

032334  012702  177703                  MOV     #177703,R2      ;R2 CONTAINS DEST ADDR
032340  005004                          CLR     R4              ;RESULT S / B = 0
032342  012703  052525          R0430:  MOV     #052525,R3      ;[R3] = DEST OP = 52525
032346  010305                          MOV     R3,R5           ;[R5] = SRC OP = 52525
032350  000257                          CCC                     ;CLEAR FLAGS
032352  000273                          273                     ;MAKE N:C = 1011

032354  160503                  I0430:  SUB     R5,R3           ;TEST THE SUB

032356  100403                          BMI     E10430
032360  001002                          BNE     E10430          ;DID N:C = 0100
032362  102401                          BVS     E10430
032364  103002                          BCC     A0430

032366  104000                  E10430: ERROR                   ;SUB FAILED TO ALTER CODES PROPERLY
032370  032342                          R0430                   ;ERROR LOOP RETURN

032372  020304                  A0430:  CMP     R3,R4           ;WAS RESULT = 0?
032374  001402                          BEQ     00430           ;BR IF YES

032376  104000                  E20430: ERROR                   ;SUB DELIVERED WRONG RESULT
032400  032342                          R0430                   ;ERROR LOOP RETURN

032402  000004                  00430:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***************************************************************
                                                .SBTTL T0431 SUB TEST SM0,DM0 - (SRC) = (DEST) = -,-
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [103,363,360,001] FC 1,7,8

                                        ;ACT BUTS:      37[004]100,103 / 27[363]000,001

                                        ;EXEC:          [363]ALUC=LLHHL :[360] D = 000000

                                        ;CODES:         [360] SPS=3  /  N:C = 0100

                                        ;SYNC:          B05J2 (-) T = 1 USEC

                                        ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 DM=0L  /  K3-3 SM=0L  /  K3-4 OVLAP INSTR H
                                                        ;  K3-8 CIN00 L

032404  012700  000431                  T0431:  MOV     #0431,R0                ;LOAD R0 WITH TEST NO.
032410  013701  032434                          MOV     @#I0431,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

032414  012702  177703                          MOV     #177703,R2      ;DEST ADDR  = R3
032420  005004                                  CLR     R4              ;RESULT S / B = 0
032422  012703  125252                  R0431:  MOV     #125252,R3      ;[R3] = DEST OP = 125252
032426  010305                                  MOV     R3,R5           ;[R5] = SOURCE OP = 125252
032430  000257                                  CCC                     ;CLEAR FLAGS
032432  000273                                  273                     ;MAKE N:C = 1011

032434  160503                          I0431:  SUB     R5,R3           ;TEST THE SUB

032436  100403                                  BMI     E10431
032440  001002                                  BNE     E10431          ;N:C = 0100?
032442  102401                                  BVS     E10431
032444  103002                                  BCC     A0431

032446  104000                          E10431: ERROR                   ;SUB FAILED TO ALTER CODES PROPERLY
032450  032422                                  R0431                   ;ERROR LOOP RETURN

032452  020304                          A0431:  CMP     R3,R4           ;RESULT = 0?
032454  001402                                  BEQ     00431           ;BR IF YES

032456  104000                          E20431: ERROR                   ;SUB DELIVERED WRONG RESULT
032460  032422                                  R0431                   ;ERROR LOOP RETURN

032462  000004                          00431:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0432 SUB TEST SM0,DM0 - (SRC) = (DEST) = -,+
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [103,363,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,103 / 27[363]000,001

                                ;EXEC:          [363]ALUC=LLHHL :[360] D = 000002

                                ;CODES:         [360] SPS=3  /  N:C = 0001

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=0L  /  K3-3 DM=0L  /  K3-4 OVLAP INSTR H
                                                ;  K3-8 CIN00 L

032464  012700  000432          T0432:  MOV     #0432,R0                ;LOAD R0 WITH TEST NO.
032470  013701  032520                  MOV     @#I0432,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

032474  012702  177703                  MOV     #177703,R2      ;R2 CONTAINS DEST ADDR
032500  012704  000002                  MOV     #2,R4           ;RESULT S / B = 2
032504  012703  000001          R0432:  MOV     #1,R3           ;[R3] = DEST OP = 1
032510  012705  177777                  MOV     #-1,R5          ;[R5] = SRC OP = -1
032514  000257                          CCC                     ;CLEAR FLAGS
032516  000276                          276                     ;MAKE N:C = 1110

032520  160503                  I0432:  SUB     R5,R3           ;TEST THE SUB

032522  100403                          BMI     E10432
032524  001402                          BEQ     E10432          ;N:C = 0001
032526  102401                          BVS     E10432
032530  103402                          BCS     A0432

032532  104000                  E10432: ERROR                   ;SUB FAILED TO ALTER CODES PROPERLY
032534  032504                          R0432                   ;ERROR LOOP RETURN

032536  020304                  A0432:  CMP     R3,R4           ;RESULT = +2?
032540  001402                          BEQ     00432           ;BR IF YES

032542  104000                  E20432: ERROR                   ;SUB DELIVERED WRONG RESULT
032544  032504                          R0432                   ;ERROR LOOP RETURN

032546  000004                  00432:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                ; ***********************************************************************
                                        .SBTTL T0433 SUB TEST SM0,DM0 (SRC) = -(DEST) = +,-
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [103,363,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,103 / 27[363]000,001

                                ;EXEC:          [363]ALUC=LLHHL :[360] D = 177776

                                ;CODES:         [360] SPS=3  /  N:C = 1000

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 DM=0L  /  K3-3 SM=0L  /  K3-4 OVLAP INSTR H
                                                ;  K3-8 CIN00 L

032550  012700  000433          T0433:  MOV     #0433,R0                ;LOAD R0 WITH TEST NO.
032554  013701  032604                  MOV     @#I0433,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

032560  012702  177703                  MOV     #177703,R2      ;R2 CONTAINS DEST ADDR
032564  012704  177776                  MOV     #-2,R4          ;RESULT S / B = -2
032570  012703  177777          R0433:  MOV     #-1,R3          ;[R3] = [DEST] = -1
032574  012705  000001                  MOV     #1,R5           ;[R5] = [SOURCE] = +1
032600  000257                          CCC                     ;CLEAR FLAGS
032602  000267                          267                     ;MAKE N:C = 0111

032604  160503                  I0433:  SUB     R5,R3           ;TEST THE SUB

032606  100003                          BPL     E10433
032610  001402                          BEQ     E10433          ;N:C = 1000
032612  102401                          BVS     E10433
032614  103002                          BCC     A0433

032616  104000                  E10433: ERROR                   ;SUB DID NOT ALTER CODES PROPERLY
032620  032570                          R0433                   ;ERROR LOOP RETURN

032622  020403                  A0433:  CMP     R4,R3           ;RESULT = -2?
032624  001402                          BEQ     00433           ;BR IF YES

032626  104000                  E20433: ERROR                   ;SUB DELIVERED WRONG RESULT
032630  032570                          R0433                   ;ERROR LOOP RETURN

032632  000004                  00433:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0434 SUB TEST SM0,DM0 - 'V'' BIT SETS
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [103,363,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,103 / 27[363]000,001

                                ;EXEC:          [363]ALUC=LLHHL :[360] D = 77777

                                ;CODES:         [360] SPS=3  /  N:C = 0011

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 DM=0L  /  K3-3 SM=0L  /  K3-4 OVLAP INSTR H
                                                ;  K3-8 CIN00 L

032634  012700  000434          T0434:  MOV     #0434,R0                ;LOAD R0 WITH TEST NO.
032640  013701  032670                  MOV     @#I0434,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

032644  012702  177703                  MOV     #177703,R2      ;DEST ADDR = 177703
032650  012704  077777                  MOV     #77777,R4       ;RESULT = 77777
032654  012703  100000          R0434:  MOV     #100000,R3      ;[R3] = DEST OP = 100000
032660  012705  000001                  MOV     #1,R5           ;[R5] = SRC OP = 1
032664  000257                          CCC                     ;CLEAR FLAGS
032666  000274                          274                     ;MAKE N:C = 1100

032670  160503                  I0434:  SUB     R5,R3           ;TEST THE SUB

032672  100403                          BMI     E10434
032674  001402                          BEQ     E10434          ;N:C = 0011 ('V'' BIT SHOULD SET)
032676  102001                          BVC     E10434
032700  103002                          BCC     A0434
                                                                ;
032702  104000                  E10434: ERROR                   ;SUB FAILED TO ALTER CODES PROPERLY
032704  032654                          R0434                   ;ERROR LOOP RETURN

032706  020304                  A0434:  CMP     R3,R4           ;RESULT = 77777?
032710  001402                          BEQ     00434           ;BR IF YES

032712  104000                  E20434: ERROR                   ;SUB DELIVERED WRONG RESULT
032714  032654                          R0434                   ;ERROR LOOP RETURN

032716  000004                  00434:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0435 SUB TEST - SM0,DM1 - <N:C> = 0110
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,226,365,367,375,016] FC 1,3,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,226 / 16[367]016,016

                                        ;EXEC:          [365]ALUC=LLHHL :[367] D = 177777

                                        ;CODES:         [367] SPS=3  /  N:C = 1001

                                        ;SYNC:          B05J2 (-) T = 2.7 USEC

                                        ;KEY SIG:       K3-8 CIN00 L  /  K3-3 ADD+SUB L  /  K3-3 SM=0L  /  K3-3 DM=1L

032720  012700  000435                  T0435:  MOV     #0435,R0                ;LOAD R0 WITH TEST NO.
032724  013701  032752                          MOV     @#I0435,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
032730  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
032734  012704  177777                          MOV     #-1,R4          ;RESULT S / B = 177777
032740  012705  000001                          MOV     #+1,R5          ;SRC OPR = +1
032744  005012                          R0435:  CLR     (R2)            ;[DEST] = 000000
032746  000257                                  CCC                     ;CLEAR FLAGS
032750  000266                                  266                     ;N:C = 0110

032752  160512                          I0435:  SUB     R5,(R2)         ;TEST THE SUB

032754  100003                                  BPL     E10435          ;N:C = 1001
032756  001402                                  BEQ     E10435
032760  102401                                  BVS     E10435
032762  103402                                  BCS     A0435

032764  104005                          E10435: ERROR5                  ;SUB FAILED TO ALTER CODES PROPERLY
032766  032744                                  R0435                   ;ERROR LOOP RETURN ADDRESS

032770  020412                          A0435:  CMP     R4,(R2)         ;CORRECT RESULT ?
032772  001403                                  BEQ     00435           ;BR IF YES

032774  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
032776  104000                          E20435: ERROR                   ;SUB DELIVERED THE WRONG RESULT
033000  032744                                  R0435                   ;ERROR LOOP RETURN ADDRESS

033002  000004                          00435:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0436 SUB TEST - SM0,DM1 - <N:C> = 1010
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       1616,266,267,226,365,367,375,016] FC 1,3,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,226 / 16[367]016,016

                                        ;EXEC:          [365]ALUC=LLHHL :[367] D = 000000

                                        ;CODES:         [367] SPS=3  /  N:C = 0100

                                        ;SYNC:          B05J2 (-) T = 2.7 USEC

                                        ;KEY SIG:       K3-8 CIN00 L  /  K3-3 ADD+SUB L  /  K3-3 SM=0L  /  K3-3 DM=1L

033004  012700  000436                  T0436:  MOV     #0436,R0                ;LOAD R0 WITH TEST NO.
033010  013701  033036                          MOV     @#I0436,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
033014  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
033020  005004                                  CLR     R4              ;RESULT S / B = 000000
033022  012705  177777                          MOV     #-1,R5          ;SRC OPR = 177777
033026  012712  177777                  R0436:  MOV     #-1,(R2)        ;[DEST] = 177777
033032  000257                                  CCC                     ;CLEAR FLAGS
033034  000272                                  272                     ;N:C = 1010

033036  160512                          I0436:  SUB     R5,(R2)         ;TEST THE SUB

033040  100403                                  BMI     E10436          ;N:C = 0100
033042  001002                                  BNE     E10436
033044  102401                                  BVS     E10436
033046  103002                                  BCC     A0436

033050  104005                          E10436: ERROR5                  ;SUB FAILED TO ALTER CODES PROPERLY
033052  033026                                  R0436                   ;ERROR LOOP RETURN ADDRESS

033054  020412                          A0436:  CMP     R4,(R2)         ;CORRECT RESULT ?
033056  001403                                  BEQ     00436           ;BR IF YES

033060  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
033062  104000                          E20436: ERROR                   ;SUB DELIVERED THE WRONG RESULT
033064  033026                                  R0436                   ;ERROR LOOP RETURN ADDRESS

033066  000004                          00436:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0437 SUB TEST - SM0,DM1 - <N:C> = 0000
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,226,365,367,375,016] FC 1,3,8

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,226 / 16[367]016,016

                                ;EXEC:          [365]ALUC=LLHHL :[367] D = 77777

                                ;CODES:         [367] SPS=3  /  N:C = 0010

                                ;SYNC:          B05J2 (-) T = 2.7 USEC

                                ;KEY SIG:       K3-8 CIN00 L  /  K3-3 ADD+SUB L  /  K3-3 SM=0L  /  K3-3 DM=1L

033070  012700  000437          T0437:  MOV     #0437,R0                ;LOAD R0 WITH TEST NO.
033074  013701  033122                  MOV     @#I0437,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
033100  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
033104  012704  077777                  MOV     #77777,R4       ;RESULT S / B = 77777
033110  012705  000001                  MOV     #+1,R5          ;SRC OPR = +1
033114  012712  100000          R0437:  MOV     #100000,(R2)    ;[DEST] = 100000
033120  000257                          CCC                     ;CLEAR FLAGS

033122  160512                  I0437:  SUB     R5,(R2)         ;TEST THE SUB

033124  100403                          BMI     E10437          ;N:C = 0010
033126  001402                          BEQ     E10437
033130  102001                          BVC     E10437
033132  103002                          BCC     A0437

033134  104005                  E10437: ERROR5                  ;SUB FAILED TO ALTER CODES PROPERLY
033136  033114                          R0437                   ;ERROR LOOP RETURN ADDRESS

033140  020412                  A0437:  CMP     R4,(R2)         ;CORRECT RESULT ?
033142  001403                          BEQ     00437           ;BR IF YES

033144  011203                          MOV     (R2),R3         ;GET THE WAS DATA
033146  104000                  E20437: ERROR                   ;SUB DELIVERED THE WRONG RESULT
033150  033114                          R0437                   ;ERROR LOOP RETURN ADDRESS

033152  000004                  00437:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0440 SUB TEST - SM1,DM0 - <N:C> = 0110
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,121,370,360,000] FC 1,2,8

                                        ;ACT BUTS:      37[004]100,141 / 35[247]120,121 / 27[370]000,000

                                        ;EXEC:          [370]ALUC=LLHHL :[360] D = 177777

                                        ;CODES:         [360] SPS=3  /  N:C = 1001

                                        ;SYNC:          B05J2 (-) T = 2.7 USEC

                                        ;KEY SIG:       K3-8 CIN00 L  /  K3-3 ADD+SUB L  /  K3-3 SM=1L  /  K3-3 DM=0L

033154  012700  000440                  T0440: .MOV     #0440,R0                ;LOAD R0 WITH TEST NO.
033160  013701  033206                         MOV     @#I0440,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
033164  012702  177703                         MOV     #177703,R2      ;DEST ADDR = R3
033170  012704  177777                         MOV     #-1,R4          ;RESULT S / B = 177777
033174  012705  070116                         MOV     #DWTB+2,R5      ;SRC ADDR = DWTB+2
033200  005003                          R0440: CLR     R3              ;[DEST] = 000000
033202  000257                                 CCC                     ;CLEAR FLAGS
033204  000266                                 266                     ;N:C = 0110

033206  161503                          I0440: SUB     (R5),R3         ;TEST THE SUB

033210  100003                                 BPL     E10440          ;N:C = 1001
033212  001402                                 BEQ     E10440
033214  102401                                 BVS     E10440
033216  103402                                 BCS     A0440

033220  104005                          E10440: ERROR5                 ;SUB FAILED TO ALTER CODES PROPERLY
033222  033200                                 R0440                   ;ERROR LOOP RETURN ADDRESS

033224  020403                          A0440: CMP     R4,R3           ;CORRECT RESULT ?
033226  001402                                 BEQ     00440           ;BR IF YES

033230  104000                          E20440: ERROR                  ;SUB DELIVERED THE WRONG RESULT
033232  033200                                 R0440                   ;ERROR LOOP RETURN ADDRESS

033234  000004                          00440: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0441 SUB TEST - SM1,DM0 - <N:C> = 1010
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [141,247,250,121,370,360,000] FC 1,2,8

                                ;ACT BUTS:      37[004]100,141 / 35[247]120,121 / 27[370]000,000

                                ;EXEC:          [370]ALUC=LLHHL :[360] D = 000000

                                ;CODES:         [360] SPS=3  /  N:C = 0100

                                ;SYNC:          B05J2 (-) T = 2.7 USEC

                                ;KEY SIG:       K3-8 CIN00 L  /  K3-3 ADD+SUB L  /  K3-3 SM=1L  /  K3-3 DM=0L

033236  012700  000441          T0441:  MOV     #0441,R0                ;LOAD R0 WITH TEST NO.
033242  013701  033266                  MOV     @#I0441,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
033246  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
033252  005004                          CLR     R4              ;RESULT S / B = 000000
033254  012705  067572                  MOV     #DWTA+2,R5      ;SRC ADDR = DWTA+2
033260  011503                  R0441:  MOV     (R5),R3         ;[DEST] = 177777
033262  000257                          CCC                     ;CLEAR FLAGS
033264  000272                          272                     ;N:C = 1010

033266  161503                  I0441:  SUB     (R5),R3 ;TEST THE SUB

033270  100403                          BMI     E10441          ;N:C = 0100
033272  001002                          BNE     E10441
033274  102401                          BVS     E10441
033276  103002                          BCC     A0441

033300  104005                  E10441: ERROR5                  ;SUB FAILED TO ALTER CODES PROPERLY
033302  033260                          R0441                   ;ERROR LOOP RETURN ADDRESS

033304  020403                  A0441:  CMP     R4,R3           ;CORRECT RESULT ?
033306  001402                          BEQ     O0441           ;BR IF YES

033310  104000                  E20441: ERROR                   ;SUB DELIVERED THE WRONG RESULT
033312  033260                          R0441                   ;ERROR LOOP RETURN ADDRESS

033314  000004                  O0441:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0442 SUB TEST - SM1,DM0 - <N:C> = 0000
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [141,247,250,121,370,360,000] FC 1,2,8

                                ;ACT BUTS:      37[004]100,141 / 35[247]120,121 / 27[370]000,000

                                ;EXEC:          [370]ALUC=LLHHL :[360] D = 077777

                                ;CODES:         [360] SPS=3  /  N:C = 0010

                                ;SYNC:          B05J2 (-) T = 2.7 USEC

                                ;KEY SIG:       K3-8 CIN00 L  /  K3-3 ADD+SUB L  /  K3-3 SM=1L  /  K3-3 DM=0L

033316  012700  000442          T0442:  MOV     #0442,R0                ;LOAD R0 WITH TEST NO.
033322  013701  033354                  MOV     @#I0442,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
033326  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
033332  012704  077777                  MOV     #77777,R4               ;RESULT S / B = 77777
033336  012705  067564                  MOV     #MBUF1,R5               ;SRC ADDR =MBUF1
033342  012703  100000          R0442:  MOV     #100000,R3      ;[DEST] = 100000
033346  012715  000001                  MOV     #+1,(R5)        ;SRC OPR = +1
033352  000257                          CCC                     ;CLEAR FLAGS

033354  161503                  I0442:  SUB     (R5),R3         ;TEST THE SUB

033356  100403                          BMI     E10442          ;N:C = 0010
033360  001402                          BEQ     E10442
033362  102001                          BVC     E10442
033364  103002                          BCC     A0442

033366  104005                  E10442: ERROR5                  ;SUB FAILED TO ALTER CODES PROPERLY
033370  033342                          R0442                   ;ERROR LOOP RETURN ADDRESS

033372  020403                  A0442:  CMP     R4,R3           ;CORRECT RESULT ?
033374  001402                          BEQ     O0442           ;BR IF YES

033376  104000                  E20442: ERROR                   ;SUB DELIVERED THE WRONG RESULT
033400  033342                          R0442                   ;ERROR LOOP RETURN ADDRESS

033402  000004                  O0442:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0443 SUB  SM1,DM1 TEST - <N:C> = 0110
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [141,247,250,161,266,267,227,365,367,375,016] FC 1,2,3,8

                                ;ACT BUTS:      37[004]100,141  /  35[247]120,161  /  33[266]220,227  /  16[367]016,016

                                ;EXEC:          [365]ALUC=LLHHL :[367]D=177777

                                ;CODES:         [367]SPS=3       /      N:C=1001

                                ;SYNC:          B05J2   (-)      T=3.4 USEC

                                ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=1 L  /  K3-3 DM=1 L  /  K3-8 CIN00 L

033404  012700  000443          T0443:  MOV     #0443,R0                ;LOAD R0 WITH TEST NO.
033410  013701  033444                  MOV     @#I0443,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
033414  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
033420  012704  177777                  MOV     #-1,R4          ;RESULT S / B = 177777
033424  012705  067564                  MOV     #MBUF1,R5       ;SOURCE ADDR = MBUF1
033430  012715  000001          R0443:  MOV     #+1,(R5)        ;[SOURCE] = 000001
033434  012712  000000                  MOV     #0,(R2)         ;[DEST] = 000000
033440  000257                          CCC                     ;CLEAR FLAGS
033442  000266                          266                     ;N:C = 0110

033444  161512                  I0443:  SUB     (R5),(R2)       ;TEST THE SUB

033446  100003                          BPL     E10443          ;N:C = 1001 ?
033450  001402                          BEQ     E10443
033452  102401                          BVS     E10443
033454  103402                          BCS     A0443

033456  104005                  E10443: ERROR5                  ;SUB FAILED TO ALTER CODES PROPERLY
033460  033430                          R0443                   ;ERROR LOOP RETURN ADDRESS

033462  020412                  A0443:  CMP     R4,(R2)         ;CORRECT RESULT ?
033464  001403                          BEQ     O0443           ;BR IF YES

033466  011203                          MOV     (R2),R3         ;GET THE WAS DATA
033470  104000                  E20443: ERROR                   ;SUB DELIVERED THE WRONG RESULT
033472  033430                          R0443                   ;ERROR LOOP RETURN ADDRESS

033474  000004                  O0443:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0444 SUB  SM1,DM2 TEST - <N:C> = 0110
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,162,260,267,227,365,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,141  /  35[247]120,162  /  33[260]220,227  /  16[367]016,016

                                        ;EXEC:          [365]ALUC=LLHHL :[367]D=177777

                                        ;CODES:         [367]SPS=3       /      N:C=1001

                                        ;SYNC:          B05J2   (-)      T=3.4 USEC

                                        ;KEY SIG:       K3-3 ADD+SUB L  /  K3-3 SM=1 L  /  K3-3 DM=2  /  K3-8 CIN00 L
                                                        ;  K5-5 BCON(1+2) H

033476  012700  000444          T0444:  MOV     #0444,R0                ;LOAD R0 WITH TEST NO.
033502  013701  033552                  MOV     @#I0444,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
033506  032737  000400  066642          BIT     #400,@#BPTLOC   ;BREAKPOINT HALT SET ??
033514  001401                          BEQ     .+4             ;BR IF NOT
033516  000000                          HALT                    ;BREAK-DEPRESS CONTINUE TO RESTART
033520  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
033524  012704  177777                  MOV     #-1,R4          ;RESULT S / B = 177777
033530  012705  067564                  MOV     #MBUF1,R5       ;SOURCE ADDR = MBUF1
033534  012715  000001          R0444:  MOV     #+1,(R5)        ;[SOURCE] = 000001
033540  012712  000000                  MOV     #0,(R2)         ;[DEST] = 000000
033544  010203                          MOV     R2,R3           ;R3 GETS DEST ADDR
033546  000257                          CCC                     ;CLEAR FLAGS
033550  000266                          266                     ;N:C = 0110

033552  161523                  I0444:  SUB     (R5),(R3)+      ;TEST THE SUB

033554  100003                          BPL     E10444          ;N:C = 1001 ?
033556  001402                          BEQ     E10444
033560  102401                          BVS     E10444
033562  103402                          BCS     A0444

033564  104005                  E10444: ERROR5                  ;SUB FAILED TO ALTER CODES PROPERLY
033566  033534                          R0444                   ;ERROR LOOP RETURN ADDRESS

033570  020412                  A0444:  CMP     R4,(R2)         ;CORRECT RESULT ?
033572  001403                          BEQ     00444           ;BR IF YES

033574  011203                          MOV     (R2),R3         ;GET THE WAS DATA
033576  104000                  E20444: ERROR                   ;SUB DELIVERED THE WRONG RESULT
033600  033534                          R0444                   ;ERROR LOOP RETURN ADDRESS

033602  000004                  00444:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0445 NEG DM2 TEST
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [162,260,267,221,367,375,016] FC 1,3,9,8

                                ;ACT BUTS:      37[004]100,162 / 33[260]220,221 / 16[367]016,016

                                ;EXEC:          [221]ALUC=LLHHL :[367] D = 125252

                                ;CODES:         [367] SPS=3  /  N:C = 1001

                                ;SYNC:          B05J2 (-) T = 2 USEC

                                ;KEY SIG:       K3-8 CIN00 L  /  K3-3 DM=2L  /  K5-5 NEG L  /  K5-5 BCON(1+2)H

033604  012700  000445          T0445:  MOV     #0445,R0                ;LOAD R0 WITH THE TEST NO.
033610  013701  033634                  MOV     @#I0445,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
033614  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
033620  012704  125252                  MOV     #125252,R4      ;RESULT S / B = 125252
033624  010205                  R0445:  MOV     R2,R5           ;[R5] = DEST ADDR
033626  012712  052526                  MOV     #52526,(R2)     ;[DEST] = 52526
033632  000257                          CCC                     ;SCOPE SYNC

033634  005425                  I0445:  NEG     (R5)+           ;TEST THE NEG - MODE 2

033636  020412                          CMP     R4,(R2)         ;RESULT = 125252?
033640  001403                          BEQ     A0445           ;BR IF YES

033642  011203                          MOV     (R2),R3         ;GET THE WAS DATA
033644  104000                  E10445: ERROR                   ;NEG DELIVERED WRONG RESULT
033646  033624                          R0445                   ;ERROR LOOP RETURN

033650  022705  067562          A0445:  CMP     #MBUF0+2,R5     ;DID REG. GET AUTO INCREMENTED?
033654  001402                          BEQ     O0445           ;BR IF YES

033656  104005                  E20445: ERROR5                  ;NEG FAILED TO UPDATE REG.
033660  033624                          R0445                   ;ERROR LOOP RETURN

033662  000004                  O0445:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0446 NEG DM3 TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [163,264,265,266,267,221,367,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,163 / 33[266]220,221 / 16[367]016,016

                                        ;EXEC:          [221]ALUC=LLHHL :[367] D = 125252

                                        ;CODES:         [367] SPS=3  /  N:C = 1001

                                        ;SYNC:          B05J2 (-) T = 2.75 USEC

                                        ;KEY SIG:       K3-8 CIN00 L  /  K3-3 DM=3L  /  K3-4 NEG L  /  K5-5 BC01 H

033664  012700  000446                  T0446:  MOV     #0446,R0                ;LOAD R0 WITH THE TEST NO.
033670  013701  033716                          MOV     @#I0446,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
033674  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
033700  012704  125252                          MOV     #125252,R4      ;RESULT S / B = 125252
033704  012705  067554                  R0446:  MOV     #ATA+10,R5      ;[ATA+10] = MBUF0
033710  012712  052526                          MOV     #52526,(R2)     ;[DEST] = 52526
033714  000257                                  CCC                     ;SCOPE SYNC

033716  005435                          I0446:  NEG     @(R5)+          ;TEST THE NEG - MODE 3

033720  020412                                  CMP     R4,(R2)         ;RESULT = 125252?
033722  001403                                  BEQ     A0446           ;BR IF YES

033724  011203                                  MOV     (R2),R3         ;GET WAS DATA
033726  104000                          E10446: ERROR                   ;NEG DELIVERED WRONG RESULT
033730  033704                                  R0446                   ;ERROR LOOP RETURN

033732  022705  067556                  A0446:  CMP     #ATA+12,R5      ;DID REG GET AUTO INCREMENTED?
033736  001402                                  BEQ     00446           ;BR IF YES

033740  104005                          E20446: ERROR5                  ;NEG FAILED TO UPDATE REG.
033742  033704                                  R0446                   ;ERROR LOOP RETURN

033744  000004                          00446:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0447 NEG DM4 TEST
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [164,260,267,221,367,375,061] FC 1,3,9,8

                                ;ACT BUTS:      37[004]100,164 / 33[260]220,221 / 16[367]016,016

                                ;EXEC:          [221]ALUC=LLHHL :[367] D = 125252

                                ;CODES:         [367] SPS=3  /  N:C = 1001

                                ;SYNC:          B05J2 (-) T = 2 USEC

                                ;KEY SIG:       K3-8 CIN00 L  /  K3-3 DM=4L  /  K3-4 NEG L  /  K5-5 BCON(1+2) H

033746  012700  000447          T0447:  MOV     #0447,R0                ;LOAD R0 WITH THE TEST NO.
033752  013701  034000                  MOV     @#I0447,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
033756  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
033762  012704  125252                  MOV     #125252,R4      ;RESULT S / B = 125252
033766  012705  067562          R0447:  MOV     #MBUF0+2,R5     ;[R5] = DEST ADDR + 2
033772  012712  052526                  MOV     #52526,(R2)     ;[DEST] = 52526
033776  000257                          CCC                     ;SCOPE SYNC

034000  005445                  I0447:  NEG     -(R5)           ;TEST THE NEG - MODE 4

034002  020412                          CMP     R4,(R2)         ;RESULT = 125252?
034004  001403                          BEQ     A0447           ;BR IF YES

034006  011203                          MOV     (R2),R3         ;GET WAS DATA
034010  104000                  E10447: ERROR                   ;NEG DELIVERED WRONG RESULT
034012  033766                          R0447                   ;ERROR LOOP RETURN

034014  020502                  A0447:  CMP     R5,R2           ;DID REG GET AUTO INCREMENTED?
034016  001402                          BEQ     00447           ;BR IF YES

034020  104005                  E20447: ERROR5                  ;NEG FAILED TO UPDATE REG
034022  033766                          R0447                   ;ERROR LOOP RETURN

034024  000004                  00447:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0450 NEG DM5 TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [165,264,265,266,267,221,367.375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,165 / 33[266]220,221 / 16[367]016,016

                                        ;EXEC:          [221]ALUC=LLHHL :[367] D = 125252

                                        ;CODES:         [367] SPS=3  /  N:C = 1001


                                        ;SYNC:          B05J2 (-) T = 2 USEC

                                        ;KEY SIG:       K3-8 CIN00 L  /  K3-3 DM=5L  /  K5-5 NEG L  /  K5-5 BC01 H

034026  012700  000450                  T0450:  MOV     #0450,R0                ;LOAD R0 WITH THE TEST NO.
034032  013701  034060                          MOV     @#I0450,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
034036  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
034042  012704  125252                          MOV     #125252,R4      ;RESULT S / B = 125252
034046  012705  067556                  R0450:  MOV     #ATA+12,R5      ;[R5] = (ADR OF MBUF0) +2
034052  012712  052526                          MOV     #52526,(R2)     ;[DEST] = 52526
034056  000257                                  CCC                     ;SCOPE SYNC

034060  005455                          I0450:  NEG     @-(R5)          ;TEST THE NEG - MODE 5

034062  020412                                  CMP     R4,(R2)         ;RESULT = 125252?
034064  001403                                  BEQ     A0450           ;BR IF YES

034066  011203                                  MOV     (R2),R3         ;GET WAS DATA
034070  104000                          E10450: ERROR                   ;NEG DELIVERED WRONG RESULT
034072  034046                                  R0450                   ;ERROR LOOP RETURN

034074  022705  067554                  A0450:  CMP     #ATA+10,R5      ;DID NEG UPDATE REG
034100  001402                                  BEQ     00450           ;BR IF YES

034102  104005                          E20450: ERROR5                  ;NEG FAILED TO UPDATE REG
034104  034046                                  R0450                   ;ERROR LOOP RETURN

034106  000004                          00450:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0451 NEG DM6 TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [166,261,262,266,267,221,367,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,166 / 33[266]220,221 / 16[367]016,016

                                        ;EXEC:          [221]ALUC=LLHHL :[367] D = 125252

                                        ;CODES:         [367] SPS=3  /  N:C = 1001

                                        ;SYNC:          B05J2 (-) T = 2.5 USEC

                                        ;KEY SIG:       K3-8 CIN00 L  /  K3-3 DM=6L  /  K3-4 NEG L  /  K5-5 BC01 H
                                                        ;  K3-4 OVLAP CYCLE L

034110  012700  000451                  T0451:  MOV     #0451,R0                ;LOAD R0 WITH THE TEST NO.
034114  013701  034142                          MOV     @#I0451,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
034120  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
034124  012704  125252                          MOV     #125252,R4      ;RESULT S / B = 125252
034130  012705  067556                  R0451:  MOV     #MBUF0-2,R5     ;[R5] = BASE ADDR
034134  012712  052526                          MOV     #52526,(R2)     ;[DEST] = 52526
034140  000257                                  CCC                     ;SCOPE SYNC

034142  005465  000002                  I0451:  NEG     2(R5)           ;TEST THE NEG - MODE 6

034146  020412                                  CMP     R4,(R2)         ;RESULT = 125252?
034150  001403                                  BEQ     00451           ;BR IF YES

034152  011203                                  MOV     (R2),R3         ;GET WAS DATA
034154  104000                  E0451:  ERROR                           ;NEG DELIVERED WRONG RESULT
034156  034130                          R0451                           ;ERROR LOOP RETURN

034160  000004                  00451:  SCOPE                           ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0452 NEG DM7 TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [166,261,263,264,265,266,267,221,367,375,016] FC 1,3,9,8

                                        ;ACT BUTS:      37[004]100,166 / 33[266]220,221 / 16[367]016,016

                                        ;EXEC:          [221]ALUC=LLHHL :[367] D = 125252

                                        ;CODES:         [367] SPS=3  /  N:C = 1001

                                        ;SYNC:          B05J2 (-) T = 3.5 USEC

                                        ;KEY SIG:       K3-8 CIN00 L  /  K3-3 DM=7L  /  K3-4 NEG L  /  K5-5 BC01 H
                                                        ;  K3-4 OVLAP CYCLE L

034162  012700  000452                  T0452:  MOV     #0452,R0                ;LOAD R0 WITH THE TEST NO.
034166  013701  034214                          MOV     @#I0452,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
034172  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
034176  012704  125252                          MOV     #125252,R4      ;RESULT S / B = 125252
034202  012705  067544                  R0452:  MOV     #ATA,R5         ;[R5] = BASE ADDR
034206  012712  052526                          MOV     #52526,(R2)     ;[DEST] = 52526
034212  000257                                  CCC                     ;SCOPE SYNC

034214  005475  000010                  I0452:  NEG     @10(R5)         ;TEST THE NEG - MODE 7

034220  020412                                  CMP     R4,(R2)         ;RESULT = 125252?
034222  001403                                  BEQ     00452           ;BR IF YES

034224  011203                                  MOV     (R2),R3         ;GET WAS DATA
034226  104000                          E0452:  ERROR                   ;NEG DELIVERED WRONG RESULT
034230  034202                                  R0452                   ;ERROR LOOP RETURN

034232  000004                          00452:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0453 MOV SM1,DM1 TEST - <N:C> = 0100
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [141,247,250,171,257,200,125,375,016] FC 1,2,4,8

                                ;ACT BUTS:      37[004]100,141 / 35[247]120,171 / 22[171]200,200 / 16[125]016,016

                                ;EXEC:          [200]ALUC=LLLLL :[125] D = 177777

                                ;CODES:         [125] SPS=3  /  N:C = 1000

                                ;SYNC:          B05J2 (-) T = 3.25 USEC

                                ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=1L  /  K3-3 MOV L

034234  012700  000453          T0453:  MOV     #0453,R0                ;LOAD R0 WITH TEST NO.
034240  013701  034270                  MOV     @#I0453,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
034244  005004                          CLR     R4              ;RESULT S / B = 177777
034246  005104                          COM     R4
034250  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
034254  012705  067572                  MOV     #DWTA+2,R5      ;SOURCE ADDR = DWTA+2
034260  010203                  R0453:  MOV     R2,R3           ;BASE DEST ADDR = MBUF0
034262  005012                          CLR     (R2)            ;MAKE [DEST] = 000000
034264  000257                          CCC                     ;CLEAR FLAGS
034266  000264                          264                     ;N:C = 0100

034270  011513                  I0453:  MOV     (R5),(R3)       ;TEST THE MOV - SM1,DM1

034272  100003                          BPL     E10453          ;N:C = 1000 ?
034274  001402                          BEQ     E10453
034276  102401                          BVS     E10453
034300  103002                          BCC     A0453

034302  104005                  E10453: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
034304  034260                          R0453                   ;ERROR LOOP RETURN

034306  020412                  A0453:  CMP     R4,(R2)         ;RESULT CORRECT ??
034310  001404                          BEQ     O0453           ;BR IF YES

034312  005003                          CLR     R3              ;GET THE WAS DATA
034314  051203                          BIS     (R2),R3
034316  104000                  E20453: ERROR                   ;MOV DELIVERED THE WRONG RESULT
034320  034260                          R0453                   ;ERROR LOOP RETURN

034322  000004                  O0453:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0454 MOV SM2,DM1 TEST - <N:C> = 0100
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,171,257,200,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,171 / 22[171]200,200 / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125] D = 177777

                                        ;CODES:         [125] SPS=3  /  N:C = 1000

                                        ;SYNC:          B05J2 (-) T = 3.25 USEC

                                        ;KEY SIG:       K3-3 SM=2L  /  K3-3 DM=1L  /  K3-3 MOV L  /  K5-5 BCON (1+2) H

034324  012700  000454                  T0454:  MOV     #0454,R0                ;LOAD R0 WITH TEST NO.
034330  013701  034360                          MOV     @#I0454,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
034334  005004                                  CLR     R4              ;RESULT S / B = 177777
034336  005104                                  COM     R4
034340  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
034344  012705  067572                          MOV     #DWTA+2,R5      ;SOURCE ADDR = DWTA+2
034350  010203                          R0454:  MOV     R2,R3           ;BASE DEST ADDR = MBUF0
034352  005012                                  CLR     (R2)            ;MAKE [DEST] = 000000
034354  000257                                  CCC                     ;CLEAR FLAGS
034356  000264                                  264                     ;N:C = 0100

034360  012513                          I0454:  MOV     (R5)+,(R3)      ;TEST THE MOV - SM2,DM1

034362  100003                                  BPL     E10454          ;N:C = 1000 ?
034364  001402                                  BEQ     E10454
034366  102401                                  BVS     E10454
034370  103002                                  BCC     A0454

034372  104005                          E10454: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
034374  034350                                  R0454                   ;ERROR LOOP RETURN

034376  020412                          A0454:  CMP     R4,(R2)         ;RESULT CORRECT ??
034400  001404                                  BEQ     00454           ;BR IF YES

034402  005003                                  CLR     R3              ;GET THE WAS DATA
034404  051203                                  BIS     (R2),R3
034406  104000                          E20454: ERROR                   ;MOV DELIVERED THE WRONG RESULT
034410  034350                                  R0454                   ;ERROR LOOP RETURN

034412  000004                          00454:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0455 MOV SM1,DM1 TEST - <N:C> = 1011
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,247,250,171,257,200,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,142 / 35[247]120,171 / 22[171]200,200 / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125] D = 000000

                                        ;CODES:         [125] SPS=3  /  N:C = 0101

                                        ;SYNC:          B05J2 (-) T = 3.25 USEC

                                        ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=1L  /  K3-3 MOV L

034414  012700  000455                  T0455:  MOV     #0455,R0                ;LOAD R0 WITH TEST NO.
034420  013701  034450                          MOV     @#I0455,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
034424  005004                                  CLR     R4              ;RESULT S / B = 000000
034426  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
034432  012705  067570                          MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
034436  010203                          R0455:  MOV     R2,R3           ;BASE DEST ADDR = MBUF0
034440  005012                                  CLR     (R2)            ;MAKE [DEST] = 177777
034442  005112                                  COM     (R2)
034444  000257                                  CCC                     ;CLEAR FLAGS
034446  000273                                  273                     ;N:C = 1011

034450  011513                          I0455:  MOV     (R5),(R3)       ;TEST THE MOV - SM1,DM1

034452  100403                                  BMI     E10455          ;N:C = 0101 ?
034454  001002                                  BNE     E10455
034456  102401                                  BVS     E10455
034460  103402                                  BCS     A0455

034462  104005                          E10455: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
034464  034436                                  R0455                   ;ERROR LOOP RETURN

034466  020412                          A0455:  CMP     R4,(R2)         ;RESULT CORRECT ??
034470  001404                                  BEQ     00455           ;BR IF YES

034472  005003                                  CLR     R3              ;GET THE WAS DATA
034474  051203                                  BIS     (R2),R3
034476  104000                          E20455: ERROR                   ;MOV DELIVERED THE WRONG RESULT
034500  034436                                  R0455                   ;ERROR LOOP RETURN

034502  000004                          00455:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0456 MOV SM2,DM1 TEST - <N:C> = 1011
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,171,257,200,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,171 / 22[171]200,200 / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125] D = 000000

                                        ;CODES:         [125] SP=3  /  N:C = 0101

                                        ;SYNC:          B05J2 (-) T = 3.25 USEC

                                        ;KEY SIG:       K3-3 SM=2L  /  K3-3 DM=1L  /  K3-3 MOV L  /  K5-5 BCON (1+2) H

034504  012700  000456                  T0456:  MOV     #0456,R0                ;LOAD R0 WITH TEST NO.
034510  013701  034540                          MOV     @#I0456,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
034514  005004                                  CLR     R4              ;RESULT S / B = 000000
034516  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
034522  012705  067570                          MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
034526  010203                          R0456:  MOV     R2,R3           ;BASE DEST ADDR = MBUF0
034530  005012                                  CLR     (R2)            ;MAKE [DEST] = 177777
034532  005112                                  COM     (R2)
034534  000257                                  CCC                     ;CLEAR FLAGS
034536  000273                                  273                     ;N:C = 1011

034540  012513                          I0456:  MOV     (R5)+,(R3)      ;TEST THE MOV - SM2,DM1

034542  100403                                  BMI     E10456          ;N:C = 0101 ?
034544  001002                                  BNE     E10456
034546  102401                                  BVS     E10456
034550  103402                                  BCS     A0456

034552  104005                          E10456: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
034554  034526                                  R0456                   ;ERROR LOOP RETURN

034556  020412                          A0456:  CMP     R4,(R2)         ;RESULT CORRECT ??
034560  001404                                  BEQ     00456           ;BR IF YES

034562  005003                                  CLR     R3              ;GET THE WAS DATA
034564  051203                                  BIS     (R2),R3
034566  104000                          E20456: ERROR                   ;MOV DELIVERED THE WRONG RESULT
034570  034526                                  R0456                   ;ERROR LOOP RETURN

034572  000004                          00456:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0457 MOV SM1,DM2 TEST - <N:C> = 0100
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,172,257,200,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,141 / 35[247]120,172 / 22[172]200,200 / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125] D = 177777

                                        ;CODES:         [125] SPS=3  /  N:C = 1000

                                        ;SYNC:          B05J2 (-) T = 3.25 USEC

                                        ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=2L  /  K3-3 MOV L  /  K5-5 BCON (1+2) H

034574  012700  000457                  T0457:  MOV     #0457,R0                ;LOAD R0 WITH TEST NO.
034600  013701  034630                          MOV     @#I0457,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
034604  005004                                  CLR     R4              ;RESULT S / B = 177777
034606  005104                                  COM     R4
034610  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
034614  012705  067572                          MOV     #DWTA+2,R5      ;SOURCE ADDR = DWTA
034620  010203                          R0457:  MOV     R2,R3           ;BASE DEST ADDR = MBUF0
034622  005012                                  CLR     (R2)            ;MAKE [DEST] = 000000
034624  000257                                  CCC                     ;CLEAR FLAGS
034626  000264                                  264                     ;N:C = 0100

034630  011523                          I0457:  MOV     (R5),(R3)+      ;TEST THE MOV - SM1,DM2

034632  100003                                  BPL     E10457          ;N:C =  1000 ?
034634  001402                                  BEQ     E10457
034636  102401                                  BVS     E10457
034640  103002                                  BCC     A0457

034642  104005                          E10457: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
034644  034620                                  R0457                   ;ERROR LOOP RETURN

034646  022703  067562                  A0457:  CMP     #MBUF0+2,R3     ;DID MOV INCREMENT DEST REG ?
034652  001402                                  BEQ     B0457           ;BR IF YES

034654  104005                          E20457: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
034656  034620                                  R0457                   ;ERROR LOOP RETURN

034660  020412                          B0457:  CMP     R4,(R2)         ;RESULT CORRECT ??
034662  001404                                  BEQ     00457           ;BR IF YES

034664  005003                                  CLR     R3              ;GET THE WAS DATA
034666  051203                                  BIS     (R2),R3
034670  104000                          E30457: ERROR                   ;MOV DELIVERED THE WRONG RESULT
034672  034620                                  R0457                   ;ERROR LOOP RETURN

034674  000004                          00457:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0460 MOV SM2,DM2 TEST - <N:C> = 0100
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,172,257,200,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,172 / 22[172]200,200 / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125] D = 177777

                                        ;CODES:         [125] SPS=3  /  N:C = 1000

                                        ;SYNC:          B05J2 (-) T = 3.25 USEC

                                        ;KEY SIG:       K3-3 SM=2L  /  K3-3 DM=2L  /  K3-3 MOV L  /  K5-5 BCON (1+2) H

034676  012700  000460                  T0460:  MOV     #0460,R0                ;LOAD R0 WITH TEST NO.
034702  013701  034732                          MOV     @#I0460,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
034706  005004                                  CLR     R4              ;RESULT S / B = 177777
034710  005104                                  COM     R4
034712  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
034716  012705  067572                          MOV     #DWTA+2,R5      ;SOURCE ADDR = DWTA
034722  010203                          R0460:  MOV     R2,R3           ;BASE DEST ADDR = MBUF0
034724  005012                                  CLR     (R2)            ;MAKE [DEST] = 000000
034726  000257                                  CCC                     ;CLEAR FLAGS
034730  000264                                  264                     ;N:C = 0100

034732  012523                          I0460:  MOV     (R5)+,(R3)+     ;TEST THE MOV - SM2,DM2

034734  100003                                  BPL     E10460          ;N:C = 1000 ?
034736  001402                                  BEQ     E10460
034740  102401                                  BVS     E10460
034742  103002                                  BCC     A0460

034744  104005                          E10460: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
034746  034722                                  R0460                   ;ERROR LOOP RETURN

034750  022703  067562                  A0460:  CMP     #MBUF0+2,R3     ;DID MOV INCREMENT DEST REG ?
034754  001402                                  BEQ     B0460           ;BR IF YES

034756  104005                          E20460: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
034760  034722                                  R0460                   ;ERROR LOOP RETURN

034762  020412                          B0460:  CMP     R4,(R2)         ;RESULT CORRECT ??
034764  001404                                  BEQ     00460           ;BR IF YES

034766  005003                                  CLR     R3              ;GET THE WAS DATA
034770  051203                                  BIS     (R2),R3
034772  104000                          E30460: ERROR                   ;MOV DELIVERED THE WRONG RESULT
034774  034722                                  R0460                   ;ERROR LOOP RETURN

034776  000004                          00460:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0461 MOV SM1,DM2 TEST - <N:C> = 1011
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,172,257,200,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,141 / 35[247]120,172 / 22[172]200,200 / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125] D = 000000

                                        ;CODES:         [125] SPS=3  /  N:C = 0101

                                        ;SYNC:          B05J2 (-) T = 3.25 USEC

                                        ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=2L  /  K3-3 MOV L  /  K5-5 BCON (1+2) H

035000  012700  000461                  T0461:  MOV     #0461,R0                ;LOAD R0 WITH TEST NO.
035004  013701  035034                          MOV     @#I0461,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
035010  005004                                  CLR     R4              ;RESULT S / B = 000000
035012  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
035016  012705  067570                          MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
035022  010203                          R0461:  MOV     R2,R3           ;BASE DEST ADDR = MBUF0
035024  005012                                  CLR     (R2)            ;MAKE [DEST] = 177777
035026  005112                                  COM     (R2)
035030  000257                                  CCC                     ;CLEAR FLAGS
035032  000273                                  273                     ;N:C = 1011

035034  011523                          I0461:  MOV     (R5),(R3)+      ;TEST THE MOV - SM1,DM2

035036  100403                                  BMI     E10461          ;N:C = 0101 ?
035040  001002                                  BNE     E10461
035042  102401                                  BVS     E10461
035044  103402                                  BCS     A0461

035046  104005                          E10461: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
035050  035022                                  R0461                   ;ERROR LOOP RETURN

035052  022703  067562                  A0461:  CMP     #MBUF0+2,R3     ;DID MOV INCREMENT DEST REG ?
035056  001402                                  BEQ     B0461           ;BR IF YES

035060  104005                          E20461: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
035062  035022                                  R0461                   ;ERROR LOOP RETURN

035064  020412                          B0461:  CMP     R4,(R2)         ;RESULT CORRECT ??
035066  001404                                  BEQ     00461           ;BR IF YES

035070  005003                                  CLR     R3              ;GET THE WAS DATA
035072  051203                                  BIS     (R2),R3
035074  104000                          E30461: ERROR                   ;MOV DELIVERED THE WRONG RESULT
035076  035022                                  R0461                   ;ERROR LOOP RETURN

035100  000004                          00461:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0462 MOV SM2,DM2 TEST - <N:C> = 1011
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,172,257,200,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,172 / 22[172]200,200 / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125] D = 000000

                                        ;CODES:         [125] SPS=3  /  N:C = 0101

                                        ;SYNC:          B05J2 (-) T = 3.25 USEC

                                        ;KEY SIG:       K3-3 SM=2L  /  K3-3 DM=2L  /  K3-3 MOV L  /  K5-5 BCON (1+2) H

035102  012700  000462                  T0462:  MOV     #0462,R0                ;LOAD R0 WITH TEST NO.
035106  013701  035136                          MOV     @#I0462,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
035112  005004                                  CLR     R4              ;RESULT S / B = 000000
035114  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
035120  012705  067570                          MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
035124  010203                          R0462:  MOV     R2,R3           ;BASE DEST ADDR = MBUF0
035126  005012                                  CLR     (R2)            ;MAKE [DEST] = 177777
035130  005112                                  COM     (R2)
035132  000257                                  CCC                     ;CLEAR FLAGS
035134  000273                                  273                     ;N:C = 1011

035136  012523                          I0462:  MOV     (R5)+,(R3)+     ;TEST THE MOV - SM2,DM2

035140  100403                                  BMI     E10462          ;N:C = 0101 ?
035142  001002                                  BNE     E10462
035144  102401                                  BVS     E10462
035146  103402                                  BCS     A0462

035150  104005                          E10462: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
035152  035124                                  R0462                   ;ERROR LOOP RETURN

035154  022703  067562                  A0462:  CMP     #MBUF0+2,R3     ;DID MOV INCREMENT DEST REG ?
035160  001402                                  BEQ     B0462           ;BR IF YES

035162  104005                          E20462: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
035164  035124                                  R0462                   ;ERROR LOOP RETURN

035166  020412                          B0462:  CMP     R4,(R2)         ;RESULT CORRECT ??
035170  001404                                  BEQ     00462           ;BR IF YES

035172  005003                                  CLR     R3              ;GET THE WAS DATA
035174  051203                                  BIS     (R2),R3
035176  104000                          E30462: ERROR                   ;MOV DELIVERED THE WRONG RESULT
035200  035124                                  R0462                   ;ERROR LOOP RETURN

035202  000004                          00462:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0463 MOV SM1,DM3 TEST - <N:C> = 0100
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,173,207,2010,200,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,141 / 35[247]120,173 / 22[207]200,200 / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125] D = 177777

                                        ;CODES:         [125] SPS=3  /  N:C = 1000

                                        ;SYNC:          B05J2 (-) T = 4 USEC

                                        ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=3L  /  K3-3 MOV L  /  K5-5 BC01 H

035204  012700  000463                  T0463:  MOV     #0463,R0                ;LOAD R0 WITH TEST NO.
035210  013701  035242                          MOV     @#I0463,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
035214  005004                                  CLR     R4              ;RESULT S / B = 177777
035216  005104                                  COM     R4
035220  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
035224  012705  067572                          MOV     #DWTA+2,R5      ;SOURCE ADDR = DWTA+2
035230  012703  067554                  R0463:  MOV     #ATA+10,R3      ;BASE DEST ADDR = ATA+10
035234  005012                                  CLR     (R2)            ;MAKE [DEST] = 000000
035236  000257                                  CCC                     ;CLEAR FLAGS
035240  000264                                  264                     ;N:C = 0100

035242  011533                          I0463:  MOV     (R5),@(R3)+     ;TEST THE MOV - SM1,DM3

035244  100003                                  BPL     E10463          ;N:C = 1000 ?
035246  001402                                  BEQ     E10463
035250  102401                                  BVS     E10463
035252  103002                                  BCC     A0463

035254  104005                          E10463: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
035256  035230                                  R0463                   ;ERROR LOOP RETURN

035260  022703  067556                  A0463:  CMP     #ATA+12,R3      ;DID MOV INCREMENT DEST REG ?
035264  001402                                  BEQ     B0463           ;BR IF YES

035266  104005                          E20463: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
035270  035230                                  R0463                   ;ERROR LOOP RETURN

035272  020412                          B0463:  CMP     R4,(R2)         ;RESULT CORRECT ??
035274  001404                                  BEQ     00463           ;BR IF YES

035276  005003                                  CLR     R3              ;GET THE WAS DATA
035300  051203                                  BIS     (R2),R3
035302  104000                          E30463: ERROR                   ;MOV DELIVERED THE WRONG RESULT
035304  035230                                  R0463                   ;ERROR LOOP RETURN

035306  000004                          00463:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0464 MOV SM2,DM3 TEST - <N:C> = 0100
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [142,240,250,173,207,210,200,125,375,016] FC 1,2,4,8

                                ;ACT BUTS:      37[004]100,142 / 35[240]120,173 / 22[207]200,200 / 16[125]016,016

                                ;EXEC:          [200]ALUC=LLLLL :[125] D = 177777

                                ;CODES:         [125] SPS=3  /  N:C = 1000

                                ;SYNC:          B05J2 (-) T = 4 USEC

                                ;KEY SIG:       K3-3 SM=2L  /  K3-3 DM=3L  /  K3-3 MOV L  /  K5-5 BC01 H
                                                ;  K5-5 BCON (1+2) H

035310  012700  000464          T0464:  MOV     #0464,R0                ;LOAD R0 WITH TEST NO.
035314  013701  035346                  MOV     @#I0464,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
035320  005004                          CLR     R4              ;RESULT S / B = 177777
035322  005104                          COM     R4
035324  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
035330  012705  067572                  MOV     #DWTA+2,R5      ;SOURCE ADDR = DWTA+2
035334  012703  067554          R0464:  MOV     #ATA+10,R3      ;BASE DEST ADDR = ATA+10
035340  005012                          CLR     (R2)            ;MAKE [DEST] = 000000
035342  000257                          CCC                     ;CLEAR FLAGS
035344  000264                          264                     ;N:C = 0100

035346  012533                  I0464:  MOV     (R5)+,@(R3)+    ;TEST THE MOV - SM2,DM3

035350  100003                          BPL     E10464          ;N:C = 1000 ?
035352  001402                          BEQ     E10464
035354  102401                          BVS     E10464
035356  103002                          BCC     A0464

035360  104005                  E10464: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
035362  035334                          R0464                   ;ERROR LOOP RETURN

035364  022703  067556          A0464:  CMP     #ATA+12,R3      ;DID MOV INCREMENT DEST REG ?
035370  001402                          BEQ     B0464           ;BR IF YES

035372  104005                  E20464: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
035374  035334                          R0464                   ;ERROR LOOP RETURN

035376  020412                  B0464:  CMP     R4,(R2)         ;RESULT CORRECT ??
035400  001404                          BEQ     00464           ;BR IF YES

035402  005003                          CLR     R3              ;GET THE WAS DATA
035404  051203                          BIS     (R2),R3
035406  104000                  E30464: ERROR                   ;MOV DELIVERED THE WRONG RESULT
035410  035334                          R0464                   ;ERROR LOOP RETURN

035412  000004                  00464:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0465 MOV SM1,DM3 TEST - <N:C> = 1011
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,173,207,210,200,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,141 / 35[247]120,173 / 22[207]200,200 / 16[125]016,016

                                        ;EXEC:          [200]ALUC-LLLLL :[125] D = 000000

                                        ;CODES:         [125] SPS=3  /  N:C = 0101

                                        ;SYNC:          B05J2 (-) T = 4 USEC

                                        ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=3L  /  K3-3 MOV L  /  K5-5 BC01 H

035414  012700  000465                  T0465:  MOV     #0465,R0                ;LOAD R0 WITH TEST NO.
035420  013701  035452                          MOV     @#I0465,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
035424  005004                                  CLR     R4              ;RESULT S / B = 000000
035426  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
035432  012705  067570                          MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
035436  012703  067554                  R0465:  MOV     #ATA+10,R3      ;BASE DEST ADDR = ATA+10
035442  005012                                  CLR     (R2)            ;MAKE [DEST] = 177777
035444  005112                                  COM     (R2)
035446  000257                                  CCC                     ;CLEAR FLAGS
035450  000273                                  273                     ;N:C = 1011

035452  011533                          I0465:  MOV     (R5),@(R3)+     ;TEST THE MOV - SM1,DM3

035454  100403                                  BMI     E10465          ;N:C = 0101 ?
035456  001002                                  BNE     E10465
035460  102401                                  BVS     E10465
035462  103402                                  BCS     A0465

035464  104005                          E10465: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
035466  035436                                  R0465                   ;ERROR LOOP RETURN

035470  022703  067556                  A0465:  CMP     #ATA+12,R3      ;DID MOV INCREMENT DEST REG ?
035474  001402                                  BEQ     B0465           ;BR IF YES

035476  104005                          E20465: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
035500  035436                                  R0465                   ;ERROR LOOP RETURN

035502  020412                          B0465:  CMP     R4,(R2)         ;RESULT CORRECT ??
035504  001404                                  BEQ     00465           ;BR IF YES

035506  005003                                  CLR     R3              ;GET THE WAS DATA
035510  051203                                  BIS     (R2),R3
035512  104000                          E30465: ERROR                   ;MOV DELIVERED THE WRONG RESULT
035514  035436                                  R0465                   ;ERROR LOOP RETURN

035516  000004                          00465:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0466 MOV SM2,DM3 TEST - <N:C> = 1011
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,173,207,210,200,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,173 / 22[207]200,200 / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125] D = 000000

                                        ;CODES:         [125] SPS=3  /  N:C = 0101

                                        ;SYNC:          B05J2 (-) T = 4 USEC

                                        ;KEY SIG:       K3-3 SM=2L  /  K3-3 DM=3L  /  K3-3 MOV L  /  K5-5 BC01 H
                                                        ;  K5-5 BCON (1+2) H

035520  012700  000466          T0466:  MOV     #0466,R0                ;LOAD R0 WITH TEST NO.
035524  013701  035556                  MOV     @#I0466,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
035530  005004                          CLR     R4              ;RESULT S / B = 000000
035532  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
035536  012705  067570                  MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
035542  012703  067554          R0466:  MOV     #ATA+10,R3      ;BASE DEST ADDR = ATA+10
035546  005012                          CLR     (R2)            ;MAKE [DEST] = 177777
035550  005112                          COM     (R2)
035552  000257                          CCC                     ;CLEAR FLAGS
035554  000273                          273                     ;N:C = 1011

035556  012533                  I0466:  MOV     (R5)+,@(R3)+    ;TEST THE MOV - SM2,DM3

035560  100403                          BMI     E10466          ;N:C = 0101 ?
035562  001002                          BNE     E10466
035564  102401                          BVS     E10466
035566  103402                          BCS     A0466

035570  104005                  E10466: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
035572  035542                          R0466                   ;ERROR LOOP RETURN

035574  022703  067556          A0466:  CMP     #ATA+12,R3      ;DID MOV INCREMENT DEST REG ?
035600  001402                          BEQ     B0466           ;BR IF YES

035602  104005                  E20466: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
035604  035542                          R0466                   ;ERROR LOOP RETURN

035606  020412                  B0466:  CMP     R4,(R2)         ;RESULT CORRECT ??
035610  001404                          BEQ     00466           ;BR IF YES

035612  005003                          CLR     R3              ;GET THE WAS DATA
035614  051203                          BIS     (R2),R3
035616  104000                  E30466: ERROR                   ;MOV DELIVERED THE WRONG RESULT
035620  035542                          R0466                   ;ERROR LOOP RETURN

035622  000004                  00466:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ************************************************************************
                                        .SBTTL T0467 MOV SM1,DM4 TEST - <N:C> = 0100
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [141,247,250,174,257,200,125,375,016] FC 1,2,4,8

                                ;ACT BUTS:      37[004]100,141 / 35[247]120,174 / 22[174]200,200 / 16[125]016,016

                                ;EXEC:          [200]ALUC=LLLLL :[125] D = 177777

                                ;CODES:         [125] SPS=3  /  N:C = 1000

                                ;SYNC:          B05J2 (-) T = 3.2 USEC

                                ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=4L  /  K3-3 MOV L  /  K5-5 BCON (1+2) H

035624  012700  000467          T0467:  MOV     #0467,R0                ;LOAD R0 WITH TEST NO.
035630  013701  035662                  MOV     @#I0467,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
035634  005004                          CLR     R4              ;RESULT S / B = 177777
035636  005104                          COM     R4
035640  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
035644  012705  067572                  MOV     #DWTA+2,R5      ;SOURCE ADDR = DWTA+2
035650  012703  067562          R0467:  MOV     #MBUF0+2,R3     ;BASE DEST ADDR = MBUF0+2
035654  005012                          CLR     (R2)            ;MAKE [DEST] = 000000
035656  000257                          CCC                     ;CLEAR FLAGS
035660  000264                          264                     ;N:C = 0100

035662  011543                  I0467:  MOV     (R5),-(R3)      ;TEST THE MOV - SM1,DM4

035664  100003                          BPL     E10467          ;N:C = 1000 ?
035666  001402                          BEQ     E10467
035670  102401                          BVS     E10467
035672  103002                          BCC     A0467

035674  104005                  E10467: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
035676  035650                          R0467                   ;ERROR LOOP RETURN

035700  020203                  A0467:  CMP     R2,R3           ;DID MOV DECREMENT DEST REG ?
035702  001402                          BEQ     B0467           ;BR IF YES

035704  104005                  E20467: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
035706  035650                          R0467                   ;ERROR LOOP RETURN

035710  020412                  B0467:  CMP     R4,(R2)         ;RESULT CORRECT ??
035712  001404                          BEQ     00467           ;BR IF YES

035714  005003                          CLR     R3              ;GET THE WAS DATA
035716  051203                          BIS     (R2),R3
035720  104000                  E30467: ERROR                   ;MOV DELIVERED THE WRONG RESULT
035722  035650                          R0467                   ;ERROR LOOP RETURN

035724  000004                  00467:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0470 MOV SM2,DM4 TEST - <N:C> = 0100
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,174,257,200,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]140,174 / 22[174]200,200 / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125] D = 177777

                                        ;CODES:         [125] SPS=3  /  N:C = 1000

                                        ;SYNC:          B05J2 (-) T = 3.2 USEC

                                        ;KEY SIG:       K3-3 SM=2L  /  K3-3 DM=4L  /  K3-3 MOV L  /  K5-5 BCON (1+2) H

035726  012700  000470                  T0470:  MOV     #0470,R0                ;LOAD R0 WITH TEST NO.
035732  013701  035764                          MOV     @#I0470,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
035736  005004                                  CLR     R4              ;RESULT S / B = 177777
035740  005104                                  COM     R4
035742  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
035746  012705  067572                          MOV     #DWTA+2,R5      ;SOURCE ADDR = DWTA+2
035752  012703  067562                  R0470:  MOV     #MBUF0+2,R3             ;BASE DEST ADDR = MBUF0+2
035756  005012                                  CLR     (R2)            ;MAKE [DEST] = 000000
035760  000257                                  CCC                     ;CLEAR FLAGS
035762  000264                                  264                     ;N:C = 0100

035764  012543                          I0470:  MOV     (R5)+,-(R3)     ;TEST THE MOV - SM2,DM4

035766  100003                                  BPL     E10470          ;N:C = 1000 ?
035770  001402                                  BEQ     E10470
035772  102401                                  BVS     E10470
035774  103002                                  BCC     A0470

035776  104005                          E10470: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
036000  035752                                  R0470                   ;ERROR LOOP RETURN

036002  020203                          A0470:  CMP     R2,R3           ;DID MOV INCREMENT DEST REG ?
036004  001402                                  BEQ     B0470           ;BR IF YES

036006  104005                          E20470: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
036010  035752                                  R0470                   ;ERROR LOOP RETURN

036012  020412                          B0470:  CMP     R4,(R2)         ;RESULT CORRECT ??
036014  001404                                  BEQ     00470           ;BR IF YES

036016  005003                                  CLR     R3              ;GET THE WAS DATA
036020  051203                                  BIS     (R2),R3
036022  104000                          E30470: ERROR                   ;MOV DELIVERED THE WRONG RESULT
036024  035752                                  R0470                   ;ERROR LOOP RETURN

036026  000004                          00470:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0471 MOV SM1,DM4 TEST - <N:C> = 1011
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,174,257,200,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,141 / 35[247]120,174 / 22[174]200,200 / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125] D = 000000

                                        ;CODES:         [125] SPS=3  /  N:C = 0101

                                        ;SYNC:          B05J2 (-) T = 3.2 USEC

                                        ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=4L  /  K3-3 MOV L  /  K5-5 BCON (1+2) H

036030  012700  000471                  T0471:  MOV     #0471,R0                ;LOAD R0 WITH TEST NO.
036034  013701  036066                          MOV     @#I0471,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
036040  005004                                  CLR     R4              ;RESULT S / B = 000000
036042  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
036046  012705  067570                          MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
036052  012703  067562                  R0471:  MOV     #MBUF0+2,R3             ;BASE DEST ADDR = MBUF0+2
036056  005012                                  CLR     (R2)            ;MAKE [DEST] = 177777
036060  005112                                  COM     (R2)
036062  000257                                  CCC                     ;CLEAR FLAGS
036064  000273                                  273                     ;N:C = 1011

036066  011543                          I0471:  MOV     (R5),-(R3)      ;TEST THE MOV - SM1,DM4

036070  100403                                  BMI     E10471          ;N:C = 0101 ?
036072  001002                                  BNE     E10471
036074  102401                                  BVS     E10471
036076  103402                                  BCS     A0471

036100  104005                          E10471: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
036102  036052                                  R0471                   ;ERROR LOOP RETURN

036104  020203                          A0471:  CMP     R2,R3           ;DID MOV INCREMENT DEST REG ?
036106  001402                                  BEQ     B0471           ;BR IF YES

036110  104005                          E20471: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
036112  036052                                  R0471                   ;ERROR LOOP RETURN

036114  020412                          B0471:  CMP     R4,(R2)         ;RESULT CORRECT ??
036116  001404                                  BEQ     O0471           ;BR IF YES

036120  005003                                  CLR     R3              ;GET THE WAS DATA
036122  051203                                  BIS     (R2),R3
036124  104000                          E30471: ERROR                   ;MOV DELIVERED THE WRONG RESULT
036126  036052                                  R0471                   ;ERROR LOOP RETURN

036130  000004                          O0471:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0472 MOV SM2,DM4 TEST - <N:C> = 1011
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,174,257,200,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,174 / 22[174]200,200 / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125] D = 000000

                                        ;CODES:         [125] SPS=3  /  N:C = 0101

                                        ;SYNC:          B05J2 (-) T = 3.2 USEC

                                        ;KEY SIG:       K3-3 SM=2L  /  K3-3 DM=4L  /  K3-3 MOV L  /  K5-5 BCON (1+2) H

036132  012700  000472                  T0472:  MOV     #0472,R0                ;LOAD R0 WITH TEST NO.
036136  013701  036170                          MOV     @#I0472,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
036142  005004                                  CLR     R4              ;RESULT S / B = 000000
036144  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
036150  012705  067570                          MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
036154  012703  067562                  R0472:  MOV     #MBUF0+2,R3     ;BASE DEST ADDR = MBUF0+2
036160  005012                                  CLR     (R2)            ;MAKE [DEST] = 177777
036162  005112                                  COM     (R2)
036164  000257                                  CCC                     ;CLEAR FLAGS
036166  000273                                  273                     ;N:C = 1011

036170  012543                          I0472:  MOV     (R5)+,-(R3)     ;TEST THE MOV - SM2,DM4

036172  100403                                  BMI     E10472          ;N:C = 0101 ?
036174  001002                                  BNE     E10472
036176  102401                                  BVS     E10472
036200  103402                                  BCS     A0472

036202  104005                          E10472: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
036204  036154                                  R0472                   ;ERROR LOOP RETURN

036206  020203                          A0472:  CMP     R2,R3           ;DID MOV INCREMENT DEST REG ?
036210  001402                                  BEQ     B0472           ;BR IF YES

036212  104005                          E20472: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
036214  036154                                  R0472                   ;ERROR LOOP RETURN

036216  020412                          B0472:  CMP     R4,(R2)         ;RESULT CORRECT ??
036220  001404                                  BEQ     00472           ;BR IF YES

036222  005003                                  CLR     R3              ;GET THE WAS DATA
036224  051203                                  BIS     (R2),R3
036226  104000                          E30472: ERROR                   ;MOV DELIVERED THE WRONG RESULT
036230  036154                                  R0472                   ;ERROR LOOP RETURN

036232  000004                          00472:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0473 MOV SM1,DM5 TEST - <N:C> = 0100
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,175,207,210,200,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,141 / 35[247]120,175 / 22[207]200,200 / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125] D = 177777

                                        ;CODES:         [125] SPS=3  /  N:C = 1000

                                        ;SYNC:          B05J2 (-) T = 4 USEC

                                        ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=5L  /  K3-3 MOV L  /  K5-5 BC01 H


036234  012700  000473          T0473:  MOV     #0473,R0                ;LOAD R0 WITH TEST NO.
036240  013701  036272                  MOV     @#I0473,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
036244  005004                          CLR     R4              ;RESULT S / B = 177777
036246  005104                          COM     R4
036250  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
036254  012705  067572                  MOV     #DWTA+2,R5      ;SOURCE ADDR = DWTA+2
036260  012703  067556          R0473:  MOV     #ATA+12,R3              ;BASE DEST ADDR = ATA+12
036264  005012                          CLR     (R2)            ;MAKE [DEST] = 000000
036266  000257                          CCC                     ;CLEAR FLAGS
036270  000264                          264                     ;N:C = 0100

036272  011553                  I0473:  MOV     (R5),@-(R3)     ;TEST THE MOV - SM1,DM5

036274  100003                          BPL     E10473          ;N:C = 0100 ?
036276  001402                          BEQ     E10473
036300  102401                          BVS     E10473
036302  103002                          BCC     A0473

036304  104005                  E10473: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
036306  036260                          R0473                   ;ERROR LOOP RETURN

036310  022703  067554          A0473:  CMP     #ATA+10,R3      ;DID MOV DECREMENT DEST REG ?
036314  001402                          BEQ     B0473           ;BR IF YES

036316  104005                  E20473: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
036320  036260                          R0473                   ;ERROR LOOP RETURN

036322  020412                  B0473:  CMP     R4,(R2)         ;RESULT CORRECT ??
036324  001404                          BEQ     00473           ;BR IF YES

036326  005003                          CLR     R3              ;GET THE WAS DATA
036330  051203                          BIS     (R2),R3
036332  104000                  E30473: ERROR                   ;MOV DELIVERED THE WRONG RESULT
036334  036260                          R0473                   ;ERROR LOOP RETURN

036336  000004                  00473:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0474 MOV SM2,DM5 TEST - <N:C> = 0100
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,175,207,210,200,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,175 / 22[207]200,200 / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125] D = 177777

                                        ;CODES:         [125] SPS=3  /  N:C = 1000

                                        ;SYNC:          B05J2 (-) T = 4 USEC

                                        ;KEY SIG:       K3-3 SM=2L  /  K3-3 DM=5L  /  K3-3 MOV L  /  K5-5 BC01 H
                                                        ;  K5-5 BCON (1+2) H

036340  012700  000474          T0474:  MOV     #0474,R0                ;LOAD R0 WITH TEST NO.
036344  013701  036376                  MOV     @#I0474,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
036350  005004                          CLR     R4              ;RESULT S / B = 177777
036352  005104                          COM     R4
036354  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
036360  012705  067572                  MOV     #DWTA+2,R5      ;SOURCE ADDR = DWTA+2
036364  012703  067556          R0474:  MOV     #ATA+12,R3      ;BASE DEST ADDR = ATA+12
036370  005012                          CLR     (R2)            ;MAKE [DEST] = 00000
036372  000257                          CCC                     ;CLEAR FLAGS
036374  000264                          264                     ;N:C = 1000

036376  012553                  I0474:  MOV     (R5)+,@-(R3)    ;TEST THE MOV - SM2,DM5

036400  100003                          BPL     E10474          ;N:C = 1000 ?
036402  001402                          BEQ     E10474
036404  102401                          BVS     E10474
036406  103002                          BCC     A0474

036410  104005                  E10474: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
036412  036364                          R0474                   ;ERROR LOOP RETURN

036414  022703  067554          A0474:  CMP     #ATA+10,R3      ;DID MOV DECREMENT DEST REG ?
036420  001402                          BEQ     B0474           ;BR IF YES

036422  104005                  E20474: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
036424  036364                          R0474                   ;ERROR LOOP RETURN

036426  020412                  B0474:  CMP     R4,(R2)         ;RESULT CORRECT ??
036430  001404                          BEQ     00474           ;BR IF YES

036432  005003                          CLR     R3              ;GET THE WAS DATA
036434  051203                          BIS     (R2),R3
036436  104000                  E30474: ERROR                   ;MOV DELIVERED THE WRONG RESULT
036440  036364                          R0474                   ;ERROR LOOP RETURN

036442  000004                  00474:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0475 MOV SM1,DM5 TEST - <N:C> = 1011
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,175,207,210,200,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,141 / 35[247]120,175 / 22[207]200,200 / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125] D = 000000

                                        ;CODES:         [125] SPS=3  /  N:C = 0101

                                        ;SYNC:          B05J2 (-) T = 4 USEC

                                        ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=5L  /  K3-3 MOV L  /  K5-5 BC01 H

036444  012700  000475                  T0475:  MOV     #0475,R0                ;LOAD R0 WITH TEST NO.
036450  013701  036502                          MOV     @#I0475,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
036454  005004                                  CLR     R4              ;RESULT S / B = 000000
036456  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
036462  012705  067570                          MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
036466  012703  067556                  R0475:  MOV     #ATA+12,R3              ;BASE DEST ADDR = ATA+12
036472  005012                                  CLR     (R2)            ;MAKE [DEST] = 177777
036474  005112                                  COM     (R2)
036476  000257                                  CCC                     ;CLEAR FLAGS
036500  000273                                  273                     ;N:C = 1011

036502  011553                          I0475:  MOV     (R5),@-(R3)     ;TEST THE MOV - SM1,DM5

036504  100403                                  BMI     E10475          ;N:C = 0101 ?
036506  001002                                  BNE     E10475
036510  102401                                  BVS     E10475
036512  103402                                  BCS     A0475

036514  104005                          E10475: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
036516  036466                                  R0475                   ;ERROR LOOP RETURN

036520  022703  067554                  A0475:  CMP     #ATA+10,R3      ;DID MOV DECREMENT DEST REG ?
036524  001402                                  BEQ     B0475           ;BR IF YES

036526  104005                          E20475: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
036530  036466                                  R0475                   ;ERROR LOOP RETURN

036532  020412                          B0475:  CMP     R4,(R2)         ;RESULT CORRECT ??
036534  001404                                  BEQ     00475           ;BR IF YES

036536  005003                                  CLR     R3              ;GET THE WAS DATA
036540  051203                                  BIS     (R2),R3
036542  104000                          E30475: ERROR                   ;MOV DELIVERED THE WRONG RESULT
036544  036466                                  R0475                   ;ERROR LOOP RETURN

036546  000004                          00475:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0476 MOV SM2,DM5 TEST - <N:C> = 1011
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,175,207,210,200,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,175 / 22[207]200,200 / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125] D = 000000

                                        ;CODES:         [125] SPS=3  /  N:C = 0101

                                        ;SYNC:          B05J2 (-) T = 4 USEC

                                        ;KEY SIG:       K3-3 SM=2L  /  K3-3 DM=5L  /  K3-3 MOV L  /  K5-5 BC01 H
                                                        ;  K5-5 BCON (1+2) H

036550  012700  000476          T0476:  MOV     #0476,R0                ;LOAD R0 WITH TEST NO.
036554  013701  036606                  MOV     @#I0476,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
036560  005004                          CLR     R4              ;RESULT S / B = 000000
036562  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
036566  012705  067570                  MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
036572  012703  067556          R0476:  MOV     #ATA+12,R3      ;BASE DEST ADDR = ATA+12
036576  005012                          CLR     (R2)            ;MAKE [DEST] = 177777
036600  005112                          COM     (R2)
036602  000257                          CCC                     ;CLEAR FLAGS
036604  000273                          273                     ;N:C = 1011

036606  011553                  I0476:  MOV     (R5),@-(R3)     ;TEST THE MOV - SM2,DM5

036610  100403                          BMI     E10476          ;N:C = 0101 ?
036612  001002                          BNE     E10476
036614  102401                          BVS     E10476
036616  103402                          BCS     A0476

036620  104005                  E10476: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
036622  036572                          R0476                   ;ERROR LOOP RETURN

036624  022703  067554          A0476:  CMP     #ATA+10,R3      ;DID MOV DECREMENT DEST REG ?
036630  001402                          BEQ     B0476           ;BR IF YES

036632  104005                  E20476: ERROR5                  ;MOV FAILED TO UPDATE DEST REG
036634  036572                          R0476                   ;ERROR LOOP RETURN

036636  020412                  B0476:  CMP     R4,(R2)         ;RESULT CORRECT ??
036640  001404                          BEQ     00476           ;BR IF YES

036642  005003                          CLR     R3              ;GET THE WAS DATA
036644  051203                          BIS     (R2),R3
036646  104000                  E30476: ERROR                   ;MOV DELIVERED THE WRONG RESULT
036650  036572                          R0476                   ;ERROR LOOP RETURN

036652  000004                  00476:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0477 MOV SM1,DM6 TEST - <N:C> = 0100
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,177,206,212,200,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,141 / 35[247]120,177 / 17[177]212,212 / 21[206]200,200
                                                        ; / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125] D = 177777

                                        ;CODES:         [125] SPS=3  /  N:C = 1000

                                        ;SYNC:          B05J2 (-) T = 4 USEC

                                        ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=6L K3-3 MOV L

036654  012700  000477                  T0477:  MOV     #0477,R0                ;LOAD R0 WITH TEST NO.
036660  013701  036712                          MOV     @#I0477,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
036664  005004                                  CLR     R4              ;RESULT S / B = 177777
036666  005104                                  COM     R4
036670  012702  067566                          MOV     #MBUF0+6,R2     ;DEST ADDR = MBUF0+6
036674  012705  067572                          MOV     #DWTA+2,R5      ;SOURCE ADDR = DWTA+2
036700  012703  067560                  R0477:  MOV     #MBUF0,R3       ;BASE DEST ADDR = MBUF0
036704  005012                                  CLR     (R2)            ;MAKE [DEST] = 000000
036706  000257                                  CCC                     ;CLEAR FLAGS
036710  000264                                  264                     ;N:C = 0100

036712  011563  000006                  I0477:  MOV     (R5),6(R3)      ;TEST THE MOV - SM1,DM6

036716  100003                                  BPL     E10477          ;N:C = 1000 ?
036720  001402                                  BEQ     E10477
036722  102401                                  BVS     E10477
036724  103002                                  BCC     A0477

036726  104005                          E10477: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
036730  036700                                  R0477                   ;ERROR LOOP RETURN

036732  020412                          A0477:  CMP     R4,(R2)         ;RESULT CORRECT ??
036734  001404                                  BEQ     00477           ;BR IF YES

036736  005003                                  CLR     R3              ;GET THE WAS DATA
036740  051203                                  BIS     (R2),R3
036742  104000                          E20477: ERROR                   ;MOV DELIVERED THE WRONG RESULT
036744  036700                                  R0477                   ;ERROR LOOP RETURN

036746  000004                          00477:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0500 MOV SM2,DM6 TEST - <N:C> = 0100
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,177,206,212,200,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,177 / 17[177]212,212 / 21[206]200,200
                                                        ; / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125] D = 177777

                                        ;CODES:         [125] SPS=3  /  N:C = 1000

                                        ;SYNC:          B05J2 (-) T = 4 USEC

                                        ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=6L  /  K3-3 MOV L  /  K5-5 BCON (1+2) H

036750  012700  000500                  T0500:  MOV     #0500,R0                ;LOAD R0 WITH TEST NO.
036754  013701  037006                          MOV     @#I0500,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
036760  005004                                  CLR     R4              ;RESULT S / B = 177777
036762  005104                                  COM     R4
036764  012702  067566                          MOV     #MBUF0+6,R2     ;DEST ADDR = MBUF0+6
036770  012705  067572                          MOV     #DWTA+2,R5      ;SOURCE ADDR = DWTA+2
036774  012703  067560                  R0500:  MOV     #MBUF0,R3       ;BASE DEST ADDR = MBUF0
037000  005012                                  CLR     (R2)            ;MAKE [DEST] = 000000
037002  000257                                  CCC                     ;CLEAR FLAGS
037004  000264                                  264                     ;N:C = 0100

037006  012563  000006                  I0500:  MOV     (R5)+,6(R3)     ;TEST THE MOV - SM2,DM6

037012  100003                                  BPL     E10500          ;N:C = 1000 ?
037014  001402                                  BEQ     E10500
037016  102401                                  BVS     E10500
037020  103002                                  BCC     A0500

037022  104005                          E10500: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
037024  036774                                  R0500                   ;ERROR LOOP RETURN

037026  020412                          A0500:  CMP     R4,(R2)         ;RESULT CORRECT ??
037030  001404                                  BEQ     00500           ;BR IF YES

037032  005003                                  CLR     R3              ;GET THE WAS DATA
037034  051203                                  BIS     (R2),R3
037036  104000                          E20500: ERROR                   ;MOV DELIVERED THE WRONG RESULT
037040  036774                                  R0500                   ;ERROR LOOP RETURN

037042  000004                          00500:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ************************************************************************
                                                .SBTTL T0501 MOV SM1,DM6 TEST - <N:C> = 1011
                                        ; ************************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,177,206,212,200,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,141 / 35[247]120,177 / 17[177]212,212 / 21[206]200,200
                                                        ; / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125] D = 000000

                                        ;CODES:         [125] SPS=3  /  N:C = 0101

                                        ;SYNC:          B05J2 (-) T = 4 USEC

                                        ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=6L  /  K3-3 MOV L

037044  012700  000501                  T0501:  MOV     #0501,R0                ;LOAD R0 WITH TEST NO.
037050  013701  037102                          MOV     @#I0501,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
037054  005004                                  CLR     R4              ;RESULT S / B = 000000
037056  012702  067566                          MOV     #MBUF0+6,R2     ;DEST ADDR = MBUF0+6
037062  012705  067570                          MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
037066  012703  067560                  R0501:  MOV     #MBUF0,R3               ;BASE DEST ADDR = MBUF0
037072  005012                                  CLR     (R2)            ;MAKE [DEST] = 177777
037074  005112                                  COM     (R2)
037076  000257                                  CCC                     ;CLEAR FLAGS
037100  000273                                  273                     ;N:C = 1011

037102  011563  000006                  I0501:  MOV     (R5),6(R3)      ;TEST THE MOV - SM1,DM6

037106  100403                                  BMI     E10501          ;N:C = 0101 ?
037110  001002                                  BNE     E10501
037112  102401                                  BVS     E10501
037114  103402                                  BCS     A0501

037116  104005                          E10501: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
037120  037066                                  R0501                   ;ERROR LOOP RETURN

037122  020412                          A0501:  CMP     R4,(R2)         ;RESULT CORRECT ??
037124  001404                                  BEQ     O0501           ;BR IF YES

037126  005003                                  CLR     R3              ;GET THE WAS DATA
037130  051203                                  BIS     (R2),R3
037132  104000                          E20501: ERROR                   ;MOV DELIVERED THE WRONG RESULT
037134  037066                                  R0501                   ;ERROR LOOP RETURN

037136  000004                          O0501:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0502 MOV SM2,DM6 TEST - <N:C> = 1011
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,177,206,212,200,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,177 / 17[177]212,212 / 21[206]200,200
                                                        ; / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125] D = 000000

                                        ;CODES:         [125] SPS=3  /  N:C = 0101

                                        ;SYNC:          B05J2 (-) T = 4 USEC

                                        ;KEY SIG:       K3-3 SM=2L  /  K3-3 DM=6L  /  K3-3 MOV L  /  K5-5 BCON (1+2) H

037140  012700  000502                  T0502:  MOV     #0502,R0                ;LOAD R0 WITH TEST NO.
037144  013701  037176                          MOV     @#I0502,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
037150  005004                                  CLR     R4              ;RESULT S / B = 000000
037152  012702  067566                          MOV     #MBUF0+6,R2     ;DEST ADDR = MBUF0+6
037156  012705  067570                          MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
037162  012703  067560                  R0502:  MOV     #MBUF0,R3       ;BASE DEST ADDR = MBUF0
037166  005012                                  CLR     (R2)            ;MAKE [DEST] = 177777
037170  005112                                  COM     (R2)
037172  000257                                  CCC                     ;CLEAR FLAGS
037174  000273                                  273                     ;N:C = 1011

037176  012563  000006                  I0502:  MOV     (R5)+,6(R3)     ;TEST THE MOV - SM2,DM6

037202  100403                                  BMI     E10502          ;N:C = 0101 ?
037204  001002                                  BNE     E10502
037206  102401                                  BVS     E10502
037210  103402                                  BCS     A0502

037212  104005                          E10502: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
037214  037162                                  R0502                   ;ERROR LOOP RETURN

037216  020412                          A0502:  CMP     R4,(R2)         ;RESULT CORRECT ??
037220  001404                                  BEQ     O0502           ;BR IF YES

037222  005003                                  CLR     R3              ;GET THE WAS DATA
037224  051203                                  BIS     (R2),R3
037226  104000                          E20502: ERROR                   ;MOV DELIVERED THE WRONG RESULT
037230  037162                                  R0502                   ;ERROR LOOP RETURN

037232  000004                          O0502:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0503 MOV SM1,DM7 TEST - <N:C> = 0100
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,177,206,213,207,210,200,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,141 / 35[247]120,177 / 17[177]212,213 / 22[207]200,200
                                                        ; / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125] D = 177777

                                        ;CODES:         [125] SPS=3  /  N:C = 1000

                                        ;SYNC:          B05J2 (-) T = 5 USEC

                                        ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=7L  /  K3-3 MOV L

037234  012700  000503                  T0503:  MOV     #0503,R0                ;LOAD R0 WITH TEST NO.
037240  013701  037272                          MOV     @#I0503,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
037244  005004                                  CLR     R4              ;RESULT S / B = 177777
037246  005104                                  COM     R4
037250  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
037254  012705  067572                          MOV     #DWTA+2,R5      ;SOURCE ADDR = DWTA+2
037260  012703  067544                  R0503:  MOV     #ATA,R3         ;BASE DEST ADDR = ATA
037264  005012                                  CLR     (R2)            ;MAKE [DEST] = 000000
037266  000257                                  CCC                     ;CLEAR FLAGS
037270  000264                                  264                     ;N:C = 0100

037272  011573  000010                  I0503:  MOV     (R5),@10(R3)    ;TEST THE MOV - SM1,DM7

037276  100003                                  BPL     E10503          ;N:C = 1000 ?
037300  001402                                  BEQ     E10503
037302  102401                                  BVS     E10503
037304  103002                                  BCC     A0503

037306  104005                          E10503: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
037310  037260                                  R0503                   ;ERROR LOOP RETURN

037312  020412                          A0503:  CMP     R4,(R2)         ;RESULT CORRECT ??
037314  001404                                  BEQ     00503           ;BR IF YES

037316  005003                                  CLR     R3              ;GET THE WAS DATA
037320  051203                                  BIS     (R2),R3
037322  104000                          E20503: ERROR                   ;MOV DELIVERED THE WRONG RESULT
037324  037260                                  R0503                   ;ERROR LOOP RETURN

037326  000004                          00503:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ************************************************************************
                                                .SBTTL T0504 MOV SM2,DM7 TEST - <N:C> = 0100
                                        ; ************************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,177,206,213,207,210,200,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,177 / 17[177]212,213 / 21[207]200,200
                                                        ; / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125] D = 177777

                                        ;CODES:         [125] SPS=3  /  N:C = 1000

                                        ;SYNC:          B05J2 (-) T = 5 USEC

                                        ;KEY SIG:       K3-3 SM=2L  /  K3-3 DM=7L  /  K3-3 MOV L  /  K5-5 BCON (1+2) H

037330  012700  000504          T0504:  MOV     #0504,R0                ;LOAD R0 WITH TEST NO.
037334  013701  037400                  MOV     @#I0504,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
037340  032737  001000  066642          BIT     #1000,@#BPTLOC  ;BREAKPOINT HALT SET ??
037346  001401                          BEQ     .+4             ;BR IF NOT
037350  000000                          HALT                    ;BREAK-DEPRESS CONTINUE TO RESTART
037352  005004                          CLR     R4              ;RESULT S / B = 177777
037354  005104                          COM     R4
037356  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
037362  012705  067572                  MOV     #DWTA+2,R5      ;SOURCE ADDR = DWTA+2
037366  012703  067544          R0504:  MOV     #ATA,R3         ;BASE DEST ADDR = ATA
037372  005012                          CLR     (R2)            ;MAKE [DEST] = 000000
037374  000257                          CCC                     ;CLEAR FLAGS
037376  000264                          264                     ;N:C = 0100

037400  011573  000010          I0504:  MOV     (R5),@10(R3)    ;TEST THE MOV - SM2,DM7

037404  100003                          BPL     E10504          ;N:C = 1000 ?
037406  001402                          BEQ     E10504
037410  102401                          BVS     E10504
037412  103002                          BCC     A0504

037414  104005          E10504: ERROR5                          ;MOV FAILED TO ALTER CODES PROPERLY
037416  037366                  R0504                           ;ERROR LOOP RETURN

037420  020412          A0504:  CMP     R4,(R2)         ;RESULT CORRECT ??
037422  001404                  BEQ     O0504           ;BR IF YES

037424  005003                  CLR     R3              ;GET THE WAS DATA
037426  051203                  BIS     (R2),R3
037430  104000          E20504: ERROR                           ;MOV DELIVERED THE WRONG RESULT
037432  037366                  R0504                           ;ERROR LOOP RETURN

037434  000004          O0504:  SCOPE                           ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0505 MOV SM1,DM7 TEST - <N:C> = 1011
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,177,206,213,207,210,200,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,141 / 35[247]120,177 / 17[177]212,213 / 22[207]200,200
                                                        ; / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125] D = 000000

                                        ;CODES:         [125] SPS= 3  /  N:C = 0101

                                        ;SYNC:          B05J2 (-) T = 5 USEC

                                        ;KEY SIG:       K3-3 SM=1L  /  K3-3 DM=7L  /  K3-3 MOV L

037436  012700  000505                  T0505:  MOV     #0505,R0                ;LOAD R0 WITH TEST NO.
037442  013701  037474                          MOV     @#I0505,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
037446  005004                                  CLR     R4              ;RESULT S / B = 000000
037450  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
037454  012705  067570                          MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
037460  012703  067544                  R0505:  MOV     #ATA,R3         ;BASE DEST ADDR = ATA
037464  005012                                  CLR     (R2)            ;MAKE [DEST] = 177777
037466  005112                                  COM     (R2)
037470  000257                                  CCC                     ;CLEAR FLAGS
037472  000273                                  273                     ;N:C = 1011

037474  011573  000010                  I0505:  MOV     (R5),@10(R3)    ;TEST THE MOV - SM1,DM7

037500  100403                                  BMI     E10505          ;N:C = 0101 ?
037502  001002                                  BNE     E10505
037504  102401                                  BVS     E10505
037506  103402                                  BCS     A0505

037510  104005                          E10505: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
037512  037460                                  R0505                   ;ERROR LOOP RETURN

037514  020412                          A0505:  CMP     R4,(R2)         ;RESULT CORRECT ??
037516  001404                                  BEQ     O0505           ;BR IF YES

037520  005003                                  CLR     R3              ;GET THE WAS DATA
037522  051203                                  BIS     (R2),R3
037524  104000                          E20505: ERROR                   ;MOV DELIVERED THE WRONG RESULT
037526  037460                                  R0505                   ;ERROR LOOP RETURN

037530  000004                          O0505:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; *****************************************************************
                                                .SBTTL T0506 MOV SM2,DM7 TEST - <N:C> = 1011
                                        ; *****************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,177,206,213,207,210,200,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,177 / 17[177]212,213 / 22[207]200,200
                                                        ; / 16[125]016,016

                                        ;EXEC:          [200]ALUC=LLLLL :[125] D = 000000

                                        ;CODES:         [125] SPS=3  /  N:C = 0101

                                        ;SYNC:          B05J2 (-) T = 5 USEC

                                        ;KEY SIG:       K3-3 SM=2L  /  K3-3 DM=7L  /  K3-3 MOV L  /  K5-5 BCON (1+2) H

037532  012700  000506                  T0506:  MOV     #0506,R0                ;LOAD R0 WITH TEST NO.
037536  013701  037570                          MOV     @#I0506,R1      ;LOAD R1 WITH TEST INSTRUCTION  WORD
037542  005004                                  CLR     R4              ;RESULT S / B = 000000
037544  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
037550  012705  067570                          MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
037554  012703  067544                  R0506:  MOV     #ATA,R3         ;BASE DEST ADDR = ATA
037560  005012                                  CLR     (R2)            ;MAKE [DEST] = 177777
037562  005112                                  COM     (R2)
037564  000257                                  CCC                     ;CLEAR FLAGS
037566  000273                                  273                     ;N:C = 1011

037570  011573  000010                  I0506:  MOV     (R5),@10(R3)    ;TEST THE MOV - SM2,DM7

037574  100403                                  BMI     E10506          ;N:C = 0101 ?
037576  001002                                  BNE     E10506
037600  102401                                  BVS     E10506
037602  103402                                  BCS     A0506

037604  104005                          E10506: ERROR5                  ;MOV FAILED TO ALTER CODES PROPERLY
037606  037554                                  R0506                   ;ERROR LOOP RETURN

037610  020412                          A0506:  CMP     R4,(R2)         ;RESULT CORRECT ??
037612  001404                                  BEQ     00506           ;BR IF YES

037614  005003                                  CLR     R3              ;GET THE WAS DATA
037616  051203                                  BIS     (R2),R3
037620  104000                          E20506: ERROR                   ;MOV DELIVERED THE WRONG RESULT
037622  037554                                  R0506                   ;ERROR LOOP RETURN

037624  000004                          00506:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                        .SBTTL T0507 MOV  SM0,DM1 TEST
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [171,257,201,125,375,016] FC 1,4,8

                                ;ACT BUTS:      37[004]100,171  /  22[171]200,201  /  16[125]016,016

                                ;EXEC:          [201]ALUC=LLLLL :[125]D=TEST NO.

                                ;CODES:         [125] SPS=3      /      N:C=X000

                                ;SYNC:          B05J2   (-)     T=2.42 USEC

                                ;KEY SIG:       K3-3 MOV L  /  K3-3 SM=0 L  /  K3-3 DM=1 L

037626  012700  000507          T0507:  MOV     #0507,R0                ;LOAD R0 WITH TEST NO.
037632  013701  037652                  MOV     @#I0507,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
037636  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
037642  010004                          MOV     R0,R4           ;RESULT S / B = #T0507
037644  010205                  R0507:  MOV     R2,R5           ;R5 GETS DEST ADDR
037646  005012                          CLR     (R2)            ;[DEST] = 000000
037650  000257                          CCC                     ;SCOPE SYNC

037652  010015                  I0507:  MOV     R0,(R5)         ;TEST THE MOV

037654  020412                          CMP     R4,(R2)         ;RESULT CORRECT ?
037656  001403                          BEQ     00507           ;BR IF YES

037660  011203                          MOV     (R2),R3         ;GET THE WAS DATA
037662  104000                  E0507:  ERROR                   ;MOV DELIVERED THE WRONG RESULT
037664  037644                          R0507                   ;ERROR LOOP RETURN ADDRESS

037666  000004                  00507:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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                                        ; ***************************************************************
                                                .SBTTL T0510 MOV  SM0,DM2 TEST
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [172,257,201,125,375,016] FC 1,4,8

                                        ;ACT BUTS:      37[004]100,172  /  22[172]200,201  /  16[125]016,016

                                        ;EXEC:          [201]ALUC=LLLLL :[125]D= TEST NO.

                                        ;CODES:         [125]SPS=3       /      N:C=X000

                                        ;SYNC:          B05J2   (-)     T=2.5 USEC

                                        ;KEY SIG:       K3-3 MOV L  /  K3-3 SM=0 L  /  K3-3 DM=2 L  /  K5-5 BCON(1+2) H
                                                        ;K3-8 CIN00 L

037670  012700  000510                  T0510:  MOV     #0510,R0                ;LOAD R0 WITH TEST NO.
037674  013701  037714                          MOV     @#I0510,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
037700  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
037704  010004                                  MOV     R0,R4           ;RESULT S / B = #T0510
037706  010205                          R0510:  MOV     R2,R5           ;R5 GETS DEST ADDR
037710  005012                                  CLR     (R2)            ;[DEST] = 000000
037712  000257                                  CCC                     ;SCOPE SYNC

037714  010025                          I0510:  MOV     R0,(R5)+        ;TEST THE MOV

037716  020412                                  CMP     R4,(R2)         ;RESULT CORRECT ?
037720  001403                                  BEQ     00510           ;BR IF YES

037722  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
037724  104000                          E0510:  ERROR                   ;MOV DELIVERED THE WRONG RESULT
037726  037706                                  R0510                   ;ERROR LOOP RETURN ADDRESS

037730  000004                          00510:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0511 MOV  SM0,DM3 TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [173,207,210,201,125,375,016] FC 1,4,8

                                        ;ACT BUTS:      37[004]100,173  /  22[207]200,201  /  16[125]016,016

                                        ;EXEC:          [201]ALUC=LLLLL :[125]D= TEST NO.

                                        ;CODES:         [125]SPS=3       /      N:C=X000

                                        ;SYNC:          B05J2   (-)     T=3.2 USEC

                                        ;KEY SIG:       K3-3 MOV L  /  K3-3 SM=0 L  /  K3-3 DM=3 L  /  K5-5 BC01 H

037732  012700  000511                  T0511:  MOV     #0511,R0                ;LOAD R0 WITH TEST NO.
037736  013701  037760                          MOV     @#I0511,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
037742  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
037746  010004                                  MOV     R0,R4           ;RESULT S / B = #T0511
037750  012705  067554                  R0511:  MOV     #ATA+10,R5      ;BASE DEST ADDR = ATA+10
037754  005012                                  CLR     (R2)            ;[DEST] = 000000
037756  000257                                  CCC                     ;SCOPE SYNC

037760  010035                          I0511:  MOV     R0,@(R5)+       ;TEST THE MOV

037762  020412                                  CMP     R4,(R2)         ;CORRECT RESULT
037764  001403                                  BEQ     O0511           ;BR IF YES

037766  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
037770  104000                          E0511:  ERROR                   ;MOV DELIVERED THE WRONG RESULT
037772  037750                                  R0511                   ;ERROR LOOP RETURN ADDRESS

037774  000004                          O0511:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0512 MOV  SM0,DM4 TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [174,257,201,125,375,016] FC 1,4,8

                                        ;ACT BUTS:      37[004]100,174  /  22[174]200,201  /  16[125]016,016

                                        ;EXEC:          [201]ALUC=LLLLL :[125]D= TEST NO.

                                        ;CODES:         [125]SPS=3       /      N:C=X000

                                        ;SYNC:          B05J2   (-)     T=2.5 USEC

                                        ;KEY SIG:       K3-3 MOV L  /  K3-3 SM=0 L  /  K3-3 DM=4 L  /  K5-5 BCON(1+2) H
                                                        ;K3-8 CIN00 L

037776  012700  000512                  T0512:  MOV     #0512,R0                ;LOAD R0 WITH TEST NO.
040002  013701  040024                          MOV     @#I0512,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
040006  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
040012  010004                                  MOV     R0,R4           ;RESULT S / B = #T0512
040014  012705  067562                  R0512:  MOV     #MBUF0+2,R5     ;R5 CONTAINS BASE DEST ADDR
040020  005012                                  CLR     (R2)            ;[DEST] = 000000
040022  000257                                  CCC                     ;SCOPE SYNC

040024  010045                          I0512:  MOV     R0,-(R5)        ;TEST THE MOV

040026  020412                                  CMP     R4,(R2)         ;CORRECT RESULT ?
040030  001403                                  BEQ     00512           ;BR IF YES

040032  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
040034  104000                          E0512:  ERROR                   ;MOV DELIVERED THE WRONG RESULT
040036  040014                                  R0512                   ;ERROR LOOP RETURN ADDRESS

040040  000004                          00512:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***************************************************************
                                                .SBTTL T0513 MOV  SM0,DM5 TEST
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [175,207,210,201,125,375,016] FC 1,4,8

                                        ;ACT BUTS:      37[004]100,175  /  22[207]200,201  /  16[125]016,016

                                        ;EXEC:          [201]ALUC=LLLLL :[125]D= TEST NO.

                                        ;CODES:         [125]SPS=3       /      N:C=X000

                                        ;SYNC:          B05J2   (-)      T= 3.2 USEC

                                        ;KEY SIG:       K3-3 MOV L  /  K3-3 SM=0 L  /  K3-3 DM=5 L  /  K5-5 BC01 H

040042  012700  000513                  T0513:  MOV     #0513,R0                ;LOAD R0 WITH TEST NO.
040046  013701  040070                          MOV     @#I0513,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
040052  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
040056  010004                                  MOV     R0,R4           ;RESULT S / B = #T0513
040060  012705  067556                  R0513:  MOV     #ATA+12,R5      ;R5 CONTAINS BASE DEST ADDR
040064  005012                                  CLR     (R2)            ;[DEST] = 000000
040066  000257                                  CCC                     ;SCOPE SYNC

040070  010055                          I0513:  MOV     R0,@-(R5)       ;TEST THE MOV

040072  020412                                  CMP     R4,(R2)         ;CORRECT RESULT ?
040074  001403                                  BEQ     O0513           ;BR IF YES

040076  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
040100  104000                          E0513:  ERROR                   ;MOV DELIVERED THE WRONG RESULT
040102  040060                                  R0513                   ;ERROR LOOP RETURN ADDRESS

040104  000004                          O0513:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                        .SBTTL T0514 MOV  SM0,DM6 TEST
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [176,206,212,201,125,375,016] FC 1,4,8

                                ;ACT BUTS:      37[004]100,176  /  17[176]212,212  /  21[206]200,201
                                                ; /  16[125]016,016

                                ;EXEC:          [201]ALUC=LLLLL :[125]D= TEST NO.

                                ;CODES:         [125]SPS=3       /      N:C=X000

                                ;SYNC:          B05J2   (-)     T= 2.84 USEC

                                ;KEY SIG:       K3-3 MOV L  /  K3-3 SM=0 L  /  K3-3 DM=6 L  /  K5-5 BC01 H
                                                ;K4-4 OVLAP CYCLE L

040106  012700  000514          T0514:  MOV     #0514,R0                ;LOAD R0 WITH TEST NO.
040112  013701  040134                  MOV     @#I0514,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
040116  012702  067564                  MOV     #MBUF1,R2       ;DEST ADDR = MBUF1
040122  010004                          MOV     R0,R4           ;RESULT S / B = #T0514
040124  012705  067560                  MOV     #MBUF0,R5       ;BASE DEST ADDR = MBUF0
040130  005012                  R0514:  CLR     (R2)            ;[DEST] = 000000
040132  000257                          CCC                     ;SCOPE SYNC

040134  010065  000004          I0514:  MOV     R0,4(R5)        ;TEST THE MOV

040140  020412                          CMP     R4,(R2)         ;RESULT CORRECT ?
040142  001403                          BEQ     O0514           ;BR IF YES

040144  011203                          MOV     (R2),R3         ;GET THE WAS DATA
040146  104000                  E0514:  ERROR                   ;MOV DELIVERED THE WRONG RESULT
040150  040130                          R0514                   ;ERROR LOOP RETURN ADDRESS

040152  000004                  O0514:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0515 MOVB TEST - SM0,DM0 - EXTEND 1'S
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [170,204,003,204,001] FC 1,4

                                        ;ACT BUTS:      37[004]100,170 / 20[170]000,003 / 27[003]000,001

                                        ;EXEC:          [170]ALUC=LLLLL :[204] AND TIME D = 177652

                                        ;CODES:         [204] SPS=3  /  N:C = 1000

                                        ;SYNC:          B05J2 (-) T = 1.8 USEC

                                        ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 MOV L  /  K3-3 SM=0L  /  K3-3 DM=0L

040154  012700  000515                  T0515:  MOV     #0515,R0                ;LOAD R0 WITH TEST NO.
040160  013701  040206                          MOV     @#I0515,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
040164  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
040170  012704  177652                          MOV     #177652,R4      ;RESULT S / B = 177652
040174  012705  000252                          MOV     #252,R5         ;SOURCE OP = 252
040200  005003                          R0515:  CLR     R3              ;[DEST] = 000000
040202  000257                                  CCC                     ;CLEAR FLAGS
040204  000266                                  266                     ;N:C = 0110

040206  110503                          I0515:  MOVB    R5,R3           ;TEST THE MOVB

040210  100003                                  BPL     E10515          ;N:C = 1000 ?
040212  001402                                  BEQ     E10515
040214  102401                                  BVS     E10515
040216  103002                                  BCC     A0515

040220  104005                          E10515: ERROR5                  ;MOVB FAILED TO ALTER CODES PROPERLY
040222  040200                                  R0515                   ;ERROR LOOP RETURN ADDRESS

040224  020403                          A0515:  CMP     R4,R3           ;RESULT CORRECT ?
040226  001402                                  BEQ     00515           ;BR IF YES

040230  104000                          E20515: ERROR                   ;MOVB DELIVERED THE WRONG RESULT
040232  040200                                  R0515                   ;ERROR LOOP RETURN ADDRESS

040234  000004                          00515:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0516 MOVB TEST - SM0,DM0 - EXTEND 0'S
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [170,204,003,204,001] FC 1,4

                                ;ACT BUTS:      37[004]100,170 / 20[170]000,003 / 27[003]000,001

                                ;EXEC:          [170]ALUC=LLLLL :[204] D = 000000

                                ;CODES:         [204] SPS=3  /  N:C = 0101

                                ;SYNC:          B05J2 (-) T = 1.8 USEC

                                ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 MOV L

040236  012700  000516          T0516:  MOV     #0516,R0                ;LOAD R0 WITH TEST NO.
040242  013701  040270                  MOV     @#I0516,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
040246  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
040252  005004                          CLR     R4              ;RESULT S / B = 000000
040254  012705  177400                  MOV     #177400,R5      ;SOURCE OP = 177400
040260  005003                  R0516:  CLR     R3              ;[DEST] = 177777
040262  005103                          COM     R3
040264  000257                          CCC                     ;CLEAR FLAGS
040266  000271                          271                     ;N:C = 1001

040270  110503                  I0516:  MOVB    R5,R3           ;TEST THE MOVB

040272  100403                          BMI     E10516          ;N:C = 0101 ?
040274  001002                          BNE     E10516
040276  102401                          BVS     E10516
040300  103402                          BCS     A0516

040302  104005                  E10516: ERROR5                  ;MOVB FAILED TO ALTER CODES PROPERLY
040304  040260                          R0516                   ;ERROR LOOP RETURN ADDRESS

040306  020403                  A0516:  CMP     R4,R3           ;RESULT CORRECT ?
040310  001402                          BEQ     00516           ;BR IF YES

040312  104000                  E20516: ERROR                   ;MOVB DELIVERED THE WRONG RESULT
040314  040260                          R0516                   ;ERROR LOOP RETURN ADDRESS

040316  000004                  00516:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0517 MOVB TEST - SM1,DM0 - SOURCE ADDR EVEN
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,160,204,003,204,000] FC 1,2,4

                                        ;ACT BUTS:      37[004]140,141 / 35[247]120,160 / 20[160]000,003 / 27[003]000,000

                                        ;EXEC:          [160]ALUC=LLLLL :[204] 2ND TIME D = 000000

                                        ;CODES:         [204] SPS=3  /  N:C = 0100

                                        ;SYNC:          B05J2 (-) T = 2 USEC

                                        ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 MOV L  /  K3-3 SM=1L  /  K3-3 DM=0L

040320  012700  000517                  T0517:  MOV     #0517,R0                ;LOAD R0 WITH TEST NO.
040324  013701  040350                          MOV     @#I0517,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
040330  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
040334  005004                                  CLR     R4              ;RESULT S / B = 000000
040336  012705  070130                          MOV     #DBTA,R5        ;SOURCE ADDR = DBTA
040342  005003                          R0517:  CLR     R3              ;[DEST] = 177777
040344  005103                                  COM     R3
040346  000257                                  CCC                     ;SCOPE SYNC

040350  111503                          I0517:  MOVB    (R5),R3         ;TEST THE MOVB

040352  020403                                  CMP     R4,R3           ;RESULT CORRECT ?
040354  001402                                  BEQ     00517           ;BR IF YES

040356  104000                          E0517:  ERROR                   ;MOVB DELIVERED THE WRONG RESULT
040360  040342                                  R0517                   ;ERROR LOOP RETURN ADDRESS

040362  000004                          00517:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0520 MOVB TEST - SM1,DM0 - SOURCE ADDR ODD
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [141,247,250,137,251,160,204,003,204,000] FC 1,2,4

                                ;ACT BUTS:      37[004]100,141 / 35[247]120,137 / 20[160]000,003 / 27[003]000,000

                                ;EXEC:          [160]ALUC=LLLLL :[204](2ND TIME)  D = 000125

                                ;CODES:         [204] SPS=3  /  N:C = 0000

                                ;SYNC:          B05J2 (-) T = 2 USEC

                                ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 MOV L  /  K3-7 ODD BYTE H  /  K1-6 BA00 (1) H

040364  012700  000520          T0520:  MOV     #0520,R0                ;LOAD R0 WITH TEST NO.
040370  013701  040416                  MOV     @#I0520,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
040374  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
040400  012704  000125                  MOV     #125,R4         ;RESULT S / B = 125
040404  012705  070133                  MOV     #DBTA+3,R5      ;SOURCE ADDR = DBTA+3
040410  012703  177400          R0520:  MOV     #177400,R3      ;[DEST] = 177400
040414  000257                          CCC                     ;SCOPE SYNC

040416  111503                  I0520:  MOVB    (R5),R3         ;TEST THE MOVB

040420  020403                          CMP     R4,R3           ;RESULT CORRECT ?
040422  001402                          BEQ     00520           ;BR IF YES

040424  104000                  E0520:  ERROR                   ;MOVB DELIVERED THE WRONG RESULT
040426  040410                          R0520                   ;ERROR LOOP RETURN ADDRESS

040430  000004                  00520:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0521 MOVB TEST - SM2,DM0 - SOURCE ADDR ODD
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,137,251,160,204,003,204,000] FC 1,2,4

                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,137 / 36[137]120,160 / 20[160]000,003
                                                        ; / 27[003]000,000

                                        ;EXEC:          [160]ALUC=LLLLL :[204] 2ND TIME D = 177777

                                        ;CODES:         [204] SPS=3  /  N:C = 1000

                                        ;SYNC:          B05J2 (-) T = 2.1 USEC

                                        ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 MOV L  /  K5-5 BCON (1+2) H  /  K3-7 ODD BYTE
                                                        ;  K1-6 BA00 (1) H

040432  012700  000521                  T0521:  MOV     #0521,R0                ;LOAD R0 WITH TEST NO.
040436  013701  040462                          MOV     @#I0521,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
040442  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
040446  012704  177777                          MOV     #-1,R4          ;RESULT S / B = 177777
040452  012705  070131                  R0521:  MOV     #DBTA+1,R5      ;SOURCE ADDR = DBTA+1
040456  005003                                  CLR     R3              ;[DEST] = 000000
040460  000257                                  CCC                     ;SCOPE SYNC

040462  112503                          I0521:  MOVB    (R5)+,R3        ;TEST THE MOVB

040464  020403                                  CMP     R4,R3           ;RESULT CORRECT ?
040466  001402                                  BEQ     A0521           ;BR IF YES

040470  104000                          E10521: ERROR                   ;MOVB DELIVERED THE WRONG RESULT
040472  040452                                  R0521                   ;ERROR LOOP RETURN ADDRESS

040474  022705  070132                  A0521:  CMP     #DBTA+2,R5      ;DID MOVB INCREMENT SRC REG ?
040500  001402                                  BEQ     00521           ;BR IF YES

040502  104005                          E20521: ERROR5                  ;MOVB FAILED TO UPDATE SRC REG
040504  040452                                  R0521                   ;ERROR LOOP RETURN ADDRESS

040506  000004                          00521:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                ; ***********************************************************************
                                        .SBTTL T0522 MOVB TEST - SM2,DM0 - SOURCE ADDR EVEN
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [142,240,250,160,204,003,204,000] FC 1,2,4

                                ;ACT BUTS:      37[004]100,142 / 35[240]120,160 / 20[160]000,003 / 27[003]000,000

                                ;EXEC:          [160]ALUC=LLLLL :[204]2ND TIME D = 000000

                                ;CODES:         [204] SPS=3  /  N:C - 0100

                                ;SYNC:          B05J2 (-) T = 2.1 USEC

                                ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 MOV L  /  K5-5 BCON (1+2) H

040510  012700  000522          T0522:  MOV     #0522,R0                ;LOAD R0 WITH TEST NO.
040514  013701  040540                  MOV     @#I0522,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
040520  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
040524  005004                          CLR     R4              ;RESULT S / B = 000000
040526  012705  070130          R0522:  MOV     #DBTA,R5        ;SOURCE ADDR = DBTA
040532  012703  177400                  MOV     #177400,R3      ;[DEST] = 177400
040536  000257                          CCC                     ;SCOPE SYNC

040540  112503                  I0522:  MOVB    (R5)+,R3                ;TEST THE MOVB

040542  020403                          CMP     R4,R3           ;RESULT CORRECT ?
040544  001402                          BEQ     A0522           ;BR IF YES

040546  104000                  E10522: ERROR                   ;MOVB DELIVERED THE WRONG RESULT
040550  040526                          R0522                   ;ERROR LOOP RETURN ADDRESS

040552  022705  070131          A0522:  CMP     #DBTA+1,R5      ;DID MOVB INCREMENT SRC REG ?
040556  001402                          BEQ     00522           ;BR IF YES

040560  104005                  E20522: ERROR5                  ;MOVB FAILED TO UPDATE SOURCE REG
040562  040526                          R0522                   ;ERROR LOOP RETURN ADDRESS

040564  000004                  00522:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0523 MOVB TEST - SM1,DM1 - SRC ADR ODD / DST ADR EVEN
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,137,251,171,257,202,205,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,141 / 35[247]120,137 / 36[137]120,171 / 22[171]200,202
                                                        ; / 16[125]016,016

                                        ;EXEC:          [202]ALUC=LLLLL :[125] D = 177777

                                        ;CODES:         [125] SPS=3  /  N:C = 1000

                                        ;SYNC:          B05J2 (-) T = 3.2 USEC

                                        ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 MOV L  /  K3-3 SM=1L  /  K3-3 DM=1L
                                                        ;  K1-6 BA00(1) H  /  K3-7 ODD BYTE H

040566  012700  000523                  T0523:  MOV     #0523,R0                ;LOAD R0 WITH TEST NO.
040572  013701  040616                          MOV     @#I0523,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
040576  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
040602  012704  000377                          MOV     #377,R4         ;RESULT S / B = 377
040606  012705  070131                          MOV     #DBTA+1,R5      ;SRC ADDR = DBTA +1
040612  005012                          R0523:  CLR     (R2)            ;[DEST] = 000000
040614  000257                                  CCC                     ;CLEAR FLAGS - SCOPE SYNC

040616  111512                          I0523:  MOVB    (R5),(R2)       ;TEST THE MOVB

040620  020412                                  CMP     R4,(R2)         ;CORRECT RESULT ?
040622  001403                                  BEQ     00523           ;BR IF YES

040624  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
040626  104000                          E0523:  ERROR                   ;MOVB DELIVERED WRONG RESULT
040630  040612                                  R0523                   ;ERROR LOOP RETURN ADDRESS

040632  000004                          00523:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0524 MOVB TEST - SM1,DM2 - SRC ADR ODD / DST ADR EVEN
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,137,251,172,257,202,205,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,141 / 35[247]120,137 / 36[137]120,172 / 22[172]200,202
                                                        ; / 16[125]016,016

                                        ;EXEC:          [202]ALUC=LLLLL :[125] D = 177777

                                        ;CODES:         [125] SPS=3  /  N:C = 1000

                                        ;SYNC:          B05J2 (-) T = 3.7 USEC

                                        ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 MOV L  /  K5-5 BCON (1+2) H  /  K3-7 ODD BYTE
                                                        ;  K1-6 BA00(1) H

040634  012700  000524                  T0524:  MOV     #0524,R0                ;LOAD R0 WITH TEST NO.
040640  013701  040666                          MOV     @#I0524,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
040644  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
040650  012704  000377                          MOV     #377,R4         ;RESULT S / B = 377
040654  012705  070131                          MOV     #DBTA+1,R5      ;SRC ADDR = DBTA +1
040660  005012                          R0524:  CLR     (R2)            ;[DEST] = 000000
040662  010203                                  MOV     R2,R3           ;[R3] = DEST ADDR
040664  000257                                  CCC                     ;CLEAR FLAGS - SCOPE SYNC

040666  111523                          I0524:  MOVB    (R5),(R3)+      ;TEST THE MOVB

040670  020412                                  CMP     R4,(R2)         ;CORRECT RESULT ?
040672  001403                                  BEQ     A0524           ;BR IF YES

040674  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
040676  104000                          E10524: ERROR                   ;MOVB DELIVERED WRONG RESULT
040700  040660                                  R0524                   ;ERROR LOOP RETURN ADDRESS

040702  022703  067561                  A0524:  CMP     #MBUF0+1,R3     ;DID MOVB INCREMENT THE DEST REG ?
040706  001402                                  BEQ     00524           ;BR IF YES

040710  104005                          E20524: ERROR5                  ;MOVB FAILED TO UPDATE DEST REG
040712  040660                                  R0524                   ;ERROR LOOP RETURN ADDRESS

040714  000004                          00524:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0525 MOVB TEST - SM1,DM3 - SRC ADR ODD / DST ADR EVEN
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,137,251,173,207,210,202,205,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,141 / 35[247]120,137 / 36[137]120,173 / 22[207]200,202
                                                        ; / 16[125]016,016

                                        ;EXEC:          [202]ALUC=LLLLL :[125] D = 177777

                                        ;CODES:         [125] SPS=3  /  N:C = 1000

                                        ;SYNC:          B05J2 (-) T = 4 USEC

                                        ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 MOV L  /  K5-5 BC01 H  /  K3-7 ODD BYTE H
                                                        ;  K1-6 BA00 (1) H

040716  012700  000525                  T0525:  MOV     #0525,R0                ;LOAD R0 WITH TEST NO.
040722  013701  040752                          MOV     @#I0525,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
040726  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
040732  012704  000377                          MOV     #377,R4         ;RESULT S / B = 377
040736  012705  070131                          MOV     #DBTA+1,R5      ;SRC ADDR = DBTA +1
040742  005012                          R0525:  CLR     (R2)            ;[DEST] = 000000
040744  012703  067554                          MOV     #ATA+10,R3      ;BASE DEST ADDR = ATA +10
040750  000257                                  CCC                     ;CLEAR FLAGS - SCOPE SYNC

040752  111533                          I0525:  MOVB    (R5),@(R3)+     ;TEST THE MOVB

040754  022703  067556                          CMP     #ATA+12,R3      ;DID DEST REG GET INCREMENTED ?
040760  001402                                  BEQ     A0525           ;BR IF YES

040762  104005                          E10525: ERROR5                  ;MOVB FAILED TO UPDATE DEST REG
040764  040742                                  R0525                   ;ERROR LOOP RETURN ADDRESS

040766  020412                          A0525:  CMP     R4,(R2)         ;CORRECT RESULT ?
040770  001403                                  BEQ     O0525           ;BR IF YES

040772  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
040774  104000                          E20525: ERROR                   ;MOVB DELIVERED WRONG RESULT
040776  040742                                  R0525                   ;ERROR LOOP RETURN ADDRESS


041000  000004                          O0525:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0526 MOVB TEST - SM1,DM4 - SRC ADR ODD / DST ADR EVEN
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,137,251,174,257,202,205,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,141 / 35[247]120,137 / 36[137]120,174 / 22[174]200,202
                                                        ; / 16[125]016,016

                                        ;EXEC:          [202]ALUC=LLLLL :[125] D = 177777

                                        ;CODES:         [125] SPS=3  /  N:C = 1000

                                        ;SYNC:          B05J2 (-) T = 3.1 USEC

                                        ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 MOV L  /  K5-5 BCON (1+2) H  /  K3-7 ODD BYTE
                                                        ;  K1-6 BA00(1) H

041002  012700  000526                  T0526:  MOV     #0526,R0                ;LOAD R0 WITH TEST NO.
041006  013701  041036                          MOV     @#I0526,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
041012  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
041016  012704  000377                          MOV     #377,R4         ;RESULT S / B = 377
041022  012705  070131                          MOV     #DBTA+1,R5      ;SRC ADDR = DBTA +1
041026  005012                          R0526:  CLR     (R2)            ;[DEST] = 000000
041030  012703  067561                          MOV     #MBUF0+1,R3     ;INITIAL DEST ADDR = MBUF0+1
041034  000257                                  CCC                     ;CLEAR FLAGS - SCOPE SYNC

041036  111543                          I0526:  MOVB    (R5),-(R3)      ;TEST THE MOVB

041040  020302                                  CMP     R3,R2           ;DID MOVB DECREMENT DEST REG ?
041042  001402                                  BEQ     A0526           ;BR IF YES

041044  104005                          E10526: ERROR5                  ;MOVB FAILED TO UPDATE DEST REG
041046  041026                                  R0526                   ;ERROR LOOP RETURN ADDRESS

041050  020412                          A0526:  CMP     R4,(R2)         ;CORRECT RESULT ?
041052  001403                                  BEQ     00526           ;BR IF YES

041054  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
041056  104000                          E20526: ERROR                   ;MOVB DELIVERED WRONG RESULT
041060  041026                                  R0526                   ;ERROR LOOP RETURN ADDRESS

041062  000004                          00526:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                ; ************************************************************************
                                        .SBTTL T0527 MOVB TEST - SM1,DM5 - SRC ADR ODD / DST ADR EVEN
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [141,247,250,137,251,175,207,210,202,205,125,375,016] FC 1,2,4,8

                                ;ACT BUTS:      37[004]100,141 / 35[247]120,137 / 36[137]120,175 / 22[207]200,202
                                                ; / 16[125]016,016

                                ;EXEC:          [202]ALUC=LLLLL :[125] D = 177777

                                ;CODES:         [125] SPS=3  /  N:C = 1000

                                ;SYNC:          B05J2 (-) T = 4 USEC

                                ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 MOV L  /  K5-5 BC01 H  /  K3-7 ODD BYTE H
                                                ;  K1-6 BA00(1) H

041064  012700  000527          T0527:  MOV     #0527,R0                ;LOAD R0 WITH TEST NO.
041070  013701  041120                  MOV     @#I0527,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
041074  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
041100  012704  000377                  MOV     #377,R4         ;RESULT S / B = 377
041104  012705  070131                  MOV     #DBTA+1,R5      ;SRC ADDR = DBTA +1
041110  005012          R0527:  CLR     (R2)            ;[DEST] = 000000
041112  012703  067556                  MOV     #ATA+12,R3      ;INITIAL DEST ADDR = ATA +12
041116  000257                          CCC             ;CLEAR FLAGS - SCOPE SYNC

041120  111553          I0527:  MOVB    (R5),@-(R3)     ;TEST THE MOVB

041122  022703  067554                  CMP     #ATA+10,R3      ;DID MOVB DECREMENT DEST REG ?
041126  001402                          BEQ     A0527           ;BR IF YES

041130  104005          E10527: ERROR5                          ;MOVB FAILED TO UPDATE DEST REG
041132  041110                  R0527                           ;ERROR LOOP RETURN ADDRESS

041134  020412          A0527:  CMP     R4,(R2)         ;CORRECT RESULT ?
041136  001403                  BEQ     O0527           ;BR IF YES

041140  011203                  MOV     (R2),R3         ;GET THE WAS DATA
041142  104000          E20527: ERROR                           ;MOVB DELIVERED WRONG RESULT
041144  041110                  R0527                           ;ERROR LOOP RETURN ADDRESS

041146  000004          O0527:  SCOPE                           ;CALL SCOPE LOOP UTILITY
```

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                                ; ************************************************************************
                                        .SBTTL T0530 MOVB TEST - SM1,DM6 - SRC ADR ODD / DST ADR EVEN
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [141,247,250,137,251,177,206,212,202,205,125,375,016] FC 1,2,4,8

                                ;ACT BUTS:      37[004]100,141 / 35[247]120,137 / 36[137]120,177 / 17[177]212,212
                                                ; / 21[206]200,202 / 16[125]016,016

                                ;EXEC:          [202]ALUC=LLLLL :[125] D = 177777

                                ;CODES:         [125] SPS=3  /  N:C = 1000

                                ;SYNC:          B05J2 (-) T = 4.4 USEC

                                ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 MOV L  /  K5-5 BC01 H  /  K3-7 ODD BYTE H
                                                ;  K1-6 BA00(1) H

041150  012700  000530          T0530:  MOV     #0530,R0                ;LOAD R0 WITH TEST NO.
041154  013701  041204                  MOV     @#I0530,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
041160  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
041164  012704  000377                  MOV     #377,R4         ;RESULT S / B = 377
041170  012705  070131                  MOV     #DBTA+1,R5      ;SRC ADDR = DBTA +1
041174  005012          R0530:  CLR     (R2)            ;[DEST] = 000000
041176  012703  067566                  MOV     #MBUF0+6,R3     ;BASE DEST ADDR = MBUF0+6
041202  000257                          CCC                     ;CLEAR FLAGS - SCOPE SYNC

041204  111563  177772          I0530:  MOVB    (R5),-6(R3)     ;TEST THE MOVB

041210  020412                          CMP     R4,(R2)         ;CORRECT RESULT ?
041212  001403                          BEQ     00530           ;BR IF YES

041214  011203                          MOV     (R2),R3         ;GET THE WAS DATA
041216  104000          E0530:  ERROR                           ;MOVB DELIVERED WRONG RESULT
041220  041174                  R0530                           ;ERROR LOOP RETURN ADDRESS

041222  000004          00530:  SCOPE                           ;CALL THE SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0531 MOVB TEST - SM1,DM7 - SRC ADR ODD / DST ADR EVEN
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,137,251,177,206,213,207,210,202,205,125,375,016] FC 1,2,4,8

                                        ;ACT BUTS:      37[004]100,141 / 35[247]120,137 / 36[137]120,177 / 17[177]212,213
                                                        ; / 21[206]XNU / 22[207]200,202 / 16[125]016,016

                                        ;EXEC:          [202]ALUC=LLLLL :[125] D = 177777

                                        ;CODES:         [125] SPS=3  /  N:C - 1000

                                        ;SYNC:          B05J2 (-) T = 4.8 USEC

                                        ;KEY SIG:       K3-6 BYTE INSTR H  /  K3-3 MOV L  /  K5-5 BC01 H  /  K3-7 ODD BYTE H
                                                        ;  K1-6 BA00 (1) H

041224  012700  000531          T0531:  MOV     #0531,R0                ;LOAD R0 WITH TEST NO.
041230  013701  041260                  MOV     @#I0531,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
041234  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
041240  012704  000377                  MOV     #377,R4         ;RESULT S / B = 377
041244  012705  070131                  MOV     #DBTA+1,R5      ;SRC ADDR = DBTA +1
041250  005012          R0531:  CLR     (R2)            ;[DEST] = 000000
041252  012703  067544                  MOV     #ATA,R3         ;BASE DEST ADDR = ATA
041256  000257                          CCC                     ;CLEAR FLAGS - SCOPE SYNC

041260  111573  000010          I0531:  MOVB    (R5),@10(R3)    ;TEST THE MOVB

041264  020412                          CMP     R4,(R2)         ;CORRECT RESULT ?
041266  001403                          BEQ     O0531           ;BR IF YES

041270  011203                          MOV     (R2),R3         ;GET THE WAS DATA
041272  104000          E0531:  ERROR                           ;MOVB DELIVERED WRONG RESULT
041274  041250                  R0531                           ;ERROR LOOP RETURN ADDRESS

041276  000004          O0531:  SCOPE                           ;CALL SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0532 MOVB  SM0,DM1 TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [171,257,203,205,125,375,016] FC 1,4,8

                                        ;ACT BUTS:      37[004]100,171  /  22[171]200,203  /  16[125]016,016

                                        ;EXEC:          [203]ALUC=LLLLL :[125]D=177777

                                        ;CODES:         [125]SPS=3       /      N:C=1000

                                        ;SYNC:          B05J2   (-)     T=2.6 USEC

                                        ;KEY SIG:       K3-3 MOV L  /  K3-3 SM=0 L  /  K3-3 DM=1 L  /  K3-6 BYTE INSTR H

041300  012700  000532                  T0532:  MOV     #0532,R0                ;LOAD R0 WITH TEST NO.
041304  013701  041332                          MOV     @#I0532,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
041310  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
041314  012704  000377                          MOV     #377,R4         ;RESULT S / B = 377
041320  012703  177777                          MOV     #-1,R3          ;R3 CONTAINS SOURCE OP
041324  010205                          R0532:  MOV     R2,R5           ;R5 CONTAINS DEST ADDR
041326  005012                                  CLR     (R2)            ;[DEST] = 000000
041330  000257                                  CCC                     ;SCOPE SYNC

041332  110315                          I0532:  MOVB    R3,(R5)         ;TEST THE MOVB

041334  020412                                  CMP     R4,(R2)         ;RESULT CORRECT ?
041336  001403                                  BEQ     00532           ;BR IF YES

041340  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
041342  104000                          E0532:  ERROR                   ;MOVB DELIVERED THE WRONG RESULT
041344  041324                                  R0532                   ;ERROR LOOP RETURN ADDRESS

041346  000004                          00532:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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                                        ; ***************************************************************
                                                .SBTTL T0533 MOVB  SM0,DM2 TEST
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [172,257,203,205,125,375,016] FC 1,4,8

                                        ;ACT BUTS:      37[004]100,172  /  22[172]200,203  /  16[125]016,016

                                        ;EXEC:          [203]ALUC=LLLLL :[125]D=177777

                                        ;CODES:         [125]SPS=3       /      N:C=1000

                                        ;SYNC:          B05J2   (-)      T=2.6 USEC

                                        ;KEY SIG:       K3-3 MOV L  /  K3-3 SM=0 L  /  K3-3 DM=1 L  /  K3-6 BYTE INSTR H
                                                        ;  K5-5 BCON(1+2) H

041350  012700  000533                  T0533:  MOV     #0533,R0                ;LOAD R0 WITH TEST NO.
041354  013701  041402                          MOV     @#I0533,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
041360  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
041364  012704  000377                          MOV     #377,R4         ;RESULT S / B = 377
041370  012703  177777                          MOV     #-1,R3          ;R3 CONTAINS SOURCE OP
041374  010205                          R0533:  MOV     R2,R5           ;R5 CONTAINS DEST ADDR
041376  005012                                  CLR     (R2)            ;[DEST] = 000000
041400  000257                                  CCC                     ;SCOPE SYNC

041402  110325                          I0533:  MOVB    R3,(R5)+        ;TEST THE MOVB

041404  020412                                  CMP     R4,(R2)         ;RESULT CORRECT ?
041406  001403                                  BEQ     00533           ;BR IF YES

041410  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
041412  104000                          E0533:  ERROR                   ;MOVB DELIVERED THE WRONG RESULT
041414  041374                                  R0533                   ;ERROR LOOP RETURN ADDRESS

041416  000004                          00533:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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                                        ; ***************************************************************
                                                .SBTTL T0534 MOVB  SM0,DM3 TEST
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [173,207,210,203,205,125,375,016] FC 1,4,8

                                        ;ACT BUTS:      37[004]100,173  /  22[207]200,203  / 16[125]016,016

                                        ;EXEC:          [203]ALUC=LLLLL :[125]D=177777

                                        ;CODES:         [125]SPS=3       /      N:C=1000

                                        ;SYNC:          B05J2   (-)      T=3.4 USEC

                                        ;KEY SIG:       K3-3 MOV L  /  K3-6 BYTE INSTR H  /  K3-3 SM=0 L  /  K3-3 DM=3 L

041420  012700  000534                  T0534:  MOV     #0534,R0                ;LOAD R0 WITH TEST NO.
041424  013701  041454                          MOV     @#I0534,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
041430  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
041434  012704  000377                          MOV     #377,R4         ;RESULT S / B = 377
041440  012703  177777                          MOV     #-1,R3          ;SOURCE OP IN R3
041444  012705  067554                  R0534:  MOV     #ATA+10,R5      ;BASE DEST ADDR = ATA+10
041450  005012                                  CLR     (R2)            ;[DEST] = 000000
041452  000257                                  CCC                     ;SCOPE SYNC

041454  110335                          I0534:  MOVB    R3,@(R5)+       ;TEST THE MOVB

041456  020412                                  CMP     R4,(R2)         ;RESULT CORRECT ?
041460  001403                                  BEQ     00534           ;BR IF YES

041462  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
041464  104000                          E0534:  ERROR                   ;MOVB DELIVERED THE WRONG RESULT
041466  041444                                  R0534                   ;ERROR LOOP RETURN ADDRESS

041470  000004                          00534:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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                                        ; ***************************************************************
                                                .SBTTL T0535 MOVB  SM0,DM4 TEST
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [174,257,203,205,125,375,016] FC 1,4,8

                                        ;ACT BUTS:      37[004]100,174  /  22[174]200,203  /  16[125]016,016

                                        ;EXEC:          [203]ALUC=LLLLL :[125]D=177777

                                        ;CODES:         [125]SPS=3       /      N:C=1000

                                        ;SYNC:          B05J2   (-)      T=2.6 USEC

                                        ;KEY SIG:       K3-3 MOV L  /  K3-3 SM=0 L  /  K3-3 DM=4 L  /  K3-6 BYTE INSTR H
                                                        ;  K5-5 BCON(1+2) H

041472  012700  000535                  T0535:  MOV     #0535,R0                ;LOAD R0 WITH TEST NO.
041476  013701  041526                          MOV     @#I0535,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
041502  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
041506  012704  177400                          MOV     #177400,R4      ;RESULT S / B = 177400
041512  012703  177777                          MOV     #-1,R3          ;R3 CONTAINS SOURCE OP
041516  012705  067562                  R0535:  MOV     #MBUF0+2,R5     ;BASE DEST ADDR = MBUF0+2
041522  005012                                  CLR     (R2)            ;[DEST] = 000000
041524  000257                                  CCC                     ;SCOPE SYNC

041526  110345                          I0535:  MOVB    R3,-(R5)        ;TEST THE MOVB

041530  020412                                  CMP     R4,(R2)         ;RESULT CORRECT ?
041532  001403                                  BEQ     00535           ;BR IF YES

041534  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
041536  104000                          E0535:  ERROR                   ;MOVB DELIVERED THE WRONG RESULT
041540  041516                                  R0535                   ;ERROR LOOP RETURN ADDRESS

041542  000004                          00535:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0536 MOVB  SM0,DM6 TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [176,206,212,203,205,125,375,016] FC 1,4,8

                                        ;ACT BUTS:      37[004]100,176  /  17[176]212,212  /  21[206]200,203  /  16[125]016,016

                                        ;EXEC:          [203]ALUC=LLLLL :[125]D=177777

                                        ;CODES:         [125]SPS=3       /      N:C=1000

                                        ;SYNC:          B05J2   (-)      T=3 USEC

                                        ;KEY SIG:       K3-3 MOV L  /  K3-3 SM=0 L  /  K3-3 DM=6 L  /  K3-6 BYTE INSTR H
                                                        ;  K3-4 OVLAP CYCLE L

041544  012700  000536          T0536:  MOV     #0536,R0                ;LOAD R0 WITH TEST NO.
041550  013701  041600                  MOV     @#I0536,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
041554  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
041560  012704  000377                  MOV     #377,R4         ;RESULT S / B = 377
041564  012703  177777                  MOV     #-1,R3          ;R3 CONTAINS SOURCE OP
041570  012705  067562          R0536:  MOV     #MBUF0+2,R5     ;BASE DEST ADDR = MBUF0+2
041574  005012                          CLR     (R2)            ;[DEST] = 000000
041576  000257                          CCC                     ;SCOPE SYNC

041600  110365  177776          I0536:  MOVB    R3,-2(R5)       ;TEST THE MOVB

041604  020412                          CMP     R4,(R2)         ;RESULT CORRECT ?
041606  001403                          BEQ     00536           ;BR IF YES

041610  011203                          MOV     (R2),R3         ;GET THE WAS DATA
041612  104000          E0536:  ERROR                           ;MOVB DELIVERED THE WRONG RESULT
041614  041570                  R0536                           ;ERROR LOOP RETURN ADDRESS

041616  000004          00536:  SCOPE                           ;CALL THE SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0537 BIS TEST - SM0,DM0 - <N:C> = 0111
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [102,364,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,102 / 31[102]360,360 / 27[364]000,001

                                ;EXEC:          [364]ALUC=LLLLH :[360] D = 177777

                                ;CODES:         [360] SPS=3  /  N:C = 1001

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K3-4 OVLAP INSTR H  /  K3-3 BIS L  /  K3-3 SM=0L  /  K3-3 DM=0L

041620  012700  000537          T0537:  MOV     #0537,R0                ;LOAD R0 WITH TEST NO.
041624  013701  041654                  MOV     @#I0537,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
041630  012702  177703                  MOV     #177703,R2      ;DEST ADDR = 177703
041634  012704  177777                  MOV     #-1,R4          ;RESULT S / B = 177777
041640  012705  125252                  MOV     #125252,R5      ;SRC OPR = 125252
041644  012703  052525          R0537:  MOV     #52525,R3       ;[DEST] = 52525
041650  000257                          CCC                     ;CLEAR FLAGS
041652  000267                          267                     ;N:C = 0111

041654  050503                  I0537:  BIS     R5,R3           ;TEST THE BIS

041656  100003                          BPL     E10537          ;N:C = 1001 ?
041660  001402                          BEQ     E10537
041662  102401                          BVS     E10537
041664  103402                          BCS     A0537

041666  104005                  E10537: ERROR5                  ;BIS FAILED TO ALTER CODES PROPERLY
041670  041644                          R0537                   ;ERROR LOOP RETURN ADDRESS

041672  020403                  A0537:  CMP     R4,R3           ;CORRECT RESULT ?
041674  001402                          BEQ     00537           ;BR IF YES

041676  104000                  E20537: ERROR                   ;BIS DELIVERED THE WRONG RESULT
041700  041644                          R0537                   ;ERROR LOOP RETURN ADDRESS

041702  000004                  00537:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0540 BIS TEST - SM0,DM0 - <N:C> = 1000
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [102,364,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,102 / 31[102]360,360 / 27[364]000,001

                                ;EXEC:          [364]ALUC=LLLLH :[360] D = 000000

                                ;CODES:         [360] SPS=3  /  N:C = 0100

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K3-4 OVLAP INSTR H  /  K3-3 BIS L  /  K3-3 SM=0L  /  K3-3 DM=0L

041704  012700  000540          T0540:  MOV     #0540,R0                ;LOAD R0 WITH TEST NO.
041710  013701  041732                  MOV     @#I0540,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
041714  012702  177703                  MOV     #177703,R2      ;DEST ADDR = 177703
041720  005004                          CLR     R4              ;RESULT S / B = 000000
041722  005005                          CLR     R5              ;SRC OPR = 000000
041724  005003                  R0540:  CLR     R3              ;[DEST] = 000000
041726  000257                          CCC                     ;CLEAR FLAGS
041730  000270                          SEN                     ;N:C = 1000

041732  050503                  I0540:  BIS     R5,R3           ;TEST THE BIS

041734  100403                          BMI     E10540          ;N:C = 0100
041736  001002                          BNE     E10540
041740  102401                          BVS     E10540
041742  103002                          BCC     A0540

041744  104005                  E10540: ERROR5                  ;BIS FAILED TO ALTER CODES PROPERLY
041746  041724                          R0540                   ;ERROR LOOP RETURN ADDRESS

041750  020403                  A0540:  CMP     R4,R3           ;CORRECT RESULT ?
041752  001402                          BEQ     00540           ;BR IF YES

041754  104000                  E20540: ERROR                   ;BIS DELIVERED THE WRONG RESULT
041756  041724                          R0540                   ;ERROR LOOP RETURN ADDRESS

041760  000004                  00540:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0541 BIC TEST - SM0,DM0 - <N:C> = 0111
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [102,364,360,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,102 / 31[102]360,360 / 27[364]000,001

                                ;EXEC:          [364]ALUC=HLLHL :[360] D = 100000

                                ;CODES:         [360] SPS=3  /  N:C = 1001

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K3-4 OVLAP INSTR H  /  K3-3 BIC L  /  K3-3 SM=0L  /  K3-3 DM=0L

041762  012700  000541          T0541:  MOV     #0541,R0                ;LOAD R0 WITH TEST NO.
041766  013701  042016                  MOV     @#I0541,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
041772  012702  177703                  MOV     #177703,R2      ;DEST ADDR = 177703
041776  012704  100000                  MOV     #100000,R4      ;RESULT S / B = 100000
042002  012705  077777                  MOV     #77777,R5       ;SRC OPR = 77777
042006  012703  177777          R0541:  MOV     #-1,R3          ;[DEST] = 177777
042012  000257                          CCC                     ;CLEAR FLAGS
042014  000267                          267                     ;N:C = 0111

042016  040503                  I0541:  BIC     R5,R3           ;TEST THE BIC

042020  100003                          BPL     E10541          ;N:C = 1001 ?
042022  001402                          BEQ     E10541
042024  102401                          BVS     E10541
042026  103402                          BCS     A0541

042030  104005                  E10541: ERROR5                  ;BIC FAILED TO ALTER CODES PROPERLY
042032  042006                          R0541                   ;ERROR LOOP RETURN ADDRESS

042034  020403                  A0541:  CMP     R4,R3           ;CORRECT RESULT ?
042036  001402                          BEQ     O0541           ;BR IF YES

042040  104000                  E20541: ERROR                   ;BIC DELIVERED THE WRONG RESULT
042042  042006                          R0541                   ;ERROR LOOP RETURN ADDRESS

042044  000004                  O0541:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0542 BIC TEST - SM0,DM0 - <N:C> = 1000
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [102,364,360,001] FC 1,7,8

                                        ;ACT BUTS:      37[004]100,102 / 31[102]360,360 / 27[364]000,001

                                        ;EXEC:          [364]ALUC=HLLHL :[360] D = 000000

                                        ;CODES:         [360] SPS=3  /  N:C = 0100

                                        ;SYNC:          B05J2 (-) T = 1 USEC

                                        ;KEY SIG:       K3-4 OVLAP INSTR H  /  K3-3 BIC L  /  K3-3 SM=0L  /  K3-3 DM=0L

042046  012700  000542                  T0542:  MOV     #0542,R0                ;LOAD R0 WITH TEST NO.
042052  013701  042074                          MOV     @#I0542,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
042056  012702  177703                          MOV     #177703,R2      ;DEST ADDR = 177703
042062  005004                                  CLR     R4              ;RESULT S / B = 000000
042064  005005                                  CLR     R5              ;SRC OPR = 000000
042066  005003                          R0542:  CLR     R3              ;[DEST] = 000000
042070  000257                                  CCC                     ;CLEAR FLAGS
042072  000270                                  SEN                     ;N:C = 1000

042074  040503                          I0542:  BIC     R5,R3           ;TEST THE BIC

042076  100403                                  BMI     E10542          ;N:C = 0100
042100  001002                                  BNE     E10542
042102  102401                                  BVS     E10542
042104  103002                                  BCC     A0542

042106  104005                          E10542: ERROR5                  ;BIC FAILED TO ALTER CODES PROPERLY
042110  042066                                  R0542                   ;ERROR LOOP RETURN ADDRESS

042112  020403                          A0542:  CMP     R4,R3           ;CORRECT RESULT ?
042114  001402                                  BEQ     O0542           ;BR IF YES

042116  104000                          E20542: ERROR                   ;BIC DELIVERED THE WRONG RESULT
042120  042066                                  R0542                   ;ERROR LOOP RETURN ADDRESS

042122  000004                          O0542:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                ; ***********************************************************************
                                        .SBTTL T0543 BIT TEST - SM0,DM0 - <N:C> = 0111
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [102,364,362,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,102 / 31[102]360,362 / 27[364]000,001

                                ;EXEC:          [364]ALUC=HHLHH :[362] D = 100000

                                ;CODES:         [362] SPS=3  /  N:C = 1001

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K3-4 OVLAP INSTR H  /  K3-3 BIT L  /  K3-3 SM=0L  /  K3-3 DM=0L
                                                ;  K4-4 ALLOW CLK L

042124  012700  000543          T0543:  MOV     #0543,R0                ;LOAD R0 WITH TEST NO.
042130  013701  042160                  MOV     @#I0543,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
042134  012702  177703                  MOV     #177703,R2      ;DEST ADDR = 177703
042140  012704  100000                  MOV     #100000,R4      ;RESULT S / B = 100000
042144  012705  100000                  MOV     #100000,R5      ;SRC OPR = 100000
042150  012703  100000          R0543:  MOV     #100000,R3      ;[DEST] = 100000
042154  000257                          CCC                     ;CLEAR FLAGS
042156  000267                          267                     ;N:C = 0111

042160  030503                  I0543:  BIT     R5,R3           ;TEST THE BIT

042162  100003                          BPL     E10543          ;N:C = 1001
042164  001402                          BEQ     E10543
042166  102401                          BVS     E10543
042170  103402                          BCS     A0543

042172  104005                  E10543: ERROR5                  ;BIT FAILED TO ALTER CODES PROPERLY
042174  042150                          R0543                   ;ERROR LOOP RETURN ADDRESS

042176  020403                  A0543:  CMP     R4,R3           ;CORRECT RESULT ?
042200  001403                          BEQ     O0543           ;BR IF YES

042202  011203                          MOV     (R2),R3         ;GET THE WAS DATA
042204  104000                  E20543: ERROR                   ;BIT DELIVERED A RESULT
042206  042150                          R0543                   ;ERROR LOOP RETURN ADDRESS

042210  000004                  O0543:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0544 BIT TEST - SM0,DM0 - <N:C> = 1000
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [102,364,362,001] FC 1,7,8

                                        ;ACT BUTS:      37[004]100,102 / 31[102]360,362 / 27[364]000,001

                                        ;EXEC:          [364]ALUC=HHLHH :[362] D = 000000

                                        ;CODES:         [362] SPS=3  /  N:C = 0100

                                        ;SYNC:          B05J2 (-) T = 1 USEC

                                        ;KEY SIG:       K3-3 BIT L  /  K3-3 SM=0L  /  K3-3 DM=0L  /  K3-4 OVLAP INSTR H
                                                        ;  K4-4 ALLOW CLK L

042212  012700  000544          T0544:  MOV     #0544,R0                ;LOAD R0 WITH TEST NO.
042216  013701  042256                  MOV     @#I0544,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
042222  032737  002000  066642          BIT     #2000,@#BPTLOC  ;BREAKPOINT HALT SET ??
042230  001401                          BEQ     .+4             ;BR IF NOT
042232  000000                          HALT                    ;BREAK-DEPRESS CONTINUE TO RESTART
042234  012702  177703                  MOV     #177703,R2      ;DEST ADDR = 177703
042240  012704  125252                  MOV     #125252,R4      ;RESULT S / B = 125252
042244  012705  052525                  MOV     #52525,R5       ;SRC OPR = 52525
042250  010403                  R0544:  MOV     R4,R3           ;[DEST] = 125252
042252  000257                          CCC                     ;CLEAR FLAGS
042254  000270                          SEN                     ;N:C = 1000

042256  030503                  I0544:  BIT     R5,R3   ;TEST THE BIT

042260  100403                          BMI     E10544          ;N:C = 0100
042262  001002                          BNE     E10544
042264  102401                          BVS     E10544
042266  103002                          BCC     A0544

042270  104005                  E10544: ERROR5                  ;BIT FAILED TO ALTER CODES PROPERLY
042272  042250                          R0544                   ;ERROR LOOP RETURN ADDRESS

042274  020403                  A0544:  CMP     R4,R3           ;CORRECT RESULT ?
042276  001402                          BEQ     O0544           ;BR IF YES

042300  104000                  E20544: ERROR                   ;BIT DELIVERED A RESULT
042302  042250                          R0544                   ;ERROR LOOP RETURN ADDRESS

042304  000004                  O0544:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0545 CMP TEST - SM0,DM0 - <N:C> = 0110
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [102,364,362,001]FC 1,7,8

                                ;ACT BUTS:      37[004]100,102 / 31[102]360,362 / 27[364]000,001

                                ;EXEC:          [364]ALUC=LLHHL :[362] D = 177777

                                ;CODES:         [362] SPS=3  /  N:C = 1001

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K3-8 CIN00 L  /  K3-3 CMP L  /  K3-3 SM=0L  /  K3-3 DM=0L
                                                ;  K3-4 OVLAP INSTR H  /  K4-4 ALLOW CLK L

042306  012700  000545          T0545:  MOV     #0545,R0                ;LOAD R0 WITH TEST NO.
042312  013701  042340                  MOV     @#I0545,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
042316  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
042322  012704  000001                  MOV     #+1,R4          ;RESULT S / B = +1
042326  005005                          CLR     R5              ;SRC OPR = 000000
042330  012703  000001          R0545:  MOV     #+1,R3          ;[DEST0546
042334  000257                          CCC                     ;CLEAR FLAGS
042336  000266                          266                     ;N:C = 0110

042340  020503                  I0545:  CMP     R5,R3           ;TEST THE CMP

042342  100003                          BPL     E10545          ;N:C = 1001
042344  001402                          BEQ     E10545
042346  102401                          BVS     E10545
042350  103402                          BCS     A0545

042352  104005                  E10545: ERROR5                  ;CMP FAILED TO ALTER CODES PROPERLY
042354  042330                          R0545                   ;ERROR LOOP RETURN ADDRESS

042356  020403                  A0545:  CMP     R4,R3           ;CORRECT RESULT ?
042360  001402                          BEQ     O0545           ;BR IF YES

042362  104000                  E20545: ERROR                   ;CMP DELIVERED A RESULT
042364  042330                          R0545                   ;ERROR LOOP RETURN ADDRESS

042366  000004                  O0545:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0546 CMP TEST - SM0,DM0 - <N:C> = 1010
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [102,364,362,001] FC 1,7,8

                                        ;ACT BUTS:      37[004]100,102 / 31[102]360,362 / 27[364]000,001

                                        ;EXEC:          [364]ALUC=LLHHL :[362] D = 000000

                                        ;CODES:         [362] SPS=3  /  N:C = 0100

                                        ;SYNC:          B05J2 (-) T = 1 USEC

                                        ;KEY SIG:       K3-8 CIN00 L  /  K3-3 CMP L  /  K3-3 SM=0L  /  K3-3 DM=0L
                                                        ;  K3-4 OVLAP INSTR H  /  K4-4 ALLOW CLK L

042370  012700  000546                  T0546:  MOV     #0546,R0                ;LOAD R0 WITH TEST NO.
042374  013701  042422                          MOV     @#I0546,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
042400  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
042404  012704  177777                          MOV     #-1,R4          ;RESULT S / B = 177777
042410  012705  177777                          MOV     #-1,R5          ;SRC OPR = 177777
042414  010403                          R0546:  MOV     R4,R3           ;[DEST] = 177777
042416  000257                                  CCC                     ;CLEAR FLAGS
042420  000272                                  272                     ;N:C = 1010

042422  020503                          I0546:  CMP     R5,R3           ;TEST THE CMP

042424  100403                                  BMI     E10546          ;N:C = 0100
042426  001002                                  BNE     E10546
042430  102401                                  BVS     E10546
042432  103002                                  BCC     A0546

042434  104005                          E10546: ERROR5                  ;CMP FAILED TO ALTER CODES PROPERLY
042436  042414                                  R0546                   ;ERROR LOOP RETURN ADDRESS

042440  020403                          A0546:  CMP     R4,R3           ;CORRECT RESULT ?
042442  001402                                  BEQ     O0546           ;BR IF YES

042444  104000                          E20546: ERROR                   ;CMP DELIVERED A RESULT
042446  042414                                  R0546                   ;ERROR LOOP RETURN ADDRESS

042450  000004                          O0546:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0547 CMP TEST - SM0,DM0 - <N:C> = 0000
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [102,364,362,001] FC 1,7,8

                                ;ACT BUTS:      37[004]100,102 / 31[102]360,362 / 27[364]000,001

                                ;EXEC:          [364]ALUC=LLHHL :[362] D = 077777

                                ;CODES:         [362] SPS=3  /  N:C = 0010

                                ;SYNC:          B05J2 (-) T = 1 USEC

                                ;KEY SIG:       K3-8 CIN00 L  /  K3-3 CMP L  /  K3-3 SM=0L  /  K3-3 DM=0L
                                                ;  K3-4 OVLAP INSTR H  /  K34-4 ALLOW CLK L

042452  012700  000547          T0547:  MOV     #0547,R0                ;LOAD R0 WITH TEST NO.
042456  013701  042504                  MOV     @#I0547,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
042462  012702  177703                  MOV     #177703,R2      ;DEST ADDR = R3
042466  012704  000001                  MOV     #+1,R4          ;RESULT S / B = +1
042472  012705  100000                  MOV     #100000,R5                      ;SRC OPR = 100000
042476  012703  000001          R0547:  MOV     #+1,R3          ;[DEST0550

042502  000257                          CCC                     ;CLEAR FLAGS

042504  020503                  I0547:  CMP     R5,R3           ;TEST THE CMP

042506  100403                          BMI     E10547          ;N:C = 0010
042510  001402                          BEQ     E10547
042512  102001                          BVC     E10547
042514  103002                          BCC     A0547

042516  104005                  E10547: ERROR5                  ;CMP FAILED TO ALTER CODES PROPERLY
042520  042476                          R0547                   ;ERROR LOOP RETURN ADDRESS

042522  020403                  A0547:  CMP     R4,R3           ;CORRECT RESULT ?
042524  001402                          BEQ     00547           ;BR IF YES

042526  104000                  E20547: ERROR                   ;CMP DELIVERED A RESULT
042530  042476                          R0547                   ;ERROR LOOP RETURN ADDRESS

042532  000004                  00547:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0550 BIS TEST - SM0,DM1 - <N:C> = 0111
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,7,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016

                                        ;EXEC:          [224]ALUC=LLLLH :[367] D = 177777

                                        ;CODES:         [367] SPS=3  /  N:C = 1001

                                        ;SYNC:          B05J2 (-) T = 2.8 USEC

                                        ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=0L  /  K3-3 DM=1L

042534  012700  000550                  T0550:  MOV     #0550,R0                ;LOAD R0 WITH TEST NO.
042540  013701  042570                          MOV     @#I0550,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
042544  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
042550  012704  177777                          MOV     #-1,R4          ;RESULT S / B = 177777
042554  012705  125252                          MOV     #125252,R5      ;SRC OPR = 125252
042560  012712  052525                  R0550:  MOV     #52525,(R2)     ;[DEST] = 52525
042564  000257                                  CCC                     ;CLEAR FLAGS
042566  000267                                  267                     ;N:C = 0111

042570  050512                          I0550:  BIS     R5,(R2)         ;TEST THE BIS

042572  100003                                  BPL     E10550          ;N:C = 1001
042574  001402                                  BEQ     E10550
042576  102401                                  BVS     E10550
042600  103402                                  BCS     A0550

042602  104005                          E10550: ERROR5                  ;BIS FAILED TO ALTER CODES PROPERLY
042604  042560                                  R0550                   ;ERROR LOOP RETURN ADDRESS

042606  020412                          A0550:  CMP     R4,(R2)         ;CORRECT RESULT ?
042610  001403                                  BEQ     O0550           ;BR IF YES

042612  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
042614  104000                          E20550: ERROR                   ;BIS DELIVERED THE WRONG RESULT
042616  042560                                  R0550                   ;ERROR LOOP RETURN ADDRESS

042620  000004                          O0550:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                ; ***********************************************************************
                                        .SBTTL T0551 BIS TEST - SM0,DM1 - <N:C> = 1000
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,7,8

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016

                                ;EXEC:          [224]ALUC=LLLLH :[367] D = 000000

                                ;CODES:         [367] SPS=3  /  N:C = 0100

                                ;SYNC:          B05J2 (-) T = 2.8 USEC

                                ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=0L  /  K3-3 DM=1L

042622  012700  000551          T0551:  MOV     #0551,R0                ;LOAD R0 WITH TEST NO.
042626  013701  042650                  MOV     @#I0551,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
042632  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
042636  005004                          CLR     R4              ;RESULT S / B = 000000
042640  005005                          CLR     R5              ;SRC OPR = 000000
042642  005012          R0551:  CLR     (R2)            ;[DEST] = 000000
042644  000257                          CCC                     ;CLEAR FLAGS
042646  000270                          SEN                     ;N:C = 1000

042650  050512          I0551:  BIS     R5,(R2)         ;TEST THE BIS

042652  100403                          BMI     E10551          ;N:C = 0100
042654  001002                          BNE     E10551
042656  102401                          BVS     E10551
042660  103002                          BCC     A0551

042662  104005          E10551: ERROR5                  ;BIS FAILED TO ALTER CODES PROPERLY
042664  042642                          R0551           ;ERROR LOOP RETURN ADDRESS

042666  020412          A0551:  CMP     R4,(R2)         ;CORRECT RESULT ?
042670  001403                          BEQ     O0551           ;BR IF YES

042672  011203                          MOV     (R2),R3         ;GET THE WAS DATA
042674  104000          E20551: ERROR                   ;BIS DELIVERED THE WRONG RESULT
042676  042642                          R0551           ;ERROR LOOP RETURN ADDRESS

042700  000004          O0551:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0552 BIC TEST - SM0,DM1 - <N:C> = 0111
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,7,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016

                                        ;EXEC:          [224]ALUC=HLLHL :[367] D = 100000

                                        ;CODES:         [367] SPS=3  /  N:C = 1001

                                        ;SYNC:          B05J2 (-) T = 2.7 USEC

                                        ;KEY SIG:       K3-3 BIC L  /  K3-3 SM=0L  /  K3-3 DM=1L

042702  012700  000552                  T0552:  MOV     #0552,R0                ;LOAD R0 WITH TEST NO.
042706  013701  042736                          MOV     @#I0552,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
042712  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
042716  012704  100000                          MOV     #100000,R4      ;RESULT S / B = 100000
042722  012705  077777                          MOV     #77777,R5               ;SRC OPR = 77777
042726  012712  177777                  R0552:  MOV     #-1,(R2)        ;[DEST] = 177777
042732  000257                                  CCC                     ;CLEAR FLAGS
042734  000267                                  267                     ;N:C = 0111

042736  040512                          I0552:  BIC     R5,(R2)         ;TEST THE BIC

042740  100003                                  BPL     E10552          ;N:C = 1001
042742  001402                                  BEQ     E10552
042744  102401                                  BVS     E10552
042746  103402                                  BCS     A0552

042750  104005                          E10552: ERROR5                  ;BIC FAILED TO ALTER CODES PROPERLY
042752  042726                                  R0552                   ;ERROR LOOP RETURN ADDRESS

042754  020412                          A0552:  CMP     R4,(R2)         ;CORRECT RESULT ?
042756  001403                                  BEQ     00552           ;BR IF YES

042760  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
042762  104000                          E20552: ERROR                   ;BIC DELIVERED THE WRONG RESULT
042764  042726                                  R0552                   ;ERROR LOOP RETURN ADDRESS

042766  000004                          00552:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0553 BIC TEST - SM0,DM1 - <N:C> = 1000
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,7,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016

                                        ;EXEC:          [224]ALUC=HLLHL :[367] D = 000000

                                        ;CODES:         [367] SPS=3  /  N:C = 0100

                                        ;SYNC:          B05J2 (-) T = 2.7 USEC

                                        ;KEY SIG:       K3-3 BIC L  /  K3-3 SM=0L  /  K3-3 DM=1L

042770  012700  000553                  T0553:  MOV     #0553,R0                ;LOAD R0 WITH TEST NO.
042774  013701  043016                          MOV     @#I0553,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
043000  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
043004  005004                                  CLR     R4              ;RESULT S / B = 000000
043006  005005                                  CLR     R5              ;SRC OPR = 000000
043010  005012                          R0553:  CLR     (R2)            ;[DEST] = 000000
043012  000257                                  CCC                     ;CLEAR FLAGS
043014  000270                                  SEN                     ;N:C = 1000

043016  040512                          I0553:  BIC     R5,(R2)         ;TEST THE BIC

043020  100403                                  BMI     E10553          ;N:C = 0100
043022  001002                                  BNE     E10553
043024  102401                                  BVS     E10553
043026  103002                                  BCC     A0553

043030  104005                          E10553: ERROR5                  ;BIC FAILED TO ALTER CODES PROPERLY
043032  043010                                  R0553                   ;ERROR LOOP RETURN ADDRESS

043034  020412                          A0553:  CMP     R4,(R2)         ;CORRECT RESULT ?
043036  001403                                  BEQ     O0553           ;BR IF YES

043040  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
043042  104000                          E20553: ERROR                   ;BIC DELIVERED THE WRONG RESULT
043044  043010                                  R0553                   ;ERROR LOOP RETURN ADDRESS

043046  000004                          O0553:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0554 BIT TEST - SM0,DM1 - <N:C> = 0111
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,7,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016

                                        ;EXEC:          [224]ALUC=HHLHH :[367] D = 100000

                                        ;CODES:         [367] SPS=3  /  N:C = 1001

                                        ;SYNC:          B05J2 (-) T = 2.7 USEC

                                        ;KEY SIG:       K3-3 BIT L  /  K3-3 SM=0L  /  K3-3 DM=0L  /  K4-4 ALLOW CLK L

043050  012700  000554                  T0554:  MOV     #0554,R0                ;LOAD R0 WITH TEST NO.
043054  013701  043104                          MOV     @#I0554,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
043060  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
043064  012704  100000                          MOV     #100000,R4      ;RESULT S / B = 100000
043070  012705  100000                          MOV     #100000,R5      ;SRC OPR = 100000
043074  012712  100000                  R0554:  MOV     #100000,(R2)    ;[DEST] = 100000
043100  000257                                  CCC                     ;CLEAR FLAGS
043102  000267                                  267                     ;N:C = 0111

043104  030512                          I0554:  BIT     R5,(R2)         ;TEST THE BIT

043106  100003                                  BPL     E10554          ;N:C = 1001
043110  001402                                  BEQ     E10554
043112  102401                                  BVS     E10554
043114  103402                                  BCS     A0554

043116  104005                          E10554: ERROR5                  ;BIT FAILED TO ALTER CODES PROPERLY
043120  043074                                  R0554                   ;ERROR LOOP RETURN ADDRESS

043122  020412                          A0554:  CMP     R4,(R2)         ;CORRECT RESULT ?
043124  001403                                  BEQ     O0554           ;BR IF YES

043126  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
043130  104000                          E20554: ERROR                   ;BIT DELIVERED A RESULT
043132  043074                                  R0554                   ;ERROR LOOP RETURN ADDRESS

043134  000004                          O0554:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0555 BIT TEST - SM0,DM1 - <N:C> = 1000
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,7,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016

                                        ;EXEC:          [224]ALUC=HHLHH :[367] D = 000000

                                        ;CODES:         [367] SPS=3  /  N:C = 0100

                                        ;SYNC:          B05J2 (-) T = 2.7 USEC

                                        ;KEY SIG:       K3-3 BIT L  /  K3-3 SM=0L  /  K3-3 DM=1L  /  K4-4 ALLOW CLK L

043136  012700  000555                  T0555:  MOV     #0555,R0                ;LOAD R0 WITH TEST NO.
043142  013701  043172                          MOV     @#I0555,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
043146  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
043152  012704  052525                          MOV     #52525,R4       ;RESULT S / B = 52525
043156  012705  125252                          MOV     #125252,R5      ;SRC OPR = 125252
043162  012712  052525                  R0555:  MOV     #52525,(R2)     ;[DEST] = 52525
043166  000257                                  CCC                     ;CLEAR FLAGS
043170  000270                                  SEN                     ;N:C = 1000

043172  030512                          I0555:  BIT     R5,(R2)         ;TEST THE BIT

043174  100403                                  BMI     E10555          ;N:C = 0100
043176  001002                                  BNE     E10555
043200  102401                                  BVS     E10555
043202  103002                                  BCC     A0555

043204  104005                          E10555: ERROR5                  ;BIT FAILED TO ALTER CODES PROPERLY
043206  043162                                  R0555                   ;ERROR LOOP RETURN ADDRESS

043210  020412                          A0555:  CMP     R4,(R2)         ;CORRECT RESULT ?
043212  001403                                  BEQ     00555           ;BR IF YES

043214  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
043216  104000                          E20555: ERROR                   ;BIT DELIVERED A RESULT
043220  043162                                  R0555                   ;ERROR LOOP RETURN ADDRESS
043222  000004                          00555:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0556 CMP TEST - SM0,DM1 - <N:C> = 1010
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016

                                        ;EXEC:          [224]ALUC=LLHHL :[367] D = 000000

                                        ;CODES:         [367] SPS=3  /  N:C = 0100

                                        ;SYNC:          B05J2 (-) T = 2.7 USEC

                                        ;KEY SIG:       K3-8 CIN00 L  /  K3-3 CMP L  /  K3-3 SM=0L  /  K3-3 DM=1L
                                                        ;  K4-4 ALLOW CLK L

043224  012700  000556                  T0556:  MOV     #0556,R0                ;LOAD R0 WITH TEST NO.
043230  013701  043260                          MOV     @#I0556,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
043234  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
043240  012704  177777                          MOV     #-1,R4          ;RESULT S / B = -1
043244  012705  177777                          MOV     #-1,R5          ;SRC OPR = 177777
043250  012712  177777                  R0556:  MOV     #-1,(R2)        ;[DEST] = 177777
043254  000257                                  CCC                     ;CLEAR FLAGS
043256  000272                                  272                     ;N:C = 1010

043260  020512                          I0556:  CMP     R5,(R2)         ;TEST THE CMP

043262  100403                                  BMI     E10556          ;N:C = 0100
043264  001002                                  BNE     E10556
043266  102401                                  BVS     E10556
043270  103002                                  BCC     A0556

043272  104005                          E10556: ERROR5                  ;CMP FAILED TO ALTER CODES PROPERLY
043274  043250                                  R0556                   ;ERROR LOOP RETURN ADDRESS

043276  020412                          A0556:  CMP     R4,(R2)         ;CORRECT RESULT ?
043300  001403                                  BEQ     00556           ;BR IF YES

043302  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
043304  104000                          E20556: ERROR                   ;CMP DELIVERED A RESULT
043306  043250                                  R0556                   ;ERROR LOOP RETURN ADDRESS

043310  000004                          00556:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0557 CMP TEST - SM0,DM1 - <N:C> = 0110
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,8

                                        ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016

                                        ;EXEC:          [224]ALUC=LLHHL :[367] D = 177777

                                        ;CODES:         [367] SPS=3  /  N:C = 1001

                                        ;SYNC:          B05J2 (-) T = 2.7 USEC

                                        ;KEY SIG:       K3-8 CIN00 L  /  K3- CMP L  /  K3-3 SM=0L  /  K3-3 DM=1L
                                                        ;  K4-4 ALLOW CLK L

043312  012700  000557                  T0557:  MOV     #0557,R0                ;LOAD R0 WITH TEST NO.
043316  013701  043344                          MOV     @#I0557,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
043322  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
043326  012704  000001                          MOV     #+1,R4          ;RESULT S / B = +1
043332  005005                                  CLR     R5              ;SRC OPR = 000000
043334  012712  000001                  R0557:  MOV     #+1,(R2)        ;[DEST0560
043340  000257                                  CCC                     ;CLEAR FLAGS
043342  000266                                  266                     ;N:C = 0110

043344  020512                          I0557:  CMP     R5,(R2)         ;TEST THE CMP

043346  100003                                  BPL     E10557          ;N:C = 1001
043350  001402                                  BEQ     E10557
043352  102401                                  BVS     E10557
043354  103402                                  BCS     A0557

043356  104005                          E10557: ERROR5                  ;CMP FAILED TO ALTER CODES PROPERLY
043360  043334                                  R0557                   ;ERROR LOOP RETURN ADDRESS

043362  020412                          A0557:  CMP     R4,(R2)         ;CORRECT RESULT ?
043364  001403                                  BEQ     00557           ;BR IF YES

043366  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
043370  104000                          E20557: ERROR                   ;CMP DELIVERED A RESULT
043372  043334                                  R0557                   ;ERROR LOOP RETURN ADDRESS

043374  000004                          00557:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ************************************************************************
                                        .SBTTL T0560 CMP TEST - SM0,DM1 - <N:C> = 0000
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,8

                                ;ACT BUTS:      37[004]100,161 / 33[266]220,224 / 16[367]016,016

                                ;EXEC:          [224]ALUC=LLHHL :[367] D = 077777

                                ;CODES:         [367] SPS=3  /  N:C = 0010

                                ;SYNC:          B05J2 (-) T = 2.7 USEC

                                ;KEY SIG:       K3-8 CIN00 L  /  K3-3 CMP L  /  K3-3 SM=0L  /  K3-3 DM=1L
                                                ;  K4-4 ALLOW CLK L

043376  012700  000560          T0560:  MOV     #0560,R0                ;LOAD R0 WITH TEST NO.
043402  013701  043430                  MOV     @#I0560,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
043406  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
043412  012704  000001                  MOV     #+1,R4          ;RESULT S / B = +1
043416  012705  100000                  MOV     #100000,R5      ;SRC OPR = 100000
043422  012712  000001          R0560:  MOV     #+1,(R2)        ;[DEST0561
043426  000257                          CCC                     ;CLEAR FLAGS

043430  020512                  I0560:  CMP     R5,(R2)         ;TEST THE CMP

043432  100403                          BMI     E10560          ;N:C = 0010
043434  001402                          BEQ     E10560
043436  102001                          BVC     E10560
043440  103002                          BCC     A0560

043442  104005                  E10560: ERROR5                  ;CMP FAILED TO ALTER CODES PROPERLY
043444  043422                          R0560                   ;ERROR LOOP RETURN ADDRESS

043446  020412                  A0560:  CMP     R4,(R2)         ;CORRECT RESULT ?
043450  001403                          BEQ     00560           ;BR IF YES

043452  011203                          MOV     (R2),R3         ;GET THE WAS DATA
043454  104000                  E20560: ERROR                   ;CMP DELIVERED A RESULT
043456  043422                          R0560                   ;ERROR LOOP RETURN ADDRESS

043460  000004                  00560:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0561 BIS TEST - SM1,DM0 - <N:C> = 0111
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,120,371,360,000] FC 1,2,8

                                        ;ACT BUTS:      37[004]100,141 / 35[247]120,120 / 31[120]360,360 / 27[371]000,000

                                        ;EXEC:          [371]ALUC=LLLLH :[360] D = 177777

                                        ;CODES:         [360] SPS=3  /  N:C = 1001

                                        ;SYNC:          B05J2 (-) T = 2.8 USEC

                                        ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=1L  /  K3-3 DM=0L

043462  012700  000561                  T0561:  MOV     #0561,R0                ;LOAD R0 WITH TEST NO.
043466  013701  043516                          MOV     @#I0561,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
043472  012702  177703                          MOV     #177703,R2      ;DEST ADDR = 177703
043476  012704  177777                          MOV     #-1,R4          ;RESULT S / B = 177777
043502  012705  067600                          MOV     #DWTA+10,R5     ;SRC ADDR = DWTA+10
043506  012703  052525                  R0561:  MOV     #52525,R3       ;[DEST] = 52525
043512  000257                                  CCC                     ;CLEAR FLAGS
043514  000267                                  267                     ;N:C = 0111

043516  051503                          I0561:  BIS     (R5),R3         ;TEST THE BIS

043520  100003                                  BPL     E10561          ;N:C = 1001
043522  001402                                  BEQ     E10561
043524  102401                                  BVS     E10561
043526  103402                                  BCS     A0561

043530  104005                          E10561: ERROR5                  ;BIS FAILED TO ALTER CODES PROPERLY
043532  043506                                  R0561                   ;ERROR LOOP RETURN ADDRESS

043534  020403                          A0561:  CMP     R4,R3           ;CORRECT RESULT ?
043536  001402                                  BEQ     O0561           ;BR IF YES

043540  104000                          E20561: ERROR                   ;BIS DELIVERED THE WRONG RESULT
043542  043506                                  R0561                   ;ERROR LOOP RETURN ADDRESS

043544  000004                          O0561:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0562 BIS TEST - SM1,DM0 - <N:C> = 1000
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [141,247,250,120,371,360,000] FC 1,2,8

                                ;ACT BUTS:      37[004]100,141 / 35[247]120,120 / 31[120]360,360 / 27[371]000,000

                                ;EXEC:          [371]ALUC=LLLLH :[360] D = 000000

                                ;CODES:         [360] SPS=3  /  N:C =0100

                                ;SYNC:          B05J2 (-) T = 2.8 USEC

                                ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=1L  /  K3-3 DM=0L

043546  012700  000562          T0562:  MOV     #0562,R0                ;LOAD R0 WITH TEST NO.
043552  013701  043576                  MOV     @#I0562,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
043556  012702  177703                  MOV     #177703,R2      ;DEST ADDR = 177703
043562  005004                          CLR     R4              ;RESULT S / B =000000
043564  012705  067570                  MOV     #DWTA,R5        ;SRC ADDR = DWTA
043570  005003                  R0562:  CLR     R3              ;[DEST] = 000000
043572  000257                          CCC                     ;CLEAR FLAGS
043574  000270                          SEN                     ;N:C = 1000

043576  051503                  I0562:  BIS     (R5),R3         ;TEST THE BIS

043600  100403                          BMI     E10562          ;N:C = 0100
043602  001002                          BNE     E10562
043604  102401                          BVS     E10562
043606  103002                          BCC     A0562

043610  104005                  E10562: ERROR5                  ;BIS FAILED TO ALTER CODES PROPERLY
043612  043570                          R0562                   ;ERROR LOOP RETURN ADDRESS

043614  020403                  A0562:  CMP     R4,R3           ;CORRECT RESULT ?
043616  001402                          BEQ     00562           ;BR IF YES

043620  104000                  E20562: ERROR                   ;BIS DELIVERED THE WRONG RESULT
043622  043570                          R0562                   ;ERROR LOOP RETURN ADDRESS

043624  000004                  00562:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0563 BIC TEST - SM1,DM0 - <N:C> = 0111
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [141,247,250,120,371,360,000] FC 1,2,8

                                ;ACT BUTS:      37[004]100,141 / 35[247]120,120 / 31[120]360,360 / 27[371]000,000

                                ;EXEC:          [371]ALUC=HLLHL :[360] D = 100000

                                ;CODES:         [360] SPS=3  /  N:C = 1001

                                ;SYNC:          B05J2 (-) T = 2.5 USEC

                                ;KEY SIG:       K3-3 BIC L  /  K3-3 SM=1L  /  K3-3 DM=0L

043626  012700  000563          T0563:  MOV     #0563,R0                ;LOAD R0 WITH TEST NO.
043632  013701  043666                  MOV     @#I0563,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
043636  012702  177703                  MOV     #177703,R2      ;DEST ADDR = 177703
043642  012704  100000                  MOV     #100000,R4      ;RESULT S / B = 100000
043646  012705  067564                  MOV     #MBUF1,R5       ;SRC ADDR = MBUF1
043652  012703  177777          R0563:  MOV     #-1,R3  ;[DEST] = 177777
043656  012715  077777                  MOV     #77777,(R5)     ;SRC OPR = 77777
043662  000257                          CCC                     ;CLEAR FLAGS
043664  000267                          267                     ;N:C = 0111

043666  041503                  I0563:  BIC     (R5),R3         ;TEST THE BIC

043670  100003                          BPL     E10563          ;N:C = 1001 ?
043672  001402                          BEQ     E10563
043674  102401                          BVS     E10563
043676  103402                          BCS     A0563

043700  104005                  E10563: ERROR5                  ;BIC FAILED TO ALTER CODES PROPERLY
043702  043652                          R0563                   ;ERROR LOOP RETURN ADDRESS

043704  020403                  A0563:  CMP     R4,R3           ;CORRECT RESULT ?
043706  001402                          BEQ     O0563           ;BR IF YES

043710  104000                  E20563: ERROR                   ;BIC DELIVERED THE WRONG RESULT
043712  043652                          R0563                   ;ERROR LOOP RETURN ADDRESS

043714  000004                  O0563:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0564 BIC TEST - SM1,DM0 - <N:C> = 1000
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [141,247,250,120,371,360,000] FC 1,2,8

                                ;ACT BUTS:      37[004]100,141 / 35[247]120,120 / 31[120]360,360 / 27[371]000,000

                                ;EXEC:          [371]ALUC=HLLHL :[360] D = 000000

                                ;CODES:         [360] SPS=3  /  N:C = 0100

                                ;SYNC:          B05J2 (-) T = 2.5 USEC

                                ;KEY SIG:       K3-3 BIC L  /  K3-3 SM=1L  /  K3-3 DM=0L

043716  012700  000564          T0564:  MOV     #0564,R0                ;LOAD R0 WITH TEST NO.
043722  013701  043746                  MOV     @#I0564,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
043726  012702  177703                  MOV     #177703,R2      ;DEST ADDR = 177703
043732  005004                          CLR     R4              ;RESULT S / B = 000000
043734  012705  067570                  MOV     #DWTA,R5        ;SRC ADDR = DWTA
043740  005003                  R0564:  CLR     R3              ;[DEST] =000000
043742  000257                          CCC                     ;CLEAR FLAGS
043744  000270                          SEN                     ;N:C = 1000

043746  041503                  I0564:  BIC     (R5),R3         ;TEST THE BIC

043750  100403                          BMI     E10564          ;N:C = 0100
043752  001002                          BNE     E10564
043754  102401                          BVS     E10564
043756  103002                          BCC     A0564

043760  104005                  E10564: ERROR5                  ;BIC FAILED TO ALTER CODES PROPERLY
043762  043740                          R0564                   ;ERROR LOOP RETURN ADDRESS

043764  020403                  A0564:  CMP     R4,R3           ;CORRECT RESULT ?
043766  001402                          BEQ     00564           ;BR IF YES

043770  104000                  E20564: ERROR                   ;BIC DELIVERED THE WRONG RESULT
043772  043740                          R0564                   ;ERROR LOOP RETURN ADDRESS

043774  000004                  00564:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0565 BIT TEST - SM1,DM0 - <N:C> = 0111
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [141,247,250,120,371,362,000] FC 1,2,8

                                ;ACT BUTS:      37[004]100,141 / 35[247]120,120 / 31[120]360,362 / 27[371]000,000

                                ;EXEC:          [371]ALUC=HHLHH :[362] D = 100000

                                ;CODES:         [362] SPS=3  /  N:C = 1001

                                ;SYNC:          B05J2 (-) T = 2.5 USEC

                                ;KEY SIG:       K3-3 BIT L  /  K3-3 SM=1L  /  K3-3 DM=0L  /  K4-4 ALLOW CLK L

043776  012700  000565          T0565:  MOV     #0565,R0                ;LOAD R0 WITH TEST NO.
044002  013701  044030                  MOV     @#I0565,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
044006  012702  177703                  MOV     #177703,R2      ;DEST ADDR = 177703
044012  012704  100000                  MOV     #100000,R4      ;RESULT S / B = 100000
044016  012705  067572                  MOV     #DWTA+2,R5      ;SRC ADDR = DWTA+2
044022  010403                  R0565:  MOV     R4,R3           ;[DEST] = 100000
044024  000257                          CCC                     ;CLEAR FLAGS
044026  000267                          267                     ;N:C = 0111

044030  031503                  I0565:  BIT     (R5),R3         ;TEST THE BIT

044032  100003                          BPL     E10565          ;N:C = 1001 ?
044034  001402                          BEQ     E10565
044036  102401                          BVS     E10565
044040  103402                          BCS     A0565

044042  104005                  E10565: ERROR5                  ;BIT FAILED TO ALTER CODES PROPERLY
044044  044022                          R0565                   ;ERROR LOOP RETURN ADDRESS

044046  020403                  A0565:  CMP     R4,R3           ;CORRECT RESULT ?
044050  001402                          BEQ     O0565           ;BR IF YES

044052  104000                  E20565: ERROR                   ;BIT DELIVERED A RESULT
044054  044022                          R0565                   ;ERROR LOOP RETURN ADDRESS

044056  000004                  O0565:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0566 BIT TEST - SM1,DM0 - <N:C> = 1000
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,120,371,362,000] FC 1,2,8

                                        ;ACT BUTS:      37[004]100,141 / 35[247]120,120 / 31[120]360,362 / 27[371]000,000

                                        ;EXEC:          [371]ALUC=HHLHH :[362] D = 000000

                                        ;CODES:         [362] SPS=3  /  N:C = 0100

                                        ;SYNC:          B05J2 (-) T = 2.5 USEC

                                        ;KEY SIG:       K3-3 BIT L  /  K3-3 SM=1L  /  K3-3 DM=0L  /  K4-4 ALLOW CLK L

044060  012700  000566                  T0566:  MOV     #0566,R0                ;LOAD R0 WITH TEST NO.
044064  013701  044112                          MOV     @#I0566,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
044070  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
044074  012704  052525                          MOV     #52525,R4       ;RESULT S / B = 52525
044100  012705  067600                          MOV     #DWTA+10,R5     ;SRC ADDR = DWTA+10
044104  010403                          R0566:  MOV     R4,R3           ;[DEST] = 52525
044106  000257                                  CCC                     ;CLEAR FLAGS
044110  000270                                  SEN                     ;N:C = 1000

044112  031503                          I0566:  BIT     (R5),R3         ;TEST THE BIT

044114  100403                                  BMI     E10566          ;N:C = 0100
044116  001002                                  BNE     E10566
044120  102401                                  BVS     E10566
044122  103002                                  BCC     A0566

044124  104005                          E10566: ERROR5                  ;BIT FAILED TO ALTER CODES PROPERLY
044126  044104                                  R0566                   ;ERROR LOOP RETURN ADDRESS

044130  020403                          A0566:  CMP     R4,R3           ;CORRECT RESULT ?
044132  001402                                  BEQ     00566           ;BR IF YES

044134  104000                          E20566: ERROR                   ;BIT DELIVERED A RESULT
044136  044104                                  R0566                   ;ERROR LOOP RETURN ADDRESS
044140  000004                          00566:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0567 CMP TEST - SM1,DM0 - <N:C> = 0110
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,120,371,362,000] FC 1,2,8

                                        ;ACT BUTS:      37[004]100,141 / 35[247]120,120 / 31[120]360,362 / 27[371]000,000

                                        ;EXEC:          [371]ALUC=LLHHL :[362] D = 177777

                                        ;CODES:         [362] SPS=3  /  N:C = 1001

                                        ;SYNC:          B05J2 (-) T = 2.7 USEC

                                        ;KEY SIG:       K3-8 CIN00 L  /  K3-3 CMP L  /  K3-3 SM=1L  /  K3-3 DM=0L
                                                        ;  K4-4 ALLOW CLK L

044142  012700  000567                  T0567:  MOV     #0567,R0                ;LOAD R0 WITH TEST NO.
044146  013701  044174                          MOV     @#I0567,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
044152  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
044156  012704  000001                          MOV     #+1,R4          ;RESULT S / B = +1
044162  012705  067570                          MOV     #DWTA,R5        ;SRC ADDR = DWTA
044166  010403                          R0567:  MOV     R4,R3           ;[DEST0570
044170  000257                                  CCC                     ;CLEAR FLAGS
044172  000266                                  266                     ;N:C = 0110

044174  021503                          I0567:  CMP     (R5),R3         ;TEST THE CMP

044176  100003                                  BPL     E10567          ;N:C = 1001
044200  001402                                  BEQ     E10567
044202  102401                                  BVS     E10567
044204  103402                                  BCS     A0567

044206  104005                          E10567: ERROR5                  ;CMP FAILED TO ALTER CODES PROPERLY
044210  044166                                  R0567                   ;ERROR LOOP RETURN ADDRESS

044212  020403                          A0567:  CMP     R4,R3           ;CORRECT RESULT ?
044214  001402                                  BEQ     00567           ;BR IF YES

044216  104000                          E20567: ERROR                   ;CMP DELIVERED A RESULT
044220  044166                                  R0567                   ;ERROR LOOP RETURN ADDRESS

044222  000004                          00567:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0570 CMP TEST - SM1,DM0 - <N:C> = 1010
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,120,371,362,000] FC 1,2,8

                                        ;ACT BUTS:      37[004]100,141 / 35[247]120,120 / 31[120]360,362 / 27[371]000,000

                                        ;EXEC:          [371]ALUC=LLHHL :[362] D = 000000

                                        ;CODES:         [362] SPS=3  /  N:C = 0100

                                        ;SYNC:          B05J2 (-) T = 2.7 USEC

                                        ;KEY SIG:       K3-8 CIN00 L  /  K3-3 CMP L  /  K3-3 SM=1L  /  K3-3 DM=0L
                                                        ;  K4-4 ALLOW CLK L

044224  012700  000570                  T0570:  MOV     #0570,R0                ;LOAD R0 WITH TEST NO.
044230  013701  044256                          MOV     @#I0570,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
044234  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
044240  012704  177777                          MOV     #-1,R4          ;RESULT S / B = 177777
044244  012705  067572                          MOV     #DWTA+2,R5      ;SRC ADDR = DWTA+2
044250  010403                          R0570:  MOV     R4,R3           ;[DEST] = 177777
044252  000257                                  CCC                     ;CLEAR FLAGS
044254  000272                                  272                     ;N:C = 1010

044256  021503                          I0570:  CMP     (R5),R3         ;TEST THE CMP

044260  100403                                  BMI     E10570          ;N:C = 0100
044262  001002                                  BNE     E10570
044264  102401                                  BVS     E10570
044266  103002                                  BCC     A0570

044270  104005                          E10570: ERROR5                  ;CMP FAILED TO ALTER CODES PROPERLY
044272  044250                                  R0570                   ;ERROR LOOP RETURN ADDRESS

044274  020403                          A0570:  CMP     R4,R3           ;CORRECT RESULT ?
044276  001402                                  BEQ     00570           ;BR IF YES

044300  104000                          E20570: ERROR                   ;CMP DELIVERED A RESULT
044302  044250                                  R0570                   ;ERROR LOOP RETURN ADDRESS

044304  000004                          00570:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0571 CMP TEST - SM1,DM0 - <N:C> = 0000
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,120,371,362,000] FC 1,2,8

                                        ;ACT BUTS:      37[004]100,141 / 35[247]120,120 / 31[120]360,362 / 27[371]000,000

                                        ;EXEC:          [371]ALUC=LLHHL :[362] D = 077777

                                        ;CODES:         [362] SPS=3  /  N:C = 0010

                                        ;SYNC:          B05J2 (-) T = 2.7 USEC

                                        ;KEY SIG:       K3-8 CIN00 L  /  K3-3 CMP L  /  K3-3 SM=1L  /  K3-3 DM=0L
                                                        ;  K4-4 ALLOW CLK L

044306  012700  000571                  T0571:  MOV     #0571,R0                ;LOAD R0 WITH TEST NO.
044312  013701  044344                          MOV     @#I0571,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
044316  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
044322  012704  000001                          MOV     #+1,R4          ;RESULT S / B = +1
044326  012705  067564                          MOV     #MBUF1,R5       ;SRC ADDR = MBUF1
044332  012703  000001                  R0571:  MOV     #+1,R3          ;[DEST0572
044336  012715  100000                          MOV     #100000,(R5)    ;SRC OPR = 100000
044342  000257                                  CCC                     ;CLEAR FLAGS

044344  021503                          I0571:  CMP     (R5),R3         ;TEST THE CMP

044346  100403                                  BMI     E10571          ;N:C = 0010
044350  001402                                  BEQ     E10571
044352  102001                                  BVC     E10571
044354  103002                                  BCC     A0571

044356  104005                          E10571: ERROR5                  ;CMP FAILED TO ALTER CODES PROPERLY
044360  044332                                  R0571                   ;ERROR LOOP RETURN ADDRESS

044362  020403                          A0571:  CMP     R4,R3           ;CORRECT RESULT ?
044364  001402                                  BEQ     00571           ;BR IF YES

044366  104000                          E20571: ERROR                   ;CMP DELIVERED A RESULT
044370  044332                                  R0571                   ;ERROR LOOP RETURN ADDRESS

044372  000004                          00571:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0572 BIS  SM1,DM1 TEST - <N:C> = 0111
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [141,247,250,161,266,267,225,367,375,016] FC 1,2,3,8

                                ;ACT BUTS:      37[004]100,141  /  35[247]120,161  /  33[266]220,225  /  16[367]016,016

                                ;EXEC:          [225]ALUC=LLLLH :[367]D=177777

                                ;CODES:         [367]SPS=3       /       N:C=1001

                                ;SYNC:          B05J2   (-)      T= 3.4 USEC

                                ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=1 L  /  K3-3 DM=1 L

044374  012700  000572          T0572:  MOV     #0572,R0                ;LOAD R0 WITH TEST NO.
044400  013701  044430                  MOV     @#I0572,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
044404  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
044410  012704  177777                  MOV     #-1,R4          ;RESULT S / B = 1777777
044414  012705  067600                  MOV     #DWTA+10,R5     ;SOURCE ADDR = DWTA+10
044420  012712  052525          R0572:  MOV     #52525,(R2)     ;[DEST] = 052525
044424  000257                          CCC                     ;CLEAR FLAGS
044426  000267                          267                     ;N:C = 0111

044430  051512                  I0572:  BIS     (R5),(R2)       ;TEST THE BIS

044432  100003                          BPL     E10572          ;N:C = 1001?
044434  001402                          BEQ     E10572
044436  102401                          BVS     E10572
044440  103402                          BCS     A0572

044442  104005                  E10572: ERROR5                  ;BIS FAILED TO ALTER CODES PROPERLY
044444  044420                          R0572                   ;ERROR LOOP RETURN ADDRESS

044446  020412                  A0572:  CMP     R4,(R2)         ;CORRECT RESULT ?
044450  001403                          BEQ     O0572           ;BR IF YES

044452  011203                          MOV     (R2),R3         ;GET THE WAS DATA
044454  104000                  E20572: ERROR                   ;BIS DELIVERED THE WRONG RESULT
044456  044420                          R0572                   ;ERROR LOOP RETURN ADDRESS

044460  000004                  O0572:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0573 BIS  SM1,DM1 TEST - <N:C> = 1000
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [141,247,250,161,266,267,225,367,375,016] FC 1,2,3,8

                                ;ACT BUTS:      37[004]100,141  /  35[247]120,161  /  33[266]220,225  /  16[367]016,016

                                ;EXEC:          [225]ALUC=LLLLH :[367]D=000000

                                ;CODES:         [367]SPS=3       /       N:C=0100

                                ;SYNC:          B05J2   (-)      T=3.4 USEC

                                ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=1 L  /  K3-3 DM=1 L

044462  012700  000573          T0573:  MOV     #0573,R0                ;LOAD R0 WITH TEST NO.
044466  013701  044516                  MOV     @#I0573,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
044472  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
044476  012704  000000                  MOV     #0,R4           ;RESULT S / B = 000000
044502  012705  067570                  MOV     #DWTA,R5        ;SOURCE ADDR = DWTA
044506  012712  000000          R0573:  MOV     #0,(R2)         ;[DEST] = 000000
044512  000257                          CCC                     ;CLEAR FLAGS
044514  000270                          SEN                     ;N:C = 1000

044516  051512                  I0573:  BIS     (R5),(R2)       ;TEST THE BIS

044520  100403                          BMI     E10573          ;N:C = 0100 ?
044522  001002                          BNE     E10573
044524  102401                          BVS     E10573
044526  103002                          BCC     A0573

044530  104005                  E10573: ERROR5                  ;BIS FAILED TO ALTER CODES PROPERLY
044532  044506                          R0573                   ;ERROR LOOP RETURN ADDRESS

044534  020412                  A0573:  CMP     R4,(R2)         ;CORRECT RESULT ?
044536  001403                          BEQ     00573           ;BR IF YES

044540  011203                          MOV     (R2),R3         ;GET THE WAS DATA
044542  104000                  E20573: ERROR                   ;BIS DELIVERED THE WRONG RESULT
044544  044506                          R0573                   ;ERROR LOOP RETURN ADDRESS

044546  000004                  00573:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***************************************************************
                                                .SBTTL T0574 BIC  SM1,DM1 TEST - <N:C> = 0111
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,161,266,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,141  /  35[247]120,161  /  33[266]220,225  /  16[367]016,016

                                        ;EXEC:          [225]ALUC=HLLHL :[367]D=100000

                                        ;CODES:         [367]SPS=3       /      N:C=1001

                                        ;SYNC:          B05J2   (-)     T= 3.4 USEC

                                        ;KEY SIG:       K3-3 BIC L  /  K3-3 SM=1 L  /  K3-3 DM=1 L

044550  012700  000574                  T0574:  MOV     #0574,R0                ;LOAD R0 WITH TEST NO.
044554  013701  044610                          MOV     @#I0574,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
044560  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
044564  012704  100000                          MOV     #100000,R4      ;RESULT S / B = 100000
044570  012705  067564                          MOV     #MBUF1,R5       ;SOURCE ADDR = MBUF1
044574  012715  077777                  R0574:  MOV     #77777,(R5)     ;[SOURCE] = 77777
044600  012712  177777                          MOV     #-1,(R2)        ;[DEST] = 177777
044604  000257                                  CCC                     ;CLEAR FLAGS
044606  000267                                  267                     ;N:C = 0111

044610  041512                          I0574:  BIC     (R5),(R2)       ;TEST THE BIC

044612  100003                                  BPL     E10574          ;N:C = 1001 ?
044614  001402                                  BEQ     E10574
044616  102401                                  BVS     E10574
044620  103402                                  BCS     A0574

044622  104005                          E10574: ERROR5                  ;BIC FAILED TO ALTER CODES PROPERLY
044624  044574                                  R0574                   ;ERROR LOOP RETURN ADDRESS

044626  020412                          A0574:  CMP     R4,(R2)         ;CORRECT RESULT ?
044630  001403                                  BEQ     O0574           ;BR IF YES

044632  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
044634  104000                          E20574: ERROR                   ;BIC DELIVERED THE WRONG RESULT
044636  044574                                  R0574                   ;ERROR LOOP RETURN ADDRESS

044640  000004                          O0574:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0575 BIC  SM1,DM1 TEST - <N:C> = 1000
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,162,266,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,141  /  35[247]120,161  /  33[266]220,225  /  16[367]016,016

                                        ;EXEC:          [225]ALUC=HLLHL :[367]D=000000

                                        ;CODES:         [367]SPS=3       /      N:C=0100

                                        ;SYNC:          B05J2   (-)      T= 3.4 USEC

                                        ;KEY SIG:       K3-3 BIC L  /  K3-3 SM=1 L  /  K3-3 DM=1 L

044642  012700  000575                  T0575:  MOV     #0575,R0                ;LOAD R0 WITH TEST NO.
044646  013701  044702                          MOV     @#I0575,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
044652  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
044656  012704  000000                          MOV     #0,R4           ;RESULT S / B = 000000
044662  012705  067564                          MOV     #MBUF1,R5       ;SOURCE ADDR = MBUF1
044666  012715  000000                  R0575:  MOV     #0,(R5)         ;[SOURCE] = 000000
044672  012712  000000                          MOV     #0,(R2)         ;[DEST] = 000000
044676  000257                                  CCC                     ;CLEAR FLAGS
044700  000270                                  SEN                     ;N:C = 1000

044702  041512                          I0575:  BIC     (R5),(R2)       ;TEST THE BIC

044704  100403                                  BMI     E10575          ;N:C = 0100 ?
044706  001002                                  BNE     E10575
044710  102401                                  BVS     E10575
044712  103002                                  BCC     A0575

044714  104005                          E10575: ERROR5                  ;BIC FAILED TO ALTER CODES PROPERLY
044716  044666                                  R0575                   ;ERROR LOOP RETURN ADDRESS

044720  020412                          A0575:  CMP     R4,(R2)         ;CORRECT RESULT ?
044722  001403                                  BEQ     O0575           ;BR IF YES

044724  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
044726  104000                          E20575: ERROR                   ;BIC DELIVERED THE WRONG RESULT
044730  044666                                  R0575                   ;ERROR LOOP RETURN ADDRESS

044732  000004                          O0575:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0576 BIT  SM1,DM1 TEST - <N:C> = 1000
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,161,266,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,141  /  35[247]120,161  /  33[266]220,225  /  16[367]016,016

                                        ;EXEC:          [225]ALUC=HHLHH :[367]D=000000

                                        ;CODES:         [367]SPS=3       /      N:C=0100

                                        ;SYNC:          B05J2   (-)      T=3.4 USEC

                                        ;KEY SIG:       K3-3 BIT L  /  K3-3 SM=1 L  /  K3-3 DM=1 L  /  K4-4 ALLOW CLK L

044734  012700  000576                  T0576:  MOV     #0576,R0                ;LOAD R0 WITH TEST NO.
044740  013701  044774                          MOV     @#I0576,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
044744  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
044750  012704  125252                          MOV     #125252,R4      ;RESULT S / B = 125252
044754  012705  067564                          MOV     #MBUF1,R5       ;SOURCE ADDR = MBUF1
044760  012715  052525                  R0576:  MOV     #52525,(R5)     ;[SOURCE] = 052525
044764  012712  125252                          MOV     #125252,(R2)    ;[DEST] = 125252
044770  000257                                  CCC                     ;CLEAR FLAGS
044772  000270                                  SEN                     ;N:C = 1000

044774  031512                          I0576:  BIT     (R5),(R2)       ;TEST THE BIT

044776  100403                                  BMI     E10576          ;N:C = 0100 ?
045000  001002                                  BNE     E10576
045002  102401                                  BVS     E10576
045004  103002                                  BCC     A0576

045006  104005                          E10576: ERROR5                  ;BIT FAILED TO ALTER CODES PROPERLY
045010  044760                                  R0576                   ;ERROR LOOP RETURN ADDRESS

045012  020412                          A0576:  CMP     R4,(R2)         ;CORRECT RESULT ?
045014  001403                                  BEQ     00576           ;BR IF YES

045016  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
045020  104000                          E20576: ERROR                   ;BIT DELIVERED A RESULT
045022  044760                                  R0576                   ;ERROR LOOP RETURN ADDRESS

045024  000004                          00576:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0577 BIT  SM1,DM1 TEST - <N:C> = 0111
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,161,266,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,141  /  35[247]120,161  /  33[266]220,225  /  16[367]016,016

                                        ;EXEC:          [225]ALUC=HHLHH :[367]D=100000

                                        ;CODES:         [367]SPS=3       /      N:C=1001

                                        ;SYNC:          B05J2   (-)      T=3.4 USEC

                                        ;KEY SIG:       K3-3 BIT L  /  K3-3 SM=1 L  /  K3-3 DM=1 L  /  K4-4 ALLOW CLK L

045026  012700  000577                  T0577:  MOV     #0577,R0                ;LOAD R0 WITH TEST NO.
045032  013701  045066                          MOV     @#I0577,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
045036  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
045042  012704  100000                          MOV     #100000,R4      ;RESULT S / B = 100000
045046  012705  067564                          MOV     #MBUF1,R5       ;SOURCE ADDR = MBUF1
045052  012715  100000                  R0577:  MOV     #100000,(R5)    ;[SOURCE] = 100000
045056  012712  100000                          MOV     #100000,(R2)    ;[DEST] = 100000
045062  000257                                  CCC                     ;CLEAR FLAGS
045064  000267                                  267                     ;N:C = 0111

045066  031512                          I0577:  BIT     (R5),(R2)       ;TEST THE BIT

045070  100003                                  BPL     E10577          ;N:C = 1001 ?
045072  001402                                  BEQ     E10577
045074  102401                                  BVS     E10577
045076  103402                                  BCS     A0577

045100  104005                          E10577: ERROR5                  ;BIT FAILED TO ALTER CODES PROPERLY
045102  045052                                  R0577                   ;ERROR LOOP RETURN ADDRESS

045104  020412                          A0577:  CMP     R4,(R2)         ;CORRECT RESULT ?
045106  001403                                  BEQ     O0577           ;BR IF YES

045110  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
045112  104000                          E20577: ERROR                   ;BIT DELIVERED A RESULT
045114  045052                                  R0577                   ;ERROR LOOP RETURN ADDRESS

045116  000004                          O0577:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0600 CMP  SM1,DM1 TEST - <N:C> = 1010
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,161,266,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,141  /  35[247]120,161  /  33[266]220,225  /  16[367]016,016

                                        ;EXEC:          [225]ALUC=LLHHL :[367]D=000000

                                        ;CODES:         [367]SPS=3       /      N:C=0100

                                        ;SYNC:          B05J2   (-)      T=3.4 USEC

                                        ;KEY SIG:       K3-3 CMP L  /  K3-3 SM=1 L  /  K3-3 DM=1 L  /  K3-8 CIN00 L
                                                        ;  K4-4 ALLOW CLK L

045120  012700  000600                  T0600:  MOV     #0600,R0                ;LOAD R0 WITH TEST NO.
045124  013701  045156                          MOV     @#I0600,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
045130  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
045134  012704  177777                          MOV     #-1,R4          ;RESULT S / B = 177777
045140  012705  067564                          MOV     #MBUF1,R5               ;SOURCE ADDR =
045144  012715  177777                  R0600:  MOV     #-1,(R5)        ;[SOURCE] = 177777
045150  010412                                  MOV     R4,(R2)         ;[DEST] = 177777
045152  000257                                  CCC                     ;CLEAR FLAGS
045154  000272                                  272                     ;N:C = 1010

045156  021512                          I0600:  CMP     (R5),(R2)       ;TEST THE CMP

045160  100403                                  BMI     E10600          ;N:C = 0100 ?
045162  001002                                  BNE     E10600
045164  102401                                  BVS     E10600
045166  103002                                  BCC     A0600

045170  104005                          E10600: ERROR5                  ;CMP FAILED TO ALTER CODES PROPERLY
045172  045144                                  R0600                   ;ERROR LOOP RETURN ADDRESS

045174  020412                          A0600:  CMP     R4,(R2)         ;CORRECT RESULT ?
045176  001403                                  BEQ     00600           ;BR IF YES

045200  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
045202  104000                          E20600: ERROR                   ;CMP DELIVERED A RESULT
045204  045144                                  R0600                   ;ERROR LOOP RETURN ADDRESS

045206  000004                          00600:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0601 CMP  SM1,DM1 TEST - <N:C> = 0110
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,161,266,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,141  /  35[247]120,161  /  33[266]220,225  /  16[367]016,016

                                        ;EXEC:          [225]ALUC=LLHHL :[367]D=177777

                                        ;CODES:         [367]SPS=3       /      N:C=1001

                                        ;SYNC:          B05J2   (-)      T=3.4 USEC

                                        ;KEY SIG:       K3-3 CMP L  /  K3-3 SM=1 L  /  K3-3 DM=1 L  /  K3-8 CIN00 L
                                                        ;  K4-4 ALLOW CLK L

045210  012700  000601                  T0601:  MOV     #0601,R0                ;LOAD R0 WITH TEST NO.
045214  013701  045250                          MOV     @#I0601,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
045220  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
045224  012704  000001                          MOV     #+1,R4          ;RESULT S / B = 000001
045230  012705  067564                          MOV     #MBUF1,R5       ;SOURCE ADDR = MBUF1
045234  012715  000000                  R0601:  MOV     #0,(R5)         ;[SOURCE] = 000000
045240  012712  000001                          MOV     #+1,(R2)        ;[DEST] = 000001
045244  000257                                  CCC                     ;CLEAR FLAGS
045246  000266                                  266                     ;N:C = 0110

045250  021512                          I0601:  CMP     (R5),(R2)       ;TEST THE CMP

045252  100003                                  BPL     E10601          ;N:C = 1001 ?
045254  001402                                  BEQ     E10601
045256  102401                                  BVS     E10601
045260  103402                                  BCS     A0601

045262  104005                          E10601: ERROR5                  ;CMP FAILED TO ALTER CODES PROPERLY
045264  045234                                  R0601                   ;ERROR LOOP RETURN ADDRESS

045266  020412                          A0601:  CMP     R4,(R2)         ;CORRECT RESULT ?
045270  001403                                  BEQ     00601           ;BR IF YES

045272  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
045274  104000                          E20601: ERROR                   ;CMP DELIVERED A RESULT
045276  045234                                  R0601                   ;ERROR LOOP RETURN ADDRESS

045300  000004                          00601:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***************************************************************
                                                .SBTTL T0602 CMP  SM1,DM1 TEST - <N:C> = 0000
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,161,266,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,141  /  35[247]120,161  /  33[266]220,225  /  16[367]016,016

                                        ;EXEC:          [225]ALUC=LLHHL :[367]D=077777

                                        ;CODES:         [367]SPS=3       /      N:C=0010

                                        ;SYNC:          B05J2   (-)      T=3.4 USEC

                                        ;KEY SIG:       K3-3 CMP L  /  K3-3 SM=1 L  /  K3-3 DM=1 L  /  K3-8 CIN00 L
                                                        ;  K4-4 ALLOW CLK L

045302  012700  000602                  T0602:  MOV     #0602,R0                ;LOAD R0 WITH TEST NO.
045306  013701  045340                          MOV     @#I0602,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
045312  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
045316  012704  000001                          MOV     #+1,R4          ;RESULT S / B = 000001
045322  012705  067564                          MOV     #MBUF1,R5       ;SOURCE ADDR = MBUF1
045326  012715  100000                  R0602:  MOV     #100000,(R5)    ;[SOURCE] = 100000
045332  012712  000001                          MOV     #+1,(R2)        ;[DEST] = 000001
045336  000257                                  CCC                     ;N:C = 0000

045340  021512                          I0602:  CMP     (R5),(R2)       ;TEST THE CMP

045342  100403                                  BMI     E10602          ;N:C = 0010 ?
045344  001402                                  BEQ     E10602
045346  102001                                  BVC     E10602
045350  103002                                  BCC     A0602

045352  104005                          E10602: ERROR5                  ;CMP FAILED TO ALTER CODES PROPERLY
045354  045326                                  R0602                   ;ERROR LOOP RETURN ADDRESS

045356  020412                          A0602:  CMP     R4,(R2)         ;CORRECT RESULT ?
045360  001403                                  BEQ     00602           ;BR IF YES

045362  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
045364  104000                          E20602: ERROR                   ;CMP DELIVERED A RESULT
045366  045326                                  R0602                   ;ERROR LOOP RETURN ADDRESS

045370  000004                          00602:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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                                        ; ***************************************************************
                                                .SBTTL T0603 BISB  SM1,DM0 TEST - SOURCE ADDR ODD
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,137,251,120,371,360,000] FC 1,2,8

                                        ;ACT BUTS:      37[004]100,141  /  35[247]120,137  /  36[137]120,120  /  31[120]360,360
                                                        ;  /  27[371]000,000

                                        ;EXEC:          [371]ALUC=LLLLH :[360]D=177777

                                        ;CODES:         [360]SPS=3       /      N:C=1000

                                        ;SYNC:          B05J2   (-)     T=2.8 USEC

                                        ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=1 L  /  K3-3 DM=0 L  /  K1-6 BA00(1) H
                                                        ;  K3-7 ODD BYTE H  /  K3-6 BYTE INSTR H

045372  012700  000603                  T0603:  MOV     #0603,R0                ;LOAD R0 WITH TEST NO.
045376  013701  045422                          MOV     @#I0603,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
045402  012702  177703                          MOV     #177703,R2      ;DEST ADDR = R3
045406  012704  000377                          MOV     #377,R4         ;RESULT S / B = 377
045412  012705  070131                  R0603:  MOV     #DBTA+1,R5      ;SOURCE ADDR = DBTA+1
045416  005003                                  CLR     R3              ;[DEST] = 000000
045420  000257                                  CCC                     ;SCOPE SYNC

045422  151503                          I0603:  BISB    (R5),R3         ;TEST THE BISB

045424  020403                                  CMP     R4,R3           ;RESULT CORRECT ?
045426  001402                                  BEQ     00603           ;BR IF YES

045430  104000                          E0603:  ERROR                   ;BISB DELIVERED THE WRONG RESULT
045432  045412                                  R0603                   ;ERROR LOOP RETURN ADDRESS

045434  000004                          00603:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0604 BISB  SM1,DM1 TEST - SOURCE ADDR ODD
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,137,251,161,266,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,141  /  35[247]120,137  /  36[137]120,161  /  33[266]220,225
                                                        ;  /  16[367]016,016

                                        ;EXEC:          [225]ALUC=LLLLH :[367]D=177777

                                        ;CODES:         [367]SPS=3       /      N:C=1000

                                        ;SYNC:          B05J2   (-)      T=3.8 USEC

                                        ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=1 L  /  K3-3 DM=1 L  /  K3-6 BYTE INSTR H
                                                        ;  K3-7 ODD BYTE H  /  K1-6 BA00(1) H

045436  012700  000604          T0604:  MOV     #0604,R0                ;LOAD R0 WITH TEST NO.
045442  013701  045500                  MOV     @#I0604,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
045446  032737  004000  066642          BIT     #4000,@#BPTLOC  ;BREAKPOINT HALT SET ??
045454  001401                          BEQ     .+4             ;BR IF NOT
045456  000000                          HALT                    ;BREAK-DEPRESS CONTINUE TO RESTART
045460  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
045464  012704  000377                  MOV     #377,R4         ;RESULT S / B = 377
045470  012705  070131          R0604:  MOV     #DBTA+1,R5      ;SOURCE ADDR = DBTA+1
045474  005012                          CLR     (R2)            ;[DEST] = 000000
045476  000257                          CCC                     ;SCOPE SYNC

045500  151512                  I0604:  BISB    (R5),(R2)       ;TEST THE BISB

045502  020412                          CMP     R4,(R2)         ;CORRECT RESULT
045504  001403                          BEQ     00604           ;BR IF YES

045506  011203                          MOV     (R2),R3         ;GET THE WAS DATA
045510  104000                  E0604:  ERROR                   ;BISB DELIVERED THE WRONG RESULT
045512  045470                          R0604                   ;ERROR LOOP RETURN ADDRESS

045514  000004                  00604:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ****************************************************************
                                                .SBTTL T0605 BISB  SM1,DM2 TEST - SOURCE ADDR ODD
                                        ; ****************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,137,251,162,260,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,141  /  35[247]120,137  /  36[137]120,162  /  33[260]220,225
                                                        ;  /  16[367]016,016

                                        ;EXEC:          [225]ALUC=LLLLH :[367]D=177777

                                        ;CODES:         [367]SPS=3       /      N:C=1000

                                        ;SYNC:          B05J2   (-)      T=3.8 USEC

                                        ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=1 L  /  K3-3 DM=2 L  /  K3-6 BYTE INSTR H
                                                        ;  /  K1-6 BA00(1) H  /  K3-7 ODD BYTE H  /  K5-5 BCON(1+2) H

045516  012700  000605          T0605:  MOV     #0605,R0                ;LOAD R0 WITH TEST NO.
045522  013701  045550                  MOV     @#I0605,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
045526  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
045532  012704  000377                  MOV     #377,R4         ;RESULT S / B = 377
045536  012705  070131          R0605:  MOV     #DBTA+1,R5      ;SOURCE ADDR = DBTA+1
045542  005012                          CLR     (R2)            ;[DEST] = 000000
045544  010203                          MOV     R2,R3           ;DEST ADDR IN R3
045546  000257                          CCC                     ;SCOPE SYNC

045550  151523                  I0605:  BISB    (R5),(R3)+      ;TEST THE BISB

045552  020412                          CMP     R4,(R2)         ;CORRECT RESULT
045554  001403                          BEQ     00605           ;BR IF YES

045556  011203                          MOV     (R2),R3         ;GET THE WAS DATA
045560  104000                  E0605:  ERROR                   ;BISB DELIVERED THE WRONG RESULT
045562  045536                          R0605                   ;ERROR LOOP RETURN ADDRESS

045564  000004                  00605:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0606 BISB  SM1,DM3 TEST - SOURCE ADDR ODD
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,137,251,163,264,265,266,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,141  /  35[247]120,137  /  36[137]120,163  /  33[266]220,225
                                                        ;  /  16[367]016,016

                                        ;EXEC:          [225]ALUC=LLLLH :[367]D=177777

                                        ;CODES:         [367]SPS=3       /      N:C=1000

                                        ;SYNC:          B05J2   (-)      T=4.5 USEC

                                        ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=1 L  /  K3-3 DM=3 L  /  K3-6 BYTE INSTR H
                                                        ;  /  K3-7 ODD BYTE H  /  K1-6 BA00(1) H  /  K5-5 BC01 H

045566  012700  000606          T0606:  MOV     #0606,R0                ;LOAD R0 WITH TEST NO.
045572  013701  045622                  MOV     @#I0606,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
045576  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
045602  012704  000377                  MOV     #377,R4         ;RESULT S / B = 377
045606  012705  070131          R0606:  MOV     #DBTA+1,R5      ;SOURCE ADDR = DBTA+1
045612  005012                          CLR     (R2)            ;[DEST] = 000000
045614  012703  067554                  MOV     #ATA+10,R3      ;BASE DEST ADDR = ATA+10
045620  000257                          CCC                     ;SCOPE SYNC

045622  151533                  I0606:  BISB    (R5),@(R3)+     ;TEST THE BISB

045624  020412                          CMP     R4,(R2)         ;CORRECT RESULT
045626  001403                          BEQ     00606           ;BR IF YES

045630  011203                          MOV     (R2),R3         ;GET THE WAS DATA
045632  104000                  E0606:  ERROR                   ;BISB DELIVERED THE WRONG RESULT
045634  045606                          R0606                   ;ERROR LOOP RETURN ADDRESS

045636  000004                  00606:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0607 BISB  SM1,DM4 TEST - SOURCE ADDR ODD
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,137,251,164,260,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,141  /  35[247]120,137  /  36[137]120,164  /  33[260]220,225
                                                        ;  /  16[367]016,016

                                        ;EXEC:          [225]ALUC=LLLLH :[367]D=177777

                                        ;CODES:         [367]SPS=3       /       N:C=1000

                                        ;SYNC:          B05J2   (-)      T=3.8 USEC

                                        ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=1 L  /  K3-3 DM=4 L  /  K3-6 BYTE INSTR H
                                                        ;  /  K1-6 BA00(1) H  /  K3-7 ODD BYTE H  /  K5-5 BCON(1+2) H

045640  012700  000607          T0607:  MOV     #0607,R0                ;LOAD R0 WITH TEST NO.
045644  013701  045674                  MOV     @#I0607,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
045650  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
045654  012704  177400                  MOV     #177400,R4      ;RESULT S / B = 177400
045660  012705  070131          R0607:  MOV     #DBTA+1,R5      ;SOURCE ADDR = DBTA+1
045664  012703  067562                  MOV     #MBUF0+2,R3     ;BASE DEST ADDR = MBUF0+2
045670  005012                          CLR     (R2)            ;[DEST] = 000000
045672  000257                          CCC                     ;SCOPE SYNC

045674  151543                  I0607:  BISB    (R5),-(R3)      ;TEST THE BISB

045676  020412                          CMP     R4,(R2)         ;CORRECT RESULT
045700  001403                          BEQ     O0607           ;BR IF YES

045702  011203                          MOV     (R2),R3         ;GET THE WAS DATA
045704  104000                  E0607:  ERROR                   ;BISB DELIVERED THE WRONG RESULT
045706  045660                          R0607                   ;ERROR LOOP RETURN ADDRESS

045710  000004                  O0607:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0610 BISB  SM1,DM5 TEST - SOURCE ADDR ODD
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,137,251,165,264,265,266,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,141  /  35[247]120,137  /  36[137]120,165  /  33[266]220,225
                                                        ;  /  16[367]016,016

                                        ;EXEC:          [225]ALUC=LLLLH :[367]D=177777

                                        ;CODES:         [367]SPS=3       /       N:C=1000

                                        ;SYNC:          B05J2   (-)      T= 4.5 USEC

                                        ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=1 L  /  K3-3 DM=5 L  /  K3-6 BYTE INSTR H
                                                        ;  K1-6 BA00(1) H  /  K3-7 ODD BYTE H  /  K5-5 BC01 H

045712  012700  000610          T0610:  MOV     #0610,R0                ;LOAD R0 WITH TEST NO.
045716  013701  045746                  MOV     @#I0610,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
045722  012702  067560                  MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
045726  012704  000377                  MOV     #377,R4         ;RESULT S / B = 377
045732  012705  070131          R0610:  MOV     #DBTA+1,R5      ;SOURCE ADDR = DBTA+1
045736  012703  067556                  MOV     #ATA+12,R3      ;BASE DEST ADDR = ATA+12
045742  005012                          CLR     (R2)            ;[DEST] = 000000
045744  000257                          CCC                     ;SCOPE SYNC

045746  151553                  I0610:  BISB    (R5),@-(R3)     ;TEST THE BISB

045750  020412                          CMP     R4,(R2)         ;CORRECT RESULT
045752  001403                          BEQ     00610           ;BR IF YES

045754  011203                          MOV     (R2),R3         ;GET THE WAS DATA
045756  104000                  E0610:  ERROR                   ;BISB DELIVERED THE WRONG RESULT
045760  045732                          R0610                   ;ERROR LOOP RETURN ADDRESS

045762  000004                  00610:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0611 BISB  SM1,DM6 TEST - SOURCE ADDR ODD
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,137,251,167,261,262,266,267,225,367,375,016] FC 1,2,3,8

                                        ;ACT BUTS:      37[004]100,141  /  35[247]120,137  /  36[137]120,167  /  17[167]262,262
                                                        ;  /  33[266]220,225  /  16[367]016,016

                                        ;EXEC:          [225]ALUC=LLLLH :[367]D=177777

                                        ;CODES:         [367]SPS=3       /      N:C=1000

                                        ;SYNC:          B05J2   (-)      T=4.6 USEC

                                        ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=1 L  /  K3-3 DM=6 L  /  K3-6 BYTE INSTR H
                                                        ;  K3-7 ODD BYTE H  /  K1-6 BA00(1) H

045764  012700  000611                  T0611:  MOV     #0611,R0                ;LOAD R0 WITH TEST NO.
045770  013701  046020                          MOV     @#I0611,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
045774  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
046000  012704  000377                          MOV     #377,R4         ;RESULT S / B = 377
046004  012705  070131                  R0611:  MOV     #DBTA+1,R5      ;SOURCE ADDR = DBTA+1
046010  012703  067566                          MOV     #MBUF0+6,R3     ;BASE DEST ADDR = MBUF0+6
046014  005012                                  CLR     (R2)            ;[DEST] = 000000
046016  000257                                  CCC                     ;SCOPE SYNC

046020  151563  177772                  I0611:  BISB    (R5),-6(R3)     ;TEST THE BISB

046024  020412                                  CMP     R4,(R2)         ;CORRECT RESULT
046026  001403                                  BEQ     00611           ;BR IF YES

046030  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
046032  104000                  E0611:  ERROR                           ;BISB DELIVERED THE WRONG RESULT
046034  046004                          R0611                           ;ERROR LOOP RETURN ADDRESS

046036  000004                  00611:  SCOPE                           ;CALL THE SCOPE LOOP UTILITY
```

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                                        ; ***************************************************************
                                                .SBTTL T0612 BISB  SM1,DM7 TEST - SOURCE ADDR ODD
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,137,251,167,261,263,264,265,266,267,225,367,375,016] FC 1,2

                                        ;ACT BUTS:      37[004]100,141  /  35[247]120,137  /  36[137]120,167  /  17[167]262,263
                                                        ;  /  33[266]220,225  /  16[367]016,016

                                        ;EXEC:          [225]ALUC=LLLLH :[367]D=177777

                                        ;CODES:         [367]SPS=3       /      N:C=1000

                                        ;SYNC:          B05J2   (-)      T=5.2 USEC

                                        ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=1 L  /  K3-3 DM=7 L  / K3-6 BYTE INSTR H
                                                        ;  K3-7 ODD BYTE H  /  K1-6 BA00(1) H

046040  012700  000612                  T0612:  MOV     #0612,R0                ;LOAD R0 WITH TEST NO.
046044  013701  046074                          MOV     @#I0612,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
046050  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
046054  012704  000377                          MOV     #377,R4         ;RESULT S / B = 377
046060  012705  070131                  R0612:  MOV     #DBTA+1,R5      ;SOURCE ADDR = DBTA+1
046064  012703  067544                          MOV     #ATA,R3         ;BASE DEST ADDR = ATA
046070  005012                                  CLR     (R2)            ;[DEST] = 000000
046072  000257                                  CCC                     ;SCOPE SYNC

046074  151573  000010                  I0612:  BISB    (R5),@10(R3)    ;TEST THE BISB

046100  020412                                  CMP     R4,(R2)         ;CORRECT RESULT
046102  001403                                  BEQ     00612           ;BR IF YES

046104  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
046106  104000                          E0612:  ERROR                   ;BISB DELIVERED THE WRONG RESULT
046110  046060                                  R0612                   ;ERROR LOOP RETURN ADDRESS

046112  000004                          00612:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0613 BISB  SM0,DM2 TEST - DEST ADDR EVEN
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [162,260,267,224,367,375,016] FC 1,3,8

                                        ;ACT BUTS:      37[004]100,162  /  33[260]220,224  /  16[367]016,016

                                        ;EXEC:          [224]ALUC=LLLLH :[367]D=000377

                                        ;CODES:         [367]SPS=3       /  N:C=1000

                                        ;SYNC:          B05J2   (-)      T=2.7 USEC

                                        ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=0 L  /  K3-3 DM=1 L  /  K3-6 BYTE INSTR H
                                                        ;  K5-5 BCON(1+2) H

046114  012700  000613                  T0613:  MOV     #0613,R0                ;LOAD R0 WITH TEST NO.
046120  013701  046142                          MOV     @#I0613,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
046124  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
046130  012704  000377                          MOV     #377,R4         ;RESULT S / B = 377
046134  010203                          R0613:  MOV     R2,R3           ;DEST ADDR IN R3
046136  005012                                  CLR     (R2)            ;[DEST] = 000000
046140  000257                                  CCC                     ;SCOPE SYNC

046142  150423                          I0613:  BISB    R4,(R3)+        ;TEST THE BISB

046144  020412                                  CMP     R4,(R2)         ;CORRECT RESULT
046146  001403                                  BEQ     00613           ;BR IF YES

046150  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
046152  104000                          E0613:  ERROR                   ;BISB DELIVERED THE WRONG RESULT
046154  046134                                  R0613                   ;ERROR LOOP RETURN ADDRESS

046156  000004                          00613:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0614 BISB  SM0,DM1 TEST - DEST ADDR ODD
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,237,270,230,254,074,366,375,016] FC 1,3,8

                                        ;ACT BUTS:      37[004]100,161  /  33[266]220,237  /  34[237]220,230  /  16[366]016,016

                                        ;EXEC:          [230]ALUC=LLLLH :[375]D=177777

                                        ;CODES:         [254]SPS=1,[074]SPS=3    /      N:C=1000

                                        ;SYNC:          B05J2   (-)     T=3 USEC

                                        ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=0 L  /  K3-3 DM=1 L  /  K3-6 BYTE INSTR H
                                                        ;  K3-7 ODD BYTE H  /  K1-6 BA00(1) H

046160  012700  000614                  T0614:  MOV     #0614,R0                ;LOAD R0 WITH TEST NO.
046164  013701  046214                          MOV     @#I0614,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
046170  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
046174  012704  177400                          MOV     #177400,R4      ;RESULT S / B = 177400
046200  012705  000377                          MOV     #377,R5         ;[R5]=SOURCE OPR = 377
046204  012703  067561                  R0614:  MOV     #MBUF0+1,R3     ;ODD DEST ADDR IN R3
046210  005012                                  CLR     (R2)            ;[DEST] = 000000
046212  000257                                  CCC                     ;SCOPE SYNC

046214  150513                          I0614:  BISB    R5,(R3)         ;TEST THE BISB

046216  020412                                  CMP     R4,(R2)         ;CORRECT RESULT
046220  001403                                  BEQ     00614           ;BR IF YES

046222  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
046224  104000                          E0614:  ERROR                   ;BISB DELIVERED THE WRONG RESULT
046226  046204                                  R0614                   ;ERROR LOOP RETURN ADDRESS

046230  000004                          00614:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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                                        ; ***************************************************************
                                                .SBTTL T0615 BISB  SM0,DM1 TEST - DEST ADDR EVEN
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,224,367,375,016] FC 1,3,8

                                        ;ACT BUTS:      37[004]100,161  /  33[266]220,224  /  16[367]016,016

                                        ;EXEC:          [224]ALUC=LLLLH :[367]D=000377

                                        ;CODES:         [367]SPS=3       /      N:C=1000

                                        ;SYNC:          B05J2   (-)      T=2.6 USEC

                                        ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=0 L  /  K3-3 DM=1 L  /  K3-6 BYTE INSTR H

046232  012700  000615                  T0615:  MOV     #0615,R0                ;LOAD R0 WITH TEST NO.
046236  013701  046260                          MOV     @#I0615,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
046242  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
046246  012704  000377                          MOV     #377,R4         ;RESULT S / B = 377
046252  010203                          R0615:  MOV     R2,R3           ;DEST ADDR IN R3
046254  005012                                  CLR     (R2)            ;[DEST] = 000000
046256  000257                                  CCC                     ;SCOPE SYNC

046260  150413                          I0615:  BISB    R4,(R3)         ;TEST THE BISB

046262  020412                                  CMP     R4,(R2)         ;CORRECT RESULT
046264  001403                                  BEQ     00615           ;BR IF YES

046266  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
046270  104000                          E0615:  ERROR                   ;BISB DELIVERED THE WRONG RESULT
046272  046252                                  R0615                   ;ERROR LOOP RETURN ADDRESS

046274  000004                          00615:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0616 BISB  SM1,DM1 TEST - DEST ADDR ODD
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,137,251,161,266,267,237,270,231,254,074,366,375,016] FC 1,2

                                        ;ACT BUTS:      37[004]100,141  /  35[247]120,137  /  36[137]120,161  /  33[266]220,237
                                                        ;  /  34[237]220,231  /  16[366]016,016

                                        ;EXEC:          [231]ALUC=LLLLH :[375]D=177777

                                        ;CODES:         [254]SPS=1,[074]SPS=3    /      N:C=1000

                                        ;SYNC:          B05J2   (-)     T=4.2 USEC

                                        ;KEY SIG:       K3-3 BIS L  /  K3-3 SM=1 L  /  K3-3 DM=1 L  /  K3-6 BYTE INSTR H
                                                        ;  K3-7 ODD BYTE H  /  K1-6 BA00(1) H

046276  012700  000616                  T0616:  MOV     #0616,R0                ;LOAD R0 WITH TEST NO.
046302  013701  046332                          MOV     @#I0616,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
046306  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
046312  012704  177400                          MOV     #177400,R4      ;RESULT S / B = 177400
046316  012705  070131                  R0616:  MOV     #DBTA+1,R5      ;SOURCE ADDR = DBTA+1
046322  012703  067561                          MOV     #MBUF0+1,R3     ;ODD DEST ADDR IN R3
046326  005012                                  CLR     (R2)            ;[DEST] = 000000
046330  000257                                  CCC                     ;SCOPE SYNC

046332  151513                          I0616:  BISB    (R5),(R3)       ;TEST THE BISB

046334  020412                                  CMP     R4,(R2)         ;CORRECT RESULT
046336  001403                                  BEQ     00616           ;BR IF YES

046340  011203                                  MOV     (R2),R3         ;GET THE WAS DATA
046342  104000                          E0616:  ERROR                   ;BISB DELIVERED THE WRONG RESULT
046344  046316                                  R0616                   ;ERROR LOOP RETURN ADDRESS

046346  000004                          00616:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***************************************************************
                                                .SBTTL T0617 JMP MODE 1 TEST, FLAGS = 1111
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [151,300,306,313,016] FC 1,5

                                        ;ACT BUTS:      37[004]100,151 / 15[151]306,306 / 16[306]016,016

                                        ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0617

                                        ;CODES:         N:C = 1111 (NO CHANGE)

                                        ;SYNC:          B05J2 (-) T = 1.8 USEC

                                        ;KEY SIG:       K3-3 DM=1L  /  K3-5 JMP L  /  K3-5 JMP+JSR H

046350  012700  000617                  T0617:  MOV     #0617,R0                ;LOAD R0 WITH TEST NO.
046354  013701  046366                          MOV     @#I0617,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

046360  012702  046376                  R0617:  MOV     #A0617,R2               ;R2 CONTAINS JUMP ADDRESS
046364  000277                                  SCC                     ;MAKE N:C = 1111

046366  000112                          I0617:  JMP     (R2)            ;TEST THE JMP - GO TO A0617

046370  104006                          E10617: ERROR6                  ;JMP FAILED TO LOAD PC
046372  046360                                  R0617                   ;ERROR LOOP RETURN
046374  000406                                  BR      00617           ;GO CALL SCOPE

046376  103003                          A0617:  BCC     E20617          ;BR IF JMP CLEARED ''C''
046400  102002                                  BVC     E20617          ;BR IF JMP CLEARED 'V''
046402  001001                                  BNE     E20617          ;BR IF JMP CLEARED 'Z''
046404  100402                                  BMI     00617           ;BR IF 'N' STILL SET

046406  104006                          E20617: ERROR6                  ;JMP ALTERED CODES - CLEARED ONE
046410  046360                                  R0617                   ;ERROR LOOP RETURN

046412  000004                           00617: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; ***************************************************************
                                                .SBTTL T0620 JMP MODE 1 TEST, FLAGS = 0000
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [151,300,306,313,016] FC 1,5

                                        ;ACT BUTS:      37[004]100,151 / 15[151]306,306 / 16[306]016,016

                                        ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0620

                                        ;CODES:         N:C = 0000 (NO CHANGE)

                                        ;SYNC:          B05J2 (-) T = 1.8 USEC

                                        ;KEY SIG:       K3-3 DM=1L  /  K3-5 JMP L  /  K3-5 JMP+JSR H

046414  012700  000620                  T0620:  MOV     #0620,R0                ;LOAD R0 WITH TEST NO.
046420  013701  046432                          MOV     @#I0620,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

046424  012702  046442                  R0620:  MOV     #A0620,R2               ;R2 CONTAINS JMP ADDRESS
046430  000257                                  CCC                     ;MAKE N:C = 0000

046432  000112                          I0620:  JMP     (R2)            ;TEST THE JMP - GO TO A0620

046434  104006                          E10620: ERROR6                  ;JMP FAILED TO LOAD PC
046436  046424                                  R0620                   ;ERROR LOOP RETURN
046440  000406                                  BR      00620           ;GO CALL SCOPE

046442  103403                          A0620:  BCS     E20620          ;BR IF JMP SET ''C''
046444  102402                                  BVS     E20620          ;BR IF JMP SET ''V''
046446  001401                                  BEQ     E20620          ;BR IF JMP SET ''Z''
046450  100002                                  BPL     00620           ;BR IF ''N'' STILL CLEAR

046452  104006                          E20620: ERROR6                  ;JMP ALTERED CODES - SET ONE
046454  046424                                  R0620                   ;ERROR LOOP RETURN

046456  000004                           00620: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0621 JMP MODE 2 TEST; FLAGS = 1111
                                        ; ***********************************************************************
046460  012700  000621                  T0621:  MOV     #0621,R0                ;LOAD R0 WITH TEST NO.
                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [152,235,300,306,313,016] FC 1,5

                                        ;ACT BUTS:      37[004]100,152 / 15[235]306,306 / 16[306]016,016

                                        ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0621

                                        ;CODES:         N:C = 1111 (NO CHANGE)

                                        ;SYNC:          B05J2 (-) T = 2.1 USEC

                                        ;KEY SIG:       K3-3 DM=2L  /  K3-5 JMP L  /  K3-5 JMP+JSR H  /  K5-5 BC01 H

046464  013701  046476                          MOV     @#I0621,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

046470  012702  046506                  R0621:  MOV     #A0621,R2               ;R2 CONTAINS JUMP ADDRESS
046474  000277                                  SCC                     ;SET N:C = 1111

046476  000122                          I0621:  JMP     (R2)+           ;TEST THE JMP - GO TO A0621

046500  104006                          E10621: ERROR6                  ;JMP FAILED TO LOAD PC
046502  046470                                  R0621                   ;ERROR LOOP RETURN
046504  000413                                  BR      00621           ;GO TO SCOPE EXIT

046506  103003                          A0621:  BCC     E20621          ;BR IF JMP CLEARED ''C''
046510  102002                                  BVC     E20621          ;BR IF JMP CLEARED ''V''
046512  001001                                  BNE     E20621          ;BR IF JMP CLEARED ''Z''
046514  100402                                  BMI     B0621           ;BR IF ''N'' STILL SET

046516  104006                          E20621: ERROR6                  ;JMP ALTERED CODES - CLEARED
046520  046470                                  R0621                   ;ERROR LOOP RETURN

046522  022702  046510                  B0621:  CMP     #A0621+2,R2     ;DID R2 GET AUTO-INCREMENTED?
046526  001402                                  BEQ     00621           ;BR IF YES

046530  104006                          E30621: ERROR6                  ;JMP FAILED TO UPDATE REGISTER (R2)
046532  046470                                  R0621                   ;ERROR LOOP RETURN

046534  000004                           00621: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***************************************************************
                                                .SBTTL T0622 JMP MODE 2 TEST; FLAGS = 0000
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [152,235,300,306,313,016] FC 1,5

                                        ;ACT BUTS:      37[004]100,152 / 15[235]306,306 / 16[306]016,016

                                        ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0622

                                        ;CODES:         N:C = 0000 (NO CHANGE)

                                        ;SYNC:          B05J2 (-) T = 2.1 USEC

                                        ;KEY SIG:       K3-3 DM=2L  /  K3-5 JMP L  /  K3-5 JMP+JSR H  /  K5-5 BC01 H

046536  012700  000622                  T0622:  MOV     #0622,R0                ;LOAD R0 WITH TEST NO.
046542  013701  046554                          MOV     @#I0622,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

046546  012702  046564                  R0622:  MOV     #A0622,R2               ;R2 CONTAINS JUMP ADDRESS
046552  000257                                  CCC                     ;MAKE N:C = 0000

046554  000122                          I0622:  JMP     (R2)+           ;TEST THE JMP - GO TO A0622

046556  104006                          E10622: ERROR6                  ;JMP FAILED TO LOAD PC
046560  046546                                  R0622                   ;ERROR LOOP RETURN
046562  000406                                  BR      00622           ;GO TO SCOPE EXIT

046564  103403                          A0622:  BCS     E20622          ;BR IF JMP SET ''C''
046566  102402                                  BVS     E20622          ;BR IF JMP SET 'V''
046570  001401                                  BEQ     E20622          ;BR IF JMP SET ''Z''
046572  100002                                  BPL     00622           ;BR IF 'N' IS CLEAR

046574  104006                          E20622: ERROR6                  ;JMP ALTERED CODES - SET
046576  046546                                  R0622                   ;ERROR LOOP RETURN

046600  000004                           00622: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***************************************************************
                                                .SBTTL T0623 JMP TEST MODE 3; FLAGS = 1111
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [153,303,306,313,016] FC 1,5

                                        ;ACT BUTS:      37[004]100,153 / 15[153]306,306 / 16[306]016,016

                                        ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0623

                                        ;CODES:         N:C = 1111 (NO CHANGE)

                                        ;SYNC:          B05J2 (-) T = 2.3 USEC

                                        ;KEY SIG:       K3-3 DM=3L  /  K3-5 JMP L  /  K3-5 JMP+JSR H  /  K5-5 BC01 H

046602  012700  000623                  T0623:  MOV     #0623,R0                ;LOAD R0 WITH TEST NO.
046606  013701  046620                          MOV     @#I0623,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

046612  012702  046660                  R0623:  MOV     #JMP3,R2        ;R2 CONTAINS ADDRESS OF JUMP ADDRESS
046616  000277                                  SCC                     ;SET N:C = 1111

046620  000132                          I0623:  JMP     @(R2)+          ;TEST THE JMP - GO TO A0623

046622  104006                          E10623: ERROR6                  ;JMP FAILED TO LOAD PC
046624  046612                                  R0623                   ;ERROR LOOP RETURN
046626  000417                                  BR      00623           ;GO TO SCOPE EXIT

046630  103003                          A0623:  BCC     E20623          ;BR IF JMP CLEARED ''C''
046632  102002                                  BVC     E20623          ;BR IF JMP CLEARED 'V''
046634  001001                                  BNE     E20623          ;BR IF JMP CLEARED 'Z''
046636  100402                                  BMI     B0623           ;BR IF 'N' STILL SET

046640  104006                          E20623: ERROR6                  ;JMP ALTERED CODES - CLEAR
046642  046612                                  R0623                   ;ERROR LOOP RETURN

046644  022702  046662                  B0623:  CMP     #JMP3+2,R2      ;DID JMP UPDATE R2?
046650  001406                                  BEQ     00623           ;BR IF YES

046652  104006                          E30623: ERROR6                  ;JMP FAILED TO UPDATE REGISTER
046654  046612                                  R0623                   ;ERROR LOOP RETURN
046656  000403                                  BR      00623           ;GO TO SCOPE EXIT
046660  046630                          JMP3:   A0623                   ;JMP3 CONTAINS JUMP ADDRESS
046662  104006                          E40623: ERROR6                  ;ERROR CALL OCCURS IF MODE3 HAPPENS
046664  046612                                  R0623                   ;ERROR LOOP RETURN
                                                                        ;TO EXECUTE AS MODE 1 OR 2 AND
                                                                        ;A0623 IS LEGAL INSTRUCTION

046666  000004                           00623: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0624 JMP TEST MODE 3; FLAGS = 0000
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [153,303,306,313,016] FC 1,5

                                        ;ACT BUTS:      37[004]100,153 / 15[153]306,306 / 16[306]016,016

                                        ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0624

                                        ;CODES:         N:C = 0000 (NO CHANGE)

                                        ;SYNC:          B05J2 (-) T = 2.3 USEC

                                        ;KEY SIG:       K3-3 DM=3L  /  K3-5 JMP L  /  K3-5 JMP+JSR H  /  K5-5 BC01 H

046670  012700  000624                  T0624:  MOV     #0624,R0                ;LOAD R0 WITH TEST NO.
046674  013701  046706                          MOV     @#I0624,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

046700  012702  046734                  R0624:  MOV     #JMP3A,R2       ;R2 CONTAINS ADDRESS OF JUMP ADDRESS
046704  000257                                  CCC                     ;MAKE N:C = 0000

046706  000132                          I0624:  JMP     @(R2)+          ;TEST THE JMP - GO TO A0624

046710  104006                          E10624: ERROR6                  ;JMP FAILED TO LOAD THE PC
046712  046700                                  R0624                   ;ERROR LOOP RETURN

046714  000412                                  BR      00624           ;GO TO SCOPE EXIT

046716  103403                          A0624:  BCS     E20624          ;BR IF JMP SET ''C''
046720  102402                                  BVS     E20624          ;BR IF JMP SET ''V''
046722  001401                                  BEQ     E20624          ;BR IF JMP SET ''Z''
046724  100006                                  BPL     00624           ;BR IF ''N'' STILL CLEAR

046726  104006                          E20624: ERROR6                  ;JMP ALTERED CODES - SET
046730  046700                                  R0624                   ;ERROR LOOP RETURN
046732  000403                                  BR      00624           ;GO TO SCOPE EXIT

046734  046716                          JMP3A:  A0624                   ;JUMP ADDRESS IN JMP3A
046736  104006                          E30624: ERROR6                  ;JMP MODE 3 EXECUTED LIKE MODE 1 OR 2
046740  046700                                  R0624                   ;ERROR LOOP RETURN

046742  000004                           00624: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0625 JMP TEST MODE 4; FLAGS = 1111
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [154,300,306,313,016] FC 1,5

                                        ;ACT BUTS:      37[004]100,154 / 15[154]306,306 / 16[306]016,016

                                        ;EXEC:          [306]ALUC=LLLLL :[313] D = #E20625-2

                                        ;CODES:         N:C = 1111 (NO CHANGE)

                                        ;SYNC:          B05J2 (-) T = 1.9 USEC

                                        ;KEY SIG:       K3-3 DM=4L  /  K3-5 JMP L  /  K3-5 JMP+JSR H  /  K5-5 BC01 H

046744  012700  000625                  T0625:  MOV     #0625,R0                ;LOAD R0 WITH TEST NO.
046750  013701  046762                          MOV     @#I0625,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
046754  012702  046774                  R0625:  MOV     #E20625,R2      ;[R2] = JMP ADDRESS PLUS 2
046760  000277                                  SCC                     ;MAKE N:C = 1111

046762  000142                          I0625:  JMP     -(R2)           ;TEST THE JMP - GO TO E20625 MINUS 2

046764  104006                          E10625: ERROR6                  ;JMP FAILED TO LOAD PC
046766  046754                                  R0625                   ;ERROR LOOP RETURN
046770  000417                                  BR      00625           ;GO TO SCOPE EXIT

046772  000403                                  BR      A0625           ;GO TEST FLAGS - JMP LOADED PC OK
046774  104006                          E20625: ERROR6                  ;JMP FAILED TO AUTO-DECREMENT R2
046776  046754                                  R0625                   ;ERROR LOOP RETURN
047000  000413                                  BR      00625           ;GO TO SCOPE EXIT

047002  103003                          A0625:  BCC     E30625          ;BR IF JMP CLEARED 'C'
047004  102002                                  BVC     E30625          ;BR IF JMP CLEARED 'V'
047006  001001                                  BNE     E30625          ;BR IF JMP CLEARED 'Z'
047010  100402                                  BMI     B0625           ;BR IF 'N' STILL SET

047012  104006                          E30625: ERROR6                  ;JMP ALTERED FLAGS
047014  046754                                  R0625                   ;ERROR LOOP RETURN

047016  022702  046772                  B0625:  CMP     #E20625-2,R2    ;DID JMP UPDATE R2 PROPERLY?
047022  001402                                  BEQ     00625           ;BR IF YES

047024  104006                          E40625: ERROR6                  ;JMP FAILED TO UPDATE REGISTER
047026  046754                                  R0625                   ;ERROR LOOP RETURN

047030  000004                           00625: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************
                                                .SBTTL T0626 JMP TEST MODE 4; FLAGS = 0000
                                        ; ***********************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [154,300,306,313,016] FC 1,5

                                        ;ACT BUTS:      37[004]100,154 / 15[154]306,306 / 16[306]016,016

                                        ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0626

                                        ;CODES:         N:C = 0000 (NO CHANGE)

                                        ;SYNC:          B05J2 (-) T = 1.9 USEC

                                        ;KEY SIG:       K3-3 DM=4L  /  K3-5 JMP L  /  K3-5 JMP+JSR H  /  K5-5 BC01 H

047032  012700  000626                  T0626:  MOV     #0626,R0                ;LOAD R0 WITH TEST NO.
047036  013701  047050                          MOV     @#I0626,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

047042  012702  047062                  R0626:  MOV     #A0626+2,R2     ;[R2] = JUMP ADDRESS PLUS 2
047046  000257                                  CCC                     ;MAKE N:C = 0000

047050  000142                          I0626:  JMP     -(R2)           ;TEST THE JMP - TO TO A0626

047052  104006                          E10626: ERROR6                  ;JMP FAILED TO LOAD PC
047054  047042                                  R0626                   ;ERROR LOOP RETURN
047056  000406                                  BR      00626           ;GO TO SCOPE EXIT

047060  103403                          A0626:  BCS     E20626          ;BR IF JMP SET ''C''
047062  102402                                  BVS     E20626          ;BR IF JMP SET ''V''
047064  001401                                  BEQ     E20626          ;BR IF JMP SET ''Z''
047066  100002                                  BPL     00626           ;BR IF ''N'' STILL CLEAR

047070  104006                          E20626: ERROR6                  ;JMP ALTERED CODES - SET
047072  047042                                  R0626                   ;ERROR LOOP RETURN

047074  000004                           00626: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***************************************************************
                                                .SBTTL T0627 JMP TEST MODE 5; FLAGS = 1111
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [155,303,306,313,016] FC 1,5

                                        ;ACT BUTS:      37[004]100,155 / 15[155]306,306 / 16[306]016,016

                                        ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0627

                                        ;CODES:         N:C = 1111 (NO CHANGE)

                                        ;SYNC:          B05J2 (-) T = 2.3 USEC

                                        ;KEY SIG:       K3-3 DM=5L  /  K3-5 JMP L  /  K3-5 JMP+JSR H  /  K5-5 BC01 H

047076  012700  000627                  T0627:  MOV     #0627,R0                ;LOAD R0 WITH TEST NO.
047102  013701  047114                          MOV     @#I0627,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

047106  012702  047156                  R0627:  MOV     #JMP5,R2        ;JMP CONTAINS ADDR+2 OF JUMP ADDRESS
047112  000277                                  SCC

047114  000152                          I0627:  JMP     @-(R2)          ;TEST THE JMP - GO TO A0627

047116  104006                          E10627: ERROR6                  ;JMP FAILED TO LOAD PC
047120  047106                                  R0627                   ;ERROR LOOP RETURN
047122  000417                                  BR      00627           ;GO TO SCOPE OXIT

047124  103003                          A0627:  BCC     E20627          ;BR IF JMP CLEARED ''C''
047126  102002                                  BVC     E20627
047130  001001                                  BNE     E20627
047132  100402                                  BMI     B0627

047134  104006                          E20627: ERROR6                  ;JMP ALTERED CODES - CLEARED
047136  047106                                  R0627                   ;ERROR LOOP RETURN

047140  022702  047154                  B0627:  CMP     #JMP5-2,R2      ;DID R2 GET AUTO-DECREMENTED
047144  001406                                  BEQ     00627           ;BR IF YES

047146  104006                          E30627: ERROR6                  ;JMP FAILED TO UPDATE REGISTER
047150  047106                                  R0627                   ;ERROR LOOP RETURN
047152  000403                                  BR      00627           ;GO TO SCOPE EXIT
047154  047124                                  A0627                   ;THIS LOCATION CONTAINS JMP ADDRESS
047156  104006                          JMP5:   ERROR6                  ;JMP EXECUTED LIKE A MODE 1 OR 2
047160  047106                                  R0627                   ;ERROR LOOP RETURN

047162  000004                           00627: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***************************************************************
                                                .SBTTL T0630 JMP TEST MODE 5; FLAG = 0000
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [155,303,306,313,016] FC 1,5

                                        ;ACT BUTS:      37[004]100,155 / 15[155]306,306 / 16[306]016,016

                                        ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0630

                                        ;CODES:         N:C = 0000 (NO CHANGE)

                                        ;SYNC:          B05J2 (-) T = 2.3 USEC

                                        ;KEY SIG:       K3-3 DM=5L  /  K3-5 JMP L  /  K3-5 JMP+JSR H  /  K5-5 BC01 H

047164  012700  000630                  T0630:  MOV     #0630,R0                ;LOAD R0 WITH TEST NO.
047170  013701  047202                          MOV     @#I0630,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

047174  012702  047232                  R0630:  MOV     #JMP5A,R2       ;[R2] = ADDR +2 OF JUMP ADDRESS
047200  000257                                  CCC                     ;SET N:C = 0000

047202  000152                          I0630:  JMP     @-(R2)          ;TEST THE JMP - GO TO A0630

047204  104006                          E10630: ERROR6                  ;JMP FAILED TO LOAD PC
047206  047174                                  R0630                   ;ERROR LOOP RETURN
047210  000412                                  BR      00630           ;GO TO SCOPE EXIT

047212  103403                          A0630:  BCS     E20630          ;BR IF JMP SET ''C''
047214  102402                                  BVS     E20630          ;BR IF JMP SET 'V''
047216  001401                                  BEQ     E20630          ;BR IF JMP SET 'Z''
047220  100006                                  BPL     00630           ;BR IF 'N'' STILL CLEAR

047222  104006                          E20630: ERROR6                  ;JMP ALTERED THE CODES - SET
047224  047174                                  R0630                   ;ERROR LOOP RETURN
047226  000403                                  BR      00630           ;GO TO SCOPE EXIT

047230  047212                                  A0630                   ;THIS LOCATION CONTAINS JUMP ADDRESS
047232  104006                          JMP5A:  ERROR6                  ;JMP EXECUTED LIKE A MODE 1 OR 2
047234  047174                                  R0630                   ;ERROR LOOP RETURN

047236  000004                           00630: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0631 JMP TEST MODE 6; FLAGS = 1111
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [156,304,305,300,306,313,016] FC 1,5

                                        ;ACT BUTS:      37[004]100,156 / 15[305]306,306 / 16[306]016,016

                                        ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0631

                                        ;CODES:         N:C = 1111 (NO CHANGE)

                                        ;SYNC:          B05J2 (-) T = 2.4 USEC

                                        ;KEY SIG:       K3-3 DM=6L  /  K3-5 JMP L  /  K3-5 JMP+JSR H

047240  012700  000631                  T0631:  MOV     #0631,R0                ;LOAD R0 WITH TEST NO.
047244  013701  047256                          MOV     @#I0631,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

047250  012702  047306                  R0631:  MOV     #E30631,R2      ;[R2] = BASE ADDRESS TO BE INDEXED
047254  000277                                  SCC                     ;MAKE N:C = 1111

047256  000162  177762                  I0631:  JMP     A0631-E30631(R2)        ;TEST THE JMP - GO TO A0631

047262  104006                          E10631: ERROR6                  ;JMP FAILED TO LOAD THE PC
047264  047250                                  R0631                   ;ERROR LOOP RETURN
047266  000411                                  BR      00631           ;GO TO SCOPE EXIT

047270  103003                          A0631:  BCC     E20631          ;BR IF JMP CLEARED ''C''
047272  102002                                  BVC     E20631
047274  001001                                  BNE     E20631
047276  100405                                  BMI     00631           ;BR IF 'N' STILL SET

047300  104006                          E20631: ERROR6                  ;JMP ALTERED CODES - CLEARED
047302  047250                                  R0631                   ;ERROR LOOP RETURN
047304  000402                                  BR      00631           ;GO TO SCOPE EXIT

047306  104006                          E30631: ERROR6                  ;JMP EXECUTED LIKE A MODE 1 OR 2 OR
047310  047250                                  R0631                   ;ERROR LOOP RETURN
                                                                        ;FAILED TO INDEX [R2]

047312  000004                           00631: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0632 JMP TEST MODE 6; FLAGS = 0000
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [156,304,305,300,306,313,016] FC 1,5

                                        ;ACT BUTS:      37[004]100,156 / 15[305]306,306 / 16[306]016,016

                                        ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0632

                                        ;CODES:         N:C = 0000 (NO CHANGE)

                                        ;SYNC:          B05J2 (-) T = 2.4 USEC

                                        ;KEY SIG:       K3-3 DM=6L  /  K3-5 JMP L  /  K3-5 JMP+JSR H

047314  012700  000632                  T0632:  MOV     #0632,R0                ;LOAD R0 WITH TEST NO.
047320  013701  047332                          MOV     @#I0632,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

047324  012702  047362                  R0632:  MOV     #E30632,R2      ;[R2] = BASE ADDRESS FOR JUMP
047330  000257                                  CCC                     ;MAKE N:C = 0000

047332  000162  177762                  I0632:  JMP     A0632-E30632(R2)        ;TEST THE JMP -- GO TO A0632

047336  104006                          E10632: ERROR6                  ;JMP FAILED TO LOAD PC
047340  047324                                  R0632                   ;ERROR LOOP RETURN
047342  000411                                  BR      00632           ;GO TO SCOPE EXIT

047344  103403                          A0632:  BCS     E20632          ;BR IF JMP SET "C"
047346  102402                                  BVS     E20632          ;BR IF JMP SET "V"
047350  001401                                  BEQ     E20632          ;BR IF JMP SET "Z"
047352  100005                                  BPL     00632           ;BR IF "N" STILL CLEAR

047354  104006                          E20632: ERROR6                  ;JMP ALTERED CODES
047356  047324                                  R0632                   ;ERROR LOOP RETURN
047360  000402                                  BR      00632           ;GO TO SCOPE EXIT

047362  104006                          E30632: ERROR6                  ;JMP EXECUTED LIKE A MODE 1 OR 2, OR
047364  047324                                  R0632                   ;ERROR LOOP RETURN
                                                                        ;FAILED TO INDEX [R2]

047366  000004                           00632: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                        .SBTTL T0633 JMP TEST MODE 7; FLAGS = 1111
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [157,301,302,303,306,313,016] FC 1,5

                                ;ACT BUTS:      37[004]100,157 / 15[302]306,306 / 16[306]016,016

                                ;EXEC:          [360]ALUC=LLLLL :[313] D = #A0633

                                ;CODES:         N:C = 1111 (NO CHANGE)

                                ;SYNC:          B05J2 (-) T = 3 USEC

                                ;KEY SIG:       K3-3 DM=7L  /  K3-5 JMP L  /  K3-5 JMP+JSR H

047370  012700  000633          T0633:  MOV     #0633,R0                ;LOAD R0 WITH TEST NO.
047374  013701  047406                  MOV     @#I0633,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

047400  012702  047420          R0633:  MOV     #E20633,R2      ;[R2] = BASE ADDRESS
047404  000277                          SCC                     ;MAKE N:C = 1111

047406  000172  000024          I0633:  JMP     @JMP7-E20633(R2)        ;TEST THE JMP - GO TO A0633

047412  104006                  E10633: ERROR6                  ;JMP FAILED TO LOAD PC
047414  047400                          R0633                   ;ERROR LOOP RETURN
047416  000415                          BR      00633           ;GO TO SCOPE EXIT

047420  104006                  E20633: ERROR6                  ;JMP FAILED TO INDEX OR ACTED LIKE MODE 1 OR 2
047422  047400                          R0633                   ;ERROR LOOP RETURN
047424  000412                          BR      00633           ;GO TO SCOPE EXIT

047426  103003                  A0633:  BCC     E30633          ;BR IF JMP CLEARED "C"
047430  102002                          BVC     E30633          ;BR IF JMP CLEARED "V"
047432  001001                          BNE     E30633          ;BR IF JMP CLEARED "Z"
047434  100406                          BMI     00633           ;BR IF "N" STILL SET

047436  104006                  E30633: ERROR6                  ;JMP ALTERED CODES - CLEARED
047440  047400                          R0633                   ;ERROR LOOP RETURN
047442  000403                          BR      00633           ;GO TO SCOPE EXIT

047444  047426                  JMP7:   A0633                   ;THIS LOCATION CONTAINS JMP ADDRESS

047446  104006                  E40633: ERROR6                  ;JMP EXECUTED LIKE MODE 6
047450  047400                          R0633                   ;ERROR LOOP RETURN

047452  000004                   00633: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***************************************************************
                                                .SBTTL T0634 JMP TEST MODE 7; FLAGS = 0000
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [157,301,302,303,306,313,016] FC 1,5

                                        ;ACT BUTS:      37[004]100,157 / 15[302]306,306 / 16[306]016,016

                                        ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0634

                                        ;CODES:         N:C = 0000 (NO CHANGE)

                                        ;SYNC:          B05J2 (-) T = 3 USEC

                                        ;KEY SIG:       K3-3 DM=7L  /  K3-5 JMP L  /  K3-5 JMP+JSR H

047454  012700  000634                  T0634:  MOV     #0634,R0                ;LOAD R0 WITH TEST NO.
047460  013701  047472                          MOV     @#I0634,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

047464  012702  047504                  R0634:  MOV     #E20634,R2      ;[R2] = BASE ADDRESS
047470  000257                                  CCC                     ;MAKE N:C = 0000

047472  000172  000024                  I0634:  JMP     @JMP7A-E20634(R2)       ;TEST THE JMP - GO TO A0634

047476  104006                          E10634: ERROR6                  ;JMP FAILED TO LOAD PC
047500  047464                                  R0634                   ;ERROR LOOP RETURN
047502  000415                                  BR      00634           ;GO TO SCOPE EXIT

047504  104006                          E20634: ERROR6                  ;JMP FAILED TO INDEX
047506  047464                                  R0634                   ;ERROR LOOP RETURN
047510  000412                                  BR      00634           ;GO TO SCOPE EXIT

047512  103403                          A0634:  BCS     E30634          ;BR IF JMP SET ''C''
047514  102402                                  BVS     E30634          ;BR IF JMP SET ''V''
047516  001401                                  BEQ     E30634          ;BR IF JMP SET ''Z''
047520  100006                                  BPL     00634           ;BR IF ''N'' STILL CLEAR

047522  104006                          E30634: ERROR6                  ;JMP ALTERED CODES - SET
047524  047464                                  R0634                   ;ERROR LOOP RETURN
047526  000403                                  BR      00634           ;GO TO SCOPE EXIT

047530  047512                          JMP7A:  A0634                   ;THIS LOCATION CONTAINS JUMP ADDRESS

047532  104006                          E40634: ERROR6                  ;JMP EXECUTED LIKE A MODE 6
047534  047464                                  R0634                   ;ERROR LOOP RETURN

047536  000004                           00634: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0635 JSR MODE 1 TEST - LOAD PC  /  PUSH SP
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [151,300,307,310,311,312,306,313,016] FC 1,5

                                        ;ACT BUTS:      37[004]100,151 / 15[151]306,307 / 16[306]016,016

                                        ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0635

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2 (-) T = 3 USEC

                                        ;KEY SIG:       K3-3 DM=1L  /  K3-5 JMP+JSR H  /  K3-5 JSR H

047540  012700  000635                  T0635:  MOV     #0635,R0                ;LOAD R0 WITH TEST NO.
047544  013701  047560                          MOV     @#I0635,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
047550  010605                                  MOV     SP,R5           ;SAVE THE SP
047552  012702  047566                  R0635:  MOV     #A0635,R2               ;DEST ADDR = A0635
047556  000257                                  CCC                     ;SCOPE SYNC

047560  004412                          I0635:  JSR     R4,(R2)         ;TEST THE JSR - GO TO A0635

047562  104005                          E10635: ERROR5                  ;JSR FAILED TO LOAD THE PC
047564  047552                                  R0635                   ;ERROR LOOP RETURN

047566  005726                          A0635:  TST     (SP)+           ;POP THE SP
047570  020605                                  CMP     SP,R5           ;DID JSR PUSH THE SP ?
047572  001404                                  BEQ     00635           ;BR IF YES

047574  005746                                  TST     -(SP)           ;RESTORE ERROR SP
047576  104005                          E20635: ERROR5                  ;JSR FAILED TO PUSH THE SP
047600  047552                                  R0635                   ;ERROR LOOP RETURN

047602  010506                                  MOV     R5,SP           ;RESTORE SP IN CASE OF ERROR
047604  000004                          00635:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0636 JSR MODE 1 TEST - CHECK RN AND OLD PC
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [151,300,307,310,311,312,306,313,016] FC 1,5

                                        ;ACT BUTS:      37[004]100,151 / 15[151]306,307 / 16[306]016,016

                                        ;EXEC:          [310] D = 125252  /  [312] D = #E10636  /  [313] D = #A0636

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2 (-) T = 3 USEC

                                        ;KEY SIG:       K3-3 DM=1L  /  K3-5 JSR H  /  K3-5 JMP+JSR H

047606  012700  000636                  T0636:  MOV     #0636,R0                ;LOAD R0 WITH TEST NO.
047612  013701  047636                          MOV     @#I0636,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
047616  010605                                  MOV     SP,R5           ;SAVE THE SP
047620  012702  047644                  R0636:  MOV     #A0636,R2               ;DEST ADDR = A0636
047624  005066  177776                          CLR     -2(SP)          ;INIT STACK LOC TO GET [R4]
047630  012704  125252                          MOV     #125252,R4      ;INIT RN = 125252
047634  000257                                  CCC                     ;SCOPE SYNC

047636  004412                          I0636:  JSR     R4,(R2)         ;TEST THE JSR - GO TO A0636

047640  104005                          E10636: ERROR5                  ;JSR FAILED TO LOAD THE PC
047642  047620                                  R0636                   ;ERROR LOOP RETURN

047644  022726  125252                  A0636:  CMP     #125252,(SP)+   ;DID JSR SAVE REG ON STACK
047650  001402                                  BEQ     C0636           ;BR IF IT DID

047652  104005                          E20636: ERROR5                  ;JSR FAILED TO SAVE REG ON STACK
047654  047620                                  R0636                   ;ERROR LOOP RETURN

047656  022704  047640                  C0636:  CMP     #E10636,R4      ;DID OLD PC GET SAVED ?
047662  001402                                  BEQ     B0636           ;BR IF YES

047664  104005                          E30636: ERROR5                  ;JSR FAILED TO SAVE TH OLD PC
047666  047620                                  R0636                   ;ERROR LOOP RETURN

047670  010506                          B0636:  MOV     R5,SP           ;RESTORE SP IN CASE ERROR SCREWED IT UP
047672  000004                          00636:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; *****************************************************************
                                                .SBTTL T0637 JSR MODE 1 TEST - <N:C> = 0000
                                        ; *****************************************************************
047674  012700  000637                  T0637:  MOV     #0637,R0                ;LOAD R0 WITH TEST NO.
                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [151,300,307,310,311,312,306,313,016] FC 1,5

                                        ;ACT BUTS:      37[004]100,151 / 15[151]306,307 / 16[306]016,016

                                        ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0637

                                        ;CODES:         N:C = 0000 (NO CHANGE)

                                        ;SYNC:          B05J2 (-) T = 3 USEC

                                        ;KEY SIG:       K3-3 DM=1L  /  K3-5 JSR H  /  K3-5 JMP+JSR H

047700  013701  047714                          MOV     @#I0637,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
047704  010605                                  MOV     SP,R5           ;SAVE THE SP
047706  012702  047722                  R0637:  MOV     #A0637,R2               ;DEST ADDR = A0637
047712  000257                                  CCC                     ;N:C = 0000

047714  004412                          I0637:  JSR     R4,(R2)         ;TEST THE JSR - GO TO A0637

047716  104005                          E10637: ERROR5                  ;JSR FAILED TO LOAD THE PC
047720  047706                                  R0637                   ;ERROR LOOP RETURN

047722  100403                          A0637:  BMI     E20637          ;N:C = 0000 ?
047724  001402                                  BEQ     E20637
047726  102401                                  BVS     E20637
047730  103002                                  BCC     B0637

047732  104005                          E20637: ERROR5                  ;JSR FAILED - ALTERED FLAGS
047734  047706                                  R0637                   ;ERROR LOOP RETURN

047736  010506                          B0637:  MOV     R5,SP           ;RESET SP IN CASE OF ERROR
047740  000004                          00637:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0640 JSR MODE 1 TEST - <N:C> = 1111
                                ; ***********************************************************************
047742  012700  000640          T0640:  MOV     #0640,R0                ;LOAD R0 WITH TEST NO.
                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [151,300,307,311,312,306,313,016] FC 1,5

                                ;ACT BUTS:      37[004]100,151 / 15[151]306,307 / 16[306]016,016

                                ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0640

                                ;CODES:         N:C = 1111 (NO CHANGE)

                                ;SYNC:          B05J2 (-) T = 3 USEC

                                ;KEY SIG:       K3-3 DM=1L  /  K3-5 JSR H  /  K3-5 JMP+JSR H

047746  013701  047762                  MOV     @#I0640,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
047752  010605                          MOV     SP,R5           ;SAVE THE SP
047754  012702  047770          R0640:  MOV     #A0640,R2               ;DEST ADDR = A0640
047760  000277                          SCC                     ;N:C = 1111

047762  004412                  I0640:  JSR     R4,(R2)         ;TEST THE JSR - GO TO A0640

047764  104005                  E10640: ERROR5                  ;JSR FAILED TO LOAD THE PC
047766  047754                          R0640                   ;ERROR LOOP RETURN

047770  100003                  A0640:  BPL     E20640          ;N:C = 1111 ?
047772  001002                          BNE     E20640
047774  102001                          BVC     E20640
047776  103402                          BCS     B0640
050000  104005                  E20640: ERROR5                  ;JSR ALTERED FLAGS
050002  047754                          R0640                   ;ERROR LOOP RETURN

050004  010506                  B0640:  MOV     R5,SP           ;RESET SP IN CASE OF ERROR
050006  000004                  00640:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0641 JSR MODE 2 TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [152,235,300,307,310,311,312,306,313,016] FC 1,5

                                        ;ACT BUTS:      37[004]100,152 / 15[235]306,307 / 16[306]016,016

                                        ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0641

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2 (-) T = 3.25 USEC

                                        ;KEY SIG:       K3-3 DM=2L  /  K3-5 JSR H  /  K3-5 JMP+JSR H  /  K5-5 BC01 H

050010  012700  000641                  T0641:  MOV     #0641,R0                ;LOAD R0 WITH TEST NO.
050014  013701  050032                          MOV     @#I0641,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
050020  010605                                  MOV     SP,R5           ;SAVE THE SP
050022  010506                          R0641:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPS
050024  012702  050040                          MOV     #A0641,R2               ;DEST ADDR = A0641
050030  000257                                  CCC                     ;SCOPE SYNC

050032  004422                          I0641:  JSR     R4,(R2)+        ;TEST THE JSR - GO TO A0641

050034  104005                          E10641: ERROR5                  ;JSR FAILED TO LOAD THE PC
050036  050022                                  R0641                   ;ERROR LOOP RETURN

050040  005726                          A0641:  TST     (SP)+           ;RESET SP
050042  020605                                  CMP     SP,R5           ;DID JSR PUSH STACK ?
050044  001404                                  BEQ     00641           ;BR IF YES

050046  005746                                  TST     -(SP)           ;RESET SP TO ERROR VALUE
050050  104005                          E20641: ERROR5                  ;JSR FAILED TO PUSH SP
050052  050022                                  R0641                   ;ERROR LOOP RETURN

050054  010506                                  MOV     R5,SP           ;RESTORE SP JUST IN CASE

050056  000004                          00641:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0642 JSR MODE 3 TEST
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [153,303,307,310,311,312,306,313,016] FC 1,5

                                ;ACT BUTS:      37[004]100,153 / 15[153]306,307 / 16[313]016,016

                                ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0642

                                ;CODES:         N / A

                                ;SYNC:          B05J2 (-) T = 3.5 USEC

                                ;KEY SIG:       K3-3 DM=3L  /  K3-5 JSR H  /  K3-5 JMP+JSR H  /  K5-5 BC01 H

050060  012700  000642          T0642:  MOV     #0642,R0                ;LOAD R0 WITH TEST NO.
050064  013701  050102                  MOV     @#I0642,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
050070  010605                          MOV     SP,R5           ;SAVE THE SP
050072  010506          R0642:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPS
050074  012702  050126                  MOV     #JSR3,R2                ;DEST ADDR = [JSR3]
050100  000257                          CCC                     ;SCOPE SYNC

050102  004432          I0642:  JSR     R4,@(R2)+       ;TEST THE JSR - GO TO A0642 VIA JSR3

050104  104005          E10642: ERROR5                  ;JSR FAILED TO LOAD THE PC
050106  050072                  R0642                   ;ERROR LOOP RETURN

050110  005726          A0642:  TST     (SP)+           ;RESET SP
050112  020605                  CMP     SP,R5           ;DID JSR PUSH STACK ?
050114  001410                  BEQ     O0642           ;BR IF YES

050116  005746                  TST     -(SP)           ;RESET SP TO ERROR VALUE
050120  104005          E20642: ERROR5                  ;JSR FAILED
050122  050072                  R0642                   ;ERROR LOOP RETURN
050124  000403                  BR      B0642           ;GO EXIT

050126  050110          JSR3:   A0642                   ;CONTAINS JUMP ADDR
050130  104005          E30642: ERROR5                  ;JSR EXECUTED LIKE A MODE 1 OR 2
050132  050072                  R0642                   ;ERROR LOOP RETURN

050134  010506          B0642:  MOV     R5,SP           ;RESTORE SP JUST IN CASE

050136  000004          O0642:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0643 JSR MODE 4 TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [154,300,307,311,312,306,313,016] FC 1,5

                                        ;ACT BUTS:      37[004]100,154 / 15[154]306,307 / 16[306]016,016

                                        ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0643

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2 (-) T = 3.1 USEC

                                        ;KEY SIG:       K3-3 DM=4L  /  K3-5 JSR H  /  K3-5 JMP+JSR H  /  K5-5 BC01 H

050140  012700  000643                  T0643:  MOV     #0643,R0                ;LOAD R0 WITH TEST NO.
050144  013701  050162                          MOV     @#I0643,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
050150  010605                                  MOV     SP,R5           ;SAVE THE SP
050152  010506                          R0643:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPS
050154  012702  050172                          MOV     #E20643,R2      ;DEST ADDR = A0643+2
050160  000257                                  CCC                     ;SCOPE SYNC

050162  004442                          I0643:  JSR     R4,-(R2)        ;TEST THE JSR - GO TO A0643

050164  104005                          E10643: ERROR5                  ;JSR FAILED TO LOAD THE PC
050166  050152                                  R0643                   ;ERROR LOOP RETURN

050170  000402                          A0643:  BR      B0643           ;JUMPED OK - GO CHECK SP
050172  104005                          E20643: ERROR5                  ;JSR FAILED TO DECREMENT DEST REG
050174  050152                                  R0643                   ;ERROR LOOP RETURN

050176  005726                          B0643:  TST     (SP)+           ;RESET SP
050200  020605                                  CMP     SP,R5           ;DID JSR PUSH STACK ?
050202  001404                                  BEQ     00643           ;BR IF YES

050204  005746                                  TST     -(SP)           ;RESET SP TO ERROR VALUE
050206  104005                          E30643: ERROR5                  ;JSR FAILED TO PUSH SP
050210  050152                                  R0643                   ;ERROR LOOP RETURN

050212  010506                          C0643:  MOV     R5,SP           ;RESTORE SP JUST IN CASE

050214  000004                          00643:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0644 JSR MODE 5 TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [155,303,307,310,311,312,306,313,016] FC 1,5

                                        ;ACT BUTS:      37[004]100,155 / 15[155]306,307 / 16[306]016,016

                                        ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0644

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2 (-) T = 3.5 USEC

                                        ;KEY SIG:       K3-3 DM=5L  /  K3-5 JSR H  /  K3-5 JMP+JSR H  /  K5-5 BC01 H

050216  012700  000644                  T0644:  MOV     #0644,R0                ;LOAD R0 WITH TEST NO.
050222  013701  050252                          MOV     @#I0644,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
050226  032737  010000  066642                  BIT     #10000,@#BPTLOC ;BREAKPOINT HALT SET ??
050234  001401                                  BEQ     .+4             ;BR IF NOT
050236  000000                                  HALT                    ;BREAK-DEPRESS CONTINUE TO RESTART
050240  010605                                  MOV     SP,R5           ;SAVE THE SP
050242  010506                          R0644:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPS
050244  012702  050300                          MOV     #E30644,R2      ;DEST ADDR = [E30644 - 2]
050250  000257                                  CCC                     ;SCOPE SYNC

050252  004452                          I0644:  JSR     R4,@-(R2)       ;TEST THE JSR - GO TO A0644

050254  104005                          E10644: ERROR5                  ;JSR FAILED TO LOAD THE PC
050256  050242                                  R0644                   ;ERROR LOOP RETURN

050260  005726                          A0644:  TST     (SP)+           ;RESET SP
050262  020605                                  CMP     SP,R5           ;DID JSR PUSH STACK ?
050264  001410                                  BEQ     00644           ;BR IF YES

050266  005746                                  TST     -(SP)           ;RESET SP TO ERROR VALUE
050270  104005                          E20644: ERROR5                  ;JSR FAILED TO PUSH SP
050272  050242                                  R0644                   ;ERROR LOOP RETURN
050274  000403                                  BR      B0644           ;GO EXIT

050276  050260                                  A0644                   ;CONTAINS JUMP ADDRESS
050300  104005                          E30644: ERROR5                  ;JSR EXECUTED LIKE A MODE 1 OR 2
050302  050242                                  R0644                   ;ERROR LOOP RETURN

050304  010506                          B0644:  MOV     R5,SP           ;RESTORE SP JUST IN CASE

050306  000004                          00644:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0645 JSR MODE 6 TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [156,304,305,300,307,310,311,312,306,313,016] FC 1,5

                                        ;ACT BUTS:      37[004]100,156 / 15[305]306,307 / 16[306]016,016

                                        ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0645

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2 (-) T = 3.5 USEC

                                        ;KEY SIG:       K3-3 DM=6L  /  K3-5 JSR H  /  K3-5 JMP+JSR H

050310  012700  000645                  T0645:  MOV     #0645,R0                ;LOAD R0 WITH TEST NO.
050314  013701  050332                          MOV     @#I0645,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
050320  010605                                  MOV     SP,R5           ;SAVE THE SP
050322  010506                          R0645:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPS
050324  012702  050336                          MOV     #E10645,R2      ;[R2] = BASE DEST ADDR
050330  000257                                  CCC                     ;SCOPE SYNC

050332  004462  000004                  I0645:  JSR     R4,A0645-E10645(R2)     ;TEST THE JSR - GO TO A0645

050336  104005                          E10645: ERROR5                  ;JSR FAILED TO LOAD THE PC OR INDEX FAILED
050340  050322                                  R0645                   ;ERROR LOOP RETURN

050342  005726                          A0645:  TST     (SP)+           ;RESET SP
050344  020605                                  CMP     SP,R5           ;DID JSR PUSH STACK ?
050346  001404                                  BEQ     00645           ;BR IF YES

050350  005746                                  TST     -(SP)           ;RESET SP TO ERROR VALUE
050352  104005                          E20645: ERROR5                  ;JSR FAILED TO PUSH STACK
050354  050322                                  R0645                   ;ERROR LOOP RETURN
050356  010506                                  MOV     R5,SP           ;RESET SP JUST IN CASE

050360  000004                          00645:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0646 JSR MODE 7 TEST
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [157,301,302,303,307,310,311,312,306,313,016] FC 1,5

                                        ;ACT BUTS:      37[004]100,157 / 15[302]306,307 / 16[306]016,016

                                        ;EXEC:          [306]ALUC=LLLLL :[313] D = #A0646

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2 (-) T = 4.1 USEC

                                        ;KEY SIG:       K3-3 DM=7L  /  K3-5 JSR H  /  K3-5 JMP+JSR H

050362  012700  000646                  T0646:  MOV     #0646,R0                ;LOAD R0 WITH TEST NO.
050366  013701  050404                          MOV     @#I0646,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
050372  010605                                  MOV     SP,R5           ;SAVE THE SP
050374  010506                          R0646:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPS
050376  012702  050410                          MOV     #E10646,R2      ;BASE DEST ADDR = E10646
050402  000257                                  CCC                     ;SCOPE SYNC

050404  004472  000022                  I0646:  JSR     R4,@JSR7-E10646(R2);TEST THE JSR - GO TO A0646 VIA JSR7

050410  104005                          E10646: ERROR5                  ;JSR FAILED TO LOAD THE PC
                                                                        ;OR INDEX FAILED
050412  050374                                  R0646                   ;ERROR LOOP RETURN

050414  005726                          A0646:  TST     (SP)+           ;RESET SP
050416  020605                                  CMP     SP,R5           ;DID JSR PUSH STACK ?
050420  001410                                  BEQ     00646           ;BR IF YES

050422  005746                                  TST     -(SP)           ;RESET SP TO ERROR VALUE
050424  104005                          E20646: ERROR5                  ;JSR FAILED TO PUSH STACK
050426  050374                                  R0646                   ;ERROR LOOP RETURN
050430  000403                                  BR      B0646           ;SKIP TO EXIT

050432  050414                          JSR7:   A0646                   ;CONTAINS JUMP ADDR
050434  104005                          E30646: ERROR5                  ;JSR WORKED LIKE A MODE 1 OR 2
050436  050374                                  R0646                   ;ERROR LOOP RETURN

050440  010506                          B0646:  MOV     R5,SP           ;RESTORE SP JUST IN CASE

050442  000004                          00646:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***************************************************************
                                        .SBTTL T0647 SOB TEST, [R] = 1, NO BRANCH
                                ; ***************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [130,342,343,345,347,016] FC 1,7

                                ;ACT BUTS:      37[004]100,130 / 12[342]344,345 / 16[345]016,016

                                ;EXEC:          [130]ALUC=LHHHH :[343] D = 000000

                                ;CODES:         N / A

                                ;SYNC:          B05J2 (-) T = 2 USEC

                                ;KEY SIG:       K3-6 SOB L  /  K1-7 D(15:00)=0 H

050444  012700  000647          T0647:  MOV     #0647,R0                ;LOAD R0 WITH TEST NO.
050450  013701  050472                  MOV     @#I0647,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

050454  012702  000001          R0647:  MOV     #1,R2           ;SET SOB COUNTER = 1
050460  000403                          BR      I0647-2         ;GO DO THE SOB

050462  104006                  E0647:  ERROR6                  ;SOB SHOULDN'T HAVE BRANCHED HERE
050464  050454                          R0647                   ;ERROR LOOP RETURN
050466  000402                          BR      00647           ;GO TO SCOPE CALL

050470  000257                          CCC                     ;SYNC INSTR.
050472  077205                  I0647:  SOB     R2,E0647                ;TEST THE SOB

050474  000004                   00647: SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0650 SOB TEST, [R] = 5, BRANCH 4 TIMES
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [130,342,343,344,346,016] FC 1,7

                                ;ACT BUTS:      37[004]100,130 / 12[342]344,344 / 16[344]016,016

                                ;EXEC:          [130]ALUC=LHHHH :[343] D = 000004 (1ST TIME)
                                ;               [346]ALUC=LLHHL :[016] D = #A0650
                                ;CODES:         N / A

                                ;SYNC:          B05J2 (-) T = 2.36 USEC

                                ;KEY SIG:       K3-6 SOB L  /  K2-7 DAD3 (1) H  /  K3-8 CIN00 L

050476  012700  000650          T0650:  MOV     #0650,R0                ;LOAD R0 WITH TEST NO.
050502  013701  050526                  MOV     @#I0650,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

050506  012702  000005          R0650:  MOV     #5,R2           ;SET SOB COUNTER = 5
050512  012705  177773                  MOV     #-5,R5          ;SET UP R5 TO COUNT 5 BRANCHES
050516  000402                          BR      I0650-2         ;GO DO THE SOB

050520  005205                  A0650:  INC     R5              ;COUNT ONE BRANCH
050522  001412                          BEQ     E20650          ;BR IF TOO MANY LOOPS BY SOB

050524  000257                          CCC                     ;SCOPE SYNC
050526  077204                  I0650:  SOB     R2,A0650                ;TEST THE SOB
050530  000402                          BR      SOB2            ;SKIP NEXT TWO WORDS

050532  000474                  SOB1:   BR      SOB3            ;USED BY LAST SOB TEST TO TEST MAX OFFSET
050534  000240                          NOP

050536  005702                  SOB2:   TST     R2              ;R2 SHOULD CONTAIN 0
050540  001405                          BEQ     00650           ;BR IF IT DOES

050542  104006                  E10650: ERROR6                  ;SOB COUNTER NOT ZERO
050544  050506                          R0650                   ;ERROR LOOP RETURN
050546  000402                          BR      00650           ;GO TO SCOPE CALL
050550  104006                  E20650: ERROR6                  ;SOB MADE TOO MANY BRANCHES
050552  050506                          R0650                   ;ERROR LOOP RETURN
050554  000004                  00650:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***************************************************************
                                                .SBTTL T0651 SOB TEST, [R] = 1, FLAGS = 1111
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [130,342,343,345,347,016] FC 1,7

                                        ;ACT BUTS:      37[004]100,130 / 12[342]344,345 / 16[345]016,016

                                        ;EXEC:          [130]ALUC=LHHHH :[343] D = 000000

                                        ;CODES:         N:C = 1111 (NO CHANGE)

                                        ;SYNC:          B05J2 (-) T = 2 USEC

                                        ;KEY SIG:       K3-6 SOB L  /  K1-7 D(15:00)=0 H

050556  012700  000651                  T0651:  MOV     #0651,R0                ;LOAD R0 WITH TEST NO.
050562  013701  050574                          MOV     @#I0651,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

050566  012702  000001                  R0651:  MOV     #1,R2           ;SET SOB COUNTER = 1
050572  000277                                  SCC                     ;MAKE N:C = 1111

050574  077202                          I0651:  SOB     R2,I0651-2      ;TEST THE SOB

050576  103003                                  BCC     E0651           ;BR IF C = 0
050600  102002                                  BVC     E0651           ;BR IF V = 0
050602  001001                                  BNE     E0651           ;BR IF Z = 0
050604  100402                                  BMI     00651           ;BR IF N = 1

050606  104006                          E0651:  ERROR6                  ;SOB ALTERED CODES - CLEARED ONE
050610  050566                                  R0651                   ;ERROR LOOP RETURN

050612  000004                          00651:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***************************************************************
                                                .SBTTL T0652 SOB TEST, [R] = 1, FLAGS = 0000
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [130,342,343,345,347,016] FC 1,7

                                        ;ACT BUTS:      37[004]100,130 / 12[342]344,345 / 16[345]016,016

                                        ;EXEC:          [130]ALUC=LHHHH :[343] D = 000000

                                        ;CODES:         N:C = 0000 (NO CHANGE)

                                        ;SYNC:          B05J2 (-) T = 2 USEC

                                        ;KEY SIG:       K3-6 SOB L  /  K1-7 D(15:00)=0 H

050614  012700  000652                  T0652:  MOV     #0652,R0                ;LOAD R0 WITH TEST NO.
050620  013701  050632                          MOV     @#I0652,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

050624  012702  000001                  R0652:  MOV     #1,R2           ;SET SOB COUNTER = 1
050630  000257                                  CCC                     ;MAKE N:C = 0000

050632  077202                          I0652:  SOB     R2,I0652-2      ;TEST THE SOB

050634  103403                                  BCS     E0652           ;BR IF C = 1
050636  102402                                  BVS     E0652           ;BR IF V = 1
050640  001401                                  BEQ     E0652           ;BR IF Z = 1

050642  100002                                  BPL     00652           ;BR IF N = 0

050644  104006                          E0652:  ERROR6                  ;SOB ALTERED CODES - SET ONE
050646  050624                                  R0652                   ;ERROR LOOP RETURN

050650  000004                          00652:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***************************************************************
                                                .SBTTL T0653 SOB TEST, [R] = 5, FLAGS = 1111
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [130,342,343,344,346,016] FC 1,7

                                        ;ACT BUTS:      37[004]100,130 / 12[342]344,344 / 16[344]016,016

                                        ;EXEC:          [130]ALUC=LHHHH :[343] D = 000004 (1ST TIME9
                                        ;               [346]ALUC=LLHHL :[016] D = #I0653
                                        ;CODES:         N:C = 1111 (NO CHANGE)

                                        ;SYNC:          B05J2 (-) T = 2.36 USEC

                                        ;KEY SIG:       K3-6 SOB L  /  K2-7 DAD3 (1) H  /  K3-8 CIN00 L

050652  012700  000653                  T0653:  MOV     #0653,R0                ;LOAD R0 WITH TEST NO.
050656  013701  050670                          MOV     @#I0653,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

050662  012702  000005                  R0653:  MOV     #5,R2           ;SET SOB COUNTER = 5
050666  000277                                  SCC                     ;MAKE N:C = 1111

050670  077201                          I0653:  SOB     R2,I0653                ;TEST THE SOB

050672  103003                                  BCC     E0653           ;BR IF C = 0
050674  102002                                  BVC     E0653           ;BR IF V = 0
050676  001001                                  BNE     E0653           ;BR IF Z = 0
050700  100402                                  BMI     00653           ;BR IF N = 1

050702  104006                          E0653:  ERROR6                  ;SOB ALTERED CODES - CLEARED ONE
050704  050662                                  R0653                   ;ERROR LOOP RETURN

050706  000004                          00653:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***************************************************************
                                                .SBTTL T0654 SOB TEST, [R] = 5, FLAGS = 0000
                                        ; ***************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [130,342,343,344,346,016] FC 1,7

                                        ;ACT BUTS:      37[004]100,130 / 12[342]344,344 / 16[344]016,016

                                        ;EXEC:          [130]ALUC=LHHHH :[343] D = 000004 (1ST TIME)
                                        ;               [346]ALUC=LLHHL :[016] D = #I0654
                                        ;CODES:         N:C = 0000 (NO CHANGE)

                                        ;SYNC:          B05J2 (-) T = 2.36 USEC

                                        ;KEY SIG:       K3-6 SOB L  /  K2-7 DAD3 (1) H  /  K3-8 CIN00 L

050710  012700  000654                  T0654:  MOV     #0654,R0                ;LOAD R0 WITH TEST NO.
050714  013701  050726                          MOV     @#I0654,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD

050720  012702  000005                  R0654:  MOV     #5,R2           ;SET SOB COUNTER = 5
050724  000257                          SOB3:   CCC                     ;MAKE N:C = 0000

050726  077277                          I0654:  SOB     R2,SOB1         ;TEST THE SOB

050730  103403                                  BCS     E0654           ;BR IF C = 1
050732  102402                                  BVS     E0654           ;BR IF V = 1
050734  001401                                  BEQ     E0654           ;BR IF Z = 1
050736  100002                                  BPL     00654           ;BR IF N = 0

050740  104006                          E0654:  ERROR6                  ;SOB ALTERED CODES - SET ONE
050742  050720                                  R0654                   ;ERROR LOOP RETURN

050744  000004                          00654:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0655 RTS TEST - <N:C> = 1111
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [124,323,324,325,016] FC 1,6

                                ;ACT BUTS:      37[004]100,124 / 16[324]016,016

                                ;EXEC:          [323] D = #A0655  /  [325] D = 177777

                                ;CODES:         N:C = 1111 (NO CHANGE)

                                ;SYNC:          B05J2 (-) T = 2.5 USEC

                                ;KEY SIG:       K3-6 RTS L  /  K5-5 BC01 H

050746  012700  000655          T0655:  MOV     #0655,R0                ;LOAD R0 WITH TEST NO.
050752  013701  051000                  MOV     @#I0655,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
050756  010605                          MOV     SP,R5           ;SAVE THE SP
050760  012704  177777          R0655:  MOV     #-1,R4          ;R3 SHOULD GET 177777
050764  010506                          MOV     R5,SP           ;RESET SP FOR ERROR LOOP
050766  012703  051010                  MOV     #A0655,R3               ;RTS SHOULD LOAD PC FROM [R3]
050772  012746  177777                  MOV     #-1,-(SP)       ;RTS SHOULD LOAD R3 WITH 177777
050776  000277                          SCC                     ;N:C = 1111

051000  000203                  I0655:  RTS     R3              ;TEST THE RTS - GO TO A0655

051002  104005                  E10655: ERROR5                  ;RTS FAILED TO LOAD THE PC
051004  050760                          R0655                   ;ERROR LOOP RETURN ADDRESS
051006  000420                          BR      D0655           ;GO TO EXIT - SCHOOLS OUT

051010  100003                  A0655:  BPL     E20655          ;N:C = 1111 ?
051012  001002                          BNE     E20655
051014  102001                          BVC     E20655
051016  103402                          BCS     B0655

051020  104005                  E20655: ERROR5                  ;RTS ALTERED CODES - CLEARED ONE
051022  050760                          R0655                   ;ERROR LOOP RETURN

051024  020403                  B0655:  CMP     R4,R3           ;DID R3 GET LOADED FROM STACK ?
051026  001402                          BEQ     C0655           ;BR IF YES

051030  104000                  E30655: ERROR                   ;RTS FAILED TO LOAD REG
051032  050760                          R0655                   ;ERROR LOOP RETURN

051034  020506                  C0655:  CMP     R5,SP           ;DID RTS POP THE STACK POINTER ?
051036  001405                          BEQ     00655           ;BR IF YES

051040  010504                          MOV     R5,R4           ;[R4] = S / B SP
051042  010603                          MOV     SP,R3           ;[R3] = WAS SP
051044  104000                  E40655: ERROR                   ;RTS FAILED TO POP SP
051046  050760                          R0655                   ;ERROR LOOP RETURN

051050  010506                  D0655:  MOV     R5,SP           ;FIX THE SP
```

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22180  051052  000004                00655:  SCOPE                    ;CALL  THE SCOPE LOOP UTILITY
22181
```

```
                                ; ***********************************************************************
                                        .SBTTL T0656 RTS TEST - <N:C> = 0000
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [124,323,324,325,016] FC 1,6

                                ;ACT BUTS:      37[004]100,124 / 16[324]016,016

                                ;EXEC:          [323] D = #A0656  /  [325] D = 177777

                                ;CODES:         N:C = 0000 (NO CHANGE)

                                ;SYNC:          B05J2 (-) T = 2.5 USEC

                                ;KEY SIG:       K3-6 RTS L  /  K5-5 BC01 H

051054  012700  000656          T0656:  MOV     #0656,R0                ;LOAD R0 WITH TEST NO.
051060  013701  051106                  MOV     @#I0656,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
051064  010605                          MOV     SP,R5           ;SAVE THE SP
051066  012704  177777          R0656:  MOV     #-1,R4          ;R3 SHOULD GET 177777
051072  010506                          MOV     R5,SP           ;RESET SP FOR ERROR LOOP
051074  012703  051116                  MOV     #A0656,R3               ;RTS SHOULD LOAD PC FROM [R3]
051100  012746  177777                  MOV     #-1,-(SP)       ;RTS SHOULD LOAD R3 WITH 177777
051104  000257                          CCC                     ;N:C = 0000

051106  000203                  I0656:  RTS     R3              ;TEST THE RTS - GO TO A0656

051110  104005                  E10656: ERROR5                  ;RTS FAILED TO LOAD THE PC
051112  051066                          R0656                   ;ERROR LOOP RETURN ADDRESS
051114  000420                          BR      D0656           ;GO TO EXIT - SCHOOLS OUT

051116  100403                  A0656:  BMI     E20656          ;N:C = 0000 ?
051120  001402                          BEQ     E20656
051122  102401                          BVS     E20656
051124  103002                          BCC     B0656

051126  104005                  E20656: ERROR5                  ;RTS ALTERED CODES - CLEARED ONE
051130  051066                          R0656                   ;ERROR LOOP RETURN

051132  020403                  B0656:  CMP     R4,R3           ;DID R3 GET LOADED FROM STACK ?
051134  001402                          BEQ     C0656           ;BR IF YES

051136  104000                  E30656: ERROR                   ;RTS FAILED TO LOAD REG
051140  051066                          R0656                   ;ERROR LOOP RETURN

051142  020506                  C0656:  CMP     R5,SP           ;DID RTS POP THE STACK POINTER ?
051144  001405                          BEQ     00656           ;BR IF YES

051146  010504                          MOV     R5,R4           ;[R4] = S / B SP
051150  010603                          MOV     SP,R3           ;[R3] = WAS SP
051152  104000                  E40656: ERROR                   ;RTS FAILED TO POP SP
051154  051066                          R0656                   ;ERROR LOOP RETURN

051156  010506                  D0656:  MOV     R5,SP           ;FIX THE SP
```

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22238  051160  000004                00656:  SCOPE                    ;CALL  THE SCOPE LOOP UTILITY
22239
```

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                                        ; ***********************************************************************
                                                .SBTTL T0657 RTT TEST - <N:C> = 1111
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [101,320,321,322,017,015,013] FC 1,6,10

                                        ;ACT BUTS:      37[004]100,101 / 26[017]010,013

                                        ;EXEC:          [320] D = #A0657  /  [322] D = 340

                                        ;CODES:         [322] SPS=7  /  N:C = 0000

                                        ;SYNC:          B05J2 (-) T = 3 USEC

                                        ;KEY SIG:       K3-6 RTT H  /  K3-6 RTI+RTT L  /  K5-5 BC01 H

051162  012700  000657                  T0657:  MOV     #0657,R0                ;LOAD R0 WITH TEST NO.
051166  013701  051220                          MOV     @#I0657,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
051172  010605                                  MOV     SP,R5           ;SAVE THE SP
051174  010506                          R0657:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
051176  012704  000340                          MOV     #340,R4         ;[R4] = S / B PSW AT HTIS POINT
051202  012746  000340                          MOV     #340,-(SP)      ;NEW PSW S / B = 340
051206  012746  051230                          MOV     #A0657,-(SP)    ;NEW PC S / B = A0657
051212  005037  177776                          CLR     @#PSW           ;CLEAR THE PSW
051216  000277                                  SCC                     ;N:C = 1111

051220  000006                          I0657:  RTT                     ;TEST THE RTT - GO TO A0657

051222  104005                          E10657: ERROR5                  ;RTT FAILED TO LOAD THE PC
051224  051174                                  R0657                   ;ERROR LOOP RETURN ADDRESS
051226  000414                                  BR      C0657           ;GO TO EXIT - SCHOOL'S OUT

051230  013703  177776                  A0657:  MOV     @#PSW,R3        ;SAVE THE PSW
051234  020403                                  CMP     R4,R3           ;WAS PSW = 340 ?
051236  001402                                  BEQ     B0657           ;BR IF IT WAS

051240  104000                          E20657: ERROR                   ;RTT FAILED TO LOAD PSW PROPERLY
                                                                        ;[R3] = WAS PSW
                                                                        ;[R4] = S / B PSW
051242  051174                                  R0657                   ;ERROR LOOP RETURN ADDRESS

051244  020506                          B0657:  CMP     R5,SP           ;DID RTT UPDATE THE SP ?
051246  001405                                  BEQ     00657           ;BR IF YES

051250  010504                                  MOV     R5,R4           ;[R4] = S / B SP
051252  010603                                  MOV     SP,R3           ;[R3] = WAS SP
051254  104000                          E30657: ERROR                   ;RTT FAILED TO UPDATE SP
051256  051174                                  R0657                   ;ERROR LOOP RETURN ADDRESS

051260  010506                          C0657:  MOV     R5,SP           ;FIX THE SP
051262  000004                          00657:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0660 RTT TEST - <N:C> = 0000
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [101,320,321,322,017,015,013] FC 1,6,10

                                        ;ACT BUTS:      37[004]100,101 / 26[017]010,013

                                        ;EXEC:          [320] D = #A0660  /  [322] D = 000017

                                        ;CODES:         [322] SPS=7  /  N:C = 1111

                                        ;SYNC:          B05J2 (-) T = 3 USEC

                                        ;KEY SIG:       K3-6 RTI+RTT L  /  K3-6 RTT H  /  K5-5 BC01 H

051264  012700  000660          T0660:  MOV     #0660,R0                ;LOAD R0 WITH TEST NO.
051270  013701  051324                  MOV     @#I0660,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
051274  010605                          MOV     SP,R5           ;SAVE THE SP
051276  010506                  R0660:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
051300  012704  000017                  MOV     #017,R4         ;[R4] = S / B PSW AT HTIS POINT
051304  012746  000017                  MOV     #017,-(SP)      ;NEW PSW S / B = 017
051310  012746  051334                  MOV     #A0660,-(SP)    ;NEW PC S / B = A0660
051314  012737  000340  177776          MOV     #340,@#PSW      ;MAKE [PSW] = 340
051322  000257                          CCC                     ;N:C = 0000

051324  000006                  I0660:  RTT                     ;TEST THE RTT - GO TO A0660

051326  104005                  E10660: ERROR5                  ;RTT FAILED TO LOAD THE PC
051330  051276                          R0660                   ;ERROR LOOP RETURN ADDRESS
051332  000414                          BR      C0660           ;GO TO EXIT - SCHOOL'S OUT

051334  013703  177776          A0660:  MOV     @#PSW,R3        ;SAVE THE PSW
051340  020403                          CMP     R4,R3           ;WAS PSW = 017 ?
051342  001402                          BEQ     B0660           ;BR IF IT WAS

051344  104000                  E20660: ERROR                   ;RTT FAILED TO LOAD PSW PROPERLY
                                                                ;[R3] = WAS PSW
                                                                ;[R4] = S / B PSW
051346  051276                          R0660                   ;ERROR LOOP RETURN ADDRESS

051350  020506                  B0660:  CMP     R5,SP           ;DID RTT UPDATE THE SP ?
051352  001405                          BEQ     O0660           ;BR IF YES

051354  010504                          MOV     R5,R4           ;[R4] = S / B SP
051356  010603                          MOV     SP,R3           ;[R3] = WAS SP
051360  104000                  E30660: ERROR                   ;RTT FAILED TO UPDATE SP
051362  051276                          R0660                   ;ERROR LOOP RETURN ADDRESS

051364  010506                  C0660:  MOV     R5,SP           ;FIX THE SP
051366  000004                  O0660:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                ; ************************************************************************
                                        .SBTTL T0661 MARK INSTRUCTION TEST - <N:C>=0000
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [112,353,354,355,356,357,016] FC 1,5

                                ;ACT BUTS:      37[004]100,112 / 16[356]016,016

                                ;EXEC:          [355] D = #B0661+2  /  [356] D = 125252  /  [357] D = #A0661

                                ;CODES:         N:C = 0000 (NO CHANGE)

                                ;SYNC:          B05J2 (-) T = 2.6 USEC

                                ;KEY SIG:       K3-6 MARK L  /  K5-5 BC01 H

051370  012700  000661          T0661:  MOV     #0661,R0                ;LOAD R0 WITH TEST NO.
051374  013701  051420                  MOV     @#I0661,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
051400  010604                          MOV     SP,R4           ;SAVE SP
051402  012703  125252                  MOV     #125252,R3      ;[R5] SHOULD BE 125252
051406  012705  051444          R0661:  MOV     #A0661,R5               ;MARK GOES TO A0661 VIA [R5]
051412  010337  051432                  MOV     R3,@#B0661      ;INITIALIZE WORD LOADED INTO R5
051416  000257                          CCC                     ;N:C=0000

051420  006404                  I0661:  MARK+4                  ;TEST THE MARK

051422  010406                          MOV     R4,SP           ;RESET SP
051424  104005                  E10661: ERROR5                  ;MARK FAILED TO EXECUTE
051426  051406                          R0661                   ;ERROR LOOP RETURN ADDRESS

051430  000435                          BR      O0661           ;GO TO SCOPE EXIT

051432  125252                  B0661:  125252                  ;THIS WORD SHOULD GET LOADED INTO R5

051434  010406                          MOV     R4,SP           ;RESET SP
051436  104005                  E20661: ERROR5                  ;MARK FAILED TO LOAD RC FROM [R5]
051440  051406                          R0661                   ;ERROR LOOP RETURN ADDRESS

051442  000430                          BR      O0661           ;GO TO SCOPE EXIT

051444  100403                  A0661:  BMI     D0661           ;N:C=0000?
051446  001402                          BEQ     D0661
051450  102401                          BVS     D0661
051452  103005                          BCC     C0661

051454  013702  177776          D0661:  MOV     @#PSW,R2        ;SAVE FLAGS IN R2
051460  010406                          MOV     R4,SP           ;RESET SP
051462  104006                  E30661: ERROR6                  ;MSRK SET A FLAG -[PSW] IN R2
051464  051406                          R0661                   ;ERROR LOOP RETURN ADDRESS

051466  020627  051434          C0661:  CMP     SP,#B0661+2     ;DID MARK RESET SP?
051472  001405                          BEQ     F0661           ;BR IF YES
051474  010602                          MOV     SP,R2           ;PUT BAD SP IN R2
051476  010406                          MOV     R4,SP           ;RESET SP
```

```
051500  104005          E40661: ERROR5          ;MARK FAILED TO RESET SP -[R2]=SP WAS
051502  051406                  R0661           ;ERROR LOOP RETURN ADDRESS

051504  000407                  BR      O0661   ;GO TO SCOPE EXIT

051506  020503          F0661:  CMP     R5,R3   ;DID MARK RESTORE OLD R5
051510  001404                  BEQ     G0661   ;BR IF YES

051512  010502                  MOV     R5,R2   ;[R2]=WAS R5
051514  010406                  MOV     R4,SP   ;RESET SP
051516  104007          E50661: ERROR7          ;MARK FAILED TO RESET R5
051520  051406                  R0661           ;ERROR LOOP RETURN

051522  010406          G0661:  MOV     R4,SP   ;RESET SP

051524  000004          O0661:  SCOPE           ;CALL THE SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0662 MARK INSTRUCTION TEST - <N:C>=1111
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [112,353,354,355,356,357,016] FC 1,5

                                ;ACT BUTS:      37[004]100,112 / 16[356]016,016

                                ;EXEC:          [355] D = #B0662+2  /  [356] D = 125252  /  [357] D = #A0662

                                ;CODES:         N:C = 1111 (NO CHANGE)

                                ;SYNC:          B05J2 (-) T = 2.6 USEC

                                ;KEY SIG:       K3-6 MARK L  /  K5-5 BC01 H

051526  012700  000662          T0662:  MOV     #0662,R0                ;LOAD R0 WITH TEST NO.
051532  013701  051556                  MOV     @#I0662,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
051536  010604                          MOV     SP,R4           ;SAVE SP
051540  012703  125252                  MOV     #125252,R3      ;[R5] SHOULD BE 125252
051544  012705  051602          R0662:  MOV     #A0662,R5               ;MARK GOES TO A0662 VIA [R5]
051550  010337  051570                  MOV     R3,@#B0662      ;INITIALIZE WORD LOADED INTO R5
051554  000277                          SCC                     ;N:C=1111

051556  006404                  I0662:  MARK+4                  ;TEST THE MARK

051560  010406                          MOV     R4,SP           ;RESET SP
051562  104005                  E10662: ERROR5                  ;MARK FAILED TO EXECUTE
051564  051544                          R0662                   ;ERROR LOOP RETURN ADDRESS

051566  000435                          BR      O0662           ;GO TO SCOPE EXIT

051570  125252                  B0662:  125252                  ;THIS WORD SHOULD GET LOADED INTO R5

051572  010406                          MOV     R4,SP           ;RESET SP
051574  104005                  E20662: ERROR5                  ;MARK FAILED TO LOAD RC FROM [R5]
051576  051544                          R0662                   ;ERROR LOOP RETURN ADDRESS

051600  000430                          BR      O0662           ;GO TO SCOPE EXIT

051602  100003                  A0662:  BPL     D0662           ;N:C=1111?
051604  001002                          BNE     D0662
051606  102001                          BVC     D0662
051610  103405                          BCS     C0662

051612  013702  177776          D0662:  MOV     @#PSW,R2        ;SAVE FLAGS IN R2
051616  010406                          MOV     R4,SP           ;RESET SP
051620  104006                  E30662: ERROR6                  ;MSRK SET A FLAG -[PSW] IN R2
051622  051544                          R0662                   ;ERROR LOOP RETURN ADDRESS

051624  020627  051572          C0662:  CMP     SP,#B0662+2     ;DID MARK RESET SP?
051630  001405                          BEQ     F0662           ;BR IF YES
051632  010602                          MOV     SP,R2           ;PUT BAD SP IN R2
051634  010406                          MOV     R4,SP           ;RESET SP
```

```
051636  104005          E40662: ERROR5          ;MARK FAILED TO RESET SP -[R2]=SP WAS
051640  051544                  R0662           ;ERROR LOOP RETURN ADDRESS

051642  000407                  BR      O0662   ;GO TO SCOPE EXIT

051644  020503          F0662:  CMP     R5,R3   ;DID MARK RESTORE OLD R5
051646  001404                  BEQ     G0662   ;BR IF YES

051650  010502                  MOV     R5,R2   ;[R2]=WAS R5
051652  010406                  MOV     R4,SP   ;RESET SP
051654  104007          E50662: ERROR7          ;MARK FAILED TO RESET R5
051656  051544                  R0662           ;ERROR LOOP RETURN

051660  010406          G0662:  MOV     R4,SP   ;RESET SP

051662  000004          O0662:  SCOPE           ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; *******************************************************************
                                                .SBTTL T0663 BASIC KW11-L RESPONSE TEST
                                        ; *******************************************************************

051664  012700  000663          T0663:  MOV     #0663,R0                ;LOAD R0 WITH TEST NO.
051670  013701  051722                  MOV     @#I0663,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
051674  005737  066636                  TST     @#OPTION        ;IS THE KW11 INSTALLED ??
051700  100023                          BPL     00663           ;BR IF NOT - SKIP THIS TEST
051702  010605                          MOV     SP,R5           ;SAVE SP
051704  012702  177546                  MOV     #LKCSR,R2       ;[R2] = LINE CLOCK ADDRESS
051710  010506                  R0663:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
051712  012737  051726  000004          MOV     #A0663,@#4      ;GO TO A0663 IF BUS TIMEOUT
051720  000257                          CCC                     ;SCOPE SYNC

051722  005712                  I0663:  TST     (R2)            ;REFERENCE LKCSR ADDR

051724  000405                          BR      B0663           ;GO TO EXIT

051726  012737  065160  000004  A0663:  MOV     #BERR,@#4       ;RESTORE TIMEOUT VECTOR
051734  104006                  E0663:  ERROR6                  ;LKCSR FAILED TO RESPOND
051736  051710                          R0663                   ;ERROR LOOP RETURN ADDRESS

051740  010506                  B0663:  MOV     R5,SP           ;RESET SP
051742  012737  065160  000004          MOV     #BERR,@#4       ;RESTORE TIMEOUT VECTOR

051750  000004                  00663:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0664 KW11-L TEST - LKCSR BIT 7 SET
                                ; ***********************************************************************

051752  012700  000664          T0664:  MOV     #0664,R0                ;LOAD R0 WITH TEST NO.
051756  013701  052002                  MOV     @#I0664,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
051762  005737  066636                  TST     @#OPTION        ;IS THE KW11-L INSTALLED ??
051766  100012                          BPL     O0664           ;BR IF NOT - SKIP THIS TEST
051770  012702  177546                  MOV     #LKCSR,R2       ;DEST ADDR = 177546
051774  012704  000200                  MOV     #200,R4         ;[LKCSR] S / B = 200
052000  000257                  R0664:  CCC                     ;SCOPE SYNC

052002  030412                  I0664:  BIT     R4,(R2)         ;TEST BIT 7 IN LKCSR

052004  001003                          BNE     O0664           ;BR IF IT'S SET

052006  011203                          MOV     (R2),R3         ;GET WAS DATA
052010  104000                  E0664:  ERROR                   ;BIT 7 NOT SET IN LKCSR
052012  052000                          R0664                   ;ERROR LOOP RETURN ADDRESS

052014  000004                  O0664:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                ; *******************************************************************
                                        .SBTTL T0665 KW11-L TEST - LKCSR BIT 6 CLEAR
                                ; *******************************************************************

052016  012700  000665          T0665:  MOV     #0665,R0                ;LOAD R0 WITH TEST NO.
052022  013701  052046                  MOV     @#I0665,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
052026  005737  066636                  TST     @#OPTION        ;IS THE KW11-L INSTALLED ??
052032  100013                          BPL     00665           ;BR IF NOT - SKIP THIS TEST
052034  012702  177546                  MOV     #LKCSR,R2       ;R2 POINTS TO LKCSR
052040  012704  000200                  MOV     #200,R4         ;[LKCSR] S / B = 200
052044  000257                  R0665:  CCC                     ;SCOPE SYNC

052046  032712  000100          I0665:  BIT     #100,(R2)       ;TEST BIT 6 IN LKCSR

052052  001403                          BEQ     00665           ;BR IF CLEAR

052054  011203                          MOV     (R2),R3         ;GET WAS DATA
052056  104000                  E0665:  ERROR                   ;BIT 6 (INTR. ENAB.) IN LKCSR WAS SET
052060  052044                          R0665                   ;ERROR LOOP RETURN ADDRESS

052062  000004                  00665:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; *******************************************************************
                                                .SBTTL T0666 KW11-L TEST - LKCSR BIT 6 SET
                                        ; *******************************************************************

052064  012700  000666          T0666:  MOV     #0666,R0                ;LOAD R0 WITH TEST NO.
052070  013701  052142                  MOV     @#I0666,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
052074  005737  066636                  TST     @#OPTION        ;IS THE KW11 INSTALLED ??
052100  100037                          BPL     00666           ;BR IF NOT - SKIP THIS TEST
052102  010605                          MOV     SP,R5           ;SAVE SP
052104  012702  177546                  MOV     #LKCSR,R2       ;R2 POINTS TO LKCSR
052110  012704  000300                  MOV     #300,R4         ;[LKCSR] S / B = 300
052114  012737  052160  000100  R0666:  MOV     #A0666,@#100    ;SET UP LCLK VECTOR IN CASE LOGIC
052122  012737  000340  000102          MOV     #340,@#102      ;FAULT CAUSES ATL INTERRUPT
052130  010506                          MOV     R5,SP           ;RESET SP FOR ERROR LOOP
052132  012737  000340  177776          MOV     #340,@#PSW      ;SET PRIORITY TO LEVEL 7
052140  000257                          CCC                     ;SCOPE SYNC

052142  052712  000100          I0666:  BIS     #100,(R2)       ;SET BIT 6 IN LKCSR

052146  020412                          CMP     R4,(R2)         ;RESULT CORRECT?
052150  001403                          BEQ     A0666           ;BR IF YES

052152  011203                          MOV     (R2),R3         ;GET WAS DATA
052154  104000                  E10666: ERROR                   ;BIT 6 FAILED TO SET IN LKCSR
052156  052114                          R0666                   ;ERROR LOOP RETURN ADDRESS


052160  042737  000102  000100  A0666:  BIC     #102,@#100      ;RESTORE TRAP CATCHER IN KW11-L VECTOR
052166  005037  000102                  CLR     @#102
052172  042712  000100                  BIC     #100,(R2)       ;TURN OF KW11-L INTR. ENAB.
052176  010506                          MOV     R5,SP           ;RESET SP

052200  000004                  00666:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                ; *******************************************************************
                                        .SBTTL T0667 KW11-L BASIC INTERRUPT TEST
                                ; *******************************************************************


052202  012700  000667          T0667:  MOV     #0667,R0                ;LOAD R0 WITH TEST NO.
052206  013701  052256                  MOV     @#I0667,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
052212  005737  066636                  TST     @#OPTION        ;IS THE KW11-L INSTALLED ??
052216  100041                          BPL     00667           ;BR IF NOT - SKIP THIS TEST
052220  010605                          MOV     SP,R5           ;SAVE SP
052222  012702  177546                  MOV     #LKCSR,R2       ;R2 POINTS TO LKCSR
052226  010506                  R0667:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
052230  005004                          CLR     R4              ;INITIALIZE TIMER
052232  012737  052276  000100          MOV     #A0667,@#100    ;SET UP LINE CLOCK VECTOR TO TO
052240  012737  000340  000102          MOV     #340,@#102      ;TO A0667 WITH PROCESSOR PRIORITY = 7
052246  005012                          CLR     (R2)            ;CLEAR LKCSR
052250  005037  177776                  CLR     @#PSW           ;SET PRIORITY TO LEVEL 000
052254  000257                          CCC                     ;SCOPE SYNC

052256  052712  000100          I0667:  BIS     #100,(R2)       ;ENABLE LINE CLK INTERRUPT

052262  005304                          DEC     R4              ;WAIT FOR INTR - REPORT ERROR IF
052264  001376                          BNE     .-2             ;R4 GOES TO 000000

052266  042712  000100                  BIC     #100,(R2)       ;TURN OFF INTR. ENAB.
052272  104006                  E0667:  ERROR6                  ;KW11-L FAILED TO INTERRUPT
052274  052226                          R0667                   ;ERROR LOOP RETURN ADDRESS

052276  042712  000100          A0667:  BIC     #100,(R2)       ;TURN OFF INTR. ENAB.
052302  012737  000102  000100          MOV     #102,@#100      ;RESTORE TRAP CATCHER IN KW11-L VECTOR
052310  005037  000102                  CLR     @#102
052314  010506                          MOV     R5,SP           ;RESET SP
052316  005037  177776                  CLR     @#PSW           ;RESET PRIORITY TO LEVEL 0

052322  000004                  00667:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; *****************************************************************
                                                .SBTTL T0670 RESET TEST - <N:C> = 1111
                                        ; *****************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [127,025,040,043,016] FC 1,6

                                        ;ACT BUTS:      37[004]100,127 / 02[025]042,043

                                        ;EXEC:          [025] BUT02 TRIGGERS RESET LOGIC ON K5-8

                                        ;CODES:         N:C = 1111 (NO CHANGE)

                                        ;SYNC:          B05J2 (-) T = 80 MILLISEC

                                        ;KEY SIG:       K3-6 RESET L  /  K3-6 HALT+RESET L  /  K5-3 BUT02 H  /  K5-8 RESET RESTA
                                                        ;K5-8 INIT*RESET H  /  K5-8 BUS INIT L  /  K5-8 P ENDRESET L  /
                                                        ;  K2-8 CLKOFF(1) H

052324  012700  000670          T0670:  MOV     #0670,R0                ;LOAD R0 WITH TEST NO.
052330  013701  052362                  MOV     @#I0670,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
052334  012737  000001  066664          MOV     #1,@#ITCNT      ;NO ITERATIONS ON THIS TEST
052342  012702  177564                  MOV     #XCSR,R2        ;R2 POINTS TO DL11 XCSR
052346  012737  000340  177776  R0670:  MOV     #340,@#PSW      ;MAKE PRTY. BITS ALL 1'S
052354  052712  000004                  BIS     #4,(R2)         ;SET THE DL11 MAINT. BIT
052360  000277                          SCC                     ;N:C = 1111

052362  000005                  I0670:  RESET                   ;TEST THE RESET - IT SHOULD CLEAR THE DL11 MAINT BIT

052364  013705  177776                  MOV     @#PSW,R5        ;SAVE THE PSW
052370  032712  000004                  BIT     #4,(R2)         ;DID MAINT. BIT CLEAR ??
052374  001404                          BEQ     A0670           ;BR IF YES

052376  042712  000004                  BIC     #4,(R2)         ;MAKE SURE TO TURN OFF MAINT. BIT
052402  104006                  E10670: ERROR6                  ;RESET FAILED TO CLEAR MAINT BIT
052404  052346                          R0670                   ;ERROR LOOP RETURN ADDRESS

052406  022705  000357          A0670:  CMP     #357,R5         ;DID RESET ALTER THE PSW ??
052412  001405                          BEQ     B0670           ;BR IF NOT

052414  012704  000357                  MOV     #357,R4         ;[R4] = S/B PSW
052420  010503                          MOV     R5,R3           ;[R3] = WAS PSW
052422  104000                  E20670: ERROR                   ;RESET ALTERED THE PSW
052424  052346                          R0670                   ;ERROR LOOP RETURN ADDRESS

052426  005037  177776          B0670:  CLR     @#PSW           ;CLEAR OUT THE PSW
052432  042712  000004                  BIC     #4,(R2)         ;MAKE SURE MAINT BIT IS OFF

052436  000004                  00670:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0671 RESET TEST - <N:C> = 0000
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [127,025,040,043,016] FC 1,6

                                        ;ACT BUTS:      37[004]100,127 / 02[025]042,043

                                        ;EXEC:          [025] BUT02 TRIGGERS RESET LOGIC ON K5-8

                                        ;CODES:         N:C = 0000 (NO CHANGE)

                                        ;SYNC:          B05J2 (-) T = 80 MILLISEC

                                        ;KEY SIG:       K3-6 RESET L  /  K3-6 HALT+RESET L  /  K5-3 BUT02 H  /  K5-8 RESET RESTA
                                                        ;K5-8 INIT*RESET H  /  K5-8 BUS INIT L  /  K5-8 P ENDRESET L  /
                                                        ;  K2-8 CLKOFF (1) H

052440  012700  000671          T0671:  MOV     #0671,R0                ;LOAD R0 WITH TEST NO.
052444  013701  052476                  MOV     @#I0671,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
052450  012737  000001  066664          MOV     #1,@#ITCNT      ;NO ITERATIONS ON THIS TEST
052456  012702  177564                  MOV     #XCSR,R2        ;R2 POINTS TO DL11 XCSR
052462  012737  000000  177776  R0671:  MOV     #0,@#PSW        ;MAKE PRTY. BITS ALL 0'S
052470  052712  000004                  BIS     #4,(R2)         ;SET THE DL11 MAINT. BIT
052474  000257                          CCC                     ;N:C = 0000

052476  000005                  I0671:  RESET                   ;TEST THE RESET - IT SHOULD CLEAR THE DL11 MAINT BIT

052500  013705  177776                  MOV     @#PSW,R5        ;SAVE THE PSW
052504  032712  000004                  BIT     #4,(R2)         ;DID MAINT. BIT CLEAR ??
052510  001404                          BEQ     A0671           ;BR IF YES

052512  042712  000004                  BIC     #4,(R2)         ;MAKE SURE TO TURN OFF MAINT. BIT
052516  104006                  E10671: ERROR6                  ;RESET FAILED TO CLEAR MAINT BIT
052520  052462                          R0671                   ;ERROR LOOP RETURN ADDRESS

052522  022705  000000          A0671:  CMP     #0,R5           ;DID RESET ALTER THE PSW ??
052526  001405                          BEQ     B0671           ;BR IF NOT

052530  012704  000357                  MOV     #357,R4         ;[R4] = S/B PSW
052534  010503                          MOV     R5,R3           ;[R3] = WAS PSW
052536  104000                  E20671: ERROR                   ;RESET ALTERED THE PSW
052540  052462                          R0671                   ;ERROR LOOP RETURN ADDRESS

052542  005037  177776          B0671:  CLR     @#PSW           ;CLEAR OUT THE PSW
052546  042712  000004                  BIC     #4,(R2)         ;MAKE SURE MAINT BIT IS OFF

052552  000004                  00671:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0672 WAIT INSTRUCTION TEST - [PSW] = 151
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [114,015,012,020,021:
                                        ;                       INTR.   014,022,023,007,[TRAP MICROROUTINE]
                                        ;                   NO  INTR.   017,015,012,020,021,017 ETC. FC 1,10,6,10

                                        ;ACT BUTS:      37[004]100,114  /  26[114]010,012  /  25[020]014,014  /  07[022]006,007

                                        ;EXEC           BUT 25 IN LOC. 020 SHOULD CAUSE EXIT FROM WAIT LOOP

                                        ;CODES:         N / A    /      N:C=1001 (NO CHANGE)

                                        ;SYNC:          B05J2   (-)     T=2.24 USEC + INTR. WAIT TIME

                                        ;KEY SIG:       K4-5 BRPTR(1) L  /  K3-6 WAIT L  /  K4-6 BRQ H  /  K5-4 -BRSV(0) H

052554  012700  000672                  T0672:  MOV     #0672,R0                ;LOAD R0 WITH TEST NO.
052560  013701  052642                          MOV     @#I0672,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
052564  010605                                  MOV     SP,R5           ;SAVE THE SP
052566  012702  177564                          MOV     #XCSR,R2        ;R2 POINT TO DL11 XCSR
052572  012737  052662  000064          R0672:  MOV     #A0672,@#64     ;GO TO A0672 ON DL11 INTR.
052600  012737  000200  000066                  MOV     #200,@#66       ;AT LEVEL 4
052606  010506                                  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
052610  005012                                  CLR     (R2)            ;INIT DL11 XCSR
052612  005003                                  CLR     R3              ;INIT TIMER

052614  105712                          1$:     TSTB    (R2)            ;DL11 XMIT READY SET ??
052616  100403                                  BMI     2$              ;BR IF YES
052620  005303                                  DEC     R3              ;COUNT THE TIMER
052622  001374                                  BNE     1$              ;BR IF NO TIMEOUT
052624  000441                                  BR      E40672          ;GO REPORT TIMEOUT

052626  012737  000140  177776          2$:     MOV     #140,@#PSW      ;SET PSW PRTY BITS TO LEVEL 3
052634  000277                                  SCC                     ;N:C=1111
052636  152712  000100                          BISB    #100,(R2)       ;ENAB. DL11 INTR - N:C=1001

052642  000001                          I0672:  WAIT                    ;TEST THE WAIT-GO TO A0672 ON INTR

052644  012737  000340  177776                  MOV     #340,@#PSW      ;LOCK OUT INTR
052652  005012                                  CLR     (R2)            ;TURN OFF DL11 INTR ENAB
052654  104006                          E10672: ERROR6                  ;WAIT FAILED TO EXECUTE PROPERLY
052656  052572                                  R0672                   ;ERROR LOOP RETURN ADDRESSS
052660  000425                                  BR      C0672           ;GO EXIT THIS TEST

052662  042712  000100                  A0672:  BIC     #100,(R2)       ;TURN OFF DL11 INTR ENAB
052666  022716  052644                          CMP     #I0672+2,(SP)   ;DID WAIT GET FETCHED ??
052672  001403                                  BEQ     B0672           ;BR IF YES

052674  104006                          E20672: ERROR6                  ;WAIT NOT FETCHED PROPERLY
052676  052572                                  R0672                   ;ERROR LOOP RETURN ADDRESS
052700  000415                                  BR      C0672           ;GO EXIT THE TEST
```

```
052702  022766  000151  000002  B0672:  CMP     #151,2(SP)      ;DID 'WAIT' ALTER THE PSW ??
052710  001411                          BEQ     C0672           ;BR IF YES

052712  012704  000151                  MOV     #151,R4         ;[R4] = S/B PSW
052716  016603  000002                  MOV     2(SP),R3        ;[R3] = WAS PSW
052722  104000                  E30672: ERROR                   ;'WAIT' ALTERED THE PSW
052724  052572                          R0672                   ;ERROR LOOP RETURN ADDRESS
052726  000402                          BR      C0672           ;GOT TO EXIT TEST

052730  104006                  E40672: ERROR6                  ;DL11 FAILED TO SET READY ON TIME
052732  052572                          R0672                   ;ERROR LOOP RETURN ADDRESS

052734  010506                  C0672:  MOV     R5,SP           ;RESET THE SP
052736  005037  177776                  CLR     @#PSW           ;CLEAR OUT THE PSW
052742  005012                          CLR     (R2)            ;TURN OFF DL11 INTR.
052744  012737  000066  000064          MOV     #66,@#64        ;RESTORE DL11 VECTOR WITH TRAPCATCHER
052752  005037  000066                  CLR     @#66

052756  000004                  00672:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0673 WAIT INSTRUCTION TEST - [PSW] = 010
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [114,015,012,020,021:
                                        ;                       INTR.   014,022,023,007,[TRAP MICROROUTINE]
                                        ;                   NO  INTR.   017,015,012,020,021,017 ETC. FC 1,10,6,10

                                        ;ACT BUTS:      37[004]100,114  /  26[114]010,012  /  25[020]014,014  /  07[022]006,007

                                        ;EXEC           BUT 25 IN LOC. 020 SHOULD CAUSE EXIT FROM WAIT LOOP

                                        ;CODES:         N / A    /      N:C=1000 (NO CHANGE)

                                        ;SYNC:          B05J2   (-)     T=2.24 USEC + INTR. WAIT TIME

                                        ;KEY SIG:       K4-5 BRPTR(1) L  /  K3-6 WAIT L  /  K4-6 BRQ H  /  K5-4 -BRSV(0) H

052760  012700  000673                  T0673:  MOV     #0673,R0                ;LOAD R0 WITH TEST NO.
052764  013701  053046                          MOV     @#I0673,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
052770  010605                                  MOV     SP,R5           ;SAVE THE SP
052772  012702  177564                          MOV     #XCSR,R2        ;R2 POINT TO DL11 XCSR
052776  012737  053066  000064  R0673:  MOV     #A0673,@#64     ;GO TO A0673 ON DL11 INTR.
053004  012737  000200  000066          MOV     #200,@#66       ;AT LEVEL 4
053012  010506                          MOV     R5,SP           ;RESET SP FOR ERROR LOOP
053014  005012                          CLR     (R2)            ;INIT DL11 XCSR
053016  005003                          CLR     R3              ;INIT TIMER

053020  105712                  1$:     TSTB    (R2)            ;DL11 XMIT READY SET ??
053022  100403                          BMI     2$              ;BR IF YES
053024  005303                          DEC     R3              ;COUNT THE TIMER
053026  001374                          BNE     1$              ;BR IF NO TIMEOUT
053030  000441                          BR      E40673          ;GO REPORT TIMEOUT

053032  012737  000000  177776  2$:     MOV     #0,@#PSW        ;SET PSW PRTY BITS TO LEVEL 0
053040  000257                          CCC                     ;N:C=0000
053042  152712  000100                  BISB    #100,(R2)       ;ENAB. DL11 INTR - N:C=1000

053046  000001                  I0673:  WAIT                    ;TEST THE WAIT-GO TO A0673 ON INTR

053050  012737  000340  177776          MOV     #340,@#PSW      ;LOCK OUT INTR
053056  005012                          CLR     (R2)            ;TURN OFF DL11 INTR ENAB
053060  104006                  E10673: ERROR6                  ;WAIT FAILED TO EXECUTE PROPERLY
053062  052776                          R0673                   ;ERROR LOOP RETURN ADDRESSS
053064  000425                          BR      C0673           ;GO EXIT THIS TEST

053066  042712  000100          A0673:  BIC     #100,(R2)       ;TURN OFF DL11 INTR ENAB
053072  022716  053050                  CMP     #I0673+2,(SP)   ;DID WAIT GET FETCHED ??
053076  001403                          BEQ     B0673           ;BR IF YES

053100  104006                  E20673: ERROR6                  ;WAIT NOT FETCHED PROPERLY
053102  052776                          R0673                   ;ERROR LOOP RETURN ADDRESS
053104  000415                          BR      C0673           ;GO EXIT THE TEST
```

```
053106  022766  000010  000002  B0673:  CMP     #010,2(SP)      ;DID 'WAIT'' ALTER THE PSW ??
053114  001411                          BEQ     C0673           ;BR IF YES

053116  012704  000010                  MOV     #010,R4         ;[R4] = S/B PSW
053122  016603  000002                  MOV     2(SP),R3        ;[R3] = WAS PSW
053126  104000                  E30673: ERROR                   ;'WAIT'' ALTERED THE PSW
053130  052776                          R0673                   ;ERROR LOOP RETURN ADDRESS
053132  000402                          BR      C0673           ;GOT TO EXIT TEST

053134  104006                  E40673: ERROR6                  ;DL11 FAILED TO SET READY ON TIME
053136  052776                          R0673                   ;ERROR LOOP RETURN ADDRESS

053140  010506                  C0673:  MOV     R5,SP           ;RESET THE SP
053142  005037  177776                  CLR     @#PSW           ;CLEAR OUT THE PSW
053146  005012                          CLR     (R2)            ;TURN OFF DL11 INTR.
053150  012737  000066  000064          MOV     #66,@#64        ;RESTORE DL11 VECTOR WITH TRAPCATCHER
053156  005037  000066                  CLR     @#66

053162  000004                  O0673:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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                                        ; *****************************************************************************
                                                .SBTTL T0674 BR PRIORITY ARBITRATION TEST - LEVEL 0 USING KW11-L
                                        ; *****************************************************************************

053164  012700  000674          T0674:  MOV     #0674,R0                ;LOAD R0 WITH TEST NO.
053170  013701  053240                  MOV     @#I0674,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
053174  005737  066636                  TST     @#OPTION        ;IS KW11-L INSTALLED ??
053200  100041                          BPL     00674           ;BR IF NOT - SKIP THIS TEST
053202  010605                          MOV     SP,R5           ;SAVE THE SP
053204  012702  177546                  MOV     #LKCSR,R2       ;R2 POINTS TO LCLK
053210  012737  053260  000100          MOV     #A0674,@#100    ;GO TO A0674 ON LCLK INTR
053216  012737  000340  000102          MOV     #340,@#102      ;LOCK OUT INTRS IN LCLK SERV.
053224  010506                  R0674:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
053226  005004                          CLR     R4              ;INIT R4 AS TIMER
053230  012737  000000  177776          MOV     #0,@#PSW        ;SET CPU PRTY TO LEVEL 000
053236  000257                          CCC                     ;SCOPE SYNC

053240  052712  000100          I0674:  BIS     #100,(R2)       ;ENABLE LCLK INTR

053244  005304                          DEC     R4              ;COUNT TIMER
053246  001376                          BNE     .-2             ;LCLK SHOULD INTR BEFORE TIMEOUT

053250  042712  000100                  BIC     #100,(R2)       ;TURN OFF INTR ENAB.
053254  104006                  E0674:  ERROR6                  ;KW11-L FAILED TO INTR AT LEVEL 0
053256  053224                          R0674                   ;ERROR LOOP RETURN ADDRESS

053260  042712  000100          A0674:  BIC     #100,(R2)       ;TURN OFF INTR. ENABLE
053264  012737  000102  000100          MOV     #102,@#100      ;RESTORE TRAP CATCHER IN THE VECT
053272  005037  000102                  CLR     @#102
053276  010506                          MOV     R5,SP           ;RESET THE SP
053300  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0

053304  000004                  00674:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; *****************************************************************
                                                .SBTTL T0675 BR PRIORITY ARBITRATION TEST - LEVEL 1 USING KW11-L
                                        ; *****************************************************************

053306  012700  000675          T0675:  MOV     #0675,R0                ;LOAD R0 WITH TEST NO.
053312  013701  053362                  MOV     @#I0675,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
053316  005737  066636                  TST     @#OPTION        ;IS KW11-L INSTALLED ??
053322  100041                          BPL     00675           ;BR IF NOT - SKIP THIS TEST
053324  010605                          MOV     SP,R5           ;SAVE THE SP
053326  012702  177546                  MOV     #LKCSR,R2       ;R2 POINTS TO KW11-L CSR
053332  012737  053402  000100          MOV     #A0675,@#100    ;IF INTR OCCURS - GO TO A0675
053340  012737  000340  000102          MOV     #340,@#102      ;WITH CPU PRIORITY AT LEVEL 7
053346  010506                  R0675:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPING
053350  005004                          CLR     R4              ;INITIALIZE R4 AS TIMER
053352  012737  000040  177776          MOV     #40,@#PSW       ;SET CPU PRIORITY TO LEVEL 1
053360  000257                          CCC                     ;SCOPE SYNC

053362  052712  000100          I0675:  BIS     #100,(R2)       ;ENABLE KW11-L INTERRUPTS

053366  005304                          DEC     R4              ;COUNT THE TIMER - LCLK SHOULD PREVENT
053370  001376                          BNE     .-2             ;TIMER FROM GETTING BACK TO 000000

053372  042712  000100                  BIC     #100,(R2)       ;TURN OFF THE INTERRUPT ENABLE
053376  104006                  E0675:  ERROR6                  ;KW11-L FAILED TO INTR AT LEVEL 1
053400  053346                          R0675                   ;ERROR LOOP RETURN ADDRESS

053402  042712  000100          A0675:  BIC     #100,(R2)       ;TURN OFF INTR. ENABLE
053406  012737  000102  000100          MOV     #102,@#100      ;RESTORE TRAP CATCHER IN THE VECTOR
053414  005037  000102                  CLR     @#102
053420  010506                          MOV     R5,SP           ;RESET THE SP
053422  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0

053426  000004                  00675:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; *****************************************************************
                                                .SBTTL T0676 BR PRIORITY ARBITRATION TEST - LEVEL 2 USING KW11-L
                                        ; *****************************************************************

053430  012700  000676          T0676:  MOV     #0676,R0                ;LOAD R0 WITH TEST NO.
053434  013701  053504                  MOV     @#I0676,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
053440  005737  066636                  TST     @#OPTION        ;IS KW11-L INSTALLED ??
053444  100041                          BPL     00676           ;BR IF NOT - SKIP THIS TEST
053446  010605                          MOV     SP,R5           ;SAVE THE SP
053450  012702  177546                  MOV     #LKCSR,R2       ;R2 POINTS TO KW11-L CSR
053454  012737  053524  000100          MOV     #A0676,@#100    ;IF INTR OCCURS - GO TO A0676
053462  012737  000340  000102          MOV     #340,@#102      ;WITH CPU PRIORITY AT LEVEL 7
053470  010506                  R0676:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPING
053472  005004                          CLR     R4              ;INITIALIZE R4 AS TIMER
053474  012737  000100  177776          MOV     #100,@#PSW      ;SET CPU PRIORITY TO LEVEL 2
053502  000257                          CCC                     ;SCOPE SYNC

053504  052712  000100          I0676:  BIS     #100,(R2)       ;ENABLE KW11-L INTERRUPTS

053510  005304                          DEC     R4              ;COUNT THE TIMER - LCLK SHOULD PREVENT
053512  001376                          BNE     .-2             ;TIMER FROM GETTING BACK TO 000000

053514  042712  000100                  BIC     #100,(R2)       ;TURN OFF THE INTERRUPT ENABLE
053520  104006                  E0676:  ERROR6                  ;KW11-L FAILED TO INTR AT LEVEL 2
053522  053470                          R0676                   ;ERROR LOOP RETURN ADDRESS

053524  042712  000100          A0676:  BIC     #100,(R2)       ;TURN OFF INTR. ENABLE
053530  012737  000102  000100          MOV     #102,@#100      ;RESTORE TRAP CATCHER IN THE VECTOR
053536  005037  000102                  CLR     @#102
053542  010506                          MOV     R5,SP           ;RESET THE SP
053544  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0

053550  000004                  00676:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; *******************************************************************
                                        .SBTTL T0677 BR PRIORITY ARBITRATION TEST - LEVEL 3 USING KW11-L
                                ; *******************************************************************

053552  012700  000677          T0677:  MOV     #0677,R0                ;LOAD R0 WITH TEST NO.
053556  013701  053626                  MOV     @#I0677,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
053562  005737  066636                  TST     @#OPTION        ;IS KW11-L INSTALLED ??
053566  100041                          BPL     00677           ;BR IF NOT - SKIP THIS TEST
053570  010605                          MOV     SP,R5           ;SAVE THE SP
053572  012702  177546                  MOV     #LKCSR,R2       ;R2 POINTS TO KW11-L CSR
053576  012737  053646  000100          MOV     #A0677,@#100    ;IF INTR OCCURS - GO TO A0677
053604  012737  000340  000102          MOV     #340,@#102      ;WITH CPU PRIORITY AT LEVEL 7
053612  010506                  R0677:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPING
053614  005004                          CLR     R4              ;INITIALIZE R4 AS TIMER
053616  012737  000140  177776          MOV     #140,@#PSW      ;SET CPU PRIORITY TO LEVEL 3
053624  000257                          CCC                     ;SCOPE SYNC

053626  052712  000100          I0677:  BIS     #100,(R2)       ;ENABLE KW11-L INTERRUPTS

053632  005304                          DEC     R4              ;COUNT THE TIMER - LCLK SHOULD PREVENT
053634  001376                          BNE     .-2             ;TIMER FROM GETTING BACK TO 000000

053636  042712  000100                  BIC     #100,(R2)       ;TURN OFF THE INTERRUPT ENABLE
053642  104006                  E0677:  ERROR6                  ;KW11-L FAILED TO INTR AT LEVEL 3
053644  053612                          R0677                   ;ERROR LOOP RETURN ADDRESS

053646  042712  000100          A0677:  BIC     #100,(R2)       ;TURN OFF INTR. ENABLE
053652  012737  000102  000100          MOV     #102,@#100      ;RESTORE TRAP CATCHER IN THE VECTOR
053660  005037  000102                  CLR     @#102

053664  010506                          MOV     R5,SP           ;RESET THE SP
053666  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0

053672  000004                  00677:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; *****************************************************************
                                                .SBTTL T0700 BR PRIORITY ARBITRATION TEST - LEVEL 4 USING KW11-L
                                        ; *****************************************************************

053674  012700  000700          T0700:  MOV     #0700,R0                ;LOAD R0 WITH TEST NO.
053700  013701  053750                  MOV     @#I0700,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
053704  005737  066636                  TST     @#OPTION        ;IS KW11-L INSTALLED ??
053710  100041                          BPL     00700           ;BR IF NOT - SKIP THIS TEST
053712  010605                          MOV     SP,R5           ;SAVE THE SP
053714  012702  177546                  MOV     #LKCSR,R2       ;R2 POINTS TO KW11-L CSR
053720  012737  053770  000100          MOV     #A0700,@#100    ;IF INTR OCCURS - GO TO A0700
053726  012737  000340  000102          MOV     #340,@#102      ;WITH CPU PRIORITY AT LEVEL 7
053734  010506                  R0700:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPING
053736  005004                          CLR     R4              ;INITIALIZE R4 AS TIMER
053740  012737  000200  177776          MOV     #200,@#PSW      ;SET CPU PRIORITY TO LEVEL 4
053746  000257                          CCC                     ;SCOPE SYNC

053750  052712  000100          I0700:  BIS     #100,(R2)       ;ENABLE KW11-L INTERRUPTS

053754  005304                          DEC     R4              ;COUNT THE TIMER - LCLK SHOULD PREVENT
053756  001376                          BNE     .-2             ;TIMER FROM GETTING BACK TO 000000

053760  042712  000100                  BIC     #100,(R2)       ;TURN OFF THE INTERRUPT ENABLE
053764  104006                  E0700:  ERROR6                  ;KW11-L FAILED TO INTR AT LEVEL 4
053766  053734                          R0700                   ;ERROR LOOP RETURN ADDRESS

053770  042712  000100          A0700:  BIC     #100,(R2)       ;TURN OFF INTR. ENABLE
053774  012737  000102  000100          MOV     #102,@#100      ;RESTORE TRAP CATCHER IN THE VECTOR
054002  005037  000102                  CLR     @#102
054006  010506                          MOV     R5,SP           ;RESET THE SP
054010  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0

054014  000004                  00700:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; *****************************************************************
                                                .SBTTL T0701 BR PRIORITY ARBITRATION TEST - LEVEL 5 USING KW11-L
                                        ; *****************************************************************

054016  012700  000701          T0701:  MOV     #0701,R0                ;LOAD R0 WITH TEST NO.
054022  013701  054072                  MOV     @#I0701,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
054026  005737  066636                  TST     @#OPTION        ;IS KW11-L INSTALLED ??
054032  100041                          BPL     00701           ;BR IF NOT - SKIP THIS TEST
054034  010605                          MOV     SP,R5           ;SAVE THE SP
054036  012702  177546                  MOV     #LKCSR,R2       ;R2 POINTS TO KW11-L CSR
054042  012737  054112  000100          MOV     #A0701,@#100    ;IF INTR OCCURS - GO TO A0701
054050  012737  000340  000102          MOV     #340,@#102      ;WITH CPU PRIORITY AT LEVEL 7
054056  010506                  R0701:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPING
054060  005004                          CLR     R4              ;INITIALIZE R4 AS TIMER
054062  012737  000240  177776          MOV     #240,@#PSW      ;SET CPU PRIORITY TO LEVEL 5
054070  000257                          CCC                     ;SCOPE SYNC

054072  052712  000100          I0701:  BIS     #100,(R2)       ;ENABLE KW11-L INTERRUPTS

054076  005304                          DEC     R4              ;COUNT THE TIMER - LCLK SHOULD PREVENT
054100  001376                          BNE     .-2             ;TIMER FROM GETTING BACK TO 000000

054102  042712  000100                  BIC     #100,(R2)       ;TURN OFF THE INTERRUPT ENABLE
054106  104006                  E0701:  ERROR6                  ;KW11-L FAILED TO INTR AT LEVEL 5
054110  054056                          R0701                   ;ERROR LOOP RETURN ADDRESS

054112  042712  000100          A0701:  BIC     #100,(R2)       ;TURN OFF INTR. ENABLE
054116  012737  000102  000100          MOV     #102,@#100      ;RESTORE TRAP CATCHER IN THE VECTOR
054124  005037  000102                  CLR     @#102
054130  010506                          MOV     R5,SP           ;RESET THE SP
054132  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0

054136  000004                  00701:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T0702 BR PRIORITY ARBITRATION TEST - LEVEL 0 USING DL11
                                ; ***********************************************************************

054140  012700  000702          T0702:  MOV     #0702,R0                ;LOAD R0 WITH TEST NO.
054144  013701  054206                  MOV     @#I0702,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
054150  010605                          MOV     SP,R5           ;SAVE THE SP
054152  012702  177564                  MOV     #XCSR,R2        ;R2 POINTS TO DL11 XCSR
054156  012737  054226  000064          MOV     #A0702,@#64     ;IF INTR OCCURS - GO TO A0702
054164  012737  000340  000066          MOV     #340,@#66       ;WITH CPU PRIORITY AT LEVEL 7
054172  010506                  R0702:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPING
054174  005004                          CLR     R4              ;INITIALIZE R4 AS TIMER
054176  012737  000000  177776          MOV     #0,@#PSW        ;SET CPU PRIORITY TO LEVEL 0
054204  000257                          CCC                     ;SCOPE SYNC

054206  052712  000100          I0702:  BIS     #100,(R2)       ;ENABLE DL11 INTERRUPTS

054212  005304                          DEC     R4              ;COUNT THE TIMER - DL11 SHOULD PREVENT
054214  001376                          BNE     .-2             ;TIMER FROM GETTING BACK TO 000000

054216  042712  000100                  BIC     #100,(R2)       ;TURN OFF THE INTERRUPT ENABLE
054222  104006                  E0702:  ERROR6                  ;DL11 FAILED TO INTR AT LEVEL 0
054224  054172                          R0702                   ;ERROR LOOP RETURN ADDRESS

054226  042712  000100          A0702:  BIC     #100,(R2)       ;TURN OFF INTR. ENABLE
054232  012737  000066  000064          MOV     #66,@#64        ;RESTORE TRAP CATCHER IN THE VECTOR
054240  005037  000066                  CLR     @#66
054244  010506                          MOV     R5,SP           ;RESET THE SP
054246  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0

054252  000004                  00702:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; *****************************************************************
                                                .SBTTL T0703 BR PRIORITY ARBITRATION TEST - LEVEL 1 USING DL11
                                        ; *****************************************************************

054254  012700  000703          T0703:  MOV     #0703,R0                ;LOAD R0 WITH TEST NO.
054260  013701  054322                  MOV     @#I0703,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
054264  010605                          MOV     SP,R5           ;SAVE THE SP
054266  012702  177564                  MOV     #XCSR,R2        ;R2 POINTS TO DL11 XCSR
054272  012737  054342  000064          MOV     #A0703,@#64     ;IF INTR OCCURS - GO TO A0703
054300  012737  000340  000066          MOV     #340,@#66       ;WITH CPU PRIORITY AT LEVEL 7
054306  010506                  R0703:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPING
054310  005004                          CLR     R4              ;INITIALIZE R4 AS TIMER
054312  012737  000040  177776          MOV     #40,@#PSW       ;SET CPU PRIORITY TO LEVEL 1
054320  000257                          CCC                     ;SCOPE SYNC

054322  052712  000100          I0703:  BIS     #100,(R2)       ;ENABLE DL11 INTERRUPTS

054326  005304                          DEC     R4              ;COUNT THE TIMER - DL11 SHOULD PREVENT
054330  001376                          BNE     .-2             ;TIMER FROM GETTING BACK TO 000000

054332  042712  000100                  BIC     #100,(R2)       ;TURN OFF THE INTERRUPT ENABLE
054336  104006                  E0703:  ERROR6                  ;DL11 FAILED TO INTR AT LEVEL 1
054340  054306                          R0703                   ;ERROR LOOP RETURN ADDRESS

054342  042712  000100          A0703:  BIC     #100,(R2)       ;TURN OFF INTR. ENABLE
054346  012737  000066  000064          MOV     #66,@#64        ;RESTORE TRAP CATCHER IN THE VECTOR
054354  005037  000066                  CLR     @#66
054360  010506                          MOV     R5,SP           ;RESET THE SP
054362  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0

054366  000004                  O0703:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; *****************************************************************
                                                .SBTTL T0704 BR PRIORITY ARBITRATION TEST - LEVEL 2 USING DL11
                                        ; *****************************************************************

054370  012700  000704          T0704:  MOV     #0704,R0                ;LOAD R0 WITH TEST NO.
054374  013701  054450                  MOV     @#I0704,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
054400  032737  020000  066642          BIT     #20000,@#BPTLOC ;BREAKPOINT HALT SET ??
054406  001401                          BEQ     .+4             ;BR IF NOT
054410  000000                          HALT                    ;BREAK-DEPRESS CONTINUE TO RESTART
054412  010605                          MOV     SP,R5           ;SAVE THE SP
054414  012702  177564                  MOV     #XCSR,R2        ;R2 POINTS TO DL11 CSR
054420  012737  054470  000064          MOV     #A0704,@#64     ;IF INTR OCCURS - GO TO A0704
054426  012737  000340  000066          MOV     #340,@#66       ;WITH CPU PRIORITY AT LEVEL 7
054434  010506                  R0704:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPING
054436  005004                          CLR     R4              ;INITIALIZE R4 AS TIMER
054440  012737  000100  177776          MOV     #100,@#PSW      ;SET CPU PRIORITY TO LEVEL 2
054446  000257                          CCC                     ;SCOPE SYNC

054450  052712  000100          I0704:  BIS     #100,(R2)       ;ENABLE DL11 INTERRUPTS

054454  005304                          DEC     R4              ;COUNT THE TIMER - DL11 SHOULD PREVENT
054456  001376                          BNE     .-2             ;TIMER FROM GETTING BACK TO 000000

054460  042712  000100                  BIC     #100,(R2)       ;TURN OFF THE INTERRUPT ENABLE
054464  104006                  E0704:  ERROR6                  ;DL11 FAILED TO INTR AT LEVEL 2
054466  054434                          R0704                   ;ERROR LOOP RETURN ADDRESS

054470  042712  000100          A0704:  BIC     #100,(R2)       ;TURN OFF INTR. ENABLE
054474  012737  000066  000064          MOV     #66,@#64        ;RESTORE TRAP CATCHER IN THE VECTOR
054502  005037  000066                  CLR     @#66
054506  010506                          MOV     R5,SP           ;RESET THE SP
054510  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0

054514  000004                  00704:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; *****************************************************************
                                                .SBTTL T0705 BR PRIORITY ARBITRATION TEST - LEVEL 3 USING DL11
                                        ; *****************************************************************

054516  012700  000705          T0705:  MOV     #0705,R0                ;LOAD R0 WITH TEST NO.
054522  013701  054564                  MOV     @#I0705,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
054526  010605                          MOV     SP,R5           ;SAVE THE SP
054530  012702  177564                  MOV     #XCSR,R2        ;R2 POINTS TO DL11 CSR
054534  012737  054604  000064          MOV     #A0705,@#64     ;IF INTR OCCURS - GO TO A0705
054542  012737  000340  000066          MOV     #340,@#66       ;WITH CPU PRIORITY AT LEVEL 7
054550  010506                  R0705:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPING
054552  005004                          CLR     R4              ;INITIALIZE R4 AS TIMER
054554  012737  000140  177776          MOV     #140,@#PSW      ;SET CPU PRIORITY TO LEVEL 3
054562  000257                          CCC                     ;SCOPE SYNC

054564  052712  000100          I0705:  BIS     #100,(R2)       ;ENABLE DL11 INTERRUPTS

054570  005304                          DEC     R4              ;COUNT THE TIMER - DL11 SHOULD PREVENT
054572  001376                          BNE     .-2             ;TIMER FROM GETTING BACK TO 000000

054574  042712  000100                  BIC     #100,(R2)       ;TURN OFF THE INTERRUPT ENABLE
054600  104006                  E0705:  ERROR6                  ;DL11 FAILED TO INTR AT LEVEL 3
054602  054550                          R0705                   ;ERROR LOOP RETURN ADDRESS

054604  042712  000100          A0705:  BIC     #100,(R2)       ;TURN OFF INTR. ENABLE
054610  012737  000066  000064          MOV     #66,@#64        ;RESTORE TRAP CATCHER IN THE VECTOR
054616  005037  000066                  CLR     @#66
054622  010506                          MOV     R5,SP           ;RESET THE SP
054624  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0

054630  000004                  O0705:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; *******************************************************************
                                        .SBTTL T0706 BR PRIORITY ARBITRATION TEST - LEVEL 7 USING KW11-L
                                ; *******************************************************************

054632  012700  000706          T0706:  MOV     #0706,R0                ;LOAD R0 WITH TEST NO.
054636  013701  054706                  MOV     @#I0706,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
054642  005737  066636                  TST     @#OPTION        ;IS KW11-L INSTALLED ??
054646  100042                          BPL     O0706           ;BR IF NOT - SKIP THIS TEST
054650  010605                          MOV     SP,R5           ;SAVE THE SP
054652  012702  177546                  MOV     #LKCSR,R2       ;R2 POINTS TO KW11-L CSR
054656  012737  054720  000100          MOV     #A0706,@#100    ;IF INTR OCCURS - GO TO A0706
054664  012737  000340  000102          MOV     #340,@#102      ;WITH CPU PRIORITY AT LEVEL 7
054672  010506                  R0706:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
054674  005004                          CLR     R4              ;INITIALIZE R4 AS TIMER
054676  012737  000340  177776          MOV     #340,@#PSW      ;SET CPU PRIORITY TO LEVEL 7
054704  000257                          CCC                     ;SCOPE SYNC

054706  052712  000100          I0706:  BIS     #100,(R2)       ;ENABLE INTERRUPTS

054712  005304                          DEC     R4              ;COUNT UNTIL [R4] = 000000 - THEN
054714  001376                          BNE     .-2             ;CONTINUE - NO INTERRUPT SHOULD OCCUR
054716  000404                          BR      B0706           ;GO TO EXIT - ALL OK

054720  042712  000100          A0706:  BIC     #100,(R2)       ;TURN OFF THE INTR ENABLE
054724  104006                  E0706:  ERROR6                  ;INTR OCCURRED WITH CPU AT LEVEL 7
054726  054672                          R0706                   ;ERROR LOOP RETURN ADDRESS

054730  042712  000100          B0706:  BIC     #100,(R2)       ;TURN OFF INTR ENABLE
054734  012737  000102  000100          MOV     #102,@#100      ;RESET THE TRAP CATCHER IN THE VECTOR
054742  005037  000102                  CLR     @#102
054746  010506                          MOV     R5,SP           ;RESET SP JUST IN CASE
054750  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0

054754  000004                  O0706:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; *********************************************************************
                                        .SBTTL T0707 BR PRIORITY ARBITRATION TEST - LEVEL 6 USING KW11-L
                                ; *********************************************************************

054756  012700  000707          T0707:  MOV     #0707,R0                ;LOAD R0 WITH TEST NO.
054762  013701  055032                  MOV     @#I0707,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
054766  005737  066636                  TST     @#OPTION        ;IS KW11-L INSTALLED ??
054772  100042                          BPL     O0707           ;BR IF NOT - SKIP THIS TEST
054774  010605                          MOV     SP,R5           ;SAVE THE SP
054776  012702  177546                  MOV     #LKCSR,R2       ;R2 POINTS TO KW11-L CSR
055002  012737  055044  000100          MOV     #A0707,@#100    ;IF INTR OCCURS - GO TO A0707
055010  012737  000340  000102          MOV     #340,@#102      ;WITH CPU PRIORITY AT LEVEL 7
055016  010506                  R0707:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
055020  005004                          CLR     R4              ;INITIALIZE R4 AS TIMER
055022  012737  000300  177776          MOV     #300,@#PSW      ;SET CPU PRIORITY TO LEVEL 6
055030  000257                          CCC                     ;SCOPE SYNC

055032  052712  000100          I0707:  BIS     #100,(R2)       ;ENABLE INTERRUPTS

055036  005304                          DEC     R4              ;COUNT UNTIL [R4] = 000000 - THEN
055040  001376                          BNE     .-2             ;CONTINUE - NO INTERRUPT SHOULD OCCUR
055042  000404                          BR      B0707           ;GO TO EXIT - ALL OK

055044  042712  000100          A0707:  BIC     #100,(R2)       ;TURN OFF THE INTR ENABLE
055050  104006                  E0707:  ERROR6                  ;INTR OCCURRED WITH CPU AT LEVEL 6
055052  055016                          R0707                   ;ERROR LOOP RETURN ADDRESS

055054  042712  000100          B0707:  BIC     #100,(R2)       ;TURN OFF INTR ENABLE
055060  012737  000102  000100          MOV     #102,@#100      ;RESET THE TRAP CATCHER IN THE VECTOR
055066  005037  000102                  CLR     @#102
055072  010506                          MOV     R5,SP           ;RESET SP JUST IN CASE
055074  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0

055100  000004                  O0707:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; *****************************************************************
                                        .SBTTL T0710 BR PRIORITY ARBITRATION TEST - LEVEL 7 USING DL11
                                ; *****************************************************************

055102  012700  000710          T0710:  MOV     #0710,R0                ;LOAD R0 WITH TEST NO.
055106  013701  055150                  MOV     @#I0710,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
055112  010605                          MOV     SP,R5           ;SAVE THE SP
055114  012702  177564                  MOV     #XCSR,R2        ;R2 POINTS TO DL11 XCSR
055120  012737  055162  000064          MOV     #A0710,@#64     ;IF INTR OCCURS - GO TO A0710
055126  012737  000340  000066          MOV     #340,@#66       ;WITH CPU PRIORITY AT LEVEL 7
055134  010506                  R0710:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
055136  005004                          CLR     R4              ;INITIALIZE R4 AS TIMER
055140  012737  000340  177776          MOV     #340,@#PSW      ;SET CPU PRIORITY TO LEVEL 7
055146  000257                          CCC                     ;SCOPE SYNC

055150  052712  000100          I0710:  BIS     #100,(R2)       ;ENABLE INTERRUPTS

055154  005304                          DEC     R4              ;COUNT UNTIL [R4] = 000000 - THEN
055156  001376                          BNE     .-2             ;CONTINUE - NO INTERRUPT SHOULD OCCUR
055160  000404                          BR      B0710           ;GO TO EXIT - ALL OK

055162  042712  000100          A0710:  BIC     #100,(R2)       ;TURN OFF THE INTR ENABLE
055166  104006                  E0710:  ERROR6                  ;INTR OCCURRED WITH CPU AT LEVEL 7
055170  055134                          R0710                   ;ERROR LOOP RETURN ADDRESS

055172  042712  000100          B0710:  BIC     #100,(R2)       ;TURN OFF INTR ENABLE
055176  012737  000066  000064          MOV     #66,@#64        ;RESET THE TRAP CATCHER IN THE VECTOR
055204  005037  000066                  CLR     @#66
055210  010506                          MOV     R5,SP           ;RESET SP JUST IN CASE
055212  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0

055216  000004                  00710:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; *****************************************************************
                                                .SBTTL T0711 BR PRIORITY ARBITRATION TEST - LEVEL 6 USING DL11
                                        ; *****************************************************************

055220  012700  000711          T0711:  MOV     #0711,R0                ;LOAD R0 WITH TEST NO.
055224  013701  055266                  MOV     @#I0711,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
055230  010605                          MOV     SP,R5           ;SAVE THE SP
055232  012702  177564                  MOV     #XCSR,R2        ;R2 POINTS TO DL11 XCSR
055236  012737  055300  000064          MOV     #A0711,@#64     ;IF INTR OCCURS - GO TO A0711
055244  012737  000340  000066          MOV     #340,@#66       ;WITH CPU PRIORITY AT LEVEL 7
055252  010506                  R0711:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
055254  005004                          CLR     R4              ;INITIALIZE R4 AS TIMER
055256  012737  000300  177776          MOV     #300,@#PSW      ;SET CPU PRIORITY TO LEVEL 6
055264  000257                          CCC                     ;SCOPE SYNC

055266  052712  000100          I0711:  BIS     #100,(R2)       ;ENABLE INTERRUPTS

055272  005304                          DEC     R4              ;COUNT UNTIL [R4] = 000000 - THEN
055274  001376                          BNE     .-2             ;CONTINUE - NO INTERRUPT SHOULD OCCUR
055276  000404                          BR      B0711           ;GO TO EXIT - ALL OK

055300  042712  000100          A0711:  BIC     #100,(R2)       ;TURN OFF THE INTR ENABLE
055304  104006                  E0711:  ERROR6                  ;INTR OCCURRED WITH CPU AT LEVEL 6
055306  055252                          R0711                   ;ERROR LOOP RETURN ADDRESS

055310  042712  000100          B0711:  BIC     #100,(R2)       ;TURN OFF INTR ENABLE
055314  012737  000066  000064          MOV     #66,@#64        ;RESET THE TRAP CATCHER IN THE VECTOR
055322  005037  000066                  CLR     @#66
055326  010506                          MOV     R5,SP           ;RESET SP JUST IN CASE
055330  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0

055334  000004                  O0711:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; *****************************************************************
                                        .SBTTL T0712 BR PRIORITY ARBITRATION TEST - LEVEL 5 USING DL11
                                ; *****************************************************************

055336  012700  000712          T0712:  MOV     #0712,R0                ;LOAD R0 WITH TEST NO.
055342  013701  055404                  MOV     @#I0712,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
055346  010605                          MOV     SP,R5           ;SAVE THE SP
055350  012702  177564                  MOV     #XCSR,R2        ;R2 POINTS TO DL11 XCSR
055354  012737  055416  000064          MOV     #A0712,@#64     ;IF INTR OCCURS - GO TO A0712
055362  012737  000340  000066          MOV     #340,@#66       ;WITH CPU PRIORITY AT LEVEL 7
055370  010506                  R0712:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
055372  005004                          CLR     R4              ;INITIALIZE R4 AS TIMER
055374  012737  000240  177776          MOV     #240,@#PSW      ;SET CPU PRIORITY TO LEVEL 5
055402  000257                          CCC                     ;SCOPE SYNC

055404  052712  000100          I0712:  BIS     #100,(R2)       ;ENABLE INTERRUPTS

055410  005304                          DEC     R4              ;COUNT UNTIL [R4] = 000000 - THEN
055412  001376                          BNE     .-2             ;CONTINUE - NO INTERRUPT SHOULD OCCUR
055414  000404                          BR      B0712           ;GO TO EXIT - ALL OK

055416  042712  000100          A0712:  BIC     #100,(R2)       ;TURN OFF THE INTR ENABLE
055422  104006                  E0712:  ERROR6                  ;INTR OCCURRED WITH CPU AT LEVEL 5
055424  055370                          R0712                   ;ERROR LOOP RETURN ADDRESS

055426  042712  000100          B0712:  BIC     #100,(R2)       ;TURN OFF INTR ENABLE
055432  012737  000066  000064          MOV     #66,@#64        ;RESET THE TRAP CATCHER IN THE VECTOR
055440  005037  000066                  CLR     @#66
055444  010506                          MOV     R5,SP           ;RESET SP JUST IN CASE
055446  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0

055452  000004                  O0712:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; *****************************************************************
                                        .SBTTL T0713 BR PRIORITY ARBITRATION TEST - LEVEL 4 USING DL11
                                ; *****************************************************************

055454  012700  000713          T0713:  MOV     #0713,R0                ;LOAD R0 WITH TEST NO.
055460  013701  055522                  MOV     @#I0713,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
055464  010605                          MOV     SP,R5           ;SAVE THE SP
055466  012702  177564                  MOV     #XCSR,R2        ;R2 POINTS TO DL11 XCSR
055472  012737  055534  000064          MOV     #A0713,@#64     ;IF INTR OCCURS - GO TO A0713
055500  012737  000340  000066          MOV     #340,@#66       ;WITH CPU PRIORITY AT LEVEL 7
055506  010506                  R0713:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
055510  005004                          CLR     R4              ;INITIALIZE R4 AS TIMER
055512  012737  000200  177776          MOV     #200,@#PSW      ;SET CPU PRIORITY TO LEVEL 4
055520  000257                          CCC                     ;SCOPE SYNC

055522  052712  000100          I0713:  BIS     #100,(R2)       ;ENABLE INTERRUPTS

055526  005304                          DEC     R4              ;COUNT UNTIL [R4] = 000000 - THEN
055530  001376                          BNE     .-2             ;CONTINUE - NO INTERRUPT SHOULD OCCUR
055532  000404                          BR      B0713           ;GO TO EXIT - ALL OK

055534  042712  000100          A0713:  BIC     #100,(R2)       ;TURN OFF THE INTR ENABLE
055540  104006                  E0713:  ERROR6                  ;INTR OCCURRED WITH CPU AT LEVEL 4
055542  055506                          R0713                   ;ERROR LOOP RETURN ADDRESS

055544  042712  000100          B0713:  BIC     #100,(R2)       ;TURN OFF INTR ENABLE
055550  012737  000066  000064          MOV     #66,@#64        ;RESET THE TRAP CATCHER IN THE VECTOR
055556  005037  000066                  CLR     @#66
055562  010506                          MOV     R5,SP           ;RESET SP JUST IN CASE
055564  005037  177776                  CLR     @#PSW           ;SET CPU PRIORITY BACK TO LEVEL 0

055570  000004                  O0713:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0714 ''CLR  @#PSW'' ALLOWS IMMEDIATE BR-BG-INTR SEQUENCE
                                        ; ***********************************************************************

                                        ;THIS TEST VERIFIES THAT IF A 'BR'' REQUEST IS PENDING WHEN A ''CLR  @#PSW''
                                        ;IS EXECUTED TO LOWER THE CPU PRIORITY, THE REQUEST IS GRANTED BEFORE
                                        ;EXECUTION OF THE INSTRUCTION FOLLOWING THE ''CLR''

055572  012700  000714          T0714:  MOV     #0714,R0                ;LOAD R0 WITH THE TEST NO.
055576  013701  055672                  MOV     @#I0714,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
055602  005737  066636                  TST     @#OPTION        ;IS THE KW11-L INSTALLED ??
055606  100053                          BPL     00714           ;SKIP THIS TEST IF NOT
055610  012702  177546                  MOV     #LKCSR,R2       ;R2 POINTS TO KW11-L CSR
055614  010605                          MOV     SP,R5           ;SAVE THE SP
055616  012737  055700  000100          MOV     #A0714,@#100    ;SET UP LCLK VECTOR TO GO TO A0714
055624  012737  000300  000102          MOV     #300,@#102
055632  010506                  R0714:  MOV     R5,SP           ;RESET THE SP FOR ERROR LOOPING
055634  005004                          CLR     R4              ;INITIALIZE TIMER FO KW
055636  005003                          CLR     R3              ;CLEAR SOFTWARE FLAG
055640  012737  000340  177776          MOV     #340,@#PSW      ;LOCK OUT ALL INTRS
055646  052712  000100                  BIS     #100,(R2)       ;ENABLE LCLK INTRS
055652  042712  000200                  BIC     #200,(R2)       ;CLEAR LINE CLOCK READY
055656  105712                  1$:     TSTB    (R2)            ;LCLK READY TO INTR ??
055660  100403                          BMI     2$              ;BR IF YES
055662  005304                          DEC     R4              ;COUNT THE TIMER
055664  001374                          BNE     1$              ;BR IF NO TIMEOUT
055666  000412                          BR      B0714           ;GO REPORT TIMEOUT
055670  000257                  2$:     CCC                     ;SCOPE SYNC

055672  005037  177776          I0714:  CLR     @#PSW           ;ALLOW INTRS - LCLK SHOULD INTERRUPT
                                                                ;BEFORE FETCHING NEXT INSTRUCTION
055676  005103                          COM     R3              ;SHOULD NOT BE FETCHED
055700  005012                  A0714:  CLR     (R2)            ;DISABLE THE LCLK INTR
055702  005703                          TST     R3              ;DID SOFTWARE FLAG GET SET ??
055704  001406                          BEQ     C0714           ;BR IF NOT - IT WORKED OK
055706  104006                  E10714: ERROR6                  ;LCLK FAILED TO INTR ONTIME
055710  055632                          R0714                   ;ERROR LOOP RETURN ADDRESS
055712  000403                          BR      C0714           ;GO EXIT

055714  005012                  B0714:  CLR     (R2)            ;DISABLE  LCLK INTR
055716  104006                  E20714: ERROR6                  ;KW11-L TIMED OUT
055720  055632                          R0714                   ;ERROR LOOP RETURN ADDRESS

055722  010506                  C0714:  MOV     R5,SP           ;RESET THE SP
055724  012737  000102  000100          MOV     #102,@#100      ;RESTORE THE KW11-L TRAPCATCHER
055732  005037  000102                  CLR     @#102

055736  000004                  00714:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; *****************************************************************
                                                .SBTTL T0715 "BR6 VS BR4" PRIORITY ARBITRATION TEST
                                        ; *****************************************************************

                                        ;THIS TEST VERIFIES THAT IF BOTH A "BR4" AND A "BR6" REQUEST ARE
                                        ;PENDING WHEN THE CPU PRIORITY IS LOWERED TO ALLOW INTRS. THAT "BR6"
                                        ;REQUEST IS GRANTED FIRST EVEN THOUGH THE "BR4" REQUEST MAY HAVE
                                        ;OCCURRED FIRST

055740  012700  000715          T0715:  MOV     #0715,R0                ;LOAD R0 WITH THE TEST NO.
055744  013701  056106                  MOV     @#I0715,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
055750  005737  066636                  TST     @#OPTION        ;IS THE LCLK INSTALLED ??
055754  100133                          BPL     O0715           ;BR IF NOT - SKIP THIS TEST
055756  012702  177546                  MOV     #LKCSR,R2       ;R2 POINTS TO KW11-L CSR
055762  012703  177564                  MOV     #XCSR,R3        ;R3 POINTS TO DL11 XCSR
055766  010605                          MOV     SP,R5           ;SAVE THE SP
055770  012737  056116  000100          MOV     #A0715,@#100    ;SET UP THE LCLK VECTOR - GO TO A0715
055776  012737  000300  000102          MOV     #300,@#102
056004  012737  056152  000064          MOV     #C0715,@#64     ;SET UP THE DL11 VECTOR - GO TO C0715
056012  012737  000200  000066          MOV     #200,@#66
056020  010506                  R0715:  MOV     R5,SP           ;RESET SP FOR ERROR LOOPING
056022  012737  000340  177776          MOV     #340,@#PSW      ;LOCK OUT ALL INTRS
056030  005037  067560                  CLR     @#MBUF0         ;INIT TIMER
056034  005037  067564                  CLR     @#MBUF1         ;CLEAR DL11 INTR FLAG
056040  005004                          CLR     R4              ;INIT TIMER
056042  052713  000100                  BIS     #100,(R3)       ;ENABLE DL11 XMIT INTR
056046  105713                  1$:     TSTB    (R3)            ;XMIT READY SET ??
056050  100403                          BMI     2$              ;BR IF YES
056052  005304                          DEC     R4              ;COUNT THE TIMER
056054  001374                          BNE     1$              ;BR IF NO TIMEOUT
056056  000444                          BR      F0715           ;GO REPORT TIMEOUT FOR DL11

056060  005004                  2$:     CLR     R4              ;INIT THE TIMER AGAIN
056062  052712  000100                  BIS     #100,(R2)       ;ENABLE LCLK INTRS
056066  042712  000200                  BIC     #200,(R2)       ;CLEAR THE LINE CLOCK READY BIT
056072  105712                  3$:     TSTB    (R2)            ;LCLK READY TO INTR
056074  100403                          BMI     4$              ;BR IF YES
056076  005304                          DEC     R4              ;COUNT THE TIMER
056100  001374                          BNE     3$              ;BR IF NO TIMEOUT
056102  000437                          BR      G0715           ;GO REPORT KW11-L TIMEOUT
056104  000257                  4$:     CCC                     ;SCOPE SYNC

056106  005037  177776          I0715:  CLR     @#PSW           ;ALLOW INTRS - KW SHOULD INTR FIRST

056112  005137  067560                  COM     @#MBUF0         ;SET SOFTWARE FLAG IF FETCHED
056116  005013                  A0715:  CLR     (R3)            ;DISABLE BOTH INTERRUPTS
056120  005012                          CLR     (R2)
056122  005737  067560                  TST     @#MBUF0         ;DID SOFTWARE FLAG GET SET ??
056126  001403                          BEQ     B0715           ;BR IF NOT

056130  104007                  E10715: ERROR7                  ;KW11-L INTR OCCURRED TOO LATE
056132  056020                          R0715                   ;ERROR LOOP RETURN ADDRESS
056134  000426                          BR      H0715           ;GO TO EXIT

056136  005737  067564          B0715:  TST     @#MBUF1         ;DID DL11 SOFTWARE FLAG SET ??
056142  001423                          BEQ     H0715           ;BR IF NOT
```

```
056144  104007                  E20715: ERROR7                  ;DL11 INTERRUPTED THE KW11
056146  056020                          R0715                   ;ERROR LOOP RETURN ADDDRESS
056150  000420                          BR      H0715           ;GO TO EXIT TEST

056152  005137  067564          C0715:  COM     @#MBUF1         ;FLAG THE DL11 INTR
056156  005013                          CLR     (R3)            ;DISABLE BOTH INTR ENABLES
056160  005012                          CLR     (R2)
056162  104007                  E30715: ERROR7                  ;DL11 SHOULD NOT HAVE INTERRUPTED
056164  056020                          R0715                   ;ERROR LOOP RETURN ADDDRESS
056166  000411                          BR      H0715           ;GO EXIT TEST

056170  005012                  F0715:  CLR     (R2)            ;DISABLE THE INTR ENABLES
056172  005013                          CLR     (R3)
056174  104007                  E40715: ERROR7                  ;DL11 TIMEOUT
056176  056020                          R0715                   ;ERROR LOOP RETURN ADDRESS
056200  000404                          BR      H0715           ;GO TO EXIT

056202  005012                  G0715:  CLR     (R2)            ;DISABLE INTR ENABLES
056204  005013                          CLR     (R3)
056206  104007                  E50715: ERROR7                  ;KW11 TIMEOUT
056210  056020                          R0715                   ;ERROR LOOP RETURN ADDRESS

056212  010506                  H0715:  MOV     R5,SP           ;RESET THE SP
056214  005037  177776                  CLR     @#PSW           ;RESET THE CPU PRIORITY
056220  012737  000102  000100          MOV     #102,@#100      ;RESTORE LCLK VECTOR
056226  005037  000102                  CLR     @#102
056232  012737  000066  000064          MOV     #66,@#64        ;RESTORE THE DL11 XMIT VECTOR
056240  005037  000066                  CLR     @#66

056244  000004                  00715:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ******************************************************************
                                        ; /////////////COMBINED INSTRUCTION EXERCISER SECTION /////////////
                                        ; ************************************************************************

                                        ; ************************************************************************
                                                .SBTTL T0716 'BPT'' TRAP LINKAGE TEST
                                        ; ****************************************************************************

056246  012700  000716          T0716:  MOV     #0716,R0                ;SAVE THE TEST NO. IN R0
056252  013701  056272                  MOV     @#I0716,R1      ;LOAD INSTRUCTION TEST WORD INTO R1
056256  010605                          MOV     SP,R5           ;SAVE THE SP
056260  012737  056300  000014          MOV     #A0716,@#14     ;GO TO A0716 ON 'BPT'' TRAP
056266  010506                  R0716:  MOV     R5,SP           ;RESET THE SP FOR ERROR LOOPING
056270  000257                          CCC                     ;SCOPE SYNC

056272  000003                  I0716:  BPT                     ;TEST THE 'BPT'' - GO TO A0716

056274  104005                  E0716:  ERROR5                  ;BPT FAILED TO TRAP
056276  056266                          R0716                   ;ERROR LOOP RETURN ADDRESS

056300  010506                  A0716:  MOV     R5,SP           ;RESET THE SP
056302  012737  000016  000014          MOV     #16,@#14        ;RESTORE THE VECTOR

056310  000004                  O0716:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY


                                        ; ************************************************************************
                                                .SBTTL T0717 RED ZONE OVERFLOW TEST - MOV R,-(SP)
                                        ; ************************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [174,257,200,JAMUPP,TRAP MICROROUTINE] FC 1,4,6,10

                                        ;ACT BUTS:      37[004]100,174 / 22[174]200,200 / 01[332]122,123 / 26[123]010,013

                                        ;EXEC:          [200] BUS STOP TRIGGERS JAMUPP LOGIC

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2 (-) T = 10 USEC

                                        ;KEY SIG:       K5-5 STACK04 H  /  K5-5 STPM2 H  /  K1-7 BOVFLW STOP H  /  K4-4 OVFLW ER
                                                        ;K4-4 BUS STOP H  /  K4-3 JBERR (1) L  /  K4-3 JAMUPP L  /  K4-3 JAM CLK

056312  012700  000717          T0717:  MOV     #0717,R0                ;LOAD R0 WITH TEST NO.
056316  013701  056356                  MOV     @#I0717,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
056322  010605                          MOV     SP,R5           ;SAVE SP
056324  013704  000004          R0717:  MOV     @#4,R4          ;SAVE T.O. VECTOR
056330  013703  000336                  MOV     @#336,R3        ;SAVE VECTOR AT 336
056334  012737  056372  000004          MOV     #A0717,@#4      ;GO TO A0717 ON OVFLW
056342  012737  125252  000336          MOV     #125252,@#336   ;INIT. [336]
056350  012706  000340                  MOV     #340,SP         ;SET SP TO CAUSE RED ZONE TRAP
056354  000257                          CCC                     ;SCOPE SYNC

056356  010046                  I0717:  MOV     R0,-(SP)        ;FORCE RED ZONE TRAP - GO TO A0717
```

```
056360  010437  000004                  MOV     R4,@#4          ;RESTORE T.O. VECTOR
056364  010506                          MOV     R5,SP           ;RESET SP FOR ERROR CALL
056366  104005                  E10717: ERROR5                  ;MOV FAILED TO CAUSE TRAP
056370  056324                          R0717                   ;ERROR LOOP RETURN ADDRESS

056372  010437  000004          A0717:  MOV     R4,@#4          ;RESTORE T.O. VECTOR
056376  022706  000000                  CMP     #0,SP           ;[SP]=0?
056402  001403                          BEQ     B0717           ;BE IF YES

056404  010506                          MOV     R5,SP           ;RESET SP FOR ERROR CALL
056406  104005                  E20717: ERROR5                  ;SP NOT BEING JAMMED TO 4
056410  056324                          R0717                   ;ERROR LOOP RETURN ADDRESS

056412  022737  125252  000336  B0717:  CMP     #125252,@#336   ;DID PUSH OCCUR IN YELLOW ZONE?
056420  001403                          BEQ     C0717           ;BR IF NOT

056422  010506                          MOV     R5,SP           ;RESET SP FOR ERROR CALL
056424  104005                  E30717: ERROR5                  ;MOV PUSHED INTO YELLOW ZONE
056426  056324                          R0717                   ;ERROR LOOP RETURN ADDRESS

056430  010337  000336          C0717:  MOV     R3,@#336        ;RESTORE VECTOR 336
056434  010506                          MOV     R5,SP           ;RESET SP

056436  000004                  O0717:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0720 YELLOW ZONE OVERFLOW TEST - MOV R,-(SP)
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [174,257,201,125,375,017,015,010,TRAP MICROROUTINE] FC 1,4,8,10,6

                                        ;ACT BUTS:      37[004]100,174 / 22[174]200,201 / 16[125]016,017 / 26[017]010,010

                                        ;EXEC:          K4-4 CLK BOVFL SETS K5-4 BOVFLW FLOP

                                        ;CODES:         N/A

                                        ;SYNC:          B05J2   (-)     T= 10USEC

                                        ;KEY SIG:       K4-4 CLK BOVFLW H / K4-4 CKOVF H / K1-7 BOVFL L

056440  012700  000720                  T0720:  MOV     #0720,R0                ;LOAD R0 WITH TEST NO.
056444  013701  056476                          MOV     @#I0720,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
056450  010605                                  MOV     SP,R5           ;SAVE SP
056452  012702  000376                          MOV     #376,R2         ;R2 POINTS TO STACK
056456  013704  000004                  R0720:  MOV     @#4,R4          ;SAVE T.O. VECTOR
056462  012737  056512  000004                  MOV     #A0720,@#4      ;ON OVFLW - GO TO A0720
056470  012706  000400                          MOV     #400,SP         ;SET SP TO CAUSE OVFLW
056474  000257                                  CCC                     ;SCOPE SYNC

056476  010046                          I0720:  MOV     R0,-(SP)        ;FORCE STACK OVFLW - GO TO A0720

056500  010437  000004                          MOV     R4,@#4          ;RESTORE T.O. VECTOR
056504  010506                                  MOV     R5,SP           ;RESET SP FOR ERROR CALL
056506  104005                          E10720: ERROR5                  ;STACK OVFLW FAILED TO TRAP
056510  056456                                  R0720                   ;ERROR LOOP RETURN ADDRESS

056512  010437  000004                  A0720:  MOV     R4,@#4          ;RESTORE T.O. VECTOR
056516  020012                                  CMP     R0,(R2)         ;DID [R0] GET PUSHED?
056520  001403                                  BEQ     B0720           ;BR IF YES

056522  010506                                  MOV     R5,SP           ;RESET SP FOR ERROR CALL
056524  104005                          E20720: ERROR5                  ;MOV FAILED TO PUSH IN YELLOW ZONE
056526  056456                                  R0720                   ;ERROR LOOP RETURN ADDRESS

056530  005706                          B0720:  TST     SP              ;[SP]=0?
056532  001003                                  BNE     C0720           ;BR IF NOT

056534  010506                                  MOV     R5,SP           ;RESET SP FOR ERROR CALL
056536  104005                          E30720: ERROR5                  ;RED ZONE INSTEAD OF YELLOW ZONE
056540  056456                                  R0720                   ;ERROR LOOP RETURN ADDRESS

056542  010506                          C0720:  MOV     R5,SP           ;RESET SP

056544  000004                          00720:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; *******************************************************************
                                                .SBTTL T0721 YELLOW ZONE OVERFLOW TEST - (CMP  R0,-(SP))
                                        ; *******************************************************************

056546  012700  000721          T0721:  MOV     #0721,R0                ;LOAD R0 WITH TEST NO.
056552  013701  056600                  MOV     @#I0721,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
056556  010605                          MOV     SP,R5           ;SAVE THE SP
056560  013704  000004                  MOV     @#4,R4          ;SAVE TRAP VECTOR
056564  012737  056604  000004  R0721:  MOV     #A0721,@#4      ;GO TO A0721 IF TRAP SPRUNG
056572  012706  000400                  MOV     #400,SP         ;SET SP TO PUSH INTO 'YELLOW ZONE'
056576  000257                          CCC                     ;SCOPE SYNC

056600  020046                  I0721:  CMP     R0,-(SP)        ;TEST THE CMP - NO TRAP SHOULD OCCUR

056602  000405                          BR      B0721           ;GO TO EXIT TEST

056604  010437  000004          A0721:  MOV     R4,@#4          ;RESTORE TRAP VECTOR
056610  010506                          MOV     R5,SP           ;RESET THE SP
056612  104005                  E0721:  ERROR5                  ;CMP CAUSED OVERFLOW TRAP
056614  056564                          R0721                   ;ERROR LOOP RETURN ADDRESS

056616  010437  000004          B0721:  MOV     R4,@#4          ;RESTORE THE VECTOR
056622  010506                          MOV     R5,SP           ;RESET THE SP

056624  000004                  O0721:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0722 YELLOW ZONE OVERFLOW TEST - (BIT  R0,-(SP))
                                        ; ***********************************************************************

056626  012700  000722          T0722:  MOV     #0722,R0                ;LOAD R0 WITH TEST NO.
056632  013701  056660                  MOV     @#I0722,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
056636  010605                          MOV     SP,R5           ;SAVE THE SP
056640  013704  000004                  MOV     @#4,R4          ;SAVE TRAP VECTOR
056644  012737  056664  000004  R0722:  MOV     #A0722,@#4      ;GO TO A0722 IF TRAP SPRUNG
056652  012706  000400                  MOV     #400,SP         ;SET SP TO PUSH INTO ''YELLOW ZONE''
056656  000257                          CCC                     ;SCOPE SYNC

056660  030046                  I0722:  BIT     R0,-(SP)        ;TEST THE BIT - NO TRAP SHOULD OCCUR

056662  000405                          BR      B0722           ;GO TO EXIT TEST

056664  010437  000004          A0722:  MOV     R4,@#4          ;RESTORE TRAP VECTOR
056670  010506                          MOV     R5,SP           ;RESET THE SP
056672  104005                  E0722:  ERROR5                  ;BIT CAUSED OVERFLOW TRAP
056674  056644                          R0722                   ;ERROR LOOP RETURN ADDRESS

056676  010437  000004          B0722:  MOV     R4,@#4          ;RESTORE THE VECTOR
056702  010506                          MOV     R5,SP           ;RESET THE SP

056704  000004                  O0722:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; *******************************************************************
                                                .SBTTL T0723 YELLOW ZONE OVERFLOW TEST - (TST  -(SP))
                                        ; *******************************************************************

056706  012700  000723          T0723:  MOV     #0723,R0                ;LOAD R0 WITH TEST NO.
056712  013701  056740                  MOV     @#I0723,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
056716  010605                          MOV     SP,R5           ;SAVE THE SP
056720  013704  000004                  MOV     @#4,R4          ;SAVE TRAP VECTOR
056724  012737  056744  000004  R0723:  MOV     #A0723,@#4      ;GO TO A0723 IF TRAP SPRUNG
056732  012706  000400                  MOV     #400,SP         ;SET SP TO PUSH INTO 'YELLOW ZONE''
056736  000257                          CCC                     ;SCOPE SYNC

056740  005746                  I0723:  TST     -(SP)           ;TEST THE TST - NO TRAP SHOULD OCCUR

056742  000405                          BR      B0723           ;GO TO EXIT TEST

056744  010437  000004          A0723:  MOV     R4,@#4          ;RESTORE TRAP VECTOR
056750  010506                          MOV     R5,SP           ;RESET THE SP
056752  104005                  E0723:  ERROR5                  ;TST CAUSED OVERFLOW TRAP
056754  056724                          R0723                   ;ERROR LOOP RETURN ADDRESS

056756  010437  000004          B0723:  MOV     R4,@#4          ;RESTORE THE VECTOR
056762  010506                          MOV     R5,SP           ;RESET THE SP

056764  000004                  O0723:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0724 ODD ADDRESS ERROR TEST - SUB  RA,(RB) - (RB) = ODD
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:

                                        ;ACT BUTS:

                                        ;EXEC:

                                        ;CODES:

                                        ;SYNC:

                                        ;KEY SIG:

056766  012700  000724                  T0724:  MOV     #0724,R0                ;LOAD R0 WITH TEST NO.
056772  013701  057022                          MOV     @#I0724,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
056776  010605                                  MOV     SP,R5           ;SAVE SP
057000  013704  000004                  R0724:  MOV     @#4,R4          ;SAVE T.O. VECTOR
057004  012737  057034  000004                  MOV     #A0724,@#4      ;ON ODD ADDR ERROR - GO TO A0724
057012  010506                                  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
057014  012702  000001                          MOV     #1,R2           ;R2 GETS ODD ADDRESS
057020  000257                                  CCC                     ;SCOPE SYNC

057022  160012                          I0724:  SUB     R0,(R2)         ;FORCE ODD ADDR ERROR - GO TO A0724

057024  010437  000004                          MOV     R4,@#4          ;RESTORE T.O. VECTOR
057030  104005                          E0724:  ERROR5                  ;ODD ADDR FAILED TO TRAP
057032  057000                                  R0724                   ;ERROR LOOP RETURN ADDRESS

057034  010437  000004                  A0724:  MOV     R4,@#4          ;RESTORE T.O. VECTOR
057040  010506                                  MOV     R5,SP           ;RESET SP
057042  005037  000000                          CLR     @#0             ;CLR LOC. 0 JUST IN CASE

057046  000004                          O0724:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                ; *********************************************************************
                                        .SBTTL T0725 TEST FOR ODD ADDR. ERROR TRAP FOR DEST. DEFERRED MODES
                                ; *********************************************************************

057050  012700  000725          T0725:  MOV     #0725,R0                ;LOAD R0 WITH TEST NO.
057054  012702  067565                  MOV     #MBUF1+1,R2     ;DEST ADDR=MBUF1+1 (ODD)
057060  012737  057154  000004          MOV     #A0725,@#4      ;GO TO A0725 ON ODA TRAP

057066  010205                  R10725: MOV     R2,R5           ;[R5] = DEST. ADDR
057070  013701  057076                  MOV     @#I10725,R1     ;[R1] = TEST INSTR
057074  000257                          CCC                     ;SCOPE SYNC

057076  105435                  I10725: NEGB    @(R5)+          ;TEST DM=3 TRAP

057100  104006                  E10725: ERROR6                  ;ODA TRAP NOT SPRUNG IN ROM LOC. 163
057102  057066                          R10725                  ;ERROR LOOP RETURN ADDRESS

057104  012705  067567          R20725: MOV     #MBUF1+3,R5     ;[R5] = DEST. ADDR
057110  013701  057116                  MOV     @#I20725,R1     ;[R1] = TEST INSTR
057114  000257                          CCC                     ;SCOPE SYNC

057116  105455                  I20725: NEGB    @-(R5)          ;TEST DM=5 TRAP

057120  104006                  E20725: ERROR6                  ;ODA TRAP NOT SPRUNG IN ROM LOC. 165
057122  057104                          R20725                  ;ERROR LOOP RETURN ADDRESS

057124  010205                  R30725: MOV     R2,R5           ;[R5] = DEST ADDR
057126  013701  057134                  MOV     @#I30725,R1     ;[R1] = TEST INSTR
057132  000257                          CCC                     ;SCOPE SYNC

057134  105475  000000          I30725: NEGB    @0(R5)          ;TEST DM=7 TRAP

057140  104006                  E30725: ERROR6                  ;ODA TRAP NOT SPRUNG IN ROM LOC 263
057142  057124                          R30725                  ;ERROR LOOP RETURN ADDRESS

057144  012737  065160  000004          MOV     #BERR,@#4       ;RESET T.O. VECTOR
057152  000403                          BR      00725           ;GO TO SCOPE EXIT

057154  062716  000004          A0725:  ADD     #4,(SP)         ;MOV RETURN PC AROUND ERROR CALL
057160  000002                          RTI                     ;RETURN TO NEXT SUB-TEST

057162  000004                  00725:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; *********************************************************************
                                        .SBTTL T0726 TEST FOR ODD ADDR ERROR TRAP FOR SOURCE DEFERRED MODES
                                ; *********************************************************************

057164  012700  000726          T0726:  MOV     #0726,R0                ;LOAD R0 WITH TEST NO.
057170  012702  067565                  MOV     #MBUF1+1,R2     ;[R2] = SOURCE ADDR. (ODD)
057174  012737  057270  000004          MOV     #A0726,@#4      ;GO TO A0726 ON TRAP

057202  010205                  R10726: MOV     R2,R5           ;[R5] = SOURCE ADDR.
057204  013701  057212                  MOV     @#I10726,R1     ;[R1] = TEST INSTR.
057210  000257                          CCC                     ;SCOPE SYNC

057212  113504                  I10726: MOVB    @(R5)+,R4       ;TEST SM=3

057214  104006                  E10726: ERROR6                  ;ODA TRAP NOT SPRUNG IN ROM LOC. 143
057216  057202                          R10726                  ;ERROR LOOP RETURN ADDRESS

057220  012705  067567          R20726: MOV     #MBUF1+3,R5     ;[R5] = SOURCE ADDR
057224  013701  057232                  MOV     @#I20726,R1     ;[R1] = TEST INSTR
057230  000257                          CCC                     ;SCOPE SYNC

057232  115504                  I20726: MOVB    @-(R5),R4       ;TEST SM=5

057234  104006                  E20726: ERROR6                  ;ODA TRAP NOT SPRUNG IN ROM LOC 145
057236  057220                          R20726                  ;ERROR LOOP RETURN ADDRESS
057240  010205                  R30726: MOV     R2,R5           ;[R5] = SOURCE ADDR
057242  013701  057250                  MOV     @#I30726,R1     ;[R1] = TEST INSTR
057246  000257                          CCC                     ;SCOPE SYNC

057250  117504  000000          I30726: MOVB    @0(R5),R4       ;TEST SM=7

057254  104006                  E30726: ERROR6                  ;ODA TRAP NOT SPRUNG IN ROM LOC 244
057256  057240                          R30726                  ;ERROR LOOP RETURN ADDRESS

057260  012737  065160  000004          MOV     #BERR,@#4       ;RESET T.O. VECTOR
057266  000403                          BR      00726           ;GO TO SCOPE EXIT

057270  062716  000004          A0726:  ADD     #4,(SP)         ;MOVE RETURN PC AROUND ERROR CALL
057274  000002                          RTI                     ;RETURN TO NEXT SUB-TEST

057276  000004                  00726:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                ; ***********************************************************************
                                        .SBTTL T0727 TEST FOR ODD ADDR ERROR TRAP FOR JMP DEST DEFERRED MODES
                                ; ***********************************************************************

057300  012700  000727          T0727:  MOV     #0727,R0                ;LOAD R0 WITH TEST NO.
057304  012702  057407                  MOV     #B0727+3,R2     ;DEST ADDR = B0727+3 (ODD)
057310  012737  057412  000004          MOV     #A0727,@#4      ;GO TO A0727 ON ODA TRAP

057316  010205                  R10727: MOV     R2,R5           ;[R5] = DEST ADDR
057320  013701  057326                  MOV     @#I10727,R1     ;[R1] = TEST INSTR
057324  000257                          CCC                     ;SCOPE SYNC

057326  000135                  I10727: JMP     @(R5)+          ;TEST JMP DM=3

057330  104006                  E10727: ERROR6                  ;ODA TRAP NOT SPRUNG IN ROM LOC 153
057332  057316                          R10727                  ;ERROR LOOP RETURN ADDRESS

057334  012705  057407          R20727: MOV     #B0727+3,R5     ;[R5] = DEST ADDR
057340  013701  057346                  MOV     @#I20727,R1     ;[R1] = TEST INSTR
057344  000257                          CCC                     ;SCOPE SYNC

057346  000155                  I20727: JMP     @-(R5)          ;TEST JMP DM=5

057350  104006                  E20727: ERROR6                  ;ODA TRAP NOT SPRUNG IN ROM LOC 155
057352  057334                          R20727                  ;ERROR LOOP RETURN ADDRESS

057354  010205                  R30727: MOV     R2,R5           ;[R5] = DEST ADDR
057356  013701  057364                  MOV     @#I30727,R1     ;[R1] = TEST INSTR
057362  000257                          CCC                     ;SCOPE SYNC

057364  000175  000000          I30727: JMP     @0(R5)          ;TEST JMP DM=7

057370  104006                  E30727: ERROR6                  ;ODA TRAP NOT SPRUNG IN LOC 302
057372  057354                          R30727                  ;ERROR LOOP RETURN ADDRESS

057374  012737  065160  000004          MOV     #BERR,@#4       ;RESET BUS T.O. VECTOR
057402  000421                          BR      00727           ;GO TO SCOPE EXIT

057404  000000                  B0727:  HALT                    ;CATASTOPHIC ERROR - [PC] QUESTIONABLE.
057406  000000                          HALT                    ;RESTART PROGRAM - DO NOT CONTINUE.
057410  000000                          HALT

057412  032716  000001          A0727:  BIT     #1,(SP)         ;TRAP DUE TO ODD PC?
057416  001003                          BNE     C0727           ;BR IF YES
057420  062716  000004                  ADD     #4,(SP)         ;MOV RETURN PC AROUND ERROR CALL
057424  000002                          RTI                     ;RETURN TO NEXT SUB TEST

057426  011603                  C0727:  MOV     (SP),R3         ;GET ODD PC OFF STACK INTO R3
057430  062706  000004                  ADD     #4,SP           ;FIX SP

057434  104007                  E40727: ERROR7                  ;PC TRAPPED WITH ODD ADDRESS
057436  057300                          T0727

057440  012737  065160  000004          MOV     #BERR,@#4       ;RESET T.O. VECTOR

057446  000004                  00727:  SCOPE                   ;CALL SCOPE LOOP UTILITY
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23955

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                                ; ***********************************************************************
                                        .SBTTL T0730 TEST FOR STACK OFLW FOR DEST MODES 1,2,4, AND 6.
                                ; ***********************************************************************

057450  012700  000730          T0730:  MOV     #0730,R0                ;LOAD R0 WITH TEST NO.
057454  012737  057602  000004          MOV     #A0730,@#4      ;GO TO A0730 ON OVFLW TRAP
057462  010605                          MOV     SP,R5           ;SAVE SP
057464  012702  000376                  MOV     #376,R2         ;USE R2 TO SET UP SP TO CAUSE TRAP

057470  013701  057500          R10730: MOV     @#I10730,R1     ;[R1] = TEST INSTR.
057474  010206                          MOV     R2,SP           ;SET UP SP TO CAUSE OVERFLOW
057476  000257                          CCC                     ;SCOPE SYNC

057500  005016                  I10730: CLR     (SP)            ;TEST DM1 - SHOULD SPRING TRAP

057502  010506                          MOV     R5,SP           ;RESET SP
057504  104006                  E10730: ERROR6                  ;DM1 FAILED TO CAUSE OVERFLOW TRAP
057506  057470                          R10730                  ;ERROR LOOP RETURN ADDRESS

057510  013701  057520          R20730: MOV     @#I20730,R1     ;[R1] = TEST INSTR.
057514  010206                          MOV     R2,SP           ;SET UP SP TO CAUSE OVERFLOW
057516  000257                          CCC                     ;SCOPE SYNC

057520  005026                  I20730: CLR     (SP)+           ;TEST DM2 - SHOULD SPRING TRAP

057522  010506                          MOV     R5,SP           ;RESET SP
057524  104006                  E20730: ERROR6                  ;DM2 FAILED TO CAUSE OVERFLOW TRAP
057526  057510                          R20730                  ;ERROR LOOP RETURN ADDRESS

057530  013701  057540          R30730: MOV     @#I30730,R1     ;[R1] = TEST INSTR.
057534  010206                          MOV     R2,SP           ;SET UP SP TO CAUSE OVERFLOW
057536  000257                          CCC                     ;SCOPE SYNC

057540  005046                  I30730: CLR     -(SP)           ;TEST DM4 - SHOULD SPRING TRAP

057542  010506                          MOV     R5,SP           ;RESET SP
057544  104006                  E30730: ERROR6                  ;DM4 FAILED TO CAUSE OVERFLOW TRAP
057546  057530                          R30730                  ;ERROR LOOP RETURN ADDRESS

057550  013701  057560          R40730: MOV     @#I40730,R1     ;[R1] = TEST INSTR.

057554  010206                          MOV     R2,SP           ;SET SP TO CAUSE ERROR
057556  000257                          CCC                     ;SCOPE SYNC

057560  005066  000000          I40730: CLR     0(SP)           ;TEST DM6 - SHOULD SPRING TRAP

057564  010506                          MOV     R5,SP           ;RESET SP
057566  104006                  E40730: ERROR6                  ;DM6 FAILED TO CAUSE OVERFLOW TRAP
057570  057550                          R40730                  ;ERROR LOOP RETURN ADDRESS

057572  012737  065160  000004          MOV     #BERR,@#4       ;RESET BUS T.O. VECTOR
057600  000407                          BR      00730           ;GO TO SCOPE EXIT

057602  011604                  A0730:  MOV     (SP),R4         ;GET RETURN PC OFF STACK
057604  062704  000006                  ADD     #6,R4           ;MOVE RETURN PC AROUND ERROR CALL
057610  010506                          MOV     R5,SP           ;RESET SP
```

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24012  057612  005046                        CLR     -(SP)          ;PUSH NEW PS ON STACK
24013  057614  010446                        MOV     R4,-(SP)       ;PUSH RETURN PC ON STACK
24014  057616  000002                        RTI                    ;RETURN TO NEXT SUB-TEST
24015
24016  057620  000004                00730:  SCOPE                  ;CALL SCOPE LOOP UTILITY
24017
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                                ; ***********************************************************************
                                        .SBTTL T0731 TEST FOR STACK OVFLW FOR MOV DEST MODES 1,2,4, AND 6.
                                ; ***********************************************************************

057622  012700  000731          T0731:  MOV     #0731,R0                ;LOAD R0 WITH TEST NO.
057626  012737  057754  000004          MOV     #A0731,@#4      ;GO TO A0731 ON STACK OVFLW TRAP
057634  010605                          MOV     SP,R5           ;SAVE SP
057636  012702  000376                  MOV     #376,R2         ;USE R2 TO SET UP SP TO CAUSE TRAP

057642  013701  057652          R10731: MOV     @#I10731,R1     ;[R1] = TEST INSTR.
057646  010206                          MOV     R2,SP           ;SET UP SP TO CAUSE OVERFLOW
057650  000257                          CCC                     ;SCOPE SYNC

057652  010016                  I10731: MOV     R0,(SP)         ;TEST MOV DM1 - SHOULD SPRING TRAP

057654  010506                          MOV     R5,SP           ;RESET SP
057656  104006                  E10731: ERROR6                  ;MOV DM1 FAILED TO SPRING TRAP
057660  057642                          R10731                  ;ERROR LOOP RETURN ADDRESS

057662  013701  057672          R20731: MOV     @#I20731,R1     ;[R1] = TEST INSTR.
057666  010206                          MOV     R2,SP           ;SET UP SP TO CAUSE OVERFLOW
057670  000257                          CCC                     ;SCOPE SYNC

057672  010026                  I20731: MOV     R0,(SP)+        ;TEST MOV DM2 - SHOULD SPRING TRAP

057674  010506                          MOV     R5,SP           ;RESET SP
057676  104006                  E20731: ERROR6                  ;MOV DM2 FAILED TO SPRING TRAP
057700  057662                          R20731                  ;ERROR LOOP RETURN ADDRESS

057702  013701  057712          R30731: MOV     @#I30731,R1     ;[R1] = TEST INSTR.
057706  010206                          MOV     R2,SP           ;SET UP SP TO CAUSE OVERFLOW
057710  000257                          CCC                     ;SCOPE SYNC

057712  010046                  I30731: MOV     R0,-(SP)        ;TEST MOV DM4 - SHOULD SPRING TRAP

057714  010506                          MOV     R5,SP           ;RESET SP
057716  104006                  E30731: ERROR6                  ;MOV DM4 FAILED TO SPRING TRAP
057720  057702                          R30731                  ;ERROR LOOP RETURN ADDRESS

057722  013701  057732          R40731: MOV     @#I40731,R1     ;[R1] = TEST INSTR.
057726  010206                          MOV     R2,SP           ;SET UP SP TO CAUSE OVERFLOW
057730  000257                          CCC                     ;SCOPE SYNC

057732  010066  000000          I40731: MOV     R0,0(SP)        ;TEST MOV DM6 - SHOULD SPRING TRAP

057736  010506                          MOV     R5,SP           ;RESET SP
057740  104006                  E40731: ERROR6                  ;MOV DM6 FAILED TO CAUSE OVFLW TRAP
057742  057722                          R40731                  ;ERROR LOOP RETURN ADDRESS

057744  012737  065160  000004          MOV     #BERR,@#4       ;RESET T.O. VECTOR
057752  000407                          BR      00731           ;GO TO SCOPE EXIT

057754  011604                  A0731:  MOV     (SP),R4         ;GET RETURN PC
057756  062704  000006                  ADD     #6,R4           ;MOVE RETURN PC AROUND ERROR CALL
057762  010506                          MOV     R5,SP           ;RESET SP
057764  005046                          CLR     -(SP)           ;PUSH NEW PSW
```

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057766  010446                          MOV     R4,-(SP)        ;PUSH RETURN PC
057770  000002                          RTI                     ;RETURN TO NEXT SUB-TEST

057772  000004                  00731:  SCOPE                   ;CALL SCOPE LOOP UTILITY

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                                        ; *******************************************************************
                                                .SBTTL T0732 TEST THAT JSR CAN CAUSE OVERFLOW TRAP
                                        ; *******************************************************************

057774  012700  000732          T0732:  MOV     #0732,R0                ;LOAD R0 WITH TEST NO.
060000  012737  060036  000004          MOV     #A0732,@#4      ;GO TO A0732 ON OVERFLOW ERROR
060006  010605                          MOV     SP,R5           ;SAVE SP
060010  013701  060022                  MOV     @#I0732,R1      ;LOAD R1 WITH TEST INSTR WORD
060014  012706  000400          R0732:  MOV     #400,SP         ;SET THE SP TO CAUSE TRAP
060020  000257                          CCC                     ;SCOPE SYNC

060022  004737  060042          I0732:  JSR     PC,@#B0732      ;TEST JSR - SHOULD SPRING TRAP

060026  010506                          MOV     R5,SP           ;RESET SP
060030  104005                  E10732: ERROR5                  ;JSR PUSH DID NOT SPRING OVFL TRAP
060032  060014                          R0732                   ;ERROR LOOP RETURN ADDRESS

060034  000405                          BR      C0732           ;GO TO SCOPE EXIT

060036  010506                  A0732:  MOV     R5,SP           ;RESET SP
060040  000403                          BR      C0732           ;GO EXIT TEST - ALL OK

060042  010506                  B0732:  MOV     R5,SP           ;RESET SP
060044  104005                  E20732: ERROR5                  ;JSR PUSH FAILED TO SPRING OVFLW TRAP
060046  060014                          R0732                   ;ERROR LOOP RETURN ADDRESS

060050  012737  065160  000004  C0732:  MOV     #BERR,@#4       ;RESET BUS T.O. VECTOR

060056  000004                  O0732:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; *******************************************************************
                                        .SBTTL T0733 TEST THAT 1ST PUSH IN TRAP MICROROUTINE CAUSES OVFLW TRAP
                                ; *******************************************************************

060060  012700  000733          T0733:  MOV     #0733,R0                ;LOAD R0 WITH TEST NO.
060064  013704  000014                  MOV     @#14,R4         ;SAVE BREAK POINT TRAP VECTOR
060070  013701  060120                  MOV     @#I0733,R1      ;LOAD R1 WITH TEST INSTR
060074  010605                          MOV     SP,R5           ;SAVE SP
060076  012737  060132  000004          MOV     #A0733,@#4      ;GO TO A0733 ON OVFLW TRAP
060104  012737  060136  000014          MOV     #B0733,@#14     ;GO TO B0733 IF BPT SERVICED
060112  012706  000400          R0733:  MOV     #400,SP         ;SET UP SP TO CAUSE OVFLW ON 1ST PUSH
060116  000257                          CCC                     ;SCOPE SYNC

060120  000003                  I0733:  BPT                     ;TEST THE BPT - SHOULD CAUSE OVERFLOW TRAP

060122  010506                          MOV     R5,SP           ;RESET SP
060124  104005                  E10733: ERROR5                  ;BPT FAILED TO TRAP
060126  060112                          R0733                   ;ERROR LOOP RETURN ADDRESS

060130  000405                          BR      C0733           ;GO TO SCOPE EXIT

060132  010506                  A0733:  MOV     R5,SP           ;RESET SP
060134  000403                          BR      C0733           ;GO EXIT - ALL OK

060136  010506                  B0733:  MOV     R5,SP           ;RESET SP
060140  104005                  E20733: ERROR5                  ;OVFLW TRAP FAILED TO BUMP BPT SERVICE
060142  060112                          R0733                   ;ERROR LOOP RETURN ADDRESS

060144  012737  065160  000004  C0733:  MOV     #BERR,@#4       ;RESET VECTORS
060152  010437  000014                  MOV     R4,@#14

060156  000004                  00733:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; *******************************************************************
                                                .SBTTL T0734 TEST THAT 2ND PUSH IN TRAP MICROUTINE CAUSES OVFLW TRAP
                                        ; *******************************************************************

060160  012700  000734          T0734:  MOV     #0734,R0                ;LOAD R0 WITH TEST NO.
060164  013701  060220                  MOV     @#I0734,R1      ;LOAD R1 WITH TEST INSTR WORD
060170  013704  000014                  MOV     @#14,R4         ;SAVE BPT VECTOR
060174  010605                          MOV     SP,R5           ;SAVE SP
060176  012737  060232  000004          MOV     #A0734,@#4      ;GO TO A0734 ON STACK OVFLOW
060204  012737  060236  000014          MOV     #B0734,@#14     ;GO TO B0734 IF BPT SERVICED
060212  012706  000402          R0734:  MOV     #402,SP         ;SET SP TO CAUSE TRAP ON 2ND PUSH
060216  000257                          CCC                     ;SCOPE SYNC

060220  000003                  I0734:  BPT                     ;TEST THE BPT - SHOULD CAUSE OVERFLOW TRAP

060222  010506                          MOV     R5,SP           ;RESET SP
060224  104005                  E10734: ERROR5                  ;BPT FAILED TO TRAP
060226  060212                          R0734                   ;ERROR LOOP RETURN ADDRESS

060230  000405                          BR      C0734           ;GO TO SCOPE EXIT

060232  010506                  A0734:  MOV     R5,SP           ;RESET SP
060234  000403                          BR      C0734           ;GO EXIT - ALL OK

060236  010506                  B0734:  MOV     R5,SP           ;RESET SP
060240  104005                  E20734: ERROR5                  ;OVFLW TRAP FAILED TO BUMP BPT SERVICE
060242  060212                          R0734                   ;ERROR LOOP RETURN ADDRESS

060244  012737  065160  000004  C0734:  MOV     #BERR,@#4       ;RESET VECTORS
060252  010437  000014                  MOV     R4,@#14

060256  000004                  O0734:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0735 ILLEGAL INSTRUCTION TEST - JSR RN,%R
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [150,007,115,326,327,113,330,331,077,140,332,333,123,015,013] FC 1,6,10

                                        ;ACT BUTS:      37[004]100,150 / 01[332]122,123 / 26[123]010,013

                                        ;EXEC:          [115] D = NEW PSW  /  [113] D = OLD PSW  /  [331] D = #I0735:2  /  [333]

                                        ;CODES:         [140] SPS=7  /  N:C = [LOC 6]

                                        ;SYNC:          B05J2 (-) T = 5.8 USEC

                                        ;KEY SIG:       K3-6 ILL INSTR L  /  K5-5 STPM3 H  /  K3-3 DM=0L  /  K3-5 JMP+JSR H

060260  012700  000735                  T0735:  MOV     #0735,R0                ;LOAD R0 WITH TEST NO.
060264  013701  060314                          MOV     @#I0735,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
060270  010605                                  MOV     SP,R5           ;SAVE SP
060272  013704  000004                  R0735:  MOV     @#4,R4          ;SAVE T.O. VECTOR
060276  012737  060326  000004                  MOV     #A0735,@#4      ;ILLEGAL INSTR. TRAP GOES TO A0735
060304  010506                                  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
060306  012702  060322                          MOV     #E0735,R2               ;IN CASE JSR JUMPS TO [R2]
060312  000257                                  CCC                     ;SCOPE SYNC

060314  004302                          I0735:  JSR     R3,R2           ;JSR MODE 0 FORCES TRAP - GO TO A0735

060316  010437  000004                          MOV     R4,@#4          ;RESTORE T.O. VECTOR
060322  104005                          E0735:  ERROR5                  ;JSR FAILED TO SPRING TRAP
060324  060272                                  R0735                   ;ERROR LOOP RETURN ADDRESS

060326  010437  000004                  A0735:  MOV     R4,@#4          ;RESTORE VECTOR
060332  010506                                  MOV     R5,SP           ;RESET SP

060334  000004                          00735:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0736 ILLEGAL INSTRUCTION TEST - JMP %R
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [150,007,115,326,327,113,330,331,077,140,332,333,123,015,013] FC 1,6,10

                                        ;ACT BUTS:      37[004]100,150 / 01[332]122,123 / 26[123]010,013

                                        ;EXEC:          [115] D = NEW PSW  /  [113] D = OLD PSW  /  [311] D = #I0736+2  /  [333]

                                        ;CODES:         [140] SPS=7  /  N:C = [LOC 6]

                                        ;SYNC:          B05J2 (-) T = 5.8 USEC

                                        ;KEY SIG:       K3-6 ILL INSTR L  /  K5-5 STPM3 H  /  K3-3 DM=0L  /  K3-5 JMP+JSR H

060336  012700  000736                  T0736:  MOV     #0736,R0                ;LOAD R0 WITH TEST NO.
060342  013701  060372                          MOV     @#I0736,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
060346  010605                                  MOV     SP,R5           ;SAVE SP
060350  013704  000004                  R0736:  MOV     @#4,R4          ;SAVE VECTOR POINTER AT LOC. 4
060354  012737  060404  000004                  MOV     #A0736,@#4      ;ON TRAP - GO TO A0736
060362  010506                                  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
060364  012702  060400                          MOV     #E0736,R2               ;IN CASE IT JUMPS TO ADDR IN RN
060370  000257                                  CCC                     ;SCOPE SYNC

060372  000102                          I0736:  JMP     R2              ;JMP MODE 0 FORCES TRAP - GO TO A0736

060374  010437  000004                          MOV     R4,@#4          ;RESTORE VECTOR POINTER AT LOC. 4
060400  104005                          E0736:  ERROR5                  ;ILLEGAL INSTR TRAP FAILED
060402  060350                                  R0736                   ;ERROR LOOP RETURN ADDRESS

060404  010437  000004                  A0736:  MOV     R4,@#4          ;RESTORE VECTOR POINTER AT LOC. 4
060410  010506                                  MOV     R5,SP           ;RESET SP

060412  000004                          00736:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0737 BUS TIMEOUT TRAP TEST - TST (R)
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:

                                        ;ACT BUTS:

                                        ;EXEC:

                                        ;CODES:

                                        ;SYNC:

                                        ;KEY SIG:

060414  012700  000737                  T0737:  MOV     #0737,R0                ;LOAD R0 WITH TEST NO.
060420  013701  060450                          MOV     @#I0737,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
060424  010605                                  MOV     SP,R5           ;SAVE SP
060426  013704  000004                  R0737:  MOV     @#4,R4          ;SAVE ORIGINAL T.O. VECTOR POINTER
060432  012737  060462  000004                  MOV     #A0737,@#4      ;ON T.O. TRAP - GO TO A0737
060440  012702  160000                          MOV     #160000,R2      ;R3 ADDRESS CAUSES T.O.
060444  010506                                  MOV     R5,SP           ;RESET SP FOR ERROR LOOP
060446  000257                                  CCC                     ;SCOPE SYNC

060450  005712                          I0737:  TST     (R2)            ;FORCE T.O. TRAP - GO TO A0737

060452  010437  000004                          MOV     R4,@#4          ;RESTORE T.O. VECTOR
060456  104005                          E0737:  ERROR5                  ;TIMEOUT TRAP FAILED
060460  060426                                  R0737                   ;ERROR LOOP RETURN ADDRESS
060462  010437  000004                  A0737:  MOV     R4,@#4          ;RESTORE T.O. VECTOR
060466  010506                                  MOV     R5,SP           ;RESET SP

060470  000004                          00737:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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                                        ; *****************************************************************
                                                .SBTTL T0740 'T' BIT TRAP TEST
                                        ; *****************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [104,373,362,002,015,010,216,215,115,326,327,113,330,331
                                                        ;077,140,332,333,123,015,013] FC 1,7,8,10,6,10
                                        ;ACT BUTS:      37[004]100,104 / 31[104]360,362 / 27[373]000,002 / 26[002]010,010
                                                        ;01[332]122,123 / 26[123]010,013
                                        ;EXEC:          [362] BUPP = 002 ('T' BIT TRAP)

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2 (-) T = 8 USEC

                                        ;KEY SIG:       K5-2 PS(T)(1) H  /  K5-5 STPM3 H  /  K5-5 STPM2 H

060472  012700  000740          T0740:  MOV     #0740,R0                ;LOAD R0 WITH TEST NO.
060476  013701  060530                  MOV     @#I0740,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
060502  010605                          MOV     SP,R5           ;SAVE SP
060504  010506          R0740:          MOV     R5,SP           ;RESET SP FOR ERROR LOOP
060506  012737  060540  000014          MOV     #A0740,@#14     ;GO TO A0740 WHEN 'T' TRAP SPRUNG
060514  012746  000020                  MOV     #20,-(SP)       ;SET 'T' BIT ON STACK
060520  012746  060530                  MOV     #I0740,-(SP)    ;SET UP NEW PC ON STACK
060524  000257                          CCC                     ;SCOPE SYNC
060526  000006                          RTT                     ;TURN ON 'T' BIT - GO TO I0740

060530  005700          I0740:  TST     R0              ;SPRING 'T' BIT TRAP - GO TO A0740

060532  104005          E10740: ERROR5                  ;NO 'T' BIT TRAP OCCURRED
060534  060504                  R0740                   ;ERROR LOOP RETURN ADDRESS

060536  000406                          BR      B0740           ;GO EXIT

060540  032766  000020  000002  A0740:  BIT     #20,2(SP)       ;'T' BIT SET IN OLD PSW?
060546  001002                          BNE     B0740           ;BR IF YES

060550  104000          E20740: ERROR                   ;#T# BIT NOT SAVED ON STACK
060552  060504                  R0740                   ;ERROR LOOP RETURN ADDRESS

060554  012737  000016  000014  B0740:  MOV     #16,@#14        ;RESTORE 'T' BIT TRAP CATCHER
060562  005037  000016                  CLR     @#16
060566  010506                          MOV     R5,SP           ;RESET SP

060570  000004          O0740:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0741 TEST PUSH INTO PSW WITH [SP] = 000000
                                        ; ***********************************************************************

                                        ;THESE NEXT TWO TESTS VERIFY THAT A "RED ZONE" TRAP OCCURS IF A
                                        ;PUSH IS ATTEMPTED WITH THE [SP] INITIALLY EQUAL TO 000000,177572,

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,174,257,200,JAMUPP 336,317,215,115
                                                        ; 326,327,113,330,331,077,140,332,333,123,015,013] FC 1,2,4,6,10
                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,174 / 22[174]200,200 / 01[332]122,123
                                                        ; / 26[123]010,013

                                        ;EXEC:          [200] BUS STOP TRIGGERS JAMUPP LOGIC

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2 (-) T = 10 USEC

                                        ;KEY SIG:       K4-6 PROC ADRS H  /  K4-4 BUS STOP H  /  K4-4 OVFLW ERR L  /  K4-3 JBERR
                                                        ; K4-3 JAMUPP L  /  K4-3 JAM CLK H  /  K4-3 PJAMSTART H  /  K5-5 STACK04

060572  012700  000741          T0741:  MOV     #0741,R0                ;LOAD R0 WITH TEST NO.
060576  013701  060622                  MOV     @#I0741,R1      ;LOAD R1 WITH COPY OF TEST INSTRUCTION
060602  010605                          MOV     SP,R5           ;SAVE THE SP
060604  013704  000004          R0741:  MOV     @#4,R4          ;SAVE THE BUS ERROR VECTOR
060610  012737  060646  000004          MOV     #A0741,@#4      ;"RED ZONE" TRAP GOES TO A0741
060616  005006                          CLR     SP              ;MAKE SP = 000000
060620  000257                          CCC                     ;SCOPE SYNC

060622  012746  177777          I0741:  MOV     #-1,-(SP)       ;ATTEMPT PUSH INTO PSW - SHOULD CAUSE
                                                                ;"RED ZONE" TRAP TO BE SPRUNG

060626  010437  000004                  MOV     R4,@#4          ;RESTORE BUS ERROR VECTOR
060632  005004                          CLR     R4              ;[R4] = S / B SP
060634  010603                          MOV     SP,R3           ;[R3] = WAS SP
060636  010506                          MOV     R5,SP           ;RESET THE SP
060640  104000          E10741: ERROR                           ;TRAP NOT SPRUNG
060642  060604                  R0741                           ;ERROR LOOP RETURN ADDRESS
060644  000413                          BR      O0741           ;GO TO SCOPE EXIT - SCHOOL'S OUT

060646  022706  000000          A0741:  CMP     #0,SP           ;WAS IT A RED ZONE TRAP ?
060652  001407                          BEQ     B0741           ;BR IF YES

060654  010437  000004                  MOV     R4,@#4          ;RESTORE BUS ERROR VECTOR
060660  005004                          CLR     R4              ;[R4]= S / B SP
060662  010603                          MOV     SP,R3           ;[R3] = WAS SP
060664  010506                          MOV     R5,SP           ;RESET THE SP
060666  104000          E20741: ERROR                           ;TRAP SPRUNG BUT NOT RED ZONE
060670  060604                  R0741                           ;ERROR LOOP RETURN ADDRESS

060672  010506          B0741:  MOV     R5,SP           ;FIX UP THE SP

060674  000004          O0741:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0742 TEST PUSH INTO SR WITH [SP] = 177572
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,174,257,200,JAMUPP 336,317,215,115
                                                        ; 326,327,113,330,331,077,140,332,333,123,015,013] FC 1,2,4,6,10
                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,174 / 22[174]200,200 / 01[332]122,123
                                                        ; / 26[123]010,013

                                        ;EXEC:          [200] BUS STOP TRIGGERS JAMUPP LOGIC

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2 (-) T = 10 USEC

                                        ;KEY SIG:       K4-6 PROC ADRS H  /  K4-4 BUS STOP  /  K4-4 OVFLW ERR L  /  K4-3 JBERR(1
                                                        ;4-3 JAMUPP L  /  K4-3 JAM CLK H  /  K4-3 PJAMSTART H  /  K5-5 STACK04 H

060676  012700  000742          T0742:  MOV     #0742,R0                ;LOAD R0 WITH TEST NO.
060702  013701  060730                  MOV     @#I0742,R1      ;LOAD R1 WITH COPY OF TEST INSTRUCTION
060706  010605                          MOV     SP,R5           ;SAVE THE SP
060710  013704  000004          R0742:  MOV     @#4,R4          ;SAVE THE BUS ERROR VECTOR
060714  012737  060754  000004          MOV     #A0742,@#4      ;'RED ZONE'' TRAP GOES TO A0742
060722  012706  177572                  MOV     #177572,SP      ;MAKE SP=177572
060726  000257                          CCC                     ;SCOPE SYNC

060730  012746  177777          I0742:  MOV     #-1,-(SP)       ;ATTEMPT PUSH INTO SR - SHOULD CAUSE
                                                                ;'RED ZONE'' TRAP TO BE SPRUNG

060734  010437  000004                  MOV     R4,@#4          ;RESTORE BUS ERROR VECTOR
060740  005004                          CLR     R4              ;[R4] = S / B SP
060742  010603                          MOV     SP,R3           ;[R3] = WAS SP
060744  010506                          MOV     R5,SP           ;RESET THE SP
060746  104000          E10742: ERROR                           ;TRAP NOT SPRUNG
060750  060710                  R0742                           ;ERROR LOOP RETURN ADDRESS
060752  000413                  BR      O0742                   ;GO TO SCOPE EXIT - SCHOOL'S OUT

060754  022706  000000          A0742:  CMP     #0,SP           ;WAS IT A RED ZONE TRAP ?
060760  001407                  BEQ     B0742                   ;BR IF YES

060762  010437  000004                  MOV     R4,@#4          ;RESTORE BUS ERROR VECTOR
060766  005004                          CLR     R4              ;[R4]= S / B SP
060770  010603                          MOV     SP,R3           ;[R3] = WAS SP
060772  010506                          MOV     R5,SP           ;RESET THE SP
060774  104000          E20742: ERROR                           ;TRAP SPRUNG BUT NOT RED ZONE
060776  060710                  R0742                           ;ERROR LOOP RETURN

061000  010506          B0742:  MOV     R5,SP           ;FIX UP THE SP

061002  000004          O0742:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0743 TEST PUSH INTO SLR WITH [SP] = 177776
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [142,240,250,174,257,200,JAMUPP 336,317,215,115
                                                        ; 326,327,113,330,331,077,140,332,333,123,015,013] FC 1,2,4,6,10
                                        ;ACT BUTS:      37[004]100,142 / 35[240]120,174 / 22[174]200,200 / 01[332]122,123
                                                        ; / 26[123]010,013

                                        ;EXEC:          [200] BUS STOP TRIGGERS JAMUPP LOGIC

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2 (-) T = 10 USEC

                                        ;KEY SIG:       K4-6 PROC ADRS H  /  K4-4 BUS STOP  /  K4-4 OVFLW ERR L  /  K4-3 JBERR(1
                                                        ;4-3 JAMUPP L  /  K4-3 JAM CLK H  /  K4-3 PJAMSTART H  /  K5-5 STACK04 H

061004  012700  000743          T0743:  MOV     #0743,R0                ;LOAD R0 WITH TEST NO.
061010  013701  061046                  MOV     @#I0743,R1      ;LOAD R1 WITH COPY OF TEST INSTRUCTION
061014  010605                          MOV     SP,R5           ;SAVE THE SP
061016  032737  000004  066636          BIT     #4,@#OPTION     ;IS KJ11 INSTALLED ??
061024  001435                          BEQ     00743           ;BR IF NOT - SKIP THIS TEST
061026  013704  000004          R0743:  MOV     @#4,R4          ;SAVE THE BUS ERROR VECTOR
061032  012737  061072  000004          MOV     #A0743,@#4      ;'RED ZONE'' TRAP GOES TO A0743
061040  012706  177776                  MOV     #177776,SP      ;MAKE SP=177776
061044  000257                          CCC                     ;SCOPE SYNC

061046  012746  177777          I0743:  MOV     #-1,-(SP)       ;ATTEMPT PUSH INTO SR - SHOULD CAUSE
                                                                ;'RED ZONE'' TRAP TO BE SPRUNG

061052  010437  000004                  MOV     R4,@#4          ;RESTORE BUS ERROR VECTOR
061056  005004                          CLR     R4              ;[R4] = S / B SP
061060  010603                          MOV     SP,R3           ;[R3] = WAS SP
061062  010506                          MOV     R5,SP           ;RESET THE SP
061064  104000          E10743: ERROR                           ;TRAP NOT SPRUNG
061066  061026                  R0743                           ;ERROR LOOP RETURN ADDRESS
061070  000413                          BR      00743           ;GO TO SCOPE EXIT - SCHOOL'S OUT

061072  022706  000000          A0743:  CMP     #0,SP           ;WAS IT A RED ZONE TRAP ?
061076  001407                          BEQ     B0743           ;BR IF YES

061100  010437  000004                  MOV     R4,@#4          ;RESTORE BUS ERROR VECTOR
061104  005004                          CLR     R4              ;[R4]= S / B SP
061106  010603                          MOV     SP,R3           ;[R3] = WAS SP
061110  010506                          MOV     R5,SP           ;RESET THE SP
061112  104000          E20743: ERROR                           ;TRAP SPRUNG BUT NOT RED ZONE
061114  061026                  R0743                           ;ERROR LOOP RETURN

061116  010506          B0743:  MOV     R5,SP           ;FIX UP THE SP

061120  000004          00743:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
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061122  013737  000010  067564          MOV     @#10,@#MBUF1    ;SAVE RSVD INSTR VECTOR
061130  013737  000012  067566          MOV     @#12,@#MBUF1+2

                                ; ***********************************************************************
                                        .SBTTL T0744 RSVD INSTRUCTION TEST - 000007 THRU 000077
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [100,126,007,115,326,327,113,330,331,077,140,332,333,123,015,013] FC 1,6

                                ;ACT BUTS:      37[004]100,100 / 01[332]122,123 / 26[123]010,013

                                ;EXEC:          [115] D = 000000  /  [113] D = OLD PSW  /  [331] D = #I0744+2  /  [333]

                                ;CODES:         [140] SPS=7  /  N:C = 0000

                                ;SYNC:          B05J2 (-) T = 5.8 USEC

                                ;KEY SIG:       K3-6 RSVD INSTR L  /  K5-5 BC01 H  /  K5-3 BUT01 H  /  K5-3 BUT03 H
                                                ;  K5-3 BUT04 H

061136  012700  000744          T0744:  MOV     #0744,R0                ;LOAD R0 WITH TEST NO.
061142  010605                          MOV     SP,R5           ;SAVE THE SP
061144  012737  061200  000010          MOV     #A0744,@#10     ;SET UP RSVD INSTR. TRAP VECTOR
061152  005037  000012                  CLR     @#12
061156  012701  000007                  MOV     #7,R1           ;SET UP FIRST ONE IN GROUP
061162  010506                  R0744:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP AND NEW INSTR
061164  010137  061172                  MOV     R1,@#I0744      ;LOAD NEW INSTR
061170  000257                          CCC                     ;SCOPE SYNC

061172  000007                  I0744:  000007                  ;TEST THE RSVD INSTR - THIS LOCATION
                                                                ;GETS CHANGED EACH PASS THROUGH

061174  104005                  E0744:  ERROR5                  ;RSVD INSTR. IN R1 FAILED TO TRAP
061176  061162                          R0744                   ;ERROR LOOP RETURN

061200  005201                  A0744:  INC     R1              ;GENERATE NEW RSVD INSTR
061202  022701  000100                  CMP     #100,R1         ;AT END OF THIS GROUP ??
061206  001365                          BNE     R0744           ;BR IF NOT

061210  010506                          MOV     R5,SP           ;MAKE SURE TO RESET THE SP
061212  000004                  00744:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0745 RSVD INSTRUCTION TEST - 000210 THRU 000237
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [100,126,007,115,326,327,113,330,331,077,140,332,333,123,015,013] FC 1,6

                                        ;ACT BUTS:      37[004]100,100 / 01[332]122,123 / 26[123]010,013

                                        ;EXEC:          [115] D = 000000  /  [113] D = OLD PSW  /  [331] D = #I0745+2  /  [333]

                                        ;CODES:         [140] SPS=7  /  N:C = 0000

                                        ;SYNC:          B05J2 (-) 1 = 5.8 USEC

                                        ;KEY SIG:       K3-6 RSVD INSTR L  /  K5-5 BC01 H  /  K5-3 BUT01 H  /  K5-3 BUT03 H
                                                        ;  K5-3 BUT04 H
                                                        ;K5-5 STPM3 H

061214  012700  000745          T0745:  MOV     #0745,R0                ;LOAD R0 WITH TEST NO.
061220  010605                          MOV     SP,R5           ;SAVE THE SP
061222  032737  040000  066642          BIT     #40000,@#BPTLOC ;BREAKPOINT HALT SET ??
061230  001401                          BEQ     .+4             ;BR IF NOT
061232  000000                          HALT                    ;BREAK-DEPRESS CONTINUE TO RESTART
061234  012737  061270  000010          MOV     #A0745,@#10     ;SET UP RSVD INSTR. TRAP VECTOR
061242  005037  000012                  CLR     @#12
061246  012701  000210                  MOV     #210,R1         ;SET UP FIRST ONE IN GROUP
061252  010506                  R0745:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP AND NEW INSTR
061254  010137  061262                  MOV     R1,@#I0745      ;LOAD NEW INSTR
061260  000257                          CCC                     ;SCOPE SYNC

061262  000210                  I0745:  000210                  ;TEST THE RSVD INSTR - THIS LOCATION
                                                                ;GETS CHANGED EACH PASS THROUGH

061264  104005                  E0745:  ERROR5                  ;RSVD INSTR. IN R1 FAILED TO TRAP
061266  061252                          R0745                   ;ERROR LOOP RETURN

061270  005201                  A0745:  INC     R1              ;GENERATE NEW RSVD INSTR
061272  022701  000240                  CMP     #240,R1         ;AT END OF THIS GROUP ??
061276  001365                          BNE     R0745           ;BR IF NOT

061300  010506                          MOV     R5,SP           ;MAKE SURE TO RESET THE SP
061302  000004                  00745:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0746 RSVD INSTRUCTION TEST - 000065 THRU 000066
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [100,126,007,115,326,327,113,330,331,077,140,332,333,123,015,013] FC 1,6

                                        ;ACT BUTS:      37[004]100,100 / 01[332]122,123 / 26[123]010,013

                                        ;EXEC:          [115] D = 000000  /  [113] D = OLD PSW  /  [331] D = #I0746+2  /  [333]

                                        ;CODES:         [140] SPS=7  /  N:C = 0000

                                        ;SYNC:          B05J2 (-) T = 5.8 USEC

                                        ;KEY SIG:       K3-6 RSVD INSTR L  /  K5-5 BC01 H  /  K5-3 BUT01 H  /  K5-3 BUT03 H
                                                        ;  K5-3 BUT04 H
                                                        ;K5-5 STPM3 H

061304  012700  000746          T0746:  MOV     #0746,R0                ;LOAD R0 WITH TEST NO.
061310  105737  066636                  TSTB    @#OPTION        ;KT11D INSTALLED ??
061314  100424                          BMI     00746           ;SKIP THIS TEST IF YES
061316  010605                          MOV     SP,R5           ;SAVE THE SP
061320  012737  061354  000010          MOV     #A0746,@#10     ;SET UP RSVD INSTR. TRAP VECTOR
061326  005037  000012                  CLR     @#12
061332  012701  000065                  MOV     #65,R1          ;SET UP FIRST ONE IN GROUP
061336  010506                  R0746:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP AND NEW INSTR
061340  010137  061346                  MOV     R1,@#I0746      ;LOAD NEW INSTR
061344  000257                          CCC                     ;SCOPE SYNC

061346  000065                  I0746:  000065                  ;TEST THE RSVD INSTR - THIS LOCATION
                                                                ;GETS CHANGED EACH PASS THROUGH

061350  104005                  E0746:  ERROR5                  ;RSVD INSTR. IN R1 FAILED TO TRAP
061352  061336                          R0746                   ;ERROR LOOP RETURN

061354  005201                  A0746:  INC     R1              ;GENERATE NEW RSVD INSTR
061356  022701  000067                  CMP     #67,R1          ;AT END OF THIS GROUP ??
061362  001365                          BNE     R0746           ;BR IF NOT

061364  010506                          MOV     R5,SP           ;MAKE SURE TO RESET THE SP
061366  000004                  00746:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0747 RSVD INSTRUCTION TEST - 007000 THRU 007777
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [100,126,007,115,326,327,113,330,331,077,140,332,333,123,015,013] FC 1,6

                                        ;ACT BUTS:      37[004]100,100 / 01[332]122,123 / 26[123]010,013

                                        ;EXEC:          [115] D = 000000  /  [113] D = OLD PSW  /  [331] D = #I0747+2  /  [333]

                                        ;CODES:         [140] SPS=7  /  N:C = 0000

                                        ;SYNC:          B05J2 (-) T = 5.8 USEC

                                        ;KEY SIG:       K3-6 RSVD INSTR L  /  K5-5 BC01 H  / K5-3 BUT01 H  /  K5-3 BUT03 H
                                                        ;  K5-3 BUT04 H
                                                        ;K5-5 STPM3 H

061370  012700  000747          T0747:  MOV     #0747,R0                ;LOAD R0 WITH TEST NO.
061374  032737  000001  066636          BIT     #1,@#OPTION     ;KE11-E (EIS) INSTALLED ??
061402  001024                          BNE     00747           ;SKIP THIS TEST IF YES
061404  010605                          MOV     SP,R5           ;SAVE THE SP
061406  012737  061442  000010          MOV     #A0747,@#10     ;SET UP RSVD INSTR. TRAP VECTOR
061414  005037  000012                  CLR     @#12
061420  012701  007000                  MOV     #7000,R1        ;SET UP FIRST ONE IN GROUP
061424  010506                  R0747:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP AND NEW INSTR
061426  010137  061434                  MOV     R1,@#I0747      ;LOAD NEW INSTR
061432  000257                          CCC                     ;SCOPE SYNC

061434  007000                  I0747:  007000                  ;TEST THE RSVD INSTR - THIS LOCATION
                                                                ;GETS CHANGED EACH PASS THROUGH

061436  104005                  E0747:  ERROR5                  ;RSVD INSTR. IN R1 FAILED TO TRAP
061440  061424                          R0747                   ;ERROR LOOP RETURN

061442  005201                  A0747:  INC     R1              ;GENERATE NEW RSVD INSTR
061444  022701  010000                  CMP     #10000,R1       ;AT END OF THIS GROUP ??
061450  001365                          BNE     R0747           ;BR IF NOT

061452  010506                          MOV     R5,SP           ;MAKE SURE TO RESET THE SP
061454  000004                  00747:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0750 RSVD INSTRUCTION TEST - 070000 THRU 073777
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [100,126,007,115,326,327,113,330,331,077,140,332,333,123,015,013] FC 1,6

                                        ;ACT BUTS:      37[004]100,100 / 01[332]122,123 / 26[123]010,013

                                        ;EXEC:          [115] D = 000000  /  [113] D = OLD PSW  /  [331] D = #I0750+2  /  [333]

                                        ;CODES:         [140] SPS=7  /  N:C = 0000

                                        ;SYNC:          B05J2 (-) T = 5.8 USEC

                                        ;KEY SIG:       K3-6 RSVD INSTR L  /  K5-5 BC01 H  /  K5-3 BUT01 H  /  K5-3 BUT03 H
                                                        ;  K5-3 BUT04 H
                                                        ;K5-5 STPM3 H

061456  012700  000750          T0750:  MOV     #0750,R0                ;LOAD R0 WITH TEST NO.
061462  032737  000001  066636          BIT     #1,@#OPTION     ;IS THE KE11-E INSTALLED ??
061470  001024                          BNE     00750           ;BR IF YES - SKIP THIS TEST
061472  010605                          MOV     SP,R5           ;SAVE THE SP
061474  012737  061530  000010          MOV     #A0750,@#10     ;SET UP RSVD INSTR. TRAP VECTOR
061502  005037  000012                  CLR     @#12
061506  012701  070000                  MOV     #70000,R1       ;SET UP FIRST ONE IN GROUP
061512  010506                  R0750:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP AND NEW INSTR
061514  010137  061522                  MOV     R1,@#I0750      ;LOAD NEW INSTR
061520  000257                          CCC                     ;SCOPE SYNC

061522  070000                  I0750:  070000                  ;TEST THE RSVD INSTR - THIS LOCATION
                                                                ;GETS CHANGED EACH PASS THROUGH

061524  104005                  E0750:  ERROR5                  ;RSVD INSTR. IN R1 FAILED TO TRAP.
061526  061512                          R0750                   ;ERROR LOOP RETURN

061530  005201                  A0750:  INC     R1              ;GENERATE NEW RSVD INSTR
061532  022701  074000                  CMP     #74000,R1       ;AT END OF THIS GROUP ??
061536  001365                          BNE     R0750           ;BR IF NOT

061540  010506                          MOV     R5,SP           ;MAKE SURE TO RESET THE SP
061542  000004                  00750:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

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                                        ; ***********************************************************************
                                                .SBTTL T0751 RSVD INSTRUCTION TEST - 075000 THRU 075037
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [100,126,007,115,326,327,113,330,331,077,140,332,333,123,015,013] FC 1,6

                                        ;ACT BUTS:      37[004]100,100 / 01[332]122,123 / 26[123]010,013

                                        ;EXEC:          [115] D = 000000  /  [113] D = OLD PSW  /  [331] D = #I0751+2  /  [333]

                                        ;CODES:         [140] SPS=7  /  N:C = 0000

                                        ;SYNC:          B05J2 (-) T = 5.8 USEC

                                        ;KEY SIG:       K3-6 RSVD INSTR L  /  K5-5 BC01 H  /  K5-3 BUT01 H  /  K5-3 BUT03 H
                                                        ;  K5-3 BUT04 H
                                                        ;K5-5 STPM3 H

061544  012700  000751          T0751:  MOV     #0751,R0                ;LOAD R0 WITH TEST NO.
061550  032737  000002  066636          BIT     #2,@#OPTION     ;KE11-F (FIS) INSTALLED ??
061556  001024                          BNE     00751           ;SKIP TEST IF YES
061560  010605                          MOV     SP,R5           ;SAVE THE SP
061562  012737  061616  000010          MOV     #A0751,@#10     ;SET UP RSVD INSTR. TRAP VECTOR
061570  005037  000012                  CLR     @#12
061574  012701  075000                  MOV     #75000,R1       ;SET UP FIRST ONE IN GROUP
061600  010506                  R0751:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP AND NEW INSTR
061602  010137  061610                  MOV     R1,@#I0751      ;LOAD NEW INSTR
061606  000257                          CCC                     ;SCOPE SYNC

061610  075000                  I0751:  75000                   ;TEST THE RSVD INSTR - THIS LOCATION
                                                                ;GETS CHANGED EACH PASS THROUGH

061612  104005                  E0751:  ERROR5                  ;RSVD INSTR. IN R1 FAILED TO TRAP
061614  061600                          R0751                   ;ERROR LOOP RETURN

061616  005201                  A0751:  INC     R1              ;GENERATE NEW RSVD INSTR
061620  022701  075040                  CMP     #75040,R1       ;AT END OF THIS GROUP ??
061624  001365                          BNE     R0751           ;BR IF NOT

061626  010506                          MOV     R5,SP           ;MAKE SURE TO RESET THE SP
061630  000004                  00751:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0752 RSVD INSTRUCTION TEST - 075040 THRU 076777
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [100,126,007,115,326,327,113,330,331,077,140,332,333,123,015,013] FC 1,6

                                        ;ACT BUTS:      37[004]100,100 / 01[332]122,123 / 26[123]010,013

                                        ;EXEC:          [115] D = 000000  /  [113] D = OLD PSW  /  [331] D = #I0752+2  /  [333]

                                        ;CODES:         [140] SPS=7  /  N:C = 0000

                                        ;SYNC:          B05J2 (-) T = 5.8 USEC

                                        ;KEY SIG:       K3-6 RSVD INSTR L  /  K5-5 BC01 H  /  K5-3 BUT01 H  /  K5-3 BUT03 H
                                                        ;  K5-3 BUT04 H
                                                        ;K5-5 STPM3 H

061632  012700  000752                  T0752:  MOV     #0752,R0                ;LOAD R0 WITH TEST NO.
061636  010605                                  MOV     SP,R5           ;SAVE THE SP
061640  012737  061674  000010                  MOV     #A0752,@#10     ;SET UP RSVD INSTR. TRAP VECTOR
061646  005037  000012                          CLR     @#12
061652  012701  075040                          MOV     #75040,R1       ;SET UP FIRST ONE IN GROUP
061656  010506                          R0752:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP AND NEW INSTR
061660  010137  061666                          MOV     R1,@#I0752      ;LOAD NEW INSTR
061664  000257                                  CCC                     ;SCOPE SYNC

061666  075040                          I0752:  75040                   ;TEST THE RSVD INSTR - THIS LOCATION
                                                                        ;GETS CHANGED EACH PASS THROUGH

061670  104005                          E0752:  ERROR5                  ;RSVD INSTR. IN R1 FAILED TO TRAP
061672  061656                                  R0752                   ;ERROR LOOP RETURN

061674  005201                          A0752:  INC     R1              ;GENERATE NEW RSVD INSTR
061676  022701  077000                          CMP     #77000,R1       ;AT END OF THIS GROUP ??
061702  001365                                  BNE     R0752           ;BR IF NOT

061704  010506                                  MOV     R5,SP           ;MAKE SURE TO RESET THE SP
061706  000004                          00752:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T0753 RSVD INSTRUCTION TEST - 106400 THRU 107777
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [100,126,007,115,326,327,113,330,331,077,140,332,333,123,015,013] FC 1,6

                                        ;ACT BUTS:      37[004]100,100 / 01[332]122,123 / 26[123]010,013

                                        ;EXEC:          [115] D = 000000  /  [113] D = OLD PSW  /  [331] D = #I0753+2  /  [333]

                                        ;CODES:         [140] SPS=7  /  N:C = 0000

                                        ;SYNC:          B05J2 (-) T = 5.8 USEC

                                        ;KEY SIG:       K3-6 RSVD INSTR L  /  K5-5 BC01 H  /  K5-3 BUT01 H  /  K5-3 BUT03 H
                                                        ;  K5-3 BUT04 H
                                                        ;K5-5 STPM3 H

061710  012700  000753          T0753:  MOV     #0753,R0                ;LOAD R0 WITH TEST NO.
061714  032737  000200  066636          BIT     #200,@#OPTION   ;IS THE KT11-D INSTALLED ??
061722  001024                          BNE     00753           ;BR IF YES - SKIP THIS TEST
061724  010605                          MOV     SP,R5           ;SAVE THE SP
061726  012737  061762  000010          MOV     #A0753,@#10     ;SET UP RSVD INSTR. TRAP VECTOR
061734  005037  000012                  CLR     @#12
061740  012701  106400                  MOV     #106400,R1      ;SET UP FIRST ONE IN GROUP
061744  010506                  R0753:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP AND NEW INSTR
061746  010137  061754                  MOV     R1,@#I0753      ;LOAD NEW INSTR
061752  000257                          CCC                     ;SCOPE SYNC

061754  106400                  I0753:  106400                  ;TEST THE RSVD INSTR - THIS LOCATION
                                                                ;GETS CHANGED EACH PASS THROUGH

061756  104005                  E0753:  ERROR5                  ;RSVD INSTR. IN R1 FAILED TO TRAP
061760  061744                          R0753                   ;ERROR LOOP RETURN

061762  005201                  A0753:  INC     R1              ;GENERATE NEW RSVD INSTR
061764  022701  110000                  CMP     #110000,R1      ;AT END OF THIS GROUP ??
061770  001365                          BNE     R0753           ;BR IF NOT

061772  010506                          MOV     R5,SP           ;MAKE SURE TO RESET THE SP
061774  000004                  00753:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
```

```
                                        ; *********************************************************************
                                                .SBTTL T0754 RSVD INSTRUCTION TEST - 170000 THRU 177777
                                        ; *********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [100,126,007,1115,326,327,113,330,331,077,140,332,333,123,015,013] FC 1,

                                        ;ACT BUTS:      37[004]100,100 / 01[332]122,123 / 26[123]010,013

                                        ;EXEC:          [115] D = 000000  /  [113] D = OLD PSW  /  [331] D = #I0754+2  /  [333]

                                        ;CODES:         [140] SPS=7  /  N:C = 0000

                                        ;SYNC:          B05J2 (-) T = 5.8 USEC

                                        ;KEY SIG:       K3-6 RSVD INSTR L  /  K5-5 BC01 H  /  K5-3 BUT01 H  /  K5-3 BUT03 H
                                                        ;  K5-3 BUT04 H
                                                        ;K5-5 STPM3 H

061776  012700  000754          T0754:  MOV     #0754,R0                ;LOAD R0 WITH TEST NO.
062002  010605                          MOV     SP,R5           ;SAVE THE SP
062004  012737  062040  000010          MOV     #A0754,@#10     ;SET UP RSVD INSTR. TRAP VECTOR
062012  005037  000012                  CLR     @#12
062016  012701  170000                  MOV     #170000,R1      ;SET UP FIRST ONE IN GROUP
062022  010506                  R0754:  MOV     R5,SP           ;RESET SP FOR ERROR LOOP AND NEW INSTR
062024  010137  062032                  MOV     R1,@#I0754      ;LOAD NEW INSTR
062030  000257                          CCC                     ;SCOPE SYNC

062032  170000                  I0754:  170000                  ;TEST THE RSVD INSTR - THIS LOCATION
                                                                ;GETS CHANGED EACH PASS THROUGH

062034  104005                  E0754:  ERROR5                  ;RSVD INSTR. IN R1 FAILED TO TRAP
062036  062022                          R0754                   ;ERROR LOOP RETURN

062040  005201                  A0754:  INC     R1              ;GENERATE NEW RSVD INSTR
062042  022701  000000                  CMP     #0,R1           ;AT END OF THIS GROUP ??
062046  001365                          BNE     R0754           ;BR IF NOT

062050  010506                          MOV     R5,SP           ;MAKE SURE TO RESET THE SP
062052  000004                  00754:  SCOPE                   ;CALL THE SCOPE LOOP UTILITY
062054  013737  067564  000010          MOV     @#MBUF1,@#10    ;RESTORE RSVD INSTR VECTOR
062062  013737  067566  000012          MOV     @#MBUF1+2,@#12
```

```
062070  012737  065026  000014  TSET:   MOV     #TBSER,@#14      ;SET UP THE 'T' BIT TRAP VECTOR
062076  012737  000340  000016          MOV     #340,@#16        ;PRIORITY 7
062104  012737  062104  066654  DMRET:  MOV     #DMRET,@#RETURN  ;INITIALIZE SCOPE LOOP RETURN

                                ; ***********************************************************************
                                .SBTTL T0755 BUT SERVICE TEST IN ROM LOCATION 373 - (TST %R)
                                ; ************************************************************************

                                ;THIS NEXT GROUP OF 28 SEQUENTIAL TESTS VERIFIES THAT A 'T' BIT
                                ;TRAP CAN BE SERVICED IN EACH MICROWORD THAT DOES A 'BUT SERVICE'
                                ;EACH ROUTINE ENTERS THE TRAP MICROUTINE WHEN THE TRAP IS SPRUNG
                                ;WHICH GENERATES THE FOLLOWING ROM SEQUENCE:

                                        ;[010,216,215,115,326,327,113,330,331,077,140,332,333,
                                        ;123,015,013]  FC 6,10,1

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [104,373,362,002,015,TRAP MICOROUTINE] FC 1,7,8,10,6

                                ;ACT BUTS:      37[004]100,104  /  27[373]000,002  /  26[002]010,010

                                ;EXEC:          [362] BUPP=002 ('T' BIT TRAP)

                                ;CODES:         N / A

                                ;SYNC:          B05J2  (-)

                                ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
                                ;               K5-5 STPM2 H

062112  012700  000755          T0755:  MOV     #0755,R0                 ;LOAD R0 WITH TEST NO.
062116  013701  062142                  MOV     @#I0755,R1       ;LOAD R1 WITH TEST INSTRUCTION WORD
062122  010605                          MOV     SP,R5            ;SAVE THE SP
062124  010506                  R0755:  MOV     R5,SP            ;RESTORE SP FOR ERROR LOOPING
062126  012746  000020                  MOV     #20,-(SP)        ;SET 'T' BIT IN THE NEW PSW
062132  012746  062142                  MOV     #I0755,-(SP)     ;MAKE NEW PC = I0755
062136  000257                          CCC                      ;SCOPE SYNC
062140  000006                          RTT                      ;SET 'T' BIT - GO TO I0755

062142  005700                  I0755:  TST     R0               ;TST INSTRUCTION SHOULD SPRING TRAP

062144  104005                  E0755:  ERROR5                   ;BUT SERVICE IN 373 FAILED
062146  062124                          R0755                    ;ERROR LOOP RETURN

062150  000004                  00755:  SCOPE                    ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ************************************************************************
                                        .SBTTL T0756 BUT SERVICE TEST IN ROM LOCATION 366 - (BISB RA,(RB))
                                        ; ************************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,270,230,254,074,366,375,017,015,
                                        ;               TRAP MICROROUTINE] FC 1,3,8,10,6
                                        ;ACT BUTS:      37[004]100,161  /  33[266]220,237  /  34[237]220,230
                                        ;               16[366]016,017  /  26[017]010,010
                                        ;EXEC:          [375] BUPP=017 ('T' BIT TRAP)

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2  (-)

                                        ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
                                        ;               K5-5 STPM2 H

062152  012700  000756                  T0756:  MOV     #0756,R0                ;LOAD R0 WITH TEST NO.
062156  013701  062206                          MOV     @#I0756,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
062162  010605                                  MOV     SP,R5           ;SAVE THE SP
062164  010506                          R0756:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
062166  012702  067561                          MOV     #MBUF0+1,R2     ;DEST ADDR = MBUF0
062172  012746  000020                          MOV     #20,-(SP)       ;SET 'T' BIT IN THE NEW PSW
062176  012746  062206                          MOV     #I0756,-(SP)    ;MAKE NEW PC = I0756
062202  000257                                  CCC                     ;SCOPE SYNC
062204  000006                                  RTT                     ;SET 'T' BIT - GO TO I0756

062206  150012                          I0756:  BISB    R0,(R2)         ;BISB INSTRUCTION SHOULD SPRING TRAP

062210  104005                          E0756:  ERROR5                  ;BUT SERVICE IN 366 FAILED
062212  062164                                  R0756                   ;ERROR LOOP RETURN

062214  000004                          00756:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                        .SBTTL T0757 BUT SERVICE TEST IN ROM LOCATION 367 - (SXT (RN))
                                        ; ************************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,234,367,375,017,015,TRAP MICROROUTINE]
                                        ;               FC 1,3,8,10,6
                                        ;ACT BUTS:      37[004]100,161  /  33[266]220,234  /  16[367]016,017
                                        ;               26[017]010,010

                                        ;EXEC:          [375] BUPP=017 ("T" BIT TRAP)

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2  (-)

                                        ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
                                        ;               K5-5 STPM2 H

062216  012700  000757                  T0757:  MOV     #0757,R0                ;LOAD R0 WITH TEST NO.
062222  013701  062252                          MOV     @#I0757,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
062226  010605                                  MOV     SP,R5           ;SAVE THE SP
062230  010506                          R0757:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
062232  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
062236  012746  000020                          MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
062242  012746  062252                          MOV     #I0757,-(SP)    ;MAKE NEW PC = I0757
062246  000257                                  CCC                     ;SCOPE SYNC
062250  000006                                  RTT                     ;SET "T" BIT - GO TO I0757

062252  006712                          I0757:  SXT     (R2)            ;SXT INSTRUCTION SHOULD SPRING TRAP

062254  104005                          E0757:  ERROR5                  ;BUT SERVICE IN 367 FAILED
062256  062230                                  R0757                   ;ERROR LOOP RETURN

062260  000004                          00757:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                        .SBTTL T0760 BUT SERVICE TEST IN ROM LOCATION 132 - (SXT %R)
                                        ; ************************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [132,360,002,015,TRAP MICROROUTINE] FC 1,8,10,6

                                        ;ACT BUTS:      37[004]100,132  /  27[132]000,002  /  26[002]010,010

                                        ;EXEC:          [360] BUPP=002 ("T" BIT TRAP)

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2  (-)

                                        ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
                                        ;               K5-5 STPM2 H

062262  012700  000760                  T0760:  MOV     #0760,R0                ;LOAD R0 WITH TEST NO.
062266  013701  062312                          MOV     @#I0760,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
062272  010605                                  MOV     SP,R5           ;SAVE THE SP
062274  010506                          R0760:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
062276  012746  000020                          MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
062302  012746  062312                          MOV     #I0760,-(SP)    ;MAKE NEW PC = I0760
062306  000257                                  CCC                     ;SCOPE SYNC
062310  000006                                  RTT                     ;SET "T" BIT - GO TO I0760

062312  006702                          I0760:  SXT     R2              ;SXT INSTRUCTION SHOULD SPRING TRAP

062314  104005                          E0760:  ERROR5                  ;BUT SERVICE IN 132 FAILED
062316  062274                                  R0760                   ;ERROR LOOP RETURN

062320  000004                          00760:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; *****************************************************************
                                        .SBTTL T0761 BUT SERVICE TEST IN ROM LOCATION 372 - (NEG %R)
                                        ; ******************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [105,372,360,002,015,TRAP MICROROUTINE] FC 1,7,8,10,6

                                        ;ACT BUTS:      37[004]100,105  /  31[105]360,360  /  27[372]000,002
                                        ;               26[002]010,010

                                        ;EXEC:          [360] BUPP=002 ('T'' BIT TRAP)

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2  (-)

                                        ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
                                        ;               K5-5 STPM2 H

062322  012700  000761                  T0761:  MOV     #0761,R0                ;LOAD R0 WITH TEST NO.
062326  013701  062352                          MOV     @#I0761,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
062332  010605                                  MOV     SP,R5           ;SAVE THE SP
062334  010506                          R0761:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
062336  012746  000020                          MOV     #20,-(SP)       ;SET 'T'' BIT IN THE NEW PSW
062342  012746  062352                          MOV     #I0761,-(SP)    ;MAKE NEW PC = I0761
062346  000257                                  CCC                     ;SCOPE SYNC
062350  000006                                  RTT                     ;SET 'T'' BIT - GO TO I0761

062352  005402                          I0761:  NEG     R2              ;NEG INSTRUCTION SHOULD SPRING TRAP

062354  104005                          E0761:  ERROR5                  ;BUT SERVICE IN 372 FAILED
062356  062334                                  R0761                   ;ERROR LOOP RETURN

062360  000004                          00761:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; *****************************************************************************
                                        .SBTTL T0762 BUT SERVICE TEST IN ROM LOCATION 370 - (SUB (RA),RB)
                                        ; *****************************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,121,370,360,002,015,TRAP MICROROUTINE]
                                        ;               FC 1,2,8,10,6

                                        ;ACT BUTS:      37[004]100,141  /  35[247]120,121  /  27[370]000,002
                                        ;               26[002]010,010

                                        ;EXQC:  [360] BUPP=002 ('T'' BIT TRAP)

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2  (-)

                                        ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
                                        ;               K5-5 STPM2 H

062362  012700  000762                  T0762:  MOV     #0762,R0                ;LOAD R0 WITH TEST NO.
062366  013701  062416                          MOV     @#I0762,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
062372  010605                                  MOV     SP,R5           ;SAVE THE SP
062374  010506                          R0762:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
062376  012703  067560                          MOV     #MBUF0,R3       ;SOURCE ADDR = MBUF0
062402  012746  000020                          MOV     #20,-(SP)       ;SET 'T'' BIT IN THE NEW PSW
062406  012746  062416                          MOV     #I0762,-(SP)    ;MAKE NEW PC = I0762
062412  000257                                  CCC                     ;SCOPE SYNC
062414  000006                                  RTT                     ;SET 'T'' BIT - GO TO I0762

062416  161302                          I0762:  SUB     (R3),R2         ;SUB INSTRUCTION SHOULD SPRING TRAP

062420  104005                          E0762:  ERROR5                  ;BUT SERVICE IN 370 FAILED
062422  062374                                  R0762                   ;ERROR LOOP RETURN

062424  000004                          00762:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ************************************************************************
                                        .SBTTL T0763 BUT SERVICE TEST IN ROM LOCATION 371 - (ADD (RA),RB)
                                        ; ************************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,120,371,360,002,015,TRAP MICROROUTINE]
                                        ;               FC 1,2,8,10,6

                                        ;ACT BUTS:      37[004]100,141  /  35[247]120,120  /  31[120]360,360
                                        ;               27[371]000,002  /  26[002]010,010

                                        ;EXEC:          [360] BUPP=002 ("T" BIT TRAP)

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2  (-)

                                        ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
                                        ;               K5-5 STPM2 H

062426  012700  000763                  T0763:  MOV     #0763,R0                ;LOAD R0 WITH TEST NO.
062432  013701  062462                          MOV     @#I0763,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
062436  010605                                  MOV     SP,R5           ;SAVE THE SP
062440  010506                          R0763:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
062442  012705  067560                          MOV     #MBUF0,R5       ;SOURCE ADDR = MBUF0
062446  012746  000020                          MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
062452  012746  062462                          MOV     #I0763,-(SP)    ;MAKE NEW PC = I0763
062456  000257                                  CCC                     ;SCOPE SYNC
062460  000006                                  RTT                     ;SET "T" BIT - GO TO I0763

062462  061502                          I0763:  ADD     (R5),R2         ;ADD INSTRUCTION SHOULD SPRING TRAP

062464  104005                          E0763:  ERROR5                  ;BUT SERVICE IN 371 FAILED
062466  062440                                  R0763                   ;ERROR LOOP RETURN

062470  000004                          O0763:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ************************************************************************
                                        .SBTTL T0764 BUT SERVICE TEST IN ROM LOCATION 135 - (SWAB %R)
                                        ; ************************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [134,135,360,002,015,TRAP MICROROUTINE] FC 1,7,8,10,6

                                        ;ACT BUTS:      37[004]100,134  /  27[135]000,002  /  26[002]010,010

                                        ;EXEC:          [135] BUPP=002 ('T'' BIT TRAP)

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2  (-)

                                        ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
                                        ;               K5-5 STPM2 H

062472  012700  000764                  T0764:  MOV     #0764,R0                ;LOAD R0 WITH TEST NO.
062476  013701  062522                          MOV     @#I0764,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
062502  010605                                  MOV     SP,R5           ;SAVE THE SP
062504  010506                          R0764:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
062506  012746  000020                          MOV     #20,-(SP)       ;SET 'T'' BIT IN THE NEW PSW
062512  012746  062522                          MOV     #I0764,-(SP)    ;MAKE NEW PC = I0764
062516  000257                                  CCC                     ;SCOPE SYNC
062520  000006                                  RTT                     ;SET 'T'' BIT - GO TO I0764

062522  000302                          I0764:  SWAB    R2              ;SWAB INSTRUCTION SHOULD SPRING TRAP

062524  104005                          E0764:  ERROR5                  ;BUT SERVICE IN 135 FAILED
062526  062504                                  R0764                   ;ERROR LOOP RETURN

062530  000004                          00764:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ************************************************************************
                                .SBTTL T0765 BUT SERVICE TEST IN ROM LOCATION 363 - (SUB RA,RB)
                                ; ***************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [103,363,360,002,015,TRAP MICROROUTINE] FC 1,7,8,10,6

                                ;ACT BUTS:      37[004]100,103  /  27[363]000,002  /  26[002]010,010

                                ;EXEC:          [360] BUPP=002 ('T' BIT TRAP)

                                ;CODES:         N / A

                                ;SYNC:          B05J2  (-)

                                ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
                                ;               K5-5 STPM2 H

062532  012700  000765          T0765:  MOV     #0765,R0                ;LOAD R0 WITH TEST NO.
062536  013701  062562                  MOV     @#I0765,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
062542  010605                          MOV     SP,R5           ;SAVE THE SP
062544  010506                  R0765:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
062546  012746  000020                  MOV     #20,-(SP)       ;SET 'T' BIT IN THE NEW PSW
062552  012746  062562                  MOV     #I0765,-(SP)    ;MAKE NEW PC = I0765
062556  000257                          CCC                     ;SCOPE SYNC
062560  000006                          RTT                     ;SET 'T' BIT - GO TO I0765

062562  160304                  I0765:  SUB     R3,R4           ;SUB INSTRUCTION SHOULD SPRING TRAP

062564  104005                  E0765:  ERROR5                  ;BUT SERVICE IN 363 FAILED
062566  062544                          R0765                   ;ERROR LOOP RETURN

062570  000004                  00765:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                        .SBTTL T0766 BUT SERVICE TEST IN ROM LOCATION 364 - (ADD RA,RB)
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [102,364,360,002,015,TRAP MICROROUTINE] FC 1,7,8,10,6

                                        ;ACT BUTS:      37[004]100,102  /  31[102]360,360  /  27[364]000,002
                                        ;               26[002]010,010

                                        ;EXEC:          [360] BUPP=002 ("T" BIT TRAP)

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2  (-)

                                        ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
                                        ;               K5-5 STPM2 H

062572  012700  000766                  T0766:  MOV     #0766,R0                ;LOAD R0 WITH TEST NO.
062576  013701  062622                          MOV     @#I0766,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
062602  010605                                  MOV     SP,R5           ;SAVE THE SP
062604  010506                          R0766:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
062606  012746  000020                          MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
062612  012746  062622                          MOV     #I0766,-(SP)    ;MAKE NEW PC = I0766
062616  000257                                  CCC                     ;SCOPE SYNC
062620  000006                                  RTT                     ;SET "T" BIT - GO TO I0766

062622  060304                          I0766:  ADD     R3,R4           ;ADD INSTRUCTION SHOULD SPRING TRAP

062624  104005                          E0766:  ERROR5                  ;BUT SERVICE IN 364 FAILED
062626  062604                                  R0766                   ;ERROR LOOP RETURN

062630  000004                          00766:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ************************************************************************
                                        .SBTTL T0767 BUT SERVICE TEST IN ROM LOCATION 125 - (MOV RA,(RB))
                                        ; ***************************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [171,257,201,125,375,017,015,TRAP MICROROUTINE] FC 1,4,8,10,6

                                        ;ACT BUTS:      37[004]100,171  /  22[171]200,201  /  16[125]016,017
                                        ;               26[017]010,010

                                        ;EXEC:          [375] BUPP=017 ('T'' BIT TRAP)

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2  (-)

                                        ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
                                        ;               K5-5 STPM2 H

062632  012700  000767                  T0767:  MOV     #0767,R0                ;LOAD R0 WITH TEST NO.
062636  013701  062666                          MOV     @#I0767,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
062642  010605                                  MOV     SP,R5           ;SAVE THE SP
062644  012702  067560                          MOV     #MBUF0,R2       ;DEST ADDR = MBUF0
062650  010506                          R0767:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
062652  012746  000020                          MOV     #20,-(SP)       ;SET 'T'' BIT IN THE NEW PSW
062656  012746  062666                          MOV     #I0767,-(SP)    ;MAKE NEW PC = I0767
062662  000257                                  CCC                     ;SCOPE SYNC
062664  000006                                  RTT                     ;SET ''T'' BIT - GO TO I0767

062666  010012                          I0767:  MOV     R0,(R2)         ;MOV INSTRUCTION SHOULD SPRING TRAP

062670  104005                          E0767:  ERROR5                  ;BUT SERVICE IN 125 FAILED
062672  062650                                  R0767                   ;ERROR LOOP RETURN

062674  000004                          00767:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ************************************************************************
                                .SBTTL T0770 BUT SERVICE TEST IN ROM LOCATION 170 - (MOV RA,RB)
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [170,204,002,015,TRAP MICROROUTINE] FC 1,4,10,6

                                ;ACT BUTS:      37[004]100,170  /  20[170]000,002  /  26[002]010,010

                                ;EXEC:          [204] BUPP=002 ('T' BIT TRAP)

                                ;CODES:         N / A

                                ;SYNC:          B05J2  (-)

                                ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
                                ;               K5-5 STPM2 H

062676  012700  000770          T0770:  MOV     #0770,R0                ;LOAD R0 WITH TEST NO.
062702  013701  062726                  MOV     @#I0770,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
062706  010605                          MOV     SP,R5           ;SAVE THE SP
062710  010506                  R0770:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
062712  012746  000020                  MOV     #20,-(SP)       ;SET 'T' BIT IN THE NEW PSW
062716  012746  062726                  MOV     #I0770,-(SP)    ;MAKE NEW PC = I0770
062722  000257                          CCC                     ;SCOPE SYNC
062724  000006                          RTT                     ;SET 'T' BIT - GO TO I0770

062726  010003                  I0770:  MOV     R0,R3           ;MOV INSTRUCTION SHOULD SPRING TRAP

062730  104005                  E0770:  ERROR5                  ;BUT SERVICE IN 170 FAILED
062732  062710                          R0770                   ;ERROR LOOP RETURN

062734  000004                  00770:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                        .SBTTL T0771 BUT SERVICE TEST IN ROM LOCATION 160 - (MOV (RA),RB)
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [141,247,250,160,204,002,015,TRAP MICROROUTINE]
                                        ;               FC 1,2,4,10,6

                                        ;ACT BUTS:      37[004]100,141  /  35[247]120,160  /  20[160]000,002
                                        ;               26[002]010,010

                                        ;EXEC:          [204] BUPP=002 ('T'' BIT TRAP)

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2  (-)

                                        ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
                                        ;               K5-5 STPM2 H

062736  012700  000771                  T0771:  MOV     #0771,R0                ;LOAD R0 WITH TEST NO.
062742  013701  062772                          MOV     @#I0771,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
062746  010605                                  MOV     SP,R5           ;SAVE THE SP
062750  012703  067570                          MOV     #DWTA,R3        ;SOURCE ADDR = DWTA
062754  010506                          R0771:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
062756  012746  000020                          MOV     #20,-(SP)       ;SET 'T'' BIT IN THE NEW PSW
062762  012746  062772                          MOV     #I0771,-(SP)    ;MAKE NEW PC = I0771
062766  000257                                  CCC                     ;SCOPE SYNC
062770  000006                                  RTT                     ;SET 'T'' BIT - GO TO I0771

062772  011304                          I0771:  MOV     (R3),R4         ;MOV INSTRUCTION SHOULD SPRING TRAP

062774  104005                          E0771:  ERROR5                  ;BUT SERVICE IN 160 FAILED
062776  062754                                  R0771                   ;ERROR LOOP RETURN

063000  000004                          00771:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                        .SBTTL T0772 BUT SERVICE TEST IN ROM LOCATION 003 - (MOVB RA,RB)
                                        ; ************************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [170,204,003,204,002,015,TRAP MICROROUTINE] FC 1,4,10,6

                                        ;ACT BUTS:      37[004]100,170  /  20[170]000,003  /  27[003]000,002
                                        ;               26[002]010,010

                                        ;EXEC:          [204] 2ND TIME THRU BUPP=002  ('T'' BIT TRAP)

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2  (-)

                                        ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
                                        ;               K5-5 STPM2 H

063002  012700  000772                  T0772:  MOV     #0772,R0                ;LOAD R0 WITH TEST NO.
063006  013701  063032                          MOV     @#I0772,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
063012  010605                                  MOV     SP,R5           ;SAVE THE SP
063014  010506                          R0772:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
063016  012746  000020                          MOV     #20,-(SP)       ;SET 'T'' BIT IN THE NEW PSW
063022  012746  063032                          MOV     #I0772,-(SP)    ;MAKE NEW PC = I0772
063026  000257                                  CCC                     ;SCOPE SYNC
063030  000006                                  RTT                     ;SET 'T'' BIT - GO TO I0772

063032  110003                          I0772:  MOVB    R0,R3           ;MOVB INSTRUCTION SHOULD SPRING TRAP

063034  104005                          E0772:  ERROR5                  ;BUT SERVICE IN 003 FAILED
063036  063014                                  R0772                   ;ERROR LOOP RETURN

063040  000004                          00772:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; *****************************************************************
                                        .SBTTL T0773 BUT SERVICE TEST IN ROM LOCATION 271 - (ROR %R)
                                        ; *****************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [106,271,274,002,015,TRAP MICROROUTINE] FC 1,9,10,6

                                        ;ACT BUTS:      37[004]100,106  /  27[271]000,002  /  26[002]010,010

                                        ;EXEC:          [274] BUPP=002 ('T' BIT TRAP)

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2  (-)

                                        ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
                                        ;               K5-5 STPM2 H

063042  012700  000773                  T0773:  MOV     #0773,R0                ;LOAD R0 WITH TEST NO.
063046  013701  063072                          MOV     @#I0773,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
063052  010605                                  MOV     SP,R5           ;SAVE THE SP
063054  010506                          R0773:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
063056  012746  000020                          MOV     #20,-(SP)       ;SET 'T' BIT IN THE NEW PSW
063062  012746  063072                          MOV     #I0773,-(SP)    ;MAKE NEW PC = I0773
063066  000257                                  CCC                     ;SCOPE SYNC
063070  000006                                  RTT                     ;SET 'T' BIT - GO TO I0773

063072  006003                          I0773:  ROR     R3              ;ROR INSTRUCTION SHOULD SPRING TRAP

063074  104005                          E0773:  ERROR5                  ;BUT SERVICE IN 271 FAILED
063076  063054                                  R0773                   ;ERROR LOOP RETURN

063100  000004                          00773:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                        .SBTTL T0774 BUT SERVICE TEST IN ROM LOCATION 273 - (RORB %R)
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [107,272,273,274,002,015,TRAP MICROROUTINE] FC 1,9,10,6

                                        ;ACT BUTS:      [274] BUPP=002 ('T' BIT TRAP)

                                        ;EXEC:          Z

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2  (-)

                                        ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
                                        ;               K5-5 STPM2 H

063102  012700  000774                  T0774:  MOV     #0774,R0                ;LOAD R0 WITH TEST NO.
063106  013701  063132                          MOV     @#I0774,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
063112  010605                                  MOV     SP,R5           ;SAVE THE SP
063114  010506                          R0774:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
063116  012746  000020                          MOV     #20,-(SP)       ;SET 'T' BIT IN THE NEW PSW
063122  012746  063132                          MOV     #I0774,-(SP)    ;MAKE NEW PC = I0774
063126  000257                                  CCC                     ;SCOPE SYNC
063130  000006                                  RTT                     ;SET 'T' BIT - GO TO I0774

063132  106003                          I0774:  RORB    R3              ;RORB INSTRUCTION SHOULD SPRING TRAP

063134  104005                          E0774:  ERROR5                  ;BUT SERVICE IN 273 FAILED
063136  063114                                  R0774                   ;ERROR LOOP RETURN

063140  000004                          00774:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                        .SBTTL T0775 BUT SERVICE TEST IN ROM LOCATION 277 - (ROR (RN))
                                        ; ************************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [161,266,267,232,275,277,376,017,015,TRAP MICROROUTINE]
                                        ;               FC 1,3,9,10,6

                                        ;ACT BUTS:      37[004]100,161  /  33[266]220,232  /  16[277]016,017
                                        ;               26[017]010,010

                                        ;EXEC:          [376] BUPP = 017 ('T'' BIT TRAP)

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2  (-)

                                        ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
                                        ;               K5-5 STPM2 H

063142  012700  000775                  T0775:  MOV     #0775,R0                ;LOAD R0 WITH TEST NO.
063146  013701  063176                          MOV     @#I0775,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
063152  010605                                  MOV     SP,R5           ;SAVE THE SP
063154  012703  067560                          MOV     #MBUF0,R3       ;DEST ADDR = MBUF0
063160  010506                          R0775:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
063162  012746  000020                          MOV     #20,-(SP)       ;SET 'T'' BIT IN THE NEW PSW
063166  012746  063176                          MOV     #I0775,-(SP)    ;MAKE NEW PC = I0775
063172  000257                                  CCC                     ;SCOPE SYNC
063174  000006                                  RTT                     ;SET 'T'' BIT - GO TO I0775

063176  006013                          I0775:  ROR     (R3)            ;ROR INSTRUCTION SHOULD SPRING TRAP

063200  104005                          E0775:  ERROR5                  ;BUT SERVICE IN 277 FAILED
063202  063160                                  R0775                   ;ERROR LOOP RETURN

063204  000004                          00775:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ************************************************************************
                                .SBTTL T0776 BUT SERVICE TEST IN ROM LOCATION 374 - (NEGB (RN))
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [161,266,267,223,253,075,374,375,017,015,TRAP MICROROUTINE]
                                ;               FC 1,3,9,8,10,6

                                ;ACT BUTS:      37[004]100,161  /  33[266]220,223  /  16[374]016,017
                                ;               26[017]010,010

                                ;EXEC:          [375] BUPP=017 ('T'' BIT TRAP)

                                ;CODES:         N / A

                                ;SYNC:          B05J2  (-)

                                ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
                                ;               K5-5 STPM2 H

063206  012700  000776          T0776:  MOV     #0776,R0                ;LOAD R0 WITH TEST NO.
063212  013701  063242                  MOV     @#I0776,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
063216  010605                          MOV     SP,R5           ;SAVE THE SP
063220  012703  067561                  MOV     #MBUF0+1,R3     ;DEST ADDR = MBUF0+1 (ODD)
063224  010506                  R0776:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
063226  012746  000020                  MOV     #20,-(SP)       ;SET 'T'' BIT IN THE NEW PSW
063232  012746  063242                  MOV     #I0776,-(SP)    ;MAKE NEW PC = I0776
063236  000257                          CCC                     ;SCOPE SYNC
063240  000006                          RTT                     ;SET 'T'' BIT - GO TO I0776

063242  105413                  I0776:  NEGB    (R3)            ;NEGB INSTRUCTION SHOULD SPRING TRAP

063244  104005                  E0776:  ERROR5                  ;BUT SERVICE IN 374 FAILED
063246  063224                          R0776                   ;ERROR LOOP RETURN

063250  000004                  00776:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                        .SBTTL T0777 BUT SERVICE TEST IN ROM LOCATION 306 - (JMP (RN))
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [151,300,306,313,017,015,TRAP MICROROUTINE] FC 1,5,10,6

                                        ;ACT BUTS:      37[004]100,151  /  15[151]306,306  /  16[306]016,017
                                        ;               26[017]010,010

                                        ;EXEC:          [313] BUPP=017 ('T'' BIT TRAP)

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2  (-)

                                        ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
                                        ;               K5-5 STPM2 H

063252  012700  000777                  T0777:  MOV     #0777,R0                ;LOAD R0 WITH TEST NO.
063256  013701  063306                          MOV     @#I0777,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
063262  010605                                  MOV     SP,R5           ;SAVE THE SP
063264  012702  063310                          MOV     #E0777,R2       ;DEST ADDR = E0777 FOR JMP
063270  010506                          R0777:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
063272  012746  000020                          MOV     #20,-(SP)       ;SET 'T'' BIT IN THE NEW PSW
063276  012746  063306                          MOV     #I0777,-(SP)    ;MAKE NEW PC = I0777
063302  000257                                  CCC                     ;SCOPE SYNC
063304  000006                                  RTT                     ;SET 'T'' BIT - GO TO I0777

063306  000112                          I0777:  JMP     (R2)            ;JMP INSTRUCTION SHOULD SPRING TRAP

063310  104005                          E0777:  ERROR5                  ;BUT SERVICE IN 306 FAILED
063312  063270                                  R0777                   ;ERROR LOOP RETURN

063314  000004                          O0777:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ************************************************************************
                                        .SBTTL T1000 BUT SERVICE TEST IN ROM LOCATION 110 - (BVS A)
                                        ; ************************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [110,347,017,015,TRAP MICROROUTINE] FC 1,7,10,6

                                        ;ACT BUTS:      37[004]100,110  /  16[110]016,017  /  26[017]010,010

                                        ;EXEC:          [347] BUPP=017 ('T' BIT TRAP)

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2  (-)

                                        ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
                                        ;               K5-5 STPM2 H

063316  012700  001000                  T1000:  MOV     #1000,R0                ;LOAD R0 WITH TEST NO.
063322  013701  063346                          MOV     @#I1000,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
063326  010605                                  MOV     SP,R5           ;SAVE THE SP
063330  010506                          R1000:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
063332  012746  000020                          MOV     #20,-(SP)       ;SET 'T' BIT IN THE NEW PSW
063336  012746  063346                          MOV     #I1000,-(SP)    ;MAKE NEW PC = I1000
063342  000257                                  CCC                     ;SCOPE SYNC
063344  000006                                  RTT                     ;SET 'T' BIT - GO TO I1000

063346  102400                          I1000:  BVS     E1000           ;BVS INSTRUCTION SHOULD SPRING TRAP

063350  104005                          E1000:  ERROR5                  ;BUT SERVICE IN 110 FAILED
063352  063330                                  R1000                   ;ERROR LOOP RETURN

063354  000004                          O1000:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                        .SBTTL T1001 BUT SERVICE TEST IN ROM LOCATION 340 - (BR A)
                                        ; ************************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [111,340,341,017,015,TRAP MICROROUTINE] FC 1,7,10,6

                                        ;ACT BUTS:      37[004]100,111  /  16[340]016,017  /  26[017]010,010

                                        ;EXEC:          [341] BUPP=017 ('T' BIT TRAP)

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2  (-)

                                        ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
                                        ;               K5-5 STPM2 H

063356  012700  001001                  T1001:  MOV     #1001,R0                ;LOAD R0 WITH TEST NO.
063362  013701  063406                          MOV     @#I1001,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
063366  010605                                  MOV     SP,R5           ;SAVE THE SP
063370  010506                          R1001:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
063372  012746  000020                          MOV     #20,-(SP)       ;SET 'T' BIT IN THE NEW PSW
063376  012746  063406                          MOV     #I1001,-(SP)    ;MAKE NEW PC = I1001
063402  000257                                  CCC                     ;SCOPE SYNC
063404  000006                                  RTT                     ;SET 'T' BIT - GO TO I1001

063406  000400                          I1001:  BR      E1001           ;BR INSTRUCTION SHOULD SPRING TRAP

063410  104005                          E1001:  ERROR5                  ;BUT SERVICE IN 340 FAILED
063412  063370                                  R1001                   ;ERROR LOOP RETURN

063414  000004                          O1001:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                        .SBTTL T1002 BUT SERVICE TEST IN ROM LOCATION 350 - (CCC)
                                        ; ***********************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [116,350,351,017,015,TRAP MICROROUTINE] FC 1,7,10,6

                                        ;ACT BUTS:      37[004]100,116  /  16[350]016,017  /  26[017]010,010

                                        ;EXEC   [351] BUPP=017 ('T'' BIT TRAP)

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2  (-)

                                        ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
                                        ;               K5-5 STPM2 H

063416  012700  001002                  T1002:  MOV     #1002,R0                ;LOAD R0 WITH TEST NO.
063422  013701  063444                          MOV     @#I1002,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
063426  010605                                  MOV     SP,R5           ;SAVE THE SP
063430  010506                          R1002:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
063432  012746  000020                          MOV     #20,-(SP)       ;SET 'T'' BIT IN THE NEW PSW
063436  012746  063444                          MOV     #I1002,-(SP)    ;MAKE NEW PC = I1002
063442  000006                                  RTT                     ;SET 'T'' BIT - GO TO I1002

063444  000257                          I1002:  CCC             ;CCC INSTRUCTION SHOULD SPRING TRAP

063446  104005                          E1002:  ERROR5                  ;BUT SERVICE IN 350 FAILED
063450  063430                                  R1002                   ;ERROR LOOP RETURN

063452  000004                          O1002:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                .SBTTL T1003 BUT SERVICE TEST IN ROM LOCATION 117 - (SCC)
                                ; ***********************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [117,352,017,015,TRAP MICROROUTINE] FC 1,7,10,6

                                ;ACT BUTS:      37[004]100,117  /  16[117]016,017  /  26[017]010,010

                                ;EXEC:          [352] BUPP=017 ('T'' BIT TRAP)

                                ;CODES:         N / A

                                ;SYNC:          B05J2  (-)

                                ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
                                ;               K5-5 STPM2 H

063454  012700  001003          T1003:  MOV     #1003,R0                ;LOAD R0 WITH TEST NO.
063460  013701  063502                  MOV     @#I1003,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
063464  010605                          MOV     SP,R5           ;SAVE THE SP
063466  010506          R1003:          MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
063470  012746  000020                  MOV     #20,-(SP)       ;SET 'T'' BIT IN THE NEW PSW
063474  012746  063502                  MOV     #I1003,-(SP)    ;MAKE NEW PC = I1003
063500  000006                          RTT                     ;SET 'T'' BIT - GO TO I1003

063502  000277          I1003:  SCC                             ;SCC INSTRUCTION SHOULD SPRING TRAP

063504  104005          E1003:  ERROR5                          ;BUT SERVICE IN 117 FAILED
063506  063466                  R1003                           ;ERROR LOOP RETURN

063510  000004          O1003:  SCOPE                           ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                        .SBTTL T1004 BUT SERVICE TEST IN ROM LOCATION 324 - (RTS PC)
                                        ; ************************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [124,323,324,325,017,015,TRAP MICROROUTINE] FC 1,6,10,6

                                        ;ACT BUTS:      37[004]100,124  /  16[324]016,017  /  26[017]010,010

                                        ;EXEC:          [325] BUPP=017 ('T'' BIT TRAP)

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2  (-)

                                        ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
                                        ;               K5-5 STPM2 H

063512  012700  001004                  T1004:  MOV     #1004,R0                ;LOAD R0 WITH TEST NO.
063516  013701  063546                          MOV     @#I1004,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
063522  010605                                  MOV     SP,R5           ;SAVE THE SP
063524  010506                          R1004:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
063526  012746  063550                          MOV     #E1004,-(SP)    ;RTS WILL LOAD PC WITH E1004
063532  012746  000020                          MOV     #20,-(SP)       ;SET 'T'' BIT IN THE NEW PSW
063536  012746  063546                          MOV     #I1004,-(SP)    ;MAKE NEW PC = I1004
063542  000257                                  CCC                     ;SCOPE SYNC
063544  000006                                  RTT                     ;SET 'T'' BIT - GO TO I1004

063546  000207                          I1004:  RTS     PC              ;RTS INSTRUCTION SHOULD SPRING TRAP

063550  104005                          E1004:  ERROR5                  ;BUT SERVICE IN 324 FAILED
063552  063524                                  R1004                   ;ERROR LOOP RETURN

063554  000004                          O1004:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                        .SBTTL T1005 BUT SERVICE TEST IN ROM LOCATION 345 - (SOB RN,A)
                                        ; ************************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [130,342,343,345,347,017,015,TRAP MICROROUTINE] FC 1,7,10,6

                                        ;ACT BUTS:      37[004]100,130  /  16[345]016,017  /  26[017]010,010

                                        ;EXEC:          [347] BUPP=017 ('T'' BIT TRAP)

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2  (-)

                                        ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
                                        ;               K5-5 STPM2 H

063556  012700  001005          T1005:  MOV     #1005,R0                ;LOAD R0 WITH TEST NO.
063562  013701  063626                  MOV     @#I1005,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
063566  032737  100000  066642          BIT     #100000,@#BPTLOC;BREAKPOINT HALT SET ??
063574  001401                          BEQ     .+4             ;BR IF NOT
063576  000000                          HALT                    ;BREAK-DEPRESS CONTINUE TO RESTART
063600  010605                          MOV     SP,R5           ;SAVE THE SP
063602  010506                  R1005:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
063604  012703  000001                  MOV     #1,R3           ;SOB COUNT = +1
063610  012746  000020                  MOV     #20,-(SP)       ;SET 'T'' BIT IN THE NEW PSW
063614  012746  063626                  MOV     #I1005,-(SP)    ;MAKE NEW PC = I1005
063620  000257                          CCC                     ;SCOPE SYNC
063622  000006                          RTT                     ;SET 'T'' BIT - GO TO I1005
063624  000401                          BR      E1005

063626  077302                  I1005:  SOB     R3,I1005-2      ;SOB INSTRUCTION SHOULD SPRING TRAP

063630  104005                  E1005:  ERROR5                  ;BUT SERVICE IN 345 FAILED
063632  063602                          R1005                   ;ERROR LOOP RETURN

063634  000004                  O1005:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ************************************************************************
                                .SBTTL T1006 BUT SERVICE TEST IN ROM LOCATION 344 - (SOB RA,A)
                                ; ************************************************************************

                                ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                ;ROM SEQ:       [130,342,343,344,346,017,015,TRAP MICROROUTINE] FC 1,7,10,6

                                ;ACT BUTS:      37[004]100,130  /  16[344]016,017  /  26[017]010,010

                                ;EXEC:          [346] BUPP=017 ("T" BIT TRAP)

                                ;CODES:         N / A

                                ;SYNC:          B05J2  (-)

                                ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
                                ;               K5-5 STPM2 H

063636  012700  001006          T1006:  MOV     #1006,R0                ;LOAD R0 WITH TEST NO.
063642  013701  063700                  MOV     @#I1006,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
063646  010605                          MOV     SP,R5           ;SAVE THE SP
063650  010506                  R1006:  MOV     R5,SP           ;RESTORE SP FOR ERROR LOOPING
063652  012703  000002                  MOV     #2,R3           ;SOB COUNT = +2
063656  012746  000020                  MOV     #20,-(SP)       ;SET "T" BIT IN THE NEW PSW
063662  012746  063700                  MOV     #I1006,-(SP)    ;MAKE NEW PC = I1006
063666  000257                          CCC                     ;SCOPE SYNC
063670  000006                          RTT                     ;SET "T" BIT - GO TO I1006
063672  104005                  E1006:  ERROR5                  ;BUT SERVICE IN 373 FAILED
063674  063650                          R1006                   ;ERROR LOOP RETURN
063676  000403                          BR      01006           ;GO TO SCOPE EXIT

063700  077304                  I1006:  SOB     R3,E1006                ;SOB INSTRUCTION SHOULD SPRING TRAP

063702  000240                          NOP                     ;TO BE COMPATIBLE WITH "T" BIT SERV.
063704  000240                          NOP

063706  000004                  01006:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                        .SBTTL T1007 BUT SERVICE TEST IN ROM LOCATION 356 - (MARK 0)
                                        ; ************************************************************************

                                        ;MICROPROGRAMMING  /  LOGIC INFORMATION

                                        ;ROM SEQ:       [112,353,354,355,356,357,017,015,TRAP MICROROUTINE]
                                        ;               FC 1,5,10,6

                                        ;ACT BUTS:      37[004]100,112  /  016[356]016,017  /  26[017]010,010

                                        ;EXEC:          [357]  BUPP = 017  ('T'' BIT TRAP)

                                        ;CODES:         N / A

                                        ;SYNC:          B05J2  (-)

                                        ;KEY SIG:       K5-2 PS (T) (1) H  /  K3-7 SERVICE H  /  K5-5 STPM3 H
                                        ;               K5-5 STPM2 H

063710  012700  001007                  T1007:  MOV     #1007,R0                ;LOAD R0 WITH TEST NO.
063714  013701  063744                          MOV     @#I1007,R1      ;LOAD R1 WITH TEST INSTRUCTION WORD
063720  010604                                  MOV     SP,R4           ;SAVE THE SP
063722  010406                          R1007:  MOV     R4,SP           ;RESTORE SP FOR ERROR LOOPING
063724  012746  000020                          MOV     #20,-(SP)       ;SET ''T'' BIT IN THE NEW PSW
063730  012746  063744                          MOV     #I1007,-(SP)    ;MAKE NEW PC = I1007
063734  012705  063754                          MOV     #A1007,R5               ;MARK GOES TO A1007 IF TRAP NOT SPRUNG
063740  000257                                  CCC                     ;SCOPE SYNC
063742  000006                                  RTT                     ;SET ''T'' BIT - GO TO I1007

063744  006401                          I1007:  MARK+1                  ;MRK INSTRUCTION SHOULD SPRING TRAP

063746  000000                                  0                       ;''T'' BIT SERVICE WILL PUSH THE ''PSW''
063750  000000                                  0                       ;AND THE ''PC'' IN THESE LOCATIONS
063752  000400                                  BR      A1007           ;JUST IN CASE MARK FAILS

063754  010406                          A1007:  MOV     R4,SP           ;RESET THE SP
063756  000401                                  BR      E1007           ;GO REPORT ERROR
063760  000402                                  BR      B1007           ;''T'' TRAP WORKED - GO TO EXIT
063762  104005                          E1007:  ERROR5                  ;MRK FAILED TO SPRING ''T'' TRAP
063764  063722                                  R1007                   ;ERROR LOOP RETURN ADDRESS

063766  010406                          B1007:  MOV     R4,SP           ;RESET THE SP IF ALL OK

063770  000004                          O1007:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T1010 ALU ADD FUNCTION TEST
                                        ; ***********************************************************************

                                        ;THIS TEST VERIFIES THAT THE ALU ADD FUNCTION CAN RESPOND CORRECTLY
                                        ;TO THE 8 POSSIBLE COMBINATIONS THAT COULD OCCUR AT THE INPUTS OF
                                        ;EACH OF THE 16 BIT POSITIONS AS DESCRIBED BELOW:

                                        ;       AIN     BIN     CIN

                                        ;       0       0       0
                                        ;       0       0       1
                                        ;       0       1       0
                                        ;       0       1       1
                                        ;       1       0       0
                                        ;       1       0       1
                                        ;       1       1       0
                                        ;       1       1       1

                                        ;THE TEST NO.S ALONG WITH THE CORRECT ANSWERS ARE STORED IN A TABLE
                                        ;TAGGED ''ALUADD'' AS SHOWN BELOW:

                                                ;ALUADD:        NULL
                                        ;                       SRC OP1
                                        ;                       DST OP1
                                        ;                       SUM1
                                        ;                       SRC OP2
                                        ;                       DST OP2
                                        ;                       SUM2
                                        ;                       ETC.

                                        ;UPON DETECTION OF AN ERROR THE PRINTOUT HAS THE FOLLOWING SIG-
                                        ;NIFICANCE IN COLUMNS 5-8:

                                        ;       COL5 [R1] = SOURCE OPR
                                        ;       COL6 [R2] = DEST OPR
                                        ;       COL7 [R3] = WAS SUM
                                        ;       COL8 [R4] = S / B SUM

                                        ;AFTER REPORTING THE ERROR THE ROUTINE WILL LOCK ON THE FAILING PAIR
                                        ;OF NO.S IF SW09=1 OR GO ON TO THE NEXT PAIR IF SW09=0.

063772  012700  001010                  T1010:  MOV     #1010,R0                ;LOAD R0 WITH TEST NO.
063776  012705  067604                          MOV     #ALUADD,R5      ;R5 POINTS TO TABLE OF NO.S
064002  005725                          L1010:  TST     (R5)+           ;POINT TO A SRC OP
064004  022705  067666                          CMP     #ALUADD+62,R5   ;DONE ALL NO.S IN TABLE ?
064010  001416                                  BEQ     01010           ;BR IF YES
064012  012501                                  MOV     (R5)+,R1        ;LOAD SRC OP
064014  012503                                  MOV     (R5)+,R3        ;LOAD DEST OP
064016  000257                                  CCC                     ;SCOPE SYNC

064020  060103                          I1010:  ADD     R1,R3           ;TEST THE ADD FUNCTION


064022  021503                                  CMP     (R5),R3         ;CORRECT SUM ?
064024  001766                                  BEQ     L1010           ;GO ADD NEXT PAIR IF YES
```

```
064026  011504                          MOV     (R5),R4         ;GET S / B SUM
064030  014502                          MOV     -(R5),R2        ;GET DEST OP
064032  104000                  E1010:  ERROR                   ;ALU ADD OPERATION FAILED
064034  064042                          R1010                   ;ERROR LOOP RETURN ADDRESS

064036  005725                          TST     (R5)+           ;CORRECT R5 POINTER
064040  000760                          BR      L1010           ;GO DO NEXT PAIR

064042  024545                  R1010:  CMP     -(R5),-(R5)     ;RESET R5 TO POINT TO BAD GUYS
064044  000756                          BR      L1010           ;GO REPEAT FAILING PAIR

064046  000004                  O1010:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T1011 ALU SUB FUNCTION TEST
                                ; ***********************************************************************

                                ;THIS TEST VERIFIES THAT THE ALU ADD FUNCTION CAN RESPOND CORRECTLY
                                ;TO THE 8 POSSIBLE COMBINATIONS THAT COULD OCCUR AT THE INPUTS OF
                                ;EACH OF THE 16 BIT POSITIONS AS DESCRIBED BELOW:

                                ;       AIN     BIN     CIN

                                ;       0       0       0
                                ;       0       0       1
                                ;       0       1       0
                                ;       0       1       1
                                ;       1       0       0
                                ;       1       0       1
                                ;       1       1       0
                                ;       1       1       1

                                ;THE TEST NO.S ALONG WITH THE CORRECT ANSWERS ARE STORED IN A TABLE
                                ;TAGGED ''ALUADD'' AS SHOWN BELOW:

                                        ;ALUSUB:        NULL
                                ;                       SRC OP1
                                ;                       DST OP1
                                ;                       DIFF1
                                ;                       SRC OP2
                                ;                       DST OP2
                                ;                       DIFF2
                                ;                       ETC.

                                ;UPON DETECTION OF AN ERROR THE PRINTOUT HAS THE FOLLOWING SIG-
                                ;NIFICANCE IN COLUMNS 5-8:

                                ;       COL5 [R1] = SOURCE OPR
                                ;       COL6 [R2] = DEST OPR
                                ;       COL7 [R3] = WAS DIFFERENCE
                                ;       COL8 [R4] = S / B DIFFERENCE

                                ;AFTER REPORTING THE ERROR THE ROUTINE WILL LOCK ON THE FAILING PAIR
                                ;OF NO.S IF SW09=1 OR GO ON TO THE NEXT PAIR IF SW09=0.

064050  012700  001011          T1011:  MOV     #1011,R0                ;LOAD R0 WITH TEST NO.
064054  012705  070032                  MOV     #ALUSUB,R5      ;R5 POINTS TO TABLE OF NO.S
064060  005725                  L1011:  TST     (R5)+           ;POINT TO A SRC OP
064062  022705  070114                  CMP     #ALUSUB+62,R5   ;DONE ALL NO.S IN TABLE ?
064066  001416                          BEQ     01011           ;BR IF YES
064070  012501                          MOV     (R5)+,R1        ;LOAD SRC OP
064072  012503                          MOV     (R5)+,R3        ;LOAD DEST OP
064074  000257                          CCC                     ;SCOPE SYNC

064076  160103                  I1011:  SUB     R1,R3           ;TEST THE SUB FUNCTION

064100  021503                          CMP     (R5),R3         ;CORRECT DIFF. ?
064102  001766                          BEQ     L1011           ;GO SUB NEXT PAIR IF YES
```

```
064104  011504                    MOV     (R5),R4         ;GET S / B DIFF
064106  014502                    MOV     -(R5),R2        ;GET DEST OP
064110  104000            E1011:  ERROR                   ;ALU SUB OPERATION FAILED
064112  064120                    R1011                   ;ERROR LOOP RETURN ADDRESS

064114  005725                    TST     (R5)+           ;CORRECT R5 POINTER
064116  000760                    BR      L1011           ;GO DO NEXT PAIR

064120  024545            R1011:  CMP     -(R5),-(R5)     ;RESET R5 TO POINT TO BAD GUYS
064122  000756                    BR      L1011           ;GO REPEAT FAILING PAIR

064124  000004            O1011:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T1012 ALU ''AND'' FUNCTION TEST USING BIC INSTRUCTION
                                        ; ***********************************************************************

                                        ;THIS TEST VERIFIES THAT THE ALU ''AND'' FUNCTION RESPONDS CORRECTLY
                                        ;TO ALL POSSIBLE COMBINATIONS FOR EACH OF THE 16 BIT POSITIONS
                                        ;IT  EXECUTES THE BIC INSTRUCTION FOR THE FOLLOWING PAIRS OF
                                        ;OPERANDS AND TESTS FOR THE INDICATED RESULT:

                                                ;SOURCE OP      DEST. OP        RESULT

                                                ;000000         000000          000000
                                                ;177777         177777          000000
                                                ;000000         177777          177777
                                                ;177777         000000          000000
                                                ;125252         125252          000000
                                                ;052525         052525          000000
                                                ;125252         052525          052525
                                                ;052525         125252          125252

                                        ;THE 8 PAIRS OF NO.S AND THE ANSWERS ARE STORED IN A TEBLE TAGGED
                                        ;''ANDTAB'' IN THE FOLLOWING PATTERN:
                                                ;ANDTAB:        NULL
                                        ;                       SRC OP1
                                        ;                       DST OP1
                                        ;                       ANS1
                                        ;                       SRC OP2
                                        ;                       DST OP2
                                        ;                       ANS2
                                        ;                       ETC.

                                        ;WHEN AN ERROR IS REPORTED THE PRINTOUT IN COL. 5-8 HAS THE
                                        ;FOLLOWING SIGNIFICANCE:

                                        ;       COL 5 [R1] = SOURCE OPR
                                        ;       COL 6 [R2] = DEST OPR
                                        ;       COL 7 [R3] = WAS ANSWER
                                        ;       COL 8 [R4] = S / B ANSWER

                                        ;AFTER REPORTING THE ERROR THE ROUTINE WILL LOCK ON THE FAILING
                                        ;PAIR OF NO.S IF SW09=1 OR GO ON TO TEST THE NEXT PAIR IF SW09=0

064126  012700  001012                  T1012:  MOV     #1012,R0                ;LOAD R0 WITH TEST NO.
064132  012705  067666                          MOV     #ANDTAB,R5      ;R5 POINTS TO TABLE OF TEST NO.S
064136  005725                          L1012:  TST     (R5)+           ;POINT TO A SOURCE OPR
064140  022705  067750                          CMP     #ANDTAB+62,R5   ;DONE ALL COMBINATIONS ?
064144  001416                                  BEQ     01012           ;BR IF YES
064146  012501                                  MOV     (R5)+,R1        ;LOAD THE SRC OP
064150  012503                                  MOV     (R5)+,R3        ;LOAD THE DEST OP
064152  000257                                  CCC                     ;SCOPE SYNC

064154  040103                          I1012:  BIC     R1,R3           ;TEST THE ''AND''

064156  020315                                  CMP     R3,(R5)         ;RESULT CORRECT ?
064160  001766                                  BEQ     L1012           ;BR IF YES - GET THE NEXT PAIR
```

```
064162  011504                  MOV     (R5),R4         ;GET THE S / B DATA
064164  014502                  MOV     -(R5),R2        ;GET DEST OP
064166  104000          E1012:  ERROR                   ;ALU ''AND'' FAILED
064170  064176                  R1012                   ;ERROR LOOP RETURN

064172  005725                  TST     (R5)+           ;CORRECT R5 POINTER
064174  000760                  BR      L1012           ;GO GET NEXT PAIR

064176  024545          R1012:  CMP     -(R5),-(R5)     ;RESET R5 TO POINT BACK TO BAD GUYS
064200  000756                  BR      L1012           ;GO REPEAT THE BAD GUYS

064202  000004          O1012:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                ; ***********************************************************************
                                        .SBTTL T1013 ALU ''OR'' FUNCTION TEST USING BIS INSTRUCTION
                                ; ***********************************************************************

                                ;THIS TEST VERIFIES THAT THE ALU ''OR'' FUNCTION RESPONDS CORRECTLY
                                ;TO ALL POSSIBLE COMBINATIONS FOR EACH OF THE 16 BIT POSITIONS
                                ;IT  EXECUTES THE BIS INSTRUCTION FOR THE FOLLOWING PAIRS OF
                                ;OPERANDS AND TESTS FOR THE INDICATED RESULT:

                                        ;SOURCE OP      DEST. OP        RESULT

                                        ;000000         000000          000000
                                        ;177777         177777          177777
                                        ;000000         177777          177777
                                        ;177777         000000          177777
                                        ;125252         125252          125252
                                        ;052525         052525          052525
                                        ;125252         052525          177777
                                        ;052525         125252          177777

                                ;THE 8 PAIRS OF NO.S AND THE ANSWERS ARE STORED IN A TABLE TAGGED
                                ;''ORTAB'' IN THE FOLLOWING PATTERN:
                                        ;ORTAB: NULL
                                ;                       SRC OP1
                                ;                       DST OP1
                                ;                       ANS1
                                ;                       SRC OP2
                                ;                       DST OP2
                                ;                       ANS2
                                ;                       ETC.

                                ;WHEN AN ERROR IS REPORTED THE PRINTOUT IN COL. 5-8 HAS THE
                                ;FOLLOWING SIGNIFICANCE:

                                ;       COL 5 [R1] = SOURCE OPR
                                ;       COL 6 [R2] = DEST OPR
                                ;       COL 7 [R3] = WAS ANSWER
                                ;       COL 8 [R4] = S / B ANSWER

                                ;AFTER REPORTING THE ERROR THE ROUTINE WILL LOCK ON THE FAILING
                                ;PAIR OF NO.S IF SW09=1 OR GO ON TO TEST THE NEXT PAIR IF SW09=0

064204  012700  001013          T1013:  MOV     #1013,R0                ;LOAD R0 WITH TEST NO.
064210  012705  067750                  MOV     #ORTAB,R5       ;R5 POINTS TO TABLE OF TEST NO.S
064214  005725                  L1013:  TST     (R5)+           ;POINT TO A SOURCE OPR
064216  022705  070032                  CMP     #ORTAB+62,R5    ;DONE ALL COMBINATIONS ?
064222  001416                          BEQ     01013           ;BR IF YES
064224  012501                          MOV     (R5)+,R1        ;LOAD THE SRC OP
064226  012503                          MOV     (R5)+,R3        ;LOAD THE DEST OP
064230  000257                          CCC                     ;SCOPE SYNC

064232  050103                  I1013:  BIS     R1,R3           ;TEST THE ''OR''

064234  020315                          CMP     R3,(R5)         ;RESULT CORRECT ?
064236  001766                          BEQ     L1013           ;BR IF YES - GET THE NEXT PAIR
```

```
064240  011504                  MOV     (R5),R4         ;GET THE S / B DATA
064242  014502                  MOV     -(R5),R2        ;GET DEST OP
064244  104000          E1013:  ERROR                   ;ALU 'OR'' FAILED
064246  064254                  R1013                   ;ERROR LOOP RETURN

064250  005725                  TST     (R5)+           ;CORRECT R5 POINTER
064252  000760                  BR      L1013           ;GO GET NEXT PAIR

064254  024545          R1013:  CMP     -(R5),-(R5)     ;RESET R5 TO POINT BACK TO BAD GUYS
064256  000756                  BR      L1013           ;GO REPEAT THE BAD GUYS

064260  000004          O1013:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL T1014 INC / DEC / ADD TEST - CYCLE NO.S 000000-077777
                                        ; ***********************************************************************

                                        ;THIS TEST COMBINES THE INC / DEC / ADD INSTRUCTIONS IN THE FOLLOWING
                                        ;TEST SEQUENCE:

                                                ;1. BOTH SOURCE AND DEST OPS ARE ZEROED
                                                ;2. THE TWO NO.S ARE ADDED AND THE RESULT COMPARED WITH 000000
                                                ;3. THE SOURCE OP IS INCREMENTED
                                                ;4. THE DEST OP IS DECREMENTED
                                                ;5. STEPS 2,3, AND 4 ARE REPEATED UNTIL THE SOURCE OP GOES
                                                ;   NEGATIVE

                                        ;ON DETECTION OF A NON-ZERO RESULT THE ERROR IS REPORTED AND THEN IF:

                                        ;       1. SW09=0  THE SCOPE LOOP UTILITY IAS CALLED TO REINITIALIZE
                                        ;                  THE TEST
                                        ;       2. SW09=1  THE ROUTINE LOCKS ON THE FAILING PAIR OF OPERANDS
                                        ;                  UNTIL THE ERROR GOES AWAY OR SW09 IS RESET

                                        ;THE SIGNIFICANCE OF THE PRINTOUT IN COLUMNS 5 - 8:

                                                ;COLUMN 5       [R1] SOURCE OP
                                                ;COLUMN 6       [R2] DEST OP
                                                ;COLUMN 7       [R3] WAS ANSWER
                                                ;COLUMN 8       [R4] S / B ANSWER (ALWAYS 000000)

064262  012700  001014          T1014:  MOV     #1014,R0                ;LOAD R0 WITH TEST NO.
064266  005001                          CLR     R1                      ;INITIALIZE REGS TO 000000
064270  005002                          CLR     R2
064272  005004                          CLR     R4
064274  010203                  R1014:  MOV     R2,R3                   ;LOAD DEST OPERAND
064276  000257                          CCC                             ;SCOPE SYNC

064300  060103                  I1014:  ADD     R1,R3                   ;ADD THE TWO TEST NO.S
                                                                        ;RESULT S / B = 000000

064302  020403                          CMP     R4,R3                   ;RESULT = 000000 ?
064304  001403                          BEQ     A1014                   ;BR IF YES

064306  104000                  E1014:  ERROR                           ;INCORRECT RESULT IN R3
064310  064274                          R1014                           ;ERROR LOOP RETURN

064312  000404                          BR      O1014                   ;GO TO SCOPE EXIT

064314  005201                  A1014:  INC     R1                      ;ADD 1 TO SOURCE OP
064316  100402                          BMI     O1014                   ;GET OUT IF IT WENT NEGATIVE
064320  005302                          DEC     R2                      ;SUB 1 FROM THE DEST OP
064322  000764                          BR      R1014                   ;GO ADD THE TWO NO.S

064324  000004                  O1014:  SCOPE                           ;CALL SCOPE LOOP UTILITY
```

```
                                        ; *********************************************************************
                                                .SBTTL T1015 INC / DEC / ADD TEST - CYCLE NO.S 077777-000000
                                        ; *********************************************************************

                                        ;THIS TEST COMBINES THE INC / DEC / ADD INSTRUCTIONS IN THE FOLLOWING
                                        ;TEST SEQUENCE:

                                                ;1. BOTH SOURCE AND DEST OPS ARE ZEROED
                                                ;2. THE TWO NO.S ARE ADDED AND THE RESULT COMPARED WITH 000000
                                                ;3. THE SOURCE OP IS DECREMENTED
                                                ;4. THE DEST OP IS INCREMENTED
                                                ;5. STEPS 2,3, AND 4 ARE REPEATED UNTIL THE DEST. OP GOES
                                                ;   NEGATIVE

                                        ;ON DETECTION OF A NON-ZERO RESULT THE ERROR IS REPORTED AND THEN IF:

                                        ;       1. SW09=0  THE SCOPE LOOP UTILITY IAS CALLED TO REINITIALIZE
                                        ;                  THE TEST
                                        ;       2. SW09=1  THE ROUTINE LOCKS ON THE FAILING PAIR OF OPERANDS
                                        ;                  UNTIL THE ERROR GOES AWAY OR SW09 IS RESET

                                        ;THE SIGNIFICANCE OF THE PRINTOUT IN COLUMNS 5 - 8:

                                                ;COLUMN 5       [R1] SOURCE OP
                                                ;COLUMN 6       [R2] DEST OP
                                                ;COLUMN 7       [R3] WAS ANSWER
                                                ;COLUMN 8       [R4] S / B ANSWER (ALWAYS 000000)

064326  012700  001015          T1015:  MOV     #1015,R0                ;LOAD R0 WITH TEST NO.
064332  005001                          CLR     R1              ;INITIALIZE REGS TO 000000
064334  005002                          CLR     R2
064336  005004                          CLR     R4
064340  010203                  R1015:  MOV     R2,R3           ;LOAD DEST OPERAND
064342  000257                          CCC                     ;SCOPE SYNC

064344  060103                  I1015:  ADD     R1,R3           ;ADD THE TWO TEST NO.S
                                                                ;RESULT S / B = 000000

064346  020403                          CMP     R4,R3           ;RESULT = 000000 ?
064350  001403                          BEQ     A1015           ;BR IF YES

064352  104000                  E1015:  ERROR                   ;INCORRECT RESULT IN R3
064354  064340                          R1015                   ;ERROR LOOP RETURN

064356  000404                          BR      O1015           ;GO TO SCOPE EXIT

064360  005202                  A1015:  INC     R2              ;ADD 1 TO DEST. OP
064362  100402                          BMI     O1015           ;GET OUT IF IT WENT NEGATIVE
064364  005301                          DEC     R1              ;SUB 1 FROM THE SOURCE OP
064366  000764                          BR      R1015           ;GO ADD THE TWO NO.S

064370  000004                  O1015:  SCOPE                   ;CALL SCOPE LOOP UTILITY
```

```
                                        ; ***********************************************************************
                                                .SBTTL END OF PASS SERVICE ROUTINE
                                        ; ***********************************************************************

064372  010037  066706          ENDPS:  MOV     R0,@#LAST       ;SAVE LAST TEST NO. FOR
                                                                ;MISSED TEST ERROR CHECK
064376  004737  064564                  JSR     PC,@#MISS       ;GO CHECK FOR MISSED TESTS
064402  005237  066670          1$:     INC     @#PASCNT        ;UPDATE THE PASS COUNTER
064406  032737  010000  177570          BIT     #SW12,@#SR      ;INHIBIT END PASS PRINTOUT ?
064414  001035                          BNE     6$              ;BR IF YES
064416  104400                          TYPE
064420  067147                          EOP1
064422  013702  066670                  MOV     @#PASCNT,R2     ;CONVERT AND PRINT PASS COUNT
064426  004737  065760                  JSR     PC,@#OTA
064432  104400                          TYPE
064434  067136                          DIGITS
064436  104400                          TYPE
064440  067176                          EOP2
064442  013702  066666                  MOV     @#ERRCNT,R2     ;CONVERT AND PRINT ERROR COUNT
064446  004737  065760                  JSR     PC,@#OTA
064452  104400                          TYPE
064454  067136                          DIGITS
064456  005737  066672                  TST     @#PFCNT         ;ANY POWER FAILS LOGGED THIS PASS?
064462  001410                          BEQ     2$              ;BR IF NONE
064464  013702  066672                  MOV     @#PFCNT,R2      ;GET THE PWR FAIL COUNT
064470  004737  065760                  JSR     PC,@#OTA        ;GO CONVERT PFCNT
064474  104400                          TYPE
064476  067163                          PFMESS
064500  104400                          TYPE                    ;TYPE 'PFCNT = NNNNNN
064502  067136                          DIGITS
064504  104400                  2$:     TYPE
064506  066726                          CRLF
064510  012737  000040  066662  6$:     MOV     #32.,@#ICOUNT
064516  012737  000040  066664          MOV     #32.,@#ITCNT
064524  012701  066674          PFRET:  MOV     #PRIFLG,R1      ;R1 POINTS TO BEGINNING OF FLAGS
064530  005021                  1$:     CLR     (R1)+           ;CLEAR A FLAG
064532  022701  066722                  CMP     #ONCE,R1        ;ALL DONE?
064536  001374                          BNE     1$              ;BR IF NOT
064540  000005                          RESET                   ;CLEAR THE WORLD PRIOR TO RESTART
064542  013702  000042                  MOV     @#42,R2         ;CHECK FOR XXDP/ACT11 HOOK
064546  001404                          BEQ     DONE1           ;BR IF NO HOOK FOUND
064550  004712                  LOGICAL:JSR     PC,(R2)         ;RETURN TO XXDP OR ACT MONITOR
064552  000240                          NOP
064554  000240                          NOP
064556  000240                          NOP
064560  000137  003034          DONE1:  JMP     @#BEGIN         ;GO RESTART AT THE BEGINNING
```

```
                                        ;XXXX
```

```
064674  020001          4$:     CMP     R0,R1           ;DONE ALL TABLE ENTRIES ?
064676  001402                  BEQ     5$              ;BR IF YES
064700  005200                  INC     R0              ;INDEX POINTS TO NEXT TEST FLAG
064702  000744                  BR      2$              ;GO CHECK THE NEXT FLAG
064704  000207          5$:     RTS     PC              ;RETURN TO END OF PASS SERVICE
```

```
                                        ; *****************************************************************
                                                .SBTTL POWER FAIL SUBROUTINE
                                        ; *****************************************************************

064706  012737  064746  000024  PDWN:   MOV     #PUP,@#24       ;SET UP POWER FAIL VECTOR TO GO
064714  012737  000340  000026          MOV     #340,@#26       ;TO PUP ON POWER UP - LEVEL 7
064722  005237  066672                  INC     @#PFCNT         ;COUNT THE POWER FAIL
064726  022737  177777  066666          CMP     #-1,@#ERRCNT    ;MAX ERROR COUNT ??
064734  001402                          BEQ     1$              ;BR IF YES
064736  005237  066666                  INC     @#ERRCNT        ;COUNT THE ERROR
064742  000000                  1$:     HALT                    ;PWR RESTART SHOULD GO TO 'PUP''
064744  000776                          BR      1$              ;HANG IF CONTINUE DEPRESSED

064746  012737  000340  177776  PUP:    MOV     #340,@#PSW      ;SET PRIORITY TO LEVEL 7 JUST IN CASE
064754  012706  001000                  MOV     #BT001,SP       ;RESET THE STACK POINTER
064760  005037  067560                  CLR     @#MBUF0         ;INIT STALL COUNTER
064764  005337  067560          1$:     DEC     @#MBUF0         ;COUNT ONE TIME
064770  001375                          BNE     1$              ;BR IF NOT BACK TO 000000
064772  012737  064706  000024          MOV     #PDWN,@#24      ;SET UP POWER FAIL VECTOR
065000  012737  000340  000026          MOV     #340,@#26       ;PRIORITY LEVEL 7
065006  032737  010000  177570          BIT     #SW12,@#SR      ;INHIBIT POWER FAIL MESSAGE ?
065014  001002                          BNE     2$              ;BR IF YES
065016  104400                          TYPE                    ;GO PRINT POWER MESSAGE
065020  067416                          PFMSG
065022  000137  064524          2$:     JMP     @#PFRET         ;GO CLEANUP AND ATTEMPT RESTART


                                        ; *****************************************************************
                                                .SBTTL 'T'' BIT SERVICE ROUTINE
                                        ; *****************************************************************

065026  062716  000004          TBSER:  ADD     #4,(SP)         ;MOVE RETURN PC AROUND ERROR WORDS
065032  042766  000020  000002          BIC     #20,2(SP)       ;TURN OFF THE ''T'' BIT
065040  000006                          RTT                     ;RETURN TO THE CALLING TEST
```

```
                                        ; ***********************************************************************
                                                .SBTTL  RSVD INSTRUCTION TRAP SERVICE ROUTINE
                                        ; ***********************************************************************

                                        ;THIS ROUTINE SERVICES UNEXPECTED RESERVED INSTRUCTION TRAP ERRORS
                                        ;IT RESULTS IN PRINTING THE ERROR MESSAGE: ''TRAPPED TO 10 PC=XXXXXX''
                                        ;WHERE XXXXXX IS THE ADDRESS CONTAINING THE INSTRUCTION WORD THAT
                                        ;SPRUNG THE TRAP.  AFTER PRINTING THE ERROR MESSAGE AN ATTEMPT IS
                                        ;MADE TO RESTART THE PROGRAM AT THE BEGINNING.

                                        ;IF THE TRAP IS SPRUNG WHILE IN THE PROCESS OF TRYING TO SERVICE A
                                        ;PREVIOUS RSVD INSTRUCTION TRAP OR AN UNEXPECTED BUS ERROR THE PROGRAM
                                        ;WILL HALT.  AFTER THE HALT THE STACK WILL CONTAIN INFORMATION RELATIVE
                                        ;TO THE TWO SUCCESSIVE TRAPS AS SHOWN BELOW:

                                                ;[SP]   PC+2    OF 2ND TRAP
                                                ;[SP]+2 PSW        ''
                                                ;[SP]+4 PC+2    OF 1ST TRAP
                                                ;[SP]+6 PSW        ''

                                                ;LOCATION ''CATERR'' CAN BE EXAMINED TO OBTAIN THE FOLLOWING
                                                ;INFORMATION:

                                                        ;[CATERR]=401   RSVD INSTR TRAP COMBINED WITH A BUS ERROR
                                                                        ;TRAP (PC AT TIME OF ERROR HALT INDICATES
                                                                        ;WHICH OCCURRED FIRST)
                                                        ;[CATERR]=2     TWO SUCCESSIVE BUS ERROR TRAFS
                                                        ;[CATERR]=1000  TWO SUCCESSIVE RSVD INSTR TRAPS

                                        ;THE CONTENTS OF R0 (DISPLAYED IN THE DATA LIGHTS) AT THE TIME OF THE
                                        ;HALT PROVIDES FURTHER INFORMATION AS TO THE LAST TEST BEING EXECUTED
                                        ;WHEN THE TRAPS OCCURRED.


                                        ;THESE TWO INSTRUCTIONS ARE USED BY THE BASIC INSTRUCTION
                                        ;TESTS TO VERIFY THE RSVD INSTR TRAP MECHANISM PRIOR TO ACTIVATING THE SERVICE
                                        ;ROUTINE

065042  005167  001644          RSVTST: COM     RSVFLG          ;SET RSVD INSTR TRAP TEST FLAG
065046  000002                          RTI                     ;RETURN TO BASIC TEST

065050  005737  066720          RSERR:  TST     @#CATERR        ;ANY PENDING CATASTROPHIC ERRORS
065054  001032                          BNE     2$              ;BE IF YES
065056  105237  066721                  INCB    @#1+CATERR      ;SET RSVD INSTR FLAG
065062  032737  010000  177570          BIT     #SW12,@#SR      ;INHIBIT ERROR PRINT ?
065070  001020                          BNE     1$              ;BR IF YES
065072  104400                          TYPE                    ;GO TYPE ''TRAPPED TO 10 PC=''
065074  067476                          RSMSG
065076  011602                          MOV     (SP),R2         ;GET, CONVERT AND PRINT CONTENTS
065100  005742                          TST     -(R2)
065102  004737  065760                  JSR     PC,@#OTA        ;OF THE OC
065106  104400                          TYPE
065110  067136                          DIGITS
065112  104400                          TYPE                    ;OUTPUT CR / LF
065114  066726                          CRLF
065116  022737  177777  066666          CMP     #-1,@#ERRCNT    ;MAX ERROR COUNT ??
```

```
065124  001402                          BEQ     1$              ;BR IF YES
065126  005237  066666                  INC     @#ERRCNT        ;COUNT THE ERROR
065132  012706  001000          1$:     MOV     #BT001,SP
065136  000137  064524                  JMP     @#PFRET         ;GO ATTEMPT RESTART
065142  105237  066721          2$:     INCB    @#1+CATERR      ;INCREMENT RSVD INSTR FLAG
065146  000000                          HALT                    ;CATASTROPHIC ERROR HALT
065150  000770                          BR      1$              ;DEPRESSING CONTINUE WILL CAUSE
                                                                ;ATTEMPT TO RESTART.
```

```
                                        ; ***********************************************************************
                                                .SBTTL  BUS ERROR TRAP SERVICE ROUTINE
                                        ; ***********************************************************************

                                        ;THIS ROUTINE SERVICES UNEXPECTED BUS ERROR TRAPS (BUS TIMEOUT, ODD ADDRESS
                                        ;ERRORS, STACK OVERFLOW, AND ILLEGAL INSTRUCTIONS). IT RESULTS IN PRINTING THE
                                        ;ERROR MESSAGE: "TRAPPED TO 4 PC =XXXXXX" WHERE XXXXXX IS THE
                                        ;CONTENTS OF THE PC WHEN THE TRAP WAS SPRUNG.  AFTER PRINTING THE
                                        ;ERROR MESSAGE AN ATTEMPT IS MADE TO RESTART THE PROGRAM AT
                                        ;THE BEGINNING.

                                        ;IF THE TRAP IS SPRUNG WHILE IN THE PROCESS OF TRYING TO SERVICE A PREVIOUS
                                        ;RSVD INSTR TRAP OR A PREVIOUS BUS ERROR, THE PROGRAM WILL HALT.
                                        ;AFTER THE HALT THE STACK WILL CONTAIN INFORMATION RELATIVE TO THE
                                        ;TWO SUCCESSIVE TRAPS AS SHOWN BELOW:

                                                ;[SP]   PC+2    OF 2ND TRAP
                                                ;[SP]+2 PSW         "
                                                ;[SP]+4 PC+2    OF 1ST TRAP
                                                ;[SP]+6 PSW         "


                                                ;LOCATION "CATERR" CAN BE EXAMINED TO OBTAIN THE LOLLOWING
                                                ;INFORMATION:

                                                        ;[CATERR]=401   RSVD INSTR TRAP COMBINED WITH A BUS ERROR
                                                                        ;TRAP (PC AT TIME OF ERROR HALT
                                                                        ;INDICATES WHICH OCCURRED FIRST)
                                                        ;[CATERR]=2     TWO SUCCESSIVE BUS ERRORS
                                                        ;[CATERR]=1000  TWO SUCCESSIVE RSVD INSTR TRAPS

                                        ;THE CONTENTS OF R0 (DISPLAYED IN THE DATA LIGHTS) AT THE TIME OF
                                        ;THE HALT PROVIDED FURTHER INFORMATION AS TO THE TEST IN PROGRESS
                                        ;WHEN THE TRAPS OCCURRED.

                                        ;THE CONTENTS OF THE SP CAN BE USED TO INDICATE IF STACK OVERFLOW CAUSED
                                        ;THE BUSS ERROR TRAP(S) AS SHOWN BELOW:

                                                ;400>[SP]>336   YELLOW ZONE
                                                ;[SP]=0         RED ZONE

                                        ;THESE TWO INSTRUCTIONS ARE USED BY THE BASIC INSTRUCTION TESTS TO
                                        ;VERIFY THAT THE BUS ERROR TRAP MECHANISM WORKS PRIOR TO ACTIVATING
                                        ;THE SERVICE ROUTINE

065152  005167  001536          BETST:  COM     BERFLG          ;SET BUS ERROR TRAP TEST FLAG
065156  000002                          RTI                     ;RETURN TO BASIC TEST

065160  005737  066720          BERR:   TST     @#CATERR        ;ANY CATASTROPHIC ERRORS PENDING?
065164  001031                          BNE     2$              ;BR IF YES
065166  105237  066720                  INCB    @#CATERR        ;SET CATASTROPHIC ERROR FLAG
065172  032737  010000  177570          BIT     #SW12,@#SR      ;INHIBIT ERROR PRINT
065200  001017                          BNE     1$              ;BR IF YES
065202  104400                          TYPE                    ;PRINT "TRAP TO 4" MESSAGE
065204  067430                          BEMSG
065206  011602                          MOV     (SP),R2         ;GET TRAP PC FROM STACK
```

```
065210  004737  065760                  JSR     PC,@#OTA        ;CONVERT IT TO ASCII
065214  104400                          TYPE                    ;GO TYPE TRAP PC
065216  067136                          DIGITS
065220  104400                          TYPE                    ;GO OUTPUT CR / LF
065222  066726                          CRLF
065224  022737  177777  066666          CMP     #-1,@#ERRCNT    ;MAX ERROR COUNT ??
065232  001402                          BEQ     1$              ;BR IF YES
065234  005237  066666                  INC     @#ERRCNT        ;COUNT THE ERROR
065240  012706  001000          1$:     MOV     #BT001,SP       ;RESET THE STACK POINTER
065244  000137  064524                  JMP     @#PFRET         ;GO CLEANUP FOR RESTART

065250  105237  066720          2$:     INCB    @#CATERR        ;SET CATASTROPHIC ERROR FLAG
065254  000000                          HALT                    ;CATASTROPHIC ERROR HALT-SCHOOLS OUT
065256  000770                          BR      1$              ;DEPRESS CONTINUE TO ATTEMPT RESTART
```

```
                                        ; ***************************************************************
                                                .SBTTL SCOPE SERVICE ROUTINE
                                        ; ***************************************************************

                                        ;THIS UTILITY IS CALLED BY AN IOT=SCOPE INSTRUCTION AT THE END
                                        ;OF EACH TEST IN THE COMPREHENSIVE INSTRUCTION TEST AND COM-
                                        ;BINED INSTRUCTION EXERCISER TEST SECTIONS OF THE PROGRAM.
                                        ;IT IS DESIGNED TO IMPLEMENT THE CONSOLE SWITCH OPTIONS DEFINED
                                        ;BELOW:

                                        ;       SW14 = 1        LOOP ON CURRENT TEST

                                        ;       SW11 = 1        INHIBIT SUB-TEST ITERATIONS

                                        ;       SW10 = 1        LOOP ON TEST SELECTED BY SR<09:00>


065260  005137  066702          SCOPEA: COM     @#SCOFLG        ;THESE TWO ILSTRUCTIONS ARE
065264  000002                          RTI                     ;USED IN THE BASIC TESTS TO
                                                                ;VERIFY THE IOT LINKAGE

065266  112760  000377  070140  SCOPEB: MOVB    #377,STAB1(R0)  ;SET FLAG IN MISSED TEST TABLE
065274  032737  040000  177570          BIT     #SW14,@#SR      ;LOOP ON CURRENT TEST ?
065302  001403                          BEQ     2$              ;BR IF NO - SW14=0
065304  013716  066654          1$:     MOV     @#RETURN,(SP)   ;SET UP RTN PC ON STK TO LOOP
065310  000002                          RTI                     ;RETURN TO CURRENT TEST
065312  032737  002000  177570  2$:     BIT     #SW10,@#SR      ;LOOP ON SELECTED TEST ?
065320  001412                          BEQ     3$              ;BR IF NO - SW10=0
065322  013737  177570  066700          MOV     @#SR,@#SELTST   ;GET CONTENTS OF SWITCHES
065330  042737  176000  066700          BIC     #176000,@#SELTST;MASK OUT SR<15:10>
065336  020037  066700                  CMP     R0,@#SELTST     ;IS THIS THE SELECTED TEST ?
065342  001760                          BEQ     1$              ;BR IF YES
065344  000407                          BR      4$              ;GO EXIT TO NEXT TEST
065346  032737  004000  177570  3$:     BIT     #SW11,@#SR      ;INHIBIT ITERATIONS ?
065354  001003                          BNE     4$              ;BR IF YES - SW11=1
065356  005337  066664                  DEC     @#ITCNT         ;COUNT ONE TIME
065362  001350                          BNE     1$              ;BR IF NOT DONE - DO IT AGIN
065364  013737  066662  066664  4$:     MOV     @#ICOUNT,@#ITCNT ;RESET ITERATION COUNTER
065372  011637  066654                  MOV     (SP),@#RETURN   ;SET UP NEW SCOPE RETURN
065376  000002                          RTI                     ;RETURN TO DO NEXT SEQ. TEST
```

```
                                        ; ***************************************************************
                                                .SBTTL ERROR SERVICE ROUTINE
                                        ; ***************************************************************

                                        ;THIS UTILITY IS CALLED BY AN ERRORX = EMTX INSTRUCTION OF THE
                                        ;FOLLOWING FORMAT:

                                        ;       E'N:    ERRORX
                                        ;               R'N

                                        ;       WHERE: X REPRESENTS THE CODING OF THE LOW BYTE IN THE EMT
                                        ;               AND INDICATES THE NO. OF COLUMNS TO BE PRINTED:

                                        ;                       X=0     ALL 8 COLUMNS
                                        ;                         7     1ST SEVEN COLUMNS
                                        ;                         6     1ST SIX COLUMNS
                                        ;                         5     1ST FIVE COLUMNS
                                        ;                         4     1ST FOUR COLUMNS
                                        ;                         3     1ST THREE COLUMNS
                                        ;                         2     1ST TWO COLUMNS
                                        ;                         1     1ST COLUMN ONLY

                                        ;               R'N IS THE ADDRESS WHERE CONTROL IS RETURNED AFTER
                                        ;               THE ERROR SERVICE IF SW09=1 (LOOP ON HARD ERROR).
                                        ;               IF SWITCH 09 IS RESET CONTROL ISRETURNED TO
                                        ;               E'N+4.

                                        ;IT IS DESIGNED TO SERVICE THE SWITCH OPTIONS DEFINED BELOW:

                                        ;               SW15=1  HALT ON ERROR - TESTED  AFTER
                                        ;                       PRINTING - DEPRESSING CONTINUE RESUMES NORMAL
                                        ;                       EXECUTION

                                        ;               SW13=1  INHIBIT ALL ERROR PRINTOUTS EXCEPT:

                                        ;                       1)BELL ON ERROR
                                        ;                       2)FAULT #
                                        ;                       3)INTRODUCTORY MESSAGE
                                        ;                       4)ANY CATASTROPHIC ERROR MESSAGE


                                        ;               SW09=1  LOCK ON HARD ERRORS

                                        ;THIS UTILITY ALSO CALLS THE OTA (OCTAL TO ASCII) AND TYPE (PRINT)
                                        ;UTILITIES TO FORMAT AND REPORT THE ERRORS


065400  005137  066676          ERRA:   COM     @#ERRFLG                ;THESE TWO INSTRUCTIONS ARE USED
065404  000002                          RTI                     ;IN THE BASIC TESTS TO VERIFY THE EMT

065406  022737  177777  066666  ERRB:   CMP     #-1,@#ERRCNT    ;ERROR COUNT = 177777 ??
065414  001402                          BEQ     1$              ;BR IF YES - FREEZE ERRCNT
065416  005237  066666                  INC     @#ERRCNT        ;COUNT THIS ERROR
065422  010246                  1$:     MOV     R2,-(SP)        ;SAVE R2 ON THE STACK
065424  016602  000002                  MOV     2(SP),R2        ;GET THE PC+2 OF ERROR CALL
065430  011237  066656                  MOV     (R2),@#ERRTN    ;GET THE ERROR LOOP ADDRESS
```

```
065434  014237  066640                  MOV     -(R2),@#COLCNT  ;GET THE ERROR EMT CALL
065440  042737  177770  066640          BIC     #177770,@#COLCNT;MASK OUT BITS <15:03>
065446  032737  020000  177570  3$:     BIT     #SW13,@#SR      ;INHIBIT ERROR PRINTOUT ?
065454  001103                          BNE     6$              ;BR IF YES
065456  005737  066716                  TST     @#ERFLG1        ;ERROR HEADER PRINTED FLAG SET ??
065462  001006                          BNE     4$              ;BR IF IT IS-PRINTER HEADER ONCE PER PASS
065464  104400                          TYPE                    ;CALL THE TYPE UTILITY
065466  066732                          ERHDR1                  ;ADDR OF ERROR HEADER MSG 1
065470  104400                          TYPE                    ;CALL THE TYPE UTILITY
065472  067034                          ERHDR2                  ;ADDR OF ERROR HEADER MSG2
065474  005137  066716                  COM     @#ERFLG1        ;FLAG THAT THE HEADER WAS PRINTED ONCE
065500  104400                  4$:     TYPE                    ;START WITH A CR / LF
065502  066726                          CRLF
065504  004737  065746                  JSR     PC,@#8$         ;GO OUTPUT COLUMN ONE
065510  022737  000001  066640          CMP     #1,@#COLCNT     ;WAS IT AN ERROR1 CALL ?
065516  001460                          BEQ     5$              ;BR IF YES

065520  016602  000004                  MOV     4(SP),R2        ;GET THE ERROR PSW
065524  004737  065746                  JSR     PC,@#8$         ;GO OUTPUT COLUMN TWO
065530  022737  000002  066640          CMP     #2,@#COLCNT     ;WAS IT AN ERROR2 CALL ?
065536  001450                          BEQ     5$              ;BR IF YES

065540  010602                          MOV     SP,R2           ;GET THE CONTENTS OF THE SP
065542  005722                          TST     (R2)+           ;CORRECT IT
065544  004737  065746                  JSR     PC,@#8$         ;GO OUTPUT COLUMN 3
065550  022737  000003  066640          CMP     #3,@#COLCNT     ;WAS IT AN ERROR3 CALL ?
065556  001440                          BEQ     5$              ;BR IF YES

065560  010002                          MOV     R0,R2           ;GET THE TEST # IN R0
065562  004737  065746                  JSR     PC,@#8$         ;GO OUTPUT COLUMN 4
065566  022737  000004  066640          CMP     #4,@#COLCNT     ;WAS IT AN ERROR4 CALL ?
065574  001431                          BEQ     5$              ;BR IF YES

065576  010102                          MOV     R1,R2           ;GET THE COPY OF THE INSTRUCTION
065600  004737  065746                  JSR     PC,@#8$         ;GO OUTPUT COLUMN 5
065604  022737  000005  066640          CMP     #5,@#COLCNT     ;WAS IT AN ERROR5 CALL ?
065612  001422                          BEQ     5$              ;BR IF YES

065614  012602                          MOV     (SP)+,R2        ;GET THE ORIGINAL R2 OFF STACK
065616  004737  065746                  JSR     PC,@#8$         ;GO OUTPUT COLUMN 6
065622  010246                          MOV     R2,-(SP)        ;MAINTAIN COMPATABILITY
065624  022737  000006  066640          CMP     #6,@#COLCNT     ;WAS IT AN ERROR6 CALL ?
065632  001412                          BEQ     5$              ;BR IF YES

065634  010302                          MOV     R3,R2           ;GET THE CONTENTS OF R3
065636  004737  065746                  JSR     PC,@#8$         ;GO OUTPUT COLUMN 7
065642  022737  000007  066640          CMP     #7,@#COLCNT     ;WAS IT AN ERROR7 CALL ?
065650  001403                          BEQ     5$              ;BR IF YES

065652  010402                          MOV     R4,R2           ;GET THE CONTENTS OF R4
065654  004737  065746                  JSR     PC,@#8$         ;GO OUTPUT COLUMN 8
065660  104400                  5$:     TYPE                    ;CALL THE TYPE UTILITY
065662  066726                          CRLF                    ;ADDRESS OF THE CR / LF MESSAGE
065664  012602                  6$:     MOV     (SP)+,R2        ;RESTORE THE INTEGRITY OF R2
065666  032737  002000  177570          BIT     #SW10,@#SR      ;LOOP ON SELECTED TEST ???
065674  001012                          BNE     7$              ;BR IF YES - SW09 PART OF TEST NO.
```

```
065676  032737  001000  177570          BIT     #SW09,@#SR      ;LOOP ON HARD ERRORS ???
065704  001406                          BEQ     7$              ;BR IF NOT - REWARD TO THE FIRST
                                                                ;MAINTENANCE MAN WHO CALLS THE
                                                                ;AUTHOR OF THIS PROGRAM IN
                                                                ;MARLBORO,MASS.
065706  013716  066656                  MOV     @#ERRTN,(SP)    ;PUT ERROR RETURN ADDR ON STACK
065712  042766  000020  000002          BIC     #20,2(SP)       ;CLEAR 'T'' BIT ON THE STACK IN CASE
                                                                ;THIS ERROR OCCURRED IN 'T'' BIT TESTS
065720  000002                          RTI                     ;RETURN TO LOOP ON THIS ERROR CALL
065722  005737  177570          7$:     TST     @#SR            ;HALT AFTER PRINTING ???
065726  100001                          BPL     .+4             ;BR IF NOT
065730  000000                          HALT                    ;DEPRESS CONTINUE TO RESUME TEST
                                                                ;AFTER THE HALT THE ADDRESS DISPLAY
                                                                ;CONTAINS #(7$+10) AND THE DATA DISP-
                                                                ;LAY CONTAINS THE NUMBER OF THE FAIL-
                                                                ;ING TEST
065732  062716  000002                  ADD     #2,(SP)         ;MOVE RETURN PC AROUND RN
065736  042766  000020  000002          BIC     #20,2(SP)       ;CLEAR 'T'' BIT ON STACK IN CASE THIS
                                                                ;ERROR OCCURRED IN 'T'' BIT TESTS
065744  000002                          RTI                     ;RETURN TO INSTRUCTION AFTER ERROR

                                        ;CONVERSION AND OUTPUT CALLS

065746  004737  065760          8$:     JSR     PC,@#OTA                ;CONVERT [R2] TO SIX ASCII CHARS.
065752  104400                          TYPE                    ;CALL THE TYPE UTILITY
065754  067136                          DIGITS                  ;ADDRESS OF THE ASCII BUFFER
065756  000207                          RTS     PC              ;RETURN TO CALLER ABOVE
```

```
                                        ; ***********************************************************************
                                                .SBTTL OCTAL TO ASCII CONVERSION ROUTINE
                                        ; ***********************************************************************

                                        ;THIS ROUTINE CONVERTS THE 16 BIT OCTAL NUMBER IN R2 TO ITS 6 CHAR.
                                        ;ASCII EQUIVALENT AND STORES THE CHARACTERS IN AN EIGHT CHAR. BUFFER
                                        ;THAT STARTS AT THE ADDRESS TAGGED 'DIGITS' - THE 7TH AND 8TH CHAR.
                                        ;POSITIONS ARE LOADED WITH A SPACE CHAR. FOLLOWED BY A ZERO TERMINATOR
                                        ;BYTE - THE ROUTINE IS CALLED VIA A 'JSR  PC,OTA'

065760  004737  066146                  OTA:    JSR     PC,@#SAVR               ;GO SAVE THE REGISTERS R0 THRU R5
065764  012704  067136                          MOV     #DIGITS,R4      ;SET UP R4 TO POINT TO ASCII BUFFER
065770  005003                                  CLR     R3              ;INITIALIZE R3 FOR USE AS INDEX REG.
                                                                        ;TO ASCII CONVERSION TABLE
065772  010201                                  MOV     R2,R1           ;SAVE ORIGINAL NUMBER IN R1
065774  006302                          1$:     ASL     R2              ;MOST SIGNIFICANT BIT GOES INTO 'C'
065776  006103                                  ROL     R3              ;R3 CONTAINS THE MOST SIGNIFICANT BIT
066000  012700  000006                          MOV     #6,R0           ;COUNT SIX DIGITS CONVERSION
066004  000404                                  BR      3$              ;CONVERT AND LOAD THE 1ST DIGIT
066006  006302                          2$:     ASL     R2              ;SHIFT BITS OUT OF R2 INTO 'C'
066010  006103                                  ROL     R3              ;SHIFT 'C' INTO THE LSB POS. OF R3
066012  005301                                  DEC     R1              ;COUNT ONE BIT SHIFTED
066014  001374                                  BNE     2$              ;BR UNTIL 3 BITS SHIFTED
066016  012701  000003                  3$:     MOV     #3,R1           ;INITIALIZE BIT SHIFT COUNTER
066022  116324  066644                          MOVB    DIGTAB(R3),(R4)+;MOVE CHAR. TO DIGIT BUFFER
066026  005003                                  CLR     R3              ;CLEAR INDEX TO CONVERSION TABLE
066030  005300                                  DEC     R0              ;COUNT ONE CHAR.
066032  001365                                  BNE     2$              ;BR UNTIL 6 CHARS CONVERTED
066034  004737  066166                          JSR     PC,@#RESTR      ;GO RESTORE THE REGS
066040  000207                                  RTS     PC              ;RETURN TO CALLER
```

```
                                        ; ***********************************************************************
                                                .SBTTL PRINT SUBROUTINE
                                        ; ***********************************************************************

                                        ;THIS ROUTINE IS CALLED TO PRINT ALL ASCII MESSAGES - IT IS CALLED VIA
                                        ;A TYPE = TRAP = 104400 INSTRUCTION AS SHOWN BELOW:

                                                ;TYPE
                                                ;ADDR

                                                ;WHERE ''ADDR'' IS THE STARTING ADDRESS OF THE MESSAGE BUFFER
                                                ;TO BE PRINTED - THE SUBROUTINE WILL CONTINUE TO PRINT CHAR-
                                                ;ACTERS UNTIL IT FINDS A ''000'' BYTE TERMINATOR

                                        ;IF FILLER CHARACTERS ARE REQUIRED THE LOCATION TAGGED ''FILLS'' MUST
                                        ;CONTAIN THE FOLLOWING INFORMATION:

                                                ;FILLS - ODD BYTE = NO. OF FILLERS REQUIRED
                                                ;FILLS - EVEN BYTE = FILLER CHARACTER DESIRED

                                                ;THE DEFAULT VALUE OF FILLS IS 0,0

066042  005137  066674                  PRINA:  COM     @#PRIFLG                ;THESE TWO INSTRUCTIONS ARE
066046  000002                                  RTI                             ;USED BY THE BASIC TESTS TO VERIFY
                                                                                ;THE TRAP INSTRUCTION

066050  010046                          PRINT:  MOV     R0,-(SP)                ;SAVE R0 ON THE STACK
066052  017600  000002                          MOV     @2(SP),R0               ;SET R0 TO POINT TO THE MESSAGE BUFFER
066056  062766  000002  000002                  ADD     #2,2(SP)                ;ADJUST THE RETURN PC TO POINT TO THE
                                                                                ;INSTRUCTION FOLLOWING THE CALL
066064  112046                          1$:     MOVB    (R0)+,-(SP)             ;PUSH CHAR. TO BE TYPED ON THE STACK
                                                                                ;AND UPDATE THE BUFFER POINTER
066066  001003                                  BNE     2$                      ;BRANCH IF NOT A 000 TERMINATOR
066070  005726                                  TST     (SP)+                   ;POP TERMINATOR OFF THE STACK
066072  012600                                  MOV     (SP)+,R0                ;RESTORE THE ORIGINAL R0
066074  000002                                  RTI                             ;RETURN TO CALLER
066076  004737  066130                  2$:     JSR     PC,@#5$                 ;GO TYPE THE CHARACTER
066102  122726  000012                  3$:     CMPB    #12,(SP)+               ;WAS CHAR TYPED A LINE FEED ?
066106  001366                                  BNE     1$                      ;BRANCH IF NOT
066110  013746  066660                          MOV     @#FILLS,-(SP)           ;GET THE FILLER COUNT AND CHARACTER
066114  105366  000001                  4$:     DECB    1(SP)                   ;COUNT ONE FILLER OUT
066120  002770                                  BLT     3$                      ;BR IF NO MORE FILLERS NEEDED
066122  004737  066130                          JSR     PC,@#5$                 ;GO TYPE THE FILLER
066126  000772                                  BR      4$                      ;GO COUNT AND TEST FILLER COUNT

066130  105737  177564                  5$:     TSTB    @#XCSR                  ;OUTPUT DEVICE READY
066134  100375                                  BPL     5$                      ;BRANCH BACK IF NOT READY - NOTE THE
                                                                                ;PROGRAM WILL HANG HERE IN THE EVENT THAT
                                                                                ;THE DL11 READY LOGIC FAILS DURING RUN
066136  116637  000002  177566                  MOVB    2(SP),@#XDBR            ;OUTPUT THE CHARACTER
066144  000207                                  RTS     PC                      ;RETURN TO CALLER
```

```
                                        ; ***********************************************************
                                                .SBTTL SAVE REGISTER SUBROUTINE
                                        ; ***********************************************************

                                        ;THIS ROUTINE IS CALLED BY THE ''DTA'' UTILITY AND WILL SAVE GENERAL
                                        ;REGISTERS R0 THRU R5 ON THE PROCESSOR STACK

066146  010546                          SAVR:   MOV     R5,-(SP)        ;PUSH R5 ON THE STACK
066150  010446                                  MOV     R4,-(SP)        ;PUSH R4
066152  010346                                  MOV     R3,-(SP)        ;PUSH R3
066154  010246                                  MOV     R2,-(SP)        ;PUSH R2
066156  010146                                  MOV     R1,-(SP)        ;PUSH R1
066160  010046                                  MOV     R0,-(SP)        ;PUSH R0
066162  016607  000014                          MOV     14(SP),PC       ;RETURN TO THE INSTRUCTION THAT
                                                                        ;FOLLOWS THE ''JSR PC,SAVR'' CALL
```

```
                                        ; ***************************************************************
                                                .SBTTL RESTORE REGISTERS SUB-ROUTINE
                                        ; ***************************************************************

                                        ;THIS ROUTINE COMPLEMENTS THE SAVE REGISTER ROUTINE AND WILL RESTORE
                                        ;GENERAL REGISTERS R0 THRU R5 FROM THE STACK - IT IS CALLED VIA A
                                        ;JSR    PC,RESTR.

066166  012666  000014                  RESTR:  MOV     (SP)+,14(SP)    ;REPOSITION THE RETURN PC ON THE STACK
066172  012600                                  MOV     (SP)+,R0        ;RESTORE R0 - R5
066174  012601                                  MOV     (SP)+,R1
066176  012602                                  MOV     (SP)+,R2
066200  012603                                  MOV     (SP)+,R3
066202  012604                                  MOV     (SP)+,R4
066204  012605                                  MOV     (SP)+,R5
066206  000207                                  RTS     PC              ;RETURN TO THE INSTRUCTION THAT
                                                                        ;FOLLOWS THE ''JSR RESTR'' CALL
```

```
                                        ; ***********************************************************************
                                                .SBTTL ROUTINES TO CHECK FOR AND FLAG 11/40 OPTIONS
                                        ; ***********************************************************************

066210  005737  066670          TSTOPT: TST     @#PASCNT        ;1ST PASS ??
066214  001027                          BNE     1$              ;BR IF NOT
066216  005037  066636                  CLR     @#OPTION        ;CLEAR THE OPTION FLAG WORD
066222  032737  010000  177570          BIT     #SW12,@#SR      ;INHIBIT PRINTING ??
066230  001002                          BNE     .+6             ;BR IF YES
066232  104400                          TYPE                    ;TYPE OPTIONS AVAIL. HEADER
066234  067246                          OPT1
066236  004737  066276                  JSR     PC,@#CHKKT      ;GO TEST FOR KT11-D OPTION
066242  004737  066352                  JSR     PC,@#CHKKJ      ;GO TEST FOR KJ11-A OPTION
066246  004737  066426                  JSR     PC,@#CHKKF      ;GO TEST FOR KE11-F OPTION
066252  004737  066504                  JSR     PC,@#CHKKE      ;GO TEST FOR KE11-E OPTION
066256  004737  066562                  JSR     PC,@#CHKKW      ;GO TEST FOR KW11-L OPTION
066262  005737  066636                  TST     @#OPTION        ;ANY OPTIONS FOUND
066266  001002                          BNE     1$              ;BR IF YES
066270  104400                          TYPE                    ;GO TYPE 'NONE''
066272  067401                          OPT7
066274  000207                  1$:     RTS     PC              ;RETURN TO ''CIT'' START-UP

066276  013704  000004          CHKKT:  MOV     @#4,R4          ;SAVE THE TIMEOUT VECTOR
066302  012737  066340  000004          MOV     #1$,@#4         ;GO TO 1$ IF TRAP OCCURS
066310  005737  177572                  TST     @#177572        ;REFERENCE KT11 SR0
066314  052737  000200  066636          BIS     #200,@#OPTION   ;SET BIT7 IF KT IS THERE
066322  032737  010000  177570          BIT     #SW12,@#SR      ;INHIBIT PRINTING ?
066330  001002                          BNE     .+6             ;BR IF YES
066332  104400                          TYPE                    ;GO TYPE 'KT11-D''
066334  067312                          OPT2
066336  000402                          BR      2$
066340  062706  000004          1$:     ADD     #4,SP           ;FIX UP THE SP
066344  010437  000004          2$:     MOV     R4,@#4          ;RESTORE THE TIMEOUT VECTOR
066350  000207                          RTS     PC              ;RETURN TO TSTOPT ROUTINE

066352  013704  000004          CHKKJ:  MOV     @#4,R4          ;SAVE THE TIMEOUT VECTOR
066356  012737  066414  000004          MOV     #1$,@#4         ;GO TO 1$ IF TRAP OCCURS
066364  005737  177774                  TST     @#177774        ;REFERENCE KJ11 REG.
066370  052737  000004  066636          BIS     #4,@#OPTION     ;SET BIT2 IF KJ IS THERE
066376  032737  010000  177570          BIT     #SW12,@#SR      ;INHIBIT PRINTING ?
066404  001002                          BNE     .+6             ;BR IF YES
066406  104400                          TYPE                    ;GO TYPE 'KJ11-A''
066410  067325                          OPT3
066412  000402                          BR      2$
066414  062706  000004          1$:     ADD     #4,SP           ;FIX UP THE SP
066420  010437  000004          2$:     MOV     R4,@#4          ;RESTORE THE TIMEOUT VECTOR
066424  000207                          RTS     PC              ;RETURN TO TSTOPT ROUTINE


066426  013704  000010          CHKKF:  MOV     @#10,R4         ;SAVE THE RSVD INSTR VECTOR
066432  012737  066472  000010          MOV     #1$,@#10        ;GO TO 1$ IF TRAP OCCURS
066440  012702  067560                  MOV     #MBUF0,R2       ;SET UP FOR FADD TRY
066444  075002                          FADD    R2              ;TEST FOR THE KE11-F OPTION
066446  052737  000002  066636          BIS     #2,@#OPTION     ;SET BIT1 IF IT RESPONDS
066454  032737  010000  177570          BIT     #SW12,@#SR      ;INHIBIT PRINTING ?
066462  001002                          BNE     .+6             ;BR IF YES
```

```
066464  104400                          TYPE                            ;GO TYPE 'KE11-F''
066466  067340                          OPT4
066470  000402                          BR      2$
066472  062706  000004          1$:     ADD     #4,SP                   ;FIX UP THE SP
066476  010437  000010          2$:     MOV     R4,@#10                 ;RESTORE THE RSVD INSTR VECTOR
066502  000207                          RTS     PC                      ;RETURN TO TSTOPT ROUTINE

066504  013704  000010          CHKKE:  MOV     @#10,R4                 ;SAVE THE RSVD INSTR VECTOR
066510  012737  066550  000010          MOV     #1$,@#10                ;GO TO 1$ IF TRAP OCCURS
066516  005001                          CLR     R1                      ;SET UP TO TRY ASH INSTR.
066520  005002                          CLR     R2
066522  072201                          ASH     R1,R2                   ;TRY A KE INSTR
066524  052737  000001  066636          BIS     #1,@#OPTION             ;SET BIT0 IF KE IS THERE
066532  032737  010000  177570          BIT     #SW12,@#SR              ;INHIBIT PRINTING ?
066540  001002                          BNE     .+6                     ;BR IF YES
066542  104400                          TYPE                            ;GO TYPE 'KE11-E''
066544  067353                          OPT5
066546  000402                          BR      2$
066550  062706  000004          1$:     ADD     #4,SP                   ;FIX UP THE SP
066554  010437  000010          2$:     MOV     R4,@#10                 ;RESTORE THE RSVD INSTR VECTOR
066560  000207                          RTS     PC                      ;RETURN TO TSTOPT ROUTINE

066562  013704  000004          CHKKW:  MOV     @#4,R4                  ;SAVE THE TIMEOUT VECTOR
066566  012737  066624  000004          MOV     #1$,@#4                 ;GO TO 1$ IF TRAP OCCURS
066574  005737  177546                  TST     @#177546                ;REFERENCE KW11-L CSR
066600  052737  100000  066636          BIS     #100000,@#OPTION;SET BIT15 IF KW IS THERE
066606  032737  010000  177570          BIT     #SW12,@#SR              ;INHIBIT PRINTING ?
066614  001002                          BNE     .+6                     ;BR IF YES
066616  104400                          TYPE                            ;GO TYPE 'KW11-L''
066620  067366                          OPT6
066622  000402                          BR      2$
066624  062706  000004          1$:     ADD     #4,SP                   ;FIX UP THE SP
066630  010437  000004          2$:     MOV     R4,@#4                  ;RESTORE THE TIMEOUT VECTOR
066634  000207                          RTS     PC                      ;RETURN TO TSTOPT ROUTINE
```

```
                                ;FLAGS, CONSTANTS, AND VARIABLES

066636  000000                  OPTION: 0                       ;SET UP ON ENTRY TO "CIT" SECTION TO
                                                                ;SPECIFY OPTIONS INSTALLED:
                                                                ;BIT15=1 KW11-L INSTALLED
                                                                ;BIT07=1 KT11-D INSTALLED
                                                                ;BIT02=1 KJ11-A INSTALLED
                                                                ;BIT01=1 KE11-F INSTALLED
                                                                ;BIT00=1 KE11-E INSTALLED
066640  000000                  COLCNT: 0                       ;USED BY ERROR SERVICE TO STORE COLUMN COUNT
066642  000000                  BPTLOC: 0                       ;STORES 16 USER DEFINED MAINTENANCE
                                                                ;BREAKPOINTS
066644  030460                  DIGTAB: '01                     ;OCTAL TO ASCII CONVERSION TABLE
066646  031462                          '23
066650  032464                          '45
066652  033466                          '67
066654  000000                  RETURN: 0                       ;USED BY SCOPE TO STORE RETURN ADDRESS
066656  000000                  ERRTN:  0                       ;USED BY ERROR SERV. TO STORE ERROR RETURN ADDR.
066660  002400                  FILLS:  02400                   ;STORES FILL CHAR AND FILL COUNT
066662  000001                  ICOUNT: 1                       ;ITERATION COUNTERS
066664  000001                  ITCNT:  1
066666  000000                  ERRCNT: 0                       ;STORES TOTAL ERROR COUNT
066670  000000                  PASCNT: 0                       ;STORES TOTAL NO. OF PASSES
066672  000000                  PFCNT:  0                       ;KEEPS COUNT OF # OF PWRFAILS
066674  000000                  PRIFLG: 0                       ;FLAG USED BY BASIC TESTS FOR TRAP TEST
066676  000000                  ERRFLG: 0                       ;FLAG USED BY BASIC TESTS FOR EMT TEST
066700  000000                  SELTST: 0                       ;STORES SR<8:0> FOR LOOP ON SELECTED TEST
066702  000000                  SCOFLG: 0                       ;USED BY BASIC TESTS FOR IOT TEST
066704  000000                  FIRST:  0                       ;CONTAINS FIRST TEST # LOGGED IN MISSED TEST TABLE
066706  000000                  LAST:   0                       ;CONTAINS LAST TEST # LOGGED IN MISSED TEST TABLE
066710  000000                  MISFLG: 0                       ;FLAGS MISSED TEST ERROR HEADER PRINTED
066712  000000                  RSVFLG: 0                       ;FLAG USED BY BASIC TEST OF RSVD INSTR TRAP
066714  000000                  BERFLG: 0                       ;FLAG USED BY BASIC TEST OF BUS ERROR TRAPS
066716  000000                  ERFLG1: 0                       ;ALLOWS ONLY 1 ERROR HEADER PER PASS
066720  000000                  CATERR: 0                       ;FLAGS USED BY BUS ERROR AND RSVD INSTR TRAP
                                                                ;SERVICE ROUTINES
066722  000000                  ONCE:   0                       ;FLAGS PROGRAM TITLE HAS BEEN PRINTED
```

```
                                        ;MESSAGE TABLES

                                        .EVEN
066724  000007                          BELL:   7
066726  005015                          CRLF:   5015
066730  000000                                  0
066732                                  ERHDR1:
066732  005015  024040  041520          .ASCIZ  <15><12>' (PC)    (PS)    (SP)    TEST    (IR)    DEST    WAS     S / B '
066740  020051  020040  024040
066746  051520  020051  020040
066754  024040  050123  020051
066762  020040  052040  051505
066770  020124  020040  024040
066776  051111  020051  020040
067004  042040  051505  020124
067012  020040  053440  051501
067020  020040  020040  051440
067026  027440  041040  000040
067034                                  ERHDR2:
067034  005015  024040  033522          .ASCIZ <15><12>' (R7)    (PSW)   (R6)    (R0)    (R1)    (R2)    (R3)    (R4)'<15><12>
067042  020051  020040  024040
067050  051520  024527  020040
067056  024040  033122  020051
067064  020040  024040  030122
067072  020051  020040  024040
067100  030522  020051  020040
067106  024040  031122  020051
067114  020040  024040  031522
067122  020051  020040  024040
067130  032122  006451  000012
067136  030060  030060  030060          DIGITS: .ASCIZ  '000000  '
067144  020040     000
067147     015  050012  051501          EOP1:   .ASCIZ  <15><12>'PASCNT = '
067154  047103  020124  020075
067162     000
067163     040  050040  041506          PFMESS: .ASCIZ  '  PFCNT = '
067170  052116  036440  000040
067176  020040  051105  041522          EOP2:   .ASCIZ '  ERRCNT = '
067204  052116  036440  000040
067212  005015  041103  042521          IDENT1: .ASCIZ <15><12>'CBQEAC0 KD11-A CPU DIAG'<15><12>
067220  041501  020060  042113
067226  030461  040455  041440
067234  052520  042040  040511
067242  006507  000012
067246  005015  042120  030520          OPT1:   .ASCIZ  <15><12>'PDP11/40 INTERNAL OPTIONS FOUND'<15><12>
067254  027461  030064  044440
067262  052116  051105  040516
067270  020114  050117  044524
067276  047117  020123  047506
067304  047125  006504  000012
067312  005015  052113  030461          OPT2:   .ASCIZ  <15><12>'KT11-D'<15><12>
067320  042055  005015     000
067325     015  045412  030512          OPT3:   .ASCIZ  <15><12>'KJ11-A'<15><12>
067332  026461  006501  000012
067340  005015  042513  030461          OPT4:   .ASCIZ  <15><12>'KE11-F'<15><12>
067346  043055  005015     000
```

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27064  067353     015  045412  030505  OPT5:    .ASCIZ  <15><12>'KE11-E'<15><12>
27065  067360  026461  006505  000012
27066  067366  005015  053513  030461  OPT6:    .ASCIZ  <15><12>'KW11-L'<15><12>
27067  067374  046055  005015     000
27068  067401     015  047012  047117  OPT7:    .ASCIZ  <15><12>'NONE FOUND'
27069  067406  020105  047506  047125
27070  067414  000104
27071  067416  005015  047520  042527  PFMSG:   .ASCIZ <15><12>'POWER' <15><12>
27072  067424  006522  000012
27073  067430  005015  051124  050101  BEMSG:   .ASCIZ <15><12>'TRAPPED TO 4 PC = '
27074  067436  042520  020104  047524
27075  067444  032040  050040  020103
27076  067452  020075     000
27077  067455     015  046412  051511  MISHDR: .ASCIZ <15><12>'MISSED TESTS'<15><12>
27078  067462  042523  020104  042524
27079  067470  052123  006523  000012
27080  067476  005015  051124  050101  RSMSG:   .ASCIZ <15><12>'TRAPPED TO 10 PC = '
27081  067504  042520  020104  047524
27082  067512  030440  020060  041520
27083  067520  036440  000040
27084                                  .EVEN
```

```
                                ;COMMON DATA STRUCTURES AND MISCELLANEOUS TABLES

067524  177400                  OBUF:   177400                  ;DL11 OUTPUT TEST BUFFER
067526  177400                          177400
067530  177400                          177400
067532  177400                          177400

067534  000004                  IBUF:   .BLKW   4               ;DL11 INPUT TEST BUFFER

067544  067570                  ATA:    DWTA
067546  070114                          DWTB
067550  070130                          DBTA
067552  070134                          DBTB
067554  067560                          MBUF0
067556  067564                          MBUF1

067560  000000                  MBUF0:  0
067562  000000                          0
067564  000000                  MBUF1:  0
067566  000000                          0
067570  000000                  DWTA:   0
067572  177777                          -1
067574  177400                          177400
067576  000377                          377
067600  125252                          125252
067602  052525                          052525

                                ;THIS TABLE OF 8 ENTRIES IS USED BY THE ALU ADD TEST IN THE
                                ;COMBINED INSTRUCTION TESTS

067604  000000                  ALUADD: 000000                  ;NULL
067606  000000                          000000                  ;SRC OP1
067610  000000                          000000                  ;DST OP1
067612  000000                          000000                  ;ANS1
067614  177777                          177777                  ;SRC OP2
067616  177777                          177777                  ;DST OP2
067620  177776                          177776                  ;ANS2
067622  125252                          125252                  ;SRC OP3
067624  052525                          052525                  ;DST OP3
067626  177777                          177777                  ;ANS3
067630  052525                          052525                  ;SRC OP4
067632  125252                          125252                  ;DST OP4
067634  177777                          177777                  ;ANS4
067636  125252                          125252                  ;SRC OP5
067640  125252                          125252                  ;DST OP5
067642  052524                          052524                  ;ANS5
067644  052525                          052525                  ;SRC OP6
067646  052525                          052525                  ;DST OP6
067650  125252                          125252                  ;ANS6
067652  052525                          052525                  ;SRC OP7
067654  125253                          125253                  ;DST OP7
067656  000000                          000000                  ;ANS7
067660  125253                          125253                  ;SRC OP8
067662  052525                          052525                  ;DST OP8
067664  000000                          000000                  ;ANS8
```

```
                                        ;THIS TABLE OF 8 ENTRIES IS USED BY THE ALU ''AND'' TESTS IN THE
                                        ;COMBINED INSTRUCTION EXERCISER TESTS

067666  000000                          ANDTAB: 000000                  ;NULL ENTRY
067670  000000                                  000000                  ;SRC OP1
067672  000000                                  000000                  ;DEST OP1
067674  000000                                  000000                  ;ANS1
067676  177777                                  177777                  ;SRC OP2
067700  177777                                  177777                  ;DST OP2
067702  000000                                  000000                  ;ANS2
067704  000000                                  000000                  ;SRC OP3
067706  177777                                  177777                  ;DST OP3
067710  177777                                  177777                  ;ANS3
067712  177777                                  177777                  ;SRC OP4
067714  000000                                  000000                  ;DST OP4
067716  000000                                  000000                  ;ANS4
067720  125252                                  125252                  ;SRC OP5
067722  125252                                  125252                  ;DST OP5
067724  000000                                  000000                  ;ANS5
067726  052525                                  052525                  ;SRC OP6
067730  052525                                  052525                  ;DST OP6
067732  000000                                  000000                  ;ANS6
067734  125252                                  125252                  ;SRC OP7
067736  052525                                  052525                  ;DST OP7
067740  052525                                  052525                  ;ANS7
067742  052525                                  052525                  ;SRC OP8
067744  125252                                  125252                  ;DST OP8
067746  125252                                  125252                  ;ANS8

                                        ;THIS TABLE OF 8 ENTRIES IS USED BY THE ALU ''OR'' TEST IN THE
                                        ;COMBINED INSTRUCTION EXERCISER TEST

067750  000000                          ORTAB:  000000                  ;NULL ENTRY
067752  000000                                  000000                  ;SRC OP1
067754  000000                                  000000                  ;DEST OP1
067756  000000                                  000000                  ;ANS1
067760  177777                                  177777                  ;SRC OP2
067762  177777                                  177777                  ;DST OP2
067764  177777                                  177777                  ;ANS2
067766  000000                                  000000                  ;SRC OP3
067770  177777                                  177777                  ;DST OP3
067772  177777                                  177777                  ;ANS3
067774  177777                                  177777                  ;SRC OP4
067776  000000                                  000000                  ;DST OP4
070000  177777                                  177777                  ;ANS4
070002  125252                                  125252                  ;SRC OP5
070004  125252                                  125252                  ;DST OP5
070006  125252                                  125252                  ;ANS5
070010  052525                                  052525                  ;SRC OP6
070012  052525                                  052525                  ;DST OP6
070014  052525                                  052525                  ;ANS6
070016  125252                                  125252                  ;SRC OP7
070020  052525                                  052525                  ;DST OP7
070022  177777                                  177777                  ;ANS7
070024  052525                                  052525                  ;SRC OP8
```

```
070026  125252                          125252                  ;DST OP8
070030  177777                          177777                  ;ANS8


                                ;THIS TABLE OF 8 ENTRIES IS USED BYTHE ALU SUB TEST IN THE
                                ;COMBINED INSTRUCTION EXERCISER TESTS

070032  000000                  ALUSUB: 000000                  ;NULL
070034  000000                          000000                  ;SRC OP1
070036  000000                          000000                  ;DST OP1
070040  000000                          000000                  ;ANS1
070042  177777                          177777                  ;SRC OP2
070044  177777                          177777                  ;DST OP2
070046  000000                          000000                  ;ANS2
070050  125252                          125252                  ;SRC OP3
070052  052525                          052525                  ;DST OP3
070054  125253                          125253                  ;ANS3
070056  052525                          052525                  ;SRC OP4
070060  125252                          125252                  ;DST OP4
070062  052525                          052525                  ;ANS4
070064  125252                          125252                  ;SRC OP5
070066  125252                          125252                  ;DST OP5
070070  000000                          000000                  ;ANS5
070072  052525                          052525                  ;SRC OP6
070074  052525                          052525                  ;DST OP6
070076  000000                          000000                  ;ANS6
070100  052525                          052525                  ;SRC OP7
070102  125253                          125253                  ;DST OP7
070104  052526                          052526                  ;ANS7
070106  125253                          125253                  ;SRC OP8
070110  052525                          052525                  ;DST OP8
070112  125252                          125252                  ;ANS8

070114  000000                  DWTB:   0
070116  000001                          1
070120  000400                          400
070122  177401                          177401
070124  052526                          52526
070126  125253                          125253

                                .EVEN
070130                          DBTA:
070130     000     377     252  .BYTE   000,377,252,125
070133     125
070134                          DBTB:
070134     000     001     120  .BYTE   000,001,120,253
070137     253
070140  001022                  STAB1:  .BLKB   530.            ;RESERVE 530. BYTE TABLE FOR
                                                                ;LOGGING ANY MISSED TESTS
071162  000000                  STAB2:  0

        000001                  .END
```

ALUADD	067604	25939	25941	27115#										
ALUSUB	070032	26009	26011	27204#										
ANDTAB	067666	26082	26084	27145#										
ATA	067544	5391	5492	5504	5535	5598	5629	5709	5746	5781	5794	5821	5833	5861
		14196	14208	14242	14254	14284	14297	14327	14339	14369	14382	14412	14448	14485
		14522	14559	14605	14651	14652	14667	14697	14698	14713	14743	14789	14835	14836
		14851	14881	14882	14897	14928	14967	15006	15045	16093	16106	16180	16193	16262
		16716	16731	16772	16787	16826	16842	16882	16898	17159	17174	17215	17230	17269
		17285	17325	17341	17582	17635	17684	17734	17856	17931	18342	18347	18433	18438
		18517	18632	20494	20571	20649	27094#							
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A0636	047644	21523	21533#	
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A0646	050414	21878#	21887	
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XDBR  = 177566           2950#  26843*
.     = 071164           2579#   2608    2615    2622    2624    2631    2638    2645    2652    2654    2656    2658    2660
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                         2688    2690    2692    2694    2696    2698    2700    2703    2705    2707    2709    2711    2713
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                         2767    2769    2771    2773    2775    2777    2779    2781    2783    2785    2787    2789    2791
                         2793    2795    2797    2799    2801    2803    2805    2807    2809    2811    2813    2815    2817
                         2819    2821    2823    2825    2827    2829    2831    2833    2835    2837    2839    2841    2843
                         2845    2847    2849    2851    2853    2855    2857    2859    2861    2863    2865    2867    2869
                         2871    2873    2875    2877    2879    2881    2883    2885    2887    2889    2891    2951#   4152#
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                        26963   27092#  27243#

. ABS.  071164     000

ERRORS DETECTED:  0

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RUN-TIME: 89 158 34 SECONDS
RUN-TIME RATIO: 521/282=1.8
CORE USED:  42K  (83 PAGES)
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