DV11

FREE RUNNING ROM 1

MD-11-DZDVC-C

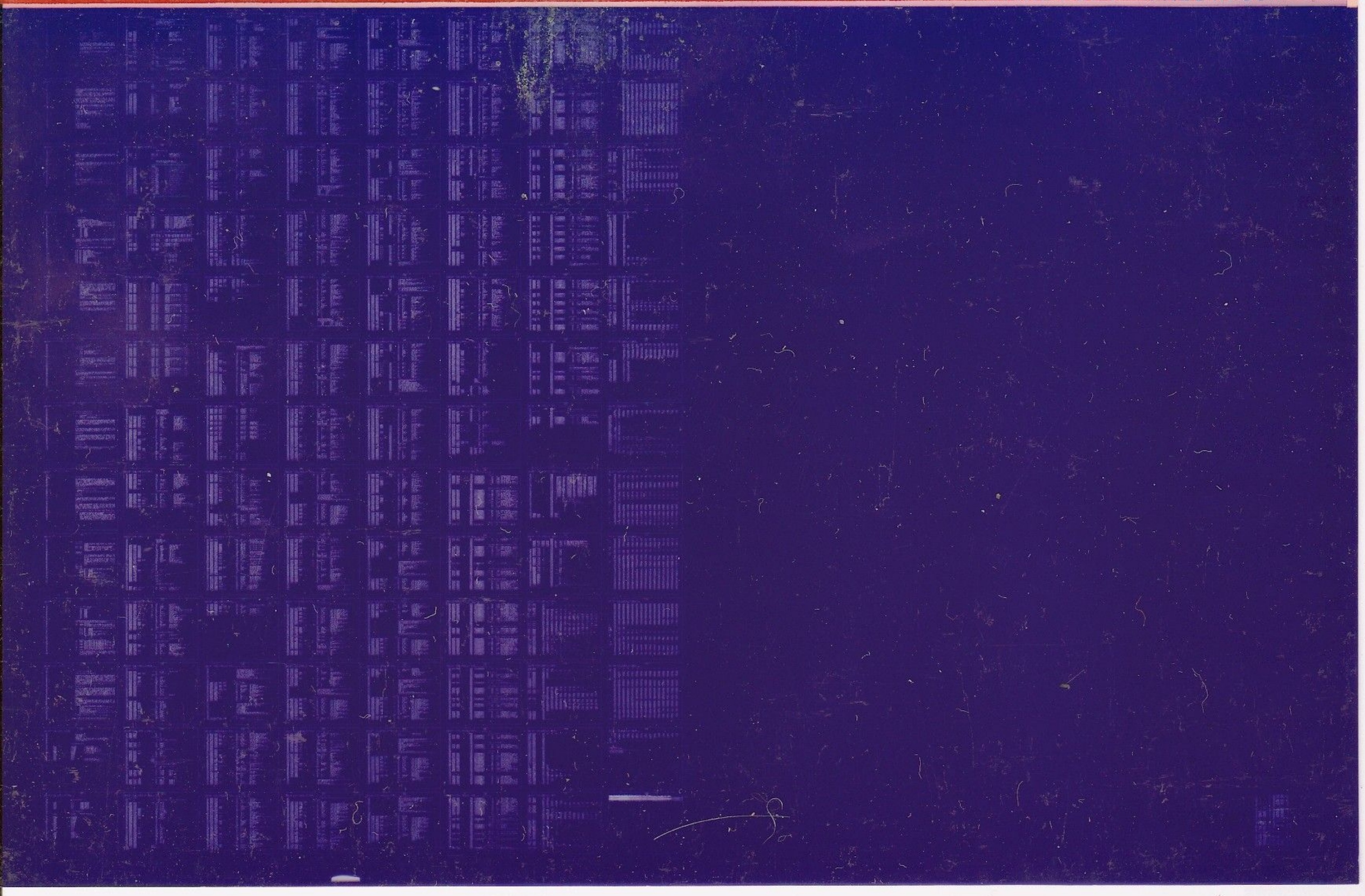
EP-DZDVC-C-DL-A

FICHE 1 OF 1

NOV 1976

digital

MADE IN USA



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IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZDVC-C-D
PRODUCT NAME: "FREE RUNNING" ROM TEST PART 1
DATE RELEASED: 21-APRIL-1976
MAINTAINER: DIAGNOSTICS
AUTHOR: JOHN EGOLF

1. ABSTRACT

THE FUNCTION OF THE DV11 DIAGNOSTICS ARE TO VERIFY THAT THE OPTION OPERATES ACCORDING TO SPECIFICATIONS. THE DIAGNOSTICS VERFIY THAT THERE ARE NO MALFUNCTIONS AND THE ALL OPERATIONS OF THE DV11 ARE CORRECT IN ITS ENVIROMENT.
PARAMETERS MAY BE SET TO ALERT DIAGNOSTICS AS TO THE DV11 CONFIGURATION BY USING THE "TRIAL" PROGRAM (DZDVE SA:210). ALL QUESTIONS SHOULD BE ANSWERED AND THEN EACH DIAGNOSTIC WILL "OVERLAY" THESE PARAMETERS WHICH ARE STORED IN THE "STATUS TABLE" (SEE SECTION 8.4A). THE ALTERNATIVE TO "TRIAL" PROGRAM IS "AUTO SIZING" (SEE SECTION 8.5).

DZDVC FIRST ACTUALLY READS THE DV11 ROMS DATA IN TEST 1 BY THE USE OF DVSCR02 AND A "BRANCH 'A'" TO ADDRESS 0 OF THE ROM. ALL DATA IS COMPARED TO CORE IMAGE. FROM TEST 2 ON; THE DV11 MICRO PROCESSOR IS ALLOWED TO "FREE RUN" (MAY THE DV11 HAVE MERCY ON YOU) AND DV11 FUNCTIONS ARE NOW TESTED. THINGS LIKE CURRENT ADDRESS INCREMENTING,BYTE COUNT INCREMENTING, SILO ENTRIES, ETC. ARE NOW CHECKED.

CURRENTLY THERE ARE SIX OFF LINE DIAGNOSTICS THAT ARE TO BE RUN IN SEQUENCE TO INSURE THAT IF AN ERROR SHOULD OCCUR IT WILL BE DETECTED AT AN EARLY STAGE AND INSURING THAT DIAGNOSIS OF ERROR WILL BE IMMEDIATE TO PROBLEM
NOTE: ADDITIONAL DIAGNOSTICS MAY BE ADDED IN THE FUTURE.

THE SIX DIAGNOSTICS ARE:
1. DZDVA [REV] BASIS R/W TEST AND ROM INSTRUCTION EXERCISER.,
2. DZDVB [REV] STATIC LINE CARD TESTS.
3. DZDVC [REV] 'FREE RUNNING' ROM TESTS PART 1.
4. DZDVD [REV] 'FREE RUNNING' ROM TESTS PART 2.
5. DZDVE [REV] MODEM CONTROL AND CABLE TESTS PLUS MANUAL PARAMETER INPUT. [TRIAL PROGRAM]
6. DZDVF [REV] ASYNCHRONOUS LINE CARD TESTS.

2. REQUIREMENTS

2.1 EQUIPMENT

ANY PDP11 FAMILY CPU (WITH MINIMUM 8K MEMORY)
ASR 33 (OR EQUILIVALENT)
DV11-AA MUX CNTRL UNIT
AT LEAST ONE OF THE FOLLOWING
DV11-BA 8 LINE SYNC MODULES
DV11-BB 8 LINE ASYNC MODULES
DV11-BC 4 SYNC LINES, 4 ASYNC LINES

2.2 STORAGE

PROGRAM WILL USE ALL 8K OF MEMORY EXCEPT WHERE ABL AND BOOTSTRAP LOADER RESIDE. LOCATION 1500 THRU 1736 ARE ESPECIALLY TO BE NOTED AND TO BE UNTOUCHED BY OPERATOR AFTER DV11 TRIAL PROGRAM HAS BEEN EXECUTED; OR AFTER THE 'AUTO SIZING' HAS BEEN DONE.

3. LOADING PROCEEDURE

3.1 METHOD

ALL PROGRAMS ARE IN ABSOLUTE FORMAT AND ARE LOADED USING THE ABSOLUTE LOADER. NOTE: IF THE DIAGNOSTICS ARE ON A MEDIA SUCH AS DISK ,MAGTAPE,DECTAPE, OR CASSETTE; FOLLOW INSTRUCTIONS FOR THE MONITOR WHICH HAS BEEN PROVIDED ON THAT SPECIFIC MEDIA.

ABSOLUTE LOADER STARTING ADDRESS *500

MEMORY * SIZE

4K	17
8K	37
12K	57
16K	77
20K	117
24K	137
28K	157

3.1.1 PLACE ADDRESS OF ABS LOADER INTO SWITCH REGISTER.
(ALSO PLACE 'HALT' SW UP)

3.1.2 DEPRESS 'LOAD ADDRESS' KEY ON CONSOLE AND RELEASE.

3.1.3 DEPRESS 'START KEY' ON CONSOLE AND RELEASE (PROGRAM SHOULD NOW BE LOADING INTO CPU)

4. STARTING PROCEEDURE

A. SET SWITCH REGISTER TO 000200
B. DEPRESS 'LOAD ADDRESS' KEY AND RELEASE
C. SET SWR TO ZERO FOR 'AUTO SIZING' OR LEAVE
LEAVE SWR BIT 7=1 TO USE EXISTING PARAMETERS SET UP BY DV11 TRIAL PROGRAM OR A PREVIOUSLY RUN DV11 DIAGNOSTIC THAT USED THE 'AUTO SIZING'.(SECTION 7.2 AND 8.4,8.5 MAY BE HELPFUL)
D. DEPRESS 'START KEY' AND RELEASE THE PROGRAM WILL TYPE MAINDEC NAME AND PROGRAM NAME (IF THIS WAS THE FIRST START UP OF THE PROGRAM) AND ALSO THE FOLLOWING:

```
'MAP OF DV11 STATUS'
1500    175000
1502    000300
1504    000226
1506    000062
1510    000226
1512    000062
1514    000226
1516    000062
1520    000226
1522    000062
```

THE ABOVE IS ONLY AN EXAMPLE! THIS WOULD INDICATE THE STATUS TABLE STARTING AT ADD. 1500 IN THE PROGRAM. THE STATUS TABLE MUST BE VERIFIED BY THE USER IF AUTO SIZING IS DONE. FOR INFORMATION OF STATUS TABLE SEE SECTION 8.4 FOR HELP.

THE PROGRAM WILL TYPE 'R' AND PROCEED TO RUN THE DIAGNOSTIC

4.1 CONTROL SWITCH SETTINGS

NOTE: IF THERE IS NO REAL SWR (177570); SWR MAY BE MODIFIED AT LOC:176 OR BY HITTING CONTROL "G" (↑G) ON CONSOLE TERMINAL.

```
SW 15   SET:  HALT ON ERROR
SW 14   SET:  LOOP ON CURRENT TEST
SW 13   SET:  INHIBIT ERROR PRINT OUT
SW 12   SET:  INHIBIT **ALL** TYPE OUT/BELL ON ERROR.
SW 11   SET:  INHIBIT ITERATIONS.  (QUICK PASS)
SW 10   SET:  ESCAPE TO NEXT TEST
SW 09   SET:  LOOP WITH CURRENT DATA
SW 08   SET:  CATCH ERROR AND LOOP ON IT
SW 07   SET:  USE PREVIOUS STATUS TABLE.  CLR-DO AUTO SIZE.
SW 06   SET:  RESERVED
SW 05   SET:  RESERVED
SW 04   SET:  RESERVED
SW 03   SET:  RESERVED
SW 02   SET:  LOCK ON SELECTED TEST
SW 01   SET:  RESTART PROGRAM AT SELECTED TEST
SW 00   SET:  RESELECT DV11'S DESIRED ACTIVE.
```

4.1.2 SWITCH REGISTER RESTRICTIONS

SW 00 RESELECT DV11'S DESIRED ACTIVE. PLEASE NOTE THAT A MESSAGE IS TYPED OUT FOR SETTING THE SWITCH REGISTER EQUAL TO DV11'S ACTIVE. THIS MEANS IF THE SYSTEM HAS FOUR DV11S; BITS 00,01,02,03 WILL BE SET IN LOC 'DVACTV' FROM THE SWITCH REGISTER. USING THIS SWITCH(SW00) ALTERS THAT LOCATION;THEREFORE IF FOUR DV11S ARE IN THE SYSTEM ***DO NOT*** SET SWITCHS GREATER THAN SW 03 IN THE UP POSITION. THIS WOULD BE A FATAL ERROR. DO NOT SELECT MORE ACTIVE DV11S THAN HAS BEEN GIVEN INFORMATION ABOUT IN TRIAL PROGRAM.

METHOD: A: LOAD ADDRESS 200
B: START WITH SW 00=1
C: PROGRAM WILL TYPE MESSAGE
D: SET THE BINARY NUMBER OF DV11S DESIRED ACTIVE EXAMPLE: 1=1 DV11; 3=2 DV11; 7=3 DV11; 17=4 DV11 37=5 DV11 ETC. PRESS CONTINUE.
E: NUMBER (IF VALID) WILL BE IN DATA LIGHTS (EXCLUDING 11/05)
F: SET WITH ANY OTHER SWITCH SETTINGS DESIRED. PRESS CONTINUE.

SW 01 RESTART PROGRAM AT SELECTED TEST IT IS STRONGLY SUGGESTED THAT AT LEAST ONE PASS HASS BEEN MADE BEFORE TRYING TO SELECT A TEST THAT IS NOT IN THE ORDER OF SEQUENCE THE REASON BEING IS THAT THE PROGRAM HAS TO CLEAR AREAS AND SET UP PARAMETERS. ALSO WHEN A TEST IS SELECTED ALWAYS START AT THE VERY BEGINNING OF THAT TEST.

SW 09 LOOP ON CURRENT DATA: THIS SWITCH WILL ONLY WORK IF CALL 'SCOP1' IS IN THAT TEST. THE REASON BEING THAT MOST TESTS DEAL WITH BLOCKS OF DIFFERENT DATA TO BE SENT OR RECEIVED ALL AT ONCE THUS IN BLOCK DATA; ONE PATTERN CANN'T BE SINGLED OUT.

4.1.3 SWITCH REGISTER PRIORITYS

ERROR SWITCHES

1. SW 12 DELETE PRINT OUT/BELL ON ERROR.
2. SW 13 DELETE ERROR PRINTOUT.
3. SW 15 HALT ON THE ERROR.
4. SW 08 GOTO BEGINNING OF THE TEST(ON ERROR).
5. SW 10 GOTO NEXT TEST(ON ERROR).

SCOPE SWITCHES

1. SW 09 (IF ENABLED BY 'SCOP1') ON AN ERROR; IF AN '*' IS PRINTED IN FRONT OF THE TEST NO. (EX. *TEST NO. 10) SW09 IS INCORPORATED IN THAT TEST AND THEREFORE SW09 IS *USUALLY* THE BEST SWITCH FOR THE SCOPE LOOP (SW14=0, SW10=0, SW09=1, SW08=0). IF SW09 IS NOT ENABELED; AND THERE IS A *HARD* ERROR (CONSTANT); SW08 IS BEST.
    (SW14=1,0, SW10=0, SW09=0, SW08=1). FOR INTERMITTEMT ERRORS; SW14=1 WILL LOOP ON TEST REGUARDLESS OF ERROR OR NOT ERROR.
    (SW14=1, SW10=0, SW09=0, SW08=1;0)
2. SW 14
3. SW 11

4.2 STARTING ADDRESS

STARTING ADDRESS IS AT 000200 THERE ARE NO OTHER STARTING ADDRESSES FOR THE DV11 DIAGNOSTICS PREVIOUSLY MENTIONED EXCEPT FOR DIDVE WHICH IS: 000200 FOR THE MODEM CONTROL AND CABLE TESTS AND 000210 FOR THE MANUAL PARAMETER INPUT PROGRAM.

NOTE: IF ADDRESS 000042 IS NON-ZERO THE PROGRAM ASSUMES IT IS UNDER ACT11 OR XXDP CONTROL AND WILL ACT ACCORDINGLY AFTER *ALL* AVAILABLE DV11'S ARE TESTED THE PROGRAM WILL RETURN TO 'XXDP' OR 'ACT-11'.

5. OPERATING PROCEDURE

WHEN PROGRAM IS INITIALLY STARTED MESSAGES AS DESCRIBED IN SECTION FOUR WILL BE PRINTED.

AND PROGRAM WILL BEGIN RUNNING THE DIAGNOSTIC

5.2 PROGRAM AND/OR OPERATOR ACTION

THE TYPICAL APPROACH SHOULD BE

1. HALT ON ERROR (VIA SW 15=1) WHEN EVER AN ERROR OCCURS.
2. CLEAR SW 15.
3. SET SW 14: (LOOP ON THIS TEST)
4. SET SW 13: (INHIBIT ERROR PRINT OUT)

THE TEST NUMBER AND PC WILL BE TYPED OUT AND POSSIBILY AN ERROR MESSAGE (THIS DEPENDS ON THE TEST) TO GIVE THE OPERATOR AN IDEA AS TO THE SOURCE OF THE PROBLEM. IF IT IS NECESSARY TO KNOW MORE INFORMATION CONCERNING THE ERROR REPORT; LOOK IN THE LISTING FOR THAT TEST NUMBER WHICH WAS TYPED OUT AND THEN NOTE THE PC OF THE ERROR REPORT THIS WAY THE EXACT FUNCTIONING OF THE TEST CAN BE INTERPEDITED.

6. ERRORS

AS DESCRIBED PREVIOUSLY THERE WILL ALWAYS BE A TEST NUMBER AND PC TYPED OUT AT THE TIME OF AN ERROR (PROVIDING SW 13=0 AND SW 12=0). IN MOST CASES ADDITIONAL INFORMATION WILL BE SUPPLIED TO THE THE ERROR MESSAGE WHICH IS TO GIVE THE OPERATOR AN INDICATION OF THE ERROR.

6.2 ERROR RECOVERY

IF FOR SOME REASON THE DV11 SHOULD 'HANG THE BUS' (GAIN CONTROL OF BUS SO THAT CONSOLE MANUAL FUNCTIONS ARE INHIBITED) AN INIT OR POWER DOWN/UP IS NECESSARY FOR OPERATOR TO REGAIN CONTROL OF CPU. IF THIS SHOULD HAPPEN; LOOK IN LOCATION 'TSTNO' (ADDRESS 1224)FOR THE NUMBER OF THE TEST THAT WAS RUNNING AT THE TIME OF THE CATASTROPHIC ERROR. IN THIS WAY THE OPERATOR WILL HAVE AN IDEA AS TO WHAT THE DV11 WAS DOING AT THE TIME OF THE ERROR.

7. RESTRICTIONS

7.1 STARTING RESTRICTIONS

SEE SECTION 4. (PLEASE)
STATUS TABLE SHOULD BE VERIFIED REGUARDLESS OF HOW PROGRAM WAS STARTED. ALSO IT IS IMPORTANT TO USE THIS LISTING ALONG WITH THE INFORMATION PRINTED ON THE TTY TO COMPLETLY ISOLATE PROBLEMS.

7.2 OPERATING RESTRICTIONS

DV11 TRIAL PROGRAM MUST BE RUN PRIOR TO THE FIRST AND ONLY THE FIRST RUNNING OF ANY DV11 DIAGNOSTIC IF "AUTO SIZING" IS NOT USED.
NOTE: IF NO PROGRAM OTHER THAN A DV11 DIAGNOSTIC WAS LOADED AFTER DV11 TRIAL OR IF CORE MEMORY HAS NOT BEEN CHANGED;OR IF THERE IS NO DV11 CONFIGURATION CHANGES; THE DV11 TRIAL PROGRAM NEED NEVER BE RUN AGAIN. HOWEVER IF ANY OF THE ABOVE HAVE BEEN VIOLATED THE DV11 TRIAL PROGRAM MUST BE RUN AGAIN BEFORE RUNNING THE DIAGNOSTICS NOTE: AN ALTERNATIVE TO THE ABOVE IS ATTEMPTING THE 'AUTO SIZING' WHEN PROGRAM IS INITIALLY STARTED WITH SW07=0.

7.3 HARDWARE CONFIGURATION RESTRICTIONS (SYNC LINE CARDS ONLY)

1. HARDWARE MUST BE SET TO FULL DUPLEX
2. PARITY OFF.
3. ALL LINES OF A PARTICULAR LINE CARD MUST BE CONFIGURED THE SAME.

8. MISCELLANEOUS

8.1 EXECUTION TIME

ALL DV11 DEVICE DIAGNOSTICS WILL GIVE AN 'END PASS' MESSAGE (PROVIDING NO ERRORS AND SW12=0) WITHIN 4 MINS. THIS IS ASSUMING SW11=1 (DELETE ITERATIONS) IS SET TO GIVE THE FASTEST POSSIBLE EXECUTION. THE ACTUAL EXECUTION TIME DEPENDS GREATLY ON THE PDP11 CPU CONFIGURATION.

8.2 PASS COMPLETE

NOTE: *EVERY* TIME THE PROGRAM IS STARTED; THE TESTS WILL RUN AS IF SW11 (DELETE ITERATIONS) WAS UP (=1). THIS IS TO 'VERIFY NO *HARD* ERRORS' AS SOON AS POSSIBLE. THEREFORE THE FIRST PASS -EACH TIME PROGRAM IS STARTED- WILL BE A 'QUICK PASS' UNTILL ALL DV11'S IN SYSTEM ARE TESTED. WHEN THE DIAGNOSTIC HAS COMPLETED A PASS THE FOLLOWING IS AN EXAMPLE OF THE PRINT OUT TO BE EXPECTED.

END PASS DZDVC-C CSR: 175000 VEC: 300 PASSES: 000001 ERRORS: 000000

NOTE: THE NUMBERS FOR CSR AND VEC ARE NOT NECESSARILY THE VALUES FOR THE DEVICE. THEY ARE ONLY FOR THIS EXAMPLE.
NOTE: DZDVE (MODEM AND CABLE TEST) END PASS MESSAGE IS A LARGE "END" TYPED OUT ON TTY. PLEASE NOTE THAT EACH CHARACTER PRINTED IS ACTUALLY AND "END PASS" INDICATION. THIS WAS USED IN PLACE OF "BELL" BECAUSE IF SW12=1 AND AN ERROR OCCURED THE BELL MAY BE MISTAKEN FOR END PASS. THE PASS EXECUTION IS SO FAST THAT THE STANDARD END PASS WAS TOO LENGHTLY. THEREFORE EACH CHAR IS AN "END PASS AND THE ENTIRE "END" IS NOT REQUIRED FOR ACCEPTANCE.

8.4 KEY LOCATIONS

RETURN (1212) CONTAINS THE ADDRESS WHERE PROGRAM WILL RETURN WHEN ITERATION COUNT IS REACHED OR IF LOOP ON TEST IS ASSERTED.

NEXT (1214) CONTAINS THE ADDRESS OF THE NEXT TEST TO BE PEFORMED.

TSTNO (1224) CONTAINS THE NUMBER OF THE TEST NOW BEING PEFORMED.

RUN (1302) THE BIT IN 'RUN' ALWAYS POINTS ONE PAST THE DV11 CURRENTLY BEING TESTED. EXAMPLE: (RUN) 1302/0000000001000000 MEANS THAT DV11 NO.05 IS THE DV11 NOW RUNNING.

DVCR00-DVCR17
DVST00-DVST17
(1500)-(1736)

THESE LOCATIONS CONTAIN THE INFORMATION NEEDED TO TEST UP TO 8 (DECIMAL) DV11S SEQUENTIALY. THEY CONTAIN THE CSR,VECTOR AND STATUS CONCERNING THE CONFIGURATION OF EACH DV11.

DVACTV (1276) EACH BIT SET IN THIS LOCATION INDICATES THAT THE ASSOCIATED DV11 WILL BE TESTED IN TURN. EXAMPLE: (DVACTV) 1276/0000000000011111 MEANS THAT DV11 NO. 00,01,02,03,04 WILL BE TESTED. EXAMPLE: (DVACTV) 1276/0000000000010001 MEANS THAT DV11 NO. 00,04 WILL BE TESTED.

DVSCR (1356) CONTAINS THE RECEIVER CSR OF THE CURRENT DV11 UNDER TEST.

L00.03 (1412)
L04.07 (1414)
L08.11 (1416)
L12.15 (1420) CONTAINS THE STATUS OF THE CURRENT DV11 UNDER TEST.

BIT 15 SET: LINE CARD *NOT INSTALLED (AND WONT BE TESTED)
BIT 14 SET: RESERVED
BIT 13 SET: RESERVED
BIT 12 SET: ONE SYNC, =0: TWO SYNCS.
BIT 11 SET: ASYNC LINE CARD, =0 SYNC LINE CARD
BIT 10 SET: RESERVED
BIT 09 SET: BITS PER CHAR. (USED WITH BIT8)
BIT 08 SET: BITS PER CHAR. (USED WITH BIT9)

BIT09	BIT08	BITS PER CHAR.
0	0	8
0	1	7
1	0	6
1	1	5

BIT 07-00 SYNC "A" FOR SPECIFIED LINE CARD. BITS 07-00 MUST BE ALL ZEROS FOR TESTING ASYNC LINE CARDS.

8.4A MORE ON THAT 'STATUS TABLE' (1500-1736)

```
        'MAP OF DV11 STATUS'
1500     175000
1502     000300
1504     000226
1506     000062
1510     000226
1512     000062
1514     004000
1516     000000
1520     004000
1522     000000
```

THE ABOVE INFORMATION WILL BE REPEATED FOR EACH OF UP TO 8 DV11'S IN THE SYSTEM(THESE WILL FOLLOW UNDER THIS TABLE). EXPLANATION:

1500 175000 THIS IS THE SYSTEM CONTROL REGISTER FOR THE 1ST DV11 IN THE SYSTEM.

1502 000300 THIS IS VECTOR 'A' FOR THE FIRST DV11 IN THE SYSTEM.

1504 000226 THIS REPRESENTS 'SYNC A' AND THE SOFTWARE STATUS FOR THE 1ST LINE CARD IN THE 1ST DV11. THE BITS ARE AS FOLLOWS:

BIT 15 SET: LINE CARD *NOT INSTALLED (AND WONT BE TESTED)
BIT 14 SET: RESERVED
BIT 13 SET: RESERVED
BIT 12 SET: ONE SYNC, =0: TWO SYNCS.
BIT 11 SET: ASYNC LINE CARD, =0 SYNC LINE CARD.
BIT 10 SET: RESERVED
BIT 09 SET: BITS PER CHAR. (USED WITH BIT8)
BIT 08 SET: BITS PER CHAR. (USED WITH BIT9)

BIT09	BIT08	BITS PER CHAR.
0	0	8
0	1	7
1	0	6
1	1	5

BIT 07-00 SYNC 'A' FOR SPECIFIED LINE CARD.

1506 000062 THIS REPRESENTS 'SYNC B' FOR THE 1ST LINE CARD.

1510 000226 THIS IS 'SYNC A' AND LINE STATUS FOR THE 2ND LINE CARD. (FOR BITS DEFINATION SEE EXPLANATION FOR LINE CARD 1).

1512 000062 THIS IS 'SYNC B' FOR THE SECOND LINE CARD.

1514 000226 THIS IS 'SYNC A' AND LINE STATUS FOR THE 3RD LINE CARD. (FOR BITS DEFINATION SEE EXPLANATION FOR LINE CARD 1).

1516 000062 THIS IS 'SYNC B' FOR LINE CARD NO. 3.

1520 000226 THIS IS 'SYNC A' AND LINE STATUS FOR THE 4TH LINE CARD. (FOR BITS DEFINATION SEE EXPLANATION FOR LINE CARD 1).

1522 000062 THIS IS SYNC B FOR THE 4TH LINE CARD.

THE ABOVE IS REPEATED FOR EACH DV11 IN THE SYSTEM. THE TABLE IS FILLED BY AUTO SIZING OR BY THE MANUAL PARAMETER INPUT PROGRAM AS DESCRIBED PREVIOUSLY. ALSO IF DESIRED BY USER; THE LOCATIONS MAY BE ALTERED BY HAND (TOGGLED IN) TO SUIT THE SPECIFIC CONFIGURATION.

8.5 *** METHOD OF AUTO SIZING ***

8.5.1 FINDING THE CONTROL STATUS REGISTER.

THE PROGRAM WILL START AT ADDRESS 175000 AND START 'REFERENCEING' ADDRESS. IF A NON-EX MEMORY TRAP OCCURES; THE POINTER (HOLDING 175000) IS UPDATED BY 10 AND THE ABOVE IS REPEATED UNTILL ADDRESS 175400 IS REACHED. IF A 'SLAVE SYNC RESPONSE' WAS ISSUED BY THE DV11 (OR ANY OTHER DEVICE) (NO NXM TRAP)(AND IT (SEL0) WAS=0) ; POINTER PLUS 12 (SEL12) IS TESTED TO CONTAIN 177777 (MUST BE EXACTLY 177777); IF A TRAP IS ENCOUNTERED OR IF SEL12 DOES NOT CONTAIN 177777 THE ABOVE UPDATING IS PERFORMED. IF SEL12 WAS EQUAL TO 177777 THE POINTER IS STORED AWAY AND THE ROUTINE CONTINUES AS ABOVE:
NOTE: IF THE PROGRAM DOES NOT FIND YOUR DV11; SOMETHING IS WRONG AND AUTO SIZING SHOULD NOT BE DONE.

8.5.2 FINDING THE VECTOR

THE VECTOR AREA (ADDRESS 300-776) IS FILLED WITH THE INSTRUCTION IOT AND '.+2' (NEXT ADDRESS). BIT7 AND BIT6 (RX INTERUPT AND RX INTERUPT IE) ARE SET INTO DVSCR REGISTER; A DELAY IS MADE AND IF NO INTERUPT OCCURES (BECAUSE OF A BAD DV11) THE PROGRAM ASSUMES VECTOR ADDRESS 300 AND THE PROBLEM SHOULD BE FIXED IN THE DIAGNOSTIC. ONCE THE PROBLEM IS FIXED; THE PROGRAM SHOULD BE RE-SETUP AGAIN TO GET CORRECT VECTOR. IF AN INTERUPT OCCURED; THE ADDRESS TO WHICH THE DV11 INTERUPTED TO IS PICKED UP AND REPORTED AS THE VECTOR. NOTE: IF THE VECTOR REPORTED IS NOT THE VECTOR SET UP BY YOU; THERE IS A PROBLEM AND AUTO SIZING SHOULD NOT BE DONE.

8.5.3 PARAMETER ASSUMPTIONS.

SINCE TOO MUCH HARDWARE WOULD NEED TO BE TURNED ON TO SIZE THE REST OF THE PARAMETERS; THE PROGRAM MUST ASSUME THE REMAINING VARIATIONS. THE RESULT IF NOT TO YOUR SPECIFIC CONFIGURATION MAY BE ALTERED BY HANG (TOGGLE IN) IS DESIRED. IN THIS WAY 95% OF THE PARAMETER SETUP WAS DONE BY THE PROGRAM AND 5% BY YOU.
THEREFORE:

1) ALL LINE CARDS(4) ARE ASSUMED TO BE INSTALLED.
   SET BIT15 OF STATUS MAP OF ANY (APPROIATE) LINE CARDS MISSING
2) TWO SYNCS.
   SET BIT12 IF YOU HAVE A 4 LINE GROUP SET FOR 1 SYNC.
3) EIGHT BITS PER CHAR.
   ADJUST BITS 9 AND BIT 8 IN STATUS MAP FOR YOUR CORRECT CONFIG.
4) SYNCHRONOUS LINE CARDS INSTALLED
   SET BIT11 OF STATUS MAP FOR ASYNC LINE CARD AND ZERO SYNC CHARS.
5) SYNC "A=226 AND SYNC "B"=062

IN ALL ADJUSTMENTS PLEASE REFER TO SECTION 8.4A FOR GREATER DEATAIL.
$

```
;*MAINDEC-11-DZDVC-C/(377)/ROM DATA CHECK AND "FREE RUNNING" TESTS
;*COPYRIGHT 1972, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
;*-----------------------------------------------------------------
```

```
                                        ;STARTING PROCEDURE
                                        ;LOAD PROGRAM
                                        ;LOAD ADDRESS 000200
                                        ;PRESS START
                                        ;PROGRAM WILL TYPE "MAINDEC-11-DZDVC-C/<377>/ROM DATA CHECK AND "FREE RU
                                        ;PROGRAM WILL TYPE "R" TO INDICATE THAT TESTING HAS STARTED
                                        ;AT THE END OF A PASS, PROGRAM WILL TYPE PASS COMPLETE MESSAGE
                                        ;AND THEN RESUME TESTING


                                    ;SWITCH REGISTER OPTIONS
                                    ;----------------------

  100000                            SW15=100000             ;=1,HALT ON ERROR
  040000                            SW14=40000              ;=1,LOOP ON CURRENT TEST
  020000                            SW13=20000              ;=1,INHIBIT ERROR TYPEOUT
  010000                            SW12=10000              ;=1,DELETE TYPEOUT/BELL ON ERROR.
  004000                            SW11=4000               ;=1,INHIBIT ITERATIONS
  002000                            SW10=2000               ;=1,ESCAPE TO NEXT TEST ON ERROR
  001000                            SW09=1000               ;=1,LOOP WITH CURRENT DATA
  000400                            SW08=400                ;=1,LOOP ON ERROR
  000200                            SW07=200                ;=1, DO "AUTO SIZING" ON INITAL START UP.
  000100                            SW06=100
  000040                            SW05=40
  000020                            SW04=20
  000010                            SW03=10
  000004                            SW02=4                  ;LOCK ON TEST SELECT
  000002                            SW01=2                  ;RESTART PROGRAM AT SELECTED TEST
  000001                            SW00=1                  ;RESELECT DV11 DESIRED ACTIVE
                                                            ;NOTE: THIS MUST NOT EXCEED ORIGINAL COUNT
```

```
560
561
562                                     ;REGISTER DEFINITIONS
563                                     ;--------------------
564
565     000000                          R0=%0           ;GENERAL REGISTER
566     000001                          R1=%1           ;GENERAL REGISTER
567     000002                          R2=%2           ;GENERAL REGISTER
568     000003                          R3=%3           ;GENERAL REGISTER
569     000004                          R4=%4           ;GENERAL REGISTER
570     000005                          R5=%5           ;GENERAL REGISTER
571     000006                          SP=%6           ;PROCESSOR STACK POINTER
572     000007                          PC=%7           ;PROGRAM COUNTER
573
574                                     ;LOCATION EQUIVALENCIES
575                                     ;----------------------
576
577     177776                          PS=177776       ;PROCESSOR STATUS WORD
578     001200                          STACK=1200      ;START OF PROCESSOR STACK
579
580     100000                          BIT15=100000
581     040000                          BIT14=40000
582     020000                          BIT13=20000
583     010000                          BIT12=10000
584     004000                          BIT11=4000
585     002000                          BIT10=2000
586     001000                          BIT9=1000
587     000400                          BIT8=400
588     000200                          BIT7=200
589     000100                          BIT6=100
590     000040                          BIT5=40
591     000020                          BIT4=20
592     000010                          BIT3=10
593     000004                          BIT2=4
594     000002                          BIT1=2
595     000001                          BIT0=1
596                                     ;---------------------------------
597     010000                          ALU=BIT12
598     020000                          RAM=BIT13
599     030000                          XFR=BIT13+BIT12
600     040000                          NPR=BIT14
601     050000                          S.C=BIT14+BIT12
602     060000                          BCC=BIT14+BIT13
603     070000                          BRB=BIT14+BIT13+BIT12
604                                     ;---------------------------------
605
606
```

```
                                        ;;*****************************************************************************
                                        ;-----------------------------------------------------------------------------
                                                ;TRAPCATCHER FOR ILLEGAL INTERRUPTS
                                                ;THE STANDARD "TRAP CATCHER" IS PLACED
                                                ;BETWEEN ADDRESS 0 TO ADDRESS 776.
                                                ;IT LOOKS LIKE "PC+2 HALT".
                                        ;-----------------------------------------------------------------------------
                                        ;;*****************************************************************************

                    000000              .=0
                                                ;STANDARD INTERRUPT VECTORS
                                                ;-------------------------

                    000024              .=24
 000024  004402                                .PFAIL                  ;POWER FAIL HANDLER
 000026  000340                                340                     ;SERVICE AT LEVEL 7
 000030  004002                                .HLT                    ;ERROR HANDLER
 000032  000340                                340                     ;SERVICE AT LEVEL 7
 000034  003750                                .TRPSRV                 ;GENERAL HANDLER DISPATCH SERVICE
 000036  000340                                340                     ;SERVICE AT LEVEL 7
                    000040              .=40
 000040  000001                                .BLKW 1                 ;SAVE FOR ACT-11 OR DDP2
 000042  000001                                .BLKW 1                 ;RETURN ADDRESS IF UNDER ACT-11 OR DDP2
 000044  000001                                .BLKW 1                 ;SAVE FOR ACT-11 OR DDP2
 000046  002560                                LOGICAL                 ;FOR USE WITH ACT-11 OR DDP2

                    000174              .=174
 000174  000000     LIGHT:  0
                    000176              .=176
 000176  000000     SSWR:   0

                    000200              .=200
 000200  000137  001742                         JMP     .START          ;GO TO START OF PROGRAM


                    001000              .=1000
 001000  005377  040515  047111         MTITLE: .ASCIZ  <377><12>/MAINDEC-11-DZDVC-C/<377>/ROM DATA CHECK AND "FREE RUNN
(2)
                    001200              .=1200
 001200             LIGHTS:
 001200  177570                                177570
 001202  177570     SWR:    177570
                                                ;INDIRECT POINTERS TO TELETYPE VECTORS AND REGISTERS
                                                ;--------------------------------------------------

 001204  177560     TKCSR:  177560                  ;TELETYPE KEYBOARD CONTROL REGISTER
 001206  177562     TKDBR:  177562                  ;TELETYPE KEYBOARD DATA BUFFER
 001210  177564     TPCSR:  177564                  ;TELEPRINTER CONTROL REGISTER
 001212  177566     TPDBR:  177566                  ;TELEPRINTER DATA BUFFER

                                                ;PROGRAM CONTROL PARAMETERS
                                                ;--------------------------

 001214  000000     RETURN: 0                       ;SCOPE ADDRESS FOR LOOP ON TEST
 001216  000000     NEXT:   0                       ;ADDRESS OF NEXT TEST TO BE EXECUTED
 001220  000000     LOCK:   0                       ;ADDRESS FOR LOCK ON CURRENT DATA
```

```
   662  001222  000003                ICOUNT: 3                       ;NUMBER OF ITERATIONS THAT CURRENT TEST WILL BE
   663  001224  000000                LPCNT:  0                       ;NUMBER OF ITEREATIONS COMPLETED
   664  001226  000000                TSTNO:  0                       ;NUMBER OF TEST IN PROGRESS
   665  001230  000000                PASCNT: 0                       ;NUMBER OF PASSES COMPLETED
   666  001232  000000                ERRCNT: 0                       ;TOTAL NUMBER OF ERRORS
   667  001234  000000                LSTERR: 0                       ;PC OF LAST ERROR CALL
   668
   669                                        ;PROGRAM VARIABLES
   670                                        ;-----------------
   671
   672  001236  000000                STAT:   0                       ;DV STATUS WORD STORAGE
   673  001240  000000                SYNCX:  0
   674  001242  000000                CLKX:   0
   675  001244  000000                MASKX:  0
   676  001246  000000                TEMP1:  0                       ;TEMPORARY STORAGE
   677  001250  000000                TEMP2:  0                       ;TEMPORARY STORAGE
   678  001252  000000                TEMP3:  0                       ;TEMPORARY STORAGE
   679  001254  000000                TEMP4:  0                       ;TEMPORARY STORAGE
   680  001256  000000                TEMP5:  0                       ;TEMPORARY STORAGE
   681  001260  000000                SAVR0:  0                       ;R0 STORAGE
   682  001262  000000                SAVR1:  0                       ;R1 STORAGE
   683  001264  000000                SAVR2:  0                       ;R2 STORAGE
   684  001266  000000                SAVR3:  0                       ;R3 STORAGE
   685  001270  000000                SAVR4:  0                       ;R4 STORAGE
   686  001272  000000                SAVR5:  0                       ;R5 STORAGE
   687  001274  000000                SAVSP:  0                       ;STACK POINTER STORAGE
   688  001276  000000                SAVPC:  0                       ;PROGRAM COUNTER STORAGE
   689  001300  000001                DVACTV: .BLKB 1                 ;DV11'S SELECTED ACTIVE.
   690  001301  000001                DVNUM:  .BLKB 1                 ;OCTAL NUMBER OF DV11'S.
   691  001302  000001                SAVACT: .BLKB 1                 ;ORIGINAL ACTV.  DEVICES.
   692  001303  000001                SAVNUM: .BLKB 1                 ;WORKABLE NUMBER.
   693  001304  000001                RUN:    .BLKB 1                 ;POINTER ONE PAST RUNNING DEVICE.
   694          001306                .EVEN
   695  001306  001500                CREAM:  DV.MAP                  ;TABLE POINTER.
```

```
                                        ;PROGRAM CONTROL FLAGS
                                        ;---------------------

001310  000     INIFLG: .BYTE   0                ;PROGRAM INITIALIZATION FLAG
001311  000     ERRFLG: .BYTE   0                ;ERROR OCCURED FLAG
001312  000     LOKFLG: .BYTE   0                ;LOCK ON CURRENT TEST FLAG
001313  000     QV.FLG: .BYTE   0                ;QUICK VERIFY FLAG.
                                                 ;ON FIRST PASS OF EACH DV11 ITERATIONS WILL BE S
                .EVEN
000000          $Y=0

                        ;DEFINITIONS FOR TRAP SUBROUTINE CALLS
                        ;POINTERS TO SUBROUTINES CAN BE FOUND
                        ;IN THE TABLE IMMEDIATLY FOLLOWING THE DEFINITIONS

                ;;*****************************************************************
                ;-----------------------------------------------------------------
001314          .TRPTAB:
104400          SCOPE=TRAP+0            ;CALL TO SCOPE LOOP AND ITERATION HANDLER
001314  002634          .SCOPE
104401          SCOP1=TRAP+1            ;CALL TO LOOP ON CURRENT DATA HANDLER
001316  003020          .SCOP1
104402          TYPE=TRAP+2             ;CALL TO TELETYPE OUTPUT ROUTINE
001320  003044          .TYPE
104403          INSTR=TRAP+3            ;CALL TO ASCII STRING INPUT ROUTINE
001322  003120          .INSTR
104404          INSTER=TRAP+4           ;CALL TO INPUT ERROR HANDLER
001324  003224          .INSTER
104405          PARAM=TRAP+5            ;CALL TO NUMERICAL DATA INPUT ROUTINE
001326  003244          .PARAM
104406          SAVO5=TRAP+6            ;CALL TO REGISTER SAVE ROUTINE
001330  003444          .SAVO5
104407          RESO5=TRAP+7            ;CALL TO REGISTER RESTORE ROUTINE
001332  003504          .RESO5
104410          CONVRT=TRAP+10          ;CALL TO DATA OUTPUT ROUTINE
001334  003536          .CONVRT
104411          CNVRT=TRAP+11           ;CALL TO DATA OUTPUT ROUNTINE WITHOUT CR/LF.
001336  003542          .CNVRT
104412          MSTCLR=TRAP+12          ;CALL TO ISUE A MASTER CLEAR
001340  004556          .MSTCLR
104413          RAMCLR=TRAP+13          ;CALL TO CLEAR THE RAMS
001342  004516          .RAMCLR
104414          DELAY=TRAP+14           ;CALL TO VARIABLE DELAY COUNTER
001344  004476          .DELAY
104415          ROMCLK=TRAP+15          ;CALL TO CLOCK ROM ONCE
001346  004566          .ROMCLK
104416          DATACLK=TRAP+16         ;CALL TO CLK DATA
001350  004576          .DATACLK

                ;-----------------------------------------------------------------
                ;;*****************************************************************
```

```
                                        ;DV11 VECTOR AND REGISTER INDIRECT POINTERS

001352  000000                DVRVEC: 0               ;POINTER TO DV11 RECEIVER INTERRUPT VECTOR
001354  000000                DVRLVL: 0               ;POINTER TO DV11 RECEIVER INTERRUPT SERVICE PS
001356  000000                DVTVEC: 0               ;POINTER TO DV11 TRANSMITTER INTERRUPT VECTOR
001360  000000                DVTLVL: 0               ;POINTER TO DV11 TRANSMITTER INTERRUPT SERVICE PS
001362  000000                DVSCR:  0               ;POINTER TO DV11 SYSTEM CONTROL REGISTER
001364  000000                DVSCRH: 0               ;POINTER TO DV11 SYSTEM CONTROL REGISTER HIGH BYTE.
001366  000000                DVRIC:  0               ;POINTER TO DV11 NEXT RECEIVED CHARACTER REGISTER
001370  000000                DVLCR:  0               ;POINTER TO DV11 LINE PRAMETER REGISTER
001372  000000                DVSRS:  0               ;POINTER TO DV11 SECONDARY REGISTER SELECT REGISTER
001374  000000                DVSRSH: 0               ;POINTER TO DV11 SECONDARY REGISTER SELECT HIGH BYTE.
001376  000000                DVSRA:  0               ;POINTER TO DV11 SECONDARY REGISTER ACCESS REGISTER
001400  000000                DVSFR:  0               ;POINTER TO DV11 SPECIAL FUNCTIONS REGISTER
001402  000000                DVNSR:  0               ;POINTER TO DV11 NPR STATUS REGISTER
001404  000000                RESV16: 0               ;POINTER TO RESERVED REGISTER.


                                        ;DV11 CONTROL INDICATORS FOR CURRENT DV11 UNDER TEST
                                        ;--------------------------------------------------

001406      000                 MASK.A: .BYTE 000       ;LAST CHAR TO TEST AND PARITY MASK FOR LINES 00-03
001407      000                 MASK.B: .BYTE 000       ;LAST CHAR TO TEST AND PARITY MASK FOR LINES 04-07
001410      000                 MASK.C: .BYTE 000       ;LAST CHAR TO TEST AND PARITY MASK FOR LINES 08-11
001411      000                 MASK.D: .BYTE 000       ;LAST CHAR TO TEST AND PARITY MASK FOR LINES 12-15

001412      010                 CLK.A:  .BYTE 8.        ;NUMBER OF CLOCKS NEEDED FOR ONE CHAR FOR LINES 00-03
001413      010                 CLK.B:  .BYTE 8.        ;NUMBER OF CLOCKS NEEDED FOR ONE CHAR FOR LINES 04-07
001414      010                 CLK.C:  .BYTE 8.        ;NUMBER OF CLOCKS NEEDED FOR ONE CHAR FOR LINES 08-11
001415      010                 CLK.D:  .BYTE 8.        ;NUMBER OF CLOCKS NEEDED FOR ONE CHAR FOR LINES 12-15

001416  000000                  L00.03: 000000          ;PARAMETERS FOR LINES 00-03
001420  000000                  L04.07: 000000          ;PARAMETERS FOR LINES 04-07
001422  000000                  L08.11: 000000          ;PARAMETERS FOR LINES 08-11
001424  000000                  L12.15: 000000          ;PARAMETERS FOR LINES 12-15

001426  000000                  SYNC2A: 000000          ;SYNC 2
001430  000000                  SYNC2B: 000000          ;
001432  000000                  SYNC2C: 000000          ;
001434  000000                  SYNC2D: 000000          ;

                                                ;SUMMARY
                                                ;-------
                                ;       MASK.X          040     5 BITS PER CHAR.
                                ;                       100     6 BITS PER CHAR.
                                ;                       200     7 BITS PER CHAR.
                                ;                       000     8 BITS PER CHAR.

                                ;       CLK.X           005     5 BITS PER CHAR.
                                ;                       006     6 BITS PER CHAR.
                                ;                       007     7 BITS PER CHAR.
                                ;                       010     8 BITS PER CHAR.
```

```
800                                                 ;DV11 STATUS TABLE AND ADDRESS ASSIGNMENTS
801                                                 ;-----------------------------------------
802
803             001500                          .=1500
804   001500                                    DV.MAP:
805   001500    000001                          DVCR00: .BLKW 1         ;CONTROL STATUS REGISTER FOR DV11 NUMBER 00
806   001502    000001                          DVTR00: .BLKW 1         ;VECTOR "A" FOR DV11 NUMBER 00
807   001504    000001                          DV00.A: .BLKW 1         ;PARAMETER FOR LINES 00-03 FOR DV11 NUMBER 00
808   001506    000001                          SYNA00: .BLKW 1         ;SYNC TWO
809   001510    000001                          DV00.B: .BLKW 1         ;PARAMETER FOR LINES 04-07 FOR DV11 NUMBER 00
810   001512    000001                          SYNB00: .BLKW 1         ;SYNC TWO
811   001514    000001                          DV00.C: .BLKW 1         ;PARAMETER FOR LINES 08-11 FOR DV11 NUMBER 00
812   001516    000001                          SYNC00: .BLKW 1         ;SYNC TWO
813   001520    000001                          DV00.D: .BLKW 1         ;PARAMETER FOR LINES 12-15 FOR DV11 NUMBER 00
814   001522    000001                          SYND00: .BLKW 1         ;SYNC TWO
815
816   001524    000001                          DVCR01: .BLKW 1         ;CONTROL STATUS REGISTER FOR DV11 NUMBER 01
817   001526    000001                          DVTR01: .BLKW 1         ;VECTOR "A" FOR DV11 NUMBER 01
818   001530    000001                          DV01.A: .BLKW 1         ;PARAMETER FOR LINES 00-03 FOR DV11 NUMBER 01
819   001532    000001                          SYNA01: .BLKW 1         ;SYNC TWO
820   001534    000001                          DV01.B: .BLKW 1         ;PARAMETER FOR LINES 04-07 FOR DV11 NUMBER 01
821   001536    000001                          SYNB01: .BLKW 1         ;SYNC TWO
822   001540    000001                          DV01.C: .BLKW 1         ;PARAMETER FOR LINES 08-11 FOR DV11 NUMBER 01
823   001542    000001                          SYNC01: .BLKW 1         ;SYNC TWO
824   001544    000001                          DV01.D: .BLKW 1         ;PARAMETER FOR LINES 12-15 FOR DV11 NUMBER 01
825   001546    000001                          SYND01: .BLKW 1         ;SYNC TWO
826
827   001550    000001                          DVCR02: .BLKW 1         ;CONTROL STATUS REGISTER FOR DV11 NUMBER 02
828   001552    000001                          DVTR02: .BLKW 1         ;VECTOR "A" FOR DV11 NUMBER 02
829   001554    000001                          DV02.A: .BLKW 1         ;PARAMETER FOR LINES 00-03 FOR DV11 NUMBER 02
830   001556    000001                          SYNA02: .BLKW 1         ;SYNC TWO
831   001560    000001                          DV02.B: .BLKW 1         ;PARAMETER FOR LINES 04-07 FOR DV11 NUMBER 02
832   001562    000001                          SYNB02: .BLKW 1         ;SYNC TWO
833   001564    000001                          DV02.C: .BLKW 1         ;PARAMETER FOR LINES 08-11 FOR DV11 NUMBER 02
834   001566    000001                          SYNC02: .BLKW 1         ;SYNC TWO
835   001570    000001                          DV02.D: .BLKW 1         ;PARAMETER FOR LINES 12-15 FOR DV11 NUMBER 02
836   001572    000001                          SYND02: .BLKW 1         ;SYNC TWO
837
838   001574    000001                          DVCR03: .BLKW 1         ;CONTROL STATUS REGISTER FOR DV11 NUMBER 03
839   001576    000001                          DVTR03: .BLKW 1         ;VECTOR "A" FOR DV11 NUMBER 03
840   001600    000001                          DV03.A: .BLKW 1         ;PARAMETER FOR LINES 00-03 FOR DV11 NUMBER 03
841   001602    000001                          SYNA03: .BLKW 1         ;SYNC TWO
842   001604    000001                          DV03.B: .BLKW 1         ;PARAMETER FOR LINES 04-07 FOR DV11 NUMBER 03
843   001606    000001                          SYNB03: .BLKW 1         ;SYNC TWO
844   001610    000001                          DV03.C: .BLKW 1         ;PARAMETER FOR LINES 08-11 FOR DV11 NUMBER 03
845   001612    000001                          SYNC03: .BLKW 1         ;SYNC TWO
846   001614    000001                          DV03.D: .BLKW 1         ;PARAMETER FOR LINES 12-15 FOR DV11 NUMBER 03
847   001616    000001                          SYND03: .BLKW 1         ;SYNC TWO
848
849   001620    000001                          DVCR04: .BLKW 1         ;CONTROL STATUS REGISTER FOR DV11 NUMBER 04
850   001622    000001                          DVTR04: .BLKW 1         ;VECTOR "A" FOR DV11 NUMBER 04
851   001624    000001                          DV04.A: .BLKW 1         ;PARAMETER FOR LINES 00-03 FOR DV11 NUMBER 04
852   001626    000001                          SYNA04: .BLKW 1         ;SYNC TWO
853   001630    000001                          DV04.B: .BLKW 1         ;PARAMETER FOR LINES 04-07 FOR DV11 NUMBER 04
854   001632    000001                          SYNB04: .BLKW 1         ;SYNC TWO
855   001634    000001                          DV04.C: .BLKW 1         ;PARAMETER FOR LINES 08-11 FOR DV11 NUMBER 04
```

```
856  001636  000001                  SYNC04: .BLKW 1         ;SYNC TWO
857  001640  000001                  DV04.D: .BLKW 1         ;PARAMETER FOR LINES 12-15 FOR DV11 NUMBER 04
858  001642  000001                  SYND04: .BLKW 1         ;SYNC TWO
859
860  001644  000001                  DVCR05: .BLKW 1         ;CONTROL STATUS REGISTER FOR DV11 NUMBER 05
861  001646  000001                  DVTR05: .BLKW 1         ;VECTOR "A" FOR DV11 NUMBER 05
862  001650  000001                  DV05.A: .BLKW 1         ;PARAMETER FOR LINES 00-03 FOR DV11 NUMBER 05
863  001652  000001                  SYNA05: .BLKW 1         ;SYNC TWO
864  001654  000001                  DV05.B: .BLKW 1         ;PARAMETER FOR LINES 04-07 FOR DV11 NUMBER 05
865  001656  000001                  SYNB05: .BLKW 1         ;SYNC TWO
866  001660  000001                  DV05.C: .BLKW 1         ;PARAMETER FOR LINES 08-11 FOR DV11 NUMBER 05
867  001662  000001                  SYNC05: .BLKW 1         ;SYNC TWO
868  001664  000001                  DV05.D: .BLKW 1         ;PARAMETER FOR LINES 12-15 FOR DV11 NUMBER 05
869  001666  000001                  SYND05: .BLKW 1         ;SYNC TWO
870
871  001670  000001                  DVCR06: .BLKW 1         ;CONTROL STATUS REGISTER FOR DV11 NUMBER 06
872  001672  000001                  DVTR06: .BLKW 1         ;VECTOR "A" FOR DV11 NUMBER 06
873  001674  000001                  DV06.A: .BLKW 1         ;PARAMETER FOR LINES 00-03 FOR DV11 NUMBER 06
874  001676  000001                  SYNA06: .BLKW 1         ;SYNC TWO
875  001700  000001                  DV06.B: .BLKW 1         ;PARAMETER FOR LINES 04-07 FOR DV11 NUMBER 06
876  001702  000001                  SYNB06: .BLKW 1         ;SYNC TWO
877  001704  000001                  DV06.C: .BLKW 1         ;PARAMETER FOR LINES 08-11 FOR DV11 NUMBER 06
878  001706  000001                  SYNC06: .BLKW 1         ;SYNC TWO
879  001710  000001                  DV06.D: .BLKW 1         ;PARAMETER FOR LINES 12-15 FOR DV11 NUMBER 06
880  001712  000001                  SYND06: .BLKW 1         ;SYNC TWO
881
882  001714  000001                  DVCR07: .BLKW 1         ;CONTROL STATUS REGISTER FOR DV11 NUMBER 07
883  001716  000001                  DVTR07: .BLKW 1         ;VECTOR "A" FOR DV11 NUMBER 07
884  001720  000001                  DV07.A: .BLKW 1         ;PARAMETER FOR LINES 00-03 FOR DV11 NUMBER 07
885  001722  000001                  SYNA07: .BLKW 1         ;SYNC TWO
886  001724  000001                  DV07.B: .BLKW 1         ;PARAMETER FOR LINES 04-07 FOR DV11 NUMBER 07
887  001726  000001                  SYNB07: .BLKW 1         ;SYNC TWO
888  001730  000001                  DV07.C: .BLKW 1         ;PARAMETER FOR LINES 08-11 FOR DV11 NUMBER 07
889  001732  000001                  SYNC07: .BLKW 1         ;SYNC TWO
890  001734  000001                  DV07.D: .BLKW 1         ;PARAMETER FOR LINES 12-15 FOR DV11 NUMBER 07
891  001736  000001                  SYND07: .BLKW 1         ;SYNC TWO
892
893  001740  000000                  DV.END: 000000
```

```
                                                        ;PROGRAM INITIALIZATION
                                                        ;LOCK OUT INTERRUPTS
                                                        ;SET UP PROCESSOR STACK
                                                        ;SET UP POWER FAIL VECTOR
                                                        ;CLEAR PROGRAM CONTROL FLAGS AND COUNTS
                                                        ;TYPE TITLE MESSAGE

001742  012737  000340  177776        .START: MOV     #340,PS                 ;LOCK OUT INTERRUPTS
001750  012706  001200                MOV     #STACK,SP               ;SET UP STACK
001754  012737  004402  000024        MOV     #.PFAIL,@#24            ;SET UP POWER FAIL VECTOR
001762  113737  001301  001303        MOVB    DVNUM,SAVNUM            ;SAVE NUMBER OF DEVICES IN SYSTEM.
001770  005037  001230                CLR     PASCNT                  ;CLEAR PASS COUNT
001774  105037  001311                CLRB    ERRFLG                  ;CLEAR ERROR FLAG
002000  105037  001313                CLRB    QV.FLG                  ;ZERO QUICK VERIFY FLAG
002004  012737  001500  001306        MOV     #DV.MAP,CREAM           ;GET MAP POINTER.
002012  112737  000001  001304        MOVB    #1,RUN                  ;POINT POINTER TO FIRST DEVICE.
002020  005037  001232                CLR     ERRCNT                  ;CLEAR ERROR COUNT
002024  005037  001234                CLR     LSTERR                  ;CLEAR LAST ERROR POINTER
002030  012737  000001  001226        MOV     #1,TSTNO                ;SET UP FOR TEST 1
002036  012737  001742  001214        MOV     #.START,RETURN          ;SET UP FOR POWER FAIL BEFORE
                                                                        ;TESTING STARTS
002044  105737  001310                TSTB    INIFLG                  ;HAS INITIALIZATION BEEN PERFORMED
002050  001063                        BNE     1$                      ;BR IF YES
002052  013746  000004                MOV     4,-(SP)                 ;
002056  013746  000006                MOV     6,-(SP)                 ;
002062  005037  000006                CLR     6                       ;
002066  012737  002104  000004        MOV     #80$,4                  ;
002074  005777  177102                TST     @SWR                    ;
002100  000240                        NOP                             ;
002102  000407                        BR      81$                     ;
002104  022626                80$:    CMP     (SP)+,(SP)+             ;
002106  012737  000174  001200        MOV     #LIGHT,LIGHTS           ;
002114  012737  000176  001202        MOV     #SSWR,SWR               ;
002122  012637  000006                81$:    MOV     (SP)+,6         ;
002126  012637  000004                MOV     (SP)+,4                 ;
002132  104402  001000                TYPE    ,MTITLE                 ;TYPE TITLE MESSAGE
002136  105137  001310                COMB    INIFLG                  ;IF NOT SET FLAG AND DO
002142  105777  177034                TSTB    @SWR                    ;BIT7=1??
002146  100402                        BMI     16$                     ;BR IF NO AUTO SIZE
002150  004737  006624                JSR     PC,CSRMAP               ;GO DO THE AUTO SIZE
002154  104402  005461                16$:    TYPE    ,XHEAD          ;TYPE HEADER
002160  012737  001500  001246        MOV     #DV.MAP,TEMP1           ;SET POINTER
002166  017737  177054  001250        5$:     MOV     @TEMP1,TEMP2    ;SET DATA
002174  022737  177777  001250        CMP     #177777,TEMP2           ;ALL DONE?
002202  001406                        BEQ     1$                      ;BR IF YES
002204  104410                        CONVRT                          ;
002206  005506                        XSTATQ                          ;
002210  062737  000002  001246        ADD     #2,TEMP1                ;UPDATE POINTER
002216  000763                        BR      5$
002220  005737  000042                1$:     TST     @#42            ;IS PROGRAM RUNNING UNDER MONITOR
002224  001030                        BNE     3$                      ;BR IF YES
002226  032777  000001  176746        BIT     #SW00,@SWR              ;SELECT SPECIFIC DEVICES??
002234  001424                        BEQ     3$                      ;BR IF NO.
002236  104402  005402                TYPE    ,MNEW                   ;TYPE THE MESSAGE.
002242  005000                        CLR     R0                      ;ZERO DATA LIGHTS
```

```
                                                HALT                    ;WAIT FOR USER TO TELL WHAT DEVICES TO R
                                                CMPB    @SWR,SAVACT     ;IS THE NUMBER VALID?
                                                BLOS    2$              ;BR IF NUMBER IS OK.
                                                TYPE    ,MERR3          ;TELL USER OF INVALID NUMBER.
                                                HALT                    ;STOP EVERY THING.
                                                BR      .-2             ;RESTART THE PROGRAM AGAIN.
                                        2$:     MOVB    @SWR,DVACTV     ;GET NEW DEVICE PATTERN
                                                MOVB    DVACTV,R0       ;SHOW THE USER WHAT HE SELECTED.
                                                BIC     #^C<377>,R0     ;USE ONLY LOW BYTE.
                                                HALT                    ;CONTINUE DYNAMIC SWITCHES.
                                        3$:     MOV     #300,R0         ;PREPARE TO CLEAR THE FLOATING
                                                MOV     #302,R1         ;VECTOR AREA. 300-776
                                        4$:     MOV     R1,(R0)+        ;START PUTTING "PC+2 - HALT"
                                                CLR     (R1)+           ;IN VECTOR AREA.
                                                CMP     (R0)+,(R1)+     ;POP POINTERS
                                                CMP     #1000,R0        ;ALL DONE??
                                                BNE     4$              ;BR IF NO.

                                                ;TEST START AND RESTART
                                                ;----------------------

                                        .BEGIN: MOV     #340,PS         ;LOCK OUT INTERRUPTS
                                                MOV     #STACK,SP       ;SET UP STACK
                                                TST     @#42            ;IS PROGRAM UNDER MONITOR CONTROL
                                                BNE     3$              ;BR IF YES
                                                BIT     #BIT2,@SWR      ;CHECK FOR LOCK ON TEST
                                                BEQ     1$              ;BR IF NO LOCK DESIRED.
                                                TYPE    ,MLOCK          ;TYPE LOCK SELECTED.
                                                MOV     #NOP,TTST       ;ADJUST SCOPE ROUTINE.
                                                MOV     #NOP,TTST+2     ;SET UP TO LOCK
                                                BR      2$              ;CONTINUE ALONG.
                                        1$:     MOV     BRW,TTST        ;PREPARE NORMAL SCOPE ROUTINE
                                                MOV     BRX,TTST+2      ;LOCK NOT SELECTED, SET UP FOR NORMAL SC
                                        2$:
                                        3$:     MOV     #CYCLE,RETURN   ;START AT "CYCLE" FIND WHICH DEVICE TO T
                                        4$:     TYPE    ,MR             ;TYPE R
                                                JMP     @RETURN         ;START TESTING
```

```
                                                        ;END OF PASS
                                                        ;TYPE NAME OF TEST
                                                        ;UPDATE PASS COUNT
                                                        ;CHECK FOR EXIT TO ACT-11
                                                        ;RESTART TEST

002436  000005                              .EOP:   RESET                   ;MAKE THE  WORLD CLEAN AGAIN.
002440  005037  001234                              CLR     LSTERR          ;CLEAR LAST ERROR PC
002444  105037  001311                              CLRB    ERRFLG          ;CLEAR ERROR FLAG
002450  005237  001230                              INC     PASCNT          ;UPDATE PASS COUNT
002454  013777  001230  176516                      MOV     PASCNT,@LIGHTS  ;DISPLAY PASS COUNT
002462  104402  005145                              TYPE    ,MEPASS         ;TYPE END PASS
002466  104402  005330                              TYPE    ,MCSRX          ;TYPE CSR
002472  104411  002604                              CNVRT   ,XCSR           ;SHOW IT
002476  104402  005336                              TYPE    ,MVECX          ;TYPE VECTOR
002502  104411  002612                              CNVRT   ,XVEC           ;SHOW IT
002506  104402  005344                              TYPE    ,MPASSX         ;TYPE PASSES
002512  104411  002620                              CNVRT   ,XPASS          ;SHOW IT
002516  104402  005355                              TYPE    ,MERRX          ;TYPE ERRORS
002522  104411  002626                              CNVRT   ,XERR           ;SHOW IT
002526  105337  001303                              DECB    SAVNUM          ;ARE ALL DEVICES TESTED?
002532  001017                                      BNE     RESTRT          ;BR IF NO.
002534  112737  000377  001313                      MOVB    #377,QV.FLG     ;SET THE QUICK VERIFY FLAG.
002542  113737  001301  001303                      MOVB    DVNUM,SAVNUM    ;RESTORE THE COUNT
002550  013701  000042                              MOV     @#42,R1         ;CHECK FOR ACT-11 OR DDP
002554  001406                                      BEQ     RESTRT          ;IF NOT, CONTINUE TESTING
002556  000005                                      RESET                   ;STOP THE SHOW--CLEAR THE WORLD
002560                                      LOGICAL:
002560  004711                                      JSR     PC,(R1)
002562  000240                                      NOP
002564  000240                                      NOP
002566  000240                                      NOP
002570  000240                                      NOP
002572  012737  005666  001214          RESTRT: MOV     #CYCLE,RETURN
002600  000137  005666                              JMP     CYCLE
002604  000001                          XCSR:   1
002606     006     002                              .BYTE   6,2
002610  001362                                      DVSCR
002612  000001                          XVEC:   1
002614     003     002                              .BYTE   3,2
002616  001352                                      DVRVEC
002620  000001                          XPASS:  1
002622     006     002                              .BYTE   6,2
002624  001230                                      PASCNT
002626  000001                          XERR:   1
002630     006     002                              .BYTE   6,2
002632  001232                                      ERRCNT

                                                        ;SCOPE LOOP AND INTERATION HANDLER
                                                        ;--------------------------------

002634                                  .SCOPE:
002634  022737  177570  001202                      CMP     #177570,SWR     ;IS THERE A REAL SWR?
002642  001411                                      BEQ     64$             ;BR IF YES
002644  017746  176336                              MOV     @TKDBR,-(SP)    ;SAVE KEYBOARD CHAR
002650  042716  000200                              BIC     #BIT7,(SP)      ;CLEAR PARITY BIT
```

```
1043  002654  122726  000007                          CMPB    #7,(SP)+        ;WAS IT CNTRL 'G' ?
1044  002660  001002                                  BNE     .+6             ;BR IF NO.
1045  002662  004737  004640                          JSR     PC,SERV.G       ;SERVICE "CNTRL 'G'".
1046  002666  005037  001234              64$:        CLR     LSTERR          ;CLEAR LAST ERROR PC.
1047  002672  010016                                  MOV     R0,(SP)         ;SAVE R0 ON THE STACK
1048  002674  032777  040000  176300                  BIT     #BIT14,@SWR     ;"LOOP ON THIS TEST"?
1049  002702  001407                      TTST:       BEQ     1$              ;BR IF NO.  (IF LOCK SW01=1; THIS LOC =240)
1050  002704  000437                                  BR      3$              ;GOTO 3$    (IF LOCK SW01=1; THIS LOC =240)
1051  002706  105777  176272                          TSTB    @TKCSR          ;KEYBOAD DONE?
1052  002712  100034                                  BPL     3$              ;BR IF NO. (LOCK: HIT KEY TO GOTO NEXT TEST)
1053  002714  017700  176266                          MOV     @TKDBR,R0       ;CLEAR DONE BIT
1054  002720  000415                                  BR      2$              ;CONTINUE
1055  002722  032777  004000  176252          1$:     BIT     #SW11,@SWR      ;DELETE ITERATION?  (QUICK PASS)
1056  002730  001011                                  BNE     2$              ;BR IF YES
1057  002732  105737  001313                          TSTB    QV.FLG          ;HAVE PASSES BEECOMPLETED?
1058  002736  001406                                  BEQ     2$              ;BR IF QUICK PASS.
1059  002740  005237  001224                          INC     LPCNT           ;UPDATE ITERATION COUNTER
1060  002744  023737  001224  001222                  CMP     LPCNT,ICOUNT    ;ARE ALL ITERATIONS DONE??
1061  002752  001014                                  BNE     3$              ;BR IF NOT YET
1062  002754  105037  001311              2$:         CLRB    ERRFLG          ;PREPARE FOR NEW TEST
1063  002760  005037  001224                          CLR     LPCNT           ;START ICOUNTER AT 0
1064  002764  005037  001220                          CLR     LOCK
1065  002770  012737  000024  001222                  MOV     #20.,ICOUNT     ;RESET ITERATIONS
1066  002776  013737  001216  001214                  MOV     NEXT,RETURN     ;GET NEXT TEST
1067  003004  011600                      3$:         MOV     (SP),R0         ;POP R0 OFF OF THE STACK
1068  003006  022626                                  POP2SP                  ;FAKE AN "RTI"
1069  003010  000177  176200                          JMP     @RETURN         ;GO DO THE TEST
1070  003014  001407                      BRW:        1407
1071  003016  000437                      BRX:        437
1072
1073                                                  ;CHECK FOR FREEZE ON CURRENT DATA
1074                                                  ;--------------------------------
1075
1076  003020  032777  001000  176154      .SCOP1:     BIT     #SW09,@SWR      ;IS SW09=1(SET)?
1077  003026  001405                                  BEQ     1$              ;BR IF NOT SET.
1078  003030  005737  001220                          TST     LOCK
1079  003034  001402                                  BEQ     1$
1080  003036  013716  001220                          MOV     LOCK,(SP)       ;GOTO THE ADDRESS IN LOCK.
1081  003042  000002                      1$:         RTI                     ;GO BACK.
1082
1083                                                  ;TELETYPE OUTPUT ROUTINE
1084                                                  ;-----------------------
1085
1086  003044  010546                      .TYPE:      MOV     R5,-(SP)        ;SAVE R5 ON THE STACK.
1087  003046  017605  000002                          MOV     @2(SP),R5       ;GET ADDRESS OF MESSAGE.
1088  003052  062766  000002  000002                  ADD     #2,2(SP)        ;POP OVER ADDRESS.
1089  003060  032777  010000  176114          1$:     BIT     #SW12,@SWR      ;INHIBIT ALL PRINT OUT??
1090  003066  001012                                  BNE     3$              ;BR IF NO PRINT OUT WANTED (SW12=1)
1091  003070  105715                                  TSTB    (R5)            ;IS NUMBER MINUS? (MSB=1(BIT7))
1092  003072  100002                                  BPL     2$              ;BR IF NUMBER IS PLUS
1093  003074  104402  005104                          TYPE    ,MCRLF          ;TYPE A CR/LF!
1094  003100  105777  176104              2$:         TSTB    @TPCSR          ;TTY READY?
1095  003104  100375                                  BPL     2$              ;BR IF NO.
1096  003106  112577  176100                          MOVB    (R5)+,@TPDBR    ;PRINT CURRENT CHAR.
1097  003112  001362                                  BNE     1$              ;IF NOT ZERO KEEP PRINTING!
1098  003114  012605                      3$:         MOV     (SP)+,R5        ;END OF OUTPUT. RESTORE R5
```

```
1099  003116  000002                          RTI                     ;GO HOME
1100                                          ;-----------------------
1101
1102  003120  010346                  .INSTR: MOV     R3,-(SP)        ;SAVE R3 ON STACK
1103  003122  010446                          MOV     R4,-(SP)        ;SAVE R4 ON STACK
1104  003124  017637  000004  003142          MOV     @4(SP),.MSG
1105  003132  062766  000002  000004          ADD     #2,4(SP)
1106  003140  104402                  .INST1: TYPE
1107  003142  000000                  .MSG:   0
1108  003144  012704  005520                  MOV     #INBUF,R4
1109  003150  012703  000007                  MOV     #7,R3
1110  003154  105777  176024          1$:     TSTB    @TKCSR
1111  003160  100375                          BPL     1$
1112  003162  117714  176020                  MOVB    @TKDBR,(R4)
1113  003166  142714  000200                  BICB    #200,(R4)
1114  003172  122427  000015                  CMPB    (R4)+,#15
1115  003176  001417                          BEQ     INSTR2
1116  003200  105777  176004          2$:     TSTB    @TPCSR
1117  003204  100375                          BPL     2$
1118  003206  017777  175774  175776          MOV     @TKDBR,@TPDBR
1119  003214  005303                          DEC     R3
1120  003216  001356                          BNE     1$
1121  003220  012604                          MOV     (SP)+,R4
1122  003222  012603                          MOV     (SP)+,R3
1123  003224  104402  005100          .INSTE: TYPE    ,MQM
1124  003230  010346                          MOV     R3,-(SP)
1125  003232  010446                          MOV     R4,-(SP)
1126  003234  000741                          BR      .INST1
1127  003236  012604                  INSTR2: MOV     (SP)+,R4        ;RESTORE R4
1128  003240  012603                          MOV     (SP)+,R3        ;RESTORE R3
1129  003242  000002                          RTI
1130
1131                                          ;CONVERT ASCII STRING TO OCTAL
1132                                          ;-----------------------------
1133
1134  003244  010546                  .PARAM: MOV     R5,-(SP)
1135  003246  010446                          MOV     R4,-(SP)
1136  003250  016605  000004                  MOV     4(SP),R5
1137  003254  012537  003434                  MOV     (R5)+,LOLIM
1138  003260  012537  003436                  MOV     (R5)+,HILIM
1139  003264  012537  003440                  MOV     (R5)+,DEVADR
1140  003270  112537  003442                  MOVB    (R5)+,LOBITS
1141  003274  112537  003443                  MOVB    (R5)+,ADRCNT
1142  003300  010566  000004                  MOV     R5,4(SP)
1143  003304  005005                  PARAM1: CLR     R5
1144  003306  012704  005520                  MOV     #INBUF,R4
1145  003312  122714  000015                  CMPB    #15,(R4)
1146  003316  001420                          BEQ     PARERR
1147  003320  121427  000060          1$:     CMPB    (R4),#60
1148  003324  002415                          BLT     PARERR
1149  003326  121427  000067                  CMPB    (R4),#67
1150  003332  003012                          BGT     PARERR
1151  003334  142714  000060                  BICB    #60,(R4)
1152  003340  152405                          BISB    (R4)+,R5
1153  003342  122714  000015                  CMPB    #15,(R4)
1154  003346  001406                          BEQ     LIMITS
```

```
1155  003350  006305                          ASL     R5
1156  003352  006305                          ASL     R5
1157  003354  006305                          ASL     R5
1158  003356  000760                          BR      1$
1159  003360  104404                  PARERR: INSTER
1160  003362  000750                          BR      PARAM1
1161
1162                                          ;TEST TO SEE IF NUMBER IS WITHIN LIMITS
1163                                          ;--------------------------------------
1164
1165  003364  020537  003436          LIMITS: CMP     R5,HILIM
1166  003370  101373                          BHI     PARERR
1167  003372  020537  003434                  CMP     R5,LOLIM
1168  003376  103770                          BLO     PARERR
1169  003400  133705  003442                  BITB    LOBITS,R5
1170  003404  001365                          BNE     PARERR
1171
1172                                          ;STORE NUMBER AT SPECIFIED ADDRESS
1173
1174  003406  013704  003440                  MOV     DEVADR,R4
1175  003412  010524                  1$:     MOV     R5,(R4)+
1176  003414  062705  000002                  ADD     #2,R5
1177  003420  105337  003443                  DECB    ADRCNT
1178  003424  001372                          BNE     1$
1179  003426  012604                          MOV     (SP)+,R4
1180  003430  012605                          MOV     (SP)+,R5
1181  003432  000002                          RTI
1182  003434  000000                  LOLIM:  0
1183  003436  000000                  HILIM:  0
1184  003440  000000                  DEVADR: 0
1185  003442  000000                  LOBITS: 0
1186          003443                  ADRCNT=LOBITS+1
1187
1188                                          ;SAVE PC OF TEST THAT FAILED AND R0-R5
1189                                          ;------------------------------------
1190
1191  003444  016637  000004  001276  .SAV05: MOV     4(SP),SAVPC     ;SAVE R7 (PC)
1192
1193                                          ;SAVE R0-R5
1194
1195  003452  010537  001272          SV05:   MOV     R5,SAVR5        ;SAVE R5
1196  003456  010437  001270                  MOV     R4,SAVR4        ;SAVE R4
1197  003462  010337  001266                  MOV     R3,SAVR3        ;SAVE R3
1198  003466  010237  001264                  MOV     R2,SAVR2        ;SAVE R2
1199  003472  010137  001262                  MOV     R1,SAVR1        ;SAVE R1
1200  003476  010037  001260                  MOV     R0,SAVR0        ;SAVE R0
1201  003502  000002                          RTI                     ;LEAVE.
1202
1203                                          ;RESTORE R0-R5
1204
1205  003504  013700  001260          .RES05: MOV     SAVR0,R0        ;RESTORE R0
1206  003510  013701  001262                  MOV     SAVR1,R1        ;RESTORE R1
1207  003514  013702  001264                  MOV     SAVR2,R2        ;RESTORE R2
1208  003520  013703  001266                  MOV     SAVR3,R3        ;RESTORE R3
1209  003524  013704  001270                  MOV     SAVR4,R4        ;RESTORE R4
1210  003530  013705  001272                  MOV     SAVR5,R5        ;RESTORE R5
```

```
1211  003534  000002                                    RTI                     ;LEAVE
1212
1213                                                    ;CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER
1214                                                    ;-----------------------------------------------------
1215
1216  003536  104402  005104                .CONVR: TYPE    ,MCRLF
1217  003542  010046                        .CNVRT: MOV     R0,-(SP)
1218  003544  010146                                MOV     R1,-(SP)
1219  003546  010346                                MOV     R3,-(SP)
1220  003550  010446                                MOV     R4,-(SP)
1221  003552  010546                                MOV     R5,-(SP)
1222  003554  017601  000012                        MOV     @12(SP),R1
1223  003560  062766  000002  000012                ADD     #2,12(SP)
1224  003566  012137  003742                        MOV     (R1)+,WRDCNT
1225  003572  112137  003744                1$:     MOVB    (R1)+,CHRCNT
1226  003576  112137  003745                        MOVB    (R1)+,SPACNT
1227  003602  013137  003746                        MOV     @(R1)+,BINWRD
1228  003606  013704  003746                2$:     MOV     BINWRD,R4
1229  003612  113705  003744                        MOVB    CHRCNT,R5
1230  003616  012700  005562                        MOV     #TEMP,R0
1231  003622  010403                        3$:     MOV     R4,R3
1232  003624  042703  177770                        BIC     #177770,R3
1233  003630  062703  000060                        ADD     #060,R3
1234  003634  110320                                MOVB    R3,(R0)+
1235  003636  000241                                CLC
1236  003640  006004                                ROR     R4
1237  003642  000241                                CLC
1238  003644  006004                                ROR     R4
1239  003646  000241                                CLC
1240  003650  006004                                ROR     R4
1241  003652  005305                                DEC     R5
1242  003654  001362                                BNE     3$
1243  003656  012703  005624                        MOV     #MDATA,R3
1244  003662  114023                        4$:     MOVB    -(R0),(R3)+
1245  003664  105337  003744                        DECB    CHRCNT
1246  003670  001374                                BNE     4$
1247  003672  105737  003745                        TSTB    SPACNT
1248  003676  001405                                BEQ     6$
1249  003700  112723  000040                5$:     MOVB    #040,(R3)+
1250  003704  105337  003745                        DECB    SPACNT
1251  003710  001373                                BNE     5$
1252  003712  105013                        6$:     CLRB    (R3)
1253  003714  104402  005624                        TYPE    ,MDATA
1254  003720  005337  003742                        DEC     WRDCNT
1255  003724  001322                                BNE     1$
1256  003726  012605                                MOV     (SP)+,R5
1257  003730  012604                                MOV     (SP)+,R4
1258  003732  012603                                MOV     (SP)+,R3
1259  003734  012601                                MOV     (SP)+,R1
1260  003736  012600                                MOV     (SP)+,R0
1261  003740  000002                                RTI
1262  003742  000000                        WRDCNT: 0
1263  003744  000000                        CHRCNT: 0
1264          003745                        SPACNT=CHRCNT+1
1265  003746  000000                        BINWRD: 0
1266
```

```
                                                        ;TRAP DISPATCH SERVICE
                                                        ;ARGUMENT OF TRAP IS EXTRACTED
                                                        ;AND USED AS OFFSET TO OBTAIN POINTER
                                                        ;TO SELECTED SUBROUTINE

003760  011646                            .TRPSR: MOV     (SP),-(SP)          ;GET PC OF RETURN
003762  162716  000002                            SUB     #2,(SP)             ;=PC OF TRAP
003766  017616  000000                            MOV     @(SP),(SP)          ;GET TRP
003772  006316                            TRPOK:  ASL     (SP)                ;MULTIPLY TRAP ARG BY 2
003774  042716  177001                            BIC     #177001,(SP)        ;CLEAR UNWANTED BITS
004000  062716  001314                            ADD     #.TRPTAB,(SP)       ;POINTER TO SUBROUTINE ADDRESS
004004  017616  000000                            MOV     @(SP),(SP)          ;SUBROUTINE ADDRESS
004010  000136                                    JMP     @(SP)+              ;GO TO SUBROUTINE

                                                        ;ERROR HANDLER
                                                        ;-------------

004002                                  .HLT:
004002  022737  177570  001202                    CMP     #177570,SWR     ;IS THERE A REAL SWR?
004010  001411                                    BEQ     64$             ;BR IF YES
004012  017746  175170                            MOV     @TKDBR,-(SP)    ;SAVE KEYBOARD CHAR
004016  042716  000200                            BIC     #BIT7,(SP)      ;CLEAR PARITY BIT
004022  122726  000007                            CMPB    #7,(SP)+        ;WAS IT CNTRL 'G' ?
004026  001002                                    BNE     .+6             ;BR IF NO.
004030  004737  004640                            JSR     PC,$ RV.G       ;SERVICE "CNTRL 'G'".
004034  032777  010000  175140          64$:      BIT     #SW12,@SWR      ;BELL ON ERROR?
004042  001406                                    BEQ     XBX             ;BR IF NO BELL
004044  105777  175140                            TSTB    @TPCSR          ;TTY READY.
004050  100003                                    BPL     XBX             ;DON'T WAIT IF TTY NOT READY.
004052  112777  000207  175132                    MOVB    #207,@TPDBR     ;PUSH A BELL AT THE TTY.
004060  032777  020000  175114          XBX:      BIT     #SW13,@SWR      ;DELETE ERROR PRINT OUT?
004066  001105                                    BNE     HALTS           ;BR IF NO PRINT OUT WANTED.
004070  021637  001234                            CMP     (SP),LSTERR     ;WAS THIS ERROR FOUND LAST TIME?
004074  001404                                    BEQ     1$              ;BR IF YES
004076  011637  001234                            MOV     (SP),LSTERR     ;RECORD BEING HERE
004102  105037  001311                            CLRB    ERRFLG          ;PREPARE HEADER
004106  104406                          1$:       SAVOS                   ;SAVE ALL PROC REGISTERS
004110  011605                                    MOV     (SP),R5         ;GET THE PC OF ERROR
004112  162705  000002                            SUB     #2,R5           ;GET ADDRESS OF TRAP CALL
004116  011504                                    MOV     (R5),R4         ;GET HLT INSTRUCTION
004120  006304                                    ASL     R4              ;MULT BY TWO
004122  061504                                    ADD     (R5),R4         ;DOUBLE IT
004124  006304                                    ASL     R4              ;MULT AGAIN
004126  042704  177001                            BIC     #177001,R4      ;CLEAR JUNK
004132  062704  026234                            ADD     #.ERRTAB,R4     ;GET POINTER
004136  012437  004252                            MOV     (R4)+,ERRMSG    ;GET ERROR MESSAGE
004142  012437  004264                            MOV     (R4)+,DATAHD    ;GET DATA HEADRER
004146  011437  004276                            MOV     (R4),DATABP     ;GET DATA TABLE
004152  105737  001311                            TSTB    ERRFLG          ;TYPE HEADREER
004156  001403                                    BEQ     TYPMSG          ;BR IF YES
004160  005737  004276                            TST     DATABP          ;DOES DATA TABLE EXIST?
004164  001040                                    BNE     TYPDAT          ;BR IF YES.
004166  104402  005104                TYPMSG:     TYPE    ,MCRLF
004172  104402  005104                            TYPE    ,MCRLF
004176  005737  001220                            TST     LOOK
```

```
1323   004202   001402                          BEQ     1$
1324   004204   104402   005400                 TYPE    ,MASTEK
1325   004210   104402   005366         1$:     TYPE    ,MTSTN
1326   004214   104411   004374                 CNVRT   ,XTSTN          ;SHOW IT
1327   004220   104402   005454                 TYPE    ,MERRPC         ;TYPE PC.
1328   004224   104411   004366                 CNVRT   ,ERTABO         ;SHOW IT
1329   004230   104402   005104                 TYPE    ,MCRLF          ;GIVE A CR/LF
1330   004234   112737   177777   001311        MOVB    #-1,ERRFLG      ;NO MORE HEADER UNLESS NO DATA TABLE.
1331   004242   005737   004252                 TST     ERRMSG          ;IS THERE AN ERROR MESSAGE?
1332   004246   001402                          BEQ     WRKO.FM         ;BR IF NO.
1333   004250   104402                          TYPE                    ;TYPE
1334   004252   000000         ERRMSG: 0                               ;    ERROR MESSAGE
1335   004254                 WRKO.FM:                                ;
1336   004254   005737   004264                 TST     DATAHD          ;DATA HEADER?
1337   004260   001402                          BEQ     TYPDAT          ;BR IF NO
1338   004262   104402                          TYPE                    ;TYPE
1339   004264   000000         DATAHD: 0                               ;    DATA HEADER
1340   004266   005737   004276         TYPDAT: TST     DATABP          ;DATA TABLE?
1341   004272   001402                          BEQ     RESREG          ;BR IF NO.
1342   004274   104410                          CONVRT                  ;SHOW
1343   004276   000000         DATABP: 0                               ;    DATA TABLE
1344   004300   104407         RESREG: RESOS                           ;RESTORE PROC REGISTERS
1345   004302   005777   174674         HALTS:  TST     @SWR            ;HALT ON ERROR?
1346   004306   100005                          BPL     EXITER          ;BR IF NO HALT ON ERROR
1347   004310   010046                          PUSHRO                  ;SAVE RO
1348   004312   016600   000002                 MOV     2(SP),RO        ;SHOW ERROR PC IN DATA LIGHTS
1349   004316   000000                          HALT                    ;HALT
1350   004320   012600                          POPRO                   ;GET RO
1351   004322   005237   001232         EXITER: INC     ERRCNT          ;UPDATE ERROR COUNT
1352   004326   032777   000400   174646        BIT     #SWO8,@SWR      ;GOTO TOP OF TEST?
1353   004334   001007                          BNE     1$              ;BR IF YES
1354   004336   032777   002000   174636        BIT     #SWI0,@SWR      ;GOTO NEXT TEST?
1355   004344   001407                          BEQ     2$              ;BR IF NO
1356   004346   013737   001216   001214        MOV     NEXT,RETURN     ;SET FOR NEXT TEST
1357   004354   012706   001200         1$:     MOV     #STACK,SP       ;RESET SP
1358   004360   000177   174630                 JMP     @RETURN         ;GOTO SPECIFIED TEST
1359   004364   000002         2$:     RTI                             ;RETURN
1360   004366   000001         ERTABO: 1
1361   004370      006      002                 .BYTE   6,2
1362   004372   001276                          SAVPC
1363   004374   000001         XTSTN:  1
1364   004376      003      002                 .BYTE   3,2
1365   004400   001226                          TSTNO
1366                                           ;ENTER HERE ON POWER FAILURE
1367                                           ;-------------------------
1368
1369
1370   004402                 .PFAIL:
1371   004402   012737   004414   000024        MOV     #RESTART,24             ;SET UP FOR POWER UP TRAP
1372   004410   000000                          HALT                            ;HALT ON POWER DOWN NORMAL
1373   004412   000777                          BR      .
1374
1375                                           ;PROCESSOR WILL TRAP HERE WHEN POWER IS RESTORED
1376
1377   004414                 RESTAR:
1378   004414   012737   004402   000024        MOV     #.PFAIL,24      ;SET UP FOR POWER FAILURE
```

```
  1379  004422  012706  001200                        MOV     #STACK,SP       ;RESET THE STACK POINTER
  1380  004426  005037  005562                        CLR     TEMP            ;READY FOR TIMMER
  1381  004432  005237  005562                        INC     TEMP            ;PLUS ONE TO THE TIMER!
  1382  004436  001375                                BNE     .-4             ;BR IF MORE TO GO
  1383  004440  104402  005107                        TYPE    ,MPFAIL         ;TYPE THE MESSAGE
  1384  004444  104411  004470                        CNVRT   ,PFTAB          ;TELL WHAT TEST TO RETURN TO.
  1385  004450  105037  001311                        CLRB    ERRFLG          ;START CLEAN
  1386  004454  005037  001234                        CLR     LSTERR          ;""""""""""""""""
  1387  004460  104412                                MSTCLR                  ;START CLEAN-UP OF DEVICE
  1388  004462  104413                                RAMCLR                  ;CLEAR IT ALL!
  1389  004464  000177  174524                        JMP     @RETURN         ;START DOING THAT TEST AGAIN.
  1390  004470  000001                        PFTAB:  1
  1391  004472     003     002                .BYTE   3,2
  1392  004474  001226                                TSTNO
  1393  004476  010046                        .DELAY: MOV     R0,-(SP)
  1394  004500  013700  004514                        MOV     1$,R0
  1395  004504  005300                                DEC     R0
  1396  004506  001376                                BNE     .-2
  1397  004510  012600                                MOV     (SP)+,R0
  1398  004512  000002                                RTI
  1399  004514  000036                        1$:     30.
  1400
  1401  004516                                .RAMCLR:
  1402  004516  012777  004000  174636                MOV     #MRESET,@DVSCR  ;ISSUE A MASTER CLEAR
  1403  004524  010146                                MOV     R1,-(SP)        ;SAVE R1 ON THE STACK
  1404  004526  010446                                MOV     R4,-(SP)        ;SAVE R4 ON THE STACK
  1405  004530  013701  001372                        MOV     DVSRS,R1        ;GET SECONDARY SEL. REG.
  1406  004534  013704  001376                        MOV     DVSRA,R4        ;GET SECONDARY REGISTER ACCESS REG.
  1407  004540  005014                        1$:     CLR     (R4)            ;ZERO THE SECONDARY REGISTER.
  1408  004542  062711  170361                        ADD     #^C<BIT11+BIT10+BIT9+BIT8+BIT3+BIT2+BIT1+BIT0>+BIT0,(R1)
  1409  004546  001374                                BNE     1$
  1410  004550  012604                                MOV     (SP)+,R4        ;RESTORE R4
  1411  004552  012601                                MOV     (SP)+,R1        ;RESTORE R1
  1412  004554  000002                                RTI
  1413
  1414  004556                                .MSTCLR:
  1415  004556  012777  004000  174576                MOV     #MRESET,@DVSCR  ;ISSUE MASTER CLEAR.
  1416  004564  000002                                RTI
  1417
  1418  004566                                .ROMCLK:
  1419  004566  052777  000002  174566                BIS     #BIT1,@DVSCR
  1420  004574  000002                                RTI
  1421
  1422  004576                                .DATACLK:
  1423  004576  010046                                MOV     R0,-(SP)
  1424  004600  005000                                CLR     R0
  1425  004602  052777  000400  174560                BIS     #BIT8,@DVLCR
  1426  004610  017737  174554  004636        1$:     MOV     @DVLCR,3$
  1427  004616  106037  004637                        RORB    3$+1
  1428  004622  103003                                BCC     2$
  1429  004624  005200                                INC     R0
  1430  004626  001370                                BNE     1$
  1431  004630  104000                                HLT     0
  1432  004632  012600                        2$:     MOV     (SP)+,R0
  1433  004634  000002                                RTI
  1434  004636  000001                        3$:     .BLKW 1
```

```
1435
1436  004640  032777  004000  174336          SERV.G: BIT     #4000,@TKCSR    ;RX BUSY?
1437  004646  001374                                  BNE     SERV.G          ;BR IF YES
1438  004650  017737  174326  005072                  MOV     @SWR,90$        ;SAVE (SWR).
1439  004656  013777  005072  174316          1$:     MOV     90$,@SWR        ;
1440  004664  104402  005052                          TYPE    ,89$            ;
1441  004670  104411  005064                          CNVRT   ,88$            ;
1442  004674  104402  005074                          TYPE    ,91$            ;
1443  004700  105777  174300                          TSTB    @TKCSR          ;WAIT FOR DONE.
1444  004704  100375                                  BPL     .-4             ;
1445  004706  017746  174274                          MOV     @TKDBR,-(SP)    ;
1446  004712  042716  000200                          BIC     #BIT7,(SP)      ;
1447  004716  122726  000015                          CMPB    #15,(SP)+       ;
1448  004722  001450                                  BEQ     5$              ;
1449  004724  005077  174252                          CLR     @SWR            ;
1450  004730  105777  174254          2$:     TSTB    @TPCSR          ;
1451  004734  100375                                  BPL     .-4             ;
1452  004736  016677  177776  174246                  MOV     -2(SP),@TPDBR   ;
1453  004744  000241                                  CLC                     ;
1454  004746  006177  174230                          ROL     @SWR            ;
1455  004752  006177  174224                          ROL     @SWR            ;
1456  004756  006177  174220                          ROL     @SWR            ;
1457  004762  103735                                  BCS     1$              ;ERROR
1458  004764  026627  177776  000060                  CMP     -2(SP),#60      ;
1459  004772  002731                                  BLT     1$              ;
1460  004774  026627  177776  000067                  CMP     -2(SP),#67      ;
1461  005002  003325                                  BGT     1$              ;
1462  005004  042766  177770  177776                  BIC     #^C(7),-2(SP)   ;
1463  005012  056677  177776  174162                  BIS     -2(SP),@SWR     ;
1464  005020  105777  174160                          TSTB    @TKCSR          ;
1465  005024  100375                                  BPL     .-4             ;
1466  005026  017746  174154                          MOV     @TKDBR,-(SP)
1467  005032  042716  000200                          BIC     #BIT7,(SP)
1468  005036  122726  000015                          CMPB    #15,(SP)+
1469  005042  001332                                  BNE     2$              ;
1470  005044  104402  005104          5$:     TYPE    ,MCRLF          ;
1471  005050  000207                                  RTS     PC
1472
1473  005052  020377  051450  051127          89$:    .ASCIZ  <377>? (SWR)=/?
1474  005060  036451  000057
1475                                          .EVEN
1476  005064  000001                          88$:    1
1477  005066     006     000                          .BYTE   6,0
1478  005070  005072                                  90$
1479  005072  000000                          90$:    .WORD   0
1480  005074  036457  000057                  91$:    .ASCIZ  ?/=/?
1481                                          .EVEN
1482  005100  020040  000077                  MQM:    .ASCIZ  /  ?/
  (2) 005104  005015     000                  MCRLF:  .ASCIZ   <15><12>
  (2) 005107     377  053520  020122          MPFAIL: .ASCIZ  <377>/PWR FAILED. RESTART AT TEST /
  (2) 005145     377  047105  020104          MEPASS: .ASCIZ  <377>/END PASS DZDVC-C  /
  (2) 005171     377  000122                  MR:     .ASCIZ  <377>/R/
  (2) 005174  050377  047522  051107          MERR2:  .ASCIZ  <377>/PROGRAM INDICATES NO DEVICES PRESENT./
  (2) 005243     377  047111  052523          MERR3:  .ASCIZ  <377>/INSUFFICIENT DATA!/
  (2) 005267     377  042524  052123          MTSTPC: .ASCIZ  <377>/TEST PC-/
  (2) 005301     377  047514  046503          MLOCK:  .ASCIZ  <377>/LOCK ON SELECTED TEST/
```

F03

```
DZDVC-C MACY11 27(732)  17-SEP-76  11:40  PAGE 33
DZDVCC.P11      GENERAL UTILITIES (TYPE OUT,ERROR,SCOPE,ETC.)

    (2)  005330  051503  035122  000040          MCSRX:  .ASCIZ   /CSR: /
    (2)  005336  042526  035103  000040          MVECX:  .ASCIZ  /VEC: /
    (2)  005344  040520  051523  051505          MPASSX: .ASCIZ  /PASSES: /
    (2)  005355     105  051122  051117          MERRX:  .ASCIZ  /ERRORS: /
    (2)  005366  042524  052123  047040          MTSTN:  .ASCIZ  /TEST NO: /
    (2)  005400  000052                          MASTEK: .ASCIZ  /*/
    (2)  005402  051777  052105  051440          MNEW:   .ASCIZ  <377>/SET SWITCH REG TO DV11'S DESIRED ACTIVE./
    (2)  005454  041520  020072     000          MERRPC: .ASCIZ  /PC: /
    (2)  005461     377  040515  020120          XHEAD:  .ASCIZ  <377>/MAP OF DV11 STATUS/<377>
    (2)                                          .EVEN
    (2)  005506  000002                          XSTATQ: 2
 1483    005510     006     003                          .BYTE   6,3
 1484    005512  001246                                  TEMP1
 1485    005514     006     002                          .BYTE   6,2
 1486    005516  001250                                  TEMP2
 1487                                         .EVEN
 1488
 1489                                                  ;BUFFERS FOR INPUT-OUTPUT
 1490
 1491    005520  000000                       INBUF:  0
 1492            005562                               .=.+40
 1493    005562  000000                       TEMP:   0
 1494            005624                               .=.+40
 1495    005624  000000                       MDATA:  0
 1496            005666                               .=.+40
```

```
1497
1498                                                    ;
1499                                                    ;ROUTINE USED TO "CYCLE" THROUGH UP TO EIGHT DV11'S
1500                                                    ;THIS ROUTINE SETS UP THE CONTROL ADDRESS FOR THE DIAGNOSTIC
1501                                                    ;AND RUNS THE SPECIFIED DV11'S.   THIS ROUTINE *MUST*
1502                                                    ;BE RUN FIRST BEFORE ENTERING THE DIAGNOSTIC FOR THE
1503                                                    ;SETUP NECESSARY.
1504                                                    ;
1505
1506  005666  105737  001300          CYCLE:  TSTB    DVACTV          ;ARE ANY DV11'S TO BE TESTED?
1507  005672  001004                          BNE     1$              ;BR IF OK.
1508  005674  104402  005174                  TYPE    .MERR2          ;NO DV11'S SELECTED!!
1509  005700  000000                          HALT                    ;STOP THE SHOW.
1510  005702  000776                          BR      .-2             ;DISQUALIFY CONT. SW.
1511  005704  133737  001304  001300  1$:     BITB    RUN,DVACTV      ;IS THIS ONE "ACTIVE"
1512  005712  001020                          BNE     2$              ;BR IF GOOD ONE FOUND.
1513  005714  000241                          CLC                     ;CLEAR PROC. CARRY BIT.
1514  005716  106137  001304                  ROLB    RUN             ;UPDATE POINTER
1515  005722  105537  001304                  ADCB    RUN             ;CATCH CARRY FROM RUN
1516  005726  062737  000024  001306          ADD     #24,CREAM       ;UPDATE ADDRESS POINTER.
1517  005734  022737  001740  001306          CMP     #DV.END,CREAM
1518  005742  001360                          BNE     1$              ;KEEP GOING; NOT ALL TESTED FOR.
1519  005744  012737  001500  001306          MOV     #DV.MAP,CREAM   ;RESET ADDRESS POINTER.
1520  005752  000754                          BR      1$              ;KEEP LOOKING FOR ACTIVE DV11
1521  005754  000241                  2$:     CLC                     ;CLEAR PROC. CARRY.
1522  005756  106137  001304                  ROLB    RUN             ;UPDATE POINTER.
1523  005762  105537  001304                  ADCB    RUN             ;CATCH CARRY.
1524  005766  013700  001306                  MOV     CREAM,R0        ;GET ADDRESS POINTER.
1525  005772  062737  000024  001306          ADD     #24,CREAM       ;UPDATE.
1526  006000  022737  001740  001306          CMP     #DV.END,CREAM
1527                                                                  ;ALL DONE?
1528  006006  001003                          BNE     3$              ;BR IF NO.
1529  006010  012737  001500  001306          MOV     #DV.MAP,CREAM   ;RESTORE POINTER.
1530  006016  012037  001362          3$:     MOV     (R0)+,DVSCR     ;LOAD SYSTEM CTRL. REG
1531  006022  012037  001352                  MOV     (R0)+,DVRVEC    ;LOAD VECTOR
1532  006026  012037  001416                  MOV     (R0)+,L00.03    ;GET LINE PARAMETERS. 00-03
1533  006032  012037  001426                  MOV     (R0)+,SYNC2A    ;
1534  006036  012037  001420                  MOV     (R0)+,L04.07    ;                     04-07
1535  006042  012037  001430                  MOV     (R0)+,SYNC2B    ;
1536  006046  012037  001422                  MOV     (R0)+,L08.11    ;                     08-11
1537  006052  012037  001432                  MOV     (R0)+,SYNC2C    ;
1538  006056  012037  001424                  MOV     (R0)+,L12.15    ;                     12-15
1539  006062  012037  001434                  MOV     (R0)+,SYNC2D    ;
1540  006066  012700  000002                  MOV     #2,R0           ;SAVE CORE THIS WAY!
1541  006072  013737  001362  001364          MOV     DVSCR,DVSCRH    ;GET SYS CTRL. REG HIGH BYTE.
1542  006100  005237  001364                  INC     DVSCRH          ;GOT IT.
1543  006104  013737  001364  001366          MOV     DVSCRH,DVRIC    ;GET NXT REC. CHAR REG.
1544  006112  005237  001366                  INC     DVRIC           ;GOT IT
1545  006116  013737  001366  001370          MOV     DVRIC,DVLCR     ;GET LN. PAR.REG.
1546  006124  060037  001370                  ADD     R0,DVLCR        ;GOT IT
1547  006130  013737  001370  001372          MOV     DVLCR,DVSRS     ;GET SEC. REG. SEL. REG.
1548  006136  060037  001372                  ADD     R0,DVSRS        ;GOT IT
1549  006142  013737  001372  001374          MOV     DVSRS,DVSRSH    ;GET HIGH BYTE.
1550  006150  005237  001374                  INC     DVSRSH          ;GOT IT
1551  006154  013737  001374  001376          MOV     DVSRSH,DVSRA    ;SEC. REG. ACCESS.
1552  006162  005237  001376                  INC     DVSRA           ;GOT IT
```

```
1553  006166  013737  001376  001400          MOV     DVSRA,DVSFR     ;SPEC. FUN. REG.
1554  006174  060037  001400                  ADD     R0,DVSFR        ;
1555  006200  013737  001400  001402          MOV     DVSFR,DVNSR     ;NPR STAT. REG.
1556  006206  060037  001402                  ADD     R0,DVNSR        ;
1557  006212  013737  001402  001404          MOV     DVNSR,RESV16    ;RESERVED REG
1558  006220  060037  001404                  ADD     R0,RESV16       ;
1559
1560  006224  013737  001352  001354          MOV     DVRVEC,DVRLVL   ;PTY LVL
1561  006232  060037  001354                  ADD     R0,DVRLVL       ;
1562  006236  013737  001354  001356          MOV     DVRLVL,DVTVEC   ;TX VEC
1563  006244  060037  001356                  ADD     R0,DVTVEC       ;
1564  006250  013737  001356  001360          MOV     DVTVEC,DVTLVL   ;TX LVL
1565  006256  060037  001360                  ADD     R0,DVTLVL
1566
1567  006262  012700  001416                  MOV     #L00.03,R0      ;LOAD STAUS 00-03
1568  006266  012701  001406                  MOV     #MASK.A,R1      ;PREPARE MASK.
1569  006272  012702  001412                  MOV     #CLK.A,R2       ;PREPARE CLOCKS
1570  006276  004737  006516                  JSR     PC,FIX.00       ;GO AND CALCULATE CONFIGURATION.
1571
1572  006302  012700  001420                  MOV     #L04.07,R0      ;LOAD STAUS 00-03
1573  006306  012701  001407                  MOV     #MASK.B,R1      ;PREPARE MASK.
1574  006312  012702  001413                  MOV     #CLK.B,R2       ;PREPARE CLOCKS
1575  006316  004737  006516                  JSR     PC,FIX.00       ;GO AND CALCULATE CONFIGURATION.
1576
1577  006322  012700  001422                  MOV     #L08.11,R0      ;LOAD STAUS 00-03
1578  006326  012701  001410                  MOV     #MASK.C,R1      ;PREPARE MASK.
1579  006332  012702  001414                  MOV     #CLK.C,R2       ;PREPARE CLOCKS
1580  006336  004737  006516                  JSR     PC,FIX.00       ;GO AND CALCULATE CONFIGURATION.
1581
1582  006342  012700  001424                  MOV     #L12.15,R0      ;LOAD STAUS 00-03
1583  006346  012701  001411                  MOV     #MASK.D,R1      ;PREPARE MASK.
1584  006352  012702  001415                  MOV     #CLK.D,R2       ;PREPARE CLOCKS
1585  006356  004737  006516                  JSR     PC,FIX.00       ;GO AND CALCULATE CONFIGURATION.
1586  006362  032777  000002  172612          BIT     #SW01,@SWR
1587  006370  001445                          BEQ     7$
1588  006372                          4$:
1589  006372  005737  000042                  TST     @#42
1590  006376  001042                          BNE     7$
1591  006400  104402  005104                  TYPE    ,MCRLF
1592  006404  104403                          INSTR
1593  006406  005366                          MTSTN
1594  006410  104405                          PARAM
1595  006412  000001                          1
1596  006414  001000                          1000
1597  006416  001226                          TSTNO
1598  006420     000                  .BYTE   0
1599  006421     001                  .BYTE   1
1600  006422  012700  007256                  MOV     #TST1,R0
1601  006426  022710                  5$:     CMP     (PC)+,(R0)
1602  006430  012737                          MOV     (PC)+,@(PC)+
1603  006432  001015                          BNE     6$
1604  006434  023760  001226  000002          CMP     TSTNO,2(R0)
1605  006442  001011                          BNE     6$
1606  006444  022760  001226  000004          CMP     #TSTNO,4(R0)
1607  006452  001005                          BNE     6$
1608  006454  010037  001214                  MOV     R0,RETURN
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1609  006460  104402  005104                        TYPE    ,MCRLF
1610  006464  000412                                BR      8$
1611  006466  005720                        6$:     TST     (R0)+
1612  006470  020027  017056                        CMP     R0,#TLAST+10
1613  006474  001354                                BNE     5$
1614  006476  104402  005100                        TYPE    ,MQM
1615  006502  000733                                BR      4$
1616  006504  012737  007256  001214        7$:     MOV     #TST1,RETURN    ;PREPARE RETURN ADDRESS
1617  006512  000177  172476                6$:     JMP     @RETURN         ;GO START TESTING.
1618
1619  006516  011003                        FIX.00: MOV     (R0),R3         ;GET PARAMETERS.
1620  006520  042703  176377                        BIC     #^C<1400>,R3    ;CLEAR JUNK.
1621  006524  005703                                TST     R3              ;TEST FOR EIGHT BITS.
1622  006526  001004                                BNE     1$              ;BR IF NOT 8 BITS.
1623  006530  105011                                CLRB    (R1)            ;SET
1624  006532  112712  000010                        MOVB    #8.,(R2)        ;
1625  006536  000424                                BR      4$
1626  006540  022703  000400                1$:     CMP     #400,R3         ;CHECK FOR SEVEN BITS.
1627  006544  001005                                BNE     2$              ;BR IF NOT 7 BITS.
1628  006546  112711  000200                        MOVB    #200,(R1)       ;
1629  006552  112712  000007                        MOVB    #7,(R2)         ;
1630  006556  000414                                BR      4$
1631  006560  022703  001000                2$:     CMP     #1000,R3        ;CHECK FOR SIX BITS.
1632  006564  001005                                BNE     3$              ;BR IF NOT SIX BITS.
1633  006566  112711  000300                        MOVB    #300,(R1)       ;
1634  006572  112712  000006                        MOVB    #6,(R2)         ;
1635  006576  000404                                BR      4$
1636  006600  112711  000340                3$:     MOVB    #340,(R1)       ;IF NONE OF THE ABOVE; MUST BE 5 BITS.
1637  006604  112712  000005                        MOVB    #5,(R2)         ;
1638  006610  032710  040000                4$:     BIT     #PARBIT,(R0)    ;PARITY ENABLED?
1639  006614  001401                                BEQ     5$              ;IF =0; THEN NO PARITY.
1640  006616  105212                                INCB    (R2)            ;PLUS ONE TO THE CLOCK!
1641  006620  000207                        5$:     RTS     PC              ;
1642
1643                                                ;*ROUTINE USED TO "AUTO SIZE" THE DV11
1644                                                ;*CSR AND VECTOR.
1645                                                ;*NOTE: THE CSR MAY BE ANY WHERE IN THE FLOATING
1646                                                ;*      ADDRESS RANGE (175000:175400)
1647                                                ;*      AND THE VECTOR MAY BE ANY WHERE IN THE
1648                                                ;*      FLOATING VECTOR RANGE (300:770)
1649                                                ;*
1650
1651  006622                        AUTO.SIZE:
1652  006622  000005                                RESET                   ;INSURE A BUS INIT.
1653  006624  012702  001500        CSRMAP: MOV     #DV.MAP,R2              ;LOAD MAP POINTER.
1654  006630  005022                1$:     CLR     (R2)+                   ;ZERO ENTIRE MAP
1655  006632  022702  001740                CMP     #DV.END,R2              ;ALL DONE?
1656  006636  001374                        BNE     1$                      ;BR IF NO
1657  006640  105037  001301                CLRB    DVNUM                   ;SET OCTAL NUMBER OF DV11'S TO 0
1658  006644  012702  001500                MOV     #DV.MAP,R2
1659  006650  012701  175000                MOV     #175000,R1              ;SET FOR FIRST ADDRESS TO BE TESTED
1660  006654  012737  007074  000004        MOV     #6$,@#4                 ;SET FOR NON-EXISTANT DEVICE TIME OUT
1661  006662  005711                2$:     TST     (R1)                    ;IF DV11 DVSCR S/B 0
1662  006664  001037                        BNE     3$                      ;IF NO DEV ; TRAP TO 4. IF NO BIT 8 THEN NO DV11
1663  006666  022761  177777  000012        CMP     #177777,12(R1)          ;IF DV11 THEN DVSFR S/B ALL 1'S ON INIT!
1664  006674  001033                        BNE     3$                      ;BR IF NOT DV11
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1665  006676  005761  000016                          TST     16(R1)          ;IF DV11 THEN RESV16 S/B ALL 0'S
1666  006702  001030                                  BNE     3$              ;BR IF NOT DV11
1667                                          ;AT THIS POINT IT IS ASSUMED THAT R1 HOLDS A DV11 CSR ADDRESS.
1668  006704  010122                                  MOV     R1,(R2)+        ;STORE CSR IN CORE TABLE.
1669  006706  005722                                  TST     (R2)+           ;POP OVER VECTOR STORE AREA
1670  006710  052722  000226                          BIS     #226,(R2)+      ;SET LINE CARD 1 STAT AND SYNC
1671  006714  052722  000062                          BIS     #62,(R2)+       ;
1672  006720  052722  000226                          BIS     #226,(R2)+      ;SET LINE CARD 2 STAT AND SYNC
1673  006724  052722  000062                          BIS     #62,(R2)+       ;
1674  006730  052722  000226                          BIS     #226,(R2)+      ;SET LINE CARD 3 STAT AND SYNC
1675  006734  052722  000062                          BIS     #62,(R2)+       ;
1676  006740  052722  000226                          BIS     #226,(R2)+      ;SET LINE CARD 4 STAT AND SYNC
1677  006744  052722  000062                          BIS     #62,(R2)+       ;
1678  006750  105237  001301                          INCB    DVNUM           ;UPDATE DEVICE COUNTER
1679  006754  122737  000010  001301                  CMPB    #10,DVNUM       ;ARE MAX. NO. OF DEV FOUND?
1680  006762  001405                                  BEQ     100$            ;YES DON'T LOOK FOR ANY MORE.
1681  006764  062701  000010                  3$:     ADD     #10,R1          ;UPDATE CSR POINTER ADDRESS
1682  006770  022701  175400                          CMP     #175400,R1
1683  006774  001332                                  BNE     2$              ;BR IF MORE ADDRESS TO CHECK.
1684  006776  012722  177777                  100$:   MOV     #177777,(R2)+   ;TERMINATER.
1685  007002  105037  001300                          CLRB    DVACTV
1686  007006  105737  001301                          TSTB    DVNUM           ;WERE ANY DV11'S FOUND AT ALL?
1687  007012  001423                                  BEQ     5$              ;ERROR AUTO SIZER FOUND NO DV11'S IN THIS SYS.
1688  007014  113701  001301                          MOVB    DVNUM,R1
1689  007020  110137  001303                          MOVB    R1,SAVNUM       ;SAVE NUMBER OF DEVICES
1690  007024  000241                          4$:     CLC
1691  007026  106137  001300                          ROLB    DVACTV          ;GENERATE ACTIVE REGISTER OF DEVICES.
1692  007032  105237  001300                          INCB    DVACTV          ;SET THE BIT
1693  007036  005301                                  DEC     R1
1694  007040  001371                                  BNE     4$              ;BR IF MORE TO GENERATE
1695  007042  012737  000006  000004                  MOV     #6,@#4          ;RESTORE TRAP VECTOR
1696  007050  113737  001300  001302                  MOVB    DVACTV,SAVACT   ;SAVE ACTIVE REGISTER
1697  007056  000137  007102                          JMP     VECMAP          ;GO FIND THE VECTOR NOW.
1698  007062  104402  005174                  5$:     TYPE    ,MERR2          ;NOTIFY OPR THAT NO DV11'S FOUND.
1699  007066  005000                                  CLR     R0              ;MAKE DATA LIGHTS ZERO
1700  007070  000000                                  HALT                    ;STOP THE SHOW
1701  007072  000776                                  BR      .-2             ;DISABLE CONT. SW.
1702  007074  012716  006764                  6$:     MOV     #3$,(SP)        ;ENTERED BY NON-EXISTANT TIME-OUT.
1703  007100  000002                                  RTI                     ;RETURN TO MAINSTREAM
1704
1705  007102  012737  000340  000022          VECMAP: MOV     #340,@#22       ;SET IOT TRAP PRIO TO 7
1706  007110  012737  007232  000020                  MOV     #4$,@#20        ;SET IOT TRAP VECTOR
1707  007116  012702  001500                          MOV     #DV.MAP,R2      ;SET SOFTWARE POINTER
1708  007122  012700  000300                          MOV     #300,R0         ;FLOATING VECTORS START HERE.
1709  007126  012701  000302                          MOV     #302,R1         ;PC OF IOT INSTR.
1710  007132  010120                          1$:     MOV     R1,(R0)+        ;START FILLING VECTOR AREA
1711  007134  012721  000004                          MOV     #4,(R1)+        ;WITH .+2; IOT
1712  007140  022021                                  CMP     (R0)+,(R1)+     ;ADD 2 TO R0 +R1
1713  007142  020127  001000                          CMP     R1,#1000
1714  007146  101771                                  BLOS    1$              ;BR IF MORE TO FILL
1715  007150  113737  001300  001246                  MOVB    DVACTV,TEMP1    ;STORE TEMPORALLY
1716  007156  006037  001246                  2$:     ROR     TEMP1           ;BRING OUT A BIT
1717  007162  103034                                  BCC     5$              ;BR IF ALL DONE
1718  007164  005037  177776                          CLR     PS              ;ZERO CPU PRIO
1719  007170  012772  001300  000000                  MOV     #BIT9+BIT7+BIT6,@(R2)
1720  007176  005000                                  CLR     R0              ;ATTEMPT TO FORCE AN INTERUPT
```

K03


```
1721   007200  005200                          INC     R0              ;STALL
1722   007202  001376                          BNE     .-2             ;       FOR TIME TO INTERUPT
1723   007204  052762  000300  000002          BIS     #300,2(R2)      ;NO INTERUPT ASSUME 300 AND FIX DV11 LATER
1724   007212  042772  176777  000000    3$:   BIC     #^C<BIT9>,@(R2)
1725   007220  005072  000000                  CLR     @(R2)
1726   007224  062702  000024                  ADD     #24,R2          ;POP SOFTWARE POINTER
1727   007230  000752                          BR      2$              ;KEEP GOING
1728   007232  051662  000002            4$:   BIS     (SP),2(R2)      ;GET VECTOR ADDRESS
1729   007236  042762  000007  000002          BIC     #7,2(R2)        ;CLEAR JUNK
1730   007244  022626                          CMP     (SP)+,(SP)+     ;POP IOT JUNK OFF STACK
1731   007246  012716  007212                  MOV     #3$,(SP)        ;SET FOR RETURN
1732   007252  000002                          RTI
1733   007254  000207                    5$:   RTS     PC              ;ALL DONE WITH "AUTO SIZING"
1734
```

```
1735
1736                                    ;************************ TEST 1 ******************************
1737                                    ;*TEST TO VERIFY DV11 ROM DATA.
1738                                    ;*THIS PROGRAM WILL PLACE ROM ADDRESS
1739                                    ;*ZERO INTO THE DVSFR AND BIT 8
1740                                    ;*(TEST POINT 1(+3 VOLTS(TRUE))) AND BRANCH "A".
1741                                    ;*A ROM CYCLE WILL BE ISSUED AND
1742                                    ;*BRANCH "NEVER" WILL BE ASSERTED.
1743                                    ;*THE DATA WILL BE COMPARED AGAINST THE
1744                                    ;*CORE IMAGE FOR VALIDITY
1745                                    ;*AND THE ROM WILL BE CYCLED TO THE END.
1746                                    ;:*************************************************************
1747
1748                                ;  TEST 1
1749                                ;--------------
1750  007256  012737  000001  001226  TST1:   MOV     #1,TSTNO
1751  007264  012737  007372  001216          MOV     #TST2,NEXT
1752  007272  104412                          MSTCLR                  ;INIT DV11
1753  007274  012777  000010  172060          MOV     #BIT3,@DVSCR    ;SET "SOURCE SEL"
1754  007302  012777  000400  172070          MOV     #BIT8,@DVSFR    ;SET BRA +3 VOLT (SURE TRUE)
1755  007310  012700  023750                  MOV     #ROMDATA,R0     ;GET SOFTWARE POINTER FOR COMPARISON
1756  007314  005002                          CLR     R2              ;ZERO ROM ADDRESS IMAGE
1757  007316  012777  000002  172036          MOV     #BIT1,@DVSCR    ;SET ROM CLK
1758  007324  052777  000004  172030          BIS     #BIT2,@DVSCR    ;SET BRANCH DSABLE
1759  007332  011005                  1$:     MOV     (R0),R5         ;GET SOFTWARE ROM IMAGE
1760  007334  017704  172040                  MOV     @DVSFR,R4       ;GET ACTUAL ROM DATA
1761  007340  020504                          CMP     R5,R4           ;ROM DATA CORRECT
1762  007342  001401                          BEQ     2$              ;BR IF YES
1763  007344  104001                          HLT     1               ;ROM DATA COMPARISOM ERROR
1764  007346  005720                  2$:     TST     (R0)+           ;UPDATE SOFTWARE POINTER
1765  007350  022700  025536                  CMP     #ENDROM,R0      ;ALL DATA DONE
1766  007354  001405                          BEQ     3$              ;BR IF YES
1767  007356  052777  000002  171776          BIS     #BIT1,@DVSCR    ;CLK ROM
1768  007364  005202                          INC     R2              ;UPDATE ROM IMAGE ADDRESS
1769  007366  000761                          BR      1$              ;CONT TESTING
1770  007370  104400                  3$:     SCOPE                   ;SCOPE THIS TEST
1771
1772
1773                                    ;************************ TEST 2 ******************************
1774                                    ;*TEST OF DV11 MICRO PROCESSOR "FREE RUNNING"
1775                                    ;*TEST TO XMIT ONE CHAR (ALL 0'S) MAKING SURE THAT
1776                                    ;*BIT 15 OF DVSCR =1
1777                                    ;*TX WC PRIMARY =0
1778                                    ;*TX BA PRIMARY =#TXBAP+1
1779                                    ;*LINE STATE =BIT7
1780                                    ;*TX BA SECONDARY =0
1781                                    ;*TX WC SECONDARY =0
1782                                    ;*NPR STATUS REG 00:03 =LINE DESIRED PLUS BIT 8 SET
1783                                    ;*THIS TEST IS EXERCISED FOR BOTH ASYNC AND SYNC LINE CARDS.
1784                                    ;:*************************************************************
1785
1786                                ;  TEST 2
1787                                ;--------------
1788  007372  012737  000002  001226  TST2:   MOV     #2,TSTNO
1789  007400  012737  010160  001216          MOV     #TST3,NEXT
1790  007406  012700  000000                  MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
```

```
1791  007412  013737  001416  001236                  MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
1792  007420  100402                                  BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
1793  007422  004737  007510                          JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
1794  007426  012700  000004              100$:       MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
1795  007432  013737  001420  001236                  MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
1796  007440  100402                                  BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
1797  007442  004737  007510                          JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
1798  007446  012700  000010              101$:       MOV     #8.,R0          ;LOAD LINE NUMBER
1799  007452  013737  001422  001236                  MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
1800  007460  100402                                  BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
1801  007462  004737  007510                          JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
1802  007466  012700  000014              102$:       MOV     #12.,R0         ;LOAD LINE NO.
1803  007472  013737  001424  001236                  MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
1804  007500  100402                                  BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
1805  007502  004737  007510                          JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
1806  007506  104400              103$:               SCOPE                   ;SCOPE THIS TEST.
1807  007510                      105$:                                       ;TEST ENTRANCE.
1808  007510  104413                                  RAMCLR                  ;CLEAR ALL DV11 SECONDARY REGISTERS
1809  007512  012705  022350                          MOV     #TXTAB,R5       ;CLEAR
1810  007516  005001                                  CLR     R1              ;       TX
1811  007520  105025              21$:                CLRB    (R5)+           ;       CONTROL
1812  007522  105201                                  INCB    R1              ;       TABLE
1813  007524  001375                                  BNE     21$             ;
1814  007526  012702  000004                          MOV     #4,R2           ;SET FOR 4 LINE GROUP
1815  007532  012737  007540  001220                  MOV     #1$,LOCK        ;SET FOR SW09=1
1816  007540  110077  171626              1$:         MOVB    R0,@DVSRS       ;LOAD LINE NUMBER
1817  007544  004537  021026                          PERFORM ,SETREG         ;
1818  007550     000     010                          .BYTE   000,010         ;BUS ADDRESS, CONTROL TABLE
1819  007552  021350                                  TXBAP                   ;
1820  007554  022350                                  TXTAB                   ;
1821  007556  005037  021350                          CLR     TXBAP           ;SET TX DATA TO 0
1822  007562  004537  021026                          PERFORM ,SETREG         ;
1823  007566     013     001                          .BYTE   013,001 ;LINE STATE, PRINCIPLE BYTE COUNT
1824  007570  000004                                  BIT2                    ;LINE STATE CONTENTS
1825  007572  177777                                  -1                      ;ONE CHAR
1826  007574  032737  004000  001236                  BIT     #ASYNC,STAT     ;#IS THIS ASYNC LINE CARD?
1827  007602  001407                                  BEQ     60$             ;#BR IF NO.
1828  007604  004537  021072                          PERFORM ,LOAD.MODE      ;#
1829  007610  015000                                  <BIT12+BIT11>+BIT9      ;#8 BITS/PER/CHAR
1830  007612  004537  021072                          PERFORM ,LOAD.MODE      ;#SET BAUD RATE REGISTER.
1831  007616  072000                                  <BIT14+BIT13+BIT12>+BIT10
1832                                                                          ;#9600 BAUD.
1833  007620  000403                                  BR      61$             ;#CONTINUE TEST.
1834  007622  004537  021072              60$:        PERFORM ,LOAD.MODE      ;LOAD MODE
1835  007626  014000                                  BIT12+BIT11             ;
1836  007630  005277  171526              61$:        INC     @DVSCR          ;SET MICRO-PROCESSOR GO!
1837  007634  005005                                  CLR     R5              ;WAIT FOR 15=1
1838  007636  005777  171520              2$:         TST     @DVSCR          ;DVSCR 15=1?
1839  007642  100403                                  BMI     3$              ;BR IF YES
1840  007644  104414                                  DELAY                   ;WASTE TIME
1841  007646  005205                                  INC     R5              ;DELAY
1842  007650  001372                                  BNE     2$              ;ALL DONE?
1843  007652  013701  001362              3$:         MOV     DVSCR,R1        ;SET POINTER
1844  007656  011104                                  MOV     (R1),R4         ;READ SCR
1845  007660  012705  100001                          MOV     #BIT15+BIT0,R5  ;SET EXPECTED
1846  007664  020504                                  CMP     R5,R4           ;RESULTS GOOD?
```

```
1847  007666  001401                          BEQ     4$              ;BR IF OK
1848  007670  104002                          HLT     2               ;DVSCR WRONG
1849  007672  005777  171470          4$:     TST     @DVRIC          ;MAKE SURE NO RIC ENTRIES
1850  007676  001405                          BEQ     5$              ;BR IF OK
1851  007700  013701  001366                  MOV     DVRIC,R1        ;SET POINTER
1852  007704  011104                          MOV     (R1),R4         ;SAVE FOR TYPE OUT
1853  007706  005005                          CLR     R5              ;MAKE EXPECTED=0
1854  007710  104002                          HLT     2               ;REPORT RIC NOT=0
1855  007712  010005          5$:             MOV     R0,R5           ;LOAD LINE NUMBER
1856  007714  052705  100400                  BIS     #BIT15+BIT8,R5  ;SILO ENTRY PRINCIPLE BYTE COUNT=0
1857  007720  012703  000020                  MOV     #16.,R3         ;SET FOR 16 REGISTERS
1858  007724  013701  001402                  MOV     DVNSR,R1        ;SET POINTER
1859  007730  011104                          MOV     (R1),R4         ;READ NSR
1860  007732  020504                          CMP     R5,R4           ;OK?
1861  007734  001401                          BEQ     6$              ;BR IF OK
1862  007736  104002                          HLT     2               ;DVNSR NOT CORRECT
1863  007740  013701  001362          6$:     MOV     DVSCR,R1        ;SET POINTER
1864  007744  011104                          MOV     (R1),R4         ;READ DVSCR [DID BITS CLEAR]
1865  007746  100005                          BPL     7$              ;BR IF 15=0
1866  007750  012705  000001                  MOV     #BIT0,R5        ;SET EXPECTED RESULTS
1867  007754  104002                          HLT     2               ;BIT 15 OF DVSCR NOT CLEARED BY READING NSR
1868  007756  005777  171420                  TST     @DVNSR          ;REFERENCE NSR
1869  007762  005303          7$:             DEC     R3              ;ALL REGISTERS DONE?
1870  007764  001365                          BNE     6$              ;BR IF NO
1871  007766  042777  000001  171366          BIC     #BIT0,@DVSCR    ;CLEAR MICRO-PROCESSOR GO
1872  007774  012705  021351                  MOV     #TXBAP+1,R5     ;SET EXPECTED
1873  010000  010077  171366                  MOV     R0,@DVSRS       ;LOAD LINE NUMBER
1874  010004  017704  171366                  MOV     @DVSRA,R4       ;READ BUS ADDRESS
1875  010010  117701  171360                  MOVB    @DVSRSH,R1      ;GET SEC REG.
1876  010014  020504                          CMP     R5,R4           ;GOOD?
1877  010016  001401                          BEQ     8$              ;BR IF GOOD
1878  010020  104003                          HLT     3               ;BUS ADDRESS NOT INCREMENTED CORRECTLY
1879  010022  105277  171346          8$:     INCB    @DVSRSH         ;EXAMINE
1880  010026  005201                          INC     R1              ;
1881  010030  017704  171342                  MOV     @DVSRA,R4       ;BYTE COUNT REGISTER
1882  010034  001402                          BEQ     10$             ;IS IT=0?
1883  010036  005005                          CLR     R5              ;SET EXPECTED
1884  010040  104003                          HLT     3               ;BYTE COUNT NOT=0!
1885  010042  010077  171324          10$:    MOV     R0,@DVSRS       ;LOAD LINE NUMBER
1886  010046  112777  000002  171320          MOVB    #002,@DVSRSH    ;GET OPPOSITE BUS ADDRESS
1887  010054  005005                          CLR     R5              ;SET EXPECTED
1888  010056  117701  171312                  MOVB    @DVSRSH,R1      ;GET SEC REG.
1889  010062  017704  171310                  MOV     @DVSRA,R4       ;READ RESULT
1890  010066  001401                          BEQ     11$             ;BRANCH IF=0
1891  010070  104003                          HLT     3               ;OPPOSITE BUS ADDRESS SHOULDN'T BE ALTERED.
1892  010072  105277  171276          11$:    INCB    @DVSRSH         ;GET OPPOSITE BYTE COUNT
1893  010076  005201                          INC     R1              ;SET SEC POINTER
1894  010100  017704  171272                  MOV     @DVSRA,R4       ;READ
1895  010104  001401                          BEQ     12$             ;BRANCH IF=0
1896  010106  104003                          HLT     3               ;OPPOSITE BYTE CNT S/B=0
1897  010110  012705  000200          12$:    MOV     #BIT7,R5                ;SET EXPECTED RESULTS
1898  010114  112777  000013  171252          MOVB    #13,@DVSRSH     ;SEL LINE STATE
1899  010122  112701  000013                  MOVB    #13,R1          ;SET SEC REG POINTER
1900  010126  017704  171244                  MOV     @DVSRA,R4       ;READ LINE STATE
1901  010132  020504                          CMP     R5,R4           ;OK
1902  010134  001401                          BEQ     13$             ;OK!
```

```
                                                HLT     3               ;LINE STATE INCORRECT
                                        13$:    MSTCLR                  ;INIT DV11
                                                SCOPI                   ;SW09=1?
                                                INC     R0              ;UPDATE LINE POINTER
                                                DEC     R2              ;4 LINES DONE YET?
                                                BEQ     .+6             ;BR IF YES
                                                JMP     13$             ;JMP IF NO
                                                RTS     PC              ;RETURN FOR NEXT GROUP


                                                ;************************* TEST 3 ******************************
                                                ;*TEST OF DV11 MICRO PROCESSOR "FREE RUNNING"
                                                ;*TEST TO XMIT ONE CHAR (ALL 0'S) MAKING SURE THAT
                                                ;*BIT 15 OF DVSCR =1
                                                ;*TX WC PRIMARY =0
                                                ;*TX BA PRIMARY =0
                                                ;*LINE STATE =0
                                                ;*TX BA SECONDARY =TXBAS+1
                                                ;*TX WC SECONDARY =0
                                                ;*NPR STATUS REG 00:03=LINE SELECTED +BIT9+BIT8=1
                                                ;*THIS TEST IS EXERCISED FOR BOTH ASYNC AND SYNC LINE CARDS.
                                                ;:***************************************************************

                                        ;  TEST 3
                                        ;--------------
1928 010160 012737 000003 001226        TST3:   MOV     #3,TSTNO
1929 010166 012737 010754 001216                MOV     #TST4,NEXT
1930 010174 012700 000000                       MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
1931 010200 013737 001416 001236                MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
1932 010206 100402                              BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
1933 010210 004737 010276                       JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
1934 010214 012700 000004               100$:   MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
1935 010220 013737 001420 001236                MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
1936 010226 100402                              BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
1937 010230 004737 010276                       JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
1938 010234 012700 000010               101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
1939 010240 013737 001422 001236                MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
1940 010246 100402                              BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
1941 010250 004737 010276                       JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
1942 010254 012700 000014               102$:   MOV     #12.,R0         ;LOAD LINE NO.
1943 010260 013737 001424 001236                MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
1944 010266 100402                              BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
1945 010270 004737 010276                       JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
1946 010274 104400                      103$:   SCOPE                   ;SCOPE THIS TEST.
1947 010276                             105$:                           ;TEST ENTRANCE.
1948 010276 104413                              RAMCLR                  ;CLEAR ALL DV11 SECONDARY REGISTERS
1949 010300 012705 022350                       MOV     #TXTAB,R5       ;CLEAR
1950 010304 005001                              CLR     R1              ;       TX
1951 010306 105025                      21$:    CLRB    (R5)+           ;       CONTROL
1952 010310 105201                              INCB    R1              ;       TABLE
1953 010312 001375                              BNE     21$             ;
1954 010314 012702 000004                       MOV     #4,R2           ;SET FOR 4 LINE GROUP
1955 010320 012737 010326 001220                MOV     #1$,LOCK        ;SET FOR SW09=1
1956 010326 110077 171040               1$:     MOVB    R0,@DVSRS       ;LOAD LINE NUMBER
1957 010332 004537 021026                       PERFORM ,SETREG         ;
1958 010336     002     010                     .BYTE   002,010         ;BUS ADDRESS, CONTROL TABLE
```

```
 1959  010340  021750                                    TXBAS                   ;
 1960  010342  022350                                    TXTAB                   ;
 1961  010344  005037  021750                            CLR     TXBAS           ;SET TX DATA TO 0
 1962  010350  004537  021026                            PERFORM ,SETREG         ;
 1963  010354     013     003                            .BYTE   013,003 ;LINE STATE, ALTERNATE BYTE COUNT
 1964  010356  000204                                    BIT7+BIT2                       ;LINE STATE CONTENTS
 1965  010360  177777                                    -1                      ;ONE CHAR
 1966  010362  032737  004000  001236                    BIT     #ASYNC,STAT     ;#IS THIS ASYNC LINE CARD?
 1967  010370  001407                                    BEQ     60$             ;#BR IF NO.
 1968  010372  004537  021072                            PERFORM ,LOAD.MODE      ;#
 1969  010376  015000                                    (BIT12+BIT11)+BIT9      ;#8 BITS/PER/CHAR
 1970  010400  004537  021072                            PERFORM ,LOAD.MODE      ;#SET BAUD RATE REGISTER.
 1971  010404  072000                                    (BIT14+BIT13+BIT12)+BIT10
 1972                                                                            ;#9600 BAUD.
 1973  010406  000403                                    BR      61$             ;#CONTINUE TEST.
 1974  010410  004537  021072                    60$:    PERFORM ,LOAD.MODE      ;LOAD MODE
 1975  010414  014000                                    BIT12+BIT11             ;
 1976  010416  005277  170740                    61$:    INC     @DVSCR          ;SET MICRO-PROCESSOR GO!
 1977  010422  005005                                    CLR     R5              ;WAIT FOR 15=1
 1978  010424  005777  170732                    2$:     TST     @DVSCR          ;DVSCR 15=1?
 1979  010430  100403                                    BMI     3$              ;BR IF YES
 1980  010432  104414                                    DELAY                   ;WASTE TIME
 1981  010434  005205                                    INC     R5              ;DELAY
 1982  010436  001372                                    BNE     2$              ;ALL DONE?
 1983  010440  013701  001362                    3$:     MOV     DVSCR,R1        ;SET POINTER
 1984  010444  011104                                    MOV     (R1),R4         ;READ SCR
 1985  010446  012705  100001                            MOV     #BIT15+BIT0,R5  ;SET EXPECTED
 1986  010452  020504                                    CMP     R5,R4           ;RESULTS GOOD?
 1987  010454  001401                                    BEQ     4$              ;BR IF OK
 1988  010456  104002                                    HLT     2               ;DVSCR WRONG
 1989  010460  005777  170702                    4$:     TST     @DVRIC          ;MAKE SURE NO RIC ENTRIES
 1990  010464  001405                                    BEQ     5$              ;BR IF OK
 1991  010466  013701  001366                            MOV     DVRIC,R1        ;SET POINTER
 1992  010472  011104                                    MOV     (R1),R4         ;SAVE FOR TYPE OUT
 1993  010474  005005                                    CLR     R5              ;MAKE EXPECTED=0
 1994  010476  104002                                    HLT     2               ;REPORT RIC NOT=0
 1995  010500  010005                            5$:     MOV     R0,R5           ;LOAD LINE NUMBER
 1996  010502  052705  101400                            BIS     #BIT15+BIT9+BIT8,R5     ;SILO ENTRY ALTERNATE BYTE COUNT=0
 1997  010506  012703  000020                            MOV     #16.,R3         ;SET FOR 16 REGISTERS
 1998  010512  013701  001402                            MOV     DVNSR,R1        ;SET POINTER
 1999  010516  011104                                    MOV     (R1),R4         ;READ NSR
 2000  010520  020504                                    CMP     R5,R4           ;OK?
 2001  010522  001401                                    BEQ     6$              ;BR IF OK
 2002  010524  104002                                    HLT     2               ;DVNSR NOT CORRECT
 2003  010526  013701  001362                    6$:     MOV     DVSCR,R1        ;SET POINTER
 2004  010532  011104                                    MOV     (R1),R4         ;READ DVSCR [DID BITS CLEAR]
 2005  010534  100005                                    BPL     7$              ;BR IF 15=0
 2006  010536  012705  000001                            MOV     #BIT0,R5        ;SET EXPECTED RESULTS
 2007  010542  104002                                    HLT     2               ;BIT 15 OF DVSCR NOT CLEARED BY READING NSR
 2008  010544  005777  170632                            TST     @DVNSR          ;REFERENCE NSR
 2009  010550  005303                    7$:     DEC     R3              ;ALL REGISTERS DONE?
 2010  010552  001365                            BNE     6$              ;BR IF NO
 2011  010554  042777  000001  170600                    BIC     #BIT0,@DVSCR    ;CLEAR MICRO-PROCESSOR GO
 2012  010562  012705  021751                            MOV     #TXBAS+1,R5     ;SET EXPECTED
 2013  010566  010077  170600                            MOV     R0,@DVSRS       ;LOAD LINE NUMBER
 2014  010572  112777  000002  170574                    MOVB    #2,@DVSRSH      ;SEL ALTERNATE BUS ADDRESS
```

```
 2015  010600  017704  170572                         MOV     @DVSRA,R4       ;READ BUS ADDRESS
 2016  010604  117701  170564                         MOVB    @DVSRSH,R1      ;GET SEC REG.
 2017  010610  020504                                 CMP     R5,R4           ;GOOD?
 2018  010612  001401                                 BEQ     8$              ;BR IF GOOD
 2019  010614  104003                                 HLT     3               ;BUS ADDRESS NOT INCREMENTED CORRECTLY
 2020  010616  105277  170552                 8$:     INCB    @DVSRSH         ;EXAMINE
 2021  010622  005201                                 INC     R1              ;
 2022  010624  017704  170546                         MOV     @DVSRA,R4       ;BYTE COUNT REGISTER
 2023  010630  001402                                 BEQ     10$             ;IS IT=0?
 2024  010632  005005                                 CLR     R5              ;SET EXPECTED
 2025  010634  104003                                 HLT     3               ;BYTE COUNT NOT=0!
 2026  010636  010077  170530                 10$:    MOV     R0,@DVSRS       ;LOAD LINE NUMBER
 2027  010642  112777  000000  170524                 MOVB    #000,@DVSRSH    ;GET OPPOSITE BUS ADDRESS
 2028  010650  005005                                 CLR     R5              ;SET EXPECTED
 2029  010652  117701  170516                         MOVB    @DVSRSH,R1      ;GET SEC REG.
 2030  010656  017704  170514                         MOV     @DVSRA,R4       ;READ RESULT
 2031  010662  001401                                 BEQ     11$             ;BRANCH IF=0
 2032  010664  104003                                 HLT     3               ;OPPOSITE BUS ADDRESS SHOULDN'T BE ALTERED.
 2033  010666  105277  170502                 11$:    INCB    @DVSRSH         ;GET OPPOSITE BYTE COUNT
 2034  010672  005201                                 INC     R1              ;SET SEC POINTER
 2035  010674  017704  170476                         MOV     @DVSRA,R4       ;READ
 2036  010700  001401                                 BEQ     12$             ;BRANCH IF=0
 2037  010702  104003                                 HLT     3               ;OPPOSITE BYTE CNT S/B=0
 2038  010704  012705  000000                 12$:    MOV     #0,R5           ;SET EXPECTED RESULTS
 2039  010710  112777  000013  170456                 MOVB    #13,@DVSRSH     ;SEL LINE STATE
 2040  010716  112701  000013                         MOVB    #13,R1          ;SET SEC REG POINTER
 2041  010722  017704  170450                         MOV     @DVSRA,R4       ;READ LINE STATE
 2042  010726  020504                                 CMP     R5,R4           ;OK
 2043  010730  001401                                 BEQ     13$             ;OK!
 2044  010732  104003                                 HLT     3               ;LINE STATE INCORRECT
 2045  010734  104412                 13$:    MSTCLR                          ;INIT DV11
 2046  010736  104401                         SCOPI                           ;SW09=1?
 2047  010740  005200                         INC     R0                      ;UPDATE LINE POINTER
 2048  010742  005302                         DEC     R2                      ;4 LINES DONE YET?
 2049  010744  001402                         BEQ     .+6                     ;BR IF YES
 2050  010746  000137  010326                 JMP     1$                      ;JMP IF NO
 2051  010752  000207                         RTS     PC                      ;RETURN FOR NEXT GROUP
 2052
 2053
 2054                                         ;************************* TEST 4 ******************************
 2055                                         ;*TEST OF TRANSMITTER NON-EXISTANT MEMORY FLAGING.
 2056                                         ;*THIS TEST VERIFIES THAT THE MICO-PROCESSOR
 2057                                         ;*CAN FLAG A NON-EXISTANT TX BUS ADDRESS.
 2058                                         ;*EXPECTED:     (THIS IS FOR LINES  )
 2059                                         ;*DVSCR         BIT15+BIT0
 2060                                         ;*DVNSR         03:00=LINE  11:08=0  BIT15=1
 2061                                         ;*TXBAP         177320
 2062                                         ;*TXWCP         177777
 2063                                         ;*DVLINE STATE  BIT4=1
 2064                                         ;*THIS TEST IS DONE FOR SYNC AND ASYNC LINE CARDS.
 2065                                         ;;***************************************************************
 2066
 2067                                 ;  TEST 4
 2068                                 ;--------------
 2069  010754  012737  000004  001226 TST4:   MOV     #4,TSTNO
 2070  010762  012737  011434  001216         MOV     #TST5,NEXT
```

```
 2071  010770  012700  000000                        MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
 2072  010774  013737  001416  001236                MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
 2073  011002  100402                                BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
 2074  011004  004737  011072                        JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
 2075  011010  012700  000004                100$:   MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
 2076  011014  013737  001420  001236                MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
 2077  011022  100402                                BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
 2078  011024  004737  011072                        JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
 2079  011030  012700  000010                101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
 2080  011034  013737  001422  001236                MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
 2081  011042  100402                                BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
 2082  011044  004737  011072                        JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
 2083  011050  012700  000014                102$:   MOV     #12.,R0         ;LOAD LINE NO.
 2084  011054  013737  001424  001236                MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
 2085  011062  100402                                BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
 2086  011064  004737  011072                        JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
 2087  011070  104400                        103$:   SCOPE                   ;SCOPE THIS TEST.
 2088  011072                                105$:                           ;TEST ENTRANCE.
 2089  011072  104413                                RAMCLR                  ;CLEAR ALL SEC. REGISTERS
 2090  011074  012737  011106  001220                MOV     #1$,LOCK        ;SET IF SW09=1
 2091  011102  012702  000004                        MOV     #4,R2           ;SET FOR A 4 LINE GROUP
 2092  011106  010077  170260                1$:     MOV     R0,@DVSRS       ;LOAD LINE NO.
 2093  011112  052777  000060  170242                BIS     #BIT5+BIT4,@DVSCR
 2094  011120  004537  021026                        PERFORM ,SETREG         ;SET EA BITS
 2095  011124     000     010                        .BYTE   000,010         ;GO LOAD BUS ADDRESS AND CNTRL TABLE
 2096  011126  177320                                177320                  ;THIS IS ADDRESS OF 2ND KE11
 2097  011130  022350                                TXTAB                   ;
 2098  011132  042777  000060  170222                BIC     #BIT5+BIT4,@DVSCR
 2099  011140  004537  021026                        PERFORM ,SETREG         ;CLEAR EA BITS FOR CERTAIN
 2100  011144     013     001                        .BYTE   013,001         ;LOAD LINE STATE AND PRINCIPLE BYTE CNT.
 2101  011146  000004                                BIT2                    ;TX GO
 2102  011150  177777                                -1                      ;ONE CHAR
 2103  011152  032737  004000  001236                BIT     #ASYNC,STAT     ;#IS THIS ASYNC LINE CARD?
 2104  011160  001407                                BEQ     60$             ;#BR IF NO.
 2105  011162  004537  021072                        PERFORM ,LOAD.MODE      ;#
 2106  011166  015000                                (BIT12+BIT11)+BIT9      ;#8 BITS/PER/CHAR
 2107  011170  004537  021072                        PERFORM ,LOAD.MODE      ;#SET BAUD RATE REGISTER.
 2108  011174  072000                                (BIT14+BIT13+BIT12)+BIT10
 2109                                                                        ;#9600 BAUD.
 2110  011176  000403                                BR      61$             ;#CONTINUE TEST.
 2111  011200  004537  021072                60$:    PERFORM ,LOAD.MODE      ;LOAD
 2112  011204  014000                                BIT12+BIT11             ;MODE
 2113  011206  005277  170150                61$:    INC     @DVSCR          ;SET MICRO PROCESSOR GO
 2114  011212  005005                                CLR     R5              ;PREPARE TIMER
 2115  011214  005777  170142                2$:     TST     @DVSCR          ;SILO ENTRY?
 2116  011220  100403                                BMI     3$              ;BR IF DONE
 2117  011222  104414                                DELAY                   ;WASTE TIME
 2118  011224  005205                                INC     R5              ;DELAY
 2119  011226  001372                                BNE     2$              ;
 2120  011230  013701  001362                3$:     MOV     DVSCR,R1        ;SET POINTER
 2121  011234  011104                                MOV     (R1),R4         ;READ SCR
 2122  011236  012705  100001                        MOV     #BIT15+BIT0,R5  ;SET EXPECTED RESULTS
 2123  011242  020504                                CMP     R5,R4           ;DVSCR OK?
 2124  011244  001401                                BEQ     4$              ;
 2125  011246  104002                                HLT     2               ;DVSCR INCORRECT
 2126  011250  042777  000001  170104                4$:     BIC     #BIT0,@DVSCR    ;CLEAR MICRO CPU GO
```

```
                                                MOV     R0,R5           ;LOAD LINE NO.
                                                BIS     #BIT15,R5       ;SET SILO ENTRY
                                                MOV     DVNSR,R1        ;SET POINTER
                                                MOV     (R1),R4         ;READ NSR
                                                CMP     R5,R4           ;NSR OK?
                                                BEQ     5$              ;
                                                HLT     2               ;DVNSR INCORRECT
                                        5$:     CLR     R5              ;SET EXPCTED RESULTS TO 0
                                                MOV     DVSCR,R1        ;SET POINTER
                                                MOV     (R1),R4         ;READ DVSCR
                                                BEQ     6$              ;IS IT=0?
                                                HLT     2               ;MOST LIKELY BIT 15 IS NOT=0
                                        6$:     MOV     R0,@DVSRS       ;LOAD LINE NO.
                                                MOV     @DVSRA,R4       ;READ TX BUS ADDRESS PRINCIPLE
                                                MOV     #177320,R5      ;LOAD EXPECTED
                                                CLR     R1              ;SET SEC REG POINTER
                                                CMP     R5,R4           ;DID IT INCREMENT?
                                                BEQ     7$              ;BR IF NO
                                                HLT     3               ;BUS ADDRESS INCORRECT
                                        7$:     MOV     #-1,R5          ;SET EXPECTED BYTE COUNT
                                                INCB    @DVSRSH         ;SEL PRINCIPLE BYTE COUNT
                                                INC     R1              ;SET SEC REG POINTER
                                                MOV     @DVSRA,R4       ;READ IT
                                                CMP     R5,R4           ;DID IT GO TO ZERO?
                                                BEQ     9$              ;BR IF NO
                                                HLT     3               ;BYTE CNT S/B=-1
                                        9$:     MOV     #BIT4,R5        ;LINE STATE S/B TX NXM
                                                MOV     #13,R1          ;SET SEC REG POINTER
                                                MOVB    #13,@DVSRSH     ;SEL LINE STATE
                                                MOV     @DVSRA,R4       ;READ IT
                                                CMP     R5,R4           ;OK
                                                BEQ     10$             ;
                                                HLT     3               ;TX NUM S/B ONLY THING SET IN LINE STATE
                                        10$:    MSTCLR                  ;INIT DV11
                                                SCOP1                   ;LOCK ON LINE?
                                                INC     R0              ;UPDATE LINE POINTER
                                                DEC     R2              ;4 LINE GROUP DONE
                                                BEQ     .+6             ;BR IF YES
                                                JMP     1$              ;JMP IF NO
                                                RTS     PC              ;EXIT FOR NEXT GROUP


                                                ;********************** TEST 5 ******************************
                                                ;*TEST TO FORCE ALL POSSIBLE
                                                ;*TRANSMITTER NXM ERRORS PAYING
                                                ;*ATTENTION TO THE DVNSR ENTRY.
                                                ;*    EXERCISED             EXPECTED DVNSR  (BIT15 ALWAYS=1)
                                                ;*        TXBAP             11:08=0  03:00=LINE NO.
                                                ;*        TXBAS             BIT9=1   03:00=LINE NO.
                                                ;*        TXTAB             BIT11=1  03:00=LINE NO.
                                                ;*THIS TEST IS DONE FOR SYNC AND ASYNC LINE CARDS.
                                                ;;***************************************************************


                                                ;  TEST 5
                                                ;--------------
011434  012737  000005  001226          TST5:   MOV     #5,TSTNO
```

```
 2183  011442  012737  012244  001216                    MOV     #TST6,NEXT
 2184  011450  012700  000000                            MOV     #0,R0           ;PLACE LINE NUMBER INTO R0
 2185  011454  013737  001416  001236                    MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
 2186  011462  100402                                    BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
 2187  011464  004737  011552                            JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
 2188  011470  012700  000004                 100$:      MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
 2189  011474  013737  001420  001236                    MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
 2190  011502  100402                                    BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
 2191  011504  004737  011552                            JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
 2192  011510  012700  000010                 101$:      MOV     #8.,R0          ;LOAD LINE NUMBER
 2193  011514  013737  001422  001236                    MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
 2194  011522  100402                                    BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
 2195  011524  004737  011552                            JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
 2196  011530  012700  000014                 102$:      MOV     #12.,R0         ;LOAD LINE NO.
 2197  011534  013737  001424  001236                    MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
 2198  011542  100402                                    BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
 2199  011544  004737  011552                            JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
 2200  011550  104400                 103$:      SCOPE                           ;SCOPE THIS TEST.
 2201  011552                         105$:                                      ;TEST ENTRANCE.
 2202  011552  104413                                    RAMCLR                  ;CLEAR ALL SEC REGISTERS
 2203  011554  012737  011566  001220                    MOV     #1$,LOCK        ;SET FOR RETURN IF SW09=1
 2204  011562  012702  000004                            MOV     #4,R2           ;SET FOR 4 LINE GROUP
 2205  011566  104412                 1$:        MSTCLR                          ;INIT DV11
 2206  011570  010077  167576                            MOV     R0,@DVSRS       ;LOAD LINE NUMBER
 2207  011574  052777  000060  167560                    BIS     #BIT5+BIT4,@DVSCR
 2208  011602  004537  021026                            PERFORM ,SETREG         ;SET EA BITS FOR NXM
 2209  011606     000     010                            .BYTE   000,010         ;PRINCIPLE BA, CNTRL TABLE
 2210  011610  177320                                    177320                  ;NXM [2ND KE11]
 2211  011612  022350                                    TXTAB                   ;TXTABLE
 2212  011614  004537  021026                            PERFORM ,SETREG         ;
 2213  011620     013     001                            .BYTE   013,001         ;LINE STATE, PRINCIPLE BYTE CNT
 2214  011622  000004                                    BIT2                    ;TX GO
 2215  011624  177777                                    -1                      ;ONE CHAR
 2216  011626  032737  004000  001236                    BIT     #ASYNC,STAT     ;#IS THIS ASYNC LINE CARD?
 2217  011634  001407                                    BEQ     60$             ;#BR IF NO.
 2218  011636  004537  021072                            PERFORM ,LOAD.MODE      ;#
 2219  011642  015000                                    <BIT12+BIT11>+BIT9      ;#8 BITS/PER/CHAR
 2220  011644  004537  021072                            PERFORM ,LOAD.MODE      ;#SET BAUD RATE REGISTER.
 2221  011650  072000                                    <BIT14+BIT13+BIT12>+BIT10
 2222                                                                           ;#9600 BAUD.
 2223  011652  000400                                    BR      60$             ;#CONTINUE TEST.
 2224  011654  005277  167502                 60$:       INC     @DVSCR          ;SET MICRO CPU GO
 2225  011660  005005                                    CLR     R5              ;WAIT FOR
 2226  011662  005777  167474                 2$:        TST     @DVSCR          ;SILO ENTRY
 2227  011666  100404                                    BMI     3$              ;BR IF SET
 2228  011670  104414                                    DELAY                   ;WASTE TIME
 2229  011672  005205                                    INC     R5              ;DELAY
 2230  011674  001372                                    BNE     2$              ;BR IF NOT THROUGH
 2231  011676  104000                                    HLT     0               ;NO SILO ENTRY
 2232  011700  013701  001402                 3$:        MOV     DVNSR,R1        ;SET POINTER
 2233  011704  011104                                    MOV     (R1),R4         ;READ NSR
 2234  011706  010005                                    MOV     R0,R5           ;LOAD LINE NO.
 2235  011710  052705  100000                            BIS     #BIT15,R5       ;SET SILO ENTRY
 2236  011714  020504                                    CMP     R5,R4           ;OK?
 2237  011716  001401                                    BEQ     4$              ;BR IF OK
 2238  011720  104002                                    HLT     2               ;TX PRINCIPLE NXM NOT IN NSR
```



```
2239  011722  104401                          4$:     SCOP1                           ;LOCK?
2240  011724  012737  011732  001220                  MOV     #5$,LOCK                ;PREPARE LOOP
2241  011732  104412                          5$:     MSTCLR                          ;INIT DV11
2242  011734  010077  167432                          MOV     R0,@DVSRS               ;LOAD LINE NO.
2243  011740  052777  000060  167414                  BIS     #BIT5+BIT4,@DVSCR
2244  011746  004537  021026                          PERFORM ,SETREG                 ;SET EA BITS
2245  011752      002     010                         .BYTE   002,010                 ;ALTERNATE BA, CNTRL TABLE
2246  011754  177320                                  177320                          ;NXM [2ND KE11]
2247  011756  022350                                  TXTAB                           ;
2248  011760  004537  021026                          PERFORM ,SETREG                 ;
2249  011764      013     003                         .BYTE   013,003                 ;LINE STATE, ALTERNATE BYTE CNT
2250  011766  000204                                  BIT7+BIT2                       ;USE ALTERNATE TABLE, TXGO
2251  011770  177777                                  -1                              ;ONE CHAR
2252  011772  032737  004000  001236                  BIT     #ASYNC,STAT             ;#IS THIS ASYNC LINE CARD?
2253  012000  001407                                  BEQ     61$                     ;#BR IF NO.
2254  012002  004537  021072                          PERFORM ,LOAD.MODE              ;#
2255  012006  015000                                  <BIT12+BIT11>+BIT9              ;#8 BITS/PER/CHAR
2256  012010  004537  021072                          PERFORM ,LOAD.MODE              ;#SET BAUD RATE REGISTER.
2257  012014  072000                                  <BIT14+BIT13+BIT12>+BIT10
2258                                                                                  ;#9600 BAUD.
2259  012016  000400                                  BR      61$                     ;#CONTINUE TEST.
2260  012020  005277  167336                  61$:    INC     @DVSCR                  ;SET MICRO CPU GO
2261  012024  005005                                  CLR     R5                      ;DELAY
2262  012026  005777  167330                  6$:     TST     @DVSCR                  ;WAITING
2263  012032  100404                                  BMI     7$                      ;FOR
2264  012034  104414                                  DELAY                           ;
2265  012036  005205                                  INC     R5                      ;SILO
2266  012040  001372                                  BNE     6$                      ;ENTRY
2267  012042  104000                                  HLT     0                       ;NO SILO ENTRY
2268  012044  017704  167332                  7$:     MOV     @DVNSR,R4               ;READ NSR
2269  012050  010005                                  MOV     R0,R5                   ;LOAD LINE NO
2270  012052  052705  101000                          BIS     #BIT15+BIT9,R5          ;SET SILO ENTRY, ALTERNATE NXM
2271  012056  020504                                  CMP     R5,R4                   ;NSR OK?
2272  012060  001401                                  BEQ     8$                      ;
2273  012062  104002                                  HLT     2                       ;ALTERNATE BA NXM FAILED
2274  012064  104401                          8$:     SCOP1                           ;SW09=1?
2275  012066  012737  012074  001220                  MOV     #9$,LOCK                ;SET SCOPE LOOP
2276  012074  104412                          9$:     MSTCLR                          ;INIT DV11
2277  012076  010077  167270                          MOV     R0,@DVSRS               ;LOAD LINE NUMBER
2278  012102  052777  000060  167252                  BIS     #BIT5+BIT4,@DVSCR
2279  012110  004537  021026                          PERFORM ,SETREG                 ;SET EA BITS
2280  012114      010     000                         .BYTE   010,000                 ;TX CNTRL TABLE, PRINCIPLE BA
2281  012116  177320                                  177320                          ;NXM [2ND KE11]
2282  012120  021350                                  TXBAP                           ;BA
2283  012122  004537  021026                          PERFORM ,SETREG                 ;
2284  012126      013     001                         .BYTE   013,001                 ;LINE STATE, PRINCIPLE BC
2285  012130  000004                                  BIT2                            ;TX GO
2286  012132  177777                                  -1                              ;ONE XFR
2287  012134  032737  004000  001236                  BIT     #ASYNC,STAT             ;#IS THIS ASYNC LINE CARD?
2288  012142  001407                                  BEQ     62$                     ;#BR IF NO.
2289  012144  004537  021072                          PERFORM ,LOAD.MODE              ;#
2290  012150  015000                                  <BIT12+BIT11>+BIT9              ;#8 BITS/PER/CHAR
2291  012152  004537  021072                          PERFORM ,LOAD.MODE              ;#SET BAUD RATE REGISTER.
2292  012156  072000                                  <BIT14+BIT13+BIT12>+BIT10
2293                                                                                  ;#9600 BAUD.
2294  012160  000400                                  BR      62$                     ;#CONTINUE TEST.
```

```
2295  012162  005277  167174          62$:    INC     @DVSCR          ;SET MICRO CPU GO
2296  012166  005005                          CLR     R5              ;DELAY
2297  012170  005777  167166          10$:    TST     @DVSCR          ;FOR
2298  012174  100404                          BMI     11$             ;SILO
2299  012176  104414                          DELAY                   ;
2300  012200  005205                          INC     R5              ;ENTRY
2301  012202  001372                          BNE     10$             ;
2302  012204  104000                          HLT     0               ;NO SILO ENTRY
2303  012206  017704  167170          11$:    MOV     @DVNSR,R4       ;READ NSR
2304  012212  010005                          MOV     R0,R5           ;LOAD LINE NUMBER
2305  012214  052705  104000                  BIS     #BIT15+BIT11,R5 ;SET SILO ENTRY, CNTRL TABLE NXM
2306  012220  020504                          CMP     R5,R4           ;NSR OK?
2307  012222  001401                          BEQ     12$             ;YES
2308  012224  104002                          HLT     2               ;CNTRL TABLE NXM FAILED
2309  012226  104401          12$:            SCOP1                   ;SW09=1
2310  012230  005200                          INC     R0              ;UPDATE LINE NO.
2311  012232  005302                          DEC     R2              ;4 LINE GROUP DONE
2312  012234  001402                          BEQ     .+6             ;BR IF YES
2313  012236  000137  011566                  JMP     1$              ;JMP IF NO.
2314  012242  000207                          RTS     PC              ;EXIT FOR NEXT GROUP OF LINES
2315
2316
2317                                  ;********************** TEST 5 ****************************
2318                                  ;*TEST OF TRANSMITTER BCC OPERATIONS
2319                                  ;*TEST THAT THE CHAR "25" WILL
2320                                  ;*BE INCLUDED INTO THE BCC
2321                                  ;*THE POLY USED WILL BE LRC8
2322                                  ;*THIS TEST IS EXERCISED FOR BOTH ASYNC AND SYNC LINE CARDS.
2323                                  ;:**************************************************************
2324
2325                          ;  TEST 6
2326                          ;--------------
2327  012244  012737  000006  001226  TST6:   MOV     #6,TSTNO
2328  012252  012737  012610  001216          MOV     #TST7,NEXT
2329  012260  012700  000000                  MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
2330  012264  013737  001416  001236          MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
2331  012272  100402                          BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
2332  012274  004737  012362                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
2333  012300  012700  000004          100$:   MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
2334  012304  013737  001420  001236          MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
2335  012312  100402                          BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
2336  012314  004737  012362                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
2337  012320  012700  000010          101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
2338  012324  013737  001422  001236          MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
2339  012332  100402                          BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
2340  012334  004737  012362                  JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
2341  012340  012700  000014          102$:   MOV     #12.,R0         ;LOAD LINE NO.
2342  012344  013737  001424  001236          MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
2343  012352  100402                          BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
2344  012354  004737  012362                  JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
2345  012360  104400          103$:           SCOPE                   ;SCOPE THIS TEST.
2346  012362                  105$:                                   ;TEST ENTRANCE.
2347  012362  104413                          RAMCLR                  ;CLEAR ALL SEC REGISTERS
2348  012364  012737  000200  021020          MOV     #LRC8,XPOLY     ;SET SOFTWARE POLYNOMINAL
2349  012372  012705  000025                  MOV     #25,R5          ;SET DATA CHAR
2350  012376  110537  021350                  MOVB    R5,TXBAP        ;LOAD DATA
```

```
2351  012402  112765  000010  022350                  MOVB    #BIT3,TXTAB(R5) ;SET CNTRL BYTE
2352  012410  012702  000004                          MOV     #4,R2           ;SET FOR 4 LINE GROUP
2353  012414  010077  166752              1$:         MOV     R0,@DVSRS       ;LOAD LINE NO.
2354  012420  004537  021026                          PERFORM ,SETREG         ;
2355  012424     000     001                          .BYTE   000,001         ;PRINCIPLE BA, BC
2356  012426  021350                                  TXBAP                   ;
2357  012430  177777                                  -1                      ;
2358  012432  004537  021026                          PERFORM ,SETREG         ;
2359  012436     013     010                          .BYTE   013,010         ;LINE STATE, CNTRL TABLE
2360  012440  000004                                  BIT2                    ;TXGO
2361  012442  022350                                  TXTAB                   ;TABLE
2362  012444  004537  021026                          PERFORM ,SETREG         ;
2363  012450     006     012                          .BYTE   006,012         ;TX BCC REG, LINE PROTOCOL
2364  012452  000037                                  37                      ;BCC
2365  012454  000000                                  0                       ;POLYNOMINAL SELECT
2366  012456  032737  004000  001236                  BIT     #ASYNC,STAT     ;#IS THIS ASYNC LINE CARD?
2367  012464  001407                                  BEQ     60$             ;#BR IF NO.
2368  012466  004537  021072                          PERFORM ,LOAD.MODE      ;#
2369  012472  015000                                  <BIT12+BIT11>+BIT9      ;#8 BITS/PER/CHAR
2370  012474  004537  021072                          PERFORM ,LOAD.MODE      ;#SET BAUD RATE REGISTER.
2371  012500  072000                                  <BIT14+BIT13+BIT12>+BIT10
2372                                                                          ;#9600 BAUD.
2373  012502  000403                                  BR      61$             ;#CONTINUE TEST.
2374  012504  004537  021072              60$:        PERFORM ,LOAD.MODE      ;LOAD
2375  012510  014000                                  BIT12+BIT11             ;MODE
2376  012512  005277  166644              61$:        INC     @DVSCR          ;SET MICRO CODE GO
2377  012516  005005                                  CLR     R5              ;DELAY
2378  012520  005777  166636              2$:         TST     @DVSCR          ;FOR
2379  012524  100403                                  BMI     3$              ;SILO
2380  012526  104414                                  DELAY                   ;WASTE TIME
2381  012530  005205                                  INC     R5              ;ENTRY
2382  012532  001372                                  BNE     2$              ;
2383  012534  112777  000006  166632          3$:     MOVB    #6,@DVSRSH      ;SEL BCC REGISTER
2384  012542  017704  166630                          MOV     @DVSRA,R4       ;READ DVSRA [BCC REG]
2385  012546  004537  020646                          JSR     R5,SIMBCC       ;GO GET SOFTWARE BCC RESULT
2386  012552  000010                                  8.                      ;SHIFTS
2387  012554  000025                                  25                      ;DATA
2388  012556  000037                                  37                      ;PREVIOUS BCC RESULTS
2389  012560  013705  021024                          MOV     CALBCC,R5       ;READ SOFTWARE BCC RESULTS
2390  012564  117701  166604                          MOVB    @DVSRSH,R1      ;SET SEC REG POINTER
2391  012570  020504                                  CMP     R5,R4           ;SOFTWARE=HRDWARE?
2392  012572  001401                                  BEQ     4$              ;BR IF YES
2393  012574  104003                                  HLT     3               ;HRDWARE BCC WRONG
2394  012576  104412                          4$:     MSTCLR                  ;INIT DV11
2395  012600  005200                                  INC     R0              ;UPDATE LINE NO.
2396  012602  005302                                  DEC     R2              ;4 LINE GROUP DONE?
2397  012604  001303                                  BNE     1$              ;BR IF NO
2398  012606  000207                                  RTS     PC              ;EXIT FOR NEXT 4 LINE GROUP
2399
2400
2401                                          ;************************ TEST 7 *******************************
2402                                          ;*TEST OF TRANSMITTER BCC OPERATIONS
2403                                          ;*TEST THAT THE CHAR "25" WILL
2404                                          ;*BE INCLUDED INTO THE BCC
2405                                          ;*THE POLY USED WILL BE CRC16
2406                                          ;*THIS TEST IS EXERCISED FOR BOTH ASYNC AND SYNC LINE CARDS.
```

```
2407                                                    ;;*****************************************************************************
2408
2409                                                    ;  TEST 7
2410                                                    ;--------------
2411  012610  012737  000007  001226                    TST7:   MOV     #7,TSTNO
2412  012616  012737  013154  001216                            MOV     #TST10,NEXT
2413  012624  012700  000000                                    MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
2414  012630  013737  001416  001236                            MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
2415  012636  100402                                            BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
2416  012640  004737  012726                                    JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
2417  012644  012700  000004                    100$:   MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
2418  012650  013737  001420  001236                            MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
2419  012656  100402                                            BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
2420  012660  004737  012726                                    JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
2421  012664  012700  000010                    101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
2422  012670  013737  001422  001236                            MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
2423  012676  100402                                            BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
2424  012700  004737  012726                                    JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
2425  012704  012700  000014                    102$:   MOV     #12.,R0         ;LOAD LINE NO.
2426  012710  013737  001424  001236                            MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
2427  012716  100402                                            BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
2428  012720  004737  012726                                    JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
2429  012724  104400                    103$:   SCOPE                           ;SCOPE THIS TEST.
2430  012726                            105$:                                   ;TEST ENTRANCE.
2431  012726  104413                            RAMCLR                          ;CLEAR ALL SEC REGISTERS
2432  012730  012737  120001  021020                MOV     #CRC16,XPOLY    ;SET SOFTWARE POLYNOMINAL
2433  012736  012705  000025                    MOV     #25,R5          ;SET DATA CHAR
2434  012742  110537  021350                    MOVB    R5,TXBAP        ;LOAD DATA
2435  012746  112765  000010  022350            MOVB    #BIT3,TXTAB(R5) ;SET CNTRL BYTE
2436  012754  012702  000004                    MOV     #4,R2           ;SET FOR 4 LINE GROUP
2437  012760  010077  166406            1$:     MOV     R0,@DVSRS       ;LOAD LINE NO.
2438  012764  004537  021026                    PERFORM ,SETREG          ;
2439  012770     000     001                    .BYTE   000,001         ;PRINCIPLE BA, BC
2440  012772  021350                            TXBAP                   ;
2441  012774  177777                            -1                      ;
2442  012776  004537  021026                    PERFORM ,SETREG          ;
2443  013002     013     010                    .BYTE   013,010         ;LINE STATE, CNTRL TABLE
2444  013004  000004                            BIT2                    ;TXGO
2445  013006  022350                            TXTAB                   ;TABLE
2446  013010  004537  021026                    PERFORM ,SETREG          ;
2447  013014     006     012                    .BYTE   006,012         ;TX BCC REG, LINE PROTOCOL
2448  013016  000037                            37                      ;BCC
2449  013020  000010                            BIT3                    ;POLYNOMINAL SELECT
2450  013022  032737  004000  001236            BIT     #ASYNC,STAT     ;#IS THIS ASYNC LINE CARD?
2451  013030  001407                            BEQ     60$             ;#BR IF NO.
2452  013032  004537  021072                    PERFORM ,LOAD.MODE       ;#
2453  013036  015000                            <BIT12+BIT11>+BIT9      ;#8 BITS/PER/CHAR
2454  013040  004537  021072                    PERFORM ,LOAD.MODE       ;#SET BAUD RATE REGISTER.
2455  013044  072000                            <BIT14+BIT13+BIT12>+BIT10
2456                                                                    ;#9600 BAUD.
2457  013046  000403                            BR      61$             ;#CONTINUE TEST.
2458  013050  004537  021072            60$:    PERFORM ,LOAD.MODE       ;LOAD
2459  013054  014000                            BIT12+BIT11             ;MODE
2460  013056  005277  166300            61$:    INC     @DVSCR          ;SET MICRO CODE GO
2461  013062  005005                            CLR     R5              ;DELAY
2462  013064  005777  166272            2$:     TST     @DVSCR          ;FOR
```

```
2463  013070  100403                          BMI     3$              ;SILO
2464  013072  104414                          DELAY                   ;WASTE TIME
2465  013074  005205                          INC     R5              ;ENTRY
2466  013076  001372                          BNE     2$              ;
2467  013100  112777  000006  166266    3$:   MOVB    #6,@DVSRSH      ;SEL BCC REGISTER
2468  013106  017704  166264                  MOV     @DVSRA,R4       ;READ DVSRA [BCC REG]
2469  013112  004537  020646                  JSR     R5,SIMBCC       ;GO GET SOFTWARE BCC RESULT
2470  013116  000010                          8.                      ;SHIFTS
2471  013120  000025                          25                      ;DATA
2472  013122  000037                          37                      ;PREVIOUS BCC RESULTS
2473  013124  013705  021024                  MOV     CALBCC,R5       ;READ SOFTWARE BCC RESULTS
2474  013130  117701  166240                  MOVB    @DVSRSH,R1      ;SET SEC REG POINTER
2475  013134  020504                          CMP     R5,R4           ;SOFTWARE=HRDWARE?
2476  013136  001401                          BEQ     4$              ;BR IF YES
2477  013140  104003                          HLT     3               ;HRDWARE BCC WRONG
2478  013142  104412                    4$:   MSTCLR                  ;INIT DV11
2479  013144  005200                          INC     R0              ;UPDATE LINE NO.
2480  013146  005302                          DEC     R2              ;4 LINE GROUP DONE?
2481  013150  001303                          BNE     1$              ;BR IF NO
2482  013152  000207                          RTS     PC              ;EXIT FOR NEXT 4 LINE GROUP
2483
2484
2485                                          ;********************** TEST 10 ******************************
2486                                          ;*TEST OF TRANSMITTER BCC OPERATIONS
2487                                          ;*TEST THAT THE CHAR "25" WILL
2488                                          ;*BE INCLUDED INTO THE BCC
2489                                          ;*THE POLY USED WILL BE CRC.CCITT
2490                                          ;*THIS TEST IS EXERCISED FOR BOTH ASYNC AND SYNC LINE CARDS.
2491                                          ;:************************************************************
2492
2493                                    ;  TEST 10
2494                                    ;--------------
2495  013154  012737  000010  001226  TST10:  MOV     #10,TSTNO
2496  013162  012737  013520  001216          MOV     #TST11,NEXT
2497  013170  012700  000000                  MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
2498  013174  013737  001416  001236          MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
2499  013202  100402                          BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
2500  013204  004737  013272                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
2501  013210  012700  000004            100$: MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
2502  013214  013737  001420  001236          MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
2503  013222  100402                          BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
2504  013224  004737  013272                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
2505  013230  012700  000010            101$: MOV     #8.,R0          ;LOAD LINE NUMBER
2506  013234  013737  001422  001236          MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
2507  013242  100402                          BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
2508  013244  004737  013272                  JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
2509  013250  012700  000014            102$: MOV     #12.,R0         ;LOAD LINE NO.
2510  013254  013737  001424  001236          MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
2511  013262  100402                          BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
2512  013264  004737  013272                  JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
2513  013270  104400                    103$: SCOPE                   ;SCOPE THIS TEST.
2514  013272                             105$:                        ;TEST ENTRANCE.
2515  013272  104413                          RAMCLR                  ;CLEAR ALL SEC REGISTERS
2516  013274  012737  102010  021020          MOV     #CRC.CCITT,XPOLY        ;SET SOFTWARE POLYNOMINAL
2517  013302  012705  000025                  MOV     #25,R5          ;SET DATA CHAR
2518  013306  110537  021350                  MOVB    R5,TXBAP        ;LOAD DATA
```

```
2519  013312  112765  000010  022350          MOVB    #BIT3,TXTAB(R5) ;SET CNTRL BYTE
2520  013320  012702  000004                  MOV     #4,R2           ;SET FOR 4 LINE GROUP
2521  013324  010077  166042          1$:     MOV     R0,@DVSRS       ;LOAD LINE NO.
2522  013330  004537  021026                  PERFORM ,SETREG         ;
2523  013334     000     001                  .BYTE   000,001         ;PRINCIPLE BA, BC
2524  013336  021350                          TXBAP                   ;
2525  013340  177777                          -1                      ;
2526  013342  004537  021026                  PERFORM ,SETREG         ;
2527  013346     013     010                  .BYTE   013,010         ;LINE STATE, CNTRL TABLE
2528  013350  000004                          BIT2                    ;TXGO
2529  013352  022350                          TXTAB                   ;TABLE
2530  013354  004537  021026                  PERFORM ,SETREG         ;
2531  013360     006     012                  .BYTE   006,012         ;TX BCC REG, LINE PROTOCOL
2532  013362  000037                          37                      ;BCC
2533  013364  000030                          BIT4+BIT3                       ;POLYNOMINAL SELECT
2534  013366  032737  004000  001236          BIT     #ASYNC,STAT     ;#IS THIS ASYNC LINE CARD?
2535  013374  001407                          BEQ     60$             ;#BR IF NO.
2536  013376  004537  021072                  PERFORM ,LOAD.MODE      ;#
2537  013402  015000                          <BIT12+BIT11>+BIT9      ;#8 BITS/PER/CHAR
2538  013404  004537  021072                  PERFORM ,LOAD.MODE      ;#SET BAUD RATE REGISTER.
2539  013410  072000                          <BIT14+BIT13+BIT12>+BIT10
2540                                                                  ;#9600 BAUD.
2541  013412  000403                          BR      61$             ;#CONTINUE TEST.
2542  013414  004537  021072          60$:    PERFORM ,LOAD.MODE      ;LOAD
2543  013420  014000                          BIT12+BIT11             ;MODE
2544  013422  005277  165734          61$:    INC     @DVSCR          ;SET MICRO CODE GO
2545  013426  005005                          CLR     R5              ;DELAY
2546  013430  005777  165726          2$:     TST     @DVSCR          ;FOR
2547  013434  100403                          BMI     3$              ;SILO
2548  013436  104414                          DELAY                   ;WASTE TIME
2549  013440  005205                          INC     R5              ;ENTRY
2550  013442  001372                          BNE     2$              ;
2551  013444  112777  000006  165722  3$:     MOVB    #6,@DVSRSH      ;SEL BCC REGISTER
2552  013452  017704  165720                  MOV     @DVSRA,R4       ;READ DVSRA [BCC REG]
2553  013456  004537  020646                  JSR     R5,SIMBCC       ;GO GET SOFTWARE BCC RESULT
2554  013462  000010                          8.                      ;SHIFTS
2555  013464  000025                          25                      ;DATA
2556  013466  000037                          37                      ;PREVIOUS BCC RESULTS
2557  013470  013705  021024                  MOV     CALBCC,R5       ;READ SOFTWARE BCC RESULTS
2558  013474  117701  165674                  MOVB    @DVSRSH,R1      ;SET SEC REG POINTER
2559  013500  020504                          CMP     R5,R4           ;SOFTWARE=HRDWARE?
2560  013502  001401                          BEQ     4$              ;BR IF YES
2561  013504  104003                          HLT     3               ;HRDWARE BCC WRONG
2562  013506  104412                  4$:     MSTCLR                  ;INIT DV11
2563  013510  005200                          INC     R0              ;UPDATE LINE NO.
2564  013512  005302                          DEC     R2              ;4 LINE GROUP DONE?
2565  013514  001303                          BNE     1$              ;BR IF NO
2566  013516  000207                          RTS     PC              ;EXIT FOR NEXT 4 LINE GROUP
2567
2568
2569                                  ;************************ TEST 11 *******************************
2570                                  ;*TEST OF TRANSMITTER BCC OPERATIONS
2571                                  ;*TEST THAT THE CHAR "25" WILL
2572                                  ;*WILL SEND THE BCC.
2573                                  ;*THE POLY USED WILL BE CRC.CCITT
2574                                  ;*THIS TEST IS EXERCISED FOR BOTH ASYNC AND SYNC LINE CARDS.
```

```
2575                                                    ;:*****************************************************************
2576
2577                                                    ;  TEST 11
2578                                                    ;--------------
2579  013520  012737  000011  001226                    TST11:  MOV     #11,TSTNO
2580  013526  012737  014064  001216                            MOV     #TST12,NEXT
2581  013534  012700  000000                                    MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
2582  013540  013737  001416  001236                            MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
2583  013546  100402                                            BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
2584  013550  004737  013636                                    JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
2585  013554  012700  000004                    100$:   MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
2586  013560  013737  001420  001236                            MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
2587  013566  100402                                            BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
2588  013570  004737  013636                                    JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
2589  013574  012700  000010                    101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
2590  013600  013737  001422  001236                            MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
2591  013606  100402                                            BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
2592  013610  004737  013636                                    JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
2593  013614  012700  000014                    102$:   MOV     #12.,R0         ;LOAD LINE NO.
2594  013620  013737  001424  001236                            MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
2595  013626  100402                                            BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
2596  013630  004737  013636                                    JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
2597  013634  104400                    103$:   SCOPE                           ;SCOPE THIS TEST.
2598  013636                            105$:                                   ;TEST ENTRANCE.
2599  013636  104413                                            RAMCLR                  ;CLEAR ALL SEC REGISTERS
2600  013640  012737  102010  021020                            MOV     #CRC.CCITT,XPOLY        ;SET SOFTWARE POLYNOMINAL
2601  013646  012705  000025                                    MOV     #25,R5          ;SET DATA CHAR
2602  013652  110537  021350                                    MOVB    R5,TXBAP        ;LOAD DATA
2603  013656  112765  000004  022350                            MOVB    #BIT2,TXTAB(R5) ;SET CNTRL BYTE
2604  013664  012702  000004                                    MOV     #4,R2           ;SET FOR 4 LINE GROUP
2605  013670  010077  165476                    1$:     MOV     R0,@DVSRS       ;LOAD LINE NO.
2606  013674  004537  021026                            PERFORM ,SETREG          ;
2607  013700     000     001                    .BYTE   000,001         ;PRINCIPLE BA, BC
2608  013702  021350                            TXBAP                   ;
2609  013704  177777                            -1                      ;
2610  013706  004537  021026                            PERFORM ,SETREG          ;
2611  013712     013     010                    .BYTE   013,010         ;LINE STATE, CNTRL TABLE
2612  013714  000004                            BIT2                    ;TXGO
2613  013716  022350                            TXTAB                   ;TABLE
2614  013720  004537  021026                            PERFORM ,SETREG          ;
2615  013724     006     012                    .BYTE   006,012         ;TX BCC REG, LINE PROTOCOL
2616  013726  000037                            37                      ;BCC
2617  013730  000030                            BIT4+BIT3                       ;POLYNOMINAL SELECT
2618  013732  032737  004000  001236                    BIT     #ASYNC,STAT     ;#IS THIS ASYNC LINE CARD?
2619  013740  001407                                    BEQ     60$             ;#BR IF NO.
2620  013742  004537  021072                            PERFORM ,LOAD.MODE      ;#
2621  013746  015000                            <BIT12+BIT11>+BIT9      ;#8 BITS/PER/CHAR
2622  013750  004537  021072                            PERFORM ,LOAD.MODE      ;#SET BAUD RATE REGISTER.
2623  013754  072000                            <BIT14+BIT13+BIT12>+BIT10
2624                                                                    ;#9600 BAUD.
2625  013756  000403                                    BR      61$             ;#CONTINUE TEST.
2626  013760  004537  021072                    60$:    PERFORM ,LOAD.MODE      ;LOAD
2627  013764  014000                            BIT12+BIT11             ;MODE
2628  013766  005277  165370                    61$:    INC     @DVSCR          ;SET MICRO CODE GO
2629  013772  005005                                    CLR     R5              ;DELAY
2630  013774  005777  165362                    2$:     TST     @DVSCR          ;FOR
```

```
014000  100403                          BMI     3$              ;SILO
014002  104414                          DELAY                   ;WASTE TIME
014004  005205                          INC     R5              ;ENTRY
014006  001372                          BNE     2$              ;
014010  112777  000006  165356    3$:   MOVB    #6,@DVSRSH      ;SEL BCC REGISTER
014016  012703  002000                  MOV     #2000,R3        ;SET DELAY TIME
014022  104414                    5$:   DELAY                   ;WASTE TIME
014024  017704  165346                  MOV     @DVSRA,R4       ;READ BCC REG
014030  001402                          BEQ     6$              ;BR IF=0
014032  005303                          DEC     R3              ;DELAY DONE?
014034  001372                          BNE     5$              ;NO!
014036                            6$:
014036  005005                          CLR     R5              ;SET EXPECTED=0
014040  117701  165330                  MOVB    @DVSRSH,R1      ;SET SEC REG POINTER
014044  020504                          CMP     R5,R4           ;SOFTWARE=HRDWARE?
014046  001401                          BEQ     4$              ;BR IF YES
014050  104003                          HLT     3               ;HRDWARE BCC WRONG
014052  104412                    4$:   MSTCLR                  ;INIT DV11
014054  005200                          INC     R0              ;UPDATE LINE NO.
014056  005302                          DEC     R2              ;4 LINE GROUP DONE?
014060  001303                          BNE     1$              ;BR IF NO
014062  000207                          RTS     PC              ;EXIT FOR NEXT 4 LINE GROUP

                                ;************************ TEST 12 ******************************
                                ;*TEST TO FORCE NPR STATUS OVERFLOW.
                                ;*TEST TO XMIT 65(10  TRANSFERS NOT
                                ;*SERVICING THE FLAGS AND MAKING SURE THAT BIT10
                                ;*OF THE DVSCR SETS ON THE 65TH ENTRY ONLY.
                                ;*THIS TEST IS EXERCISED FOR BOTH ASYNC AND SYNC LINE CARDS.
                                ;;*************************************************************

                                ;  TEST 12
                                ;--------------
014064  012737  000012  001226  TST12:  MOV     #12,TSTNO
014072  012737  014506  001216          MOV     #TST13,NEXT
014100  012700  000000                  MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
014104  013737  001416  001236          MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
014112  100402                          BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
014114  004737  014202                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
014120  012700  000004            100$: MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
014124  013737  001420  001236          MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
014132  100402                          BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
014134  004737  014202                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
014140  012700  000010            101$: MOV     #8.,R0          ;LOAD LINE NUMBER
014144  013737  001422  001236          MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
014152  100402                          BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
014154  004737  014202                  JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
014160  012700  000014            102$: MOV     #12.,R0         ;LOAD LINE NO.
014164  013737  001424  001236          MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
014172  100402                          BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
014174  004737  014202                  JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
014200  104400                    103$: SCOPE                   ;SCOPE THIS TEST.
014202                            105$:                         ;TEST ENTRANCE.
014202  104413                          RAMCLR                  ;CLEAR ALL SEC. REGISTERS
014204  012702  000004                  MOV     #4,R2           ;SET FOR 4 LINE GROUP
014210  010077  165156            1$:   MOV     R0,@DVSRS       ;LOAD LINE NUMBER
```

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2687  014214  004537  021026                          PERFORM ,SETREG         ;
2688  014220     000     001                          .BYTE   000,001         ;TX BA P, TX BC P
2689  014222  021350                                  TXBAP                   ;
2690  014224  177777                                  -1                      ;
2691  014226  004537  021026                          PERFORM ,SETREG         ;
2692  014232     010     013                          .BYTE   010,013         ;TX CNTRL TABLE, LINE STATE
2693  014234  022350                                  TXTAB                   ;
2694  014236  000004                                  BIT2                    ;TX GO
2695  014240  005037  022350                          CLR     TXTAB           ;CLEAR CNTRL BYTE
2696  014244  005037  021350                          CLR     TXBAP           ;CLEAR TX DATA
2697  014250  032737  004000  001236                  BIT     #ASYNC,STAT     ;#IS THIS ASYNC LINE CARD?
2698  014256  001407                                  BEQ     60$             ;#BR IF NO.
2699  014260  004537  021072                          PERFORM ,LOAD.MODE      ;#
2700  014264  015000                                  <BIT12+BIT11>+BIT9      ;#8 BITS/PER/CHAR
2701  014266  004537  021072                          PERFORM ,LOAD.MODE      ;#SET BAUD RATE REGISTER.
2702  014272  072000                                  <BIT14+BIT13+BIT12>+BIT10
2703                                                                          ;#9600 BAUD.
2704  014274  000403                                  BR      61$             ;#CONTINUE TEST.
2705  014276  004537  021072                  60$:    PERFORM ,LOAD.MODE      ;LOAD
2706  014302  014000                                  BIT12+BIT11             ;MODE
2707  014304  005277  165052                  61$:    INC     @DVSCR          ;SET MICRO CPU GO
2708  014310  012703  000077                          MOV     #63.,R3         ;SET FOR 63 ENTRIES INTO SILO
2709  014314  112777  000013  165052          2$:     MOVB    #13,@DVSRSH     ;SEL LINE STATE
2710  014322  032777  000004  165046                  BIT     #BIT2,@DVSRA    ;IS TX GO SET?
2711  014330  001402                                  BEQ     3$              ;BR IF NO
2712  014332  104414                                  DELAY                   ;GIVE UCPU TIME
2713                                                                          ;TO ACCESS REG
2714  014334  000767                                  BR      2$              ;LOOK AGAIN
2715  014336  032777  002000  165016          3$:     BIT     #BIT10,@DVSCR   ;DID SILO FULL SET?
2716  014344  001401                                  BEQ     .+4             ;BR IF NO
2717  014346  104000                                  HLT     0               ;SILO FULL SET TOO SOON
2718  014350  005303                                  DEC     R3              ;63 ENTRIES MADE?
2719  014352  001414                                  BEQ     4$              ;BR IF NO
2720  014354  004537  021026                          PERFORM ,SETREG         ;TXBAP, TXBCP
2721  014360     000     001                          .BYTE   000,001         ;RELOAD BA
2722  014362  021350                                  TXBAP                   ;       BC
2723  014364  177777                                  -1                      ;
2724  014366  112777  000013  165000                  MOVB    #13,@DVSRSH     ;SEL LINE STATE
2725  014374  012777  000004  164774                  MOV     #BIT2,@DVSRA    ;CLEAR "USE SEC. TABLE" SET TX GO
2726  014402  000744                                  BR      2$              ;CONTINUE
2727  014404  004537  021026                  4$:     PERFORM ,SETREG         ;
2728  014410     001     013                          .BYTE   001,013         ;TX BC, LINE STATE
2729  014412  177777                                  -1                      ;SET FOR 64TH ENTRY
2730  014414  000004                                  BIT2                    ;TX GO
2731  014416  112777  000013  164750          6$:     MOVB    #13,@DVSRSH     ;SEL LINE STATE
2732  014424  032777  000004  164744                  BIT     #BIT2,@DVSRA    ;TX GO SET?
2733  014432  001402                                  BEQ     5$              ;BR IF NO
2734  014434  104414                                  DELAY                   ;GIVE UCPU TIME
2735                                                                          ;TO ACCESS REG
2736  014436  000767                                  BR      6$              ;CONTINUE
2737  014440  012704  000010                  5$:     MOV     #10,R4          ;
2738  014444  104414                                  DELAY
2739  014446  005304                                  DEC     R4
2740  014450  001375                                  BNE     .-4
2741  014452  013701  001362                          MOV     DVSCR,R1        ;SET POINTER
2742  014456  011104                                  MOV     (R1),R4         ;READ DVSCR
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 2743  014460  010405                          MOV     R4,R5           ;PLACE IMAGE IN GOOD
 2744  014462  052705  002000                  BIS     #BIT10,R5       ;SET NPR STATUS OVERFLOW
 2745  014466  020504                          CMP     R5,R4           ;WAS DVSCR OK?
 2746  014470  001401                          BEQ     7$              ;BR IF YES
 2747  014472  104002                          HLT     2               ;BIT10 OF DVSCR S/B=1 (SILO OVERFLOW)
 2748  014474  104412                  7$:     MSTCLR                  ;CLEAR DV11
 2749  014476  005200                          INC     R0              ;UPDATE LINE NUMBER
 2750  014500  005302                          DEC     R2              ;ALL 4 LINES DONE?
 2751  014502  001343                          BNE     1$              ;BR IF NO
 2752  014504  000207                          RTS     PC              ;EXIT FOR NEXT 4 LINE GROUP
 2753
 2754                          02000
 2755                                  ;************************ TEST 13 ************************
 2756                          02200   ;*TEST TO TURN ON ALL
 2757                          02300   ;*AVAILABLE TRANSMITTERS AT THE SAME TIME.
 2758                          02400   ;*30(8) CHARS WILL BE XMITTED.
 2759                          02500   ;*EXPECTED:
 2760                          02600   ;*1)NUMBER OF LINES PRESENT X1 ENTRIES INTO DVNSR
 2761                          02700   ;*2)ALL TXBA = TXBA+30+LINE NO.
 2762                          02800   ;*3)ALL TXWC = 0
 2763                          02900   ;*4)ALL LINE STATE REGS =BIT7
 2764                          03000   ;*5)ALL DVNSR = BIT15+BIT8+LINE NO.
 2765                          03100   ;*
 2766                          03200   ;*NOTE: ONLY PRIMARY REGISTERS ARE USED.
 2767                          03300   ;*NOTE:TURN AROUND CONNECTOR MUST BE INSTALLED
 2768                          03400   ;*      AND THE 'EIA' GATES ARE USED.
 2769                          03450   ;*THIS TEST IS DONE FOR BOTH ASYNC AND SYNC LINE CARDS.
 2770                                  ;;*******************************************************************
 2771                          03600
 2772                                  ;  TEST 13
 2773                                  ;--------------
 2774  014506  012737  000013  001226  TST13:  MOV     #13,TSTNO
 2775  014514  012737  015034  001216          MOV     #TST14,NEXT
 2776  014522  104413                          RAMCLR                  ;ZERO ALL SEC REGISTERS
 2777  014524  005001                          CLR     R1              ;SET COUNTER TO ZERO
 2778  014526  012700  000004                  MOV     #4,R0           ;SET 4 LINE COUNT
 2779  014532  005737  001416                  TST     L00.03          ;LINE CARD 1 EXIST?
 2780  014536  100401                          BMI     1$              ;BR IF NO
 2781  014540  060001                          ADD     R0,R1           ;UPDATE COUNT
 2782  014542  005737  001420          1$:     TST     L04.07          ;LINE CARD 2 EXIST?
 2783  014546  100401                          BMI     2$              ;BR IF NO
 2784  014550  060001                          ADD     R0,R1           ;
 2785  014552  005737  001422          2$:     TST     L08.11          ;LINE CARD 3 EXIST?
 2786  014556  100401                          BMI     3$              ;BR IF NO
 2787  014560  060001                          ADD     R0,R1           ;
 2788  014562  005737  001424          3$:     TST     L12.15          ;LINE CARD 4 EXIST?
 2789  014566  100401                          BMI     4$              ;BR IF NO
 2790  014570  060001                          ADD     R0,R1           ;
 2791  014572  005000                  4$:     CLR     R0              ;SET POINTER TO 0
 2792  014574  010137  025540                  MOV     R1,COUNT        ;STORE LINE CARD COUNT
 2793  014600  012702  021350          03900   MOV     #TXBAP,R2       ;SET TX BUFFER POINTER
 2794  014604  010237  014632          04000   MOV     R2,6$           ;LOAD BA
 2795  014610  105012                  04100   CLRB    (R2)            ;SET DATA TO ZERO
 2796  014612  010077  164554          04200   MOV     R0,@DVSRS       ;LOAD LINE NUMBER
 2797  014616  000240                  04300   NOP     ;PERFORM   LOAD.MODE
 2798  014620  000240                  04400   NOP     ;BIT12+BIT11
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 2799  014622  000240                    04500            NOP     ;
 2800  014624  004537  021026            04600            PERFORM ,SETREG                 ;
 2801  014630     000     001            04700            .BYTE   000,001                 ;TX BA P, TX BC P
 2802  014632  000001                    04800     6$:    .BLKW   1                       ;TXBA
 2803  014634  177750                    04900            -30                             ;TXBC
 2804  014636  004537  021026            05000            PERFORM ,SETREG                 ;
 2805  014642     010     013            05100            .BYTE   010,013                 ;TX CNTRL TAB, LINE STATE
 2806  014644  022350                    05200            TXTAB                           ;
 2807  014646  000004                    05300            BIT2                            ;TX GO
 2808  014650  005202                    05400            INC     R2                      ;UPDATE BA POINTER
 2809  014652  005200                    05500            INC     R0                      ;UPDATE LINE NO.
 2810  014654  022700  000020            05600            CMP     #16.,R0                 ;ALL LINES DONE?
 2811  014660  001351                    05700            BNE     5$                      ;BR IF NO
 2812  014662  005005                    05800            CLR     R5                      ;
 2813  014664  005037  022350            05900            CLR     TXTAB                   ;CLEAR CNTRL TABLE (1.0)
 2814  014670  012700  021350            06000            MOV     #TXBAP,R0               ;PRINCIPLE POINTER
 2815  014674  012704  021750            06100            MOV     #TXBAS,R4               ;ALTERNATE POINTER
 2816  014700  005020                    06200            CLR     (R0)+                   ;CLEAR
 2817  014702  005024                    06300            CLR     (R4)+                   ;TX BUFFERS
 2818  014704  022700  021420            06400            CMP     #TXBAP+50,R0            ;ALL DONE
 2819  014710  001373                    06500            BNE     .-10                    ;BR IF NO
 2820  014712  005277  164444            06600     60$:   INC     @DVSCR                  ;SET UCPU GO
 2821  014716  012702  021242            07$:     MOV     #REGBUF,R2              ;SET BUFFER POINTER IN R2
 2822  014722  005777  164434            8$:      TST     @DVSCR                  ;SILO ENTRY?
 2823  014726  100005                    BPL     9$                      ;BR IF NO
 2824  014730  017722  164446            MOV     @DVNSR,(R2)+            ;STORE SILO ENTRY AWAY
 2825  014734  005337  025540            DEC     COUNT                   ;ALL ENTRIES MADE?
 2826  014740  001404                    BEQ     10$                     ;BR IF YES
 2827  014742  104414            9$:     DELAY                           ;WASTE TIME
 2828  014744  005205                    INC     R5                      ;COUNT WAIT
 2829  014746  001365                    BNE     8$                      ;FOR SILO ENTRY
 2830  014750  104000                    HLT     0                       ;NO SILO ENTRY! (DVSCR15=1)
 2831  014752                    10$:
 2832  014752  005737  001416            06800            TST     L00.03                  ;LINE CARD 1 EXIST?
 2833  014756  100403                    06900            BMI     27$                     ;BR IF NO
 2834  014760  004537  020054            07000            JSR     R5,LINT1                        ;GOSUB
 2835  014764  000000                    07100            0.                              ;LINES 00-03
 2836  014766  005737  001420            07200     27$:   TST     L04.07                  ;LINE CARD 2 EXIST?
 2837  014772  100403                    07300            BMI     28$                     ;BR IF NO
 2838  014774  004537  020054            07400            JSR     R5,LINT1                ;GOSUB
 2839  015000  000004                    07500            4.                              ;LINES 04-07
 2840  015002  005737  001422            07600     28$:   TST     L08.11                  ;LINE CARD 3 EXIST?
 2841  015006  100403                    07700            BMI     29$                     ;BR IF NO
 2842  015010  004537  020054            07800            JSR     R5,LINT1                ;GOSUB
 2843  015014  000010                    07900            8.                              ;LINES 08-11
 2844  015016  005737  001424            08000     29$:   TST     L12.15                  ;LINE CARD 4 EXIST?
 2845  015022  100403                    08100            BMI     30$                     ;BR IF NO
 2846  015024  004537  020054            08200            JSR     R5,LINT1                ;GOSUB
 2847  015030  000014                    08300            12.                             ;LINES 12-15
 2848  015032  104400                    08400     30$:   SCOPE                           ;SCOPE TEST
 2849                                    08500
 2850                                    
 2851                                    08700            ;************************ TEST 14 *******************************
 2852                                    08800            ;*TEST TO TURN ON ALL
 2853                                    08900            ;*AVAILABLE TRANSMITTERS AT THE SAME TIME.
 2854                                    09000            ;*30(8) CHARS WILL BE XMITTED.
                                         09100            ;*EXPECTED:
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                                        09100           ;*1)NUMBER OF LINES PRESENT X2 ENTRIES INTO DVNSR
                                        09200           ;*2)ALL TXBAP = TXBPA+30+LINE NO.
                                        09300           ;*3)ALL TXWCP = 0
                                        09400           ;*4)ALL LINE STATE REGS =0
                                        09500           ;*5)PRIMARY ENTRY IN DVNSR = BIT15+BIT8+LINE NO.
                                        09600           ;*6)SECONDARY ENTRY IN DVNSR =BIT15+BIT9+BIT8+LINE NO.
                                        09700           ;*7)ALL TX BAS = TXBAS+30+LINE NO.
                                        09800           ;*8) ALL TXWCS =0
                                        09900           ;*
                                        10000           ;*NOTE: PRIMARY REGISTERS ARE USED FIRST; AND THEN THE SECONDARY.
                                        10100           ;*NOTE:TURN AROUND CONNECTOR MUST BE INSTALLED
                                        10200           ;*      AND THE 'EIA' GATES ARE USED.
                                        10205           ;*THIS TEST IS DONE FOR BOTH ASYNC AND SYNC LINE CARDS.
                                        10300           ;*****************************************************************
                                        10400
                                                ;  TEST 14
                                                ;--------------
015034  012737  000014  001226          TST14:  MOV     #14,TSTNO
015042  012737  015400  001216                  MOV     #TST15,NEXT
015050  104413                                  RAMCLR                  ;ZERO ALL SEC REGISTERS
015052  005001                                  CLR     R1              ;SET COUNTER TO ZERO
015054  012700  000004                          MOV     #4,R0           ;SET 4 LINE COUNT
015060  005737  001416                          TST     L00.03          ;LINE CARD 1 EXIST?
015064  100401                                  BMI     1$              ;BR IF NO
015066  060001                                  ADD     R0,R1           ;UPDATE COUNT
015070  005737  001420                  1$:     TST     L04.07          ;LINE CARD 2 EXIST?
015074  100401                                  BMI     2$              ;BR IF NO
015076  060001                                  ADD     R0,R1           ;
015100  005737  001422                  2$:     TST     L08.11          ;LINE CARD 3 EXIST?
015104  100401                                  BMI     3$              ;BR IF NO
015106  060001                                  ADD     R0,R1           ;
015110  005737  001424                  3$:     TST     L12.15          ;LINE CARD 4 EXIST?
015114  100401                                  BMI     4$              ;BR IF NO
015116  060001                                  ADD     R0,R1           ;
015120  005000                          4$:     CLR     R0              ;SET POINTER TO 0
015122  010137  025540                          MOV     R1,COUNT        ;STORE LINE CARD COUNT
015126  012737  021350  015172  10700           MOV     #TXBAP,6$       ;SET TX BA POINTER
015134  012737  021750  015216  10800           MOV     #TXBAS,11$      ;SET ALTERNATE POINTER
015142  105077  000024          10900   5$:     CLRB    @6$             ;ZERO DATA
015146  105077  000044          11000           CLRB    @11$            ;ZERO DATA
015152  010077  164214          11100           MOV     R0,@DVSRS       ;LOAD LINE NUMBER
015156  000240                  11200   60$:    NOP     ;PERFORM   ,LOAD.MODE
015160  000240                  11300           NOP     ;BIT12+BIT11
015162  000240                  11400   61$:    NOP     ;
015164  004537  021026          11500           PERFORM ,SETREG         ;
000     001                     11600           .BYTE   000,001         ;TX BA P, TX BC P
000001                          11700   6$:     .BLKW   1               ;TXBA
177750                          11800           -30                     ;TX BC
015176  004537  021026          11900           PERFORM ,SETREG         ;
010     013                     12000           .BYTE   010,013         ;TX CNT TAB, LINE STATE
022350                          12100           TXTAB                   ;
000004                          12200           BIT2                    ;TX GO
015210  004537  021026          12300           PERFORM ,SETREG         ;
002     003                     12400           .BYTE   002,003         ;TX BA (ALT), TX BC (ALT)
000001                          12500   11$:    .BLKW 1                 ;TX BA
177750                          12600           -30                     ;TX BC
```

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 2911  015222  005237  015216          12700          INC     11$             ;UPDATE TX BA POINTER (ALT)
 2912  015226  005237  015172          12800          INC     6$              ;UPDATE TX BA POINTER (P)
 2913  015232  005200                  12900          INC     R0              ;UPDATE LINE POINTER
 2914  015234  022700  000020          13000          CMP     #16.,R0         ;ALL LINES DONE?
 2915  015240  001340                  13100          BNE     5$              ;BR IF NO
 2916  015242  005005                  13200          CLR     R5              ;
 2917  015244  063737  025540  025540  13300          ADD     COUNT,COUNT     ;DOUBLE THE COUNT (P+A)
 2918  015252  005037  022350          13400          CLR     TXTAB           ;CLEAR CNTRL TABLE (1,0)
 2919  015256  005277  164100          13500          INC     @DVSCR          ;SET UCPU GO
 2920  015262  012702  021242                  7$:    MOV     #REGBUF,R2      ;SET BUFFER POINTER IN R2
 2921  015266  005777  164070                  8$:    TST     @DVSCR          ;SILO ENTRY?
 2922  015272  100005                                 BPL     9$              ;BR IF NO
 2923  015274  017722  164102                          MOV     @DVNSR,(R2)+    ;STORE SILO ENTRY AWAY
 2924  015300  005337  025540                          DEC     COUNT           ;ALL ENTRIES MADE?
 2925  015304  001404                                 BEQ     10$             ;BR IF YES
 2926  015306  104414                  9$:    DELAY                           ;WASTE TIME
 2927  015310  005205                          INC     R5              ;COUNT WAIT
 2928  015312  001365                          BNE     8$              ;FOR SILO ENTRY
 2929  015314  104000                          HLT     0               ;NO SILO ENTRY! (DVSCR15=1)
 2930  015316                          10$:
 2931  015316  005737  001416          13700          TST     L00.03          ;LINE CARD 1 EXIST?
 2932  015322  100403                  13800          BMI     27$             ;BR IF NO
 2933  015324  004537  020316          13900          JSR     R5,LINT2        ;GOSUB
 2934  015330  000000                  14000          0.                      ;LINES 00-03
 2935  015332  005737  001420          14100  27$:    TST     L04.07          ;LINE CARD 2 EXIST?
 2936  015336  100403                  14200          BMI     28$             ;BR IF NO
 2937  015340  004537  020316          14300          JSR     R5,LINT2        ;GOSUB
 2938  015344  000004                  14400          4.                      ;LINES 04-07
 2939  015346  005737  001422          14500  28$:    TST     L08.11          ;LINE CARD 5 EXIST?
 2940  015352  100403                  14600          BMI     29$             ;BR IF NO
 2941  015354  004537  020316          14700          JSR     R5,LINT2        ;GOSUB
 2942  015360  000010                  14800          8.                      ;LINES 08-11
 2943  015362  005737  001424          14900  29$:    TST     L12.15          ;LINE CARD 4 EXIST?
 2944  015366  100403                  15000          BMI     30$             ;BR IF NO
 2945  015370  004537  020316          15100          JSR     R5,LINT2        ;GOSUB
 2946  015374  000014                  15200          12.                     ;LINES 12-15
 2947  015376  104400                  15300  30$:    SCOPE                   ;SCOPE TEST
 2948                                  15400
 2949                                          ;************************ TEST 15 ******************************
 2950                                  15600   ;*TEST TO TURN ON ALL TRANSMITTER
 2951                                  15700   ;*BCC'S (USING LRC 8).
 2952                                  15800   ;*ALL TRANSMITTER PRIMARY REGISTERS
 2953                                  15900   ;*WILL XMIT 1 CHARACTER (20(8)+LINE NO.)
 2954                                  16000   ;*AT THIS TIME ALL BCC REGISTERS WILL BE
 2955                                  16100   ;*CHECKED FOR CORRECT DATA. (20(8)+LINE NO.)
 2956                                  16200   ;*NOTE: BCC INSTRUCTION HAS BEEN CHECKED AND
 2957                                  16300   ;*LRC 8 ALSO BUT IT IS NOT PROVEN
 2958                                  16400   ;*THAT THE CHAR HAS BEEN "TAKEN FROM" CORE BY THE MICRO-PROCESSOR YET.
 2959                                  16500   ;*NOTE:TURN AROUND CONNECTOR MUST BE INSTALLED
 2960                                  16600   ;*      AND THE 'EIA' GATES ARE USED.
 2961                                  16605   ;*THIS TEST IS DONE FOR BOTH ASYNC AND SYNC LINE CARDS.
 2962                                          ;;***********************************************************************
 2963                                  16800
 2964                                          ;  TEST 15
 2965                                          ;--------------
 2966  015400  012737  000015  001226          TST15:  MOV     #15,TSTNO
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 2967  015406  012737  016176  001216                        MOV     #TST16,NEXT
 2968  015414  104413                                        RAMCLR                  ;ZERO ALL SEC REGISTERS
 2969  015416  005001                                        CLR     R1              ;SET COUNTER TO ZERO
 2970  015420  012700  000004                                MOV     #4,R0           ;SET 4 LINE COUNT
 2971  015424  005737  001416                                TST     L00.03          ;LINE CARD 1 EXIST?
 2972  015430  100401                                        BMI     1$              ;BR IF NO
 2973  015432  060001                                        ADD     R0,R1           ;UPDATE COUNT
 2974  015434  005737  001420                        1$:     TST     L04.07          ;LINE CARD 2 EXIST?
 2975  015440  100401                                        BMI     2$              ;BR IF NO
 2976  015442  060001                                        ADD     R0,R1           ;
 2977  015444  005737  001422                        2$:     TST     L08.11          ;LINE CARD 3 EXIST?
 2978  015450  100401                                        BMI     3$              ;BR IF NO
 2979  015452  060001                                        ADD     R0,R1           ;
 2980  015454  005737  001424                        3$:     TST     L12.15          ;LINE CARD 4 EXIST?
 2981  015460  100401                                        BMI     4$              ;BR IF NO
 2982  015462  060001                                        ADD     R0,R1           ;
 2983  015464  005000                                4$:     CLR     R0              ;SET POINTER TO 0
 2984  015466  010137  025540                                MOV     R1,COUNT        ;STORE LINE CARD COUNT
 2985  015472  012700  022350                17100           MOV     #TXTAB,R0       ;SET CNTRL TABLE POINTER
 2986  015476  012703  000020                17200           MOV     #16.,R3         ;SET FOR 16 LINES
 2987  015502  062700  000020                17300           ADD     #20,R0          ;SET DATA CHAR
 2988  015506  112720  000010                17400   5$:     MOVB    #BIT3,(R0)+     ;"INC BCC"
 2989  015512  005303                        17500           DEC     R3              ;16 X DONE?
 2990  015514  001374                        17600           BNE     5$              ;BR IF NO
 2991  015516  012702  000020                17700           MOV     #20,R2          ;SET DATA
 2992  015522  012700  021350                17800           MOV     #TXBAP,R0       ;SET TX BUFFER POINTER
 2993  015526  012703  000020                17900           MOV     #16.,R3         ;16 LINES
 2994  015532  110220                        18000   6$:     MOVB    R2,(R0)+        ;LOAD DATA
 2995  015534  005202                        18100           INC     R2              ;UPDATE DATA
 2996  015536  005303                        18200           DEC     R3              ;ALL DONE
 2997  015540  001374                        18300           BNE     6$              ;BR IF NO
 2998  015542  012737  021350  015572        18400           MOV     #TXBAP,8$       ;SET POINTER
 2999  015550  005000                        18500           CLR     R0              ;SET TO LINE 0.
 3000  015552  010077  163614                18600   7$:     MOV     R0,@DVSRS       ;LOAD LINE NO.
 3001  015556  000240                        18700   60$:    NOP     ;PERFORM  ,LOAD.MODE
 3002  015560  000240                        18800           NOP     ;BIT12+BIT11
 3003  015562  000240                        18900   61$:    NOP     ;
 3004  015564  004537  021026                19000           PERFORM ,SETREG         ;
 3005  015570     000     001                19100           .BYTE   000,001         ;TX BA P, TX BC P
 3006  015572  000001                        19200   8$:     .BLKW   1               ;TX BA
 3007  015574  177777                        19300           -1                      ;TX BC
 3008  015576  004537  021026                19400           PERFORM ,SETREG         ;
 3009  015602     010     013                19500           .BYTE   010,013         ;TX CNTRL TAB, LINE STATE
 3010  015604  022350                        19600           TXTAB                   ;
 3011  015606  000004                        19700           BIT2                    ;TX GO
 3012  015610  005237  015572                19800           INC     8$              ;UPDATE BA POINTER
 3013  015614  005200                        19900           INC     R0              ;UPDATE LINE POINTER
 3014  015616  022700  000020                20000           CMP     #16.,R0         ;ALL DONE?
 3015  015622  001353                        20100           BNE     7$              ;BR IF NO
 3016  015624  005005                        20200           CLR     R5              ;
 3017  015626  005277  163530                20300           INC     @DVSCR          ;SET UCPU GO
 3018  015632  005777  163544                20400   9$:     TST     @DVNSR          ;SILO ENTRY?
 3019  015636  100003                        20500           BPL     11$             ;BR IF NO
 3020  015640  005337  025540                20600           DEC     COUNT           ;ALL DONE?
 3021  015644  001404                        20700           BEQ     10$             ;BR IF NO
 3022  015646  104414                        20800   11$:    DELAY                   ;WASTE TIME
```

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3023  015650  005205                  20900          INC     R5              ;UPCOUNT DELAY
3024  015652  001367                  21000          BNE     9$              ;BR
3025  015654  104000                  21100          HLT     0               ;DVNSR15 NOT=1 (NO SILO ENTRY)
3026  015656  042777  000001  163476  21200  10$:    BIC     #BIT0,@DVSCR    ;CLEAR UCPU GO
3027
3028  015664  005737  001416                         TST     L00.03          ;DOES LINE CARD EXIST?
3029  015670  100426                                 BMI     66$             ;BR IF NO
3030  015672  012700  000000                         MOV     #0.,R0          ;LOAD LINE POINTER
3031  015676  012702  000004                         MOV     #4,R2           ;SET FOR 4 LINE GROUP
3032  015702  010077  163464                 64$:    MOV     R0,@DVSRS       ;LOAD LINE NO.
3033  015706  112777  000006  163460                 MOVB    #6,@DVSRSH      ;SEL TX BCC REG
3034  015714  017704  163456                         MOV     @DVSRA,R4       ;READ IT
3035  015720  012705  000020                         MOV     #20,R5          ;SET EXPECTED=20
3036  015724  060005                                 ADD     R0,R5           ;ADD LINE NO TO EXPECTED
3037  015726  117701  163442                         MOVB    @DVSRSH,R1      ;SET SEC REG POINTER
3038  015732  020504                                 CMP     R5,R4           ;TX BCC OK?
3039  015734  001401                                 BEQ     65$             ;BR IF YES
3040  015736  104003                                 HLT     3               ;TX BCC ERROR
3041  015740  005200                 65$:    INC     R0              ;UPDATE LINE POINTER
3042  015742  005302                         DEC     R2              ;4 LINE DONE?
3043  015744  001356                         BNE     64$             ;BR IF NO
3044  015746                          66$:
3045
3046  015746  005737  001420                         TST     L04.07          ;DOES LINE CARD EXIST?
3047  015752  100426                                 BMI     69$             ;BR IF NO
3048  015754  012700  000004                         MOV     #4.,R0          ;LOAD LINE POINTER
3049  015760  012702  000004                         MOV     #4,R2           ;SET FOR 4 LINE GROUP
3050  015764  010077  163402                 67$:    MOV     R0,@DVSRS       ;LOAD LINE NO.
3051  015770  112777  000006  163376                 MOVB    #6,@DVSRSH      ;SEL TX BCC REG
3052  015776  017704  163374                         MOV     @DVSRA,R4       ;READ IT
3053  016002  012705  000020                         MOV     #20,R5          ;SET EXPECTED=20
3054  016006  060005                                 ADD     R0,R5           ;ADD LINE NO TO EXPECTED
3055  016010  117701  163360                         MOVB    @DVSRSH,R1      ;SET SEC REG POINTER
3056  016014  020504                                 CMP     R5,R4           ;TX BCC OK?
3057  016016  001401                                 BEQ     68$             ;BR IF YES
3058  016020  104003                                 HLT     3               ;TX BCC ERROR
3059  016022  005200                 68$:    INC     R0              ;UPDATE LINE POINTER
3060  016024  005302                         DEC     R2              ;4 LINE DONE?
3061  016026  001356                         BNE     67$             ;BR IF NO
3062  016030                          69$:
3063
3064  016030  005737  001422                         TST     L08.11          ;DOES LINE CARD EXIST?
3065  016034  100426                                 BMI     72$             ;BR IF NO
3066  016036  012700  000010                         MOV     #8.,R0          ;LOAD LINE POINTER
3067  016042  012702  000004                         MOV     #4,R2           ;SET FOR 4 LINE GROUP
3068  016046  010077  163320                 70$:    MOV     R0,@DVSRS       ;LOAD LINE NO.
3069  016052  112777  000006  163314                 MOVB    #6,@DVSRSH      ;SEL TX BCC REG
3070  016060  017704  163312                         MOV     @DVSRA,R4       ;READ IT
3071  016064  012705  000020                         MOV     #20,R5          ;SET EXPECTED=20
3072  016070  060005                                 ADD     R0,R5           ;ADD LINE NO TO EXPECTED
3073  016072  117701  163276                         MOVB    @DVSRSH,R1      ;SET SEC REG POINTER
3074  016076  020504                                 CMP     R5,R4           ;TX BCC OK?
3075  016100  001401                                 BEQ     71$             ;BR IF YES
3076  016102  104003                                 HLT     3               ;TX BCC ERROR
3077  016104  005200                 71$:    INC     R0              ;UPDATE LINE POINTER
3078  016106  005302                         DEC     R2              ;4 LINE DONE?
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3079  016110  001356                                    BNE     70$             ;BR IF NO
3080  016112                                    72$:
3081
3082  016112  005737  001424                            TST     L12.15          ;DOES LINE CARD EXIST?
3083  016116  100426                                    BMI     75$             ;BR IF NO
3084  016120  012700  000014                            MOV     #12.,R0         ;LOAD LINE POINTER
3085  016124  012702  000004                            MOV     #4,R2           ;SET FOR 4 LINE GROUP
3086  016130  010077  163236                    73$:    MOV     R0,@DVSRS       ;LOAD LINE NO.
3087  016134  112777  000006  163232                    MOVB    #6,@DVSRSH      ;SEL TX BCC REG
3088  016142  017704  163230                            MOV     @DVSRA,R4       ;READ IT
3089  016146  012705  000020                            MOV     #20,R5          ;SET EXPECTED=20
3090  016152  060005                                    ADD     R0,R5           ;ADD LINE NO TO EXPECTED
3091  016154  117701  163214                            MOVB    @DVSRSH,R1      ;SET SEC REG POINTER
3092  016160  020504                                    CMP     R5,R4           ;TX BCC OK?
3093  016162  001401                                    BEQ     74$             ;BR IF YES
3094  016164  104003                                    HLT     3               ;TX BCC ERROR
3095  016166  005200                            74$:    INC     R0              ;UPDATE LINE POINTER
3096  016170  005302                                    DEC     R2              ;4 LINE DONE?
3097  016172  001356                                    BNE     73$             ;BR IF NO
3098  016174                                    75$:
3099  016174  104400                  21700             SCOPE
3100                                   21800
3101                                   21900
3102
3103                                            ;********************** TEST 16 ****************************
3104                                            ;*TEST OF RECEIVER WITH MICRO-PROCESSOR FREE RUNNING.
3105                                            ;*TEST OF RECEIVER BYTE COUNT =0
3106                                            ;*TEST OF ***"ERROR CODES"*** AND RECEIVER ENTRIES INTO DVRIC
3107                                            ;*REGISTER.
3108                                            ;*EXPECTED:     (THIS IS FOR LINES $B )
3109                                            ;*DVSCR BIT15=1 BIT7=1 BIT0=1
3110                                            ;*DVRIC 11:08=LINE NUMBER BIT15+32
3111                                            ;*DVNSR 03:00=LINE NUMBER BIT15=1 BIT8=1
3112                                            ;*TXBAP =TXBAP+1
3113                                            ;*TXWCP =0
3114                                            ;*RXBA  =RXBA +0
3115                                            ;*RXWC  =0
3116                                            ;*LINE STATE     =BIT7=1 BIT0=1
3117                                            ;*IS TEST IS DONE FOR BOTH ASYNC AND SYNC LINE CARDS.
3118                                            ;:************************************************************
3119
3120                                    ;  TEST 16
3121                                    ;--------------
3122  016176  012737  000016  001226    TST16:  MOV     #16,TSTNO
3123  016204  012737  016350  001216            MOV     #TST17,NEXT
3124  016212  012700  000000                    MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
3125  016216  013737  001416  001236            MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
3126  016224  100402                            BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
3127  016226  004737  016314                    JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
3128  016232  012700  000004            100$:   MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
3129  016236  013737  001420  001236            MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
3130  016244  100402                            BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
3131  016246  004737  016314                    JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
3132  016252  012700  000010            101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
3133  016256  013737  001422  001236            MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
3134  016264  100402                            BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
```

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3135  016266  004737  016314                          JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
3136  016272  012700  000014                  102$:   MOV     #12.,R0         ;LOAD LINE NO.
3137  016276  013737  001424  001236                  MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
3138  016304  100402                                  BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
3139  016306  004737  016314                          JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
3140  016312  104400                          103$:   SCOPE                   ;SCOPE THIS TEST.
3141  016314                                  105$:                           ;TEST ENTRANCE.
3142  016314  012737  022750  025544                  MOV     #RXBA,EXPRBA    ;EXPECTED RX BA
3143  016322  012737  000000  025546                  MOV     #0,EXPRWC       ;EXPECTED RX BC
3144  016330  004537  017220                          JSR     R5,RXT01        ;GOTO SUBROUTINE
3145  016334  023350                                  RXTAB                   ;LOADED INTO RX CNTR TABLE REG
3146  016336  000000                                  0                       ;LOADED INTO CORE TABLE
3147  016340  022750                                  RXBA                    ;LOADED INTO RX BA
3148  016342  000000                                  0                       ;LOADED INTO RX BC
3149  016344  100032                                  BIT15+32                ;RIC ENTRY
3150  016346  000207                                  RTS     PC              ;EXIT
3151
3152
3153                                          ;************************ TEST 17 *******************************
3154                                          ;*TEST OF RECEIVER WITH MICRO-PROCESSOR FREE RUNNING.
3155                                          ;*TEST OF RECEIVER BYTE COUNT WARINING
3156                                          ;*TEST OF ***"ERROR CODES"*** AND RECEIVER ENTRIES INTO DVRIC
3157                                          ;*REGISTER.
3158                                          ;*EXPECTED:    (THIS IS FOR LINES $B )
3159                                          ;*DVSCR BIT15=1 BIT7=1 BIT0=1
3160                                          ;*DVRIC 11:08=LINE NUMBER BIT14+32
3161                                          ;*DVNSR 03:00=LINE NUMBER BIT15=1 BIT8=1
3162                                          ;*TXBAP =TXBAP+1
3163                                          ;*TXWCP =0
3164                                          ;*RXBA  =RXBA+1
3165                                          ;*RXWC  =0
3166                                          ;*LINE STATE    =BIT7=1 BIT0=1
3167                                          ;*IS TEST IS DONE FOR BOTH ASYNC AND SYNC LINE CARDS.
3168                                          ;:*************************************************************
3169
3170                                  ;  TEST 17
3171                                  ;--------------
3172  016350  012737  000017  001226  TST17:  MOV     #17,TSTNO
3173  016356  012737  016522  001216          MOV     #TST20,NEXT
3174  016364  012700  000000                  MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
3175  016370  013737  001416  001236          MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
3176  016376  100402                          BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
3177  016400  004737  016466                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
3178  016404  012700  000004          100$:   MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
3179  016410  013737  001420  001236          MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
3180  016416  100402                          BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
3181  016420  004737  016466                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
3182  016424  012700  000010          101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
3183  016430  013737  001422  001236          MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
3184  016436  100402                          BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
3185  016440  004737  016466                  JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
3186  016444  012700  000014          102$:   MOV     #12.,R0         ;LOAD LINE NO.
3187  016450  013737  001424  001236          MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
3188  016456  100402                          BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
3189  016460  004737  016466                  JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
3190  016464  104400                  103$:   SCOPE                   ;SCOPE THIS TEST.
```

```
3191  016466                                105$:                                ;TEST ENTRANCE.
3192  016466  012737  022751  025544                MOV     #RXBA+1,EXPRBA     ;EXPECTED RX BA
3193  016474  012737  000000  025546                MOV     #0,EXPRWC          ;EXPECTED RX BC
3194  016502  004537  017220                      JSR     R5,RXT01           ;GOTO SUBROUTINE
3195  016506  023350                              RXTAB                      ;LOADED INTO RX CNTR TABLE REG
3196  016510  000000                              0                          ;LOADED INTO CORE TABLE
3197  016512  022750                              RXBA                       ;LOADED INTO RX BA
3198  016514  177777                              -1                         ;LOADED INTO RX BC
3199  016516  040032                              BIT14+32                       ;RIC ENTRY
3200  016520  000207                              RTS     PC                 ;EXIT
3201
3202
3203                                              ;************************ TEST 20 ******************************
3204                                              ;*TEST OF RECEIVER WITH MICRO-PROCESSOR FREE RUNNING.
3205                                              ;*TEST OF RECEIVER "RXBA NXM"
3206                                              ;*TEST OF ***"ERROR CODES"*** AND RECEIVER ENTRIES INTO DVRIC
3207                                              ;*REGISTER.
3208                                              ;*EXPECTED:    (THIS IS FOR LINES $B )
3209                                              ;*DVSCR BIT15=1 BIT7=1 BIT0=1
3210                                              ;*DVRIC 11:08=LINE NUMBER BIT15+BIT14+32
3211                                              ;*DVNSR 03:00=LINE NUMBER BIT15=1 BIT8=1
3212                                              ;*TXBAP =TXBAP+1
3213                                              ;*TXWCP =0
3214                                              ;*RXBA  =177320 +0
3215                                              ;*RXWC  =-3
3216                                              ;*LINE STATE    =BIT7=1 BIT0=1
3217                                              ;*IS TEST IS DONE FOR BOTH ASYNC AND SYNC LINE CARDS.
3218                                              ;:**************************************************************
3219
3220                                      ;  TEST 20
3221                                      ;--------------
3222  016522  012737  000020  001226      TST20:  MOV     #20,TSTNO
3223  016530  012737  016674  001216              MOV     #TST21,NEXT
3224  016536  012700  000000                      MOV     #0.,R0             ;PLACE LINE NUMBER INTO R0
3225  016542  013737  001416  001236              MOV     L00.03,STAT        ;LOAD LINE CARD STATUS INTO STAT
3226  016550  100402                              BMI     100$               ;BR IF LINE CARD NOT TO BE TESTED
3227  016552  004737  016640                      JSR     PC,105$            ;GO DO THE TEST FOR LINE CARD 1
3228  016556  012700  000004      100$:           MOV     #4.,R0             ;PLACE LINE NUMBER INTO R0
3229  016562  013737  001420  001236              MOV     L04.07,STAT        ;LOAD LINE CARD STATUS INTO STAT
3230  016570  100402                              BMI     101$               ;BR IF LINE CARD NOT TO BE TESTED
3231  016572  004737  016640                      JSR     PC,105$            ;GO DO THE TEST FOR LINE CARD 2
3232  016576  012700  000010      101$:           MOV     #8.,R0             ;LOAD LINE NUMBER
3233  016602  013737  001422  001236              MOV     L08.11,STAT        ;LOAD LINE CARD STATUS INTO STAT
3234  016610  100402                              BMI     102$               ;BR IF LINE CARD NOT TO BE TESTED
3235  016612  004737  016640                      JSR     PC,105$            ;DO THE TEST FOR LINE CARD 3
3236  016616  012700  000014      102$:           MOV     #12.,R0            ;LOAD LINE NO.
3237  016622  013737  001424  001236              MOV     L12.15,STAT        ;LOAD LINE CARD STATUS
3238  016630  100402                              BMI     103$               ;BR IF LINE CARD NOT TO BE TESTED
3239  016632  004737  016640                      JSR     PC,105$            ;DO THE TESTS FOR LINE CARD 4
3240  016636  104400              103$:           SCOPE                      ;SCOPE THIS TEST.
3241  016640                      105$:                                      ;TEST ENTRANCE.
3242  016640  012737  177320  025544              MOV     #177320,EXPRBA     ;EXPECTED RX BA
3243  016646  012737  177775  025546              MOV     #-3,EXPRWC         ;EXPECTED RX BC
3244  016654  004537  017220                      JSR     R5,RXT01           ;GOTO SUBROUTINE
3245  016660  023350                              RXTAB                      ;LOADED INTO RX CNTR TABLE REG
3246  016662  000000                              0                          ;LOADED INTO CORE TABLE
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3247  016664  177320                          177320                  ;LOADED INTO RX BA
3248  016666  177775                          -3                      ;LOADED INTO RX BC
3249  016670  140032                          BIT15+BIT14+32                  ;RIC ENTRY
3250  016672  000207                          RTS     PC              ;EXIT
3251
3252
3253                                          ;************************ TEST 21 ******************************
3254                                          ;*TEST OF RECEIVER WITH MICRO-PROCESSOR FREE RUNNING.
3255                                          ;*TEST IF RECEIVER "RXTAB NXM"
3256                                          ;*TEST OF ***"ERROR CODES"*** AND RECEIVER ENTRIES INTO DVRIC
3257                                          ;*REGISTER.
3258                                          ;*EXPECTED:    (THIS IS FOR LINES $B )
3259                                          ;*DVSCR BIT15=1 BIT7=1 BIT0=1
3260                                          ;*DVRIC 11:08=LINE NUMBER BIT15+BIT14+BIT12+32
3261                                          ;*DVNSR 03:00=LINE NUMBER BIT15=1 BIT8=1
3262                                          ;*TXBAP =TXBAP+1
3263                                          ;*TXWCP =0
3264                                          ;*RXBA  =RXBA +0
3265                                          ;*RXWC  =-3
3266                                          ;*LINE STATE    =BIT7=1 BIT0=1
3267                                          ;*IS TEST IS DONE FOR BOTH ASYNC AND SYNC LINE CARDS.
3268                                          ;:**************************************************************
3269
3270                                  ;  TEST 21
3271                                  ;--------------
3272  016674  012737  000021  001226  TST21:  MOV     #21,TSTNO
3273  016702  012737  017046  001216          MOV     #TST22,NEXT
3274  016710  012700  000000                  MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
3275  016714  013737  001416  001236          MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
3276  016722  100402                          BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
3277  016724  004737  017012                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
3278  016730  012700  000004          100$:   MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
3279  016734  013737  001420  001236          MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
3280  016742  100402                          BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
3281  016744  004737  017012                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
3282  016750  012700  000010          101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
3283  016754  013737  001422  001236          MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
3284  016762  100402                          BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
3285  016764  004737  017012                  JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
3286  016770  012700  000014          102$:   MOV     #12.,R0         ;LOAD LINE NO.
3287  016774  013737  001424  001236          MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
3288  017002  100402                          BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
3289  017004  004737  017012                  JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
3290  017010  104400          103$:   SCOPE                           ;SCOPE THIS TEST.
3291  017012                  105$:                                   ;TEST ENTRANCE.
3292  017012  012737  022750  025544          MOV     #RXBA,EXPRBA    ;EXPECTED RX BA
3293  017020  012737  177775  025546          MOV     #-3,EXPRWC      ;EXPECTED RX BC
3294  017026  004537  017220                  JSR     R5,RXT01        ;GOTO SUBROUTINE
3295  017032  177266                          177320-32                       ;LOADED INTO RX CNTR TABLE REG
3296  017034  000000                          0                       ;LOADED INTO CORE TABLE
3297  017036  022750                          RXBA                    ;LOADED INTO RX BA
3298  017040  177775                          -3                      ;LOADED INTO RX BC
3299  017042  150032                          BIT15+BIT14+BIT12+32                    ;RIC ENTRY
3300  017044  000207                          RTS     PC              ;EXIT
3301
3302
```

```
3303                                        ;************************ TEST 22 ******************************
3304                                        ;*TEST OF RECEIVER WITH MICRO-PROCESSOR FREE RUNNING.
3305                                        ;*TEST OF RECEIVER "SPECIAL CHARACTER"
3306                                        ;*TEST OF ***"ERROR CODES"*** AND RECEIVER ENTRIES INTO DVRIC
3307                                        ;*REGISTER.
3308                                        ;*EXPECTED:    (THIS IS FOR LINES $B )
3309                                        ;*DVSCR BIT15=1 BIT7=1 BIT0=1
3310                                        ;*DVRIC 11:08=LINE NUMBER 32
3311                                        ;*DVNSR 03:00=LINE NUMBER BIT15=1 BIT8=1
3312                                        ;*TXBAP =TXBAP+1
3313                                        ;*TXWCP =0
3314                                        ;*RXBA  =RXBA +0
3315                                        ;*RXWC  =-3
3316                                        ;*LINE STATE    =BIT7=1 BIT0=1
3317                                        ;*IS TEST IS DONE FOR BOTH ASYNC AND SYNC LINE CARDS.
3318                                        ;:**************************************************************
3319
3320                                    ;  TEST 22
3321                                    ;--------------
3322  017046  012737  000022  001226  TST22:  MOV     #22,TSTNO
3323  017054  012737  002436  001216          MOV     #.EOP,NEXT
3324  017062  012700  000000                  MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
3325  017066  013737  001416  001236          MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
3326  017074  100402                          BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
3327  017076  004737  017164                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
3328  017102  012700  000004          100$:   MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
3329  017106  013737  001420  001236          MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
3330  017114  100402                          BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
3331  017116  004737  017164                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
3332  017122  012700  000010          101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
3333  017126  013737  001422  001236          MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
3334  017134  100402                          BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
3335  017136  004737  017164                  JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
3336  017142  012700  000014          102$:   MOV     #12.,R0         ;LOAD LINE NO.
3337  017146  013737  001424  001236          MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
3338  017154  100402                          BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
3339  017156  004737  017164                  JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
3340  017162  104400          103$:   SCOPE                           ;SCOPE THIS TEST.
3341  017164                  105$:                                   ;TEST ENTRANCE.
3342  017164  012737  022750  025544          MOV     #RXBA,EXPRBA    ;EXPECTED RX BA
3343  017172  012737  177775  025546          MOV     #-3,EXPRWC      ;EXPECTED RX BC
3344  017200  004537  017220                  JSR     R5,RXT01        ;GOTO SUBROUTINE
3345  017204  023350                          RXTAB                   ;LOADED INTO RX CNTR TABLE REG
3346  017206  000001                          BIT0                    ;LOADED INTO CORE TABLE
3347  017210  022750                          RXBA                    ;LOADED INTO RX BA
3348  017212  177775                          -3                      ;LOADED INTO RX BC
3349  017214  000032                          32                      ;RIC ENTRY
3350  017216  000207                          RTS     PC              ;EXIT
3351
3352
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 3353                                                00100           ;*SUBROUTINE.
 3354                                                00150           ;*SUBROUTINE USED BY PREVIOUS TESTS.
 3355                                                00175           ;*
 3356  017220                                        00187  RXTO1:
 3357  017220  012537  017416                        00200           MOV     (R5)+,68$       ;LOAD RX CNTRL TABLE REG.
 3358  017224  012537  020050                        00300           MOV     (R5)+,112$      ;DATA TO CORE TABLE
 3359  017230  012537  017366                        00400           MOV     (R5)+,66$       ;RX BA
 3360  017234  012537  017370                        00500           MOV     (R5)+,67$       ;RX BC
 3361  017240  012537  020052                        00600           MOV     (R5)+,115$      ;EXPECTED DVRIC ENTRY
 3362  017244  010546                                00700           MOV     R5,-(SP)        ;SAVE R5 ON STACK
 3363  017246  012705  023350                        00800           MOV     #RXTAB,R5       ;GET RX TAB POINTER
 3364  017252  013746  020050                        00900           MOV     112$,-(SP)      ;GET CNTRL FUNCTION
 3365  017256                                        01000  65$:
 3366  017256  111625                                01100           MOVB    (SP),(R5)+      ;LOAD
 3367  017260  022705  023750                        01200           CMP     #RXTAB+400,R5   ;CNTR FUNCTION
 3368  017264  001374                                01300           BNE     65$             ;BR IF NOT DONE
 3369  017266  005726                                01400           TST     (SP)+           ;POP FUNCTION OFF STACK
 3370  017270  012737  000004  020046                01500           MOV     #4,111$         ;SET FOR 4 LINE GROUP
 3371  017276  104413                                01600  64$:     RAMCLR                  ;CLEAR ALL SEC REGISTERS
 3372  017300  110077  162066                        01700           MOVB    R0,@DVSRS       ;LOAD LINE NUMBER
 3373  017304  032737  004000  001236                01800           BIT     #ASYNC,STAT     ;*IS THIS AN ASYNC LINE CARD?
 3374  017312  001406                                01900           BEQ     50$             ;*BR IF NOT ASYNC.
 3375  017314  004537  021026                        02000           PERFORM ,SETREG         ;*ADJUST REGISTERS FOR ASYNC
 3376  017320     000     001                        02100           .BYTE   000,001         ;*TXBAP AND TXBC
 3377  017322  021350                                02200           TXBAP                   ;*BUS ADDRESS
 3378  017324  177777                                02300           -1                      ;*SET TO TRANS. ONE CHAR
 3379  017326  000405                                02400           BR      51$             ;*CONTINUE TEST
 3380  017330  004537  021026                        02500  50$:     PERFORM ,SETREG         ;
 3381  017334     000     001                        02600           .BYTE   000,001         ;TX BA P, TX BC P
 3382  017336  021346                                02700           SYNC                    ;
 3383  017340  177775                                02800           -3                      ;
 3384  017342  022737  177320  017366                02900  51$:     CMP     #177320,66$     ;IS THIS NON-EX MEMORY TEST
 3385  017350  001003                                03000           BNE     15$             ;BR IF NO
 3386  017352  052777  000060  162002                03100           BIS     #BIT5+BIT4,@DVSCR       ;SET "EA" BITS
 3387  017360  004537  021026                        03200  15$:     PERFORM ,SETREG         ;
 3388  017364     004     005                        03300           .BYTE   004,005         ;RX BA, RX BC
 3389  017366  000000                                03400  66$:     0                       ;BA
 3390  017370  000000                                03500  67$:     0                       ;BC
 3391  017372  022737  177266  017416                03600           CMP     #<177320-32>,68$        ;IS THIS NON-EX MEMORY TEST
 3392  017400  001003                                03700           BNE     16$             ;BR IF NO
 3393  017402  052777  000060  161752                03800           BIS     #BIT5+BIT4,@DVSCR       ;SET "EA" BITS
 3394  017410  004537  021026                        03900  16$:     PERFORM ,SETREG         ;
 3395  017414     011     010                        04000           .BYTE   011,010         ;RX CNTRL TAB, TX CNTRL TAB
 3396  017416  000000                                04100  68$:     0                       ;
 3397  017420  022350                                04200           TXTAB                   ;
 3398  017422  004537  021026                        04300           PERFORM ,SETREG         ;
 3399  017426     013     012                        04400           .BYTE   013,012         ;LINE STATE, LINE PROTOCOL PARAM REG
 3400  017430  000004                                04500           BIT2                    ;TX GO
 3401  017432  000001                                04600           BIT0                    ;IDLE MARK
 3402  017434  032737  004000  001236                                BIT     #ASYNC,STAT     ;*IS THIS ASYNC LINE CARD?
 3403  017442  001412                                                BEQ     60$             ;*BR IF NO.
 3404  017444  004537  021072                                        PERFORM ,LOAD.MODE      ;*LOAD PARAMETERS.
 3405  017450  020000                                                BIT13                   ;*RECEIVER ENABLE
 3406  017452  004537  021072                                        PERFORM ,LOAD.MODE      ;*
 3407  017456  015000                                                <BIT12+BIT11>+BIT9      ;*8 BITS/PER/CHAR
 3408  017460  004537  021072                                        PERFORM ,LOAD.MODE      ;*SET BAUD RATE REGISTER.
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3409  017464  072000                                    (BIT14+BIT13+BIT12)+BIT10
3410                                                    ;#9600 BAUD.
3411  017466  000403                                    BR      61$             ;#CONTINUE TEST.
3412  017470  004537  021072          04800   60$:     PERFORM ,LOAD,MODE      ;LOAD
3413  017474  034000                  04900             BIT13+BIT12+BIT11       ;MODE+RX ENABLE
3414  017476  012737  000032  021350  05000   61$:     MOV     #32,TXBAP       ;SET DATA CHAR
3415  017504  005037  022402          05100             CLR     TXTAB+32        ;SET CNTRL BYTE TO ZERO
3416  017510  004537  021210          05200             PERFORM ,SETSYNC        ;ADJUST SYNC CHAR(S)
3417  017514  005277  161642          05300   2$:       INC     @DVSCR          ;SET UCPU GO
3418  017520  005005                  05400             CLR     R5              ;
3419  017522  105777  161634          05500   3$:       TSTB    @DVSCR          ;DVSCR07=1?
3420  017526  100417                  05600             BMI     4$              ;BR IF YES
3421  017530  104414                  05700             DELAY                   ;WASTE TIME
3422  017532  005205                  05800             INC     R5              ;DELAY
3423  017534  001372                  05900             BNE     3$              ;
3424  017536  112777  000013  161630  06000             MOVB    #13,@DVSRSH     ;SEL LINE STATE.
3425  017544  032777  000001  161624  06100             BIT     #BIT0,@DVSRA    ;IS RX ACTIVE SET?
3426  017552  001001                  06200             BNE     .+4             ;BR IF RX ACTIVE SET.
3427  017554  104000                  06300             HLT     0               ;RECEIVER ACTIVE IS NOT SET!
3428  017556  105777  161600          06400             TSTB    @DVSCR          ;RE-VERIFY DVSCR07.
3429  017562  100401                  06500             BMI     .+4             ;BR IF BIT7 IS SET.
3430  017564  104000                  06600             HLT     0               ;DVSCR07 NEVER SET (=1)!
3431  017566  017704  161570          06700   4$:       MOV     @DVSCR,R4       ;READ DVSCR
3432  017572  012705  100201          06800             MOV     #BIT15+BIT7+BIT0,R5
3433  017576  020504                  06900             CMP     R5,R4           ;NPR STATUS ENTRY, RX INTR, UCPU GO
3434  017600  001401                  07000             BEQ     5$              ;BR IF OK
3435  017602  104002                  07100             HLT     2               ;DVSCR INCORRECT
3436  017604  017704  161556          07200   5$:       MOV     @DVRIC,R4       ;GET DVRIC
3437  017610  013701  001366          07300             MOV     DVRIC,R1        ;SET POINTER
3438  017614  010005                  07400             MOV     R0,R5           ;GET LINE NUMBER
3439  017616  000305                  07500             SWAB    R5              ;PLACE IN HIGH BYTE
3440  017620  053705  020052          07600             BIS     11S$,R5         ;SET OTHER BITS EXPECTED
3441  017624  020504                  07700             CMP     R5,R4           ;DVRIC OK?
3442  017626  001401                  07800             BEQ     6$              ;
3443  017630  104002                  07900             HLT     2               ;DVRIC INCORRECT
3444  017632  017704  161544          08000   6$:       MOV     @DVNSR,R4       ;READ DVNSR
3445  017636  010005                  08100             MOV     R0,R5           ;LOAD LINE NO.
3446  017640  052705  100400          08200             BIS     #BIT15+BIT8,R5  ;SILO ENTRY, PRINCIPLE BC=0
3447  017644  020504                  08300             CMP     R5,R4           ;DVNSR OK
3448  017646  001403                  08400             BEQ     7$              ;
3449  017650  013701  001402          08500             MOV     DVNSR,R1        ;
3450  017654  104002                  08600             HLT     2               ;DVNSR INCORRECT
3451  017656  010077  161510          08700   7$:       MOV     R0,@DVSRS       ;LOAD LINE NO.
3452  017662  017704  161510          08800             MOV     @DVSRA,R4       ;READ TX BA?
3453  017666  012705  021351          08900             MOV     #TXBAP+1,R5     ;SET EXPECTED
3454  017672  005001                  09000             CLR     R1              ;SET SEC REG POINTER
3455  017674  020504                  09100             CMP     R5,R4           ;OK?
3456  017676  001401                  09200             BEQ     8$              ;
3457  017700  104003                  09300             HLT     3               ;TX BA P INCORRECT
3458  017702  105277  161466          09400   8$:       INCB    @DVSRSH         ;SEL TX BC?
3459  017706  005201                  09500             INC     R1              ;SET SEC REG POINTER
3460  017710  017704  161462          09600             MOV     @DVSRA,R4       ;READ IT
3461  017714  001402                  09700             BEQ     9$              ;BR IF IT=0
3462  017716  005005                  09800             CLR     R5              ;
3463  017720  104003                  09900             HLT     3               ;TX BC P NOT=0
3464  017722  112777  000004  161444  10000   9$:       MOVB    #4,@DVSRSH      ;RX BA
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3465  017730  112701  000004          10100          MOVB    #4,R1           ;SET SEC REG POINTER
3466  017734  017704  161436          10200          MOV     @DVSRA,R4       ;READ IT
3467  017740  013705  025544          10300          MOV     EXPRBA,R5       ;GET EXPECTED BA
3468  017744  020504                  10400          CMP     R5,R4           ;OK
3469  017746  001401                  10500          BEQ     10$             ;
3470  017750  104003                  10600          HLT     3               ;RX BA INCORRECT
3471  017752  105277  161416          10700  10$:    INCB    @DVSRSH         ;RX BC
3472  017756  005201                  10800          INC     R1              ;SET SEC REG POINTER
3473  017760  017704  161412          10900          MOV     @DVSRA,R4       ;
3474  017764  013705  025546          11000          MOV     EXPRWC,R5       ;SET EXPECTED BC
3475  017770  020504                  11100          CMP     R5,R4           ;
3476  017772  001401                  11200          BEQ     11$             ;RX BC INCORRECT
3477  017774  104003                  11300          HLT     3               ;LINE STATE
3478  017776  112777  000013  161370  11400  11$:    MOVB    #13,@DVSRSH     ;
3479  020004  012701  000013          11500          MOV     #13,R1          ;SET SEC REG POINTER
3480  020010  017704  161362          11600          MOV     @DVSRA,R4       ;
3481  020014  012705  000201          11700          MOV     #BIT7+BIT0,R5   ;USE SEC. TABLE, RX ACTIVE
3482  020020  020504                  11800          CMP     R5,R4           ;
3483  020022  001401                  11900          BEQ     12$             ;
3484  020024  104003                  12000          HLT     3               ;LINE STATE INCORRECT
3485  020026  005200                  12100  12$:    INC     R0              ;UPDATE LINE NO.
3486  020030  005337  020046          12200          DEC     111$            ;4 LINE GROUP DONE?
3487  020034  001402                  12300          BEQ     100$            ;BR IF YES
3488  020036  000137  017276          12400          JMP     64$             ;DO MORE
3489  020042  012605                  12500  100$:   MOV     (SP)+,R5        ;RESTORE R5
3490  020044  000205                  12600          RTS     R5              ;EXIT
3491  020046  000000                  12700  111$:   0
3492  020050  000000                  12800  112$:   0                       ;DATA TO CORE TABLE
3493  020052  000000                  12900  115$:   0                       ;DVRIC
3494                                                 ;*SUBROUTINE.
3495                                                 ;*SUBROUTINE USED BY PREVIOUS TEST.
3496                                                 ;*
3497  020054                          LINT1:
3498
3499  020054  012500                          MOV     (R5)+,R0        ;GET FIRST LINE IN 4 LINE GROUP
3500  020056  010037  020314                  MOV     R0,73$          ;SAVE LINE NUMBER
3501  020062  010546                          MOV     R5,-(SP)        ;SAVE R5 ON STACK
3502  020064  052700  100400                  BIS     #BIT15+BIT8,R0  ;SILO ENTRY + TX PRINCIPLE BC=0
3503  020070  012703  000004                  MOV     #4,R3           ;4 LINE GROUP
3504  020074  012702  021242          64$:    MOV     #REGBUF,R2      ;SET SOFTWARE BUFFER
3505  020100  012701  000020                  MOV     #16.,R1         ;SET FOR 16 ENTRIES
3506  020104  012704  000001                  MOV     #1,R4           ;
3507  020110  042700  001000          65$:    BIC     #BIT9,R0        ;MAKE SURE R0 ISN'T SEQ: BC=0.
3508  020114  020022                          CMP     R0,(R2)+        ;IS ENTRY IN SOFTWARE TABLE?
3509  020116  001403                          BEQ     66$             ;BR IF YES
3510  020120  005301                          DEC     R1              ;ALL ENTRIES DONE?
3511  020122  001372                          BNE     65$             ;BR IF NO
3512  020124  104000                          HLT     0               ;ENTRY (R0) WAS NOT IN TABLE
3513  020126  005701                  66$:    TST     R1              ;HAS COUNT GONE TO ZERO?
3514  020130  001403                          BEQ     .+10            ;BR IF YES
3515  020132  012762  177777  177776          MOV     #-1,-2(R2)      ;RUB OUT SILO ENTRY SO IT ISN'T FOUND AGAIN
3516  020140  012701  000020                  MOV     #16.,R1         ;RESET COUNT TO 16.
3517  020144  012702  021242                  MOV     #REGBUF,R2      ;SET SOFTWARE BUFFER POINTER
3518  020150  005304                          DEC     R4              ;
3519  020152  001356                          BNE     65$             ;
3520  020154  005200                          INC     R0              ;
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 3521   020156   005303                                    DEC     R3              ;
 3522   020160   001345                                    BNE     64$             ;
 3523   020162   012703   000004                           MOV     #4,R3           ;SET FOR 4 LINES
 3524   020166   013700   020314                           MOV     73$,R0          ;RESTORE LINE NUMBER
 3525   020172   010077   161174              67$:         MOV     R0,@DVSRS       ;LOAD LINE NUMBER
 3526   020176   105077   161172                           CLRB    @DVSRSH         ;SET TX BA PRINCIPLE
 3527   020202   005001                                    CLR     R1              ;SET SEC REG POINTER
 3528   020204   017704   161166                           MOV     @DVSRA,R4       ;READ IT
 3529   020210   012705   021350                           MOV     #TXBAP,R5       ;SET BASE BUS ADDRESS
 3530   020214   060005                                    ADD     R0,R5           ;ADD LINE NO. TO BA
 3531   020216   062705   000030                           ADD     #30,R5          ;ADD ADDITIONAL 30(8) FOR XFR
 3532   020222   020504                                    CMP     R5,R4           ;DID BA INCREMENT CORRECTLY?
 3533   020224   001401                                    BEQ     68$             ;BR IF YES
 3534   020226   104003                                    HLT     3               ;TX BA NOT CORRECT
 3535   020230   005005              68$:                  CLR     R5              ;EXPECT BC TO BE=0
 3536   020232   105277   161136                           INCB    @DVSRSH         ;SET TX P BC
 3537   020236   005201                                    INC     R1              ;SET SEC REG POINTER
 3538   020240   017704   161132                           MOV     @DVSRA,R4       ;READ BC
 3539   020244   001401                                    BEQ     69$             ;BR IF BC=0
 3540   020246   104003                                    HLT     3               ;TX P BC NOT=0
 3541   020250   112777   000013   161116     69$:         MOVB    #13,@DVSRSH     ;SEL LINE STATE
 3542   020256   012701   000013                           MOV     #13,R1          ;SET SEC REG POINTER
 3543   020262   017704   161110                           MOV     @DVSRA,R4       ;READ
 3544   020266   012705   000200                           MOV     #BIT7,R5        ;EXPECT "USE SECONDARY TABLES"
 3545   020272   020504                                    CMP     R5,R4           ;LINE STATE OK?
 3546   020274   001401                                    BEQ     70$             ;BR IF YES
 3547   020276   104003                                    HLT     3               ;LINE STATE INCORRECT
 3548   020300                       70$:
 3549   020300   005202                                    INC     R2              ;
 3550   020302   005200                                    INC     R0              ;UPDATE LINE POINTER
 3551   020304   005303                                    DEC     R3              ;ALL LINES DONE?
 3552   020306   001331                                    BNE     67$             ;BR IF NO
 3553   020310   012605                                    MOV     (SP)+,R5        ;RESTORE R5
 3554   020312   000205                                    RTS     R5              ;EXIT
 3555   020314   000001              73$:         .BLKW 1
 3556                                ;*SUBROUTINE.
 3557                                ;*SUBROUTINE USED BY PREVIOUS TEST.
 3558                                ;*
 3559   020316                       LINT2:
 3560
 3561   020316   012500                                    MOV     (R5)+,R0        ;GET FIRST LINE IN 4 LINE GROUP
 3562   020320   010037   020644                           MOV     R0,73$          ;SAVE LINE NUMBER
 3563   020324   010546                                    MOV     R5,-(SP)        ;SAVE R5 ON STACK
 3564   020326   052700   100400                           BIS     #BIT15+BIT8,R0  ;SILO ENTRY + TX PRINCIPLE BC=0
 3565   020332   012703   000004                           MOV     #4,R3           ;4 LINE GROUP
 3566   020336   012702   021242              64$:         MOV     #REGBUF,R2      ;SET SOFTWARE BUFFER
 3567   020342   012701   000040                           MOV     #32.,R1         ;SET FOR 32 ENTRIES
 3568   020346   012704   000002                           MOV     #2,R4
 3569   020352   042700   001000              65$:         BIC     #BIT9,R0        ;MAKE SURE R0 ISN'T SEC; BC=0.
 3570   020356   020022                                    CMP     R0,(R2)+        ;IS ENTRY IN SOFTWARE TABLE?
 3571   020360   001410                                    BEQ     66$             ;BR IF YES
 3572   020362   052700   001000                           BIS     #BIT9,R0        ;SET SEC BC=0
 3573   020366   020062   177776                           CMP     R0,-2(R2)       ;IS ENTRY IN TABLE?
 3574   020372   001403                                    BEQ     66$             ;BR IF YES
 3575   020374   005301                                    DEC     R1              ;ALL ENTRIES DONE?
 3576   020376   001365                                    BNE     65$             ;BR IF NO
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3577   020400  104000                          HLT     0               ;ENTRY (R0) WAS NOT IN TABLE
3578   020402  005701                  66$:    TST     R1              ;HAS COUNT GONE TO ZERO?
3579   020404  001403                          BEQ     .+10            ;BR IF YES
3580   020406  012762  177777  177776          MOV     #-1,-2(R2)      ;RUB OUT SILO ENTRY SO IT ISN'T FOUND AGAIN
3581   020414  012701  000040                  MOV     #32.,R1         ;RESET COUNT TO 32.
3582   020420  012702  021242                  MOV     #REGBUF,R2      ;SET SOFTWARE BUFFER POINTER
3583   020424  005304                          DEC     R4              ;
3584   020426  001351                          BNE     65$             ;
3585   020430  005200                          INC     R0              ;
3586   020432  005303                          DEC     R3              ;
3587   020434  001340                          BNE     64$             ;
3588   020436  012703  000004                  MOV     #4,R3           ;SET FOR 4 LINES
3589   020442  013700  020644                  MOV     73$,R0          ;RESTORE LINE NUMBER
3590   020446  010077  160720          67$:    MOV     R0,@DVSRS       ;LOAD LINE NUMBER
3591   020452  105077  160716                  CLRB    @DVSRSH         ;SET TX BA PRINCIPLE
3592   020456  005001                          CLR     R1              ;SET SEC REG POINTER
3593   020460  017704  160712                  MOV     @DVSRA,R4       ;READ IT
3594   020464  012705  021350                  MOV     #TXBAP,R5       ;SET BASE BUS ADDRESS
3595   020470  060005                          ADD     R0,R5           ;ADD LINE NO. TO BA
3596   020472  062705  000030                  ADD     #30,R5          ;ADD ADDITIONAL 30(8) FOR XFR
3597   020476  020504                          CMP     R5,R4           ;DID BA INCREMENT CORRECTLY?
3598   020500  001401                          BEQ     68$             ;BR IF YES
3599   020502  104003                          HLT     3               ;TX BA NOT CORRECT
3600   020504  005005                  68$:    CLR     R5              ;EXPECT BC TO BE=0
3601   020506  105277  160662                  INCB    @DVSRSH         ;SET TX P BC
3602   020512  005201                          INC     R1              ;SET SEC REG POINTER
3603   020514  017704  160656                  MOV     @DVSRA,R4       ;READ BC
3604   020520  001401                          BEQ     69$             ;BR IF BC=0
3605   020522  104003                          HLT     3               ;TX P BC NOT=0
3606   020524  112777  000013  160642  69$:    MOVB    #13,@DVSRSH     ;SEL LINE STATE
3607   020532  012701  000013                  MOV     #13,R1          ;SET SEC REG POINTER
3608   020536  017704  160634                  MOV     @DVSRA,R4       ;READ
3609   020542  005005                          CLR     R5              ;EXPECT LINE STATE=0
3610   020544  020504                          CMP     R5,R4           ;LINE STATE OK?
3611   020546  001401                          BEQ     70$             ;BR IF YES
3612   020550  104003                          HLT     3               ;LINE STATE INCORRECT
3613   020552                          70$:
3614   020552  112777  000002  160614          MOVB    #002,@DVSRSH    ;SEL TX ALTERNATE BA
3615   020560  017704  160612                  MOV     @DVSRA,R4       ;READ
3616   020564  012705  021750                  MOV     #TXBAS,R5       ;SET BASE ADDRESS
3617   020570  060005                          ADD     R0,R5           ;ADD LINE NO.
3618   020572  062705  000030                  ADD     #30,R5          ;+30 CHAR XMITTED
3619   020576  117701  160572                  MOVB    @DVSRSH,R1      ;SET SEC REG POINTER
3620   020602  020504                          CMP     R5,R4           ;TX BA (ALT) OK?
3621   020604  001401                          BEQ     71$             ;BR IF YES
3622   020606  104003                          HLT     3               ;TX BA (ALT) WRONG!
3623   020610  105277  160560          71$:    INCB    @DVSRSH         ;SEL TX BC (ALT)
3624   020614  005201                          INC     R1              ;SET SEC REG POINTER
3625   020616  017704  160554                  MOV     @DVSRA,R4       ;IS IT=0?
3626   020622  001402                          BEQ     72$             ;BR IF YES
3627   020624  005005                          CLR     R5              ;SET EXPECTED TO 0
3628   020626  104003                          HLT     3               ;TX BC ALTERNATE NOT=0
3629   020630                          72$:
3630   020630  005202                          INC     R2              ;
3631   020632  005200                          INC     R0              ;UPDATE LINE POINTER
3632   020634  005303                          DEC     R3              ;ALL LINES DONE?
```

```
3633  020636  001303                          BNE     67$             ;BR IF NO
3634  020640  012605                          MOV     (SP)+,R5        ;RESTORE R5
3635  020642  000205                          RTS     R5              ;EXIT
3636  020644  000001                  73$:    .BLKW 1
3637  020646  010046                  SIMBCC: MOV     R0,-(SP)
3638  020650  010146                          MOV     R1,-(SP)
3639  020652  010246                          MOV     R2,-(SP)
3640  020654  012537  001246                  MOV     (R5)+,TEMP1
3641  020660  012537  001250                  MOV     (R5)+,TEMP2
3642  020664  012537  001252                  MOV     (R5)+,TEMP3
3643  020670  005037  021022          1$:     CLR     BCCFBK
3644  020674  013700  001252                  MOV     TEMP3,R0
3645  020700  006037  001250                  ROR     TEMP2
3646  020704  005500                          ADC     R0
3647  020706  032700  000001                  BIT     #BIT0,R0
3648  020712  001402                          BEQ     2$
3649  020714  005137  021022                  COM     BCCFBK
3650  020720  013700  021020          2$:     MOV     XPOLY,R0
3651  020724  005100                          COM     R0
3652  020726  040037  021022                  BIC     R0,BCCFBK
3653  020732  000241                          CLC
3654  020734  006037  001252                  ROR     TEMP3
3655  020740  013700  021022                  MOV     BCCFBK,R0
3656  020744  013701  001252                  MOV     TEMP3,R1
3657  020750  010102                          MOV     R1,R2
3658  020752  040100                          BIC     R1,R0
3659  020754  043702  021022                  BIC     BCCFBK,R2
3660  020760  050200                          BIS     R2,R0
3661  020762  043737  021020  001252          BIC     XPOLY,TEMP3
3662  020770  050037  001252                  BIS     R0,TEMP3
3663  020774  005337  001246                  DEC     TEMP1
3664  021000  001333                          BNE     1$
3665  021002  013737  001252  021024          MOV     TEMP3,CALBCC
3666  021010  012602                          MOV     (SP)+,R2
3667  021012  012601                          MOV     (SP)+,R1
3668  021014  012600                          MOV     (SP)+,R0
3669  021016  000205                          RTS     R5
3670  021020  000000                  XPOLY:  0
3671  021022  000000                  BCCFBK: 0
3672  021024  000000                  CALBCC: 0
3673          000200                  LRC8=200
3674          120001                  CRC16=120001
3675          102010                  CRC.CCITT=102010
3676
3677
3678  021026  010046          13300   SETREG: MOV     R0,-(SP)
3679  021030  010146          13400           MOV     R1,-(SP)
3680  021032  112500          13500           MOVB    (R5)+,R0
3681  021034  112501          13600           MOVB    (R5)+,R1
3682  021036  110077  160332  13700           MOVB    R0,@DVSRSH
3683  021042  012577  160330  13800           MOV     (R5)+,@DVSRA
3684  021046  042777  000060  160306  13900   BIC     #BIT5+BIT4,@DVSCR
3685  021054  110177  160314  14000           MOVB    R1,@DVSRSH
3686  021060  012577  160312  14100           MOV     (R5)+,@DVSRA
3687  021064  012601          14200           MOV     (SP)+,R1
3688  021066  012600          14300           MOV     (SP)+,R0
```

```
 3689  021070  000205                          14400           EXIT
 3690                                          14500
 3691  021072                                  14600   LOAD.MODE:
 3692  021072  012577  160272                  14700           MOV     (R5)+,@DVLCR
 3693  021076  052777  100000  160264          14800           BIS     #BIT15,@DVLCR
 3694  021104  010046                          14900           MOV     R0,-(SP)
 3695  021106  005000                          15000           CLR     R0
 3696  021110  005777  160254                  15100   1$:     TST     @DVLCR
 3697  021114  100004                          15200           BPL     2$
 3698  021116  104414                          15300           DELAY
 3699  021120  005200                          15305           INC     R0
 3700  021122  001372                          15400           BNE     1$
 3701  021124  104000                          15500           HLT     0                       ;BIT 15 FAILED TO CLEAR
 3702  021126  012600                          15600   2$:     MOV     (SP)+,R0
 3703  021130  000205                          15700           EXIT
 3704
 3705  021132                                          SETSCAN:
 3706  021132  010346                                          MOV     R3,-(SP)
 3707  021134  052777  000010  160220                        BIS     #BIT3,@DVSCR
 3708  021142  012503                                        MOV     (R5)+,R3
 3709  021144  001414                                        BEQ     2$
 3710  021146  012777  050102  160224          1$:     MOV     #BIT14+BIT12+BIT6+BIT1,@DVSFR
 3711  021154  104415                                        ROMCLK
 3712  021156  005201                                        INC     R1
 3713  021160  012777  050102  160212                        MOV     #BIT14+BIT12+BIT6+BIT1,@DVSFR
 3714  021166  104415                                        ROMCLK
 3715  021170  005201                                        INC     R1
 3716  021172  005303                                        DEC     R3
 3717  021174  001364                                        BNE     1$
 3718  021176  012603                                2$:     MOV     (SP)+,R3
 3719  021200  010100                                        MOV     R1,R0
 3720  021202  000241                                        CLC
 3721  021204  006000                                        ROR     R0
 3722  021206  000205                                        EXIT
 3723  021210                                          SETSYNC:
 3724  021210  113737  001236  021346                        MOVB    STAT,SYNC       ;SET SYNC FOR THIS LINE.
 3725  021216  113737  021346  021347                        MOVB    SYNC,SYNC+1     ;PLACE SYNC IN HIGH BYTE
 3726  021224  032737  010000  001236                        BIT     #TWOSYN,STAT    ;ONE SYNC OR TWO?
 3727  021232  001402                                        BEQ     1$              ;BR IF JUMPERED FOR TWO.
 3728  021234  105037  021346                              CLRB    SYNC            ;SET FIRST SYNC TO NON-SYNC
 3729  021240  000205                                1$:     EXIT
 3730                                  16000
 3731  021242  000042                  16100   REGBUF: .BLKW   34.
 3732  021346  000001                  16200   SYNC:   .BLKW   1
 3733  021350  000400                  16300   TXBAP:  .BLKB   400
 3734  021750  000400                  16400   TXBAS:  .BLKB   400
 3735  022350  000400                  16500   TXTAB:  .BLKB   400
 3736  022750  000400                  16600   RXBA:   .BLKB   400
 3737  023350  000400                  16700   RXTAB:  .BLKB   400
 3738  023750                          16800   ROMDATA:
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 3739                                   17500                    ;;IDLE LOOP
 3740                                   17600                    ;
 3741  023750  050102                   17700  ↑B<0101000001000010>  ;ILOOP S/C     6,2      ;INCREMENT SCANNER
 3742  023752  030124                   17800  ↑B<0011000001010100>  ;      XFR     5,4      ;MOVE MASTER SCAN TO RAM ADDRESS
 3743  023754  001344                   17900  ↑B<0000001011100100>  ;      BRA     2,↑SERV  ;TEST FOR TRANSMIT FLAG WAITING,
 3744  023756  002012                   18000  ↑B<0000010000001010>  ;      BRA     4,RSERV  ;TEST FOR RECEIVER FLAG WAITING,
 3745  023760  001503                   18100  ↑B<0000001101000011>  ;      BRA     3,SSERV  ;TEST FOR RECEIVED CHARACTER WA↑
 3746  023762  020013                   18200  ↑B<0010000000001011>  ;ILOP2 RAM     0,0,13   ;OBTAIN LINE STATE
 3747  023764  070456                   18300  ↑B<0111000100101110>  ;      BRB     1,RSYNC  ;TEST RAM OUTPUT 01 (RESYNC), IF
 3748  023766  071072                   18400  ↑B<0111001000111010>  ;      BRB     2,TMARK  ;TEST RAM OUTPUT 02 (XMIT GO), I
 3749  023770  002451                   18500  ↑B<0000010100101001>  ;ILOP5 BRA     5,ISERV  ;TEST FOR CHARACTER DISPATCH PRO
 3750  023772  000400                   19600  ↑B<0000000100000000>  ;      BRA     1,ILOOP  ;TEST FOR SURE TRUE, IF YES BRAN
 3751                                   18700                    ;
 3752                                   19800                    ;
 3753                                   18900                    ;
 3754                                   19000                    ;;RECEIVE FLAG SERVICE  (LINE STATE IS IN RAM OUTPUT)
 3755                                   19100                    ;
 3756  023774  020013                   19200  ↑B<0010000000001011>  ;RSERV RAM     0,0,13   ;OBTAIN LINE STATE
 3757  023776  070036                   19300  ↑B<0111000000011110>  ;      BRB     0,TESTX  ;TEST RAM OUTPUT 00 (RECEIVER AC
 3758  024000  076417                   19400  ↑B<0111110100001111>  ;      BRB     15,S/ACT         ;TEST MATCH DETECT, IF Y
 3759  024002  050106                   19500  ↑B<0101000001000110>  ;      S/C     6,6      ;SET RESYNC PULSE,
 3760  024004  000400                   19600  ↑B<0000000100000000>  ;      BRA     1,ILOOP  ;TEST FOR SURE TRUE, IF YES BRAN
 3761  024006  020012                   19700  ↑B<0010000000001010>  ;S/ACT RAM     0,0,12   ;OBTAIN DLE/PROTOCOL
 3762  024010  070430                   19800  ↑B<0111000100011000>  ;      BRB     1,SACT2  ;TEST RAM 01 (STRIP LEADING SYNC
 3763  024012  020013                   19900  ↑B<0010000000001011>  ;SACT1 RAM     0,0,13   ;OBTAIN LINE STATE
 3764  024014  050047                   20000  ↑B<0101000000100111>  ;      S/C     5,7      ;SET RAM OUTPUT 00 (RECEIVER ACT
 3765  024016  020673                   20100  ↑B<0010000110111011>  ;      RAM     1,13,13  ;WRITE NEW LINE STATE
 3766  024020  077021                   20200  ↑B<0111111000010001>  ;      BRB     16,SACT1         ;TEST FOR WRITE INHIBIT,
 3767  024022  050023                   20300  ↑B<0101000000010011>  ;CLRRF S/C     4,3      ;SET RECEIVE DATA ENABLE
 3768  024024  050022                   20400  ↑B<0101000000010010>  ;      S/C     4,2      ;CLEAR RECEIVE DATA ENABLE AND D
 3769  024026  000400                   20500  ↑B<0000000100000000>  ;      BRA     1,ILOOP  ;TEST FOR SURE TRUE, IF YES BRAN
 3770  024030  020013                   20600  ↑B<0010000000001011>  ;SACT2 RAM     0,0,13   ;OBTAIN LINE STATE
 3771  024032  050047                   20700  ↑B<0101000000100111>  ;      S/C     5,7      ;SET RAM OUTPUT 00 (RECEIVER ACT
 3772  024034  050206                   20800  ↑B<0101000010000110>  ;      S/C     7,6      ;SET RAM OUTPUT 06 (STRIP SYNC O
 3773  024036  020673                   20900  ↑B<0010000110111011>  ;      RAM     1,13,13  ;WRITE NEW LINE STATE
 3774  024040  077030                   21000  ↑B<0111111000011000>  ;      BRB     16,SACT2         ;TEST FOR WRITE INHIBIT,
 3775  024042  000425                   21100  ↑B<0000000100010101>  ;      BRA     1,CLRRF  ;TEST FOR SURE TRUE, IF YES BRAN
 3776                                   21200                    ;
 3777                                   21300                    ;
 3778  024044  020013                   21400  ↑B<0010000000001011>  ;TESTX RAM     0,0,13   ;OBTAIN LINE STATE
 3779  024046  073041                   21500  ↑B<0111011000100001>  ;      BRB     6,TMD    ;TEST RAM OUTPUT 06 (STRIP SYNC
 3780  024050  000445                   21600  ↑B<0000000100100101>  ;      BRA     1,S/RDE  ;TEST FOR SURE TRUE, IF YES BRAN
 3781  024052  076425                   21700  ↑B<0111110100010101>  ;TMD   BRB     15,CLRRF         ;TEST MATCH DETECT, IF Y
 3782  024054  050202                   21800  ↑B<0101000010000010>  ;      S/C     7,2      ;CLEAR RAM OUTPUT 06 (STRIP SYNC
 3783  024056  020673                   21900  ↑B<0010000110111011>  ;      RAM     1,13,13  ;WRITE NEW LINE STATE
 3784  024060  077012                   22000  ↑B<0111111000001010>  ;      BRB     16,RSERV         ;TEST FOR WRITE INHIBIT,
 3785  024062  050023                   22100  ↑B<0101000000010011>  ;S/RDE S/C     4,3      ;SET RECEIVE DATA ENABLE
 3786  024064  050021                   22200  ↑B<0101000000010001>  ;      S/C     4,1      ;SET SILO IN
 3787  024066  050022                   22300  ↑B<0101000000010010>  ;      S/C     4,2      ;CLEAR RECEIVE DATA ENABLE AND D
 3788  024070  000400                   22400  ↑B<0000000100000000>  ;      BRA     1,ILOOP  ;TEST FOR SURE TRUE, IF YES BRAN
 3789                                   22500                    ;
 3790                                   22600                    ;
 3791                                   22700                    ;;RECEIVE INTERRUPT RESPONSE SERVICE
 3792                                   22800                    ;
 3793  024072  030301                   22900  ↑B<0011000011000001>  ;ISERV XFR     ,14,1    ;MOVE SILO OUT TO A REGISTER
 3794  024074  010037                   23000  ↑B<0001000000011111>  ;      ALU     37       ;LET ALU RESULT = A REGISTER
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 3795  024076  030144          23100   ↑B<0011000001100100>      ;       XFR     6,4     ;MOVE ALU RESULT 08-11 TO RAM AD
 3796  024100  050016          23200   ↑B<0101000000001110>      ;       S/C     3,5     ;CLEAR SCR08
 3797  024102  000542          23300   ↑B<0000000101100010>      ;       BRA     1,CTEST ;TEST FOR SURE TRUE, IF YES BRAN
 3798                          23400                             ;
 3799                          23500                             ;
 3800                          23600                             ;
 3801                          23700                             ;;RESYNCHRONIZE (MASTER SCAN IS IN RAM AR, LINE STATE I
 3802                          23800                             ;
 3803  024104  020013          23900   ↑B<0010000000001011>      ;RSYNC  RAM     0,0,13  ;OBTAIN LINE STATE
 3804  024106  050043          24000   ↑B<0101000000100011>      ;       S/C     5,3     ;CLEAR RAM OUTPUT 00 (RECEIVER A
 3805  024110  050041          24100   ↑B<0101000000100001>      ;       S/C     5,1     ;CLEAR RAM OUTPUT 01 (RESYNCHRON
 3806  024112  020673          24200   ↑B<0010000110111011>      ;       RAM     1,13,13 ;WRITE NEW LINE STATE
 3807  024114  077056          24300   ↑B<0111111000101110>      ;       BRB     16,RSYNC        ;TEST FOR WRITE INHIBIT,
 3808  024116  020016          24400   ↑B<0010000000001110>      ;PSI    RAM     0,0,16  ;OBTAIN LINE PROTOCOL
 3809  024120  050204          24500   ↑B<0101000010000100>      ;       S/C     7,4     ;SET RAM OUTPUT 07
 3810  024122  020676          24600   ↑B<0010000110111110>      ;       RAM     1,13,16 ;WRITE NEW LINE PROTOCOL
 3811  024124  077063          24700   ↑B<0111111000110011>      ;       BRB     16,PSI  ;TEST FOR WRITE INHIBIT, IF YES
 3812  024126  050106          24800   ↑B<0101000001000110>      ;       S/C     6,6     ;SET RESYNC PULSE
 3813  024130  050021          24900   ↑B<0101000000010001>      ;       S/C     4,1     ;SET SILO IN
 3814  024132  000405          25000   ↑B<0000000100000101>      ;       BRA     1,ILOP2 ;TEST FOR SURE TRUE, IF YES BRAN
 3815                          25100                             ;
 3816                          25200                             ;
 3817                          25300                             ;
 3818                          25400                             ;
 3819                          25500                             ;;CLEAR TMARK
 3820                          25600                             ;
 3821  024134  050101          25700   ↑B<0101000001000001>      ;TMARK  S/C     6,1     ;CLEAR TMARK
 3822  024136  000410          25800   ↑B<0000000100001000>      ;       BRA     1,ILOP5 ;TEST FOR SURE TRUE, IF YES BRAN
 3823                          25900                             ;
 3824                          26000                             ;
 3825                          26100                             ;
 3826                          26200                             ;
 3827                          26300                             ;;TEST FOR RESYNC FLAG (LINE NUMBER IN RAM AR, CHARACTE
 3828                          26400                             ;
 3829  024140  000076          26500   ↑B<0000000000111110>      ;TFRF   BRA     0,CRAM7 ;TEST BIT 15 OF ALU RESULT, IF Y
 3830  024142  000603          26600   ↑B<0000000110000011>      ;       BRA     1,DISC  ;TEST FOR SURE TRUE, IF YES BRAN
 3831  024144  020016          26700   ↑B<0010000000001110>      ;CRAM7  RAM     0,0,16  ;OBTAIN LINE PROTOCOL
 3832  024146  050200          26800   ↑B<0101000010000000>      ;       S/C     7,0     ;CLEAR RAM OUTPUT 07 (RESYNCH FL
 3833  024150  020676          26900   ↑B<0010000110111110>      ;       RAM     1,13,16 ;WRITE NEW LINE PROTOCOL
 3834  024152  077076          27000   ↑B<0111111000111110>      ;       BRB     16,CRAM7        ;TEST FOR WRITE INHIBIT,
 3835  024154  000603          27100   ↑B<0000000110000011>      ;       BRA     1,DISC  ;TEST FOR SURE TRUE, IF YES BRAN
 3836                          27200                             ;
 3837                          27300                             ;
 3838                          27400                             ;;RECEIVED CHARACTER SILO SERVICE
 3839                          27500                             ;
 3840  024156  002451          27600   ↑B<0000010100101001>      ;SSERV  BRA     5,ISERV ;TEST FOR SCR08 (COULD HAVE SET
 3841  024160  030301          27700   ↑B<0011000011000001>      ;       XFR     14,1    ;MOVE SILO OUT TO A REGISTER
 3842  024162  010037          27800   ↑B<0001000000011111>      ;       ALU     37      ;LET ALU RESULT = A REGISTER
 3843  024164  030144          27900   ↑B<0011000001100100>      ;       XFR     6,4     ;MOVE ALU RESULT 08-11 TO RAM AD
 3844  024166  020013          28000   ↑B<0010000000001011>      ;       RAM     0,0,13  ;OBTAIN LINE STATE
 3845  024170  070603          28100   ↑B<0111000110000011>      ;       BRB     1,DISC  ;TEST RAM OUTPUT 01 (RESYNC), IF
 3846  024172  020016          28200   ↑B<0010000000001110>      ;       RAM     0,0,16  ;OBTAIN LINE PROTOCOL
 3847  024174  073474          28300   ↑B<0111011100111100>      ;       BRB     7,TFRF  ;TEST RAM OUTPUT 07, IF YES BRAN
 3848  024176  104261          28400   ↑B<1000100010110001>      ;       BRA     10,POER ;TEST BITS  13, 12 OF ALU RESULT
 3849  024200  073272          28500   ↑B<0111011010111010>      ;       BRB     6,TBC2  ;TEST RAM OUTPUT 06, IF YES BRAN
 3850  024202  072645          28600   ↑B<0111010110100101>      ;       BRB     5,TBC1  ;TEST RAM OUTPUT 05, IF YES BRAN
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 3851  024204  020005          28700  ↑B<0010000000000101>  ;        RAM     0,0,5   ;OBTAIN RECEIVER BYTE COUNT
 3852  024206  076214          28800  ↑B<0111110010001100>  ;        BRB     14,CRBCO        ;TEST RAM OUTPUT 0-14=0,
 3853  024210  020012          28900  ↑B<0010000000001010>  ;        RAM     0,0,12  ;OBTAIN TRANSMITTER DLE/LINE PRO
 3854  024212  072576          29000  ↑B<0111010101111110>  ;        BRB     5,DDCMR ;TEST RAM OUTPUT 05, IF YES BRAN
 3855  024214  020015          29100  ↑B<0010000000001101>  ;        RAM     0,0,15  ;OBTAIN RECEIVER MODE BITS
 3856  024216  030242          29200  ↑B<0011000010100010>  ;ZETA    XFR     ,12,2   ;MOVE RAM OUTPUT DATA TRANSLATED
 3857  024220  050027          29300  ↑B<0101000000010111>  ;        S/C     4,7     ;CLEAR ALU RESULT UPPER BYTE
 3858  024222  030361          29400  ↑B<0011000011110001>  ;        XFR     ,17,1   ;MOVE ALU RESULT TO A REGISTER
 3859  024224  010026          29500  ↑B<0001000000010110>  ;        ALU     26      ;LET ALU RESULTS = A PLUS B
 3860  024226  030362          29600  ↑B<0011000011110010>  ;        XFR     ,17,2   ;MOVE ALU RESULTS TO B REGISTER
 3861  024230  020011          29700  ↑B<0010000000001001>  ;        RAM     0,0,11  ;OBTAIN RECEIVER CONTROL TABLE B
 3862  024232  030261          29800  ↑B<0011000010110001>  ;        XFR     ,13,1   ;MOVE RAM OUTPUT DATA TO A REGIS
 3863  024234  010026          29900  ↑B<0001000000010110>  ;        ALU     26      ;LET ALU RESULTS = A PLUS B (EFF
 3864  024236  030363          30000  ↑B<0011000011110011>  ;        XFR     I,17,3  ;MOVE ALU RESULTS TO NPR ADDRESS
 3865  024240  040000          30100  ↑B<0100000000000000>  ;        NPR             ;DO NPR TO GET CONTROL BYTE
 3866  024242  074535          30200  ↑B<0111100101011101>  ;RBUS1   BRB     11,RBUS1        ;TEST REQUEST BUS, IF YE
 3867  024244  003332          30300  ↑B<0000011011011010>  ;        BRA     6,RNXMC ;TEST NXM, IF YES, BRANCH TO REC
 3868  024246  075327          30400  ↑B<0111101011010111>  ;        BRB     12,RMPEC        ;TEST MEM PAR ERR, IF YE
 3869  024250  020017          30500  ↑B<0010000000001111>  ;        RAM     0,0,17  ;OBTAIN CONTROL BYTE STORAGE REG
 3870  024252  020637          30600  ↑B<0010000110011111>  ;        RAM     1,11,17 ;MOVE DATI REGISTER TO RAM AND W
 3871                          30700                        ;
 3872                          30800                        ;
 3873                          30900                        ;
 3874                          31000                        ;
 3875                          31100                        ;;CONTROL BYTE TESTS BEGIN (CHARACTER IS IN SILO OUT, C
 3876                          31200                        ;
 3877  024254  020017          31300  ↑B<0010000000001111>  ;CTEST RAM     0,0,17  ;OBTAIN CONTROL BYTE STORAGE REG
 3878  024256  030262          31400  ↑B<0011000010110010>  ;        XFR     ,13,2   ;MOVE RAM OUTPUT TO B REGISTER
 3879  024260  010005          31500  ↑B<0001000000000101>  ;        ALU     5       ;LET ALU RESULT = B REGISTER
 3880  024262  020575          31600  ↑B<0010000101111101>  ;        RAM     1,7,15  ;MOVE ALU RESULTS TRANSLATED 5-7
 3881  024264  105253          31700  ↑B<1000101010101011>  ;        BRA     12,CBINT        ;TEST BIT 0 OF ALU RESUL
 3882  024266  006233          31800  ↑B<0000110010011011>  ;        BRA     14,EBCC ;TEST BIT 02 OF ALU RESULT, IF Y
 3883  024270  006605          31900  ↑B<0000110110000101>  ;EPSIL   BRA     15,RBCC ;TEST BIT 03 OF ALU RESULT, IF Y
 3884                          32000                        ;
 3885                          32100                        ;
 3886                          32200                        ;;RETURN FROM RECV BCC  (CONTROL BYTE IS STILL IN ALU R
 3887                          32300                        ;
 3888  024272  007203          32400  ↑B<0000111010000011>  ;RRBCC   BRA     16,DISC ;TEST BIT 4 OF ALU RESULT, IF YE
 3889  024274  020004          32500  ↑B<0010000000000100>  ;        RAM     0,0,4   ;OBTAIN RECEIVER CURRENT ADDRESS
 3890  024276  031663          32600  ↑B<0011001110110011>  ;        XFR     0,13,3  ;MOVE RAM OUTPUT TO NPR ADDRESS
 3891  024300  030305          32700  ↑B<0011000011000101>  ;        XFR     ,14,5   ;MOVE SILO OUT TO DATO REGISTER
 3892  024302  040000          32800  ↑B<0100000000000000>  ;        NPR             ;DO NPR TO STORE RECEIVED CHARAC
 3893  024304  074556          32900  ↑B<0111100101101110>  ;RBUS2   BRB     11,RBUS2        ;TEST REQUEST BUS, IF YE
 3894  024306  003340          33000  ↑B<0000011011100000>  ;        BRA     6,RNXM  ;TEST NXM, IF YES, BRANCH TO REC
 3895  024310  020005          33100  ↑B<0010000000000101>  ;ORBC    RAM     0,0,5   ;OBTAIN RECEIVER BYTE COUNT
 3896  024312  030261          33200  ↑B<0011000010110001>  ;        XFR     ,13,1   ;MOVE RAM OUTPUT TO REGISTER A
 3897  024314  010077          33300  ↑B<0001000000111111>  ;        ALU     77      ;LET ALU RESULTS = A+1
 3898  024316  020765          33400  ↑B<0010000111110101>  ;        RAM     1,17,5  ;MOVE ALU RESULTS TO RAM INPUT (
 3899  024320  077160          33500  ↑B<0111111001110000>  ;        BRB     16,ORBC ;TEST FOR WRITE INHIBIT, IF YES
 3900  024322  020004          33600  ↑B<0010000000000100>  ;ORCA    RAM     0,0,4   ;OBTAIN RECEIVER CURRENT ADDRESS
 3901  024324  030261          33700  ↑B<0011000010110001>  ;        XFR     ,13,1   ;MOVE RAM OUTPUT DATA TO REGISTE
 3902  024326  010077          33800  ↑B<0001000000111111>  ;        ALU     77      ;LET ALU RESULTS = A+1
 3903  024330  020764          33900  ↑B<0010000111110100>  ;        RAM     1,17,4  ;MOVE ALU RESULTS TO RAM INPUT (
 3904  024332  077165          34000  ↑B<0111111001110101>  ;        BRB     16,ORCA ;TEST FOR WRITE INHIBIT, IF YES
 3905  024334  020005          34100  ↑B<0010000000000101>  ;        RAM     0,0,5   ;OBTAIN RECEIVER BYTE COUNT
 3906  024336  076217          34200  ↑B<0111110010001111>  ;        BRB     14,NBCO ;TEST RAM OUTPUT 0-14=0, IF YES,
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3907  024340  050020          34300  ↑B<0101000000010000>      ;       S/C     4,0       ;SET SILO OUT
3908  024342  000400          34400  ↑B<0000000100000000>      ;       BRA     1,ILOOP   ;TEST FOR SURE TRUE, IF YES BRAN
3909                          34500                            ;
3910                          34600                            ;
3911                          34700                            ;;DDCMP RECEPTION
3912                          34800                            ;
3913  024344  020015          34900  ↑B<0010000000001101>      ;DDCMR RAM      0,0,15    ;OBTAIN RECEIVER MODE BITS
3914  024346  076201          35000  ↑B<0111110010000001>      ;       BRB     14,DDCM2          ;TEST RAM OUTPUT 0-14=0,
3915  024350  000523          35100  ↑B<0000000101010011>      ;       BRA     1,ZETA    ;TEST FOR SURE TRUE, IF YES BRAN
3916  024352  010014          35200  ↑B<0001000000001100>      ;DDCM2 ALU      14        ;LET ALU RESULT = 0
3917  024354  000605          35300  ↑B<0000000110000101>      ;       BRA     1,RBCC    ;TEST FOR SURE TRUE, IF YES BRAN
3918                          35400                            ;
3919                          35500                            ;
3920                          35600                            ;;DISCARD RECEIVED CHARACTER
3921                          35700                            ;
3922  024356  050020          35800  ↑B<0101000000010000>      ;DISC   S/C     4,0       ;SET SILO OUT
3923  024360  000400          35900  ↑B<0000000100000000>      ;       BRA     1,ILOOP   ;TEST FOR SURE TRUE, IF YES BRAN
3924                          36000                            ;
3925                          36100                            ;
3926                          36200                            ;;CALCULATE RECV BCC (ASSUME RECEIVED CHARACTER IN SILO
3927                          36300                            ;
3928  024362  030301          36400  ↑B<0011000011000001>      ;RBCC   XFR     ,14,1     ;MOVE SILO OUT REGISTER TO A REG
3929  024364  020007          36500  ↑B<0010000000000111>      ;       RAM     0,0,7     ;OBTAIN RECV BCC CALCULATED TO D
3930  024366  030262          36600  ↑B<0011000010110010>      ;       XFR     ,13,2     ;MOVE RAM OUTPUT DATA TO B REGIS
3931  024370  020012          36700  ↑B<0010000000001010>      ;       RAM     0,0,12    ;OBTAIN TRANSMITTER DLE/LINE PRO
3932  024372  060000          36800  ↑B<0110000000000000>      ;       BCC               ;PERFORM SPECIFIED BCC CALCULATI
3933  024374  020747          36900  ↑B<0010000111100111>      ;       RAM     1,16,7    ;MOVE BCC TO RAM INPUT AND WRITE
3934  024376  000551          37000  ↑B<0000000101101001>      ;       BRA     1,RRBCC   ;TEST FOR SURE TRUE, IF YES, BRA
3935                          37100                            ;
3936                          37200                            ;
3937                          37300                            ;;CHARACTER RECEIVED WHILE RECV BC=0
3938                          37400                            ;
3939  024400  030306          37500  ↑B<0011000011000110>      ;CRBCO  XFR     ,14,6     ;MOVE SILO OUT REGISTER TO RICR
3940  024402  050010          37600  ↑B<0101000000001000>      ;       S/C     3,0       ;SET RICR 15 (TO INDICATE RECEPT
3941  024404  100662          37700  ↑B<1000000110110010>      ;       BRA     1,CNACB   ;TEST FOR SURE TRUE, IF YES BRAN
3942                          37800                            ;
3943                          37900                            ;;NEXT CHARACTER WILL HAVE BC=0  (SILO OUT HAS BEEN SET
3944                          38000                            ;
3945  024406  030326          38100  ↑B<0011000011010110>      ;NBCO   XFR     ,15,6     ;MOVE NPR DATO REGISTER TO RICR
3946  024410  050011          38200  ↑B<0101000000001001>      ;       S/C     3,1       ;SET RICR 14 (TO INDICATE RECEPT
3947  024412  075623          38300  ↑B<0111101110010011>      ;       BRB     13,MCBCX          ;TEST RAM OUTPUT 15, IF
3948  024414  100662          38400  ↑B<1000000110110010>      ;       BRA     1,CNACB   ;TEST FOR SURE TRUE, IF YES BRAN
3949                          38500                            ;
3950                          38600                            ;
3951                          38700                            ;;MODE CHANGE AND BCC EXPECT
3952                          38800                            ;
3953  024416  020013          38900  ↑B<0010000000001011>      ;MCBCX  RAM     0,0,13    ;OBTAIN LINE STATE
3954  024420  030262          39000  ↑B<0011000010110010>      ;       XFR     ,13,2     ;MOVE RAM OUTPUT TO B REGISTER
3955  024422  030202          39100  ↑B<0011000010000010>      ;       XFR     ,10,2     ;MOVE B REGISTER 8-15 TO B REGIS
3956  024424  010005          39200  ↑B<0001000000000101>      ;       ALU     5         ;LET ALU RESULT = B REGISTER
3957  024426  020575          39300  ↑B<0010000101111101>      ;       RAM     1,7,15    ;MOVE ALU RESULTS TRANSLATED TO
3958  024430  020777          39400  ↑B<0010000111111111>      ;       RAM     1,17,17   ;WRITE CONTROL BYTE STORAGE FROM
3959  024432  006240          39500  ↑B<0000110010100000>      ;       BRA     14,EBCN   ;TEST ALU RESULT 02, IF YES BRAN
3960  024434  100662          39600  ↑B<1000000110110010>      ;       BRA     1,CNACB   ;TEST FOR SURE TRUE, IF YES BRAN
3961                          39700                            ;
3962                          39800                            ;
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 3963                                39900                  ;;EXPECT BCC NEXT BECAUSE OF CONTROL BYTE
 3964                                40000                  ;
 3965  024436  020016                40100  ↑B<0010000000001110>  ;EBCC  RAM     0,0,16  ;OBTAIN LINE PROTOCOL
 3966  024440  050205                40200  ↑B<0101000010000101>  ;       S/C     7,5     ;SET RAM OUTPUT 05 (EXPECT BCC 1
 3967  024442  020676                40300  ↑B<0010000110111110>  ;       RAM     1,13,16 ;WRITE LINE PROTOCOL FROM RAM OU
 3968  024444  077233                40400  ↑B<0111111010011011>  ;       BRB     16,EBCC ;TEST FOR WRITE INHIBIT, IF YES
 3969  024446  000550                40500  ↑B<0000000101101000>  ;       BRA     1,EPSIL ;TEST FOR SURE TRUE, IF YES BRAN
 3970                                40600                  ;
 3971                                40700                  ;
 3972                                40800                  ;
 3973                                40900                  ;;EXPECT BCC NEXT BECAUSE OF BC = 0
 3974                                41000                  ;
 3975  024450  020016                41100  ↑B<0010000000001110>  ;EBCN  RAM     0,0,16  ;OBTAIN LINE PROTOCOL
 3976  024452  050205                41200  ↑B<0101000010000101>  ;       S/C     7,5     ;SET RAM OUTPUT 05 (EXPECT BCC1
 3977  024454  020676                41300  ↑B<0010000110111110>  ;       RAM     1,13,16 ;WRITE LINE PROTOCOL FROM RAM OU
 3978  024456  077240                41400  ↑B<0111111010100000>  ;       BRB     16,EBCN ;TEST FOR WRITE INHIBIT, IF YES
 3979  024460  000603                41500  ↑B<0000000110000011>  ;       BRA     1,DISC  ;TEST FOR SURE TRUE, IF YES BRAN
 3980                                41600                  ;
 3981                                41700                  ;
 3982                                41800                  ;;THIS IS BCC 1
 3983                                41900                  ;
 3984  024462  020016                42000  ↑B<0010000000001110>  ;TBC1  RAM     0,0,16  ;OBTAIN LINE PROTOCOL
 3985  024464  050201                42100  ↑B<0101000010000001>  ;       S/C     7,1     ;CLEAR RAM OUTPUT 05 (EXPECT BCC
 3986  024466  050206                42200  ↑B<0101000010000110>  ;       S/C     7,6     ;SET RAM OUTPUT 06 (EXPECT BCC 2
 3987  024470  020676                42300  ↑B<0010000110111110>  ;       RAM     1,13,16 ;WRITE LINE PROTOCOL FROM RAM
 3988  024472  077245                42400  ↑B<0111111010100101>  ;       BRB     16,TBC1 ;TEST FOR WRITE INHIBIT, IF YES
 3989  024474  030301                42500  ↑B<0011000011000001>  ;       XFR     ,14,1   ;MOVE SILO OUT REGISTER TO A REG
 3990  024476  020007                42600  ↑B<0010000000000111>  ;       RAM     0,0,7   ;OBTAIN RECV BCC CALCULATED TO D
 3991  024500  030262                42700  ↑B<0011000010110010>  ;       XFR     ,13,2   ;MOVE RAM OUTPUT DATA TO B REGIS
 3992  024502  020012                42800  ↑B<0010000000001010>  ;       RAM     0,0,12  ;OBTAIN TRANSMITTER DLE/LINE PRO
 3993  024504  060000                42900  ↑B<0110000000000000>  ;       BCC             ;PERFORM SPECIFIED BCC CALCULATI
 3994  024506  020747                43000  ↑B<0010000111100111>  ;       RAM     1,16,7  ;MOVE BCC TO RAM INPUT AND WRITE
 3995  024510  020012                43100  ↑B<0010000000001010>  ;       RAM     0,0,12  ;OBTAIN TRANSMITTER DLE/LINE PRO
 3996  024512  071670                43200  ↑B<0111001110111000>  ;       BRB     3,TBC1X ;TEST RAM OUTPUT 03
 3997  024514  072270                43300  ↑B<0111010010111000>  ;       BRB     4,TBC1X ;TEST RAM OUTPUT 04
 3998  024516  020016                43400  ↑B<0010000000001110>  ;MRTHA RAM     0,0,16  ;OBTAIN LINE PROTOCOL
 3999  024520  050202                43500  ↑B<0101000010000010>  ;       S/C     7,2     ;CLEAR RAM OUTPUT 06 (EXPECT BCC
 4000  024522  020676                43600  ↑B<0010000110111110>  ;       RAM     1,13,16 ;WRITE LINE PROTOCOL
 4001  024524  077263                43700  ↑B<0111111010110011>  ;       BRB     16,MRTHA        ;TEST FOR WRITE INHIBIT,
 4002  024526  000704                43800  ↑B<0000000111000100>  ;       BRA     1,BCCCK ;TEST FOR SURE TRUE, IF YES BRAN
 4003  024530  050020                43900  ↑B<0101000000010000>  ;TBC1X S/C     4,0     ;SET SILO OUT
 4004  024532  000400                44000  ↑B<0000000100000000>  ;       BRA     1,ILOOP ;TEST FOR SURE TRUE, IF YES BRAN
 4005                                44100                  ;
 4006                                44200                  ;
 4007                                44300                  ;;THIS IS BCC 2
 4008                                44400                  ;
 4009  024534  020016                44500  ↑B<0010000000001110>  ;TBC2  RAM     0,0,16  ;OBTAIN LINE PROTOCOL
 4010  024536  050202                44600  ↑B<0101000010000010>  ;       S/C     7,2     ;CLEAR RAM OUTPUT 06
 4011  024540  020676                44700  ↑B<0010000110111110>  ;       RAM     1,13,16 ;WRITE LINE PROTOCOL
 4012  024542  077272                44800  ↑B<0111111010111010>  ;       BRB     16,TBC2 ;TEST FOR WRITE INHIBIT, IF YES
 4013  024544  030301                44900  ↑B<0011000011000001>  ;       XFR     ,14,1   ;MOVE SILO OUT REGISTER TO A REG
 4014  024546  020007                45000  ↑B<0010000000000111>  ;       RAM     0,0,7   ;OBTAIN RECV BCC CALCULATED TO D
 4015  024550  030262                45100  ↑B<0011000010110010>  ;       XFR     ,13,2   ;MOVE RAM OUTPUT DATA TO B REGIS
 4016  024552  020012                45200  ↑B<0010000000001010>  ;       RAM     0,0,12  ;OBTAIN TRANSMITTER DLE/LINE PRO
 4017  024554  060000                45300  ↑B<0110000000000000>  ;       BCC             ;PERFORM SPECIFIED BCC CALCULATI
 4018  024556  020747                45400  ↑B<0010000111100111>  ;       RAM     1,16,7  ;MOVE BCC TO RAM INPUT AND WRITE
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4019  024560  010034          45500   ↑B<0001000000011100>    ;BCCCK ALU     34       ;LET ALU RESULT = MINUS 1
4020  024562  050027          45600   ↑B<0101000000010111>    ;      S/C     4,7      ;CLEAR ALU RESULT UPPER BYTE
4021  024564  030361          45700   ↑B<0011000011110001>    ;      XFR     ,17,1    ;MOVE ALU RESULT TO A REGISTER
4022  024566  030302          45800   ↑B<0011000011000010>    ;      XFR     ,14,2    ;MOVE SILO OUT TO B REGISTER
4023  024570  010015          45900   ↑B<0001000000001101>    ;      ALU     15       ;LET ALU RESULT = AND OF A COMPL
4024  024572  030362          46000   ↑B<0011000011110010>    ;      XFR     ,17,2    ;MOVE ALU RESULT TO B REGISTER
4025  024574  030341          46100   ↑B<0011000011100001>    ;      XFR     ,16,1    ;MOVE BCC TO A REGISTER
4026  024576  010037          46200   ↑B<0001000000011111>    ;      ALU     37       ;LET ALU RESULT = A
4027  024600  050027          46300   ↑B<0101000000010111>    ;      S/C     4,7      ;CLEAR ALU RESULT UPPER BYTE
4028  024602  030361          46400   ↑B<0011000011110001>    ;      XFR     ,17,1    ;MOVE ALU RESULT TO A REGISTER
4029  024604  010036          46500   ↑B<0001000000011110>    ;      ALU     36       ;LET ALU RESULT= A OR B
4030  024606  030361          46600   ↑B<0011000011110001>    ;      XFR     ,17,1    ;MOVE ALU RESULT TO A REGISTER
4031  024610  030342          46700   ↑B<0011000011100010>    ;      XFR     ,16,2    ;MOVE BCC TO B REGISTER
4032  024612  030202          46800   ↑B<0011000010000010>    ;      XFR     ,10,2    ;MOVE B REGISTER 8-15 TO B REGIS
4033  024614  010036          46900   ↑B<0001000000011110>    ;      ALU     36       ;LET ALU RESULT = A OR B
4034  024616  030366          47000   ↑B<0011000011110110>    ;      XFR     ,17,6    ;MOVE ALU RESULT TO RICR REGISTE
4035  024620  050015          47100   ↑B<0101000000001101>    ;      S/C     3,5      ;SET RICR 12
4036  024622  050011          47200   ↑B<0101000000001001>    ;      S/C     3,1      ;SET RICR 14
4037  024624  100662          47300   ↑B<1000000110110010>    ;      BRA     1,CNACB  ;TEST FOR SURE TRUE, IF YES BRAN
4038                          47400                           ;
4039                          47500                           ;;RECEIVER MPE / CONTROL BYTE
4040                          47600                           ;
4041  024626  030306          47700   ↑B<0011000011000110>    ;RMPEC XFR     ,14,6    ;MOVE SILO OUT TO RICR REGISTER
4042  024630  050014          47800   ↑B<0101000000001100>    ;      S/C     3,4      ;SET RICR 13
4043  024632  000733          47900   ↑B<0000000111011011>    ;      BRA     1,GAMMA  ;TEST FOR SURE TRUE, IF YES BRAN
4044                          48000                           ;
4045                          48100                           ;;RECEIVER NXM / CONTROL BYTE
4046                          48200                           ;
4047  024634  030306          48300   ↑B<0011000011000110>    ;RNXMC XFR     ,14,6    ;MOVE SILO OUT TO RICR REGISTER
4048  024636  050015          48400   ↑B<0101000000001101>    ;GAMMA S/C     3,5      ;SET RICR 12
4049  024640  050011          48500   ↑B<0101000000001001>    ;BETA  S/C     3,1      ;SET RICR 14
4050  024642  050010          48600   ↑B<0101000000001000>    ;      S/C     3,0      ;SET RICR 15
4051  024644  050017          48700   ↑B<0101000000001111>    ;      S/C     3,7      ;CLEAR NXM
4052  024646  100662          48800   ↑B<1000000110110010>    ;      BRA     1,CNACB  ;TEST FOR SURE TRUE, IF YES BRAN
4053                          48900                           ;
4054                          49000                           ;
4055                          49100                           ;;RECEIVER NXM (WE GOT HERE FROM RECEIVED CHARACTER SIL
4056                          49200                           ;
4057  024650  030306          49300   ↑B<0011000011000110>    ;RNXM  XFR     ,14,6    ;MOVE SILO OUT TO RICR REGISTER
4058  024652  000734          49400   ↑B<0000000111011100>    ;      BRA     1,BETA   ;TEST FOR SURE TRUE, IF YES BRAN
4059                          49500                           ;
4060                          49600                           ;
4061                          49700                           ;;NPR SILO OVERFLOW
4062                          49800                           ;
4063  024654  050012          49900   ↑B<0101000000001010>    ;NPRSO S/C     3,2      ;SET SCR 10 INDICATING NPR SILO
4064  024656  000400          50000   ↑B<0000000100000000>    ;      BRA     1,ILOOP  ;TEST FOR SURE TRUE, IF YES BRAN
4065                          50100                           ;
4066                          50200                           ;
4067                          50300                           ;;TRANSMIT SERVICE
4068                          50400                           ;
4069                          50500                           ;
4070                          50600                           ;;CHECK FOR BCC TRANSMISSION
4071                          50700                           ;
4072  024660  020016          50800   ↑B<0010000000001110>    ;TSERV RAM     0,0,16   ;OBTAIN LINE PROTOCOL
4073  024662  030261          50900   ↑B<0011000010110001>    ;      XFR     ,13,1    ;MOVE RAM OUTPUT DATA TO A REGIS
4074  024664  010037          51000   ↑B<0001000000011111>    ;      ALU     37       ;LET ALU RESULT=A REGISTER
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 4075  024666  105226          51100   ↑B<1000101010010110>      ;       BRA     12,SBC1 ;TEST BIT 0 OF ALU RESULT, IF YE
 4076  024670  105642          51200   ↑B<1000101110100010>      ;       BRA     13,SBC2 ;TEST BIT 1 OF ALU RESULT, IF YE
 4077  024672  003742          51300   ↑B<0000011111100010>      ;       BRA     7,NPRSO ;TEST FOR NPR SILO NOT AVAILABLE
 4078                          51400                             ;
 4079                          51500                             ;
 4080                          51600                             ;;PRINCIPAL/ALTERNATE SELECTION
 4081                          51700                             ;
 4082  024674  020013          51800   ↑B<0010000000001011>      ;       RAM     0,0,13  ;OBTAIN LINE STATE
 4083  024676  071355          51900   ↑B<0111001011101101>      ;       BRB     2,SIGMA ;TEST BIT 02 OF RAM, IF YES, BRA
 4084  024700  100544          52000   ↑B<1000000101100100>      ;       BRA     1,ITYPE ;TEST FOR SURE TRUE, IF YES BRAN
 4085  024702  073762          52100   ↑B<0111011111110010>      ;SIGMA  BRB     7,USCA  ;TEST RAM OUTPUT 07, IF YES BRAN
 4086  024704  020001          52200   ↑B<0010000000000001>      ;       RAM     0,0,1   ;OBTAIN PRINCIPAL BC (GE TEST)
 4087  024706  176100          52300   ↑B<1111110001000000>      ;       BRB     14,XPBCO        ;TEST RAM OUTPUT 0-14=0,
 4088  024710  020000          52400   ↑B<0010000000000000>      ;       RAM     0,0,0   ;OBTAIN PRINCIPAL CURRENT ADDRES
 4089  024712  000765          52500   ↑B<0000000111110101>      ;       BRA     1,OXCB  ;TEST FOR SURE TRUE, IF YES BRAN
 4090                          52600                             ;
 4091                          52700                             ;
 4092                          52800                             ;;USE ALTERNATE CA
 4093                          52900                             ;
 4094  024714  020003          53000   ↑B<0010000000000011>      ;USCA   RAM     0,0,3   ;OBTAIN ALTERNATE BC, (GE TEST)
 4095  024716  176120          53100   ↑B<1111110001010000>      ;       BRB     14,XSBCO        ;TEST RAM OUTPUT 0-14=0,
 4096  024720  020002          53200   ↑B<0010000000000010>      ;       RAM     0,0,2   ;OBTAIN ALTERNATE CURRENT ADDRES
 4097                          53300                             ;;OBTAIN XMIT CONTROL BYTE
 4098                          53400                             ;
 4099  024722  030263          53500   ↑B<0011000010110011>      ;OXCB   XFR     I,13,3  ;MOVE DATA FROM RAM OUTPUT TO NP
 4100  024724  040000          53600   ↑B<0100000000000000>      ;       NPR             ;DO NPR TO GET CHARACTER
 4101  024726  074767          53700   ↑B<0111100111110111>      ;RBUS3  BRB     11,RBUS3        ;TEST REQUEST BUS, IF YE
 4102  024730  103061          53800   ↑B<1000011000110001>      ;       BRA     6,↑NXMC ;TEST NXM, IF YES, BRANCH TO TRA
 4103  024732  175071          53900   ↑B<1111101000111001>      ;       BRB     12,TMPEC        ;TEST MEM PAR ERR, IF YE
 4104  024734  030221          54000   ↑B<0011000010010001>      ;       XFR     11,1    ;MOVE DATA FROM CDC/DATI REGISTE
 4105  024736  010037          54100   ↑B<0001000800011111>      ;       ALU     37      ;LET ALU RESULT = A REGISTER
 4106  024740  030365          54200   ↑B<0011000011110101>      ;       XFR     17,5    ;MOVE DATA FROM ALU RESULT TO DA
 4107  024742  020012          54300   ↑B<0010000000001010>      ;       RAM     0,0,12  ;OBTAIN TRANSMITTER DLE/LINE PRO
 4108  024744  173214          54400   ↑B<1111011010001100>      ;       BRB     6,DDCMX ;TEST RAM OUTPUT 06, IF YES BRAN
 4109  024746  020014          54500   ↑B<0010000000001100>      ;       RAM     0,0,14  ;OBTAIN MODE BITS
 4110  024750  030242          54600   ↑B<0011000010100010>      ;PI     XFR     12,2    ;MOVE RAM OUTPUT DATA TRANSLATED
 4111  024752  010026          54700   ↑B<0001000000010110>      ;       ALU     26      ;LET ALU RESULTS = A PLUS B
 4112  024754  030362          54800   ↑B<0011000011110010>      ;       XFR     17,2    ;MOVE ALU RESULTS TO B REGISTER
 4113  024756  020010          54900   ↑B<0010000000001000>      ;       RAM     0,0,10  ;OBTAIN CONTROL TABLE BASE ADDRE
 4114  024760  030261          55000   ↑B<0011000010110001>      ;       XFR     13,1    ;MOVE RAM OUTPUT TO A REGISTER
 4115  024762  010026          55100   ↑B<0001000000010110>      ;       ALU     26      ;LET ALU RESULT = A PLUS B ((CHA
 4116  024764  030363          55200   ↑B<0011000011110011>      ;       XFR     I,17,3  ;MOVE ALU RESULTS TO NPR ADDRESS
 4117  024766  040000          55300   ↑B<0100000000000000>      ;       NPR             ;DO NPR TO GET CONTROL BYTE
 4118  024770  174410          55400   ↑B<1111100100001000>      ;RBUS4  BRB     11,RBUS4        ;TEST REQUEST BUS, IF YE
 4119  024772  103061          55500   ↑B<1000011000110001>      ;       BRA     6,↑NXMC ;TEST NXM, IF YES, BRANCH TO TRA
 4120  024774  175071          55600   ↑B<1111101000111001>      ;       BRB     12,TMPEC        ;TEST MEM PAR ERR, IF YE
 4121  024776  030222          55700   ↑B<0011000010010010>      ;       XFR     11,2    ;MOVE DATI REGISTER TO B REGISTE
 4122  025000  010005          55800   ↑B<0001000000000101>      ;       ALU     5       ;LET ALU RESULT = B REGISTER
 4123  025002  105563          55900   ↑B<1000101101110011>      ;       BRA     13,SDLE ;TEST BIT 1 OF ALU RESULT, IF YE
 4124                          56000                             ;
 4125                          56100                             ;
 4126                          56200                             ;
 4127                          56300                             ;
 4128                          56400                             ;;RETURN FROM DLE SENDING
 4129                          56500                             ;
 4130  025004  020574          56600   ↑B<0010000101111100>      ;RDLE   RAM     1,7,14  ;MOVE ALU RESULT TRANSLATED 5-7
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 4131  025006  106202                56700  ↑B<1000110010000010>     ;       BRA     14,SSBN ;TEST BIT 2 OF ALU RESULT, IF YE
 4132                                56800                           ;
 4133                                56900                           ;
 4134                                57000                           ;;RETURN FROM SSBCCNXT
 4135                                57100                           ;
 4136  025010  106617                57200  ↑B<1000110110001111>     ;RSSBN BRA     15,XBCC ;TEST BIT 3 OF ALU RESULT, IF YE
 4137                                57300                           ;
 4138                                57400                           ;
 4139                                57500                           ;;RETURN FROM XMIT BCC
 4140                                57600                           ;
 4141  025012  174151                57700  ↑B<1111100001101001>     ;RXBCC BRB     10,SIDLE         ;TEST FOR DNA FLAG, IF Y
 4142  025014  030320                57800  ↑B<0011000011010000>     ;ALPHA XFR      15,0    ;MOVE DATO REGISTER TO TRANSMITT
 4143  025016  020013                57900  ↑B<0010000000001011>     ;       RAM     0,0,13  ;OBTAIN LINE STATE
 4144  025020  173443                58000  ↑B<1111011100100011>     ;       BRB     7,USBC  ;TEST BIT 7 OF RAM OUTPUT, IF YE
 4145                                58100                           ;
 4146                                58200                           ;
 4147                                58300                           ;;USE PRINCIPAL BC
 4148                                58400                           ;
 4149  025022  020001                58500  ↑B<0010000000000001>     ;UPBC   RAM     0,0,1   ;OBTAIN PRINCIPAL BYTE COUNT
 4150  025024  176100                59600  ↑B<1111110001000000>     ;       BRB     14,XPBCO        ;TEST RAM 0-14=0
 4151  025026  030261                58700  ↑B<0011000010110001>     ;       XFR     ,13,1   ;MOVE RAM OUTPUT TO A REGISTER
 4152  025030  010077                58800  ↑B<0001000000111111>     ;       ALU     77      ;LET ALU RESULTS = A PLUS 1
 4153  025032  020761                58900  ↑B<0010000111110001>     ;       RAM     1,17,1  ;MOVE ALU RESULT TO RAM INPUT AN
 4154  025034  177025                59000  ↑B<1111111000010101>     ;       BRB     16,UPBC ;TEST FOR WRITE INHIBIT, IF YES
 4155  025036  020000                59100  ↑B<0010000000000000>     ;OPCA   RAM     0,0,0   ;OBTAIN PRINCIPAL CURRENT ADDRES
 4156  025040  030261                59200  ↑B<0011000010110001>     ;       XFR     ,13,1   ;MOVE RAM OUTPUT TO A REGISTER
 4157  025042  010077                59300  ↑B<0001000000111111>     ;       ALU     77      ;LET ALU RESULT = A PLUS 1
 4158  025044  020760                59400  ↑B<0010000111110000>     ;       RAM     1,17,0  ;MOVE ALU RESULT TO RAM INPUT AN
 4159  025046  177033                59500  ↑B<1111111000011011>     ;       BRB     16,OPCA ;TEST FOR WRITE INHIBIT, IF YES
 4160  025050  020001                59600  ↑B<0010000000000001>     ;       RAM     0,0,1   ;OBTAIN PRINCIPAL BYTE COUNT
 4161  025052  176100                59700  ↑B<1111110001000000>     ;       BRB     14,XPBCO        ;TEST RAM 0-14-0, IF YES
 4162  025054  000400                59800  ↑B<0000000100000000>     ;       BRA     1,ILOOP ;TEST FOR SURE TRUE AND BRANCH T
 4163                                59900                           ;
 4164                                60000                           ;
 4165                                60100                           ;;USE ALTERNATE BC
 4166                                60200                           ;
 4167  025056  020003                60300  ↑B<0010000000000011>     ;USBC   RAM     0,0,3   ;OBTAIN ALTERNATE BYTE COUNT
 4168  025060  176120                60400  ↑B<1111110001010000>     ;       BRB     14,XSBCO        ;TEST RAM 0-14=0
 4169  025062  030261                60500  ↑B<0011000010110001>     ;       XFR     ,13,1   ;MOVE RAM OUTPUT TO A REGISTER
 4170  025064  010077                60600  ↑B<0001000000111111>     ;       ALU     77      ;LET ALU RESULTS = A PLUS 1
 4171  025066  020763                60700  ↑B<0010000111110011>     ;       RAM     1,17,3  ;MOVE ALU RESULT TO RAM INPUT AN
 4172  025070  177043                60800  ↑B<1111111000100011>     ;       BRB     16,USBC ;TEST FOR WRITE INHIBIT, IF YES
 4173  025072  020002                60900  ↑B<0010000000000010>     ;OSCA   RAM     0,0,2   ;OBTAIN ALTERNATE CURRENT ADDRES
 4174  025074  030261                61000  ↑B<0011000010110001>     ;       XFR     ,13,1   ;MOVE RAM OUTPUT TO A REGISTER
 4175  025076  010077                61100  ↑B<0001000000111111>     ;       ALU     77      ;LET ALU RESULT = A PLUS 1
 4176  025100  020762                61200  ↑B<0010000111110010>     ;       RAM     1,17,2  ;MOVE ALU RESULT TO RAM INPUT AN
 4177  025102  177051                61300  ↑B<1111111000101001>     ;       BRB     16,OSCA ;TEST FOR WRITE INHIBIT, IF YES
 4178  025104  020003                61400  ↑B<0010000000000011>     ;       RAM     0,0,3   ;OBTAIN ALTERNATE BYTE COUNT
 4179  025106  176120                61500  ↑B<1111110001010000>     ;       BRB     14,XSBCO        ;TEST RAM 0-14-0, IF YES
 4180  025110  000400                61600  ↑B<0000000100000000>     ;       BRA     1,ILOOP ;TEST FOR SURE TRUE, IF YES BRAN
 4181                                61700                           ;
 4182                                61800                           ;
 4183                                61900                           ;;TRANSMIT NXM/CHARACTER  (CURRENT ADDRESS REGISTER ADD
 4184                                62000                           ;
 4185                                62100                           ;
 4186                                62200                           ;;TRANSMIT NXM/CONTROL BYTE  (CONTROL TABLE BASE ADDRES
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 4187                                    62300
 4188  025112  030007                    62400    ↑B<0011000000000111>    ;TNXMC XFR      0,7     ;MOVE  TO NPR STATUS REPORT REG.
 4189  025114  020013                    62500    ↑B<0010000000001011>    ;IOTA  RAM      0,0,13  ;OBTAIN LINE STATE
 4190  025116  050207                    62600    ↑B<0101000010000111>    ;       S/C     7,7     ;SET RAM 04 (TRANSMITTER NXM)
 4191  025120  050017                    62700    ↑B<0101000000001111>    ;       S/C     3,7     ;CLEAR NXM
 4192  025122  050042                    62800    ↑B<0101000000100010>    ;       S/C     5,2     ;CLEAR RAM 02 (TRANSMITTER GO)
 4193  025124  020673                    62900    ↑B<0010000110111011>    ;       RAM     1,13,13 ;WRITE NEW LINE STATE
 4194  025126  177062                    63000    ↑B<1111111000110010>    ;       BRB     16,IOTA ;TEST FOR WRITE INHIBIT, IF YES
 4195  025130  000400                    63100    ↑B<0000000100000000>    ;       BRA     1,ILOOP ;TEST FOR SURE TRUE, IF YES BRAN
 4196                                    63200                            ;
 4197                                    63300                            ;
 4198                                    63400                            ;;TRANSMIT MPE/CHARACTER   (CURRENT ADDRESS REGISTER AD
 4199                                    63500                            ;
 4200                                    63600                            ;
 4201                                    63700                            ;
 4202                                    63800                            ;;TRANSMIT MPE/CONTROL BYTE  (CONTROL TABLE BASE ADDRES
 4203                                    63900                            ;
 4204  025132  030007                    64000    ↑B<0011000000000111>    ;TMPEC XFR      0,7     ;MOV  TO NPR STATUS REPORT REG.
 4205  025134  020013                    64100    ↑B<0010000000001011>    ;OMEGA RAM      0,0,13  ;OBTAIN LINE STATE
 4206  025136  050205                    64200    ↑B<0101000010000101>    ;       S/C     7,5     ;SET RAM 05 (TRANSMIT MPE)
 4207  025140  050042                    64300    ↑B<0101000000100010>    ;       S/C     5,2     ;CLEAR RAM 02 (TRANSMITTER GO)
 4208  025142  020673                    64400    ↑B<0010000110111011>    ;       RAM     1,13,13 ;WRITE NEW LINE STATE
 4209  025144  177072                    64500    ↑B<1111111000111010>    ;       BRB     16,OMEGA        ;TEST FOR WRITE INHIBIT,
 4210  025146  000400                    64600    ↑B<0000000100000000>    ;       BRA     1,ILOOP ;TEST FOR SURE TRUE, IF YES, BRA
 4211                                    64700                            ;
 4212                                    64800                            ;
 4213                                    64900                            ;;XMIT PBCO
 4214                                    65000                            ;
 4215  025150  020013                    65100    ↑B<0010000000001011>    ;XPBCO RAM      0,0,13  ;OBTAIN LINE STATE
 4216  025152  050204                    65200    ↑B<0101000010000100>    ;       S/C     7,4     ;SET RAM OUTPUT BIT 7 (GO TO ALT
 4217  025154  020673                    65300    ↑B<0010000110111011>    ;       RAM     1,13,13 ;MOVE RAM OUTPUT TO RAM (AND WRI
 4218  025156  177100                    65400    ↑B<1111111001000000>    ;       BRB     16,XPBCO        ;TEST FOR WRITE INHIBT,
 4219  025160  020001                    65500    ↑B<0010000000000001>    ;       RAM     0,0,1   ;OBTAIN PRINCIPAL BYTE COUNT
 4220  025162  030007                    65600    ↑B<0011000000000111>    ;       XFR     ,0,7    ;MAKE NPR SILO ENTRY
 4221  025164  175510                    65700    ↑B<1111101101001000>    ;       BRB     13,RED  ;TEST RAM OUTPUT BIT 15, IF YES
 4222  025166  100527                    65800    ↑B<1000000101010111>    ;       BRA     1,CBCO  ;TEST FOR SURE TRUE, IF YES BRAN
 4223  025170  020401                    65900    ↑B<0010000100000001>    ;RED    RAM     1,0,1   ;ZERO PRINCIPAL BYTE COUNT
 4224  025172  020016                    66000    ↑B<0010000000001110>    ;OTMB   RAM     0,0,16  ;OBTAIN  LINE PROTOCOL
 4225  025174  030262                    66100    ↑B<0011000010110010>    ;       XFR     ,13,2   ;MOVE RAM OUTPUT TO REGISTER B
 4226  025176  030202                    66200    ↑B<0011000010000010>    ;       XFR     ,10,2   ;MOVE REGISTER B9-15 TO REGISTER
 4227  025200  010005                    66300    ↑B<0001000000000101>    ;       ALU     5       ;LET ALU RESULT = B
 4228  025202  020574                    66400    ↑B<0010000101111100>    ;       RAM     1,7,14  ;MOVE ALU RESULTS TRANSLATED  TO
 4229  025204  106207                    66500    ↑B<1000110010000111>    ;       BRA     14,BCOSB        ;TEST  ALU RESULT 02, IF
 4230  025206  100527                    66600    ↑B<1000000101010111>    ;       BRA     1,CBCO  ;TEST FOR SURE TRUE, IF YES BRAN
 4231                                    66700                            ;
 4232                                    66800                            ;;XMIT SBCO
 4233                                    66900                            ;
 4234  025210  020013                    67000    ↑B<0010000000001011>    ;XSBCO RAM      0,0,13  ;OBTAIN LINE STATE
 4235  025212  050200                    67100    ↑B<0101000010000000>    ;       S/C     7,0     ;CLEAR RAM OUTPUT BIT 7 (GO TO P
 4236  025214  020673                    67200    ↑B<0010000110111011>    ;       RAM     1,13,13 ;MOVE RAM OUTPUT TO RAM (AND WRI
 4237  025216  177120                    67300    ↑B<1111111001010000>    ;       BRB     16,XSBCO        ;TEST FOR WRITE INHIBIT,
 4238  025220  020003                    67400    ↑B<0010000000000011>    ;       RAM     0,0,3   ;OBTAIN ALTERNATE BYTE COUNT
 4239  025222  030007                    67500    ↑B<0011000000000111>    ;       XFR     ,0,7    ;MAKE NPR SILO ENTRY
 4240  025224  175535                    67600    ↑B<1111101101011101>    ;       BRB     13,ESS  ;TEST RAM OUTPUT 15, IF YES, BRA
 4241                                    67700                            ;
 4242                                    67800                            ;
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 4243                                  67900                          ;;CHECK FOR BOTH BC=0
 4244                                  68000                          ;
 4245  025226  020001                  68100  ↑B<0010000000000001>    ;CBC0  RAM     0,0,1   ;OBTAIN PRINCIPAL BYTE COUNT
 4246  025230  176132                  68200  ↑B<1111110001011010>    ;      BRB     14,DELTA        ;TEST RAM OUTPUT 0-14-0
 4247  025232  000400                  68300  ↑B<0000000100000000>    ;      BRA     1,ILOOP ;TEST FOR SURE TRUE, IF YES, BRA
 4248  025234  020003                  68400  ↑B<0010000000000011>    ;DELTA RAM     0,0,3   ;OBTAIN ALTERNATE BYTE COUNT
 4249  025236  176137                  68500  ↑B<1111110001011111>    ;      BRB     14,C/GO ;TEST RAM OUTPUT 0-14-0, IF YES,
 4250  025240  000400                  68600  ↑B<0000000100000000>    ;      BRA     1,ILOOP ;TEST FOR SURE TRUE, IF YES BRAN
 4251                                  68700                          ;
 4252                                  68800                          ;
 4253                                  68900                          ;;CLEAR ALTERNATE BYTE COUNT
 4254                                  69000                          ;
 4255  025242  020403                  69100  ↑B<0010000100000011>    ;ESS   RAM     1,0,3   ;ZERO ALTERNATE BYTE COUNT
 4256  025244  100511                  69200  ↑B<1000000101001001>    ;      BRA     1,0↑MB  ;TEST FOR SURE TRUE, BRANCH TO 0
 4257                                  69300                          ;
 4258                                  69400                          ;
 4259                                  69500                          ;;CLEAR GO
 4260                                  69600                          ;
 4261  025246  020013                  69700  ↑B<0010000000001011>    ;C/GO  RAM     0,0,13  ;OBTAIN LINE STATE
 4262  025250  050042                  69800  ↑B<0101000000100010>    ;      S/C     5,2     ;CLEAR RAM 02 (TRANSMITTER GO)
 4263  025252  020673                  69900  ↑B<0010000110111011>    ;      RAM     1,13,13 ;WRITE NEW LINE STATE
 4264  025254  177137                  70000  ↑B<1111111001011111>    ;      BRB     16,C/GO ;TEST FOR WRITE INHIBIT, IF YES
 4265  025256  000400                  70100  ↑B<0000000100000000>    ;      BRA     1,ILOOP ;TEST FOR SURE TRUE, IF YES BRAN
 4266                                  70200                          ;
 4267                                  70300                          ;;SELECT TYPE OF IDLE
 4268                                  70400                          ;
 4269  025260  020012                  70500  ↑B<0010000000001010>    ;ITYPE RAM     0,0,12  ;OBTAIN TRANSMITTER DLE/PROTOCOL
 4270  025262  170147                  70600  ↑B<1111000001100111>    ;      BRB     0,BC0CG ;TEST RAM OUTPUT 00, IF YES BRAN
 4271  025264  000400                  70700  ↑B<0000000100000000>    ;      BRA     1,ILOOP ;TEST FOR SURE TRUE, IF YES BRAN
 4272  025266  050105                  70800  ↑B<0101000001000101>    ;BC0CG S/C     6,5     ;SET TMARK
 4273  025270  000400                  70900  ↑B<0000000100000000>    ;      BRA     1,ILOOP ;TEST FOR SURE TRUE, IF YES BRAN
 4274                                  71000                          ;
 4275                                  71100                          ;
 4276                                  71200                          ;;SENT IDLE  (LINE STATE IS IN RAM OUTPUT)
 4277                                  71300                          ;
 4278  025272  020013                  71400  ↑B<0010000000001011>    ;SIDLE RAM     0,0,13  ;OBTAIN LINE STATE
 4279  025274  050044                  71500  ↑B<0101000000100100>    ;      S/C     5,4     ;SET RAM 03 (TRANSMITTER UNDERRU
 4280  025276  020673                  71600  ↑B<0010000110111011>    ;      RAM     1,13,13 ;MOVE RAM OUTPUT TO RAM (AND WRI
 4281  025300  177151                  71700  ↑B<1111111001101001>    ;      BRB     16,SIDLE        ;TEST FOR WRITE INHIBIT,
 4282  025302  100422                  71800  ↑B<1000000100010010>    ;      BRA     1,ALPHA ;TEST FOR SURE TRUE, IF YES, BRA
 4283                                  71900                          ;
 4284                                  72000                          ;
 4285                                  72100                          ;;SENT IDLE/DLE
 4286                                  72200                          ;
 4287  025304  020013                  72300  ↑B<0010000000001011>    ;MU    RAM     0,0,13  ;OBTAIN LINE STATE
 4288  025306  050044                  72400  ↑B<0101000000100100>    ;      S/C     5,4     ;SET 03 (UNDERRUN)
 4289  025310  020673                  72500  ↑B<0010000110111011>    ;      RAM     1,13,13 ;WRITE LINE STATE
 4290  025312  177156                  72600  ↑B<1111111001101110>    ;      BRB     16,MU   ;TEST FOR INHIBIT
 4291  025314  100573                  72700  ↑B<1000000101111011>    ;      BRA     1,NU    ;GO BACK TO SEND IDLE
 4292                                  72800                          ;
 4293                                  72900                          ;
 4294                                  73000                          ;;SEND DLE FIRST
 4295                                  73100                          ;
 4296                                  73200                          ;;(WE GOT HERE FROM TRANSMIT SERVICE.  THE CONTROL BYTE
 4297                                  73300                          ;;IN ALU RESULT AND B REGISTER.  MASTER SCAN POSITION I
 4298                                  73400                          ;;RAM ADDRESS REGISTER 0-3).
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 4299
 4300  025316  020016   73500
 4301  025320  171175   73600  ↑B<0010000000001110>  ;SDLE  RAM   0,0,16  ;OBTAIN LINE PROTOCOL
 4302  025322  050046   73700  ↑B<1111001001111101>  ;      BRB   2,CRAM2 ;TEST RAM OUTPUT 02, IF YES BRAN
 4303  025324  020676   73800  ↑B<0101000000100110>  ;      S/C   5,6     ;SET RAM 02
 4304  025326  177163   73900  ↑B<0010000110111110>  ;      RAM   1,13,16 ;MOVE RAM OUTPUT TO RAM INPUT AN
 4305  025330  020012   74000  ↑B<1111111001110011>  ;      BRB   16,SDLE ;TEST FOR WRITE INHIBIT, IF YES
 4306  025332  030262   74100  ↑B<0010000000001010>  ;      RAM   0,0,12  ;OBTAIN TRANSMITTER DLE / LINE P
 4307  025334  174156   74200  ↑B<0011000010110010>  ;      XFR    13,2   ;MOVE RAM OUTPUT TO REGISTER B
 4308  025336  030200   74300  ↑B<1111100001101110>  ;      BRB   10,MU   ;TEST FOR DNA FLAG, IF YES BRANC
 4309  025340  000400   74400  ↑B<0011000010000000>  ;NU    XFR    10,0   ;MOVE REGISTER B 15-8 TRANSMITTE
 4310                    74500  ↑B<0000000100000000>  ;      BRA   1,ILOOP ;TEST FOR SURE TRUE, IF YES BRAN
 4311                    74600                        ;
 4312                    74700                        ;
 4313                    74800                        ;;CLEAR RAM 02 (RAM 02 IS DLE SENDING IN PROGRESS)
 4314                    74900                        ;
 4314  025342  020016   75000  ↑B<0010000000001110>  ;CRAM2 RAM   0,0,16  ;OBTAIN LINE PROTOCOL
 4315  025344  050042   75100  ↑B<0101000000100010>  ;      S/C   5,2     ;CLEAR RAM OUTPUT 02
 4316  025346  020676   75200  ↑B<0010000110111110>  ;      RAM   1,13,16 ;MOVE RAM OUTPUT TO RAM INPUT DA
 4317  025350  177175   75300  ↑B<1111111001111101>  ;      BRB   16,CRAM2        ;TEST FOR WRITE INHIBIT,
 4318  025352  100416   75400  ↑B<1000000100001110>  ;      BRA   1,RDLE  ;TEST FOR SURE TRUE, IF YES BRAN
 4319                    75500                        ;
 4320                    75600                        ;
 4321                    75700                        ;;SET SEND BCC NEXT
 4322                    75800                        ;
 4323  025354  020016   75900  ↑B<0010000000001110>  ;SSBN  RAM   0,0,16  ;OBTAIN LINE PROTOCOL
 4324  025356  050047   76000  ↑B<0101000000100111>  ;      S/C   5,7     ;SET RAM OUTPUT BIT 0
 4325  025360  020676   76100  ↑B<0010000110111110>  ;      RAM   1,13,16 ;MOVE RAM OUTPUT TO RAM INPUT AN
 4326  025362  177202   76200  ↑B<1111111010000010>  ;      BRB   16,SSBN ;TEST FOR WRITE INHIBIT, IF YES
 4327  025364  100420   76300  ↑B<1000000100010000>  ;      BRA   1,RSSBN ;TEST FOR SURE TRUE, IF YES BRAN
 4328                    76400                        ;
 4329                    76500                        ;
 4330                    76600                        ;;BCC SEND BCC
 4331                    76700                        ;
 4332  025366  020016   76800  ↑B<0010000000001110>  ;BCCSB RAM   0,0,16  ;OBTAIN LINE PROTOCOL
 4333  025370  050047   76900  ↑B<0101000000100111>  ;      S/C   5,7     ;SET RAM OUTPUT BIT 0
 4334  025372  020676   77000  ↑B<0010000110111110>  ;      RAM   1,13,16 ;MOVE RAM OUTPUT TO RAM INPUT AN
 4335  025374  177207   77100  ↑B<1111111010000111>  ;      BRB   16,BCCSB        ;TEST FOR WRITE INHIBIT,
 4336  025376  100527   77200  ↑B<1000000101010111>  ;      BRA   1,CBCC  ;TEST FOR SURE TRUE, IF YES BRAN
 4337                    77300                        ;
 4338                    77400                        ;
 4339                    77500                        ;;DDCMP TRANSMIT
 4340                    77600                        ;
 4341  025400  020014   77700  ↑B<0010000000001100>  ;DDCMX RAM   0,0,14  ;OBTAIN TRANSMITTER MODE BITS
 4342  025402  176217   77800  ↑B<1111110010001111>  ;      BRB   14,XBCC ;TEST RAM 0-14=0, IF YES BRANCH
 4343  025404  100400   77900  ↑B<1000000100000000>  ;      BRA   1,PI    ;TEST FOR SURE TRUE, IF YES BRAN
 4344                    78000                        ;
 4345                    78100                        ;
 4346                    78200                        ;;CALCULATE TRANSMITTER BCC
 4347                    78300                        ;
 4348  025406  030321   78400  ↑B<0011000011010001>  ;XBCC  XFR    15,1   ;MOVE DATO REGISTER TO A REGISTE
 4349  025410  020006   78500  ↑B<0010000000000110>  ;      RAM   0,0,6   ;OBTAIN TRANSMITTER BCC CALCULAT
 4350  025412  030262   78600  ↑B<0011000010110010>  ;      XFR    13,2   ;MOVE RAM DATA TO REGISTER B
 4351  025414  020012   78700  ↑B<0010000000001010>  ;      RAM   0,0,12  ;OBTAIN TRANSMITTER DLE/LINE PRO
 4352  025416  060000   78800  ↑B<0110000000000000>  ;      BCC           ;PERFORM SPECIFIED BCC CALCULATI
 4353  025420  020746   78900  ↑B<0010000111100110>  ;      RAM   1,16,6  ;MOVE BCC TO RAM INPUT AND WRITE
 4354  025422  100421   79000  ↑B<1000000100010001>  ;      BRA   1,RXBCC ;TEST FOR SURE TRUE, IF YES, BRA
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 4355                                  79100
 4356                                  79200
 4357                                  79300                    ;
 4358                                  79400                    ;:SEND BCC 1
 4359                                  79500                    ;
 4360                                  79600                    ;;(WE GOT HERE FROM TRANSMIT SERVICE.  THE MASTER SCAN
 4361                                  79700                    ;;IS IN THE RAM ADDRESS REGISTER 0-3.  THE LINE PROTOCO
 4362                                  79800                    ;;THE A REGISTER AND THE ALU RESULT REGISTER.)
 4363                                  79900                    ;
 4364  025424  020016                  80000  ↑B<0010000000001110>  ;SBC1  RAM     0,0,16  ;OBTAIN LINE PROTOCOL
 4365  025426  030261                  80100  ↑B<0011000010110001>  ;      XFR     ,13,1   ;MOVE RAM OUTPUT TO A REGISTER
 4366  025430  010077                  80200  ↑B<0001000000111111>  ;      ALU     77      ;LET ALU RESULT = A PLUS 1
 4367  025432  020776                  80300  ↑B<0010000111111110>  ;      RAM     1,17,16 ;MOVE ALU RESULT TO RAM INPUT DA
 4368  025434  177226                  80400  ↑B<1111111010010110>  ;      BRB     16,SBC1 ;TEST FOR WRITE INHIBIT, IF YES
 4369  025436  020006                  80500  ↑B<0010000000000110>  ;      RAM     0,0,6   ;OBTAIN TRANSMITTER BCC
 4370  025440  030260                  80600  ↑B<0011000010110000>  ;      XFR     ,13,0   ;MOVE RAM OUTPUT DATA TO TRANSMI
 4371  025442  020012                  80700  ↑B<0010000000001010>  ;      RAM     0,0,12  ;OBTAIN TRANSMITTER DLE/LINE PRO
 4372  025444  171641                  80800  ↑B<1111001110100001>  ;      BRB     3,GOIDL ;TEST RAM OUTPUT 03, IF YES BRAN
 4373  025446  172241                  80900  ↑B<1111010010100001>  ;      BRB     4,GOIDL ;TEST RAM OUTPUT 04, IF YES BRAN
 4374  025450  100645                  81000  ↑B<1000000110100101>  ;      BRA     1,C/LU1 ;TEST FOR SURE TRUE, IF YES BRAN
 4375  025452  000400                  81100  ↑B<0000000100000000>  ;GOIDL BRA     1,ILOOP ;TEST FOR SURE TRUE, IF YES BRAN
 4376                                  81200                    ;
 4377                                  81300                    ;
 4378                                  81400                    ;:SEND BCC2
 4379                                  81500                    ;
 4380                                  81600                    ;;(WE GOT HERE FROM TRANSMIT SERVICE.  THE MASTER SCAN
 4381                                  81700                    ;;IS IN THE RAM ADDRESS REGISTER 0-3.  THE LINE PROTOCO
 4382                                  81800                    ;;THE A REGISTER AND IN THE ALU RESULT REGISTER.)
 4383                                  81900                    ;
 4384  025454  020006                  82000  ↑B<0010000000000110>  ;SBC2  RAM     0,0,6   ;OBTAIN TRANSMITTER BCC
 4385  025456  030262                  82100  ↑B<0011000010110010>  ;      XFR     ,13,2   ;MOVE RAM OUTPUT DATA TO REGISTE
 4386  025460  030200                  82200  ↑B<0011000010000000>  ;      XFR     ,10,0   ;MOVE REGISTER B 8-15/0-7 TO TRA
 4387                                  82300                    ;
 4388                                  82400                    ;
 4389  025462  020406                  82500  ↑B<0010000100000110>  ;C/LU1 RAM     1,0,6   ;MOVE ZERO TO RAM INPUT DATA AND
 4390  025464  020016                  82600  ↑B<0010000000001110>  ;      RAM     0,0,16  ;OBTAIN LINE PROTOCOL
 4391  025466  050041                  82700  ↑B<0101000000100001>  ;      S/C     5,1     ;CLEAR RAM BIT 01 (SEND BCC 2)
 4392  025470  020676                  82800  ↑B<0010000110111110>  ;      RAM     1,13,16 ;MOVE RAM INPUT TO RAM INPUT DAT
 4393  025472  177245                  82900  ↑B<1111111010100101>  ;      BRB     16,C/LU1        ;TEST FOR WRITE INHIBIT,
 4394  025474  000400                  83000  ↑B<0000000100000000>  ;      BRA     1,ILOOP ;TEST FOR SURE TRUE, IF YES BRAN
 4395                                  83100                    ;
 4396                                  83200                    ;
 4397                                  83300                    ;
 4398                                  83400                    ;
 4399                                  83500                    ;;RECEIVED ERRORS
 4400                                  83600                    ;
 4401                                  83700                    ;
 4402                                  83800                    ;:CONTROL BYTE INTERRUPT
 4403                                  83900                    ;
 4404  025476  020017                  84000  ↑B<0010000000001111>  ;CBINT RAM     0,0,17  ;READ CONTROL BYTE HOLDING REGIS
 4405  025500  050043                  84100  ↑B<0101000000100011>  ;      S/C     5,3     ;CLEAR RAM 00 (GENERATE INTERRUP
 4406  025502  020677                  84200  ↑B<0010000110111111>  ;      RAM     1,13,17 ;WRITE CONTROL BYTE HOLDING REGI
 4407  025504  030306                  84300  ↑B<0011000011000110>  ;      XFR     ,14,6   ;MOVE SILO OUT TO RICR REGISTER
 4408  025506  050013                  84400  ↑B<0101000000001011>  ;      S/C     3,3     ;SET SCRO7 (RECEIVER INTERRUPT)
 4409  025510  000400                  84500  ↑B<0000000100000000>  ;      BRA     1,ILOOP ;TEST FOR SURE TRUE, IF YES BRAN
 4410                                  84600                    ;
```

H07


```
 4411                                  94700                ;
 4412                                  84800                ;;PARITY AND OVERRUN ERRORS
 4413                                  94900                ;
 4414  025512  030306                  85000  ↑B<0011000011000110>  ;POER  XFR     ,14,6   ;MOVE SILO OUT TO RICR REGISTER
 4415                                  85100                ;
 4416                                  85200                ;
 4417                                  85300                ;
 4418                                  85400                ;;CREATE NULL ACTION CONTROL BYTE (MODE IS PRESERVED)
 4419                                  85500                ;
 4420  025514  020017                  85600  ↑B<0010000000001111>  ;CNACB RAM     0,0,17  ;READ CONTROL BYTE HOLDING REGIS
 4421  025516  050043                  85700  ↑B<0101000000100011>  ;       S/C     5,3     ;CLEAR RAM 00
 4422  025520  050041                  85800  ↑B<0101000000100001>  ;       S/C     5,1     ;CLEAR RAM 01
 4423  025522  050042                  85900  ↑B<0101000000100010>  ;       S/C     5,2     ;CLEAR RAM 02
 4424  025524  050040                  86000  ↑B<0101000000100000>  ;       S/C     5,0     ;CLEAR RAM 03
 4425  025526  050207                  86100  ↑B<0101000010000111>  ;       S/C     7,7     ;SET RAM OUTPUT 04 (DISCARD)
 4426  025530  020677                  86200  ↑B<0010000110111111>  ;       RAM     1,13,17 ;WRITE CONTROL BYTE HOLDING REGI
 4427  025532  050013                  86300  ↑B<0101000000001011>  ;       S/C     3,3     ;SET SCR 07 (RECEIVER INTERRUPT)
 4428  025534  000400                  86400  ↑B<0000000100000000>  ;       BRA     1,ILOOP ;TEST FOR SURE TRUE, IF YES BRAN
 4429                                  86500                ;
 4430                                  86600                ;
 4431                                  86700                ;
 4432                                  86800                ;;END
 4433
```

```
                                                    SYMBOL TABLE
                                            [IN ORDER AS THEY APPEAR IN PROGRAM]

000000000  ILOOP   000000101  ILOP2   000001000  ILOP5   000001010  RSERV
000001111  S/ACT   000010001  SACT1   000010101  CLRRF   000011000  SACT2
000011110  TESTX   000100001  TMD     000100101  S/RDE   000101001  ISERV
000101110  RSYNC   000110011  PSI     000111010  TMARK   000111100  TFRF
000111110  CRAM7   001000011  SSERV   001010011  ZETA    001011101  RBUS1
001100010  CTEST   001101000  EPSIL   001101001  RRBCC   001101110  RBUS2
001110000  ORBC    001110101  ORCA    001111110  DDCMR   010000001  DDCM2
010000011  DISC    010000101  RBCC    010001100  CRBCO   010001111  NBCO
010010011  MCBCX   010011011  EBCC    010100000  EBCN    010100101  TBC1
010110011  MRTHA   010111000  TBC1X   010111010  TBC2    011000100  BCCCK
011010111  RMPEC   011011010  RNXMC   011011011  GAMMA   011011100  BETA
011100000  RNXM    011100010  NPRSO   011100100  TSERV   011101101  SIGMA
011110010  USCA    011110101  OXCB    011110111  RBUS3   100000000  PI
100001000  RBUS4   100001110  RDLE    100010000  RSSBN   100010001  RXBCC
100010010  ALPHA   100010101  UPBC    100011011  OPCA    100100011  USBC
100101001  OSCA    100110001  TNXMC   100110010  IOTA    100111001  TMPEC
100111010  OMEGA   101000000  XPBCO   101001000  RED     101001001  OTMB
101010000  XSBCO   101010111  CBCO    101011010  DELTA   101011101  ESS
101011111  C/GO    101100100  ITYPE   101100111  BCOCG   101101001  SIDLE
101101110  MU      101110011  SDLE    101111011  NU      101111101  CRAM2
110000010  SSBN    110000111  BCOSB   110001100  DDCMX   110001111  XBCC
110010110  SBC1    110100001  GOIDL   110100010  SBC2    110100101  C/LU1
110101011  CBINT   110110001  POER    110110010  CNACB

                    NUMBER OF TAGS FOUND:   91

                    LAST ROM ADDRESS USED: 110111010

                    INSTRUCTION       NUMBER OF TIMES USED.
                    -----------       ---------------------

                      BRA                   78
                      ALU                   25
                      RAM                   124
                      XFR                   67
                      NPR                   4
                      S/C                   65
                      BCC                   4
                      BRB                   76

025536
025536  000000  ENDROM:
025540  000000  NPRLOC: 0
025542  000000  COUNT:  0
025544  000000  DATA:   0
025546  000000  EXPRBA: 0
                EXPRWC: 0
```

```
4483                                                    00100
4484                                                    00200
4485   025550  051377  040505  020104                   00600  EM1:     .ASCIZ  <377>/READ OF ROM PRODUCED A COMPARE ERROR/
       025616  021377  051106  042505                   00700  EM2:     .ASCIZ  <377>/"FREE RUNNING" PRIMARY REGISTER ERROR./
       025666  042777  051122  051117                   00800  EM2A:    .ASCIZ  <377>/ERROR! SEE LISTING FOR DETAILS./
       025727     377  043042  042522                   00900  EM3:     .ASCIZ  <377>/"FREE RUNNING" SECONDARY REGISTER ERROR/
       026000  051377  046517  040440                   01000  DH1:     .ASCIZ  <377>/ROM ADD  EXPECTED  FOUND/
       026032  042777  050130  041505                   01100  DH2:     .ASCIZ  <377>/EXPECTED  FOUND   LINE(8) PRIMARY REG/
       026101     377  054105  042520                   01200  DH2A:    .ASCIZ  <377>/EXPECTED  FOUND   LINE(8) SECONDARY REG/
                                                        01300          .EVEN
       026152  000004                                   01700  DT1:     4
4486   026154     006       004                        01800                   .BYTE   6,4
4487   026156  001272                                   01900                   SAVR5
4488   026160     006       002                        02000                   .BYTE   6,2
4489   026162  001270                                   02100                   SAVR4
4490   026164     002       006                        02200                   .BYTE   2,6
4491   026166  001260                                   02300                   SAVR0
4492   026170     002       001                        02400                   .BYTE   2,1
4493   026172  001262                                   02500                   SAVR1
4494                                                    02600
4495   026174  000004                                   02700  DT2:     4
4496   026176     006       004                        02800                   .BYTE   6,4
4497   026200  001272                                   02900                   SAVR5
4498   026202     006       002                        03000                   .BYTE   6,2
4499   026204  001270                                   03100                   SAVR4
4500   026206     002       006                        03200                   .BYTE   2,6
4501   026210  001260                                   03300                   SAVR0
4502   026212     006       001                        03400                   .BYTE   6,1
4503   026214  001262                                   03500                   SAVR1
4504                                                    03600
4505   026216  000003                                   03700  DT1A:    3
4506   026220     003       006                        03800                   .BYTE   3,6
4507   026222  001264                                   03900                   SAVR2
4508   026224     006       004                        04000                   .BYTE   6,4
4509   026226  001272                                   04100                   SAVR5
4510   026230     006       001                        04200                   .BYTE   6,1
4511   026232  001270                                   04300                   SAVR4
4512   026234                                           04400  .ERRTAB:
4513   026234  025666                                   04500                   EM2A
4514   026236  000000                                   04600                   0
4515   026240  000000                                   04700                   0
4516   026242  025550                                   04800                   EM1
4517   026244  026000                                   04900                   DH1     ;HALT 1
4518   026246  026216                                   05000                   DT1A
4519   026250  025616                                   05100                   EM2
4520   026252  026032                                   05200                   DH2     ;HALT 2
4521   026254  026174                                   05300                   DT2
4522   026256  025727                                   05400                   EM3
4523   026260  026101                                   05500                   DH2A    ;HALT 3
4524   026262  026152                                   05600                   DT1
4525                                                    05700  ;;*****************************************************************
4526   026264                                           05800  CORMAX:
4527           000001                                   06300  .END
```

```
ADRCNT= 003443          1141*   1177*   1186#
ALU   = 010000           597#
ASYNC = 004000           605#   1826    1966    2103    2216    2252    2287    2366    2450    2534    2618    2697    3373
                        3402
AUTO.S  006622          1651#
BCC   = 060000           602#
BCCFBK  021022          3643*   3649*   3652*   3655    3659    3671#
BINWRD  003746          1227*   1228    1265#
BIT0  = 000001           595#   1408    1845    1866    1871    1985    2006    2011    2122    2126    3026    3346    3401
                        3425    3432    3481    3647
BIT1  = 000002           594#   1408    1419    1757    1767    3710    3713
BIT10 = 002000           585#   1408    1831    1971    2108    2221    2257    2292    2371    2455    2539    2623    2702
                        2715    2744    3409
BIT11 = 004000           584#   1408    1829    1835    1969    1975    2106    2112    2219    2255    2290    2305    2369
                        2375    2453    2459    2537    2543    2621    2627    2700    2706    3407    3413
BIT12 = 010000           583#    597     599     601     603    1829    1831    1835    1969    1971    1975    2106    2108
                        2112    2219    2221    2255    2257    2290    2292    2369    2371    2375    2453    2455    2459
                        2537    2539    2543    2621    2623    2627    2700    2702    2706    3299    3407    3409    3413
                        3710    3713
BIT13 = 020000           582#    598     599     602     603    1831    1971    2108    2221    2257    2292    2371    2455
                        2539    2623    2702    3405    3409    3413
BIT14 = 040000           581#    600     601     602     603    1048    1831    1971    2108    2221    2257    2292    2371
                        2455    2539    2623    2702    3199    3249    3299    3409    3710    3713
BIT15 = 100000           580#   1845    1856    1985    1996    2122    2128    2235    2270    2305    3149    3249    3299
                        3432    3446    3502    3564    3693
BIT2  = 000004           593#    975    1408    1758    1824    1964    2101    2214    2250    2285    2360    2444    2528
                        2603    2612    2694    2710    2725    2730    2732    2807    2906    3011    3400
BIT3  = 000010           592#   1408    1753    2351    2435    2449    2519    2533    2617    2988    3707
BIT4  = 000020           591#   2093    2098    2153    2207    2243    2278    2533    2617    3386    3393    3684
BIT5  = 000040           590#   2093    2098    2207    2243    2278    3386    3393    3684
BIT6  = 000100           589#   1719    3710    3713
BIT7  = 000200           588#   1042    1289    1446    1467    1719    1897    1964    2250    3432    3481    3544
BIT8  = 000400           587#   1408    1425    1754    1856    1996    3446    3502    3564
BIT9  = 001000           586#   1408    1719    1724    1829    1969    1996    2106    2219    2255    2270    2290    2369
                        2453    2537    2621    2700    3407    3507    3569    3572
BRB   = 070000           603#
BRW     003014           981   1070#
BRX     003016           982   1071#
CALBCC  021024          2389    2473    2557    3665*   3672#
CHRCNT  003744          1225*   1229    1245*   1263#   1264
CLKX    001242           674#
CLK.A   001412           774#   1569
CLK.B   001413           775#   1574
CLK.C   001414           776#   1579
CLK.D   001415           777#   1584
CNVRT = 104411           733#   1000    1002    1004    1006    1326    1328    1384    1441
CONVRT= 104410           731#    940    1342
CORMAX  026264          4526#   4527
COUNT   025540          2792*   2825*   2890*   2917*   2924*   2984*   3020*   4478#
CRC.CC= 102010          2516    2600    3675#
CRC16 = 120001          2432    3674#
CREAM   001306           695#    909*   1516*   1517    1519*   1524    1525*   1526    1529*
CSRMAP  006624           934   1653#
CYCLE   005666           984   1020    1021    1506#
DATA    025542          4479#
DATABP  004276          1315*   1318    1340    1343#
```

```
DATACL= 104416           743#
DATAHD  004264          1314*   1336    1339#
DELAY = 104414           739#   1840    1980    2117    2228    2264    2299    2380    2464    2548    2632    2637    2712
                        2734    2738    2827    2926    3022    3421    3698
DEVADR  003440          1139*   1174    1184#
DH1     026000          4485*   4517
DH2     026032          4485*   4520
DH2A    026101          4485*   4523
DT1     026152          4485*   4524
DT1A    026216          4505*   4518
DT2     026174          4495*   4521
DVACTV  001300           689#    956*    957    1506    1511    1685*   1691*   1692*   1696    1715
DVCR00  001500           805#
DVCR01  001524           816#
DVCR02  001550           827#
DVCR03  001574           838#
DVCR04  001620           849#
DVCR05  001644           860#
DVCR06  001670           871#
DVCR07  001714           882#
DVLCR   001370           757#   1425*   1426    1545*   1546*   1547    3692*   3693*   3696
DVNSR   001402           762#   1555*   1556*   1557    1858    1868    1998    2008    2129    2232    2268    2303    2824
                        2923    3018    3444    3449
DVNUM   001301           690#    905    1010    1657*   1678*   1679    1686    1688
DVRIC   001366           756#   1543*   1544*   1545    1849    1851    1989    1991    3436    3437
DVRLVL  001354           751#   1560*   1561*   1562
DVRVEC  001352           750#   1027    1531*   1560
DVSCR   001362           754#   1024    1402*   1415*   1419*   1530*   1541    1753*   1757*   1758*   1767*   1836*   1838
                        1843    1863    1871*   1976*   1978    1983    2003    2011*   2093*   2098*   2113*   2115    2120
                        2126*   2135    2207*   2224*   2226    2243*   2260*   2262    2278*   2295*   2297    2376*   2379
                        2460*   2462    2544*   2546    2628*   2630    2707*   2715    2741    2820*   2822    2919*   2921
                        3017*   3026*   3386*   3393*   3417*   3419    3428    3431    3684*   3707*
DVSCRH  001364           755#   1541*   1542*   1543
DVSFR   001400           761#   1553*   1554*   1555    1754*   1760    3710*   3713*
DVSRA   001376           760#   1406    1551*   1552*   1553    1874    1881    1889    1894    1900    2015    2022    2030
                        2035    2041    2140    2149    2156    2384    2468    2552    2638    2710    2725*   2732    3034
                        3052    3070    3088    3425    3452    3460    3466    3473    3480    3528    3538    3543    3593
                        3603    3608    3615    3625    3683*   3686*
DVSRS   001372           758#   1405    1547*   1548*   1549    1816*   1873*   1885*   1956*   2013*   2026*   2092*   2139*
                        2206*   2242*   2277*   2353*   2437*   2521*   2605*   2686*   2796*   2895*   3000*   3032*   3050*
                        3068*   3086*   3372*   3451*   3525*   3590*
DVSRSH  001374           759#   1549*   1550*   1551    1875    1879*   1886*   1888    1992*   1898*   2014*   2016    2020*
                        2027*   2029    2033*   2039*   2147*   2155*   2383*   2390    2467*   2474    2551*   2558    2635*
                        2644    2709*   2724*   2731*   3033*   3037    3051*   3055    3069*   3073    3087*   3091    3424*
                        3458*   3464*   3471*   3478*   3526*   3536*   3541*   3591*   3601*   3606*   3614*   3619    3623*
                        3682*   3685*
DVTLVL  001360           753#   1564*   1565*
DVTR00  001502           806#
DVTR01  001526           817#
DVTR02  001552           828#
DVTR03  001576           839#
DVTR04  001622           850#
DVTR05  001646           861#
DVTR06  001672           872#
DVTR07  001716           883#
DVTVEC  001356           752#   1562*   1563*   1564
```

```
DV.END  001740          893#   1517   1526   1655
DV.MAP  001500          695     804#   909    936   1519   1529   1653   1658   1707
DV00.A  001504          807#
DV00.B  001510          809#
DV00.C  001514          811#
DV00.D  001520          813#
DV01.A  001530          818#
DV01.B  001534          820#
DV01.C  001540          822#
DV01.D  001544          824#
DV02.A  001554          829#
DVC2.B  001560          831#
DV02.C  001564          833#
DV02.D  001570          835#
DV03.A  001600          840#
DV03.B  001604          842#
DV03.C  001610          844#
DV03.D  001614          846#
DV04.A  001624          851#
DV04.B  001630          853#
DV04.C  001634          855#
DV04.D  001640          857#
DV05.A  001650          862#
DV05.B  001654          864#
DV05.C  001660          866#
DV05.D  001664          868#
DV06.A  001674          873#
DV06.B  001700          875#
DV06.C  001704          877#
DV06.D  001710          879#
DV07.A  001720          884#
DV07.B  001724          886#
DV07.C  001730          888#
DV07.D  001734          890#
EM1     025550         4485#   4516
EM2     025616         4485#   4519
EM2A    025666         4485#   4513
EM3     025727         4485#   4522
ENDROM  025536         1765    4476#
ERRCNT  001232          666#    911*   1033   1351*
ERRFLG  001311          701#    907*    995*  1062*  1303*  1316   1330*  1385*
ERRMSG  004252         1313*   1331   1334#
ERTABO  004366         1328    1360#
EXIT  = 000205          605#   3689   3703   3722   3729
EXITER  004322         1346    1351#
EXPRBA  025544         3142*   3192*  3242*  3292*  3342*  3467   4480#
EXPRWC  025546         3143*   3193*  3243*  3293*  3343*  3474   4481#
FIX.00  006516         1570    1575   1580   1585   1619#
HALTS   004302         1299    1345#
HILIM   003436         1138*   1165   1183#
ICOUNT  001222          662#   1060   1065*
INBUF   005520         1108    1144   1491#
INIFLG  001310          700#    916    931*
INSTER= 104404          723#   1159
INSTR = 104403          721#   1592
INSTR2  003236         1115    1127#
```

```
LIGHT   000174            634#    926
LIGHTS  001200            645#    926*    997*
LIMITS  003364           1154    1165#
LINT1   020054           2834    2838    2842    2846    3497#
LINT2   020216           2933    2937    2941    2945    3559#
LOAD.M  021072           1828    1830    1834    1968    1970    1974    2105    2107    2111    2218    2220    2254    2256
                         2289    2291    2368    2370    2374    2452    2454    2458    2536    2538    2542    2620    2622
                         2626    2699    2701    2705    3404    3406    3408    3412    3691#
LOBITS  003442           1140*   1169    1185#   1186
LOCK    001220            661#   1064*   1078    1080    1322    1815*   1955*   2090*   2203*   2240*   2275*
LOGICA  002560            631    1014#
LOKFLG  001312            702#
LOLIM   003434           1137*   1167    1182#
LPCNT   001224            663#   1059*   1060    1063*
LRCB  = 000200           2348    3673#
LSTERR  001234            667#    912*    994*   1046*   1300    1302*   1386*
LO0.03  001416            779#   1532*   1567    1791    1931    2072    2185    2330    2414    2498    2582    2667    2779
                         2832    2877    2931    2971    3028    3125    3175    3225    3275    3325
LO4.07  001420            780#   1534*   1572    1795    1935    2076    2189    2334    2418    2502    2586    2671    2782
                         2836    2880    2935    2974    3046    3129    3179    3229    3279    3329
LO8.11  001422            781#   1536*   1577    1799    1939    2080    2193    2338    2422    2506    2590    2675    2785
                         2840    2883    2939    2977    3064    3133    3183    3233    3283    3333
L12.15  001424            782#   1538*   1582    1803    1943    2084    2197    2342    2426    2510    2594    2679    2788
                         2844    2886    2943    2980    3082    3137    3187    3237    3287    3337
MASKX   001244            675#
MASK.A  001406            769#   1568
MASK.B  001407            770#   1573
MASK.C  001410            771#   1578
MASK.D  001411            772#   1583
MASTEK  005400           1324    1482#
MCRLF   005104           1093    1216    1320    1321    1329    1470    1482#   1591    1609
MCSRX   005330            999    1482#
MDATA   005624           1243    1253    1495#
MEPASS  005145            998    1482#
MERRPC  005454           1327    1482#
MERRX   005355           1005    1482#
MERR2   005174           1482#   1508    1698
MERR3   005243            953    1482#
MLOCK   005301            977    1482#
MNEW    005402            948    1482#
MPASSX  005344           1003    1482#
MPFAIL  005107           1383    1482#
MQM     005100           1123    1482#   1614
MR      005171            985    1482#
MRESET= 004000            605#   1402    1415
MSTCLR= 104412            735#   1387    1752    1904    2045    2160    2205    2241    2276    2394    2478    2562    2648
                         2748
MTITLE  001000            643#    930
MTSTN   005366           1325    1482#   1593
MTSTPC  005267           1482#
MVECX   005336           1001    1482#
NEXT    001216            660#   1066    1356    1751*   1789*   1929*   2070*   2183*   2328*   2412*   2496*   2580*   2665*
                         2775*   2873*   2967*   3123*   3173*   3223*   3273*   3323*
NOLIST= ****** U          525    3739    4477
NPR   = 040000            600#
NPRLOC  025536           4477#
```

```
PARAM = 104405          725#  1594
PARAM1  003304         1143#  1160
PARBIT= 040000          605#  1638
PARERR  003360         1146   1148   1150   1159#  1166   1168   1170
PASCNT  001230          665#   906#   996#   997   1030
PC    =%000007          572#   934#  1015#  1045#  1292#  1471#  1570#  1575#  1580#  1595#  1601   1602#  1641#
                       1733#  1793#  1797#  1801#  1805#  1910#  1933#  1937#  1941#  1945#  2051#  2074#  2078#
                       2082#  2086#  2166#  2187#  2191#  2195#  2199#  2314#  2332#  2336#  2340#  2344#  2398#
                       2416#  2420#  2424#  2428#  2482#  2500#  2504#  2508#  2512#  2566#  2584#  2588#  2592#
                       2596#  2652#  2669#  2673#  2677#  2681#  2752#  3127#  3131#  3135#  3139#  3150#  3177#
                       3181#  3185#  3189#  3200#  3227#  3231#  3235#  3239#  3250#  3277#  3281#  3285#  3289#
                       3300#  3327#  3331#  3335#  3339#  3350#
PERFOR= 004537          605#  1817   1822   1828   1830   1834   1957   1962   1968   1970   1974   2094   2099
                       2105   2107   2111   2208   2212   2218   2220   2244   2248   2254   2256   2279   2283
                       2289   2291   2354   2358   2362   2368   2370   2374   2438   2442   2446   2452   2454
                       2458   2522   2526   2530   2536   2539   2542   2606   2610   2614   2620   2622   2626
                       2687   2691   2699   2701   2705   2720   2727   2800   2804   2899   2903   2907   3004
                       3008   3375   3380   3387   3394   3398   3404   3406   3408   3412   3416
PFTAB   004470         1384   1390#
POPRO = 012600          579#  1350
POP1SP= 005726          579#
POP2SP= 022626          579#  1068
PS    = 177776          577#   902#   971#  1718#
PUSHRO= 010046          579#  1347
PUSH1S= 005746          579#
PUSH2S= 024646          579#
QV.FLG  001313          703#   908#  1009#  1057
RAM   = 020000          598#
RAMCLR= 104413          737#  1388   1808   1948   2089   2202   2347   2431   2515   2599   2684   2776   2874
                       2968   3371
REGBUF  021242         2821   2920   3504   3517   3566   3582   3731#
RESREG  004300         1341   1344#
RESTAR  004414         1371   1377#
RESTRT  002572         1008   1012   1020#
RESV16  001404          763#  1557#  1558#
RESOS = 104407          729#  1344
RETURN  001214          659#   914#   984#   986  1020#  1066#  1069  1356#  1358  1389  1608#  1616#  1617
ROMCLK= 104415          741#  3711   3714
ROMDAT  023750         1755   3738#
RUN     001304          693#   910#  1511   1514#  1515#  1522#  1523#
RXBA    022750         3142   3147   3192   3197   3292   3297   3342   3347   3736#
RXTAB   023350         3145   3195   3245   3345   3363   3367   3737#
RXTO1   017220         3144   3194   3244   3294   3344   3356#
R0    =%000000          565#   949#   957#   958#   960#   962#   964   965  1047  1053#  1067#  1200  1205#
                       1217   1230#  1234#  1244   1260#  1348#  1393  1394#  1395#  1397#  1423  1424#  1429#
                       1432#  1524#  1530   1531   1532   1533   1534  1535   1536   1537   1538  1539   1540#
                       1546   1548   1554   1556   1558   1561   1563  1565   1567#  1572#  1577#  1582#  1600#
                       1601   1604   1606   1608   1611   1612   1619  1638   1699#  1708#  1710#  1712   1720#
                       1721#  1755#  1759   1764   1765   1790#  1794#  1798#  1802#  1816   1855   1873   1885
                       1906#  1930#  1934#  1938#  1942#  1956   1995  2013   2026   2047#  2071#  2075#  2079#
                       2083#  2092   2127   2139   2162#  2184#  2188#  2192#  2196#  2206   2234   2242   2269
                       2277   2304   2310#  2329#  2333#  2337#  2341#  2353   2395#  2413#  2417#  2421#  2425#
                       2437   2479#  2497#  2501#  2505#  2509#  2521   2563#  2581#  2585#  2599#  2593#  2605
                       2649#  2666#  2670#  2674#  2678#  2686   2749#  2778#  2781   2784   2787   2790   2791#
                       2796   2809#  2810   2814#  2816#  2818   2876#  2879   2882   2885   2988   2899#  2995
                       2913#  2914   2970#  2973   2976   2979   2982   2983#  2985#  2987#  2989#  2992#  2994#
```

```
                  2999*  3000   3013*  3014   3030*  3032   3036   3041*  3048*  3050   3054   3059*  3066*
                  3069   3072   3077*  3084*  3086   3090   3095*  3124*  3128*  3132*  3136*  3174*  3178*
                  3182*  3186*  3224*  3228*  3232*  3236*  3274*  3278*  3282*  3286*  3324*  3328*  3332*
                  3336*  3372   3438   3445   3451   3485*  3499*  3500   3502*  3507*  3508   3520*  3524*
                  3525   3530   3550*  3561*  3562   3564*  3569*  3570   3572*  3573   3585*  3589*  3590
                  3595   3617   3631*  3637   3644*  3646*  3647   3650*  3651*  3652   3655*  3658*  3660*
                  3662   3668*  3678   3680*  3682   3688*  3694   3695*  3699*  3702*  3719*  3721*
R1      =%000001    566#   961*   962    963*   964   1011*  1015   1199   1206*  1218   1222*  1224   1225
                  1226   1227   1259*  1403   1405*  1408*  1411*  1568*  1573*  1578*  1583*  1623*  1628*
                  1633*  1636*  1659*  1661   1663   1665   1668   1681*  1682   1688*  1689   1693*  1709*
                  1710   1711*  1712   1713   1810*  1812*  1843*  1844   1851*  1852   1858*  1859   1863*
                  1864   1875*  1880*  1888*  1893*  1899*  1950*  1952*  1983*  1984   1991*  1992   1998*
                  1999   2003*  2004   2016*  2021*  2029*  2034*  2040*  2120*  2121   2129*  2130   2135*
                  2136   2142*  2148*  2154*  2232*  2233   2390*  2474*  2558*  2644*  2741*  2742   2777*
                  2781*  2784*  2787*  2790*  2792   2875*  2879*  2882*  2885*  2888*  2890   2969*  2973*
                  2976*  2979*  2982*  2984   3037*  3055*  3073*  3091*  3437*  3449*  3454*  3459*  3465*
                  3472*  3479*  3505*  3510*  3513   3516*  3527*  3537*  3542*  3567*  3575*  3578   3581*
                  3592*  3602*  3607*  3619*  3624*  3638   3656*  3657   3658   3667*  3679   3681*  3685
                  3687*  3712*  3715*  3719
R2      =%000002    567#   1198   1207*  1569*  1574*  1579*  1584*  1624*  1629*  1634*  1637*  1640*  1653*
                  1654*  1655   1658*  1668*  1669   1670*  1671*  1672*  1673*  1674*  1675*  1676*  1677*
                  1684*  1707*  1719*  1723*  1724*  1725*  1726*  1728*  1729*  1756*  1768*  1814*  1907*
                  1954*  2048*  2091*  2163*  2204*  2311*  2352*  2396*  2436*  2480*  2520*  2564*  2604*
                  2650*  2685*  2750*  2793*  2794   2795*  2808*  2821*  2824*  2920*  2923*  2991*  2994
                  2995*  3031*  3042*  3049*  3060*  3067*  3078*  3085*  3096*  3504*  3508   3515*  3517*
                  3549*  3566*  3570   3573   3580*  3582*  3630*  3639   3657*  3659*  3660   3666*
R3      =%000003    568#   1102   1109*  1119*  1122*  1124   1128*  1197   1208*  1219   1231*  1232*  1233*
                  1234   1243*  1244*  1249*  1252*  1258*  1619*  1620*  1621   1626   1631   1857*  1869*
                  1997*  2009*  2636*  2640*  2708*  2718*  2986*  2989*  2993*  2996*  3503*  3521*  3523*
                  3551*  3565*  3586*  3588*  3632*  3706   3708*  3716*  3718*
R4      =%000004    569#   1103   1108*  1112*  1113*  1114   1121*  1125   1127*  1135   1144*  1145   1147
                  1149   1151*  1152   1153   1174*  1175*  1179*  1196   1209*  1220   1228*  1231   1236*
                  1238*  1240*  1257*  1307*  1308*  1309*  1310*  1311*  1312*  1313   1314   1315   1404
                  1406*  1407*  1410*  1760*  1761   1844*  1846   1852*  1859*  1860   1864*  1874*  1876
                  1881*  1889*  1894*  1900*  1901   1984*  1986   1992*  1999*  2000   2004*  2015*  2017
                  2022*  2030*  2035*  2041*  2042   2121*  2123   2130*  2131   2136*  2140*  2143   2149*
                  2150   2156*  2157   2233*  2236   2268*  2271   2303*  2306   2384*  2391   2468*  2475
                  2552*  2559   2638*  2645   2737*  2739*  2742*  2743   2745   2815*  2817*  3034*  3038
                  3052*  3056   3070*  3074   3088*  3092   3431*  3433   3436*  3441   3444*  3447   3452*
                  3455   3460*  3466*  3468   3473*  3475   3480*  3482   3506*  3518*  3528*  3532   3538*
                  3543*  3545   3568*  3583*  3593*  3597   3603*  3608*  3610   3615*  3620   3625*
R5      =%000005    570#   1086   1087*  1091   1096   1098*  1134   1136*  1137   1138   1139   1140   1141
                  1142   1143*  1152*  1155*  1156*  1157*  1165   1167   1169   1175   1176*  1180*  1195
                  1210*  1221   1229*  1241*  1256*  1305*  1306*  1307   1309   1759*  1761   1809*  1811*
                  1837*  1841*  1845*  1846   1853*  1855*  1856*  1860   1966*  1972*  1876   1883*  1887*
                  1897*  1901   1949*  1951*  1977*  1981*  1985*  1986   1993*  1995*  1996*  2000   2006*
                  2012*  2017   2024*  2028*  2038*  2042   2114*  2118*  2122*  2123   2127*  2128*  2131
                  2134*  2141*  2143   2146*  2150   2153*  2157   2225*  2229*  2234*  2235*  2236   2261*
                  2265*  2269*  2270*  2271   2296*  2300*  2304*  2305*  2306   2349*  2350   2351*  2377*
                  2381*  2385*  2389*  2391   2433*  2434   2435*  2461*  2465*  2469*  2473*  2475   2517*
                  2518   2519*  2545*  2549*  2553*  2557*  2559   2601*  2602   2603*  2629*  2633*  2643*
                  2645   2743*  2744*  2745   2812*  2828*  2834*  2838*  2842*  2846*  2916*  2927*  2933*
                  2937*  2941*  2945*  3016*  3023*  3035*  3036*  3038   3053*  3054*  3056   3071*  3072*
                  3074   3089*  3090*  3092   3144*  3194*  3244*  3294*  3344*  3357   3358   3359   3360
                  3361   3362   3363*  3366*  3367   3418*  3422*  3432*  3433   3438*  3439*  3440*  3441
                  3445*  3446*  3447   3453*  3455   3462*  3467*  3468   3474*  3475   3481*  3482   3489*
```

```
SW09   = 001000             549#   1076
SW10   = 002000             548#   1354
SW11   = 004000             547#   1055
SW12   = 010000             546#   1089    1293
SW13   = 020000             545#   1298
SW14   = 040000             544#
SW15   = 100000             543#
SYNA00   001506             808#
SYNA01   001532             819#
SYNA02   001556             830#
SYNA03   001602             841#
SYNA04   001626             852#
SYNA05   001652             863#
SYNA06   001676             874#
SYNA07   001722             885#
SYNB00   001512             810#
SYNB01   001536             821#
SYNB02   001562             832#
SYNB03   001606             843#
SYNB04   001632             854#
SYNB05   001656             865#
SYNB06   001702             876#
SYNB07   001726             887#
SYNC     021346            3382    3724*   3725*   3728*   3732#
SYNCX    001240             673#
SYNC00   001516             812#
SYNC01   001542             823#
SYNC02   001566             834#
SYNC03   001612             845#
SYNC04   001636             856#
SYNC05   001662             867#
SYNC06   001706             878#
SYNC07   001732             889#
SYNC2A   001426             784#   1533*
SYNC2B   001430             785#   1535*
SYNC2C   001432             786#   1537*
SYNC2D   001434             787#   1539*
SYND00   001522             814#
SYND01   001546             825#
SYND02   001572             836#
SYND03   001616             847#
SYND04   001642             858#
SYND05   001666             869#
SYND06   001712             880#
SYND07   001736             891#
S.C    = 050000             601#
TEMP     005562            1230    1380*   1381*   1493#
TEMP1    001246             676#    936*    937     942*   1484    1715*   1716*   3640*   3663*
TEMP2    001250             677#    937*    938    1486   3641*   3645*
TEMP3    001252             678#   3642*   3644    3654*   3656    3661*   3662*   3665
TEMP4    001254             679#
TEMP5    001256             680#
TKCSR    001204             651#   1051    1110    1436    1443    1464
TKDBR    001206             652#   1041    1053    1112    1118    1288    1445    1466
TLAST  = 017046            1612    4482#
TPCSR    001210             653#   1094    1116    1295    1450
```

```
TPDBR   001212            554#   1096*   1118*   1297*   1452*
TRPOK   003762           1276#
TSTNO   001226            664#    913*   1365    1392    1597    1604    1606    1750*   1788*   1928*   2069*   2182*   2327*
                         2411*   2495*   2579*   2664*   2774*   2872*   2966*   3122*   3172*   3222*   3272*   3322*
TST1    007256           1600    1616    1750#
TST10   013154           2412    2495#
TST11   013520           2496    2579#
TST12   014064           2580    2664#
TST13   014506           2665    2774#
TST14   015034           2775    2872#
TST15   015400           2873    2966#
TST16   016176           2967    3122#
TST17   016350           3123    3172#
TST2    007372           1751    1788#
TST20   016522           3173    3222#
TST21   016674           3223    3272#
TST22   017046           3273    3322#   4482
TST23 = ****** U         3323
TST3    010160           1789    1928#
TST4    010754           1929    2069#
TST5    011434           2070    2182#
TST6    012244           2183    2327#
TST7    012610           2328    2411#
TTST    002702            978*    979*    981*    982*   1049#
TWOSYN= 010000            605#   3726
TXBAF   021350           1819    1821*   1872    2282    2350*   2356    2434*   2440    2518*   2524    2602*   2608    2689
                         2696*   2722    2793    2814    2818    2891    2992    2998    3377    3414*   3453    3529    3594
                         3733#
TXBAS   021750           1959    1961*   2012    2815    2892    3616    3734#
TXTAB   022350           1809    1820    1949    1960    2097    2211    2247    2351*   2361    2435*   2445    2519*   2529
                         2603*   2613    2693    2695*   2806    2813*   2905    2919*   2985    3010    3397    3415*   3735#
TYPDAT  004266           1319    1337    1340#
TYPE  = 104402            719#    930     935     948     953     977     985      38     999    1001    1003    1005    1093
                         1106    1123    1216    1253    1320    1321    1324     325    1327    1329    1333    1338    1393
                         1440    1442    1470    1508    1591    1609    1614    1698
TYPMSG  004166           1317    1320#
VECMAP  007102           1697    1705#
WRDCNT  003742           1224*   1254*   1262#
WRKO.F  004254           1332    1335#
XBX     004060           1294    1296    1298#
XCSR    002604           1000    1022#
XERR    002626           1006    1031#
XFR   = 030000            599#
XHEAD   005461            935    1482#
XPASS   002620           1004    1028#
XPOLY   021020           2348*   2432*   2516*   2600*   3650    3661    3670#
XSTATQ  005506            941    1482#
XTSTN   004374           1326    1363#
XVEC    002612           1002    1025#
$CRAP = 177777              1#   1736#   1746#   1773#   1784#   1913#   1924#   2054#   2065#   2169#   2178#   2317#   2323#
                         2401#   2407#   2485#   2491#   2569#   2575#   2654#   2660#   2755#   2770#   2850#   2868#   2949#
                         2962#   3103#   3118#   3153#   3168#   3203#   3218#   3253#   3268#   3303#   3319#
$E    = 000024              1#   1751    1752#   1789    1790#   1929    1930#   2070    2071#   2183    2194#   2328    2329#
                         2412    2413#   2496    2497#   2580    2581#   2665    2666#   2775    2776#   2873    2874#   2967
                         2968#   3123    3124#   3173    3174#   3223    3224#   3273    3274#   3323    3324#
$N    = 000022              1#   1736    1748    1752#   1773    1786    1790#   1913    1926    1930#   2054    2067    2071#
```

```
                    2169    2180    2184#   2317    2325    2329#   2401    2409    2413#   2485    2493    2497#   2569
                    2577    2581#   2654    2662    2666#   2755    2772    2776#   2950    2870    2874#   2949    2964
                    2968#   3103    3120    3124#   3153    3170    3174#   3203    3220    3224#   3253    3270    3274#
                    3303    3320    3324#   4482#
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.       = 026264     616#    617     620#    627#    628#    629#    630#    633#    635#    638#    642#    644#    689#
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                     812#    813#    814#    816#    817#    818#    819#    820#    821#    822#    823#    824#    825#
                     827#    828#    829#    830#    831#    832#    833#    834#    835#    836#    838#    839#    840#
                     941#    842#    843#    844#    845#    846#    847#    849#    850#    851#    852#    853#    854#
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                     869#    871#    872#    873#    874#    875#    876#    877#    878#    879#    880#    882#    883#
                     884#    885#    886#    887#    888#    889#    890#    891#    955     1044    1291    1373    1382
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                    3579    3636#   3731#   3732#   3733#   3734#   3735#   3736#   3737#
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.CONVR  003536       732    1216#
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.TYPE   003044       720    1086#
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         2273   2302   2308   2393   2477   2561   2647   2717   2747   2830   2929   3025   3040   3058   3076
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LINET2    525#   3027   3045   3063   3081
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$CK15       1#
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$CYCLE      1#   1497
$EOP        1#    987
$FINI       1#   4482
$GETFL      1#
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$HEADE      1#    525
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$LC16     525#   2654
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$SET.T      1#
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          743
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         3170   3220   3270   3320
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         3168   3203   3218   3253   3268   3303   3318
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        3618
ASL     1155  1156  1157  1276  1308  1310
BCC     1428  1717
BCS     1457
BEQ      939   947   976  1012  1040  1049  1058  1077  1079  1115  1146  1154  1248  1287  1294
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BHI     1166
BIC      958  1042  1232  1277  1289  1311  1446  1462  1467  1620  1724  1729  1871  2011  2098
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BIS     1419  1425  1463  1670  1671  1672  1673  1674  1675  1676  1677  1723  1728  1758  1767
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BLO     1168
BLOS     952  1714
BLT     1148  1459
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DECB    1007  1177  1245  1250
EMT      579
HALT     617   950   954   959  1349  1372  1509  1700
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MOV      902   903   904   909   913   914   918   919   921   926   927   928   929   936   937
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                3003
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ROLB            1514    1522    1691
ROR             1236    1238    1240    1716    3645    3654    3721
RORB            1427
RTI             1081    1099    1129    1181    1201    1211    1261    1359    1398    1412    1416    1420    1433    1703    1732
RTS             1471    1641    1733    1910    2051    2166    2314    2398    2482    2566    2652    2752    3150    3200    3250
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SUB             1274    1306
SWAB            3439
TRAP             715     717     719     721     723     725     727     729     731     733     735     737     739     741     743
TST              922     944     973    1078    1318    1322    1331    1336    1340    1345    1589    1611    1621    1661    1665
                1669    1764    1838    1849    1868    1978    1989    2008    2115    2226    2262    2297    2378    2462    2546
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                3578    3696
TSTB             916     932    1051    1057    1091    1094    1110    1116    1247    1295    1316    1443    1450    1464    1506
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                 867     868     869     871     872     873     874     875     876     877     878     879     880     882     883
                 884     885     886     887     888     889     890     891    1434    2802    2901    2909    3006    3555    3636
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DZDVCC.P11 CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

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         1735    1736    1746    1752    1773    1784    1790    1913    1924    1930    2054    2065    2071    2169    2178
         2184    2317    2323    2329    2401    2407    2413    2485    2491    2497    2569    2575    2581    2654    2660
         2666    2755    2770    2776    2850    2868    2874    2949    2962    2968    3103    3118    3124    3153    3168
         3174    3203    3218    3224    3253    3268    3274    3303    3318    3324    3739    4477    4482    4485
.PAGE     560     607     696     748     800     894     987    1497    1735    3739
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.WORD    1479


 ERRORS DETECTED:  0
 DEFAULT GLOBALS GENERATED:  0

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 RUN-TIME: 31 50 6 SECONDS
 RUN-TIME RATIO: 242/89=2.7
 CORE USED:  23K  (45 PAGES)
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Spooler runtime 19 Seconds, 83 KCS, 519 disk reads, 3 disk writes, 103 pages