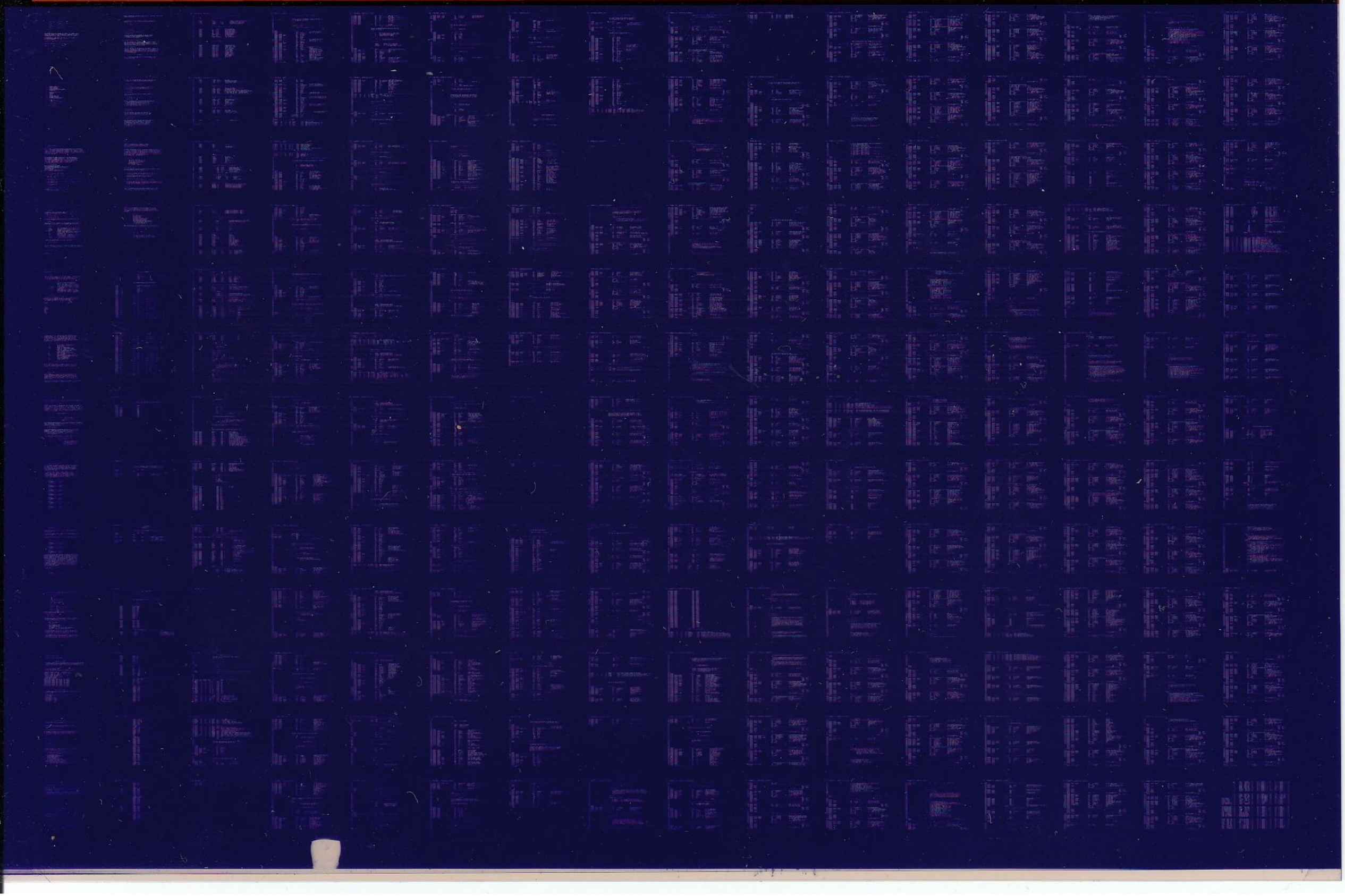
TSV05 TSV05 CTRL LTZ
CVTSBB0

AH-T096B-MC
FICHE 01 OF 02

JUL 1984
digital
Made In USA



TSV05 TSV05 CTRL LTZ
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IDENTIFICATION

PRODUCT CODE: AC-T095B-MC

PRODUCT TITLE: CVTSBBO TSV05 CONTROLLER LOGIC TEST 2

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DEPARTMENT: COMPUTER SPECIAL SYSTEMS/PPG

DATE: APRIL 27, 1983

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1.0 GENERAL INFORMATION

1.1 PROGRAM ABSTRACT

THIS IS A PDP-11/23 RESIDENT DIAGNOSTIC WHICH CHECKS THE FUNCTIONALITY OF A TSV05 MAGTAPE SUBSYSTEM WHILE CONNECTED TO A PDP-11//23 SYSTEM (Q-BUS). THE PROGRAM PROVIDES ERROR MESSAGES WHICH IDENTIFY FAILING FUNCTIONS THAT AID IN THE REPAIR OF THE DEVICE. THIS DIAGNOSTIC CONSIST OF TWELVE TEST. TEST 1-9 ARE EXECUTED IN SEQUENCE. TEST 10-12 ARE STAND ALONE TEST WHICH ALLOW THE OPERATOR TO PERFORM SPECIFIC FUNCTIONAL TEST ON SCOPE LOOPS ON CERTAIN FUNCTIONS.

THIS DIAGNOSTIC HAS BEEN WRITTEN FOR USE WITH THE DIAGNOSTIC RUNTIME SERVICES SOFTWARE (SUPERVISOR). THESE SERVICES PROVIDE THE INTERFACE TO THE OPERATOR AND TO THE SOFTWARE ENVIRONMENT. THIS PROGRAM CAN BE USED WITH XXDP+, ACT, APT, SLIDE AND PAPER TAPE. FOR A COMPLETE DESCRIPTION OF THE RUNTIME SERVICES, REFER TO THE XXDP+ USER'S MANUAL. THERE IS A BRIEF DESCRIPTION OF THE RUNTIME SERVICES IN SECTION 2 OF THIS DOCUMENT.

1.2 SYSTEM REQUIREMENTS

PDP-11/23 PROCESSOR AND MEMORY
CAUTION:DIAGNOSTIC REQUIRES 32K WORDS OF MEMORY
(28K USEABLE AND 4K RESERVED FOR I/O PAGE)
TSV05 MAGTAPE SUBSYSTEM (DRIVE AND CONTROLLER)
CONSOLE TERMINAL
PDP-11 DIAGNOSTIC SUPERVISOR (MSAAA.SYS VERSION 34 OR LATER)
PDP-11 DIAGNOSTIC LOADER/MONITOR (XXDP+)

1.3 RELATED DOCUMENTS AND STANDARDS

DIGITAL EQUIPMENT CORPORATION DOCUMENTS:

1. CHQUS XXDP+ USERS GUIDE; DOCUMENT NUMBER AC-F348E-MC
   DATE: 14 JULY 1980.

2. TSV05 TRANSPORT SUBSYSTEM USER'S GUIDE; DOCUMENT NUMBER EK-TSV05-UG-001
   DATE: AUGUST 1982

3. TSV05 TRANSPORT SUBSYSTEM TECHNICAL MANUAL; DOCUMENT NUMBER EK-TSV05-TM-001
   DATE: AUGUST 1982

4. TSV05 TRANSPORT SUBSYSTEM INSTALLATION MANUAL; DOCUMENT NUMBER EK-TSV05-IN-001
   DATE: AUGUST 1982

1.4 DIAGNOSTIC HIERARCY PREREQUISITES

FUNCTIONAL PDP-11/23 CENTRAL PROCESSOR AND MEMORY
FUNCTIONAL CONSOLE TERMINAL
FUNCTIONAL STANDALONE DIAGNOSTIC SUPERVISOR

FUNCTIONAL DIAGNOSTIC LOADER/MONITOR (XXDP+)

1.5 ASSUMPTIONS

ALL HARDWARE EXCEPT THE HARDWARE UNDER TEST IS ASSUMED TO WORK PROPERLY OR FALSE ERRORS CAN BE REPORTED.
THE TAPE BEING USED ON THE TSO5 TRANSPORT IS A KNOWN GOOD REEL OF TAPE.
CVTSAA HAS RUN SUCESSFULLY.

2.0 OPERATING INSTRUCTIONS

THIS SECTION CONTAINS A BRIEF DESCRIPTION OF THE RUNTIME SERVICES. FOR DETAILED INFORMATION, REFER TO THE XXDP+ USER'S MANUAL (CHQUS).

2.1 COMMANDS

THERE ARE ELEVEN LEGAL COMMANDS FOR THE DIAGNOSTIC RUNTIME SERVICES (SUPERVISOR). THIS SECTION LISTS THE COMMANDS AND GIVES A VERY BRIEF DESCRIPTION OF THEM. THE XXDP+ USER'S MANUAL HAS MORE DETAILS.

COMMAND	EFFECT
START	START THE DIAGNOSTIC FROM AN INITIAL STATE
RESTART	START THE DIAGNOSTIC WITHOUT INITIALIZING
CONTINUE	CONTINUE AT TEST THAT WAS INTERRUPTED (AFTER ↑C)
PROCEED	CONTINUE FROM AN ERROR HALT
EXIT	RETURN TO XXDP+ MONITOR (XXDP+ OPERATION ONLY!)
ADD	ACTIVATE A UNIT FOR TESTING (ALL UNITS ARE CONSIDERED TO BE ACTIVE AT START TIME
DROP	DEACTIVATE A UNIT
PRINT	PRINT STATISTICAL INFORMATION (IF IMPLEMENTED BY THE DIAGNOSTIC - SECTION 4.0)
DISPLAY	TYPE A LIST OF ALL DEVICE INFORMATION
FLAGS	TYPE THE STATE OF ALL FLAGS (SEE SECTION 2.3)
ZFLAGS	CLEAR ALL FLAGS (SEE SECTION 2.3)

A COMMAND CAN BE RECOGNIZED BY THE FIRST THREE CHARACTERS. SO YOU MAY, FOR EXAMPLE, TYPE "STA" INSTEAD OF "START".

2.1.1 OPERATOR COMMANDS

THE TSV05 DIAGNOSTIC IS A PDP-11/23 DIAGNOSTIC SUPERVISOR COMPATIBLE PROGRAM. ALL LOADING AND RUNTIME INSTRUCTIONS CAN BE REFERENCED IN THE CHQUS XXDP+ USERS GUIDE,DOCUMENT NUMBER AC-F348E-MC. THE USER ENTRY IS IN QUOTES.

BOOT THE DIAGNOSTIC MEDIA

```
.R VTSB??
DIAG. RUN-TIME SERVICES REV D. APR 79
CVTSB-A-0
```

```
****TSV05 LOGIC DIAGNOSTIC****
UNIT IS TSV05
>DR
```

2.2 SWITCHES

THERE ARE SEVERAL SWITCHES WHICH ARE USED TO MODIFY SUPERVISOR OPERATION. THESE SWITCHES ARE APPENDED TO THE LEGAL COMMANDS. ALL OF THE LEGAL SWITCHES ARE TABULATED BELOW WITH A BRIEF DESCRIPTION OF EACH. IN THE DESCRIPTIONS BELOW, A DECIMAL NUMBER IS DESIGNATED BY "DDDDD".

SWITCH	EFFECT
/TESTS:LIST	EXECUTE ONLY THOSE TESTS SPECIFIED IN THE LIST. LIST IS A STRING OF TEST NUMBERS, FOR EXAMPLE - /TESTS:1:5:7-10. THIS LIST WILL CAUSE TESTS 1,5,7,8,9,10 TO BE RUN. ALL OTHER TESTS WILL NOT BE RUN.
/PASS:DDDDD	EXECUTE DDDDD PASSES (DDDDD = 1 TO 64000)
/FLAGS:FLGS	SET SPECIFIED FLAGS. FLAGS ARE DESCRIBED IN SECTION 2.3.
/EOP:DDDDD	REPORT END OF PASS MESSAGE AFTER EVERY DDDDD PASSES ONLY. (DDDDD = 1 TO 64000)
/UNITS:LIST	TEST/ADD/DROP ONLY THOSE UNITS SPECIFIED IN THE LIST. LIST EXAMPLE - /UNITS:0:5:10-12 USE UNITS 0,5,10,11,12 (UNIT NUMBERS = 0-63)

EXAMPLE OF SWITCH USAGE:

```
START/TESTS:1-5/PASS:1000/EOP:100
```

THE EFFECT OF THIS COMMAND WILL BE: 1) TESTS 1 THROUGH 5 WILL BE EXECUTED, 2) ALL UNITS WILL TESTED 1000 TIMES AND 3) THE END OF PASS MESSAGES WILL BE PRINTED AFTER EACH 100 PASSES ONLY. A SWITCH CAN BE RECOGNIZED BY THE FIRST THREE CHARACTERS. YOU MAY, FOR EXAMPLE, TYPE "/TES:1-5" INSTEAD OF "/TESTS:1-5".

BELOW IS A TABLE THAT SPECIFIES WHICH SWITCHES CAN BE USED BY EACH COMMAND.

	TESTS	PASS	FLAGS	EOP	UNITS
START	X	X	X	X	X
RESTART	X	X	X	X	X
CONTINUE		X	X	X	
PROCEED			X		
DROP					X
ADD					X
PRINT					
DISPLAY					X
FLAGS					
ZFLAGS					
EXIT					

2.3 FLAGS

FLAGS ARE USED TO SET UP CERTAIN OPERATIONAL PARAMETERS SUCH AS LOOPING ON ERROR. ALL FLAGS ARE CLEARED AT STARTUP AND REMAIN CLEARED UNTIL EXPLICITLY SET USING THE FLAGS SWITCH. FLAGS ARE ALSO CLEARED AFTER A START COMMAND UNLESS SET USING THE FLAG SWITCH. THE ZFLAGS COMMAND MAY ALSO BE USED TO CLEAR ALL FLAGS. WITH THE EXCEPTION OF THE START AND ZFLAGS COMMANDS, NO COMMANDS AFFECT THE STATE OF THE FLAGS; THEY REMAIN SET OR CLEARED AS SPECIFIED BY THE LAST FLAG SWITCH.

FLAG	EFFECT
HOE	HALT ON ERROR - CONTROL IS RETURNED TO RUNTIME SERVICES COMMAND MODE
LOE	LOOP ON ERROR
IER*	INHIBIT ALL ERROR REPORTS
IBR*	INHIBIT ALL ERROR REPORTS EXCEPT FIRST LEVEL (FIRST LEVEL CONTAINS ERROR TYPE, NUMBER, PC, TEST AND UNIT)
IXE*	INHIBIT EXTENDED ERROR REPORTS (THOSE CALLED BY PRINTX MACRO'S)
PRI	DIRECT MESSAGES TO LINE PRINTER
PNT	PRINT TEST NUMBER AS TEST EXECUTES
BOE	"BELL" ON ERROR
UAM	UNATTENDED MODE (NO MANUAL INTERVENTION)
ISR	INHIBIT STATISTICAL REPORTS (DOES NOT APPLY TO DIAGNOSTICS WHICH DO NOT SUPPORT STATISTICAL REPORTING)
IDR	INHIBIT PROGRAM DROPPING OF UNITS
ADR	EXECUTE AUTODROP CODE
LOT	LOOP ON TEST

*ERROR MESSAGES ARE DESCRIBED IN SECTION 3.1

SEE THE XXDP+ USER'S MANUAL FOR MORE DETAILS ON FLAGS. YOU MAY SPECIFY MORE THAN ONE FLAG WITH THE FLAG SWITCH. FOR EXAMPLE, TO CAUSE THE PROGRAM TO LOOP ON ERROR, INHIBIT ERROR REPORTS AND TYPE A "BELL" ON ERROR, YOU MAY USE THE FOLLOWING STRING:

```
/FLAGS:LOE:IER:BOE
```

2.4 HARDWARE QUESTIONS

WHEN A DIAGNOSTIC IS STARTED, THE RUNTIME SERVICES WILL PROMPT THE USER FOR HARDWARE INFORMATION BY TYPING "CHANGE HW (L) ?" YOU MUST ANSWER "Y" AFTER A START COMMAND UNLESS THE HARDWARE INFORMATION HAS BEEN "PRELOADED" USING THE SETUP UTILITY (SEE CHAPTER 14 OF THE XXDP+ USER'S MANUAL). WHEN YOU ANSWER THIS QUESTION WITH A "Y", THE RUNTIME SERVICES WILL ASK FOR THE NUMBER OF UNITS (IN DECIMAL).

AFTER INITIAL STARTING OF THE PROGRAM (START COMMAND TO THE DIAGNOSTIC SUPERVISOR), THE PROGRAM WILL ISSUE THE "CHANGE HW?" QUESTION TO ASK IF THE HARDWARE PARAMETERS ARE TO BE CHANGED (BY THE OPERATOR).

ON A "N" (NO) RESPONSE TO THE "CHANGE HW?" QUESTION, THE DIAGNOSTIC WILL RUN USING THE DEFAULT VALUES FOR ALL QUESTIONS. THE DEFAULT ADDRESS AND VECTOR ARE:

TSBA/TSDB = 172520, VECTOR = 224

ON A "Y" (YES) RESPONSE TO THE QUESTION, THE FOLLOWING QUESTIONS WILL THEN BE ASKED TO ALLOW THE OPERATOR TO SELECT THE UNITS TO BE TESTED. A VALUE, IF PRESENT, LOCATED TO THE LEFT OF THE QUESTION MARK IS THE DEFAULT VALUE THAT WILL BE TAKEN IF ONLY A CARRIAGE RETURN IS TYPED AS A RESPONSE. A "(D)" IN A QUESTION INDICATES THAT A DECIMAL NUMBER IS REQUIRED AS A RESPONSE. AN "(O)" INDICATES AN OCTAL NUMBER IS BEING SOLICITED. AN "(L)" INDICATES THAT A LOGICAL RESPONSE IS TO BE MADE: "Y" FOR YES, "N" FOR NO.

UNITS (D) ? <ENTER THE NUMBER OF M7196 CONTROLLERS PRESENT TO BE TESTED>

UNIT 0

DEVICE ADDRESS (O) 172520 ? <ENTER THE ADDRESS OF THE TSBA/TSDB REGISTER>

VECTOR (O) 224 ? <ENTER ADDRESS OF INTERRUPT VECTOR>

THE ADDRESS AND VECTOR QUESTIONS WILL BE ASKED FOR EACH OF THE NUMBER OF UNITS (CONTROLLERS) SPECIFIED IN THE "# UNITS?" QUESTION. LOGICAL UNIT NUMBERS ARE ASSIGNED IN ORDER, BEGINNING AT 0. UP TO FOUR UNITS CAN BE SELECTED FOR TESTING AS FOLLOWS:
UP TO 4 TSV05 CONTROLLERS PER 11/23 AND UP TO 2 DRIVES PER CONTROLLER

2.5 SOFTWARE QUESTIONS

AFTER YOU HAVE ANSWERED THE HARDWARE QUESTIONS OR AFTER A RESTART OR CONTINUE COMMAND, THE RUNTIME SERVICES WILL ASK FOR SOFTWARE PARAMETERS. THESE PARAMETERS WILL GOVERN SOME DIAGNOSTIC SPECIFIC OPERATION MODES. YOU WILL BE PROMPTED BY "CHANGE SW (L) ?"
IF YOU WISH TO CHANGE ANY PARAMETERS, ANSWER BY TYPING "Y". THE SOFTWARE QUESTIONS AND THE DEFAULT VALUES ARE DESCRIBED IN THE NEXT PARAGRAPH(S).

THE FOLLOWING QUESTIONS ARE ASKED ON A START, RESTART, OR CONTINUE. THEY ALLOW FLEXIBILITY IN THE WAY THE PROGRAM BEHAVES.

CHANGE SW (L) ? <TYPE Y TO CAUSE THE FOLLOWING QUESTIONS TO BE ASKED>

INHIBIT ITERATIONS (L) N ? <TYPE "Y" TO PREVENT MULTIPLE ITERATIONS OF CERTAIN TESTS. THIS CAUSES EACH TEST PASS TO RUN AS QUICKLY AS POSSIBLE. ONLY QUICK-RUNNING LOGIC TESTS USE MULTIPLE ITERATIONS.>

2.6 EXTENDED P-TABLE DIALOGUE

WHEN YOU ANSWER THE HARDWARE QUESTIONS, YOU ARE BUILDING ENTRIES IN A TABLE THAT DESCRIBES THE DEVICES UNDER TEST. THE SIMPLEST WAY TO BUILD THIS TABLE IS TO ANSWER ALL QUESTIONS FOR EACH UNIT TO BE TESTED. IF YOU HAVE A MULTIPLEXED DEVICE SUCH AS A MASS STORAGE CONTROLLER WITH SEVERAL DRIVES OR A COMMUNICATION DEVICE WITH SEVERAL LINES, THIS BECOMES TEDIOUS SINCE MOST OF THE ANSWERS ARE REPETITIOUS.

TO ILLUSTRATE A MORE EFFICIENT METHOD, SUPPOSE YOU ARE TESTING A DEVICE, THE XY11. SUPPOSE THIS DEVICE CONSISTS OF A CONTROL MODULE WITH EIGHT UNITS (SUB-DEVICES) ATTACHED TO IT. THESE UNITS ARE DESCRIBED BY THE OCTAL NUMBERS 0 THROUGH 7. THERE IS ONE HARDWARE PARAMETER THAT CAN VARY AMONG UNITS CALLED THE Q-FACTOR. THIS Q-FACTOR MAY BE 0 OR 1. BELOW IS A SIMPLE WAY TO BUILD A TABLE FOR ONE XY11 WITH EIGHT UNITS.

```
# UNITS (D) ?  8<CR>

UNIT 1
CSR ADDRESS (O) ?  160000<CR>
SUB-DEVICE # (O) ?  0<CR>
Q-FACTOR (O) 0 ?  1<CR>

UNIT 2
CSR ADDRESS (O) ?  160000<CR>
SUB-DEVICE # (O) ?  1<CR>
Q-FACTOR (O) 1 ?  0<CR>

UNIT 3
CSR ADDRESS (O) ?  160000<CR>
SUB-DEVICE # (O) ?  2<CR>
Q-FACTOR (O) 0 ?  <CR>

UNIT 4
CSR ADDRESS (O) ?  160000<CR>
SUB-DEVICE # (O) ?  3<CR>
Q-FACTOR (O) 0 ?  <CR>

UNIT 5
CSR ADDRESS (O) ?  160000<CR>
SUB-DEVICE # (O) ?  4<CR>
Q-FACTOR (O) 0 ?  <CR>

UNIT 6
CSR ADDRESS (O) ?  160000<CR>
SUB-DEVICE # (O) ?  5<CR>
Q-FACTOR (O) 0 ?  <CR>

UNIT 7
CSR ADDRESS (O) ?  160000<CR>
SUB-DEVICE # (O) ?  6<CR>
Q-FACTOR (O) 0 ?  1<CR>

UNIT 8
CSR ADDRESS (O)  160000<CR>
```

```
        SUB-DEVICE # (0) ?  7<CR>
        Q-FACTOR (0) 1 ?  <CR>
```

NOTICE THAT THE DEFAULT VALUE FOR THE Q-FACTOR CHANGES WHEN A NON-DEFAULT RESPONSE IS GIVEN. BE CAREFUL WHEN SPECIFYING MULTIPLE UNITS!

AS YOU CAN SEE FROM THE ABOVE EXAMPLE, THE HARDWARE PARAMETERS DO NOT VARY SIGNIFICANTLY FROM UNIT TO UNIT. THE PROCEDURE SHOWN IS NOT VERY EFFICIENT.

THE RUNTIME SERVICES CAN TAKE MULTIPLE UNIT SPECIFICATIONS HOWEVER. LET'S BUILD THE SAME TABLE USING THE MULTIPLE SPECIFICATION FEATURE.

```
        # UNITS (D) ?  8<CR>

        UNIT 1
        CSR ADDRESS (0) ?  160000<CR>
        SUB-DEVICE # (0) ?  0,1<CR>
        Q-FACTOR (0) 0 ?  1,0<CR>

        UNIT 3
        CSR ADDRESS (0) ?  160000<CR>
        SUB-DEVICE # (0) ?  2-5<CR>
        Q-FACTOR (0) 0 ?  0<CR>

        UNIT 7
        CSR ADDRESS (0) ?  160000<CR>
        SUB-DEVICE # (0) ?  6,7<CR>
        Q-FACTOR (0) 0 ?  1<CR>
```

AS YOU CAN SEE IN THE ABOVE DIALOGUE, THE RUNTIME SERVICES WILL BUILD AS MANY ENTRIES AS IT CAN WITH THE INFORMATION GIVEN IN ANY ONE PASS THROUGH THE QUESTIONS. IN THE FIRST PASS, TWO ENTRIES ARE BUILT SINCE TWO SUB-DEVICES AND Q-FACTORS WERE SPECIFIED. THE SERVICES ASSUME THAT THE CSR ADDRESS IS 160000 FOR BOTH SINCE IT WAS SPECIFIED ONLY ONCE. IN THE SECOND PASS, FOUR ENTRIES WERE BUILT. THIS IS BECAUSE FOUR SUB-DEVICES WERE SPECIFIED. THE "-" CONSTRUCT TELLS THE RUNTIME SERVICES TO INCREMENT THE DATA FROM THE FIRST NUMBER TO THE SECOND. IN THIS CASE, SUB-DEVICES 2, 3, 4 AND 5 WERE SPECIFIED. (IF THE SUB-DEVICE WERE SPECIFIED BY ADDRESSES, THE INCREMENT WOULD BE BY 2 SINCE ADDRESSES MUST BE ON AN EVEN BOUNDARY.) THE CSR ADDRESSES AND Q-FACTORS FOR THE FOUR ENTRIES ARE ASSUMED TO BE 160000 AND 0 RESPECTIVELY SINCE THEY WERE ONLY SPECIFIED ONCE. THE LAST TWO UNITS ARE SPECIFIED IN THE THIRD PASS.

THE WHOLE PROCESS COULD HAVE BEEN ACCOMPLISHED IN ONE PASS AS SHOWN BELOW.

```
        # UNITS (D) ?  8<CR>

        UNIT 1
        CSR ADDRESS (0) ?  160000<CR>
        SUB-DEVICE # (0) ?  0-7<CR>
        Q-FACTOR (0) 0 ?  0,1,0,...,1,1<CR>
```

AS YOU CAN SEE FROM THIS EXAMPLE, NULL REPLIES (COMMAS ENCLOSING A NULL FIELD) TELL THE RUNTIME SERVICES TO REPEAT THE LAST REPLY.

2.7 QUICK START-UP PROCEDURE (XXDP+)

TO START-UP THIS PROGRAM:

1. BOOT XXDP+
2. GIVE THE DATE AND ANSWER THE LSI AND 50HZ (IF THERE IS A CLOCK) QUESTIONS
3. TYPE "R NAME", WHERE NAME IS THE NAME OF THE BIN OR BIC FILE FOR THIS PROGRAM
4. TYPE "START"
5. ANSWER THE "CHANGE HW" QUESTION WITH "Y"
6. ANSWER ALL THE HARDWARE QUESTIONS
7. ANSWER THE "CHANGE SW" QUESTION WITH "N"

WHEN YOU FOLLOW THIS PROCEDURE YOU WILL BE USING ONLY THE DEFAULTS FOR FLAGS AND SOFTWARE PARAMETERS. THESE DEFAULTS ARE DESCRIBED IN SECTIONS 2.3 AND 2.5.

3.0 ERROR INFORMATION

3.1 TYPES OF ERROR MESSAGES

THERE ARE THREE LEVELS OF ERROR MESSAGES THAT MAY BE ISSUED BY A DIAGNOSTIC: GENERAL, BASIC AND EXTENDED. GENERAL ERROR MESSAGES ARE ALWAYS PRINTED UNLESS THE "IER" FLAG IS SET (SECTION 2.3). THE GENERAL ERROR MESSAGE IS OF THE FORM:

```
NAME  TYPE  NUMBER  ON UNIT NUMBER  TST NUMBER PC:XXXXXX
ERROR MESSAGE
```

```
.WHERE; NAME = DIAGNOSTIC NAME
        TYPE = ERROR TYPE (SYS FATAL, DEV FATAL, HARD OR SOFT)
        NUMBER = ERROR NUMBER
        UNIT NUMBER = 0 - N (N IS LAST UNIT IN PTABLE)
        TST NUMBER = TEST AND SUBTEST WHERE ERROR OCCURRED
        PC:XXXXXX = ADDRESS OF ERROR MESSAGE CALL
```

BASIC ERROR MESSAGES ARE MESSAGES THAT CONTAIN SOME ADDITIONAL INFORMATION ABOUT THE ERROR. THESE ARE ALWAYS PRINTED UNLESS THE "IER" OR "IBR" FLAGS ARE SET (SECTION 2.3). THESE MESSAGES ARE PRINTED AFTER THE ASSOCIATED GENERAL MESSAGE.

EXTENDED ERROR MESSAGES CONTAIN SUPPLEMENTARY ERROR INFORMATION SUCH AS REGISTER CONTENTS OR GOOD/BAD DATA. THESE ARE ALWAYS PRINTED UNLESS THE "IER", "IBR" OR "IXR" FLAGS ARE SET (SECTION 2.3). THESE MESSAGES ARE PRINTED AFTER THE ASSOCIATED GENERAL ERROR MESSAGE AND ANY ASSOCIATED BASIC ERROR MESSAGES.

3.2 SPECIFIC ERROR MESSAGES

BELOW ARE SAMPLE ERROR MESSAGES. EACH ERROR MESSAGE REPRESENTS DIFFERENT TYPES OF ERRORS DETECTED BY THIS DIAGNOSTIC.

ERROR MESSAGE EXAMPLE 1

THIS ERROR IS INDICATIVE OF AN INCORRECT REGISTER OR STATUS WORD RETURNED TO THE DIAGNOSTIC. THE FIRST PART DEFINES THE TEST FUNCTION AND UNIT THAT FAILED. THE SECOND PART PRIOVIDES THE REGISTER BITS AND THEIR MNEMONICS FOR THE INCORRECT REGISTER OR STATUS WORDS. THE THIRD PART IS THE EXPECTED AND RECEIVED DATA.

```
TST: 016 FIFO EXERCISER TEST
CVTSB HRD ERR 01610 ON UNIT 00 TST 016 SUB 002 PC: 040624
FIFO STATUS (IN WORD  9) INCORRECT AFTER WRITE FIFO

 TAPE BUS SIGNALS IN WORD #8: - DESIGNATOR <BIT #>
PARERR<15>  IEOT  <12>  IFMK  <9>  IRDY<6>  IRWD<2>
IRESV2<14>  IIDENT<11>  IMER  <8>  IONL<5>  IFBY<1>
IRESV1<13>  ICER  <10>  ISPEED<7>  ILDP<4>  IFPT<0>
 TAPE BUS SIGINALS IN WORD #9:
DATMIS<7>  ILW<6>  OUTRDY<5>  INRDY<4>
 MESSAGE BUFFER ADDRESS = 047352
 MESSAGE BUFFER CONTENTS:
WORD #0 EXPD: 100020  RECV: 100020  XOR: 000000
WORD #1 EXPD: 000012  RECV: 000012  XOR: 000000
WORD #2 EXPD: 000000  RECV: 000000  XOR: 000000
WORD #3 EXPD: 000010  RECV: 000010  XOR: 000000
WORD #4 EXPD: 000000  RECV: 000000  XOR: 000000
WORD #5 EXPD: 000000  RECV: 000000  XOR: 000000
WORD #6 EXPD: 000000  RECV: 000000  XOR: 000000
WORD #7 EXPD: 000000  RECV: 000000  XOR: 000000
WORD #8 EXPD: 070217  RECV: 070217  XOR: 000000
WORD #9 EXPD: 000074  RECV: 000034  XOR: 000040
```

ERROR MESSAGE EXAMPLE 2

THIS ERROR SHOWS A FATAL FUNCTION ERROR FROM THE TAPE DRIVE.IN THIS INSTANCE A UNRECOVERABLE ERROR OCCURED WHICH INDICATES THAT THE CONTROLLER MAY BE DEFECTIVE.

```
CVTSB HRD ERR 00159 ON UNIT 00 TST 001 SUB 005 PC: 026202
TSSR NOT CORRECT AFTER SPACE RECORDS COMMAND
 TSSR = 100214
 TSSR BITS SET: SC,SSR
 TERMINATION CLASS CODE = UNRECOVERABLE ERROR
 PACKET ADDRESS = 026420
 PACKET WORD #  = 140010
 PACKET WORD #  = 000010
 PACKET WORD #  = 000000
 PACKET WORD #  = 000024
```

ERROR MESSAGE EXAMPLE 3

THIS ERROR SHOWS THAT THE MOTION BIT DID NOT GET SET WHILE DOING A REWING
WITH EXTENDED FEATURES MODE ENABLED.

```
CVTSB HRD ERR 00121 ON UNIT 00 TST 001 SUB 002 PC: 023306
MOT BIT (XSTO) NOT SET DURING REWIND (EXTENDED FEATURES MODE)
 EXPD: 000312 RECV: 000112 XOR: 000200
```

4.0 PERFORMANCE AND PROGRESS REPORTS

AT THE END OF EACH PASS, THE PASS COUNT IS GIVEN ALONG WITH THE
TOTAL NUMBER OF ERRORS REPORTED SINCE THE DIAGNOSTIC WAS STARTED.
THE "EOP" SWITCH CAN BE USED TO CONTROL HOW OFTEN THE END
OF PASS MESSAGE IS PRINTED. SECTION 2.2 DESCRIBES SWITCHES.

SUCCESSFUL RUN EXAMPLE (PDP-11/23)

```
 DR>STA/FLA:PNT:HOE:UAM

 UNITS (D) ?  1

 UNIT 0

 DEVICE ADDRESS  (O) 172520 ? <CR>

 VECTOR (O) 224 ? <CR>

 CHANGE SW (L) ? N<CR>
```

THE ABOVE COMMAND WILL START THE DIAGNOSTIC. THE COMMAND HAS THREE
SWITCHES ON WHICH ARE "PRINT EACH TEST NBR AS EXECUTED" , "HALT ON
ERROR" AND "RUN IN UNATTENDED MODE".

NOTE: THE UAM FLAG SHOULD BE USED TO PREVENT TEST 10-12 FROM BEING
EXECUTED UNLESS THE OPERATOR WANTS THESE SPECIFIC TEST.

```
TST: 001 INITIALIZE #3 TEST
TST: 002 BASIC WRITE SUBSYSTEM MEMORY TEST
TST: 003 DMA MEMORY ADDRESSING TEST
TST: 004 RAM EXERCISER TEST
TST: 005 FIFO EXERCISER TEST
TST: 006 STATIC TRANSPORT BUS CHECK
TST: 007 TRANSPORT BUS INTERFACE CHECK VIA LOOPBACK TEST
TST: 008 READ/WRITE DATA PARITY CHECK TEST
TST: 009 MISCELLANEOUS LOGIC CHECKS TEST
TST: 010 STAND-ALONE MANUAL INTERVENTION NOT EXECUTED TEST
TST: 011 STAND-ALONE CONFIGURATION TYPEOUT NOT EXECUTED TEST
TST: 012 STAND-ALONE SCOPE LOOPS NOT EXECUTED TEST
```

0 ERRORS

NOTE: THE DIAGNOSTIC WILL RUN CONTINUOUSLY UNLESS A PASS LIMIT HAS BEEN SPECIFIED WITH THE "/PASS:" SWITCH.

PROGRAM RUN TIMES:

THE AVERAGE RUN TIMES OF THE PROGRAM ARE LISTED BELOW. THESE FIGURES ARE TO BE USED AS A GUIDE. THE TIMING WAS DONE ON A PDP-11/23 PROCESSOR WITH A LA-34 CONSOLE.

THE PROGRAM RUNS IN TWO MODES; NO ITERATIONS AND DEFAULT MODE. IN THE NO ITERATIONS MODE, EACH TEST IS RUN ONCE, WITH NO ITERATIONS. IN THE DEFAULT MODE EACH TEST IS REPEATED BY THE NUMBER OF TIMES INDICATED BY THE ITERATION COUNT. NO ITERATIONS MODE IS SELECTED BY ANSWERING THE INHIBIT ITERATIONS QUESTION WITH A "Y" (YES).

TEST NUMBER	N/I SECS.	ITER SECS	DEF SECS.
1	15	50	35
2	1	6	5
3	1	1	0
4	110	540	430
5	1	10	9
6	10	120	110
7	1	3	2
8	15	15	12
9	17	17	13

THE TIMES REQUIRED TO RUN TESTS 1 THROUGH 9 IN ONE COMMAND:

Q.V. 2 MINS 19 SECONDS
DEFAULT 11 MINS 35 SECONDS

5.0 DEVICE INFORMATION TABLES

WHENEVER THE PROGRAM IS STARTED, VIA THE STA(RT) COMMAND, THE SUPERVISOR REQUESTS THE FOLLOWING P-TABLES PARAMETER CHANGES:

CHANGE HW (L) ?

UNITS (D) ? <ENTER THE NUMBER OF M7196 CONTROLLERS PRESENT TO BE TESTED>

UNIT 0

DEVICE ADDRESS (O) 172520 ? <ENTER THE ADDRESS OF THE TSBA/TSDB REGISTER>

VECTOR (O) 224 ? <ENTER ADDRESS OF INTERRUPT VECTOR>

THE ADDRESS AND VECTOR QUESTIONS WILL BE ASKED FOR EACH OF THE NUMBER OF

UNITS (CONTROLLERS) SPECIFIED IN THE "# UNITS?" QUESTION. LOGICAL UNIT NUMBERS ARE ASSIGNED IN ORDER, BEGINNING AT 0. UP TO FOUR UNITS CAN BE SELECTED FOR TESTING.

IN ADDITION, ON A START, RESTART OR CONTINUE THE SUPERVISOR REQUESTS CHANGES TO THE SOFTWARE OPERATING PARAMETERS, AS FOLLOWS:

CHANGE SW (L) ?

6.0 TEST SUMMARIES

TEST 1: INITIALIZE AFTER WRITE CHARACTERISTICS

TEST DESCRIPTION:

THIS TEST VERIFIES THAT A HARDWARE INITIALIZE COMMAND INVOKED AFTER A WRITE CHARACTERISTICS COMMAND SETS UP THE COMMAND, MESSAGE AND CHARACTERISTIC IMAGE BLOCKS IN THE CONTROLLER RAM CORRECTLY.

TEST 2: BASIC WRITE SUBSYSTEM MEMORY COMMAND

THIS TEST VERIFIES THAT THE WRITE SUBSYSTEM MEMORY COMMAND WITH A BSELO SELECT CODE OF 0 (NO-OP) EXECUTES CORRECTLY. IT ALSO VERIFIES THAT A WRITE SUBSYSTEM MEMORY COMMAND WITH A NON-ZERO MODE FIELD IS REJECTED. THE TEST FURTHER VERIFIES MICROPROGRAM COMMAND DECODING AND HANDLING SEQUENCES.

TEST 3: DMA MEMORY ADDRESSING

THIS TEST VERIFIES THAT THE CONTROLLER CAN PROPERLY ADDRESS AND ACCESS ALL AVAILABLE CPU MEMORY (OTHER THAN THAT OCCUPIED BY THE DIAGNOSTIC AND DIAGNOSTIC SUPERVISOR CODE) FOR BOTH READING (DATI) AND WRITING (DATO). VERIFIED ARE THE LSI-11 BUS DRIVERS FOR ALL AVAILABLE ADDRESS LINES. UP TO THIS POINT ONLY 16 BITS HAVE BEEN USED FOR DMA TRANSFERS.

****

CAUTION

THE LSI BUS DRIVERS FOR ALL AVAILABLE ADDRESS LINES ARE ONLY CHECKED WHEN RUNNING ON A 11/23B SYSTEM WITH MORE THAN 128K WORDS OF MEMORY!

****

TEST 4: RAM EXERCISER TEST

THIS TEST USES THE READ AND WRITE RAM (BOTH SINGLE AND 256
LOCATIONS) SELECT CODES OF THE WRITE SUBSYSTEM MEMORY COMMAND
TO EXERCISE THE CONTROLLER'S RAM MEMORY AND DMA LOGIC

TEST 5: EXTENDED FEATURES SWITCH AND TIMERS A,B

TEST DESCRIPTION:

THIS TEST VERIFIES THE INVERT EXTENDED FEATURES FUNCTION
CAN LOGICALLY INVERT THE EXTENDED FEATURES SWITCH AND
THAT THE INTERNAL TIMERS A AND B OPERATE CORRECTLY.

TEST 6: FIFO EXERCISER

TEST DESCRIPTION:

THIS TEST USES THE WRITE SUBSYSTEM MEMORY COMMAND TO
VERIFY THE CONTROLLER'S FIFO AND ASSOCIATED STATUS AND
CONTROL LOGIC.

TEST 7: STATIC TRANSPORT BUS INTERFACE TEST

TEST DESCRIPTION:

WRITE TO TSSR REGISTER TO SOFT INITIALIZE THE CONTROLLER
DO WRITE CHARACTERISTICS TO CHECK FOR EXTENDED FEATURES SWITCH
IF EXTENDED FEATURES HARDWARE SWITCH CLEAR THEN:
  DO WRITE SUBSYSTEM WRITE MISCELLANEOUS TO SET EXTENDED FEATURES.
DO WRITE CHARACTERISTICS TO SELECT RESERVED UNIT 7
DO A WRITE SUBSYSTEM READ STATUS
IF ANY TRANSPORT INTERFACE SIGNALS ARE ASSERTED THEN PRINT ERROR

TEST 8: TRANSPORT BUS INTERFACE LOOPBACK TEST

TEST DESCRIPTION:

THIS TEST VERIFIES THE CONTROLLER'S TRANSPORT BUS
DRIVERS, RECEIVERS, AND SIGNAL LOOPBACK LOGIC. NOTE
THAT THE STATIC TRANSPORT BUS TEST MUST HAVE RUN
CORRECTLY FOR THIS TEST TO PROVIDE MEANINGFUL RESULTS.

TEST 9: READ/WRITE DATA PARITY TEST

TEST DESCRIPTION:

THIS TEST VERIFIES THAT THE WRITE DATA PARITY GENERATOR
AND THE READ DATA PARITY CHECKER OPERATE PROPERLY. THE
TRANSPORT BUS SIGNAL LOOPBACK MODE IS ENABLED AND A
SET WRONG PARITY FUNCTION IS EXECUTED. THEN VARIOUS
WRITE SUBSYSTEM MEMORY FUNCTIONS ARE PERFORMED TO
WRITE DATA TO AND FROM THE FIFO IN LOOPBACK MODE.
THE PROGRAM THEN CHECKS TO INSURE A READ DATA PARITY
ERROR OCCURRED.
A RESET FIFO IS DONE AND THE READ DATA PARITY

ERROR BIT IS AGAIN TESTED TO INSURE IT CLEARED.
FINALLY A CLEAR WRONG PARITY FUNCTION IS DONE
AND IT IS VERIFIED THE DATA WORD CAN PASS IN LOOPBACK
MODE WITHOUT SETTING READ DATA PARITY ERROR.

TEST 10: MANUAL INTERVENTION

THE MANUAL INTERVENTION TEST IS A STANDALONE ROUTINE (NOT REALLY A "TEST")
THAT ALLOWS THE OPERATOR TO CHECK OUT VARIOUS ELEMENTS AND FUNCTIONS OF
THE SUBSYSTEM THAT CANNOT BE MANIPULATED BY THE PROGRAM ALONE. WHEN
THIS ROUTINE IS STARTED, IT FIRST PRINTS OUT A MENU OF SELECTABLE
SUBTESTS AND THEN WAITS FOR THE OPERATOR TO TYPE IN A SELECTION CODE.
THE ONLY WAYS TO EXIT THIS ROUTINE AND RETURN TO THE DIAGNOSTIC SUPERVISOR
ARE BY TYPING <CTRL-C> OR SELECTING CODE 6.
SELECTION CODES AND SUBROUTINES ARE:

CODE	ROUTINE
0	HELP. PRINTS THIS MENU.
1	TURN ON ALL M7196 LED INDICATORS
2	TURN OFF ALL M7196 LED INDICATORS
3	OFFLINE/ONLINE ATTENTION TEST
4	WRITE-PROTECT TEST
5	PRINT EXTENDED TRANSPORT STATUS
6	EXIT (RETURN TO SUPERVISOR)

TEST 11: CONFIGURATION TYPEOUT

THIS IS A STANDALONE ROUTINE THAT PRINTS OUT ON THE CONSOLE TERMINAL
THE CONFIGURATION OF THE M7196 MODULE AND TSV05 SUBSYSTEM. SPECIFICALLY,
THE FOLLOWING INFORMATION IS PRESENTED:

1.0 STATE OF THE EXTENDED FEATURES SWITCH ON THE M7196: ON (EXTENDED FEATURES ENABLED) OR OFF (EXTENDED FEATURES DISABLED).

2.0 STATE OF THE BUFFERING ENABLE SWITCH ON THE M7196: ON (BUFFERING ENABLED) OR OFF (BUFFERING DISABLED).

3.0 MICROCODE REVSION LEVEL OF THE M7196.

4.0 NUMBER OF TAPE TRANSPORTS CONNECTED TO THE CONTROLLER.

5.0 UNIT SELECT CODE AND STATE (ONLINE/OFFLINE, WRITE ENABLED/PROTECTED) OF EACH CONNECTED TRANSPORT. IN ADDITION, THE PROGRAM WILL INDICATE, FOR EACH ON-LINE TRANSPORT, WHETHER OR NOT IT IS EQUIPPED WITH THE EXTENDED TAPE STATUS READOUT FEATURE.

TEST 12: SCOPE LOOPS

THIS IS A STANDALONE ROUTINE PROVIDING A NUMBER OF TIGHT "SCOPE
LOOPS" USEFUL FOR DEBUGGING BASIC REGISTER ACCESS PROBLEMS WITH
THE M7196 MODULE. THESE SCOPE LOOPS CAN BE USED WHEN THE NORMAL
"LOOP ON ERROR" OR "LOOP ON TEST (SUBTEST)" FACILITIES DON'T

SEEM TO ALLOW THE OPERATOR TO ZERO IN A PROBLEM IN THE EARLY TESTS (I.E. THE HARDWARE MAY NOT BE RESPONDING TO A REGISTER ACCESS, CAUSING A BUS ERROR TRAP, EVEN THOUGH THE DEVICE ADDRESS SELECTED BY THE PROGRAM MATCHES THE CONFIGURATION SET UP IN THE HARDWARE DIP SWITCHES). THE FOLLOWING MENU OF SCOPE LOOPS ARE AVAILABLE:

CODE	SCOPE LOOP
0	HELP. PRINT THIS MENU.
1	TSBA READ ACCESS
2	TSSR READ ACCESS
3	INITIALIZE (TSSR WRITE ACCESS)
4	TSDB HIGH BYTE WRITE ACCESS
5	TSDB LOW BYTE WRITE ACCESS
6	TSDB MAINTENANCE-MODE WORD WRITE ACCESS
7	TSDBX (TSSR HIGH BYTE) WRITE ACCESS (EXTENDED FEATURES SWITCH MUST BE ON TO USE SELECTION CODE 7)
8	EXIT (RETURN TO SUPERVISOR)

FOR SCOPE LOOPS THAT WRITE INTO REGISTERS, THE PROGRAM PROMPTS THE OPERATOR FOR THE DATA TO BE WRITTEN,LIMITS ON THE DATA PATTENS ARE 0-377, TYPING <RETURN> CAUSES AN EXIT FROM THE SCOPE LOOP BACK TO MENU LEVEL.

7.0 MAINTENANCE HISTORY

REVISION A - MARCH 1982

REVISION B - APRIL 1983

MODIFIED THE DIAGNOSTIC TO HANDLE 11/23A'S WITH MORE THAN 256KB OF MEMORY. CHANGED TEST 3 SUBTEST 3 SO IT WON'T TRY TO CREATE NON-EXISTANT MEMORY ADDRESS (NXM).

```
                                        .TITLE  TSV2 - PROGRAM HEADER
                                        .SBTTL  PROGRAM HEADER

                                        .MCALL  SVC
000000                                  SVC                     ; INITIALIZE SUPERVISOR MACROS
                                        .ENABLE LC
                                        .NLIST  BEX,CND
000000                                  .ENABL  ABS,AMA
        002000                          .=2000
002000                                  BGNMOD  TSV2
002000                          TSV2::

                                ;++
                                ; THE PROGRAM HEADER IS THE INTERFACE BETWEEN
                                ; THE DIAGNOSTIC PROGRAM AND THE SUPERVISOR.
                                ;--

002000                                  POINTER BGNGW,BGNSFT,BGNAU,BGNDU,BGNRPT
002000                                  HEADER  CVTSB,B,0,655.,0
002000                          L$NAME::                ;DIAGNOSTIC NAME
002000  103                             .ASCII /C/
002001  126                             .ASCII /V/
002002  124                             .ASCII /T/
002003  123                             .ASCII /S/
002004  102                             .ASCII /B/
002005  000                             .BYTE   0
002006  000                             .BYTE   0
002007  000                             .BYTE   0
002010                          L$REV::                 ;REVISION LEVEL
002010  102                             .ASCII  /B/
002011                          L$DEPO::                ;0
002011  060                             .ASCII  /0/
002012                          L$UNIT::                ;NUMBER OF UNITS
002012  000000                          .WORD   0
002014                          L$TIML::                ;LONGEST TEST TIME
002014  001217                          .WORD   655.
002016                          L$HPCP::                ;POINTER TO H.W. QUES.
002016  101362                          .WORD   L$HARD
002020                          L$SPCP::                ;POINTER TO S.W. QUES.
002020  101514                          .WORD   L$SOFT
002022                          L$HPTP::                ;PTR. TO DEF. H.W. PTABLE
002022  002156                          .WORD   L$HW
002024                          L$SPTP::                ;PTR. TO S.W. PTABLE
002024  002166                          .WORD   L$SW
002026                          L$LADP::                ;DIAG. END ADDRESS
002026  102004                          .WORD   L$LAST
002030                          L$STA::                 ;RESERVED FOR APT STATS
002030  000000                          .WORD   0
002032                          L$CO::
002032  000000                          .WORD   0
002034                          L$DTYP::                ;DIAGNOSTIC TYPE
002034  000000                          .WORD   0
002036                          L$APT::                 ;APT EXPANSION
002036  000000                          .WORD   0
002040                          L$DTP::                 ;PTR. TO DISPATCH TABLE
002040  002124                          .WORD   L$DISPATCH
002042                          L$PRIO::                ;DIAGNOSTIC RUN PRIORITY
```

PROGRAM HEADER

```
002042  000000                  .WORD   0
002044                  L$ENVI::                ;FLAGS DESCRIBE HOW IT WAS SETUP
002044  000000                  .WORD   0
002046                  L$EXP1::                ;EXPANSION WORD
002046  000000                  .WORD   0
002050                  L$MREV::                ;SVC REV AND EDIT #
002050     003                  .BYTE   C$REVISION
002051     003                  .BYTE   C$EDIT
002052                  L$EF::                  ;DIAG. EVENT FLAGS
002052  000000                  .WORD   0
002054  000000                  .WORD   0
002056                  L$SPC::
002056  000000                  .WORD   0
002060                  L$DEVP::                ; POINTER TO DEVICE TYPE LIST
002060  003402                  .WORD   L$DVTYP
002062                  L$REPF::                ;PTR. TO REPORT CODE
002062  022664                  .WORD   L$RPT
002064                  L$EXP4::
002064  000000                  .WORD   0
002066                  L$EXP5::
002066  000000                  .WORD   0
002070                  L$AUT::                 ;PTR. TO ADD UNIT CODE
002070  022352                  .WORD   L$AU
002072                  L$DUT::                 ;PTR. TO DROP UNIT CODE
002072  022450                  .WORD   L$DU
002074                  L$LUN::                 ;LUN FOR EXERCISERS TO FILL
002074  000000                  .WORD   0
002076                  L$DESP::                ;POINTER TO DIAG. DESCRIPTION
002076  003410                  .WORD   L$DESC
002100                  L$LOAD::                ;GENERATE SPECIAL AUTOLOAD EMT
002100  104035                  EMT     E$LOAD
002102                  L$ETP::                 ;POINTER TO ERRTBL
002102  000000                  .WORD   0
002104                  L$ICP::                 ;PTR. TO INIT CODE
002104  021556                  .WORD   L$INIT
002106                  L$CCP::                 ;PTR. TO CLEAN-UP CODE
002106  022636                  .WORD   L$CLEAN
002110                  L$ACP::                 ;PTR. TO AUTO CODE
002110  022556                  .WORD   L$AUTO
002112                  L$PRT::                 ;PTR. TO PROTECT TABLE
002112  021546                  .WORD   L$PROT
002114                  L$TEST::                ;TEST NUMBER
002114  000000                  .WORD   0
002116                  L$DLY::                 ;DELAY COUNT
002116  000000                  .WORD   0
002120                  L$HIME::                ;PTR. TO HIGH MEM
002120  000000                  .WORD   0
```

```
                                .SBTTL  DISPATCH TABLE

                        ;++
                        ; THE DISPATCH TABLE CONTAINS THE STARTING ADDRESS OF EACH TEST.
                        ; IT IS USED BY THE SUPERVISOR TO DISPATCH TO EACH TEST.
                        ;--

002122                          DISPATCH 12
002122  000014                  .WORD   12
002124                  L$DISPATCH::
002124  023446                  .WORD   T1
002126  024426                  .WORD   T2
002130  026420                  .WORD   T3
002132  032014                  .WORD   T4
002134  034604                  .WORD   T5
002136  040376                  .WORD   T6
002140  050510                  .WORD   T7
002142  051770                  .WORD   T8
002144  062616                  .WORD   T9
002146  066666                  .WORD   T10
002150  074530                  .WORD   T11
002152  077702                  .WORD   T12
```

```
                                        .SBTTL  DEFAULT HARDWARE P-TABLE

                                ;++
                                ; THE DEFAULT HARDWARE P-TABLE CONTAINS DEFAULT VALUES OF
                                ; THE TEST-DEVICE PARAMETERS.  THE STRUCTURE OF THIS TABLE
                                ; IS IDENTICAL TO THE STRUCTURE OF THE RUN-TIME P-TABLE.
                                ;--
002154                                  BGNHW   DFPTBL          ;DEFAULT HARD-P-TABLE
002154  000003                          .WORD   L10000-L$HW/2
002156                          L$HW::
002156                          DFPTBL::

                                        .WORD   172520          ; 1ST (OF 2) REGISTERS.
                                        .WORD   224             ; INTERRUPT VECTOR
                                        .WORD   PRI04           ; INTERRUPT PRIORITY.
                                        ENDHW
002164                          L10000:
```

```
                                .SBTTL  SOFTWARE P-TABLE

                        ;++
                        ; THE SOFTWARE P-TABLE CONTAINS THE VALUES OF THE PROGRAM
                        ; PARAMETERS THAT CAN BE CHANGED BY THE OPERATOR.
                        ;--
002164                          BGNSW   SFPTBL
002164  000004                 .WORD   L10001-L$SW/2
002166                  L$SW::
002166                  SFPTBL::

002166  000000          TRANSTST::      .WORD   0       ; ENABLE TEST OF TRANSPORT(S) IF =1
002170  000000          NOITS::         .WORD   0       ; INHIBIT ITERATION OPTION.
                                                        ; ... 0 = ITERATE.
                                                        ; ...NZ = INHIBIT ITERATE.
002172  000017          LERRMAX::       .WORD   15.     ; LOCAL (PER TEST) ERROR LIMIT
002174  000310          GERRMAX::       .WORD   200.    ; GLOBAL (PER UNIT) ERROR LIMIT
002176                          ENDSW
002176                  L10001:

                                ENDMOD
```

```
                                .TITLE  TSV3 - GLOBAL AREAS
                                .SBTTL  GLOBAL EQUATES SECTION


002176                          BGNMOD  TSV3
002176                  TSV3::

                                .SBTTL  GLOBAL EQUATES SECTION

                                ;++
                                ; THE GLOBAL EQUATES SECTION CONTAINS PROGRAM EQUATES THAT
                                ; ARE USED IN MORE THAN ONE TEST.
                                ;--

002176                          EQUALS          ; GET STANDARD EQUATES.
                                ;
                                ; BIT DIFINITIONS
                                ;
100000                  BIT15== 100000
040000                  BIT14== 40000
020000                  BIT13== 20000
010000                  BIT12== 10000
004000                  BIT11== 4000
002000                  BIT10== 2000
001000                  BIT09== 1000
000400                  BIT08== 400
000200                  BIT07== 200
000100                  BIT06== 100
000040                  BIT05== 40
000020                  BIT04== 20
000010                  BIT03== 10
000004                  BIT02== 4
000002                  BIT01== 2
000001                  BIT00== 1
                        ;
001000                  BIT9==  BIT09
000400                  BIT8==  BIT08
000200                  BIT7==  BIT07
000100                  BIT6==  BIT06
000040                  BIT5==  BIT05
000020                  BIT4==  BIT04
000010                  BIT3==  BIT03
000004                  BIT2==  BIT02
000002                  BIT1==  BIT01
000001                  BIT0==  BIT00
                        ;
                        ; EVENT FLAG DEFINITIONS
                        ;   EF32:EF17 RESERVED FOR SUPERVISOR TO PROGRAM COMMUNICATION
                        ;
000040                  EF.START==      32.             ; START COMMAND WAS ISSUED
000037                  EF.RESTART==    31.             ; RESTART COMMAND WAS ISSUED
000036                  EF.CONTINUE==   30.             ; CONTINUE COMMAND WAS ISSUED
000035                  EF.NEW==        29.             ; A NEW PASS HAS BEEN STARTED
000034                  EF.PWR==        28.             ; A POWER-FAIL/POWER-UP OCCURRED
                        ;
                        ;
                        ; PRIORITY LEVEL DEFINITIONS
```

```
                        ;
000340                  PRI07== 340
000300                  PRI06== 300
000240                  PRI05== 240
000200                  PRI04== 200
000140                  PRI03== 140
000100                  PRI02== 100
000040                  PRI01== 40
000000                  PRI00== 0
                        ;
                        ;OPERATOR FLAG BITS
                        ;
000004                  EVL==       4
000010                  LOT==      10
000020                  ADR==      20
000040                  IDU==      40
000100                  ISR==     100
000200                  UAM==     200
000400                  BOE==     400
001000                  PNT==    1000
002000                  PRI==    2000
004000                  IXE==    4000
010000                  IBE==   10000
020000                  IER==   20000
040000                  LOE==   40000
100000                  HOE==  100000
33
34 002176                       KT11    ,,                      ;DEFINE MEMORY MANAGEMENT REGISTERS
                        .SBTTL  MEMORY MANAGEMENT DEFINITIONS
                        ;*KT11 VECTOR ADDRESS
000250                  MMVEC=  250
                        ;*KT11 STATUS REGISTER ADDRESSES
177572                  SR0=    177572
177574                  SR1=    177574
177576                  SR2=    177576
172516                  SR3=    172516
                        .IF NB
                        ;*USER "I" PAGE DESCRIPTOR REGISTERS
                        UIPDR0= 177600
                        UIPDR1= 177602
                        UIPDR2= 177604
                        UIPDR3= 177606
                        UIPDR4= 177610
                        UIPDR5= 177612
                        UIPDR6= 177614
                        UIPDR7= 177616
                        .IF NB
                        ;*USER "D" PAGE DESCRIPTOR REGISTORS
                        UDPDR0= 177620
                        UDPDR1= 177622
                        UDPDR2= 177624
                        UDPDR3= 177626
                        UDPDR4= 177630
                        UDPDR5= 177632
                        UDPDR6= 177634
                        UDPDR7= 177636
                        .ENDC
```

```
;*USER "I" PAGE ADDRESS REGISTERS
UIPAR0= 177640
UIPAR1= 177642
UIPAR2= 177644
UIPAR3= 177646
UIPAR4= 177650
UIPAR5= 177652
UIPAR6= 177654
UIPAR7= 177656
.IF NB
;*USER "D" PAGE ADDRESS REGISTERS
UDPAR0= 177660
UDPAR1= 177662
UDPAR2= 177664
UDPAR3= 177666
UDPAR4= 177670
UDPAR5= 177672
UDPAR6= 177674
UDPAR7= 177676
.ENDC
.ENDC
.IF NB
;*SUPERVISOR "I" PAGE DESCRIPTOR REGISTERS
SIPDR0= 172200
SIPDR1= 172202
SIPDR2= 172204
SIPDR3= 172206
SIPDR4= 172210
SIPDR5= 172212
SIPDR6= 172214
SIPDR7= 172216
.IF NB
;*SUPERVISOR "D" PAGE DESCRIPTOR REGISTERS
SDPDR0= 172220
SDPDR1= 172222
SDPDR2= 172224
SDPDR3= 172226
SDPDR4= 172230
SDPDR5= 172232
SDPDR6= 172234
SDPDR7= 172236
.ENDC
;*SUPERVISOR "I" PAGE ADDRESS REGISTERS
SIPAR0= 172240
SIPAR1= 172242
SIPAR2= 172244
SIPAR3= 172246
SIPAR4= 172250
SIPAR5= 172252
SIPAR6= 172254
SIPAR7= 172256
.IF NB
;*SUPERVISOR "D" PAGE ADDRESS REGISTERS
SDPAR0= 172260
SDPAR1= 172262
SDPAR2= 172264
SDPAR3= 172266
```

```
                        SDPAR4= 172270
                        SDPAR5= 172272
                        SDPAR6= 172274
                        SDPAR7= 172276
                        .ENDC
                        .ENDC
                        ;*KERNEL "I" PAGE DESCRIPTOR REGISTERS
172300                  KIPDR0= 172300
172302                  KIPDR1= 172302
172304                  KIPDR2= 172304
172306                  KIPDR3= 172306
172310                  KIPDR4= 172310
172312                  KIPDR5= 172312
172314                  KIPDR6= 172314
172316                  KIPDR7= 172316
                        .IF NB
                        ;*KERNEL "D" PAGE
                         DESCRIPTOR REGISTERS
                        KDPDR0= 172320
                        KDPDR1= 172322
                        KDPDR2= 172324
                        KDPDR3= 172326
                        KDPDR4= 172330
                        KDPDR5= 172332
                        KDPDR6= 172334
                        KDPDR7= 172336
                        .ENDC
                        ;*KERNEL "I" PAGE ADDRESS REGISTERS
172340                  KIPAR0= 172340
172342                  KIPAR1= 172342
172344                  KIPAR2= 172344
172346                  KIPAR3= 172346
172350                  KIPAR4= 172350
172352                  KIPAR5= 172352
172354                  KIPAR6= 172354
172356                  KIPAR7= 172356
                        .IF NB
                        ;*KERNEL "D" PAGE ADDRESS REGISTERS
                        KDPAR0= 172360
                        KDPAR1= 172362
                        KDPAR2= 172364
                        KDPAR3= 172366
                        KDPAR4= 172370
                        KDPAR5= 172372
                        KDPAR6= 172374
                        KDPAR7= 172376
                        .ENDC
```

```
                                .SBTTL  TSV05 REGISTER AND PACKET DEFINITIONS

                        ;
                        ; SOME GENERAL EQUATES.
                        ;

000004                  ERRVEC==        4               ; POINTER TO ERROR VECTOR FOR BUS TIME OUT.
000060                  TTIVEC==        60              ; INTERRUPT VECTOR FOR CONSOLE INPUT
177560                  TTICSR==        177560          ; BUS ADDRESS OF CONSOLE INPUT
177562                  TTIBFR==        177562          ; CONSOLE INPUT DATA BUFFER
177520                  BDVPCR==        177520          ; BDV11 PAGE CONTROL REGISTER

                        ;+
                        ;BIT DEFINITIONS FOR TSSR REGISTER
                        ;-

100000                  SC=     BIT15           ;SPECIAL CONDITION
040000                  BIE=    BIT14           ;BUS INTERFACE ERROR
020000                  SCE=    BIT13           ;SANITY CHECK ERROR
010000                  RMR=    BIT12           ;MODIFICATION REFUSED
004000                  NXM=    BIT11           ;NONEXISTANT MEMORY ERROR
002000                  NBA=    BIT10           ;NEED BUFFER ADDRESS
001400                  HIADDR= BIT9!BIT8       ;EXTENDED ADDRESS BITS
000200                  SSR=    BIT7            ;SUB SYSTEM READY
000100                  OFL=    BIT6            ;OFF LINE BIT
000060                  FATERR= BIT4!BIT5       ;FATAL TERMINATION ERROR CODES
000016                  TERCLS= BIT3!BIT2!BIT1  ;TERMINATION CODES

                        ;+
                        ;
                        ;BIT DEFINITIONS FOR EXTENDED STATUS REGISTER 0
                        ;(XST0)
                        ;
                        ;-

100000                  XSOTMK= BIT15           ;TAPE MARK DETECTED
040000                  XSORLS= BIT14           ;RECORD LENGTH SHORT
020000                  XSOLET= BIT13           ;LOGICAL END OF TAPE
010000                  XSORLL= BIT12           ;RECORD LENGTH LONG
004000                  XSOWLE= BIT11           ;WRITE LOCK ERROR
002000                  XSONEF= BIT10           ;NON EXECUTABLE FUNCTION
001000                  XSOILC= BIT9            ;ILLEGAL COMMAND
000400                  XSOILA= BIT8            ;ILLEGAL ADDRESS
000200                  XSOMOT= BIT7            ;TAPE IN MOTION
000100                  XSOONL= BIT6            ;TRANSPORT ON LINE
000040                  XSOIE=  BIT5            ;INTERRUPT ENABLE
000020                  XSOVCK= BIT4            ;VOLUME CHECK BIT
000010                  XSOPED= BIT3            ;PHASE ENCODED DRIVE
000004                  XSOWLK= BIT2            ;WRITE LOCKED
000002                  XSOBOT= BIT1            ;BEGINNING OF TAPE
000001                  XSOEOT= BIT0            ;END OF TAPE

                        ;+
                        ;BIT DEFINITIONS FOR EXTENDED STATUS REGISTER 1
                        ;(XST1)
                        ;-

100000                  X1.DLT  = BIT15         ;DATA LATE
```

```
                        X1.SPARE= BIT14          ;NOT USED
                        X1.COR  = BIT13          ;CORRECTABLE DATA ERROR
                        X1.MBZ  = BIT12+BIT11+BIT10+BIT9+BIT7+BIT6+BIT5+BIT4+BIT3+BIT2+BIT0 ;ALWAYS 0
                        X1.RBP  = BIT8           ;READ BUS PARITY ERROR
                        X1.UNC  = BIT1           ;UNCORRECTABLE DATA OR HARD ERROR

                        ;+
                        ;BIT DEFINITIONS FOR EXTENDED STATUS REGISTER 2
                        ;(XST2)
                        ;-
                        X2.OPM  = BIT15          ;OPERATION IN PROGRESS (TAPE MOVING)
                        X2.RCE  = BIT14          ;RAM CHECKSUM ERROR
                        X2.SPARE= BIT13+BIT12+BIT11+BIT9+BIT8    ;NOT USED BY TSV05 (ALWAYS=0)
                        X2.WCF  = BIT10          ;WRITE CLOCK FAILURE (FIFO NOT EMPTIED BY TRANSPORT)
                        X2.EXTF = BIT7           ;IF WRITE CHAR CMD THEN = EXTENDED FEATURES ENABLED
                        X2.BUFE = BIT6           ;IF WRITE CHAR CMD THEN = BUFFERING ENABLED
                        X2.REV  = 000077         ;IF WRITE CHAR CMD THEN = MICROCODE REVISION LEVEL
                        X2.UNIT = BIT2+BIT1+BIT0 ;IF GET STATUS THEN = CURRENTLY SELECTED UNIT NO.

                        ;+
                        ;BIT DEFINITIONS FOR EXTENDED STATUS REGISTER 3
                        ;(XST3)
                        ;-
                        X3.MDE  = 177400         ;MICRO-DIAGNOSTIC ERROR CODE
                        X3.SPARE= BIT7           ;NOT USED BY TSV05
                        X3.OPI  = BIT6           ;OPERATION INCOMPLETE
                        X3.REV  = BIT5           ;REVERSE
                        X3.TRF  = BIT4           ;TRANSPORT RESPONSE FAILURE
                        X3.DCK  = BIT3           ;DENSITY CHECK
                        X3.MBZ  =BIT2+BIT1       ;NOT USED ALWAYS 0
                        X3.RIB  = BIT0           ;REVERSE INTO BOT

                        ;+
                        ;BIT DEFINITIONS FOR EXTENDED STATUS REGISTER 4
                        ;(XST4)
                        ;-
                        X4.HSP  = BIT15          ;HIGH SPEED
                        X4.RCE  = BIT14          ;RETRY COUNT EXCEEDED
                        X4.TSM  = BIT13          ;TRANSPORT SPECIAL MODE
                        X4.MBZ  = BIT12+BIT11+BIT10+BIT9+BIT8    ;NOT USED ALWAYS 0
                        X4.WRC  = 000377         ;WRITE RETRY COUNT FIELD

                        ;+
                        ;
                        ;TSSR TERMINATION CODES (BIT 0-2)
                        ;
                        ;-

                                TSREJ=  3+2              ;COMMAND REJECTED
                                UNREC=  6                ;UNRECOVERABLE ERROR

                        ;+
                        ;
                        ;DEVICE REGISTER OFFSETS
                        ;
                        ;-
```

```
                        TSBA**  0
                        TSDB**  0               ;TSDB/TSBA REGISTER
                        TSBAH** 1
                        TSDBH** 1               ;TSDB/TSBA REGISTER HIGH BYTE
                        TSSR**  2               ;TSSR REGISTER
                        TSSRH** 3               ;TSSR REGISTER HIGH BYTE

                        ;*
                        ; TSDB ADDRESS BIT DEFINITIONS
                        ;-
                        A1716   = BIT1+BIT0     ;ADDRESS BITS 17:16 ARE IN 1:0

                        ;*
                        ; COMMAND DEFINITIONS
                        ;-
                        P.GETSTAT       = 17    ;GET STATUS
                        P.INIT          = 13    ;INITIALIZE
                        P.CONTROL       = 12    ;CONTROL COMMANDS
                        P.FORMAT        = 11    ;FORMAT
                        P.POSITION      = 10    ;POSITION
                        P.WRTSUB        = 6     ;SUBSYSTEM WRITE
                        P.WRITE         = 5     ;WRITE
                        P.WRTCHAR       = 4     ;WRITE CHARACTERISTICS
                        P.READ          = 1     ;READ

                        ;*
                        ; COMMAND PACKET HEADER WORD BIT DEFINITIONS
                        ;-
                                P.ACK   = BIT15         ;BUFFER AVAIL FOR CONTROLLER
                                P.CVC   = BIT14         ;CLEAR VOLUME CHECK
                                P.OPP   = BIT13         ;REVERSE SEQUENCE OF DATA BITS
                                P.SWB   = BIT12         ;SWAP BYTES IN MEMORY
                                P.MODE  = BIT11!BIT10!BIT9!BIT8 ;EXTENDED COMMAND MODE FIELD
                                P.IE    = BIT7          ;INTERRUPT ENABLE
                                P.FMT= BIT6!BIT5        ;PACKET HEADER TYPE (ALWAYS=0)
                                P.CMD   = 37            ;MAJOR COMMAND FIELD
                        ;*
                        ; CONTROL COMMAND MODE CODES
                        ;-
                                PC.RELEASE      = 0*256.        ;RELEASE BUFFER
                                PC.REWIND       = 1*256.        ;REWIND
                                PC.NOOP         = 2*256.        ;NO-OP
                                PC.IEREW        = 4*256.        ;REWIND IMMEDIATE INTERRUPT
                                PC.ERASE        = 5*256.        ;SECURITY ERASE

                        ;*
                        ; CONTROLLER RAM DEFINITIONS
                        ;-
                        RMCHBEG = 167           ;CHARACTERISTICS IO DATA BEGIN RAM ADDRESS
                        RMCHEND = 200           ;CHARACTERISTICS IO DATA END RAM ADDRESS
                        RMPKTBEG= 201           ;COMMAND PACKET BEGIN RAM ADDRESS
                        RMPKTEND= 210           ;COMMAND PACKET END RAM ADDRESS
                        RMMSGBEG= 215           ;MESSAGE BUFFER BEGIN RAM ADDRESS
                        RMMSGEND= 234           ;MESSAGE BUFFER END RAM ADDRESS
                        ;*
                        ;
                        ;REGISTER DEFINITIONS IN THE MESSAGE BUFFER
```

```
                        ;
                        ;-

000006                  XST0==  6               ;EXTENDED STATUS REGISTER 0 (WORD 4)
000010                  XST1==  8.              ;EXTENDED STATUS REGISTER 1 (WORD 5)
000012                  XST2==  10.             ;EXTENDED STATUS REGISTER 2 (WORD 6)
000014                  XST3==  12.             ;EXTENDED STATUS REGISTER 3 (WORD 7)
000016                  XST4==  14.             ;EXTENDED STATUS REGISTER 4 (WORD 8)

                        ;+
                        ;
                        ;OFFSETS TO WORD LOCATIONS IN PACKET DEFINITIONS
                        ;
                        ;-

000002                          PKLOW   = 2             ;LOW ORDER CHARACTERISTIC DATA POINTER
000004                          PKHI    = 4             ;HIGH ORDER CHARACTERISTIC DATA POINTER
000006                          PKBCNT  = 6             ;NUMBER OF BYTES IN DATA PACKET

000010                          EXBCNT=10               ;NUMBER OF BYTES IN EXTENDED DATA PACKET

                        ;+
                        ;DATA PACKET OFFSETS FOR WRITE SUBSYTEM COMMAND
                        ;-
000000                          BSEL0   = 0             ;BYTE 0
000001                          BSEL1   = 1             ;BYTE 1
000002                          SEL2    = 2             ;WORD 2
000004                          SELDATA = 4             ;WORD 3

                        ;+
                        ;BSELO SELECT CODES FOR WRITE SUBSYSTEM COMMAND
                        ;-
000000                  PW.NOP          = 0             ;NO-OP
000001                  PW.RDRAM        = 1             ;READ RAM
000002                  PW.WTRAM        = 2             ;WRITE RAM
000003                  PW.RFIFO        = 3             ;READ FIFO
000004                  PW.WFIFO        = 4             ;WRITE FIFO
000005                  PW.RDSTAT       = 5             ;READ STATUS
000006                  PW.WCTL         = 6             ;WRITE TAPE CONTROL
000007                  PW.WFMT         = 7             ;WRITE TAPE FORMAT
000010                  PW.WMISC        = 10            ;WRITE MISCELLANEOUS
000011                  PW.WNPR         = 11            ;WRITE NPR CONTROL
000020                  PW.D22          = 20            ;DO MICROTEST 22
000021                  PW.D11          = 21            ;DO MICROTEST 11
000022                  PW.D13          = 22            ;DO MICROTEST 13
000023                  PW.NO1311       = 23            ;DISABLE MICROTEST 11 AND 13
000024                  PW.RDEXT        = 24            ;READ EXT. TAPE STATUS (NOT SUPPORTED BY ALL TRANSPORTS

                        ;+
                        ;BSEL1 CODES FOR WRITE TAPE CONTROL
                        ;-
000200                  WC.IFAD         = BIT7          ;IFAD - FORMATTER ADDRESS
000100                  WC.IOTAD        = BIT6          ;ITAD0  - TRANSPORT ADDRESS BIT 0
000040                  WC.I1TAD        = BIT5          ;ITAD1  - TRANSPORT ADDRESS BIT 1
000020                  WC.I5RESV       = BIT4          ;IRESV5 - RESERVED #5
000010                  WC.IREW         = BIT3          ;IREW   - REWIND
000004                  WC.IRWU         = BIT2          ;IRWU   - REWIND AND UNLOAD
```

```
                        WC.IFEN         = BIT1          ;IFEN   - FORMATTER ENABLE
                        WC.IGO          = BIT0          ;GO

                        ;+
                        ;BSEL1 CODES FOR WRITE FORMAT
                        ;-
                        WF.IMISP        = BIT7          ;IMISP  - HIGH SPEED
                        WF.IWRT         = BIT6          ;IWRT   - WRITE
                        WF.IREV         = BIT5          ;IREV   - REVERSE
                        WF.IWFM         = BIT4          ;IWFM   - WRITE FILE MARK
                        WF.IEDIT        = BIT3          ;IEDIT  - EDIT
                        WF.IERASE       = BIT2          ;IERASE - ERASE
                        WF.I3RESV       = BIT1          ;IRESV3 - RESERVED #3
                        WF.I4RESV       = BIT0          ;IRESV4 - RESERVED #4

                        ;+
                        ;BSEL1 CODES FOR WRITE MISCELLANEOUS SUBCOMMAND
                        ;-
                        MS.EXT          = BIT7          ;INVERT SENSE OF EXTENDED FEATURES SWITCH
                        MS.RSFIFO       = BIT4          ;RESET FIFO AND INPUT PARITY ERRORR
                        MS.RSTAPE       = BIT3          ;RESET TAPE STATUS IN 2 FLIP-FLOPS
                        MS.ATTN         = BIT2!BIT1     ;ATTENTION TRIGGER FIELD
                        MS.RSD          = BIT0          ;RESET TIMER A,B THEN DELAY TIMES IN SEL2
                        ;+
                        ; MS.ATTN SUBCODES
                        ;-
                                MSA.NOP = 0*2           ;NO-OP (NOTHING TRIGGERED)
                                MSA.VOL = 1*2           ;SIMULATE ON-LINE/OFF-LINE TRANSISTION
                                MSA.NRAM= 2*2           ;FORCE NON-FATAL RAM ERROR (FORCES ERRCODE 54)
                                MSA.FRAM= 3*2           ;FORCE FATAL RAM ERROR (CAUSES SCE TO SET)
                        ;+
                        ; WRITE SUBSYSTEM WRITE NPR BSEL1 BIT DEFINITIONS
                        ;-
                        NP.IR           = BIT7          ;INTERRUPT REQUEST (0-1 TRANSITION)
                        NP.OUT          = BIT6          ;TAPE DATA DIRECTION OUT (0= IN)
                        NP.LOOP         = BIT5          ;ENABLE TRANSPORT LOOPBACK
                        NP.WRP          = BIT4          ;WRITE CORRECT PARITY (SET=0 TO WRITE WRONG)
                        ;+
                        ; READ STATUS MESSAGE BUFFER BIT DEFINITIONS
                        ;-

                        S2.DIM          = BIT7          ;WORD #9 BYTE 2 DATA IN MISS
                        S2.ILW          = BIT6          ;               ILW H
                        S2.OUTRDY       = BIT5          ;               OUT RDY H
                        S2.INRDY        = BIT4          ;               IN RDY H
                        S2.ATIMR        = BIT3          ;               TIMER A FLAG H
                        S2.BTIMR        = BIT2          ;               TIMER B FLAG H
                        S2.UNDEF        = BIT1+BIT0     ;(UNDEFINED)
                        S1.PARIN        = BIT15         ;WORD #8 BYTE 1 PARIN H
                        S1.I2RESV       = BIT14         ;               IRESV2
                        S1.I1RESV       = BIT13         ;               IRESV1
                        S1.IEOT         = BIT12         ;               IEOT L
                        S1.IIDENT       = BIT11         ;               IIDENT H
                        S1.ICER         = BIT10         ;               ICER H
                        S1.IFMK         = BIT9          ;               IFMK H
                        S1.IHER         = BIT8          ;               IHER H
                        S0.ISPEED       = BIT7          ;WORD #8 BYTE 0 ISPEED H
```

```
000100                  SO.IRDY         = BIT6          ;               IRDY L
000040                  SO.IONL         = BIT5          ;               IONL L
000020                  SO.ILDP         = BIT4          ;               ILDP L
000010                  SO.IDBY         = BIT3          ;               IDBY L
000004                  SO.IRWD         = BIT2          ;               IRWD L
000002                  SO.IFBY         = BIT1          ;               IFBY L
000001                  SO.IFPT         = BIT0          ;               IFPT L
                                .SBTTL  SPECIAL MACROS AND OPDEFS.

                        ;+
                        ;SAVE GENERAL REGS 1 TO 5
                        ;-

                                .MACRO  SAVREG
                                JSR     R5,REGSAV
                                .ENDM

                        ;+
                        ; MACRO TO FORCE AN ERROR
                        ;-
                        .MACRO  FORCERROR       TAG,NOTSSR
                        .NLIST
                        .IIF NDF LISTALL, .NLIST
                        .LIST
                        .IF B NOTSSR
                                MOV     TSSR(R5),R1     ;READ TSSR
                        .ENDC
                                MOV     FORCER,FORCER   ;IS FORCER SET? (LEAVE C BIT ALONE)
                                BNE     TAG             ;BR IF YES
                        .NLIST
                        .IIF NDF LISTALL, .LIST
                        .LIST
                        .ENDM

                        ;+
                        ; MACRO TO FORCE AN EXIT TO AVOID SECTION ITERATIONS
                        ;       WILL EXIT TO A LABEL IF FORCER IS NEGATIVE
                        ;       SO TO FORCE ERRORS AND EXIT ON 1 ERROR SET
                        ;       FORCER TO 177777
                        ;       TO FORCE ERRORS AND ITERATIONS SET FORCER TO 1.
                        ;-
                        .MACRO  FORCEXIT        TAG
                        .NLIST
                        .IIF NDF LISTALL, .NLIST
                        .LIST
                                MOV     FORCER,FORCER   ;IS FORCER NEGATIVE?
                                BMI     TAG             ;BR IF YES
                        .NLIST
                        .IIF NDF LISTALL, .LIST
                        .LIST
                        .ENDM
                        ;+
                        ; MACRO TO INCREMENT ERROR COUNTS
                        ;-
                        .MACRO  NEXT.ERRNO
                        .NLIST
                        ;;;.IIF NDF LISTALL, .NLIST
```

```
                                        ERRNO=ERRNO+1
                                ;;;.IIF NDF LISTALL, .LIST
                                .LIST
                                .ENDM

                                ;+
                                ;MACRO TO PERFORM XOR
                                ;-

                                        .MACRO  XOR     A,B
                                        MOV     A,-(SP)
                                        BIC     B,(SP)
                                        BIC     A,B
                                        BIS     (SP)+,B
                                        .ENDM

 000000                                 EN=0                    ; INITIALIZE ERROR NUMBER
                                        .SBTTL  FORCER  - FORCE ERROR FLAG

                                ;
                                ; THE FOLLOWING LOCATIONS MAY BE PATCHED BY THE USER
                                ; TO OBTAIN THE RESULTS DESCRIBED FOR EACH.
                                ;

002176  000000                  FORCER::       0       ; FORCE TYPE ALL HARD ERRORS (THE ONES CALLED -
                                               ; - BY THE MACRO "IFERROR").  AN ERROR NEED NOT -
                                               ; - EXIST, JUST ASSUME AND TYPE THE MESSAGE.
                                        .SBTTL  GLOBAL DATA SECTION

                                ;++
                                ;THE GLOBAL DATA SECTION CONTAINS DATA THAT ARE USED
                                ;IN MORE THAN ONE TEST.
                                ;--

                                ;
                                ;THE FOLLOWING DATA ARE SET FOR EACH UNIT AT INIT TIME.
                                ;SINGLE UNIT DEFAULTS (LISTED) ARE IN THE DEFAULT P-TABLE.
                                ;
002200  000000                  EPRTSW::        .WORD   0       ;PRINT SWITCH
002202  000000                  UNITN::         .WORD   0       ;UNIT # UNDER TEST.
002204  000000                  QVP::           .WORD   0       ;QUICK VERIFY FLAG.
002206  000000                  CSRADDR::       .WORD   0       ;ADDRESS OF CSR FOR CURRENT DEVICE
002210  000224                  IVEC::          .WORD   224     ;INTERRUPT VECTOR
002212  000200                  IPRI::          .WORD   PRI04   ;INTERRUPT PRIORITY.
002214  000000                  TSTCNT::        .WORD   0       ;NUMBER OF TESTS RUN IN THIS PASS
002216  000000                  LOOPCNT::       .WORD   0       ;REMAINING ITERATION COUNT FOR TEST
002220  000000                  DEVCNT::        .WORD   0       ;NUMBER OF DEVICE UNDER TEST
002222  000000                  FATFLG::        .WORD   0       ;SET IF FATAL ERROR IS DETECTED IN TEST
002224  000000                  INTRECV::       .WORD   0       ;SET IF TAPE INTERRUPT WAS RECEIVED
002226  000000                  EXTFEA::        .WORD   0       ;EXTENDED FEATURES SOFTWARE SW 0=OFF;1=ON
002230  000000                  BENBSW::        .WORD   0       ;BUFFER ENABLE SWITCH SW 0=OFF;1=ON
002232  000000                  EXPD::          .WORD   0       ;EXPECTED RAM DATA FOR PRAMPKT ROUTINE
002234  000000                  RECV::          .WORD   0       ;RECEIVED RAM DATA FOR PRAMPKT ROUTINE
002236  000000                  ERRHI::         .WORD   0       ;HIGH ADDRESS MEMORY ERROR
002240  000000                  ERRLO::         .WORD   0       ;LOW ADDRESS MEMORY ERROR
002242                          RAMDATA::       .BLKW   16.     ;DATA READ FROM RAM PACKET OR MESSAGE BUF AREA
002302  000000                  RAMSIZ::        .WORD   0       ;RAM DATA SIZE FOR PRAMPKT ROUTINE
```

```
                                RCVHIADD::      .WORD   0       ;RECEIVED BUFFER HIGH ADDRESS
                                RCVLOADD::      .WORD   0       ;RECEIVED BUFFER LOW ADDRESS
                                COUNT::         .WORD   0       ;TEST COUNT PATTERN
                                DATA::          .WORD   0       ;TEST DATA
                                TSTFLAG::       .WORD   0       ;TEST FLAG WORD
                                TSTPTR::        .WORD   0       ;TSTBLK POINTER
                                PRMNO::         .WORD   0       ;PRINT ROUTINE TEMP
                                EXPMSG::        .BLKB   100.    ;EXPECTED MESSAGE BUFFER DATA
                                RECMSG::        .BLKB   100.    ;RECEIVED MESSAGE BUFFER DATA
                                TMPBFR::        .BLKB   80.     ;TEMPORARY STORAGE FOR PRINT
                                        .SBTTL  TSTBLK  - TEST DATA TABLE

                                ;+
                                ;
                                ;THIS TABLE CONTAINS TEST DATA USED IN SEVERAL TESTS
                                ;
                                ;IN SEQUENCE THE DATA IS:
                                ;
                                ;       ALL ZEROS
                                ;       ALL ONES
                                ;       WALKING ONES
                                ;       WALKING ZEROS
                                ;       ALTERNATING ONES AND ZEROS
                                ;
                                ;-

002752                          TSTBLK::
002752  000000                          .WORD   0               ;ALL ZEROS
002754  177777                          .WORD   177777          ;ALL ONES
002756  000001                          .WORD   BIT0            ;DATA FOR WALKING ONES
002760  000002                          .WORD   BIT1
002762  000004                          .WORD   BIT2
002764  000010                          .WORD   BIT3
002766  000020                          .WORD   BIT4
002770  000040                          .WORD   BIT5
002772  000100                          .WORD   BIT6
002774  000200                          .WORD   BIT7
002776  000400                          .WORD   BIT8
003000  001000                          .WORD   BIT9
003002  002000                          .WORD   BIT10
003004  004000                          .WORD   BIT11
003006  010000                          .WORD   BIT12
003010  020000                          .WORD   BIT13
003012  040000                          .WORD   BIT14
003014  100000                          .WORD   BIT15
003016  177776                          .WORD   ^CBIT0          ;DATA FOR WALKING ZEROS
003020  177775                          .WORD   ^CBIT1
003022  177773                          .WORD   ^CBIT2
003024  177767                          .WORD   ^CBIT3
003026  177757                          .WORD   ^CBIT4
003030  177737                          .WORD   ^CBIT5
003032  177677                          .WORD   ^CBIT6
003034  177577                          .WORD   ^CBIT7
003036  177377                          .WORD   ^CBIT8
003040  176777                          .WORD   ^CBIT9
003042  175777                          .WORD   ^CBIT10
003044  173777                          .WORD   ^CBIT11
```

```
                                        .WORD   ↑CBIT12
                                        .WORD   ↑CBIT13
                                        .WORD   ↑CBIT14
                                        .WORD   ↑CBIT15
                                        .WORD   125252          ;ALTERNATING ONES, ZEROS
                                        .WORD   052525          ;ALTERNATING ONES, ZERO OPPOSITE FROM ABOVE
003062                          TBLEND==.
                                        .SBTTL  GLOBAL ENVIRONMENT STORAGE
                                ;
                                ;STORAGE FOR DEVICE REGISTERS
                                ;
003062  000000  100000  000000  DUMMY:  0,100000,0,0    ;DUMMY DEVICE REGISTERS...
003072  000000  000000  000000          0,0,0,0,0,0,0,0
                                                        ;...FOR MULTI-UNIT CHECKOUT.

003112  000000                  DUFLG::         .WORD   0               ;"DROPPED UNIT" FLAG.
                                                                        ;INHIBITS CODE IN "CLEAN-UP".
003114  000000                  NODEV::         .WORD   0               ;FLAG TO SAY NO DEVICE.

003116  000000                  TEMP1::         .WORD   0               ;SOME TEMP LOCATIONS.
003120  000000                  TEMP2::         .WORD   0
003122  000000                  XXCOMM::        .WORD   0               ;XXDP+ COMM BLOCK POINTER.
003124  000000                  FREE::          .WORD   0               ;1ST FREE MEMORY ADDRESS...
003126  000000                  FRESIZ::        .WORD   0               ;...AND SIZE (IN WORDS).
003130  000000                  FREEHI: .WORD   0               ;LAST WORD IN FREE SPACE
003132  000000                  KTFLG::         .WORD   0               ;KT11, MEM AVAIL FLAG -
                                                                        ;- .WORD        0 = <24K OR NO KT -
                                                                        ;- NZ = >24K AND KT.
003134  000000                  KTENABLE::      .WORD   0               ;SET BY TEST ROUTINES TO FLAG >28K UNDER TEST
003136  000000                  NXMFLG::        .WORD   0               ;SET IF WE CAN TEST CLEARED OTHERWISE
003140  000000                  NXMLO::         .WORD   0               ;NXM LO ADDRESS BITS
003142  000000                  NXMHI::         .WORD   0               ;NXM HI ADDRESS BITS FOR DAL'S 16-21
003144  000000                  T23A::          .WORD   0               ;11/23A FLAG
003146  000000                  T23B::          .WORD   0               ;11/23B FLAG
003150  000000                  T3BFLG::        .WORD   0               ;TEST 3B FLAG ↑O
003152  002000                  PST32W::        .WORD   2000            ;32W BLOCK ADDRESS FOR 32K START
003154  000000                  SIFLAG::        .WORD   0               ;
003156  000000                  BADDAT::        .WORD   0               ;ACTUAL DATA
003160  000000                  GDDAT::         .WORD   0               ;EXPECTED DATA
003162  000000                  LOOPFL::        .WORD   0
003164                          CTAB::                                  ;CONFIGURATION TABLES.
003164  000000                  CTABM::         .WORD   0               ;CONFIG WORK.
003166  000000                                  .WORD   0
003170  000000                                  .WORD   0
003172  000000                                  .WORD   0
003174  177777                                  .WORD   -1              ;END OF MEM TABLE.
003176                          CTABE::
                                ;ERROR STATISTICS TABLE (1 WORD PER UNIT), 64 UNITS MAX:
                                ;
                                ;       0       =       UNIT NOT TESTED
                                ;       100000  =       UNIT ONLINE, NO ERRORS
                                ;       10XXXX  =       UNIT ONLINE, ENCOUNTERED XXXX ERRORS
                                ;       160000  =       UNIT DROPPED, NON-EXISTENT DEVICE REGISTER
                                ;       160001  =       UNIT DROPPED, NOT IDLE AT START
                                ;       14XXXX  =       UNIT DROPPED, ENCOUNTERED XXXX ERRORS
                                ;
003176                          ERTABL:         .BLKW   64.
```

K3

GLOBAL ENVIRONMENT STORAGE

```
552 003376  000000                ERTABE:         .WORD   0
553
554 003400  000000                SKIPT:  .WORD   0               ;1=SKIP SUBTEST 0-NO SKIP OF SUBTEST
```

```
                                        .SBTTL  GLOBAL TEXT MESSAGES
                                ;++
                                ; THE GLOBAL TEXT SECTION CONTAINS FORMAT STATEMENTS,
                                ; MESSAGES, AND ASCII INFORMATION THAT ARE USED IN
                                ; MORE THAN ONE TEST.
                                ;--

                                ;+
                                ;NAMES OF DEVICES SUPPORTED
                                ;-

003402                                  DEVTYP  <TSV05>
003402                          L$DVTYP::
003402  124  123  126                    .ASCIZ  /TSV05/
                                        .EVEN

                                ;+
                                ;TEST DESCRIPTION
                                ;-
003410                                  DESCRIPT <**** TSV05 LOGIC DIAGNOSTIC - REPLACE M7196 IF ERROR ****>
003410                          L$DESC::
003410  052  052  052                    .ASCIZ  /**** TSV05 LOGIC DIAGNOSTIC - REPLACE M7196 IF ERROR ****/
                                        .EVEN


                                ;+
                                ;BIT TO ASCII CONVERSION FOR TSSR REGISTER
                                ;-

003502  003542  003545  003551  TSSRBIT::       .WORD   1$,2$,3$,4$,5$,6$,7$,8$
003522  003603  003607  003613                  .WORD   9$,10$,11$,12$,13$,14$,15$,16$
003542    123     103     000   1$:     .ASCIZ  'SC'
003545    102     111     105   2$:     .ASCIZ  'BIE'
003551    123     103     105   3$:     .ASCIZ  'SCE'
003555    122     115     122   4$:     .ASCIZ  'RMR'
003561    116     130     115   5$:     .ASCIZ  'NXM'
003565    116     102     101   6$:     .ASCIZ  'NBA'
003571    102     111     124   7$:     .ASCIZ  'BIT9'
003576    102     111     124   8$:     .ASCIZ  'BIT8'
003603    123     123     122   9$:     .ASCIZ  'SSR'
003607    117     106     114   10$:    .ASCIZ  'OFL'
003613    102     111     124   11$:    .ASCIZ  'BIT5'
003620    102     111     124   12$:    .ASCIZ  'BIT4'
003625    102     111     124   13$:    .ASCIZ  'BIT3'
003632    102     111     124   14$:    .ASCIZ  'BIT2'
003637    102     111     124   15$:    .ASCIZ  'BIT1'
003644    102     111     124   16$:    .ASCIZ  'BIT0'
                                .EVEN
003652    124     123     123   SFIERR: .ASCIZ  'TSSR ERROR AFTER SOFT INIT'
003705    124     123     123   SFHERR: .ASCIZ  'TSSR ERROR AFTER BUS RESET'
003740    040     040     116   NXR:    .ASCIZ  /  NON-EXISTANT DEVICE REGISTER/
003777    045     101     040   NXRX:   .ASCIZ  /%A  ADDRESS: %O6/
004020    045     101     040   TSSX:   .ASCII  /%A  TSBA,TSSR EXP'D: %O6%A,%O6%N/
004060    045     101     040           .ASCIZ  /%A  TSBA,TSSR REC'D: %O6%A,%O6/
004117    045     116     045   FUSI:   .ASCII  /%N%A/
004123    040     040     125   USI:    .ASCIZ  /  UNEXPECTED INTERRUPT/
004152    040     040     111   NSI:    .ASCIZ  /  INTERRUPT EXPECTED, NOT RECEIVED/
```

```
004215      045     116     045  FNOINTR:           .ASCII  /%N%A/
004221      040     040     116  NOINTR: .ASCIZ  /  NO INTERRUPT WAS GENERATED/
004256      040     040     111  IFAULT:  .ASCIZ  /  INTERRUPT FAULT/
004300      045     101     040  INTX:    .ASCIZ  /%A  CPU PC: %06%A  TSBA: %06/
004335      040     040     042  NOINIT: .ASCIZ  /  "BUS-INIT" DIDN'T INITIALIZE CONTROLLER/
004407      040     040     042  NSINIT: .ASCIZ  /  "SOFT-INIT" DIDN'T INITIALIZE THE DPU/
004457      040     040     042  BRINIT: .ASCIZ  /  "BUS-RESET" DIDN'T INITIALIZE THE DPU/

004527      000                  NUL:     .ASCIZ  //
004530      045     116     000  NULCR:   .ASCIZ  /%N/
004533      045     101     040  EXPGOT: .ASCIZ  /%A EXP'D: %06%A, REC'D: %06/
004567      045     116     045  EXPGT2: .ASCIZ  /%N%A EXP'D: %06%A, %06%N%A REC'D: %O%A, %06/
004643      045     101     040  DUAD12: .ASCIZ  /%A REG(W) WRITTEN TO: %06%A REG(R) READ; EXP'D: %06%A, REC'D: %06/
004745      122     101     115  PKTRAM::          .ASCIZ  'RAM Contents Do Not Match Packet Sent'
005013      040     040     103  SCME:    .ASCIZ  /  CONFIG DOESN'T MATCH MFG. MASTER/
005056      127     122     111  WRTMSG: .ASCIZ  'WRITE CHARACTERISTICS Failed'
005113      124     123     123  WRTERR: .ASCIZ  'TSSR Incorrect After WRITE Command, More Bits Set Than SSR'
005206      124     123     123  RDERR:   .ASCIZ  'TSSR Incorrect After READ Command, More Bits Set Than SSR'
005300      106     101     124  SCHERR: .ASCIZ  'FATAL ERROR IN SUBTEST - CHECK TAPE,CABLES,TRANSPORT etc.'
005372      105     122     122  RETERR: .ASCIZ  'ERROR IN SUBTEST - WRITE DATA RETRY FIVE TIMES FAILED'
005460      045     116     045  NOMEM:   .ASCIZ  '%N%A ***** NO NXM ADDRESS--CANNOT TEST NXM TIMEOUT. *****%N'
005554      045     116     045  M8186:   .ASCIZ  '%N%A ****************** 11/23A SYSTEM ******************%N'
005645      045     116     045  M8189:   .ASCIZ  '%N%A ****************** 11/23B SYSTEM ******************%N'
                                          .EVEN
                                          .SBTTL  GLOBAL ERROR REPORT SECTION


                                 ;++
                                 ; THE GLOBAL ERROR REPORT SECTION CONTAINS THE PRINTB AND PRINTX
                                 ; CALLS THAT ARE USED IN MORE THAN ONE TEST.
                                 ; ASCII TEXT STRINGS ARE FOUND IN THE GLOBAL TEXT SECTION.
                                 ;--

005736                                    BGNMSG  NXRERR              ;NON-EXISTANT DEVICE REGISTER.
005736                           NXRERR::
005736                                    PRINTX  #NXRX,NODEV         ;NODEV = NEXM ADDRESS.
005736  013746  003114                    MOV     NODEV,-(SP)
005742  012746  003777                    MOV     #NXRX,-(SP)
005746  012746  000002                    MOV     #2,-(SP)
005752  010600                            MOV     SP,R0
005754  104415                            TRAP    C$PNTX
005756  062706  000006                    ADD     #6,SP
005762  004737  005770                    JSR     PC,EXTEND           ; PRINT EXTENSION IF REQUIRED.
005766                                    ENDMSG
005766                           L10002:
005766  104423                            TRAP    C$MSG


                                 ;
                                 ; THIS ROUTINE APPENDS A UNIQUE EXTENSION (IF REQUIRED)
                                 ; TO ANY OF THE ABOVE ERROR SIGNATURES.
                                 ;
005770  005727                   EXTEND: TST      (PC)+
005772  000000                   EXTA:    0                           ; 0 = NO EXTENSION.
005774  001402                            BEQ     1$
005776  004777  177770                    JSR     PC,@EXTA            ; APPEND EXTENSION TEXT.
006002                           1$:      PRINTX  #NULCR              ; PRINT A BLANK LINE
006002  012746  004530                    MOV     #NULCR,-(SP)
006006  012746  000001                    MOV     #1,-(SP)
```

GLOBAL ERROR REPORT SECTION

```
        006012  010600                          MOV     SP,R0
        006014  104415                          TRAP    C$PNTX
        006016  062706  000004                  ADD     #4,SP
    673 006022  000207                          RTS     PC
```

```
                        .SBTTL  PRITSSR - PRINT TSSR CONTENTS

                ;*
                ;
                ;ROUTINE TO DISPLAY THE CONTENTS, AND BIT DEFINITIONS, OF
                ;THE TSSR REGISTER. THIS ROUTINE IS NORMALLY CALLED ONLY
                ;BY A MESSAGE PRINTING ROUTINE
                ;
                ;INPUTS:
                ;
                ;       R1      CONTENTS OF TSSR
                ;
                ;SUBORDINATE ROUTINES:
                ;
                ;       CHKAMB  CHECK FOR AMBIGUOUS CONTENTS
                ;
                ;-

006024          PRITSSR:
006024                  SAVREG                          ;SAVE GENERAL REGISTERS
006030  010104          MOV     R1,R4                   ;SAVE THE TSSR CONTENTS
006032                  PRINTB  @TSSRFOR,R4             ;PRINT THE CONTENTS OF TSSR
006032  010446          MOV     R4,-(SP)
006034  012746  006415  MOV     @TSSRFOR,-(SP)
006040  012746  000002  MOV     #2,-(SP)
006044  010600          MOV     SP,R0
006046  104414          TRAP    C$PNTB
006050  062706  000006  ADD     #6,SP
006054  010400          MOV     R4,R0                   ;GET TSSR BACK FOR CHKAMB
006056  004737  016044  JSR     PC,CHKAMB               ;ARE CONTENTS AMBIGUOUS ?
006062  103410          BCS     5$                      ;BRANCH IF NOT
006064                  PRINTX  #AMBTSSR                ;SHOW CONTENTS ARE AMBIGUOUS
006064  012746  006635  MOV     #AMBTSSR,-(SP)
006070  012746  000001  MOV     #1,-(SP)
006074  010600          MOV     SP,R0
006076  104415          TRAP    C$PNTX
006100  062706  000004  ADD     #4,SP
006104  010403  5$:     MOV     R4,R3                   ;CONTENTS OF TSSR
006106  042703  001476  BIC     #HIADDR!FATERR!TERCLS,R3        ;CLEAR ALL MULTIPLE BIT FIELDS
006112  001434          BEQ     20$                     ;NO BITS ARE SET
006114  012702  002632  MOV     #TMPBFR,R2              ;TEMPORARY ASCII BUFFER
006120  012701  003502  MOV     #TSSRBIT,R1             ;ASCII EQUIVALENT OF BITS
006124  005703  10$:    TST     R3                      ;REMAINING BITS TO CONVERT
006126  001413          BEQ     15$                     ;BRANCH WHEN ALL ARE DONE
006130  000241          CLC                             ;CLEAR CARRY FOR SHIFT
006132  006103          ROL     R3                      ;SHIFT NEXT BIT TO CARRY
006134  103006          BCC     13$                     ;BRANCH IF BIT NOT SET
006136  011100          MOV     (R1),R0                 ;POINTER TO BIT DEFINITION
006140  112022  11$:     MOVB    (R0)+,(R2)+             ;MOVE ASCIZ TO BUFFER
006142  001376          BNE     11$                     ;MOVE ALL BITS
006144  112762  000054  177777  MOVB    #',,-1(R2)      ;INSERT A COMMA TO TERMINATE
006152  005721  13$:     TST     (R1)+                   ;POINT TO NEXT DESCRIPTION
006154  000763          BR      10$                     ;GET THE REMAINING BITS
006156  105042  15$:     CLRB    -(R2)                   ;TERMINATE THE LINE
006160                  PRINTX  #TSSDEF,#TMPBFR         ;PRINT THE BIT DEFINITIONS
006160  012746  002632  MOV     #TMPBFR,-(SP)
006164  012746  006606  MOV     #TSSDEF,-(SP)
```

```
                006170  012746  000002          MOV     #2,-(SP)
                006174  010600                  MOV     SP,R0
                006176  104415                  TRAP    C$PNTX
                006200  062706  000006          ADD     #6,SP
    719
    720         006204  010403          20$:    MOV     R4,R3           ;GET THE TSSR CONTENTS
    721         006206  042703  177761          BIC     #^CTERCLS,R3    ;CLEAR ALL BUT TERMINATION
    722         006212  016303  006676          MOV     TCOCOD(R3),R3   ;GET THE TERMINATION CODE MEANING
    723         006216                          PRINTX  #TCOASC,R3      ;PRINT THE TERMINATION CODE
                006216  010346                  MOV     R3,-(SP)
                006220  012746  006476          MOV     #TCOASC,-(SP)
                006224  012746  000002          MOV     #2,-(SP)
                006230  010600                  MOV     SP,R0
                006232  104415                  TRAP    C$PNTX
                006234  062706  000006          ADD     #6,SP
    724         006240  010403                  MOV     R4,R3           ;TSSR CONTENTS AGAIN
    725         006242  042703  177717          BIC     #^CFATERR,R3    ;CLEAR ALL BUT FATAL TERMINATION
    726         006246  001416                  BEQ     25$             ;DON'T PRINT IF ZERO
    727         006250  006203                  ASR     R3
    728         006252  006203                  ASR     R3
    729         006254  006203                  ASR     R3              ;ALINE TERMINATION CODE FOR INDEX
    730         006256  016303  007236          MOV     TSFCOD(R3),R3   ;GET THE FATAL TERMINATION CODE
    731         006262                          PRINTX  #TFCASC,R3      ;PRINT THE FATAL TERMINATION CODE
                006262  010346                  MOV     R3,-(SP)
                006264  012746  006537          MOV     #TFCASC,-(SP)
                006270  012746  000002          MOV     #2,-(SP)
                006274  010600                  MOV     SP,R0
                006276  104415                  TRAP    C$PNTX
                006300  062706  000006          ADD     #6,SP
    732         006304  042704  176377  25$:    BIC     #^CHIADDR,R4    ;CLEAR ALL BUT EXTENDED ADDRESS
    733         006310  001411                  BEQ     30$             ;DON'T PRINT IF ZERO
    734         006312                          PRINTX  #TEXASC,R4      ;PRINT THE EXTENDED ADDRESS BITS
                006312  010446                  MOV     R4,-(SP)
                006314  012746  006435          MOV     #TEXASC,-(SP)
                006320  012746  000002          MOV     #2,-(SP)
                006324  010600                  MOV     SP,R0
                006326  104415                  TRAP    C$PNTX
                006330  062706  000006          ADD     #6,SP
    735         006334  013703  002200  30$:    MOV     EPRTSW,R3               ;PRINT MEAASGE BUFFER ADDRESS
    736         006340                          PRINTX  R3                      ;PRINT PROPER MESSAGE
                006340  010346                  MOV     R3,-(SP)
                006342  012746  000001          MOV     #1,-(SP)
                006346  010600                  MOV     SP,R0
                006350  104415                  TRAP    C$PNTX
                006352  062706  000004          ADD     #4,SP
    737         006356  000207                  RTS     PC              ;RETURN TO CALLER
    738
    744         006360                  EPRT2:
    745         006360      045     116     045 EPRT1:  .ASCIZ  '<NL>A ******REPLACE M7196******'
    746
    756         006415      045     116     045 TSSRFOR:        .ASCIZ  '<NL>A TSSR = <06>'
    757         006435      045     116     045 TEXASC:         .ASCIZ  '<NL>A Extended Address Bits = <06>'
    758         006476      045     116     045 TCOASC:         .ASCIZ  '<NL>A Termination Class Code = <T>'
    759         006537      045     116     045 TFCASC:         .ASCIZ  '<NL>A Fatal Termination Class Code = <T>'
    760         006606      045     116     045 TSSDEF:         .ASCIZ  '<NL>A TSSR Bits Set: <T>'
    761         006635      045     116     045 AMBTSSR:        .ASCIZ  '<NL>A TSSR Contents Are Ambiguous'
    762                                         .EVEN
```

```
006676  006716  006741  006767  TCOCOD: .WORD   1$,2$,3$,4$,5$,6$,7$,8$
006716     116     157     162  1$:     .ASCIZ  'Normal Termination'
006741     124     145     162  2$:     .ASCIZ  'Termination Condition'
006767     124     141     160  3$:     .ASCIZ  'Tape Status Alert'
007011     106     165     156  4$:     .ASCIZ  'Function Reject'
007031     122     145     143  5$:     .ASCIZ  'Recoverable Error - Tape Position One Record Down'
007113     122     145     143  6$:     .ASCIZ  'Recoverable Error - Tape Was Not Moved'
007162     125     156     162  7$:     .ASCIZ  'Unrecoverable Error'
007206     106     141     164  8$:     .ASCIZ  'Fatal Controller Error'
                                        .EVEN

007236  007246  007302  007313  TSFCOD: .WORD   1$,2$,3$,4$
007246     111     156     164  1$:     .ASCIZ  'Internal Diagnostic Failure'
007302     122     145     163  2$:     .ASCIZ  'Reserved'
007313     102     165     163  3$:     .ASCIZ  'Bus Interface or Sanity Check Error'
007357     122     145     163  4$:     .ASCIZ  'Reserved'
                                        .EVEN
                                        .SBTTL  PRIPKT  - PRINT THE ADDRESS/CONTENTS OF COMMAND PACKET

                                ;+
                                ;THIS ROUTINE PRINTS THE ADDRESS AND CONTENTS OF A COMMAND PACKET.
                                ;THIS ROUTINE IS NORMALLY ONLY CALLED FROM A PRINT ROUTINE.
                                ;
                                ;INPUT:
                                ;
                                ;       R0      NUMBER OF WORDS IN PACKET
                                ;       R3      HIGH ORDER COMMAND PACKET ADDRESS
                                ;       R4      ADDRESS OF COMMAND PACKET
                                ;
                                ;       NOTE:   R3 IS IGNORED IF THE KTENABLE FLAG IS CLEAR.
                                ;-

007370                          PRIPKT::
007370                                  SAVREG                          ;SAVE THE REGISTERS
007374  010005                          MOV     R0,R5                   ;SAVE NO. OF WORDS IN PACKET
007376  005737  003134                  TST     KTENABLE                ;ABOVE 28K UNDER TEST?
007402  001001                          BNE     10$                     ;BR IF YES
007404  005003                          CLR     R3                      ;SET HIGH ORDER ADDRESS TO 0
007406  010301                  10$:    MOV     R3,R1                   ;COPY HIGH ORDER ADDRESS
007410  010400                          MOV     R4,R0                   ;GET LOWER ADDRESS
007412  006100                          ROL     R0                      ;SHIFT BIT 15 INTO C BIT
007414  006101                          ROL     R1                      ;AND INTO HIGH ORDER.
007416                                  PRINTB  #PKTADD,R1,R4           ;PRINT PACKET ADDRESS
007416  010446                          MOV     R4,-(SP)
007420  010146                          MOV     R1,-(SP)
007422  012746  007554                  MOV     #PKTADD,-(SP)
007426  012746  000003                  MOV     #3,-(SP)
007432  010600                          MOV     SP,R0
007434  104414                          TRAP    C$PNTB
007436  062706  000010                  ADD     #10,SP
007442  010300                  15$:    MOV     R3,R0                   ;GET HIGH ORDER ADDRESS
007444  001404                          BEQ     20$                     ;BR IF NOT ABOVE 28K.
007446  010401                          MOV     R4,R1                   ;GET LOW ORDER ADDRESS
007450  004737  017316                  JSR     PC,SETMAP               ;SETUP PAR6 MAPPING FOR 18 BIT ADDRESS
007454  010004                          MOV     R0,R4                   ;GET RETURNED PAR6 ADDRESS BIAS
007456  005001                  20$:    CLR     R1                      ;SAVE WORD NUMBER
007460  012402                  25$:    MOV     (R4)+,R2                ;GET PACKET CONTENTS
```

```
                                        PRINTB  @PKTFRM,R1,R2    ;PRINT THE DATA
007462  010246                          MOV     R2,-(SP)
007464  010146                          MOV     R1,-(SP)
007466  012746  007516                  MOV     @PKTFRM,-(SP)
007472  012746  000003                  MOV     #3,-(SP)
007476  010600                          MOV     SP,R0
007500  104414                          TRAP    C$PNTB
007502  062706  000010                  ADD     #10,SP
007506  005201                          INC     R1              ;NEXT WORD NUMBER
007510  020105                          CMP     R1,R5           ;DONE ALL PACKET WORDS?
007512  002762                          BLT     25$             ;LOOP TILL ALL DONE
007514  000207                          RTS     PC              ;RETURN

007516      045     116     045 PKTFRM: .ASCIZ   '%N%A Packet Word #%D1%A = %O6'
007554      045     116     045 PKTADD: .ASCIZ   '%N%A Packet Address = %O1%O5'
                                        .EVEN
                                        .SBTTL  PRIBXOR - PRINT EXPD, RECV AND XOR BYTE

                                ;+
                                ;
                                ;PRINT EXPECTED DATA, RECEIVED DATA, AND XOR OF THE DATA BYTE
                                ;THIS ROUTINE IS NORMALLY CALLED ONLY FOR PRINT ROUTINES.
                                ;
                                ;INPUTS:
                                ;
                                ;       R1      RECEIVED DATA
                                ;       R2      EXPECTED DATA
                                ;
                                ;OUTPUT:
                                ;
                                ;       R0      XOR OF EXPECTED/RECEIVED DATA
                                ;
                                ;-

007612                          PRIBXOR::
007612                                  SAVREG                  ;SAVE THE REGISTERS
007616  010203                          MOV     R2,R3           ;EXPECTED DATA
007620                                  XOR     R1,R3           ;FORM THE EXCLUSIVE OR
007630  012700  177400                  MOV     @#C<377>,R0     ;BYTE MASK
007634  040001                          BIC     R0,R1           ;SAVE LOW BYTE RECV
007636  040002                          BIC     R0,R2           ;SAVE LOW BYTE EXPD
007640  040003                          BIC     R0,R3           ;SAVE LOW BYTE XOR
007642                                  PRINTB  @XORBFOR,R2,R1,R3 ;PRINT THE MESSAGE
007642  010346                          MOV     R3,-(SP)
007644  010146                          MOV     R1,-(SP)
007646  010246                          MOV     R2,-(SP)
007650  012746  007674                  MOV     @XORBFOR,-(SP)
007654  012746  000004                  MOV     #4,-(SP)
007660  010600                          MOV     SP,R0
007662  104414                          TRAP    C$PNTB
007664  062706  000012                  ADD     #12,SP
007670  010300                          MOV     R3,R0           ;R0 HAS XOR ON RETURN
007672  000207                          RTS     PC              ;RETURN TO CALLER

007674      045     116     045 XORBFOR:        .ASCIZ  '%N%A EXPD: %O3%A RECV: %O3%A XOR: %O3'
                                        .EVEN
                                        .SBTTL  PRIXOR  - PRINT EXPD, RECV AND XOR
```

```
                        ;*
                        ;
                        ;PRINT EXPECTED DATA, RECEIVED DATA, AND XOR OF THE TWO
                        ;THIS ROUTINE IS NORMALLY CALLED ONLY FOR PRINT ROUTINES.
                        ;
                        ;INPUTS:
                        ;
                        ;       R1      RECEIVED DATA
                        ;       R2      EXPECTED DATA
                        ;
                        ;OUTPUT:
                        ;
                        ;       R0      XOR OF EXPECTED/RECEIVED DATA
                        ;
                        ;-

007742                  PRIXOR::
007742                          SAVREG                          ;SAVE THE REGISTERS
007746  010203                  MOV     R2,R3                   ;EXPECTED DATA
007750                          XOR     R1,R3                   ;FORM THE EXCLUSIVE OR
007760                          PRINTB  #XORFOR,R2,R1,R3 ;PRINT THE MESSAGE
007760  010346                  MOV     R3,-(SP)
007762  010146                  MOV     R1,-(SP)
007764  010246                  MOV     R2,-(SP)
007766  012746  010012          MOV     #XORFOR,-(SP)
007772  012746  000004          MOV     #4,-(SP)
007776  010600                  MOV     SP,R0
010000  104414                  TRAP    C$PNTB
010002  062706  000012          ADD     #12,SP
010006  010300                  MOV     R3,R0                   ;R0 HAS XOR ON RETURN
010010  000207                  RTS     PC                      ;RETURN TO CALLER

010012  045  116  045  XORFOR: .ASCIZ  '%N%A EXPD: %06%A RECV: %06%A XOR: %06'
                        .EVEN
                        .SBTTL  PRIEQU  - PRINT BIT NUMBERS AS ASCII EQUIVALENT

                        ;*
                        ;
                        ;ROUTINE TO CONVERT BIT VALUES TO ASCII AND PRINT THE STRING
                        ;THIS ROUTINE IS NORMALLY CALLED FROM A PRINT ROUTINE
                        ;
                        ;INPUTS:
                        ;
                        ;       R0      OCTAL VALUE TO CONVERT
                        ;       R1      TABLE OF POINTERS TO ASCII EQUIVALENT
                        ;
                        ;-

010060                  PRIEQU:
010060                          SAVREG                                  ;SAVE THE REGISTERS
010064  000207                  RTS     PC                              ;RETURN TO CALLER

                        .SBTTL  PRIRAM  - PRINT RAM ADDRESS
                        ;*
                        ;
                        ;PRINT CONTROLLER RAM ADDRESS.
```

```
                                        ;THIS ROUTINE IS NORMALLY CALLED ONLY FROM PRINT ROUTINES.
                                        ;
                                        ;INPUTS:
                                        ;
                                        ;       R4      RAM ADDRESS
                                        ;
                                        ;-
010066                                  PRIRAM:
010066                                          SAVREG                          ;SAVE R1-R5 UNTIL NEXT RETURN
010072                                          PRINTB  @RAMFOR,R4              ;PRINT RAM ADDRESS IN ERROR
010072  010446                                  MOV     R4,-(SP)
010074  012746  010116                          MOV     @RAMFOR,-(SP)
010100  012746  000002                          MOV     #2,-(SP)
010104  010600                                  MOV     SP,R0
010106  104414                                  TRAP    C$PNTB
010110  062706  000006                          ADD     #6,SP
010114  000207                                  RTS     PC                      ;RETURN

010116     045     116     045  RAMFOR: .ASCIZ  '%N%A CONTROLLER RAM ADDRESS = %O6'
                                        .EVEN

                                        .SBTTL  PRIADD  - PRINT MEMORY ERROR ADDRESS
                                        ;*
                                        ;
                                        ;PRINT MEMORY ADDRESS
                                        ;THIS ROUTINE IS NORMALLY CALLED ONLY FROM PRINT ROUTINES.
                                        ;
                                        ; IMPLICIT INPUTS
                                        ;
                                        ;       ERRHI   - HIGH ORDER ADDRESS
                                        ;       ERRLO   - LOW ORDER ADDRESS
                                        ;
                                        ;-
010160                                  PRIADD:
010160                                          SAVREG                          ;SAVE R1-R5 UNTIL NEXT RETURN
010164  013700  002236                          MOV     ERRHI,R0                ;GET HIGH ADDRESSS
010170  013701  002240                          MOV     ERRLO,R1                ;GET LOW ADDRESS
010174  010102                                  MOV     R1,R2                   ;COPY LOW ADDRESS
010176  006101                                  ROL     R1                      ;SHIFT BIT 15 TO C BIT
010200  006100                                  ROL     R0                      ;SHIFT INTO HIGH ORDER
010202                                          PRINTB  @PRIAO,R0,R2            ;PRINT MEMORY ADDRESS IN ERROR
010202  010246                                  MOV     R2,-(SP)
010204  010046                                  MOV     R0,-(SP)
010206  012746  010230                          MOV     @PRIAO,-(SP)
010212  012746  000003                          MOV     #3,-(SP)
010216  010600                                  MOV     SP,R0
010220  104414                                  TRAP    C$PNTB
010222  062706  000010                          ADD     #10,SP
010226  000207                                  RTS     PC                      ;RETURN

010230     045     116     045  PRIAO:  .ASCIZ  '%N%A MEMORY ERROR ADDRESS = %O1%O5'
                                        .EVEN

                                        .SBTTL  PRITADD - PRINT MEMORY TEST ADDRESS
                                        ;*
                                        ;
                                        ;PRINT MEMORY ADDRESS
```

```
                        ;THIS ROUTINE IS NORMALLY CALLED ONLY FROM PRINT ROUTINES.
                        ;
                        ; IMPLICIT INPUTS
                        ;
                        ;       ERRHI   - HIGH ORDER ADDRESS
                        ;       ERRLO   - LOW ORDER ADDRESS
                        ;
                        ;-
010274                  PRITADD:
010274                          SAVREG                  ;SAVE R1-R5 UNTIL NEXT RETURN
010300  013702  002236          MOV     ERRHI,R2        ;GET HIGH ADDRESSS
010304  013701  002240          MOV     ERRLO,R1        ;GET LOW ADDRESS
                                ;MOV    R1,R2           ;COPY LOW ADDRESS
                                ;ROL    R1              ;SHIFT BIT 15 TO C BIT
                                ;ROL    R0              ;SHIFT INTO HIGH ORDER
010310                          PRINTB  #PRIT0,R1       ;PRINT MEMORY ADDRESS LOW IN ERROR
010310  010146                  MOV     R1,-(SP)
010312  012746  010356          MOV     #PRIT0,-(SP)
010316  012746  000002          MOV     #2,-(SP)
010322  010600                  MOV     SP,R0
010324  104414                  TRAP    C$PNTB
010326  062706  000006          ADD     #6,SP
010332                          PRINTB  #PRIT1,R2       ;PRINT MEMORY ADDRESS HIGH IN ERROR
010332  010246                  MOV     R2,-(SP)
010334  012746  010421          MOV     #PRIT1,-(SP)
010340  012746  000002          MOV     #2,-(SP)
010344  010600                  MOV     SP,R0
010346  104414                  TRAP    C$PNTB
010350  062706  000006          ADD     #6,SP
010354  000207                  RTS     PC              ;RETURN

010356  045  116  045  PRIT0:  .ASCIZ  '%N%A MEMORY TEST ADDRESS LOW = %06'
010421  045  116  045  PRIT1:  .ASCIZ  '%N%A MEMORY TEST ADDRESS HIGH = %06'
                                .EVEN
                                .SBTTL  SPACE   - SPACE RECORDS (FORWARD AND REVERSE) COMMAND

                        ;+
                        ;
                        ;ROUTINE TO ISSUE A SPACE RECORDS
                        ;COMMAND (FORWARD OR REVERSE)
                        ;
                        ;INPUT:
                        ;
                        ;       R3      NUMBER OF RECORDS TO BE SPACED OVER
                        ;               BIT15 CONTROLS DIRECTION
                        ;               BIT15 = 0 IS FORWARD
                        ;               BIT15 = 1 IS REVERSE
                        ;       R5      FIRST DEVICE UNIBUS ADDRESS
                        ;
                        ;       REQUIRES A WRITE CHARACTERISTICS DONE PREVIOUSLY
                        ;
                        ;OUTPUT:
                        ;
                        ;       CARRY   SET - SPACE RECORDS COMMAND OK
                        ;               CLR - SPACE RECORDS FAILED
                        ;
                        ;
```

```
TSV3 - GLOBAL AREAS     MACRO M1113  06-FEB-84 17:14                                    SEQ 047
SPACE    - SPACE RECORDS (FORWARD AND REVERSE) COMMAND

                                        ;       R0      THE CONTENTS OF R4 IS MOVED TO R0
                                        ;
                                        ;
                                        ;IMPLICIT OUTPUT:
                                        ;
                                        ;       TAPE HAS BEEN MOVED
                                        ;
                                        ;SIDE EFFECTS:
                                        ;
                                        ;
                                        ;-
                                        SPACE::
                                                SAVREG                          ;SAVE THE GENERAL REGISTERS
010466  012737  000764  010660                   MOV     #500.,SDELAY            ;SET UP DELAY
010472  012737  140010  010650                   MOV     #140010,80$             ;SET UP COMMAND, SPACE FORWARD
010500  005703                                   TST     R3                      ;CHECK FOR DIRECTION
010506  100403                                   BMI     5$                      ;BR, IF REVERSE INDICATED
010510  010337  010652                           MOV     R3,90$                  ;LOAD UP NUMBER OF RECORDS TO SPACE
010512  000407                                   BR      10$                     ;GO DO COMMAND
010516  042703  100000            5$:            BIC     #BIT15,R3               ;CLEAR DIRECTION BIT
010520  010337  010652                           MOV     R3,90$                  ;LOAD UP NUMBER OF RECORDS TO SPACE
010524  052737  000400  010650                   BIS     #BIT8,80$               ;SET REVERSE BIT IN COMMAND PACKET
010530  012704  010650            10$:           MOV     #80$,R4                 ;SET UP R4 WITH PACKET ADDRESS
010536  010465  000000                           MOV     R4,TSDB(R5)             ;SEND OUT COMMAND
010542  004737  016250            15$:           JSR     PC,WAITF                ;WAIT FOR SSR
010546  103420                                   BCS     20$                     ;BR, IF SSR IS SET AND OK
010552                                           DELAY   250             ;DELAY ABOUT .25 SECONDS
010554  012727  000250                           MOV     #250.,(PC)+
010560  000000                                   .WORD   0
010562  013727  002116                           MOV     L$DLY,(PC)+
010566  000000                                   .WORD   0
010570  005367  177772                           DEC     -6(PC)
010574  001375                                   BNE     .-4
010576  005367  177756                           DEC     -22(PC)
010602  001367                                   BNE     .-20
010604  005337  010660                           DEC     SDELAY                  ;BUMP DELAY COUNTER DOWN
010610  001356                                   BNE     15$                     ;BR, IF MORE DELAY
010612  000411                                   BR      60$                     ;BR IF TROUBLE CARRY = CLEAR
010614  016501  000002            20$:           MOV     TSSR(R5),R1             ;READ TSSR
010620  012702  000200                           MOV     #SSR,R2                 ;SET UP EXPECTED
010624  020201                    25$:           CMP     R2,R1                   ;ARE THEY OK
010626  001401                                   BEQ     40$                     ;BR, IF EQUAL = OK
010630  000402                                   BR      60$                     ;TROUBLE EXIT
010632  000261                    40$:           SEC                             ;SET CARRY NO TROUBLE
010634  000401                                   BR      70$                     ;EXIT
010636  000241                    60$:           CLC                             ;CARRY CLEAR = ERROR
010640                            70$:
010640  010400                                   MOV     R4,R0                   ;PASS PACKET ADDRESS
010642  000207                                   RTS     PC                      ;RETURN
```

```
                                ;
                                ;
                                ;
                                ;PACKET FOR SPACE COMMAND
                                ;
        010650                          .=<.+10>&177770
                                ;
                                ;COMMAND WORD
010650  000000                  80$:    .WORD
                                ;NUMBER OF RECORDS TO BE SPACED OVER WORD
010652  000000                  90$:    .WORD
010654  000000                          .WORD
010656  000000                          .WORD
010660  000000                  SDELAY: .WORD   0                       ;DELAY COUNTER
                                        .EVEN
                                        .SBTTL  WRTCHR  - WRITE CHARACTERISTICS COMMAND

                                ;*
                                ;
                                ;ROUTINE TO ISSUE A WRITE CHARACTERISTICS
                                ;COMMAND SO THAT OTHER COMMANDS WILL BE ACCEPTED
                                ;
                                ;INPUT:
                                ;
                                ;       R4      ADDRESS OF PACKET FROM TEST
                                ;       R5      FIRST DEVICE UNIBUS ADDRESS
                                ;       REQUIRES A CALL TO SOFINIT BE DONE PREVIOUSLY
                                ;
                                ;OUTPUT:
                                ;
                                ;       R0      TSSR CONTENTS
                                ;       CARRY   SET - WRITE CHARACTERISTICS COMMAND OK
                                ;               CLR - WRITE CHARACTERISTICS FAILED
                                ;
                                ;IMPLICIT OUTPUT:
                                ;
                                ;       MESSAGE BUFFER AND OTHER BUFFERS ALL SET UP
                                ;       SOFTWARE SWITCHES SET AS FOLLOWS:
                                ;               EXTFEA = EXTENDED FEATURES PRESENT
                                ;               BENBSW = BUFFER ENABLE SWITCH ON OR OFF
                                ;
                                ;
                                ;SIDE EFFECTS:
                                ;
                                ;
                                ;-
                                WRTCHR::
                                        SAVREG                          ;SAVE THE GENERAL REGISTERS
005037  002230                          CLR     BENBSW          ;CLEAR BUFFER ENABLE SWITCH
005037  002226                          CLR     EXTFEA                  ;CLEAR EXTENDED FEATURES SW SWITCH
010465  000000                  10$:    MOV     R4,TSDB(R5)             ;SEND OUT COMMAND
004737  016336                          JSR     PC,CHKTSSR              ;WAIT FOR SSR
103401                                  BCS     20$                     ;BR. IF SSR IS SET AND OK
000435                                  BR      60$                     ;BR IF TROUBLE CARRY = CLEAR
016501  000002                  20$:    MOV     TSSR(R5),R1             ;READ TSSR
012702  000200                          MOV     #SSR,R2                 ;SET UP EXPECTED
```

```
1095 010722  032701  000100                BIT     #OFL,R1                 ;WAS OFF LINE SET IN TSSR
1096 010726  001402                        BEQ     25$                     ;BR, IF NO OFL SET
1097 010730  052702  000100                BIS     #OFL,R2                 ;MAKE THEM LOOK ALIKE
1098 010734  020201                 25$:   CMP     R2,R1                   ;ARE THEY OK
1099 010736  001401                        BEQ     40$                     ;BR, IF EQUAL = OK
1100 010740  000421                        BR      60$                     ;TROUBLE EXIT
1101 010742  062704  000010           40$:   ADD     #8.,R4                  ;POINT TO WRT CHARA DATA PACKET
1102 010746  011403                        MOV     (R4),R3                 ;GET ADDRESS OF MESSAGE BUFFER
1103 010750  032763  000200  000012        BIT     #X2.EXTF,XST2(R3)       ;EXTENDED FEATURES BIT SET?
1104 010756  001402                        BEQ     45$                     ;BR IF NO
1105 010760  005237  002226                INC     EXTFEA                  ;SET EXTENDED FEATURES SW SWITCH
1106 010764                         45$:
1107 010764  032763  000100  000012        BIT     #X2.BUFE,XST2(R3)                               ;BUFFER ENABLE SWITCH SET
1108 010772  001402                        BEQ     50$                     ;BR, IF SWITCH NOT SET
1109 010774  005237  002230                INC     BENBSW                  ;SET SOFTWARE SWITCH FOR ENABLED
1110 011000                         50$:
1111 011000  000261                        SEC                             ;SET CARRY NO TROUBLE
1112 011002  000401                        BR      70$                     ;EXIT
1113 011004  000241                 60$:   CLC                             ;CARRY CLEAR = ERROR
1114 011006  016500  000002           70$:   MOV     TSSR(R5),R0             ;RETURN TSSR CONTENTS
1115 011012  000207                        RTS     PC                      ;RETURN
1116                                        .SBTTL  REWIND  - POSITION TAPE (REWIND) COMMAND
1117
1118                                ;+
1119                                ;
1120                                ;THIS ROUTINE WILL REWIND THE SELECTED TAPE.
1121                                ;
1122                                ;       CAUTION: THE ROUTINE DOES NOT WAIT FOR BOT
1123                                ;                TO ARRIVE. ALSO THE CALLER MUST CHECK FOR
1124                                ;                SSR TO SET IN THE TSSR
1125                                ;
1126                                ;
1127                                ;CALLING SEQUENCE:
1128                                ;
1129                                ;       DO A SOFT INIT
1130                                ;       DO A WRITE CHARACTERISTICS
1131                                ;       JSR     PC,REWIND
1132                                ;
1133                                ;INPUT:
1134                                ;
1135                                ;       R5      FIRST DEVICE UNIBUS ADDRESS
1136                                ;
1137                                ;
1138                                ;OUTPUT
1139                                ;
1140                                ;       R0      THE CONTENTS OF R4 IS PASSED TO R0
1141                                ;
1142                                ;
1143                                ;-
1144 011014                         REWIND::
1145 011014                                SAVREG                          ;SAVE R1-R5 UNTIL NEXT RETURN
1146 011020  012704  011110                MOV     #RWPACK,R4              ;GET PACKET ADDRESS
1147 011024  010465  000000                MOV     R4,TSDB(R5)             ;SEND PACKET ADDRESS TO EXECUTE
1148 011030  012703  000550                MOV     #360.,R3                ;ENOUGH TIME FOR 2400' REEL TO REWIND
1149 011034  004737  016250           10$:   JSR     PC,WAITF                ;WAIT FOR SSR TO SET
1150 011040  103417                        BCS     20$                     ;LEAVE WHEN SSR IS SET
1151 011042                                DELAY   250.                    ;WAIT FOR .25 SECONDS
```

```
        011042  012727  000372                  MOV     #250.,(PC)+
        011046  000000                          .WORD   0
        011050  013727  002116                  MOV     L$DLY,(PC)+
        011054  000000                          .WORD   0
        011056  005367  177772                  DEC     -6(PC)
        011062  001375                          BNE     .-4
        011064  005367  177756                  DEC     -22(PC)
        011070  001367                          BNE     .-20
   1152 011072  005303                          DEC     R3                      ;BUMP COUNTER DOWN
   1153 011074  001357                          BNE     10$                     ;KEEP GOING
   1154 011076  000241                          CLC                             ;CLEAR CARRY TO SET ERROR
   1155 011100  010400                  20$:    MOV     R4,R0                   ;PASS THE PACKET ADDRESS
   1156 011102  000207                          RTS     PC                      ;RETURN
   1157
   1159         011110                          .=<.+10>&177770
   1161 011110                          RWPACK:
   1162 011110  102010                          .WORD   102010                  ;POSTION COMMAND (REWIND)
   1163 011112  000000                          .WORD   0                       ;NOT USED
   1164                                         .SBTTL  CKRAM   - COMPARE RAM TO I/O PACKET
   1165
   1166                                 ;+
   1167                                 ;
   1168                                 ;ROUTINE TO READ THE FIRST 8 BYTES FROM RAM
   1169                                 ;MEMORY AND COMPARE THIS DATA TO A COMMAND PACKET.
   1170                                 ;
   1171                                 ;INPUT:
   1172                                 ;
   1173                                 ;       R4      ADDRESS OF THE COMMAND PACKET
   1174                                 ;       R5      FIRST DEVICE UNIBUS ADDRESS
   1175                                 ;
   1176                                 ;OUTPUT:
   1177                                 ;
   1178                                 ;       CARRY   SET - RAM MATCHES PACKET
   1179                                 ;               CLR - RAM DOES NOT MATCH PACKET
   1180                                 ;
   1181                                 ;IMPLICIT OUTPUT:
   1182                                 ;
   1183                                 ;       THE TABLE RAMDATA IS FILLED WITH THE
   1184                                 ;       DATA HELD IN RAM.
   1185                                 ;       RAMSIZ IS SET TO 8. FOR PRAMPKT ROUTINE
   1186                                 ;
   1187                                 ;SIDE EFFECTS:
   1188                                 ;
   1189                                 ;       THE SUBSYSTEM IS LEFT IN MAINTENANCE MODE
   1190                                 ;
   1191                                 ;-
   1192
   1193 011114                          CKRAM::
   1194 011114                                  SAVREG                          ;SAVE THE GENERAL REGISTERS
   1195 011120  012701  002242                  MOV     #RAMDATA,R1             ;ADDRESS TO SAVE THE RAM DATA
   1196 011124  012702  000201                  MOV     #RMPKTBEG,R2            ;BYTE ADDRESS OF FIRST RAM DATA
   1197 011130  005003                          CLR     R3                      ;CLEAR THE ERROR FLAG
   1198 011132  004737  016336                  JSR     PC,CHKTSSR              ;WAIT FOR SSR
   1199 011136  112765  000000  000000          MOVB    #0,TSDB(R5)             ;SET MAINTENANCE MODE
   1200 011144  004737  016336          10$:    JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
   1201 011150  010265  000000                  MOV     R2,TSDB(R5)             ;SELECT NEXT RAM ADDRESS
   1202 011154  004737  016336                  JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
```

```
ISV3 - GLOBAL AREAS     MACRO M1113  06-FEB-84 17:14                    SEQ 051
CKRAM   - COMPARE RAM TO I/O PACKET

 1203 011160  116511  000000                  MOVB    TSBA(R5),(R1)           ;READ THE RAM DATA
 1204 011164  122124                          CMPB    (R1)+,(R4)+             ;COMPARE TO EXPECTED
 1205 011166  001401                          BEQ     20$                     ;BRANCH IF OK
 1206 011170  005203                          INC     R3                      ;SET ERROR FLAG
 1207 011172  005202                  20$:    INC     R2                      ;ADDRESS OF NEXT RAM LOCATION
 1208 011174  020227  000210                  CMP     R2,#RMPKTEND            ;REACHED END YET ?
 1209 011200  003761                          BLE     10$                     ;BRANCH TILL ALL READ
 1210 011202  005703                          TST     R3                      ;WAS AN ERROR FOUND ?
 1211 011204  001402                          BEQ     30$                     ;BRANCH IF NOT
 1212 011206  000241                          CLC                             ;CLEAR CARRY TO SHOW ERROR
 1213 011210  000401                          BR      50$                     ;AND EXIT
 1214 011212  000261                  30$:    SEC                             ;SHOW GOOD COMPARE
 1215 011214  012737  000010  002302  50$:    MOV     #8.,RAMSIZ              ;SETUP RAMSIZ FOR PRAMPKT ROUTINE
 1216 011222  000207                          RTS     PC                      ;RETURN
 1217                                         .SBTTL  CKRAM2  - COMPARE RAM TO I/O CHARACTERISTICS DATA
 1218                                 ;+
 1219                                 ;
 1220                                 ;ROUTINE TO READ THE FIRST 8 OR 10 BYTES FROM RAM
 1221                                 ;MEMORY AND COMPARE THIS DATA TO A CHARACTERISTICS DATA BLOCK.
 1222                                 ;
 1223                                 ;INPUT:
 1224                                 ;
 1225                                 ;       R4      ADDRESS OF THE CHARACTERISTICS DATA
 1226                                 ;       R5      FIRST DEVICE UNIBUS ADDRESS
 1227                                 ;
 1228                                 ;OUTPUT:
 1229                                 ;
 1230                                 ;       CARRY   SET - RAM MATCHES PACKET
 1231                                 ;               CLR - RAM DOES NOT MATCH PACKET
 1232                                 ;
 1233                                 ;IMPLICIT OUTPUT:
 1234                                 ;
 1235                                 ;       THE TABLE RAMDATA IS FILLED WITH THE
 1236                                 ;       DATA HELD IN RAM.
 1237                                 ;       RAMSIZ IS SET TO 8. OR 10. FOR PRAMPKT ROUTINE
 1238                                 ;
 1239                                 ;SIDE EFFECTS:
 1240                                 ;
 1241                                 ;       THE SUBSYSTEM IS LEFT IN MAINTENANCE MODE
 1242                                 ;
 1243                                 ;-
 1244
 1245 011224                         CKRAM2::
 1246 011224                                 SAVREG                          ;SAVE THE GENERAL REGISTERS
 1247 011230  012701  002242                 MOV     #RAMDATA,R1             ;ADDRESS TO SAVE THE RAM DATA
 1248 011234  012702  000167                 MOV     #RMCHBEG,R2             ;BYTE ADDRESS OF FIRST RAM DATA
 1249 011240  005003                         CLR     R3                      ;CLEAR THE ERROR FLAG
 1250 011242  004737  016336                 JSR     PC,CHKTSSR              ;WAIT FOR SSR
 1251 011246  112765  000000  000000        MOVB    #0,TSDB(R5)             ;SET MAINTENANCE MODE
 1252 011254  004737  016336          10$:   JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
 1253 011260  010265  000000                 MOV     R2,TSDB(R5)             ;SELECT NEXT RAM ADDRESS
 1254 011264  004737  016336                 JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
 1255 011270  116511  000000                 MOVB    TSBA(R5),(R1)           ;READ THE RAM DATA
 1256 011274  122124                         CMPB    (R1)+,(R4)+             ;COMPARE TO EXPECTED
 1257 011276  001401                         BEQ     20$                     ;BRANCH IF OK
 1258 011300  005203                         INC     R3                      ;SET ERROR FLAG
 1259 011302  005202                  20$:    INC     R2                      ;ADDRESS OF NEXT RAM LOCATION
```

```
1260 011304  012737  000010  002302          MOV     #8.,RAMSIZ              ;ASSUME EXTFEA NOT SET
1261 011312  005737  002226                  TST     EXTFEA                  ;IS THE SOFTWARE EXTENDED FEATURES SET
1262 011316  001407                          BEQ     25$                     ;BR, IF NOT SET
1263 011320  012737  000012  002302          MOV     #10.,RAMSIZ             ;SET RAMSIZ FOR EXTEND FEATURES
1264 011326  020227  000200                  CMP     R2,#RMCHEND             ;AT END OF EXTENDED BUFFER
1265 011332  003750                          BLE     10$                     ;BR, IF NOT AT END YET
1266 011334  000403                          BR      27$                     ;AT END BRANCH
1267 011336  020227  000176          25$:    CMP     R2,#RMCHEND-2           ;REACHED END YET ?
1268 011342  003744                          BLE     10$                     ;BRANCH TILL ALL READ
1269 011344  005703                  27$:    TST     R3                      ;WAS AN ERROR FOUND ?
1270 011346  001402                          BEQ     30$                     ;BRANCH IF NOT
1271 011350  000241                          CLC                             ;CLEAR CARRY TO SHOW ERROR
1272 011352  000401                          BR      50$                     ;AND EXIT
1273 011354  000261                  30$:    SEC                             ;SHOW GOOD COMPARE
1274 011356  000207                  50$:    RTS     PC                      ;RETURN
1275                                         .SBTTL  CKMSG   - COMPARE WRITE CHAR. MESSAGE BUFFERS
1276                                 ;+
1277                                 ;
1278                                 ;ROUTINE TO COMPARE A WRITE CHARACTERISTICS EXPD AND RECV
1279                                 ;BUFFER. THE EXPECTED AND RECEIVED BUFFERS ARE STORED FOR
1280                                 ;ERROR PRINT ROUTINES.
1281                                 ;
1282                                 ;INPUT:
1283                                 ;
1284                                 ;       R0      RECV MESSAGE BUFFER HIGH ORDER ADDRESS
1285                                 ;       R1      RECV MESSAGE BUFFER LOW ORDER ADDRESS
1286                                 ;       R2      EXPD MESSAGE BUFFER ADDRESS
1287                                 ;OUTPUT:
1288                                 ;
1289                                 ;       CARRY   SET - MESSAGE BUFFERS MATCH
1290                                 ;               CLR -MESSAGE BUFFERS DON'T MATCH
1291                                 ;
1292                                 ;IMPLICIT OUTPUT:
1293                                 ;
1294                                 ;       EXPMSG          BUFFER IS SET TO EXPD DATA
1295                                 ;       RECMSG          BUFFER IS SET TO RECV DATA
1296                                 ;       RCVHIADD        SET TO HIGH ORDER ADDRESS OF RECV
1297                                 ;       RCVLOADD        SET TO LOW ORDER ADDRESS OF RECV
1298                                 ;
1299                                 ;-
1300 011360                         CKMSG::
1301 011360                                 SAVREG                          ;SAVE R1-R5 UNTIL NEXT RETURN
1302 011360  010037  002304                 MOV     R0,RCVHIADD             ;SAVE RECV HIGH ADDRESS
1303 011364  010137  002306                 MOV     R1,RCVLOAD              ;SAVE RECV LOW ADDRESS
1304 011370  005737  003134                 TST     KTENABLE                ;TESTING ABOVE 28K?
1305 011374  001403                         BEQ     10$                     ;BR IF NO
1306 011376  004737  017316                 JSR     PC,SETMAP               ;RETURN ADDRESS BIASED TO PAR6 IN R0
1307 011402  010001                         MOV     R0,R1                   ;GET RETURNED ADDRESS BIASED TO PAR6
1308 011404  005004          10$:    CLR     R4                      ;WORD IN BUFFER
1309 011406  005003                  CLR     R3                      ;CLEAR ERROR SEEN FLAG
1310 011410  010205                  MOV     R2,R5                   ;GET EXPD BUFFER ADDRESS
1311 011412  011264  002322  15$:    MOV     (R2),EXPMSG(R4)         ;SAVE EXPD FOR ERROR REPORT
1312 011416  011164  002466          MOV     (R1),RECMSG(R4)         ;SAVE RECV FOR ERROR REPORT
1313 011422  022221                  CMP     (R2)+,(R1)+             ;EXPD EQUAL RECV?
1314 011424  001401                  BEQ     25$                     ;BR IF YES
1315 011426  005203                  INC     R3                      ;SET ERROR SEEN FLAG
1316 011430  062704  000002  25$:    ADD     #2,R4                   ;POINT TO NEXT WORD ADDRESS
```

```
1317 011440  020427  000014                    CMP     R4,#14          ;DONE FIRST 7 WORDS?
1318 011444  003764                            BLE     15$             ;BR IF NO
1319 011446  032765  000200  000012            BIT     #X2.EXTF,XST2(R5);IS EXTENDED FEATURES SET IN EXPD?
1320 011454  001403                            BEQ     50$             ;BR IF NO
1321 011456  020427  000016                    CMP     R4,#16          ;DONE EXTENDED FEATURES WORD?
1322 011462  003755                            BLE     15$             ;BR IF NO
1323 011464  005703                 50$:       TST     R3              ;ANY ERRORS SEEN?
1324 011466  001402                            BEQ     55$             ;BR IF NO
1325 011470  000241                            CLC                     ;SET FAILURE
1326 011472  000401                            BR      60$             ;
1327 011474  000261                 55$:       SEC                     ;SET SUCCESS
1328 011476  000207                 60$:       RTS     PC              ;RETURN
1329                                            .SBTTL  CKMSG2  - COMPARE EXPD RECV MESSAGE BUFFERS
1330                                ;+
1331                                ;
1332                                ;ROUTINE TO COMPARE AN EXPECTED AND RECEIVED MESSAGE
1333                                ;BUFFER. THE EXPECTED AND RECEIVED BUFFERS ARE STORED FOR
1334                                ;ERROR PRINT ROUTINES.
1335                                ;
1336                                ;INPUT:
1337                                ;
1338                                ;       R0      RECV MESSAGE BUFFER HIGH ORDER ADDRESS
1339                                ;       R1      RECV MESSAGE BUFFER LOW ORDER ADDRESS
1340                                ;       R2      EXPD MESSAGE BUFFER ADDRESS
1341                                ;       R3      NUMBER OF BYTES TO COMPARE
1342                                ;
1343                                ;OUTPUT:
1344                                ;
1345                                ;       CARRY   SET - MESSAGE BUFFERS MATCH
1346                                ;               CLR - MESSAGE BUFFERS DON'T MATCH
1347                                ;
1348                                ;IMPLICIT OUTPUT:
1349                                ;
1350                                ;       EXPMSG          BUFFER IS SET TO EXPD DATA
1351                                ;       RECMSG          BUFFER IS SET TO RECV DATA
1352                                ;       RCVHIADD        SET TO HIGH ORDER ADDRESS OF RECV
1353                                ;       RCVLOADD        SET TO LOW ORDER ADDRESS OF RECV
1354                                ;
1355                                ;-
1356 011500                        CKMSG2::
1357 011500                                SAVREG                  ;SAVE R1-R5 UNTIL NEXT RETURN
1358 011504  020327  000144                CMP     R3,#RECMSG-EXPMSG;@@D IS COUNT ABOVE MAX ALLOWED?
1359 011510  003412                        BLE     5$              ;@@D BR IF NO
1360 011512  012703  000144                MOV     #RECMSG-EXPMSG,R3;@@D
1361 011516                                PRINTF  #DEBUGMSG       ;@@D
     011516  012746  011632                MOV     #DEBUGMSG,-(SP)
     011522  012746  000001                MOV     #1,-(SP)
     011526  010600                        MOV     SP,R0
     011530  104417                        TRAP    C$PNTF
     011532  062706  000004                ADD     #4,SP
1362 011536  010037  002304        5$:     MOV     R0,RCVHIADD     ;SAVE RECV HIGH ADDRESS
1363 011542  010137  002306                MOV     R1,RCVLOAD      ;SAVE RECV LOW ADDRESS
1364 011546  005737  003134                TST     K$ENABLE        ;TESTING ABOVE 28K?
1365 011552  001403                        BEQ     10$             ;BR IF NO
1366 011554  004737  017316                JSR     PC,SETMAP       ;RETURN ADDRESS BIASED TO PAR6 IN R0
1367 011560  010001                        MOV     R0,R1           ;GET RETURNED ADDRESS BIASED TO PAR6
1368 011562  005004                10$:    CLR     R4              ;WORD IN BUFFER
```

```
1369 011564  005005                    CLR     R5                      ;CLEAR ERROR SEEN FLAG
1370 011566  111264  002322      15$:  MOVB    (R2),EXPMSG(R4)         ;SAVE EXPD FOR ERROR REPORT
1371 011572  111164  002466            MOVB    (R1),RECMSG(R4)         ;SAVE RECV FOR ERROR REPORT
1372 011576  122221                    CMPB    (R2)+,(R1)+             ;EXPD EQUAL RECV?
1373 011600  001401                    BEQ     25$                     ;BR IF YES
1374 011602  005205                    INC     R5                      ;SET ERROR SEEN FLAG
1375 011604  062704  000001      25$:  ADD     #1,R4                   ;POINT TO NEXT BYTE
1376 011610  020403                    CMP     R4,R3                   ;DONE ALL BYTES?
1377 011612  002001                    BGE     50$                     ;BR IF YES
1378 011614  000764                    BR      15$                     ;DO NEXT BYTE
1379 011616  005705            50$:    TST     R5                      ;ANY ERRORS SEEN?
1380 011620  001402                    BEQ     55$                     ;BR IF NO
1381 011622  000241                    CLC                             ;SET FAILURE
1382 011624  000401                    BR      60$                     ;
1383 011626  000261            55$:    SEC                             ;SET SUCCESS
1384 011630  000207            60$:    RTS     PC                      ;RETURN
1385
1386 011632       120   122   117  DEBUGMSG:       .ASCIZ  'PROGRAM INTERNAL ERROR -CKMSG2 MESSAGE BUFFER EXCEEDED-';@@D
1387 011722       045   116   045  FERCM:  .ASCII  /%N%A  ***/
1388 011733       040   040   124  ERCM:   .ASCIZ  /  TSSR ERROR CODE REC'D = /
1389 011766       056   056   056  SIMSG:  .ASCIZ  /.... AFTER DOING SOFT INIT/
1390 012021       124   105   123  TINERR: .ASCIZ  /TEST: .../
                                          .EVEN
1391
1392
1393                                ;*
1394                                ;
1395                                ;PRINT ROUTINE TO FATAL SOFT INIT ERRORS
1396                                ;
1397                                ;INPUT:
1398                                ;
1399                                ;       R1      CONTENTS OF TSSR AT ERROR
1400                                ;
1401                                ;SIDE EFFECTS:
1402                                ;
1403                                ;       EXECUTES DROP UNIT TO CEASE TESTING
1404                                ;
1405                                ;-
1406
1407 012034                                BGNMSG  SFIMSG
      012034
                                    SFIMSG::
1408 012034  004737  006024                JSR     PC,PRITSSR      ;PRINT CONTENTS OF TSSR REGISTER
1409 012040  004737  017202                JSR     PC,CKDROP       ;DROP UNIT, IF ALLOWED
1410 012044                                ENDMSG
      012044
                                    L10003:
      012044  104423                       TRAP    C$MSG
1411
1412
1413                                ;*
1414                                ;PRINT ROUTINE TO PRINT THE CONTENTS OF
1415                                ;TSSR AND A COMMAND PACKET OTHER THAN GET STATUS COMMAND PACKET.
1416                                ;
1417                                ;INPUTS:
1418                                ;
1419                                ;       R1      TSSR CONTENTS
1420                                ;       R4      ADDRESS OF COMMAND PACKET
1421                                ;
1422                                ;-
```

```
1423 012046                                     BGNMSG  PKTSSR
     012046                                PKTSSR::
1424 012046  004737  006024                        JSR     PC,PRITSSR      ;PRINT THE CONTENTS OF TSSR REGISTER
1425 012052  012700  000004                        MOV     #4,R0           ;NO. OF WORDS IN PACKET
1426 012056  004737  007370                        JSR     PC,PRIPKT       ;PRINT THE CONTENTS OF COMMAND PACKET
1427 012062                                        ENDMSG
     012062                                L10004:
     012062  104423                             TRAP    C$MSG
1428
1429                                            ;+
1430                                            ;PRINT ROUTINE TO PRINT THE CONTENTS OF
1431                                            ;TSSR AND A GET STATUS COMMAND PACKET.
1432                                            ;
1433                                            ;INPUTS:
1434                                            ;
1435                                            ;       R1      TSSR CONTENTS
1436                                            ;       R4      ADDRESS OF COMMAND PACKET
1437                                            ;
1438                                            ;-
1439
1440 012064                                     BGNMSG  PKTGETS
     012064                                PKTGETS::
1441 012064  004737  006024                        JSR     PC,PRITSSR      ;PRINT THE CONTENTS OF TSSR REGISTER
1442 012070  012700  000002                        MOV     #2,R0           ;NO. OF WORDS IN GET STATUS PACKET
1443 012074  004737  007370                        JSR     PC,PRIPKT       ;PRINT THE CONTENTS OF COMMAND PACKET
1444 012100                                        ENDMSG
     012100                                L10005:
     012100  104423                             TRAP    C$MSG
1445
1446                                            ;+
1447                                            ;PRINT TSSR ERRORS FOR INITIALIZATION TESTS
1448                                            ;
1449                                            ;INPUTS:
1450                                            ;
1451                                            ;       R1      TSSR CONTENTS
1452                                            ;       R4      ADDRESS OF COMMAND PACKET
1453                                            ;-
1454
1455 012102                                     BGNMSG  SFFMSG
     012102                                SFFMSG::
1456 012102  004737  006024                        JSR     PC,PRITSSR      ;PRINT CONTENTS OF TSSR REGISTER
1457 012106                                        ENDMSG
     012106                                L10006:
     012106  104423                             TRAP    C$MSG
1458
1459                                            .SBTTL  PKTMES  - PRINT TSSR AND MESSAGE BUFFER
1460                                            ;+
1461                                            ;
1462                                            ;PRINT ROUTINE TO PRINT THE CONTENTS OF TSSR AND MESSAGE
1463                                            ;BUFFER FOR ERROR REPORTS
1464                                            ;
1465                                            ;INPUTS:
1466                                            ;
1467                                            ;       R1      CONTENTS OF TSSR
1468                                            ;       R2      LOW ORDER MESSAGE BUFFER
1469                                            ;       R3      HIGH ORDER MESSAGE BUFFER ADDRESS
1470                                            ;       NOTE: R3 IS IGNORED IF KTENABLE FLAG IS CLEAR
```

```
1471
1472 012110                                ;-
     012110                                        BGNMSG  PKTMES
                                           PKTMES::
1473 012110  004737  006024                        JSR     PC,PRITSSR          ;PRINT CONTENTS OF TSSR
1474 012114  010200                        MOV     R2,R0               ;LOW ORDER ADDRESS
1475 012116  010301                        MOV     R3,R1               ;HIGH ORDER ADDRESS
1476 012120  004737  014242                JSR     PC,PRMESS           ;PRINT THE MESSAGE BUFFER
1477 012124                                ENDMSG
     012124                                L10007:
     012124  104423                        TRAP    C$MSG
1478                                       .SBTTL  ADDSSR  - PRINT TEST ADDRESS AND TSSR
1479                                       ;*
1480                                       ;PRINT ROUTINE TO PRINT THE CONTENTS OF
1481                                       ;TSSR AND A MEMORY TEST ADDRESS
1482                                       ;
1483                                       ;INPUTS:
1484                                       ;
1485                                       ;       R5      FIRST DEVICE UNIBUS ADDRESS
1486                                       ;       ERRHI   HIGH ORDER MEMORY TEST ADDRESS
1487                                       ;       ERRLO   LOW ORDER MEMORY TEST ADDRESS
1488                                       ;-
1489
1490 012126                                        BGNMSG  ADDSSR
     012126                                ADDSSR::
1491 012126  004737  010274                        JSR     PC,PRITADD      ;PRINT MEMORY TEST ADDRESS
1492 012132  016501  000002                MOV     TSSR(R5),R1         ;GET CURRENT TSSR
1493 012136  004737  006024                JSR     PC,PRITSSR          ;PRINT THE CONTENTS OF TSSR REGISTER
1494 012142                                ENDMSG
     012142                                L10010:
     012142  104423                        TRAP    C$MSG
1495                                       .SBTTL  MSGEXP - PRINT WRITE CHAR. EXPD-RECV MESSAGE BUFFERS
1496                                       ;*
1497                                       ;
1498                                       ;PRINT ROUTINE TO PRINT WRITE CHARACTERISTIC MESSAGE BUFFER
1499                                       ;
1500                                       ;IMPLICIT INPUTS:
1501                                       ;
1502                                       ;       EXPMSG  - EXPECTED MESSAGE BUFFER
1503                                       ;       RECMSG  - RECEIVED MESSAGE BUFFER
1504                                       ;       RCVHIADD- RECEIVED MESSAGE BUFFER HIGH ORDER ADDRESS
1505                                       ;       RCVLOADD- RECEIVED MESSAGE BUFFER LOW ORDER ADDRESS
1506                                       ;-
1507
1508 012144                                        BGNMSG  MSGEXP
     012144                                MSGEXP::
1509 012144  012700  000007                        MOV     #7,R0           ;ASSUME NO EXT FEATURES
1510 012150  005737  002226                TST     EXTFEA              ;EXT FEATURES SET?
1511 012154  001402                        BEQ     5$                  ;BR IF NO
1512 012156  012700  000010                MOV     #8.,R0              ;EXT FEATURE BUFFER IS 8 WORDS
1513 012162  004737  014552                5$:     JSR     PC,PRMSGEXP     ;PRINT EXPD/RECV MESSAGE BUFFERS
1514 012166                                ENDMSG
     012166                                L10011:
     012166  104423                        TRAP    C$MSG
1515                                       .SBTTL  FIFEXP  - PRINT FIFO EXP/RECV DATA
1516                                       ;*
1517                                       ;
1518                                       ;PRINT ROUTINE TO PRINT FIFO EXP/RECV DATA
```

```
1519                                    ;
1520                                    ;       R1      - BYTE COUNT
1521                                    ;
1522                                    ;IMPLICIT INPUTS:
1523                                    ;
1524                                    ;       EXPMSG  - EXPECTED MESSAGE BUFFER (CONTAINS FIFO DATA ONLY
1525                                    ;       RECMSG  - RECEIVED MESSAGE BUFFER (CONTAINS FIFO DATA ONLY)
1526                                    ;-
1527 012170                            BGNMSG  FIFEXP
     012170                         FIFEXP::
1528 012170                            PRINTX  #FIF1MSG,R1     ;PRINT BYTES TRANSFERRED
     012170  010146                    MOV     R1,-(SP)
     012172  012746  012242            MOV     #FIF1MSG,-(SP)
     012176  012746  000002            MOV     #2,-(SP)
     012202  010600                    MOV     SP,R0
     012204  104415                    TRAP    C$PNTX
     012206  062706  000006            ADD     #6,SP
1529 012212                            PRINTX  #FIF2MSG        ;PRINT HEADER MSG
     012212  012746  012311            MOV     #FIF2MSG,-(SP)
     012216  012746  000001            MOV     #1,-(SP)
     012222  010600                    MOV     SP,R0
     012224  104415                    TRAP    C$PNTX
     012226  062706  000004            ADD     #4,SP
1530 012232  010100                    MOV     R1,R0           ;GET BYTE COUNT
1531 012234  004737  015122            JSR     PC,PRBYTEXP     ;PRINT FIFO BYTES IN ERROR
1532 012240                            ENDMSG
     012240                         L10012:
     012240  104423                    TRAP    C$MSG
1533 012242     045     116     045 FIF1MSG:    .ASCIZ  '<N><A NUMBER OF BYTES TRANSFERRED = <D2'
1534 012311     045     116     045 FIF2MSG:    .ASCIZ  '<N><A FIFO DATA BYTES IN ERROR:'
1535                                    .EVEN
1536                                    .SBTTL  MSGSTAT - PRINT STATUS HEADER AND MESSAGE BUFFERS
1537                                    ;+
1538                                    ;
1539                                    ;PRINT ROUTINE TO PRINT MESSAGE BUFFER EXPD/RECV
1540                                    ;
1541                                    ;
1542                                    ;IMPLICIT INPUTS:
1543                                    ;
1544                                    ;       EXPMSG  - EXPECTED MESSAGE BUFFER
1545                                    ;       RECMSG  - RECEIVED MESSAGE BUFFER
1546                                    ;       RCVHIADD- RECEIVED MESSAGE BUFFER HIGH ORDER ADDRESS
1547                                    ;       RCVLOADD- RECEIVED MESSAGE BUFFER LOW ORDER ADDRESS
1548                                    ;-
1549 012350                            BGNMSG  MSGSTAT
     012350                         MSGSTAT::
1550 012350  012701  012412            MOV     #STATCOD,R1     ;ASCII ADDRESS TABLE
1551 012354  012100                10$: MOV     (R1)+,R0        ;DONE ALL MSG LINES?
1552 012356  001410                    BEQ     20$             ;BR IF YES
1553 012360                            PRINTX  R0              ;PRINT STATUS BIT NAMES
     012360  010046                    MOV     R0,-(SP)
     012362  012746  000001            MOV     #1,-(SP)
     012366  010600                    MOV     SP,R0
     012370  104415                    TRAP    C$PNTX
     012372  062706  000004            ADD     #4,SP
1554 012376  000766                    BR      10$             ;DO ANOTHER MSG LINE
1555 012400  012700  000012        20$: MOV     #10.,R0         ;NUMBER OF WORDS IN A READ STATUS BUFFER
```

```
1556 012404  004737  014552                    JSR     PC,PRMSGEXP     ;PRINT EXPD/RECV MESSAGE BUFFERS
1557 012410                                     ENDMSG
     012410                               L10013:
     012410  104423                             TRAP    C$MSG
1558
1559 012412  012430  012472  012563  STATCOD:           .WORD   1$,2$,3$,4$,5$,6$,0
1560 012430    045     116     045  1$:.ASCIZ  '<N><A Tape Bus Signals in Word #8:'
1561 012472    045     116     045  2$:.ASCIZ  '<N><A         PARERR<15>  IEOT  <12>  IFMK  <9>  IRDY<6>  IRWD<2>'
1562 012563    045     116     045  3$:.ASCIZ  '<N><A         IRESV2<14>  IIDENT<11>  IHER  <8>  IONL<5>  IFBY<1>'
1563 012654    045     116     045  4$:.ASCIZ  '<N><A         IRESV1<13>  ICER  <10>  ISPEED<7>  ILDP<4>  IFPT<0>'
1564 012745    045     116     045  5$:.ASCIZ  '<N><A Tape Bus Signals in Word #9:'
1565 013007    045     116     045  6$:.ASCIZ  '<N><A         DATMIS<7>  ILW<6>  OUTRDY<5>  INRDY<4>'
1566                                            .EVEN
1567
1568                                            .SBTTL  MSGLOOP - PRINT LOOPBACK HEADER AND MESSAGE BUFFERS
1569                                    ;+
1570                                    ;
1571                                    ;PRINT ROUTINE TO PRINT MESSAGE BUFFER EXPD/RECV
1572                                    ;
1573                                    ;IMPLICIT INPUTS:
1574                                    ;
1575                                    ;       EXPMSG  - EXPECTED MESSAGE BUFFER
1576                                    ;       RECMSG  - RECEIVED MESSAGE BUFFER
1577                                    ;       RCVHIADD- RECEIVED MESSAGE BUFFER HIGH ORDER ADDRESS
1578                                    ;       RCVLOADD- RECEIVED MESSAGE BUFFER LOW ORDER ADDRESS
1579                                    ;-
1580 013064                                     BGNMSG  MSGLOOP
     013064                               MSGLOOP::
1581 013064  012701  013126                     MOV     #LOOPCOD,R1     ;ASCII ADDRESS TABLE
1582 013070  012100                      10$:   MOV     (R1)+,R0        ;DONE ALL MSG LINES?
1583 013072  001410                             BEQ     20$             ;BR IF YES
1584 013074                                     PRINTX  R0              ;PRINT STATUS BIT NAMES
     013074  010046                             MOV     R0,-(SP)
     013076  012746  000001                     MOV     #1,-(SP)
     013102  010600                             MOV     SP,R0
     013104  104415                             TRAP    C$PNTX
     013106  062706  000004                     ADD     #4,SP
1585 013112  000766                             BR      10$             ;DO ANOTHER MSG LINE
1586 013114  012700  000012              20$:   MOV     #10.,R0         ;NUMBER OF WORDS IN A READ STATUS BUFFER
1587 013120  004737  014552                     JSR     PC,PRMSGEXP     ;PRINT EXPD/RECV MESSAGE BUFFERS
1588 013124                                     ENDMSG
     013124                               L10014:
     013124  104423                             TRAP    C$MSG
1589
1590 013126  013146  013221  013320  LOOPCOD:           .WORD   1$,2$,3$,4$,5$,6$,7$,0
1591 013146    045     116     045  1$:.ASCIZ  '<N><A Tape Bus Loopback Signals in Word #8:'
1592 013221    045     116     045  2$:.ASCIZ  '<N><A       PARERR<15>          IRESV2<14>          IRESV1<13>'
1593 013320    045     116     045  3$:.ASCIZ  '<N><A IHISP=>IEOT<12>    IWRT=>IIDENT<11>    IREV  =>ICER  <10>'
1594 013417    045     116     045  4$:.ASCIZ  '<N><A IWFM =>IFMK<09>    IEDIT=>IHER <08>    IFAD  =>ISPEED<07>'
1595 013516    045     116     045  5$:.ASCIZ  '<N><A ITAD0=>IRDY<06>    ITAD1=>IONL <05>    IERASE=>ILDP  <04>'
1596 013615    045     116     045  6$:.ASCIZ  '<N><A IREW =>IDBY<03>    IRWU =>IRWD <02>    IFEN  =>IFBY  <01>'
1597 013714    045     116     045  7$:.ASCIZ  '<N><A IGO  =>IFPT<00>'
1598                                            .EVEN
1599                                            .SBTTL  MSGSUB - PRINT WRITE SUBSYSTEM MESSAGE BUFFER
1600                                    ;+
1601                                    ;
1602                                    ;PRINT ROUTINE TO PRINT MESSAGE BUFFER EXPD/RECV
```

```
1603                                    ;
1604                                    ;
1605                                    ;IMPLICIT INPUTS:
1606                                    ;
1607                                    ;       EXPMSG  - EXPECTED MESSAGE BUFFER
1608                                    ;       RECMSG  - RECEIVED MESSAGE BUFFER
1609                                    ;       RCVHIADD- RECEIVED MESSAGE BUFFER HIGH ORDER ADDRESS
1610                                    ;       RCVLOADD- RECEIVED MESSAGE BUFFER LOW ORDER ADDRESS
1611                                    ;-
1612 013742                                     BGNMSG  MSGSUB
     013742                             MSGSUB::
1613 013742  012700  000012                     MOV     #10.,R0         ;SIZE OF WRITE SUBSYSTEM BUFFER
1614 013746  004737  014552                     JSR     PC,PRMSGEXP     ;PRINT EXPD/RECV MESSAGE BUFFERS
1615 013752                                     ENDMSG
     013752                             L10015:
     013752  104423                             TRAP    C$MSG
1616
1617                                            .SBTTL  MEMADD - PRINT MEMORY ADDRESS DATA ERROR
1618                                    ;*
1619                                    ;
1620                                    ;PRINT ROUTINE TO PRINT MEMORY ADDRESS DATA COMPARE ERROR
1621                                    ;
1622                                    ;IMPLICIT INPUTS:
1623                                    ;
1624                                    ;       ERRHI   - MEMORY ERROR HIGH ORDER ADDRESS
1625                                    ;       ERRLO   - MEMORY ERROR LOW ORDER ADDRESS
1626                                    ;       EXP     - EXPECTED DATA
1627                                    ;       RECV    - RECEIVED DATA
1628                                    ;-
1629 013754                                     BGNMSG  MEMADD
     013754                             MEMADD::
1630 013754  004737  010160                     JSR     PC,PRIADD       ;PRINT MEMORY ADDRESS IN ERROR
1631 013760  013701  002232                     MOV     EXPD,R1         ;GET EXPD DATA
1632 013764  013702  002234                     MOV     RECV,R2         ;GET RECEIVED DATA
1633 013770  004737  007742                     JSR     PC,PRIXOR       ;PRINT EXPD/RECV
1634 013774                                     ENDMSG
     013774                             L10016:
     013774  104423                             TRAP    C$MSG
1635                                            .SBTTL  PRAMPKT - PRINT RAM AND PACKET DATA
1636                                    ;*
1637                                    ;
1638                                    ;PRINT ROUTINE TO DISPLAY RAM/PACKET DATA
1639                                    ;WHEN THE RAM DATA DOES NOT MATCH.
1640                                    ;
1641                                    ;INPUTS:
1642                                    ;
1643                                    ;       R4      POINTER TO COMMAND PACKET
1644                                    ;
1645                                    ;IMPLICIT INPUTS:
1646                                    ;
1647                                    ;       RAMDATA         DATA AS READ FROM THE RAM
1648                                    ;       RAMSIZ          NUMBER OF BYTES IN PACKET
1649                                    ;                       IF RAMSIZ=0 THEN DEFAULT TO 8.
1650                                    ;
1651                                    ;IMPLICIT OUTPUTS:
1652                                    ;
1653                                    ;       RAMSIZ  SET TO 0
```

```
                                        ;-
                                        ;
014002  012701  002242                  PRAMPKT:
014002                                          SAVREG                          ;SAVE R1-R5 UNTIL NEXT RETURN
014002  012701  002242                          MOV     #RAMDATA,R1             ;DATA FROM THE RAM
014006  005002                          5$:     CLR     R2                      ;INIT BYTE NUMBER
014010  122124                                  CMPB    (R1)+,(R4)+             ;COMPARE EXPECTED, RECEIVED
014012  001005                                  BNE     7$                      ;BR IF NO MATCH
014014                                          FORCERROR       7$,NOTSSR
014024  000436                                  BR      10$                     ;@@D
014026  116105  177777                  7$:     MOVB    -1(R1),R5               ;GET RECV RAM DATA
014032  116403  177777                          MOVB    -1(R4),R3               ;GET EXPD PACKET DATA
014036                                          XOR     R5,R3                   ;XOR EXPD/RECV
014046  042703  177400                          BIC     #177400,R3              ;LOW BYTE ONLY
014052  116137  177777  002234                  MOVB    -1(R1),RECV             ;GET RECEIVED RAM DATA
014060  116437  177777  002232                  MOVB    -1(R4),EXPD             ;GET EXPECTED RAM DATA
014066                                          PRINTB  #RAMASC,R2,RECV,EXPD,R3
014066  010346                                  MOV     R3,-(SP)
014070  013746  002232                          MOV     EXPD,-(SP)
014074  013746  002234                          MOV     RECV,-(SP)
014100  010246                                  MOV     R2,-(SP)
014102  012746  014156                          MOV     #RAMASC,-(SP)
014106  012746  000005                          MOV     #5,-(SP)
014112  010600                                  MOV     SP,R0
014114  104414                                  TRAP    C$PNTB
014116  062706  000014                          ADD     #14,SP
014122  005202                          10$:    INC     R2                      ;UPDATE BYTE COUNT
014124  005737  002302                          TST     RAMSIZ                  ;DEFAULT TO 8.?
014130  001404                                  BEQ     15$                     ;BR IF YES
014132  020237  002302                          CMP     R2,RAMSIZ               ;DONE ALL BYTES?
014136  003724                                  BLE     5$                      ;BR IF NO
014140  000403                                  BR      25$                     ;
014142  020227  000010                  15$:    CMP     R2,#8.                  ;DONE DEFAULT NUMBER OF BYTES?
014146  002720                          20$:    BLT     5$                      ;BR IF NO
014150  005037  002302                  25$:    CLR     RAMSIZ                  ;SET DEFAULT RAMSIZ
014154  000207                                  RTS     PC                      ;RETURN
                                        ;
014156      045     116     045         RAMASC: .ASCIZ  '%N%A  BYTE: %D2%A RAM: %03%A Packet: %03%A XOR:%03'
                                                .EVEN
                                                .SBTTL  PRMESS  - PRINT CONTENTS OF MESSAGE BUFFER
                                        ;+
                                        ;
                                        ;THIS ROUTINE PRINTS THE CONTENTS OF
                                        ;THE 7 OR 8 WORD MESSAGE BUFFER RETURNED BY THE
                                        ;TSV-05.
                                        ;
                                        ;INPUT:
                                        ;
                                        ;       R0      LOW ORDER ADDRESS OF MESSAGE BUFFER
                                        ;       R1      HIGH ORDER ADDRESS OF MESSAGE BUFFER
                                        ;       NOTE: R1 IS IGNORED IF KTENABLE FLAG IS CLEAR
                                        ;
                                        ;THIS ROUTINE IS NORMALLY CALLED FROM A PRINT ROUTINE
                                        ;
                                        ;-
                                        ;
014242                                  PRMESS:
```

```
                                                SAVREG                  ;SAVE THE REGISTERS
1702 014242
1703 014246  010005                             MOV     R0,R5           ;SAVE LOW ORDER ADDRESS
1704 014250  005737  003134                     TST     KTENABLE        ;ADDRESS ABOVE 28K?
1705 014254  001001                             BNE     10$             ;BR IF YES
1706 014256  005001                             CLR     R1              ;SET HIGH ORDER ADDRESS TO 0
1707 014260  010103                 10$:        MOV     R1,R3           ;SAVE HIGH ORDER ADDRESS
1708 014262  006100                             ROL     R0              ;SHIFT BIT15 TO C BIT
1709 014264  006101                             ROL     R1              ;SHIFT TO HIGH ORDER FOR PRINTOUT
1710 014266                                     PRINTX  #PROASC,R1,R5   ;PRINT MESSAGE BUFFER ADDRESS
     014266  010546                             MOV     R5,-(SP)
     014270  010146                             MOV     R1,-(SP)
     014272  012746  014420                     MOV     #PROASC,-(SP)
     014276  012746  000003                     MOV     #3,-(SP)
     014302  010600                             MOV     SP,R0
     014304  104415                             TRAP    C$PNTX
     014306  062706  000010                     ADD     #10,SP
1711 014312                                     PRINTX  #PR1ASC         ;PRINT HEADER FOR CONTENTS
     014312  012746  014465                     MOV     #PR1ASC,-(SP)
     014316  012746  000001                     MOV     #1,-(SP)
     014322  010600                             MOV     SP,R0
     014324  104415                             TRAP    C$PNTX
     014326  062706  000004                     ADD     #4,SP
1712 014332  005004                             CLR     R4              ;NUMBER OF THE NEXT WORD
1713 014334  010501                             MOV     R5,R1           ;COPY LOW ORDER ADDRESS
1714 014336  010300                             MOV     R3,R0           ;COPY HIGH ORDER ADDRESS
1715 014340  001403                             BEQ     20$             ;BR IF NOT ABOVE 28K
1716 014342  004737  017316                     JSR     PC,SETMAP       ;SETUP PAR ADDRESS IN R0
1717 014346  010005                             MOV     R0,R5           ;GET PAR FORMAT ADDRESS ABOVE 28K
1718 014350                         20$:        PRINTX  #PRASC,R4,(R5)+ ;PRINT THE CONTENTS OF MEMORY BUFFER
     014350  012546                             MOV     (R5)+,-(SP)
     014352  010446                             MOV     R4,-(SP)
     014354  012746  014523                     MOV     #PRASC,-(SP)
     014360  012746  000003                     MOV     #3,-(SP)
     014364  010600                             MOV     SP,R0
     014366  104415                             TRAP    C$PNTX
     014370  062706  000010                     ADD     #10,SP
1719 014374  005204                             INC     R4              ;NUMBER OF THE NEXT
1720 014376  020427  000007                     CMP     R4,#7           ;DONE ALL YET ?
1721 014402  003005                             BGT     50$             ;BRANCH IF ALL DONE
1722 014404  002761                             BLT     20$             ;PRINT FIRST 7 WORDS
1723 014406  032763  000200  000012             BIT     #X2.EXTF,XST2(R3);EXTENDED FEATUTES ON ?
1724 014414  001355                             BNE     20$             ;PRINT EXTENDED STATUS WORD
1725 014416  000207                 50$:        RTS     PC              ;RETURN
1726
1727 014420      045     116     045  PROASC: .ASCIZ  '%N%A Message Buffer Address = %01%05'
1728 014465      045     116     045  PR1ASC: .ASCIZ  '%N%A Message Buffer Contents:'
1729 014523      045     116     045  PRASC:  .ASCIZ  '%N%A    Word%D1%A: %O'
1730                                             .EVEN
1731                                             .SBTTL  PRMSGEXP - PRINT EXPD/RECV MESSAGE BUFFERS
1732                                 ;+
1733                                 ;
1734                                 ;ROUTINE TO PRINT EXPECTED AND RECEIVED MESSAGE BUFFERS
1735                                 ;
1736                                 ;       R0      - NUMBER OF WORDS IN BUFFER
1737                                 ;
1738                                 ;IMPLICIT INPUTS:
1739                                 ;
```

```
1740                                    ;       EXPMSG  - EXPECTED MESSAGE BUFFER
1741                                    ;       RECMSG  - RECEIVED MESSAGE BUFFER
1742                                    ;       RCVHIADD- RECEIVED MESSAGE BUFFER HIGH ORDER ADDRESS
1743                                    ;       RCVLOADD- RECEIVED MESSAGE BUFFER LOW ORDER ADDRESS
1744                                    ;-
1745 014552                            PRMSGEXP::
1746 014552                                    SAVREG                  ;SAVE R1-R5 UNTIL NEXT RETURN
1747 014556  010005                            MOV     R0,R5           ;SAVE NUMBER OF WORDS
1748 014560  013700  002306                    MOV     RCVLOADD,R0     ;GET RECV LOW ADDRESS
1749 014564  010004                            MOV     R0,R4           ;COPY LOW ADDRESS
1750 014566  013701  002304                    MOV     RCVHIADD,R1     ;GET RECV HIGH ADDRESS
1751 014572  006100                            ROL     R0              ;SHIFT BIT15 TO C BIT
1752 014574  006101                            ROL     R1              ;SHIFT TO HIGH ORDER FOR PRINTOUT
1753 014576                                    PRINTX  #PRMSG0,R1,R4   ;PRINT MESSAGE BUFFER ADDRESS
     014576  010446                            MOV     R4,-(SP)
     014600  010146                            MOV     R1,-(SP)
     014602  012746  014732                    MOV     #PRMSG0,-(SP)
     014606  012746  000003                    MOV     #3,-(SP)
     014612  010600                            MOV     SP,R0
     014614  104415                            TRAP    C$PNTX
     014616  062706  000010                    ADD     #10,SP
1754 014622                                    PRINTX  #PRMSG1         ;PRINT HEADER FOR CONTENTS
     014622  012746  014777                    MOV     #PRMSG1,-(SP)
     014626  012746  000001                    MOV     #1,-(SP)
     014632  010600                            MOV     SP,R0
     014634  104415                            TRAP    C$PNTX
     014636  062706  000004                    ADD     #4,SP
1755 014642  005004                            CLR     R4              ;NUMBER OF THE CURRENT WORD
1756 014644  012701  002322                    MOV     #EXPMSG,R1      ;GET EXPD BUFFER ADDRESS
1757 014650  012702  002466                    MOV     #RECMSG,R2      ;GET RECV BUFFER ADDRESS
1758 014654  011100                    20$:    MOV     (R1),R0         ;GET EXPD
1759 014656  011203                            MOV     (R2),R3         ;GET RECV
1760 014660                                    XOR     R0,R3           ;XOR EXPD/RECV
1761 014670                                    PRINTX  #PRMSG2,R4,(R1)+,(R2)+,R3
     014670  010346                            MOV     R3,-(SP)
     014672  012246                            MOV     (R2)+,-(SP)
     014674  012146                            MOV     (R1)+,-(SP)
     014676  010446                            MOV     R4,-(SP)
     014700  012746  015035                    MOV     #PRMSG2,-(SP)
     014704  012746  000005                    MOV     #5,-(SP)
     014710  010600                            MOV     SP,R0
     014712  104415                            TRAP    C$PNTX
     014714  062706  000014                    ADD     #14,SP
1762 014720  005204                            INC     R4              ;NUMBER OF THE NEXT
1763 014722  020405                            CMP     R4,R5           ;DONE ALL YET?
1764 014724  002001                            BGE     50$             ;BR IF YES
1765 014726  000752                            BR      20$             ;DO ANOTHER
1766 014730  000207                    50$:    RTS     PC              ;RETURN
1767
1768 014732     045     116     045    PRMSG0: .ASCIZ  '<N><A Message Buffer Address = <01><05>'
1769 014777     045     116     045    PRMSG1: .ASCIZ  '<N><A Message Buffer Contents:'
1770 015035     045     116     045    PRMSG2: .ASCIZ  '<N><A   WORD #<D2><A  EXPD: <06><A  RECV: <06><A  XOR: <06>'
1771                                    .EVEN
1772                                    .SBTTL  PRBYTEXP - PRINT ERROR BYTES IN EXP/REC MESSAGE BUFFER
1773                                    ;+
1774                                    ;
1775                                    ;ROUTINE TO PRINT ERROR BYTES IN MESSAGE BUFFERS
```

```
                                        ;       ONLY THE FIRST 8 ERRORS ENCOUNTERED ARE PRINTED DUE TO SCREEN SPACE
                                        ;
                                        ;       R0      - NUMBER OF BYTES IN BUFFER
                                        ;
                                        ;IMPLICIT INPUTS:
                                        ;
                                        ;       EXPMSG  - EXPECTED MESSAGE BUFFER
                                        ;       RECMSG  - RECEIVED MESSAGE BUFFER
                                        ;-
015122                                  PRBYTEXP::
015122                                          SAVREG                  ;SAVE R1-R5 UNTIL NEXT RETURN
015126  010005                                  MOV     R0,R5           ;SAVE NUMBER OF BYTES
015130  005037  002320                          CLR     PRMNO           ;INIT ERROR COUNT
015134  005004                                  CLR     R4              ;NUMBER OF THE CURRENT BYTE
015136  012701  002322                          MOV     #EXPMSG,R1      ;GET EXPD BUFFER ADDRESS
015142  012702  002466                          MOV     #RECMSG,R2      ;GET RECV BUFFER ADDRESS
015146  111100                          20$:    MOVB    (R1),R0         ;GET EXPD BYTE
015150  042700  177400                          BIC     #^C<377>,R0     ;CLEAR UPPER BYTE
015154  110037  015470                          MOVB    R0,PRBEXP       ;SAVE FOR ERROR REPORT
015160  111203                                  MOVB    (R2),R3         ;GET RECV BYTE
015162  042703  177400                          BIC     #^C<377>,R3     ;CLEAR UPPER BYTE
015166  110337  015472                          MOVB    R3,PRBREC       ;FOR ERROR REPORT
015172                                          XOR     R0,R3           ;XOR EXPD/RECV
015202  122122                                  CMPB    (R1)+,(R2)+     ;EXPD = RECV?
015204  001431                                  BEQ     30$             ;BR IF YES
015206  005237  002320                          INC     PRMNO           ;UPDATE ERROR COUNT
015212  023727  002320  000010                  CMP     PRMNO,#8.       ;PRINTED 8?
015220  101023                                  BHI     30$             ;BR IF YES
015222                                  27$:    PRINTX  #PRBMSG,R4,PRBEXP,PRBREC,R3
015222  010346                                  MOV     R3,-(SP)
015224  013746  015472                          MOV     PRBREC,-(SP)
015230  013746  015470                          MOV     PRBEXP,-(SP)
015234  010446                                  MOV     R4,-(SP)
015236  012746  015336                          MOV     #PRBMSG,-(SP)
015242  012746  000005                          MOV     #5,-(SP)
015246  010600                                  MOV     SP,R0
015250  104415                                  TRAP    C$PNTX
015252  062706  000014                          ADD     #14,SP
015256                                          FORCEXIT        50$     ;@@D
015266  000404                                  BR      35$             ;@@D
015270                                  30$:
015270                                          FORCERROR  27$,NOTSSR   ;@@D
015300                                  35$:                            ;@@D
015300  005204                                  INC     R4              ;NUMBER OF THE NEXT
015302  020405                                  CMP     R4,R5           ;DONE ALL YET?
015304  002001                                  BGE     50$             ;BR IF YES
015306  000717                                  BR      20$             ;DO ANOTHER
015310                                  50$:    PRINTX  #PRBTOT,PRMNO   ;PRINT TOTAL ERROR COUNT
015310  013746  002320                          MOV     PRMNO,-(SP)
015314  012746  015423                          MOV     #PRBTOT,-(SP)
015320  012746  000002                          MOV     #2,-(SP)
015324  010600                                  MOV     SP,R0
015326  104415                                  TRAP    C$PNTX
015330  062706  000006                          ADD     #6,SP
015334  000207                                  RTS     PC              ;RETURN

015336      045     116     045 PRBMSG: .ASCIZ  '%N%A   BYTE #%D2%A  EXPD: %03%A  RECV: %03%A  XOR: %03'
```

```
1818 015423     045     116     045  PRBTOT: .ASCIZ  '%N%A NUMBER OF BYTES IN ERROR = %D2'
1819                                         .EVEN
1820 015470  000000                  PRBEXP: .WORD   0                ;EXPD
1821 015472  000000                  PRBREC: .WORD   0                ;RECV
1822                                         .SBTTL  EXPREC  - PRINT EXPD/RECV WORD DATA
1823                                 ;*
1824                                 ;
1825                                 ;PRINT ROUTINE TO DISPLAY EXPD/RECV DATA
1826                                 ;
1827                                 ;INPUTS:
1828                                 ;
1829                                 ;       R1      RECEIVED DATA
1830                                 ;       R2      EXPECTED DATA
1831                                 ;
1832                                 ;-
1833
1834 015474                                 BGNMSG  EXPREC
     015474                          EXPREC::
1835 015474  004737  007742                JSR     PC,PRIXOR               ;PRINT THE DATA
1836 015500                                ENDMSG
     015500                          L10017:
     015500  104423                        TRAP    C$MSG
1837                                        .SBTTL  EXPBREC - PRINT EXPD/RECV BYTE DATA
1838                                 ;*
1839                                 ;
1840                                 ;PRINT ROUTINE TO DISPLAY BYTE EXPD/RECV DATA
1841                                 ;
1842                                 ;
1843                                 ;INPUTS:
1844                                 ;
1845                                 ;       R1      RECEIVED DATA BYTE
1846                                 ;       R2      EXPECTED DATA BYTE
1847                                 ;
1848                                 ;-
1849
1850 015502                                 BGNMSG  EXPBREC
     015502                          EXPBREC::
1851 015502  004737  007612                JSR     PC,PRIBXOR              ;PRINT THE DATA
1852 015506                                ENDMSG
     015506                          L10020:
     015506  104423                        TRAP    C$MSG
1853
1854
1855                                        .SBTTL  RAMERR  - PRINT RAM AND PACKET DATA
1856                                 ;*
1857                                 ;
1858                                 ;PRINT ROUTINE TO DISPLAY RAM/PACKET DATA
1859                                 ;
1860                                 ;INPUTS:
1861                                 ;
1862                                 ;       R4      POINTER TO COMMAND PACKET
1863                                 ;
1864                                 ;IMPLICIT INPUTS:
1865                                 ;
1866                                 ;       RAMDATA         DATA AS READ FROM THE RAM
1867                                 ;       RAMSIZ          NUMBER OF BYTES IN PACKET
1868                                 ;                       IF RAMSIZ=0 THEN DEFAULT TO 8.
```

```
                                ;
                                ;IMPLICIT OUTPUTS:
                                ;
                                ;       RAMSIZ  SET TO 0
                                ;-
                                
                                        BGNMSG  RAMERR
                                RAMERR::
015510  004737  013776                  JSR     PC,PRAMPKT      ;PRINT RAM/PACKET DATA
                                        ENDMSG
                                L10021:
015514  104423                          TRAP    C$MSG
                                
                                        .SBTTL  RAMTADD - PRINT TEST ADDRESS, RAM AND PACKET DATA
                                ;+
                                ;
                                ;PRINT ROUTINE TO DISPLAY RAM/PACKET DATA
                                ;
                                ;INPUTS:
                                ;
                                ;       R4      POINTER TO COMMAND PACKET
                                ;
                                ;IMPLICIT INPUTS:
                                ;
                                ;       RAMDATA         DATA AS READ FROM THE RAM
                                ;       RAMSIZ          NUMBER OF BYTES IN PACKET
                                ;                       IF RAMSIZ=0 THEN DEFAULT TO 8.
                                ;       ERRHI           HIGH ORDER TEST ADDRESS
                                ;       ERRLO           LOW ORDER TEST ADDRESS
                                ;
                                ;IMPLICIT OUTPUTS:
                                ;
                                ;       RAMSIZ  SET TO 0
                                ;-
                                
                                        BGNMSG  RAMTADD
                                RAMTADD::
015516  004737  010274                  JSR     PC,PRITADD      ;PRINT TEST ADDRESS
015522  004737  013776                  JSR     PC,PRAMPKT      ;PRINT RAM/PACKET DATA
                                        ENDMSG
                                L10022:
015526  104423                          TRAP    C$MSG
                                
                                        .SBTTL  RAMEXP  - PRINT RAM EXPD/RECV DATA
                                ;+
                                ;
                                ;PRINT ROUTINE TO DISPLAY EXPD/RECV DATA
                                ;
                                ;INPUTS:
                                ;
                                ;       R1      RECEIVED DATA
                                ;       R2      EXPECTED DATA
                                ;       R4      CONTROLLER RAM ADDRESS
                                ;-
                                
                                        BGNMSG  RAMEXP
                                RAMEXP::
```

```
1919 015530  042701  177400                BIC     #^C<377>,R1             ;SAVE EXPD RAM DATA BYTE
1920 015534  042702  177400                BIC     #^C<377>,R2             ;SAVE EXPD RAM DATA BYTE
1921 015540  004737  010066                JSR     PC,PRIRAM               ;PRINT THE RAM ADDRESS
1922 015544  004737  007742                JSR     PC,PRIXOR               ;PRINT THE DATA
1923 015550                                ENDMSG
     015550                          L10023:
     015550  104423                        TRAP    C$MSG
1924
1925                                       .SBTTL  TIMEXP  - PRINT TIMER A,B AND EXP/REC
1926                                ;+
1927                                ;
1928                                ;PRINT ROUTINE TO DISPLAY EXPD/RECV DATA
1929                                ;AND TIMER A,B HEADER MESSAGE
1930                                ;
1931                                ;INPUTS:
1932                                ;
1933                                ;       R1      RECEIVED DATA
1934                                ;       R2      EXPECTED DATA
1935                                ;-
1936
1937 015552                                BGNMSG  TIMEXP
     015552                          TIMEXP::
1938 015552                                PRINTX  #TIMSGO                 ;PRINT HEADER
     015552  012746  015600                MOV     #TIMSGO,-(SP)
     015556  012746  000001                MOV     #1,-(SP)
     015562  010600                        MOV     SP,R0
     015564  104415                        TRAP    C$PNTX
     015566  062706  000004                ADD     #4,SP
1939 015572  004737  007742                JSR     PC,PRIXOR               ;PRINT THE DATA
1940 015576                                ENDMSG
     015576                          L10024:
     015576  104423                        TRAP    C$MSG
1941
1942 015600    045    116    045  TIMSGO: .ASCIZ  '<15><12>A TIMER A STATUS IS IN BIT 3<15><12>A TIMER B STATUS IS IN BIT 2'
1943                                .EVEN
1944                                       .SBTTL  BADSSR - PRINT TSSR ERRORS ON DATA TRANSFERS
1945
1946                                ;+
1947                                ;
1948                                ;PRINT ROUTINE FOR TSSR ERRORS ON DATA TRANSFERS
1949                                ;
1950                                ;INPUTS:
1951                                ;
1952                                ;       R1      CONTENTS OF TSSR
1953                                ;       R2      DATA WRITTEN (8 BITS)
1954                                ;
1955                                ;-
1956
1957 015700                                BGNMSG  BADSSR
     015700                          BADSSR::
1958 015700  010246                        MOV     R2,-(SP)                ;SAVE DATA TRANSFERRED
1959 015702  042702  177400                BIC     #177400,R2              ;GET JUST ONE BYTE
1960 015706                                PRINTB  #XFERASC,R2
     015706  010246                        MOV     R2,-(SP)
     015710  012746  015740                MOV     #XFERASC,-(SP)
     015714  012746  000002                MOV     #2,-(SP)
     015720  010600                        MOV     SP,R0
```

```
      015722  104414                          TRAP    C$PNTB
      015724  062706  000006                  ADD     #6,SP
1961  015730  012602                          MOV     (SP)+,R2                ;RESTORE R2
1962  015732  004737  006024                  JSR     PC,PRITSSR              ;DECODE TSSR CONTENTS
1963  015736                                  ENDMSG
      015736                          L10025:
      015736  104423                          TRAP    C$MSG
1964  015740     045     116     045  XFERASC:        .ASCIZ  '#N#A Data Transferred = #03'
1965                                    .SBTTL  GLOBAL SUBROUTINES SECTION
1966
1967                                    ;++
1968                                    ; THE GLOBAL SUBROUTINES SECTION CONTAINS THE SUBROUTINES
1969                                    ; THAT ARE USED IN MORE THAN ONE TEST.
1970                                    ;--
1971                                            .SBTTL  SOFINIT - SOFT INITIALIZE OF CONTROLLER
1972
1973                                    ;+
1974                                    ;
1975                                    ;ROUTINE TO DO A SOFT INITIALIZE OF THE CONTROLLER
1976                                    ;BY WRITING INTO THE TSSR REGISTER. AFTER THE INIT,
1977                                    ;THE TSSR REGISTER IS TESTED FOR ERRORS. ANY ERRORS
1978                                    ;DETECTED SHOULD BE TREATED AS DEVICE FATAL ERRORS.
1979                                    ;
1980                                    ;INPUTS:
1981                                    ;
1982                                    ;       R5      ADDRESS OF FIRST REGISTER
1983                                    ;
1984                                    ;OUTPUTS:
1985                                    ;
1986                                    ;       R0      CONTENTS OF TSSR, IF ERROR
1987                                    ;       CARRY   SET IF INIT WAS OKAY
1988                                    ;               CLEAR IF FATAL ERROR
1989                                    ;
1990                                    ;CALLING SEQUENCE:
1991                                    ;
1992                                    ;       MOV     #ADDRESS,R5
1993                                    ;       JSR     PC,SOFINIT
1994                                    ;       BCS     CONTINUE
1995                                    ;       ERRDF                           ;REPORT FATAL ERROR
1996                                    ;
1997                                    ;-
1998
1999  015774                            SOFINIT::
2000  015774                                    SAVREG                          ; SAVE THE REGISTERS
2001  016000  012765  000000  000002            MOV     #0,TSSR(R5)             ; DO THE INIT.
2002  016006  004737  016250                    JSR     PC,WAITF                ; WAIT FOR SSR
2003  016012  016500  000002                    MOV     TSSR(R5),R0             ;GET THE TSSR REGISTER
2004  016016  010004                            MOV     R0,R4                   ;TSSR CONTENTS
2005  016020  042704  176277                    BIC     #^C<HIADDR!OFL>,R4
2006  016024  052704  002200                    BIS     #SSR!NBA,R4             ;R4 HAS EXPECTED CONTENTS
2007  016030  020400                            CMP     R4,R0                   ;ONLY EXPECTED BITS SET ?
2008  016032  001402                            BEQ     5$                      ;BRANCH IF OKAY
2009  016034  000241                            CLC                             ;CLEAR THE CARRY FOR ERROR
2010  016036  000401                            BR      10$                     ;GO TO EXIT
2011  016040  000261                    5$:     SEC                             ;SET THE CARRY BIT
2012  016042  000207                    10$:    RTS     PC                      ;RETURN TO CALLER
2013                                            .SBTTL  CHKAMB  - CHECK TSSR FOR AMBIGUITY
```

```
2014
2015                                    ;*
2016                                    ;
2017                                    ;THIS ROUTINE TESTS THE CONTENTS OF THE TSSR REGISTER
2018                                    ;FOR AMBIGUITY
2019                                    ;
2020                                    ;INPUT:
2021                                    ;
2022                                    ;       R0      CONTENTS OF TSSR
2023                                    ;
2024                                    ;OUTPUT:
2025                                    ;
2026                                    ;       R0      CONTENTS OF TSSR
2027                                    ;
2028                                    ;       CARRY   SET - NO AMBIGUITY
2029                                    ;               CLR - AMBIGUOUS CONTENTS
2030                                    ;
2031                                    ;-
2032
2033 016044                            CHKAMB:
2034 016044                                    SAVREG                          ;SAVE THE GENERAL REGISTERS
2035 016050  010004                            MOV     R0,R4                   ;CONTENTS OF TSSR
2036 016052  032700  100000                    BIT     #SC,R0                  ;IS BIT 15 SET ?
2037 016056  001004                            BNE     5$                      ;BRANCH IF YES
2038 016060  032700  174077                    BIT     #^C<NBA!OFL!SSR!HIADDR>,R0      ;ANY OTHER BITS SET ?
2039 016064  001023                            BNE     40$                     ;MUST BE AN ERROR
2040 016066  000424                            BR      45$                     ;RETURN WITH SUCCESS
2041 016070  032700  000200            5$:     BIT     #SSR,R0                 ;IS READY BIT SET ?
2042 016074  001011                            BNE     10$                     ;BRANCH IF READY BIT IS SET.
2043 016076  032700  000040                    BIT     #BIT5,R0                ;IS FATAL ERROR BIT SET ?
2044 016102  001414                            BEQ     40$                     ;ERROR IF NOT
2045 016104  042704  177761                    BIC     #^CTERCLS,R4            ;CLEAR ALL BUT TERMINATION CODE
2046 016110  020427  000016                    CMP     R4,#16                  ;ALL THREE BITS MUST BE SET
2047 016114  001007                            BNE     40$                     ;ERROR IF NOT SET
2048 016116  000410                            BR      45$                     ;OK IF ALL ARE SET
2049 016120  032700  000040            10$:    BIT     #BIT5,R0                ;IS FATAL ERROR BIT SET ?
2050 016124  001405                            BEQ     45$                     ;ERROR IF BIT IS SET WITH SSR
2051 016126  032700  000006                    BIT     #BIT2!BIT1,R0           ;IS THIS A FUNCTION REJECT
2052 016132  001002                            BNE     45$                     ;BR. IF TSSR IS OK
2053 016134  000241                    40$:    CLC                             ;AMBIGUOUS CONTENTS
2054 016136  000401                            BR      50$
2055 016140  000261                    45$:    SEC                             ;SHOW SUCCESS - NO AMBIGUITY
2056 016142  000207                    50$:    RTS     PC                      ;RETURN TO CALLER
2057                                           .SBTTL  ENAINT,DSBINT - ENABLE/DISABLE INTERRUPTS
2058                                   ;
2059                                   ; DEFAULT DISPLAY INTERRUPT HANDLERS.
2060                                   ; IF DISPLAY TIME-OUT, REPORT DEV FATAL, AND ABORT PASS.
2061                                   ; OTHERWISE, SAVE DPU REGISTERS AND DISMISS.
2062                                   ;
2063
2064                                   ; BIT DEFINITIONS FOR "INTMASK" AND "INTFLAG" BYTES:
2065                                   ;
2066          000200                           IOKCKIN=BIT7    ; DON'T CHECK FOR BAD INTERRUPTS -- TEST WILL.
2067          000001                           IOKSTP=BIT0     ; EXPECT "STOP" INTERRUPT.
2068                                   ;
2069                                   ;INTERRUPT MASK -- SAYS EXPECTING INTERRUPTS
2070 016144      000                  INTMASK:        .BYTE   0
```

```
2071                                    ;INTERRUPT FLAG -- SAYS WE GOT ONE (IF POSITIVE)
2072 016145     000                     INTFLAG:        .BYTE   0
2073
2074                                    ;SAVED INTERRUPT VECTOR:
2075 016146  000000                     INTVEC: .WORD   0
2076                                    ;SAVE CPU PC
2077 016150  000000                     INTCPC: .WORD   0
2078
2079                                    ;SUBROUTINE TO ENABLE INTERRUPTS:
2080 016152  010046                     ENAINT: MOV     R0,-(SP)        ;SAVE R0
2081 016154  013700  002210                     MOV     IVEC,R0         ;GET POINTER TO VECTORS
2082 016160  012720  016216                     MOV     #INTR,(R0)+     ;SET UP INTERRUPT VECTOR
2083 016164  012720  000340                     MOV     #PRI07,(R0)+
2084 016170  012600                             MOV     (SP)+,R0        ;RESTORE R0
2085 016172  011646                             MOV     (SP),-(SP)
2086 016174  012766  000000  000002             MOV     #0,2(SP)        ;SET CPU TO LEVEL 0
2087 016202  000002                             RTI
2088
2089                                    ;SUBROUTINE TO DISABLE INTERRUPTS (RAISE PRIORITY TO LEVEL 7)
2090 016204  011646                     DSBINT: MOV     (SP),-(SP)
2091 016206  012766  000340  000002             MOV     #PRI07,2(SP)
2092 016214  000002                             RTI
2093                                            .SBTTL  INTR    - INTERRUPT HANDLERS
2094
2095 016216                                     BGNSRV  INTR            ;DEFINE INTERRUPT ENTRY
     016216                             INTR::
2096 016216  012737  000001  002224             MOV     #1,INTRECV      ;SET FLAG TO SHOW INTERRUPT RECEIVED
2097 016224  105037  016145                     CLRB    INTFLAG         ;CLEAR FLAG TO SAY WE GOT INTERRUPT
2098 016230  132737  000001  016144             BITB    #IOKSTP,INTMASK ;EXPECTING STOP INTERRUPT?
2099 016236  001003                             BNE     1$              ;BR IF YES
2100 016240  152737  000001  016145             BISB    #IOKSTP,INTFLAG ;NO. SET THE ERROR FLAG.
2101
2102                                    ;SAVE REGISTERS, MSG BUFFER, ETC.
2103 016246                             1$:
2104 016246                                     ENDSRV
     016246                             L10026:
     016246  000002                             RTI
2105                                            .SBTTL  WAITF   - WAIT FOR SUBSYSTEM READY
2106                                    ;
2107                                    ; SUBROUTINE TO WAIT FOR THE SUBSYSTEM READY FLAG
2108                                    ;
2109                                    ;INPUTS:
2110                                    ;
2111                                    ;       R5      ADDRESS OF FIRST DEVICE REGISTER
2112                                    ;
2113                                    ;OUTPUTS:
2114                                    ;
2115                                    ;       R0      CONTENTS OF LAST TSSR READ
2116                                    ;       CARRY   SET - READY BIT SET
2117                                    ;               CLR - TIMEOUT WAITING FOR READY
2118                                    ;
2119 016250  000401                     WAITF:: BR      1$              ;NOP WHEN SUPER FIXED
2120 016252                                     BREAK                   ; DO A SUPVSR BREAK FIRST.
     016252  104422                             TRAP    C$BRK
2121 016254  012746  011000             1$:     MOV     #11000,-(SP)    ;25-APRIL-83 REV B  - 1100 MSEC TIMER
2122 016260  016500  000002             2$:     MOV     TSSR(R5),R0     ;READ THE TSSR REGISTER
2123 016264  105700                             TSTB    R0              ;TEST FOR READY BIT SET
```

```
                                        BMI     3$              ; EXIT ON STOP FLAG.
                                        DELAY   1               ; WAIT 100 USEC
016270  012727  000001                  MOV     #1,(PC)+
016274  000000                          .WORD   0
016276  013727  002116                  MOV     L$DLY,(PC)+
016302  000000                          .WORD   0
016304  005367  177772                  DEC     -6(PC)
016310  001375                          BNE     .-4
016312  005367  177756                  DEC     -22(PC)
016316  001367                          BNE     .-20
016320  005316                          DEC     (SP)            ;REDUCE DELAY COUNT
016322  001356                          BNE     2$              ;RETRY UNTIL TIMER EXPIRES
016324  000241                          CLC                     ; C = 0, CONTROLLER STILL RUNNING...
016326  000401                          BR      4$              ;...OR HUNG-UP AFTER 300 MSEC.
016330  000261                  3$:     SEC                     ; C = 1, CONTROLLER IS STOPPED.
016332  005326                  4$:     DEC     (SP)+           ;RESTORE STACK WITHOUT CHANGING CARRY BIT
016334  000207                          RTS     PC
                                        .SBTTL  CHKTSSR - CHECK TSSR FOR READY

                                ;+
                                ;
                                ;THIS ROUTINE WAITS FOR READY IN THE TSSR
                                ;AND TESTS FOR AMBIGUOUS BIT SETTINGS IN TSSR.
                                ;
                                ;INPUT:
                                ;
                                ;       R5      ADDRESS OF CSR REGISTERS
                                ;
                                ;OUTPUT:
                                ;
                                ;       R0      CONTENTS OF TSSR
                                ;       CARRY   SET - OKAY
                                ;               CLR - NOT READY AMBIGUOUS, OR SC SET
                                ;
                                ;-

016336                          CHKTSSR:
016336  004737  016250                  JSR     PC,WAITF                ;WAIT FOR READY
016342  103014                          BCC     20$                     ;BRANCH IF TIME OUT
016344  004737  016044                  JSR     PC,CHKAMB               ;TSSR AMBIGOUS?
016350  103006                          BCC     10$                     ;BR IF YES
016352  032700  100000                  BIT     #SC,R0                  ;SPECIAL CONDITION SET?
016356  001405                          BEQ     15$                     ;BR IF NO
016360  032700  074000                  BIT     #<SCE!BIE!RMR!NXM>,R0   ;ANY ERROR BITS SET?
016364  001402                          BEQ     15$                     ;BR IF NO
016366  000241                  10$:    CLC                             ;SET FAILURE
016370  000401                          BR      20$                     ;
016372  000261                  15$:    SEC                             ;SET SUCCESS
016374  000207                  20$:    RTS     PC                      ;RETURN TO CALLER
                                        .SBTTL  XNXM    - CHECK FOR NONEXISTENT MEMORY
                                ;+
                                ; ROUTINE TO TEST FOR A NEXM IN THE RANGE (R1) THRU (R2).
                                ; ON RETURN, IF "C" = 1, (R1) = NEXM ADDRESS.
                                ;               "C" = 0, ALL ADDRESSES OK.
                                ;
                                ;CALL:  MOV ADR1,R1
```

```
                                ;       MOV ADR2,R2
                                ;       JSR PC,NXM
                                ;       RETURN          ;TEST "C" AND PROCEED.
                                ;
016376  012737  016430  000004  XNXM:   MOV     #2$,@#4         ; SET BUSERR VECTOR.
016404  012737  000200  000006          MOV     #PRI04,@#6
016412  005003                          CLR     R3              ;FLAG.
016414  005711                  1$:     TST     (R1)            ;TEST THE ADDRESS(ES).
                                                                ;IF ANY TRAP, CONTINUE AT 2$.
016416  020102                          CMP     R1,R2           ;OTHERWISE, CONTINUE HERE.
016420  001407                          BEQ     3$              ;BR IF FINISHED (NO NEXM'S).
016422  062701  000002                  ADD     #2,R1           ;SET NEXT ADDRESS...
016426  000772                          BR      1$              ;...AND CONTINUE.

016430  005103                  2$:     COM     R3              ;GOT ONE, SET FLAG...
016432  012716  016440                  MOV     #3$,(SP)
016436  000002                          RTI                     ;...AND DISMISS INTERRUPT...
016440                          3$:     CLRVEC  #4              ;...AND GIVE BACK THE VECTOR.
016440  012700  000004                  MOV     #4,R0
016444  104436                          TRAP    C$CVEC
016446  005703                          TST     R3              ;DID WE CATCH ONE ??
016450  001401                          BEQ     .+4             ;NO, "C" = 0, SKIP NEXT.
016452  000261                          SEC                     ;YES, "C" = 1, (R1) = NEXM ADDR.
016454  000207                          RTS     PC


                                        .SBTTL  TSTLOOP - CHECK ITERATION COUNT
                                ;+
                                ; SUBROUTINE TO EXECUTE TEST ITERATIONS.
                                ; EXIT WITH "C" SET IF LOOPS ALLOWED AND LOOP COUNT NON-ZERO.
                                ; LOOP COUNTER IS SET BY "BEGIN.TEST" MACRO.
                                ;
                                ; CALL: LOOPTO  ARG
                                ;
016456                          TSTLOOP::
016456  005737  002170                  TST     NOITS           ; ITERATIONS INHIBITED?
016462  001006                          BNE     1$              ; YES.
016464  005737  002204                  TST     QVP             ; NO.
016470  100403                          BMI     1$              ;LOOPS DISALLOWED IN QUICK PASS.
016472  005337  002216                  DEC     LOOPCNT         ; BUMP LOOP COUNTER.
016476  001002                          BNE     2$
016500  000241                  1$:     CLC                     ;LOOP DISALLOWED, OR DONE.
016502  000401                          BR      3$
016504  000261                  2$:     SEC                     ;LOOP ENABLED.
016506  000207                  3$:     RTS     PC


                                        .SBTTL  TSTSETUP - PRINT TEST NAME AND INIT ERROR COUNTS
                                ;+
                                ; PRINT THE NUMBER AND NAME OF EACH TEST AS WE GO ALONG.
                                ; INCREMENT "TESTK" TO INDICATE THE NUMBER OF TESTS
                                ; IN THE CURRENT RUN SEQUENCE.
                                ; CLEAR THE ERROR COUNTER AND SIGNATURE EXTENSION FLAGS.
                                ;
                                ;INPUT:
                                ;
                                ;       R0      POINTER TO TEST ID ASCIZ STRING
                                ;
```

```
                                        ;OUTPUT:
                                        ;
                                        ;       R5      ADDRESS OF FIRST DEVICE REGISTER
                                        ;
                                        ;IMPLICIT OUTPUTS:
                                        ;
                                        ;       TSTCNT  UPDATED TO COUNT TESTS PERFORMED SINCE START OR RESTART
                                        ;
                                        ;SIDE EFFECTS:
                                        ;
                                        ;       INTERRUPT LEVEL IS RASIED TO LEVEL OF
                                        ;       THE DEVICE UNDER TEST
                                        ;
                                        ;-

016510                                  TSTSETUP::
016510  010046                                  MOV     R0,-(SP)        ;SAVE THE TEST ID MESSAGE
016512  005037  003154                          CLR     SIFLAG          ; CLEAR "SOFT INIT" FLAG
016516  005037  016756                          CLR     ERRK            ; CLEAR LOCAL ERROR COUNTER.
016522  005037  005772                          CLR     EXTA            ; CLEAR ERROR EXTENSION FLAG.
016526  105037  016144                          CLRB    INTMASK         ; CLEAR INTERRUPT MASK (CHECK ERROR)
016532  013700  002202                          MOV     UNITN,R0        ; GET THE UNIT NUMBER,
016536  006300                                  ASL     R0              ; ... AND MAKE IT A WORD OFFSET.
016540  005737  003114                          TST     NODEV           ; DID STARTUP FIND THE DEVICE?
016544  001430                                  BEQ     4$              ; BR IF YES
016546  100010                                  BPL     3$              ; BR IF NOT IDLE
016550  052760  160000  003176                  BIS     #160000,ERTABL(R0) ; FLAG ERROR IN THE ERROR TABLE
016556                                          ERRDF   1,NXR,NXRERR    ; NO DEVICE HERE -- PRINT IT
016556  104455                                  TRAP    C$ERDF
016560  000001                                  .WORD   1
016562  003740                                  .WORD   NXR
016564  005736                                  .WORD   NXRERR
016566  000407                                  BR      4$
016570  052760  160001  003176  3$:             BIS     #160001,ERTABL(R0)      ; FLAG ERROR IN THE ERROR TABLE
016576                                          ERRDF   NOINIT          ; DEVICE NOT IDLE
016576  104455                                  TRAP    C$ERDF
016600  000002                                  .WORD   2
016602  004335                                  .WORD   NOINIT
016604  000000                                  .WORD   0
016606  012737  177777  003112  2$:             MOV     #-1,DUFLG       ; DROP THE UNIT
016614                                          DODU    UNITN
016614  013700  002202                          MOV     UNITN,R0
016620  104451                                  TRAP    C$DODU
016622                                          DOCLN                   ; ABORT THE PASS
016622  104444                                  TRAP    C$DCLN
016624  000423                                  BR      5$

016626                                  4$:     RFLAGS  R0              ; GET THE OPERATOR FLAGS.
016626  104421                                  TRAP    C$RFLA
016630  032700  001000                          BIT     #PNT,R0         ; PRINT THE TEST NUMBERS?
016634  001412                                  BEQ     1$              ; BR IF NO
016636  011600                                  MOV     (SP),R0         ;GET THE ID MESSAGE
016640                                          PRINTF  #TNAM,R0                ;DISPLAY THE TEST ID
016640  010046                                  MOV     R0,-(SP)
016642  012746  016704                          MOV     #TNAM,-(SP)
016646  012746  000002                          MOV     #2,-(SP)
016652  010600                                  MOV     SP,R0
```

```
                016654  104417                          TRAP    C$PNTF
                016656  062706  000006                  ADD     #6,SP
     2269       016662  005237  002214          1$:     INC     TSTCNT          ; BUMP TEST COUNTER.
     2270       016666                          5$:     SETPRI  IPRI            ;PRIORITY THAT OF DEVICE
                016666  013700  002212                  MOV     IPRI,R0
                016672  104441                          TRAP    C$SPRI
     2271       016674  005726                          TST     (SP)+           ;FIX UP THE STACK
     2272       016676  013705  002200                  MOV     CSRADDR,R5      ; ADDRESS OF TSV REGISTERS ON UNIBUS
     2273       016702  000207                          RTS     PC
     2274       016704     045     123     045  TNAM:   .ASCIZ  '%S%T%A Test'
     2275                                               .EVEN
     2276                                               .SBTTL  TSTEND  - PRINT ERRORS RECEIVED
     2277                                       ;
     2278                                       ; AT END OF EACH TEST, PRINT THE NUMBER OF ERRORS RECEIVED
     2279                                       ; IF NORMAL ERROR REPORTING IS DISABLED (FLA:IER).
     2280                                       ;
     2281       016720                          TSTEND: RFLAGS  R0
                016720  104421                          TRAP    C$RFLA
     2282       016722  030027  020000                  BIT     R0,#IER
     2283       016726  001412                          BEQ     1$              ; BR IF "IER" NOT SET.
     2284       016730                                  PRINTF  #ESUM,ERRK      ; PRINT ERROR COUNT.
                016730  013746  016756                  MOV     ERRK,-(SP)
                016734  012746  016760                  MOV     #ESUM,-(SP)
                016740  012746  000002                  MOV     #2,-(SP)
                016744  010600                          MOV     SP,R0
                016746  104417                          TRAP    C$PNTF
                016750  062706  000006                  ADD     #6,SP
     2285       016754  000207                  1$:     RTS     PC
     2286
     2287       016756  000000                  ERRK:   0                       ; LOCAL ERROR COUNT.
     2288       016760     045     101     040  ESUM:   .ASCIZ  /%A %D%A ERRORS/
     2289       016777     105     122     122  EMAXDU: .ASCIZ  /ERROR LIMIT REACHED -- DROPPING UNIT/
     2290                                               .EVEN
     2291
     2292                                               .SBTTL  INCERK  - INCREMENT LOCAL ERROR COUNT
     2293                                       ;+
     2294                                       ; ROUTINES TO INCREMENT LOCAL ERROR COUNT AND CHECK FOR LIMIT:
     2295                                       ;-
     2296       017044  005237  016756          INCERK: INC     ERRK            ; INCREMENT LOCAL ERROR COUNT
     2297       017050  010046                          MOV     R0,-(SP)        ; SAVE R0
     2298       017052  013700  002202                  MOV     UNITN,R0        ; GET UNIT NUMBER.
     2299       017056  006300                          ASL     R0              ; ... AND MAKE IT A WORD OFFSET.
     2300       017060  062700  003176                  ADD     #ERTABL,R0      ; R0 GETS ADDRESS OF ERROR TABLE ENTRY.
     2301       017064  005210                          INC     (R0)            ; INCREMENT THE DEVICE ERROR COUNT
     2302       017066  032710  007777                  BIT     #7777,(R0)      ; DID WE OVERFLOW THE FIELD?
     2303       017072  001001                          BNE     1$              ; BR IF NO.
     2304       017074  005310                          DEC     (R0)            ; YES -- BACK IT UP TO 7777.
     2305       017076  012600                  1$:     MOV     (SP)+,R0        ; RESTORE R0
     2306       017100  000207                          RTS     PC              ; RETURN TO CALLER.
     2307
     2308       017102  010046                  CKEMAX: MOV     R0,-(SP)        ; SAVE R0
     2309       017104  013700  002202                  MOV     UNITN,R0        ; GET UNIT NUMBER
     2310       017110  006300                          ASL     R0              ; ... AND MAKE IT A WORD OFFSET
     2311       017112  016000  003176                  MOV     ERTABL(R0),R0   ; GET ERROR TABLE ENTRY
     2312       017116  042700  170000                  BIC     #170000,R0      ; EXTRACT ERROR COUNT FIELD
     2313       017122  020037  002174                  CMP     R0,GERRMAX      ; IS GLOBAL LIMIT EXCEEDED FOR THIS UNIT?
     2314       017126  103004                          BHIS    1$              ; BR IF YES
```

```
2315 017130  023737  016756  002172          CMP     ERRK,LERRMAX    ; IS LOCAL LIMIT EXCEEDED FOR THIS TEST?
2316 017136  103417                          BLO     2$              ; BR IF NO
2317 017140                          1$:     RFLAGS  R0              ; GET OPERATOR FLAGS
     017140  104421                          TRAP    C$RFLA
2318 017142  032700  000040                  BIT     #IDU,R0         ; IS DROPPING INHIBITED?
2319 017146  001013                          BNE     2$              ; BR IF YES.
2320 017150  012737  177777  003112          MOV     #-1,DUFLG       ; NO -- DROP THE UNIT
2321 017156                                  ERDF    4,EMAXDU
     017156  104455                          TRAP    C$ERDF
     017160  000004                          .WORD   4
     017162  016777                          .WORD   EMAXDU
     017164  000000                          .WORD   0
2322 017166                                  DODU    UNITN
     017166  013700  002202                  MOV     UNITN,R0
     017172  104451                          TRAP    C$DODU
2323 017174                                  DOCLN
     017174  104444                          TRAP    C$DCLN
2324 017176  012600                  2$:     MOV     (SP)+,R0        ; RESTORE R0
2325 017200  000207                          RTS     PC              ; RETURN TO CALLER
2326                                         .SBTTL  CKDROP  - CHECK IF UNIT SHOULD BE DROPPED
2327                                 ;+
2328                                 ; CHECK IF UNIT SHOULD BE DROPPED
2329                                 ;-
2330 017202  010046                  CKDROP: MOV     R0,-(SP)
2331 017204                                  FORCERROR       1$,NOTSSR
2332 017214                                  RFLAGS  R0
     017214  104421                          TRAP    C$RFLA
2333 017216  032700  000040                  BIT     #IDU,R0
2334 017222  001010                          BNE     1$
2335 017224  011600                          MOV     (SP),R0
2336 017226  012737  177777  003112          MOV     #-1,DUFLG
2337 017234                                  DODU    UNITN
     017234  013700  002202                  MOV     UNITN,R0
     017240  104451                          TRAP    C$DODU
2338 017242                                  DOCLN                   ;ABORT THE PASS
     017242  104444                          TRAP    C$DCLN
2339 017244  012600                  1$:     MOV     (SP)+,R0
2340 017246  000207                          RTS     PC
2341
2342
2343                                         .SBTTL  CONFIG  - DETERMINE CONFIGURATION OF SYSTEM
2344                                 ;
2345                                 ; SUBROUTINE - DETERMINE CONFIGURATION OF TSV05 SYSTEM.
2346                                 ;
2347 017250                          CONFIG:
2348 017250  004737  015774                  JSR     PC,SOFINIT
2349 017254  000207                          RTS     PC
2350                                         .SBTTL  KTON,KTOFF      - ENABLE/DISABLE MEMORY MANAGEMENT
2351                                 ;
2352                                 ; SUBROUTINE - ENABLE MEM MGT.
2353                                 ;
2354 017256  005737  003132          KTON:   TST     KTFLG           ; GOT KT?
2355 017262  001403                          BEQ     1$              ; NO.
2356 017264  012737  000001  177572          MOV     #1,SR0          ; YES. ENABLE KT11.
2357 017272  000207                  1$:     RTS     PC
2358
2359                                 ;
```

```
                                ; SUBROUTINE - DISABLE MEM MGT.
                                ;
017274  005737  003132          KTOFF:  TST     KTFLG           ; GOT KT11?
017300  001405                          BEQ     1$              ; NO.
017302  000240                          NOP
017304  000240                          NOP
017306  012737  000000  177572          MOV     #0,SR0          ; DISABLE KT.
017314  000207                  1$:     RTS     PC
                                        .SBTTL  SETMAP  - SETUP PAR6 MAPPING
                                ;*
                                ;
                                ;THIS ROUTINE SETS UP KERNEL PAR6 TP HANDLE
                                ;AN 18 BIT ADDRESS. THE OFFSET INTO THE PAGE
                                ;IS RETURNED BIASED TO PAR6.
                                ;
                                ;INPUTS:
                                ;
                                ;       R0      HIGH ORDER ADDRESS BITS
                                ;       R1      LOW ORDER ADDRESS BITS
                                ;
                                ;OUTPUTS:
                                ;
                                ;       R0      OFFSET INTO BLOCK WITH PAR6 BIAS (I.E. THE ADDRESS)
                                ;       CARRY   SET IF SUCCESS
                                ;               CLR IF ERROR
                                ;-
017316                          SETMAP:
017316                                  SAVREG                          ;SAVE R1-R4 UNTIL NEXT RETURN
017322  005737  003132                  TST     KTFLG                   ;SYSTEM HAVE ABOVE 28K?
017326  001433                          BEQ     10$                     ;BR IF NO
017330  010102                          MOV     R1,R2                   ;SAVE LOW ORDER BITS
        000006                          .REPT   6
                                        ASR     R0                      ;CONVERT WORD ADDRESS TO 32W BLOCKS
                                        ROR     R1                      ;MAKE IT DOUBLE PRECISION
                                        .ENDR
017362  042701  000177                  BIC     #177,R1                 ;ALINE FOR LOWER 4K BOUNDARY
017366  020137  003132                  CMP     R1,KTFLG                ;HIGHER THAN EXISTING MEMORY?
017372  103011                          BHIS    10$                     ;BR IF YES
017374  010137  172354                  MOV     R1,@#KIPAR6             ;SETUP MAPPING REGISTER PAR6
017400  042702  160000                  BIC     #160000,R2              ;SETUP DISPLACEMENT IN PAGE
017404  062702  140000                  ADD     #140000,R2              ;ADD IN PAR6 BIAS
017410  010200                          MOV     R2,R0                   ;RETURN IN R0
017412  000261                          SEC                             ;SET SUCCESS
017414  000401                          BR      15$                     ;
017416  000241                  10$:    CLC                             ;SET FAILURE
017420  000207                  15$:    RTS     PC                      ;RETURN
                                        .SBTTL  FILLMEM - FILL MEMORY WITH BACKGROUND PATTERN
                                ;*
                                ;  FILL MEMORY WITH A BACKGROUND PATTERN
                                ;
                                ; INPUTS:
                                ;
                                ;       R0 = BACKGROUND PATTERN
                                ;       FREE    = FIRST LOCATION AVAILABLE TO DIAGNOSTIC
                                ;       KTFLG   = SET TO HIGHEST MEMORY LOCATION IF > 28K.
                                ;
```

```
                                ; OUTPUTS:
                                ;
                                ;       NONE
                                ;-
                                ;
                                FILLMEM:
                                        SAVREG                  ;SAVE R1-R5 UNTIL NEXT RETURN
017426  004737  017274                  JSR     PC,KTOFF        ;DISABLE KT.
017432  010003                          MOV     R0,R3           ;COPY TEST PATTERN
017434  013701  003124                  MOV     FREE,R1         ;GET FIRST FREE LOCATION
017440  013702  003126                  MOV     FRESIZ,R2       ;SIZE OF FREE SPACE BELOW 28K.
017444  010321                  10$:    MOV     R3,(R1)+        ;STORE A BACKGROUND WORD
017446  005302                          DEC     R2              ;DONE ALL MEMORY IN FREE SPACE?
017450  003375                          BGT     10$             ;BR IF NO
017452  005737  003132                  TST     KTFLG           ; GOT KT?
017456  001477                          BEQ     55$             ; NO. GET OUT.
017460  004737  017256                  JSR     PC,KTON         ; YES. ENABLE KT.
017464  005000                          CLR     R0              ;HIGH ORDER ADDRESS START
017466  013701  003152                  MOV     PST32W,R1       ;GET >28K START ADDRESS (IN 32W BLOCKS)
        000006                          .REPT   6
                                        CLC                     ;CLEAR C BIT
                                        ROL     R1              ;CONVERT BLOCKS TO WORDS
                                        ROL     R0              ;MAKE IT DOUBLE PRECISION
                                        .ENDR
017536  004737  017316                  JSR     PC,SETMAP       ;SETUP PAR6 MAPPING REGISTER
017542  010320                  30$:    MOV     R3,(R0)+        ;STORE TEST PATTERN IN >28K ADDRESS
017544  020027  160000                  CMP     R0,#160000      ;END OF PAR6 MAPPING AREA?
017550  103774                          BLO     30$             ;BR IF NO
017552  162700  020000                  SUB     #20000,R0       ;BACKUP INTO PAR6 MAPPING BEGIN
017556  062737  000200  172354          ADD     #200,@#KIPAR6   ;POINT TO NEXT 4K BLOCK >28K.
017564  023737  172354  003132          CMP     @#KIPAR6,KTFLG  ;END OF MEMORY?
017572  001427                          BEQ     50$             ;BR IF YES
017574  005737  003144                  TST     T23A            ;11/23A?
017600  001407                          BEQ     35$             ;NO KEEP GOING
017602  013704  177572                  MOV     SR0,R4          ;GET SR0 CONTENTS
017606  042704  177761                  BIC     #177761,R4      ;CLEAR ALL BUT PAGE NUMBER
017612  022704  000016                  CMP     #16,R4          ;SEE IF PAGE 7
017616  001415                          BEQ     50$             ;EXIT IF THERE
017620  005737  003146          35$:    TST     T23B            ;11/23B?
017624  001410                          BEQ     45$             ;NO KEEP GOING
017626  023727  172354  007600          CMP     @#KIPAR6,#7600  ;REACHED 18 BITS?
017634  103001                          BHIS    40$             ;YES
017636  000403                          BR      45$             ;NO KEEP GOING
017640  012737  000020  172516  40$:    MOV     #20,SR3         ;SET 22 BIT RELOCATION
017646  000137  017542          45$:    JMP     30$             ;KEEP GOING ON ETC.
017652  004737  017274          50$:    JSR     PC,KTOFF        ; DISABLE KT.
017656  000207                  55$:    RTS     PC
                                        .SBTTL  CMPMEM  - COMPARE MEMORY TO BACKGROUND PATTERN
                                ;+
                                ; COMPARE MEMORY WITH A BACKGROUND PATTERN
                                ;
                                ; INPUTS:
                                ;
                                ;       R0 = BACKGROUND PATTERN
                                ;       FREE    = FIRST LOCATION AVAILABLE TO DIAGNOSTIC
                                ;       KTFLG   = SET TO HIGHEST MEMORY LOCATION IF > 28K.
                                ;
```

```
                                ; OUTPUTS:
                                ;
                                ;       CARRY   - SET IF NO ERROR
                                ;       CARRY   - CLR IF ERROR
                                ;
                                ; IMPLICIT OUTPUTS:
                                ;
                                ;       ERRHI   - ERROR HIGH ADDRESS
                                ;       ERRLO   - ERROR LOW ADDRESS
                                ;       EXPD    - EXPECTED DATA
                                ;       RECV    - RECEIVED DATA
                                ;-
017660                          CMPMEM:
017660                                  SAVREG                  ;SAVE R1-R5 UNTIL NEXT RETURN
017664  010003                          MOV     R0,R3           ;COPY TEST PATTERN
017666  004737  017274                  JSR     PC,KTOFF        ;DISABLE KT.
017672  013701  003124                  MOV     FREE,R1         ;GET FIRST FREE LOCATION
017676  013702  003126                  MOV     FRESIZ,R2       ;SIZE OF FREE SPACE BELOW 28K.
017702  020311                  10$:    CMP     R3,(R1)         ;FREE SPACE LOCATION EQUAL TO EXPD?
017704  001411                          BEQ     15$             ;BR IF YES
017706  010137  002240                  MOV     R1,ERRLO        ;SAVE ADDRESS IN ERROR
017712  005037  002236                  CLR     ERRHI           ;NO HIGH ADDRESS
017716  010337  002232                  MOV     R3,EXPD         ;SAVE EXPD FOR ERROR REPORT
017722  011137  002234                  MOV     (R1),RECV       ;SAVE RECV FOR ERROR REPORT
017726  000474                          BR      50$             ;
017730  005721                  15$:    TST     (R1)+           ;POINT TO NEXT ADDRESS
017732  005302                          DEC     R2              ;DONE ALL MEMORY IN FREE SPACE?
017734  003362                          BGT     10$             ;BR IF NO
017736  005737  003132                  TST     KTFLG           ; GOT KT?
017742  001472                          BEQ     55$             ; NO. GET OUT.
017744  004737  017256                  JSR     PC,KTON         ; YES. ENABLE KT.
017750  005000                          CLR     R0              ;HIGH ORDER ADDRESS START
017752  013701  003152                  MOV     PST32W,R1       ;GET >28K START ADDRESS (IN 32W BLOCKS)
        000006                          .REPT   6
                                        ROL     R1              ;CONVERT BLOCKS TO WORDS
                                        ROL     R0              ;MAKE IT DOUBLE PRECISION
                                        .ENDR
020006  042701  000177                  BIC     #177,R1         ;ALINE 4K BOUNDARY
020012  010046                          MOV     R0,-(SP)        ;SAVE HIGH ORDER
020014  010146                          MOV     R1,-(SP)        ;SAVE LOW ORDER
020016  004737  017316                  JSR     PC,SETMAP       ;SETUP PAR6 MAPPING REGISTER
020022  010004                          MOV     R0,R4           ;COPY ADDRESS BIASED TO PAR6
020024  012601                          MOV     (SP)+,R1        ;RESTORE LOW ORDER IN NON PAR6 FORMAT
020026  012600                          MOV     (SP)+,R0        ;RESTORE HIGH ORDER IN NON PAR6 FORMAT
020030  020314                  30$:    CMP     R3,(R4)         ;ABOVE 28K LOCATION EQUAL EXPD?
020032  001411                          BEQ     32$             ;BR IF YES
020034  010037  002236                  MOV     R0,ERRHI        ;SAVE HIGH ORDER IN ERROR
020040  010137  002240                  MOV     R1,ERRLO        ;SAVE LOW ORDER IN ERROR
020044  010337  002232                  MOV     R3,EXPD         ;SAVE EXPD FOR ERROR REPORT
020050  011437  002234                  MOV     (R4),RECV       ;SAVE RECV FOR ERROR REPORT
020054  000421                          BR      50$             ;
020056  062701  000002          32$:    ADD     #2,R1           ;UPDATE NON PAR6 ADDRESS
020062  005500                          ADC     R0              ;MAKE IT DOUBLE PRECISION ADD
020064  062704  000002                  ADD     #2,R4           ;UPDATE PAR FORMAT ADDRESS
020070  020427  160000                  CMP     R4,#160000      ;END OF PAR6 MAPPING AREA?
020074  103755                          BLO     30$             ;BR IF NO
020076  162704  020000                  SUB     #20000,R4       ;BACKUP INTO PAR6 MAPPING BEGIN
```

```
2531 020102  062737  000200  172354          ADD     #200,@#KIPAR6   ;POINT TO NEXT 4K BLOCK >28K.
2532 020110  023737  172354  003132          CMP     @#KIPAR6,KTFLG  ;END OF MEMORY?
2533 020116  101744                          BLOS    30$             ;BR IF NO
2534 020120  004737  017274          50$:    JSR     PC,KTOFF        ;TURN OFF MEMORY MAPPING
2535 020124  000241                          CLC                     ;SET FAILURE
2536 020126  000403                          BR      60$             ;
2537 020130  004737  017274          55$:    JSR     PC,KTOFF        ;TURN OFF MEMORY MAPPING
2538 020134  000261                          SEC                     ;SET SUCCESS
2539 020136  000207                  60$:    RTS     PC
2540                                          .SBTTL  REGSAV  - SAVE R1-R5 ON STACK
2541                                  ;+
2542                                  ;
2543                                  ;ROUTINE TO
2544                                  ;SAVE R1 THROUGH R5 ON THE STACK
2545                                  ;
2546                                  ;CALLING SEQUENCE:
2547                                  ;
2548                                  ;       JSR     R5,REGSAV
2549                                  ;
2550                                  ;THIS IS A COOROUTINE WHICH TRANSFER CONTROL BACK TO
2551                                  ;THE CALLING ROUTINE. AT THE END OF THE CALLING ROUTINE,
2552                                  ;THE RTS PC RETURNS CONTROL TO THIS ROUTINE TO RESTORE
2553                                  ;REGISTERS.
2554                                  ;
2555                                  ;THIS ROUTINE SHOULD ONLY BE CALLED FROM ROUTINES WHICH ARE
2556                                  ;CALLED VIA A JSR PC INSTRUCTION
2557                                  ;
2558                                  ;-
2559
2560 020140                          REGSAV:
2561 020140  010446                          MOV     R4,-(SP)
2562 020142  010346                          MOV     R3,-(SP)
2563 020144  010246                          MOV     R2,-(SP)
2564 020146  010146                          MOV     R1,-(SP)
2565 020150  010546                          MOV     R5,-(SP)
2566 020152  016605  000012                  MOV     10.(SP),R5
2567 020156  004736                          JSR     PC,@(SP)+
2568 020160  012601                          MOV     (SP)+,R1
2569 020162  012602                          MOV     (SP)+,R2
2570 020164  012603                          MOV     (SP)+,R3
2571 020166  012604                          MOV     (SP)+,R4
2572 020170  012605                          MOV     (SP)+,R5
2573 020172  000207                          RTS     PC
2574                                          .SBTTL  GETPAT  - GET 8 BIT PATTERN FROM OPERATOR
2575                                  ;+
2576                                  ;
2577                                  ;ROUTINE TO REQUEST AN 8 BIT DATA PATTERN FROM THE OPERATOR
2578                                  ;
2579                                  ;INPUTS:
2580                                  ;
2581                                  ;       NONE.
2582                                  ;
2583                                  ;OUTPUTS:
2584                                  ;
2585                                  ;       R0      OCTAL NUMBER FROM THE OPERATOR
2586                                  ;
2587                                  ;CALLING SEQUENCE:
```

```
2588                                    ;
2589                                    ;       JSR     PC,GETPAT
2590                                    ;
2591                                    ;-
2592
2593 020174                             GETPAT::
2594 020174                                     SAVREG                          ;SAVE THE GENERAL REGISTERS
2595 020200                             1$:     GMANID  DATASC,PATDAT,0,377,0,377,NO
     020200  104443                             TRAP    C$GMAN
     020202  000406                             BR      10000$
     020204  020230                             .WORD   PATDAT
     020206  000022                             .WORD   T$CODE
     020210  020232                             .WORD   DATASC
     020212  000377                             .WORD   377
     020214  000000                             .WORD   T$LOLIM
     020216  000377                             .WORD   T$HILIM
     020220                             10000$:
2596 020220                                     BNCOMPLETE      1$      ;RETRY IF ERROR
     020220  103367                             BCC     1$
2597 020222  013700  020230                     MOV     PATDAT,R0       ;DATA PATTERN FROM OPERATOR
2598 020226  000207                             RTS     PC              ;RETURN TO CALLER
2599
2600                                    ;*
2601                                    ;LOCAL DATA AREA
2602                                    ;-
2603
2604 020230  000000                     PATDAT: .WORD   0               ;TEMPORARY STORAGE FOR DATA
2605 020232     105     116     124     DATASC: .ASCIZ  'ENTER DATA PATTERN'
2606                                            .EVEN
2607                                            .SBTTL  GETSEL  - ISSUE MENU AND GET OPERATOR RESPONSE
2608                                    ;*
2609                                    ;
2610                                    ;ROUTINE TO ISSUE A MENU AND GET
2611                                    ;THE OPERATOR'S RESPONSE.
2612                                    ;
2613                                    ;INPUTS:
2614                                    ;
2615                                    ;       R0      ADDRESS OF ASCIZ STRING OF MENU
2616                                    ;       R1      MAXIMUM ALLOWABLE OPERATOR RESPONSE
2617                                    ;
2618                                    ;OUTPUTS:
2619                                    ;
2620                                    ;       R0      NUMBER OF THE OPERATOR'S SELECTION
2621                                    ;
2622                                    ;-
2623
2624 020256                             GETSEL::
2625 020256                                     SAVREG                          ;SAVE GENERAL REGISTERS
2626 020262  010002                             MOV     R0,R2                   ;SAVE THE MENU ADDRESS
2627 020264  010203                     1$:     MOV     R2,R3                   ;START OF MENU STRING
2628 020266  005713                     2$:     TST     (R3)                    ;END OF ASCII ?
2629 020270  001412                             BEQ     3$                      ;BRANCH IF ALL LINES DISPLAYED
2630 020272                                     PRINTF  @SELASC,(R3)+           ;DISPLAY THE MENU
     020272  012346                             MOV     (R3)+,-(SP)
     020274  012746  020442                     MOV     @SELASC,-(SP)
     020300  012746  000002                     MOV     #2,-(SP)
     020304  010600                             MOV     SP,R0
```

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                020306  104417                          TRAP    C$PNTF
                020310  062706  000006                  ADD     #6,SP
          2631  020314  000764                          BR      2$
          2632  020316                          3$:     GMANID  MENASC,MENRES,D,-1,0,-1,NO
                020316  104443                          TRAP    C$GMAN
                020320  000406                          BR      10001$
                020322  020476                          .WORD   MENRES
                020324  000042                          .WORD   T$CODE
                020326  020447                          .WORD   MENASC
                020330  177777                          .WORD   -1
                020332  000000                          .WORD   T$LOLIM
                020334  177777                          .WORD   T$HILIM
                020336                          10001$:
          2633  020336                                  BNCOMPLETE      1$      ;RETRY IF ERROR
                020336  103352                          BCC     1$
          2634  020340  013700  020476                  MOV     MENRES,R0       ;GET THE OPERATOR'S REPLY
          2635  020344  020001                          CMP     R0,R1           ;COMPARE TO MAXIMUM ALLOWED
          2636  020346  101411                          BLOS    5$              ;BRANCH IF OK
          2637  020350                                  PRINTF  #MENERR         ;DISPLAY ERROR MESSAGE
                020350  012746  020374                  MOV     #MENERR,-(SP)
                020354  012746  000001                  MOV     #1,-(SP)
                020360  010600                          MOV     SP,R0
                020362  104417                          TRAP    C$PNTF
                020364  062706  000004                  ADD     #4,SP
          2638  020370  000735                          BR      1$              ;RETRY
          2639  020372  000207                  5$:     RTS     PC              ;RETURN TO CALLER
          2640  020374     045     116     045  MENERR: .ASCIZ  '%N%A *** Menu Selection Too Large ***'
          2641  020442     045     116     045  SELASC: .ASCIZ  '%N%T'
          2642  020447     105     156     164  MENASC: .ASCIZ  'Enter Menu Selection: '
          2643                                  .EVEN
          2644  020476  000000                  MENRES:         .WORD   0
          2645                                  .SBTTL  CHKMAN  - CHECK MANUAL INTERVENTION LEGALITY
          2646                          ;*
          2647                          ;
          2648                          ;ROUTINE TO TEST FOR MANUAL INTERVENTION LEGALITY.
          2649                          ;
          2650                          ;INPUT:
          2651                          ;
          2652                          ;       NONE.
          2653                          ;
          2654                          ;OUTPUT:
          2655                          ;
          2656                          ;       CARRY   0       MANUAL INTERVENTION NOT ALLOWED
          2657                          ;               1       MANUAL INTERVENTION IS OK
          2658                          ;
          2659                          ;SIDE EFFECTS:
          2660                          ;
          2661                          ;       A MESSAGE IS DISPLAYED WARNING THAT TEST IS
          2662                          ;       NOT EXECUTED IF MANUAL INTERVENTION IS NOT
          2663                          ;       ALLOWED.
          2664                          ;
          2665                          ;-
          2666
          2667  020500                  CHKMAN::
          2668  020500                          SAVREG                  ;SAVE THE REGISTERS
          2669  020504                          MANUAL                  ;SEE IF MANUAL INTERVENTION OK
                020504  104450                  TRAP    C$MANI
```

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                                        BCOMPLETE 1$            ;BRANCH IF ALLOWED
020506  103411                          BCS     1$
                                        PRINTF  @NOMAN          ;PRINT THE WARNING MESSAGE
020510  012746  020534                  MOV     @NOMAN,-(SP)
020514  012746  000001                  MOV     #1,-(SP)
020520  010600                          MOV     SP,R0
020522  104417                          TRAP    C$PNTF
020524  062706  000004                  ADD     #4,SP
020530  000241                          CLC                     ;CLEAR CARRY FOR ERROR
020532  000207                  1$:     RTS     PC              ;RETURN

020534      045     116     045 NOMAN:  .ASCIZ  '<NSA *** Manual Intervention not Allowed - Test Aborted ***'
                                        .even
                                        .SBTTL  ENVIRN  - SETUP FREE DIAGNOSTIC SPACE
                                ;
                                ; SUBROUTINE TO SET-UP VARIOUS ENVIRONMENTAL PARAMETERS.
                                ;
020630                          ENVIRN: MEMORY  R0
020630  104431                          TRAP    C$MEM
020632  010037  003124                  MOV     R0,FREE         ; GET 1ST FREE ADDRESS...
020636  062737  000002  003124          ADD     #2,FREE
020644  011037  003126                  MOV     (R0),FRESIZ     ;...AND WORD COUNT.
020650  162737  000004  003126          SUB     #4,FRESIZ
020656  013702  002012                  MOV     L$UNIT,R2       ; GET NUMBER OF UNITS
020662  162737  000007  003126  10$:    SUB     #7,FRESIZ       ; TAKE AWAY 7 WORDS PER UNIT
020670  005302                          DEC     R2
020672  001373                          BNE     10$
020674  013700  003124                  MOV     FREE,R0         ;GET FIRST FREE ADDRESS
020700  063700  003126                  ADD     FRESIZ,R0       ;POINT TO LAST FREE ADDRESS
020704  162700  000002                  SUB     #2,R0           ;BACKUP 1 WORD
020710  010037  003130                  MOV     R0,FREEHI       ;STORE LAST FREE ADDRESS
020714  000240                          NOP                     ;*****************************************
020716  012701  177520                  MOV     @BDVPCR,R1      ;GET BDV11 PCR ADDRESS
020722  010102                          MOV     R1,R2           ;COPY TO R2
020724  062702  000002                  ADD     #2,R2           ;SET THE RANGE
020730  004737  016376                  JSR     PC,XNXM         ;SEE IF WE HAVE ONE
020734  103001                          BCC     15$             ;OK TO SET FLAGS
020736  000445                          BR      40$             ;RETURN WITH FLAGS CLEAR
020740  013701  177520          15$:    MOV     BDVPCR,R1       ;SAVE PCR CONTENTS
020744  062701  000001                  ADD     #1,R1           ;ADD ONE TO IT
020750  012702  177520                  MOV     @BDVPCR,R2      ;GET BDV11 PCR ADDRESS
020754  005212                          INC     (R2)            ;TRY TO WRITE TO IT
020756  013703  177520                  MOV     BDVPCR,R3       ;GET RESULTS
020762  020103                          CMP     R1,R3           ;DID IT CHANGE?
020764  001017                          BNE     20$             ;NO, MUST BE 11/23B
020766  005237  003144                  INC     T23A            ;SET THE FLAG
020772  042737  170000  002120          BIC     #170000,L$HIME  ;SUPERVISOR COULD BE WRONG
021000  000240                          NOP                     ;BR 40$ FOR RELEASE
021002                                  PRINTF  @M8186          ;TELL THE SYSTEM TYPE
021002  012746  005554                  MOV     @M8186,-(SP)
021006  012746  000001                  MOV     #1,-(SP)
021012  010600                          MOV     SP,R0
021014  104417                          TRAP    C$PNTF
021016  062706  000004                  ADD     #4,SP
021022  000413                          BR      40$             ;RETURN
021024  005237  003146          20$:    INC     T23B            ;SET THE FLAG
021030  000240                          NOP                     ;BR 40$ FOR RELEASE
```

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2715 021032                                     PRINTF  @M8189          ;TELL THE SYSTEM TYPE
     021032  012746  005645                     MOV     @M8189,-(SP)
     021036  012746  000001                     MOV     #1,-(SP)
     021042  010600                             MOV     SP,R0
     021044  104417                             TRAP    C$PNTF
     021046  062706  000004                     ADD     #4,SP
2716 021052  000207                 40$:        RTS     PC              ;RETURN
2717                                            .SBTTL  KTINIT  - SETUP KT11 MEMORY MANAGEMENT REGISTERS
2718                                ;+
2719                                ;
2720                                ;ROUTINE TO INIT KT-11
2721                                ;
2722                                ;-
2723
2724 021054                         KTINIT:
2725 021054  005037  003132                     CLR     KTFLG           ; INIT >28K MEMORY FLAG
2726 021060  005037  003134                     CLR     KTENABLE        ; INIT TEST >28K FLAG
2727 021064  023727  002120  001577             CMP     L$HIME,#1577    ; GOT ENOUGH MEMORY (>28K)?
2728 021072  101444                             BLOS    9$              ; NO.
2729 021074  013700  000004                     MOV     @#ERRVEC,R0     ; SAVE OLD ERR VEC PTR.
2730 021100  012737  021172  000004             MOV     #2$,@#ERRVEC    ; SET ERR VEC PTR.
2731 021106  005737  177572                     TST     @#SR0           ; GOT KT11?
2732 021112  000240                             NOP                     ;  (TRAP IF NO).
2733 021114  013737  002120  003132             MOV     L$HIME,KTFLG    ; YES. SET KT FLAG.
2734 021122  042737  000177  003132             BIC     #177,KTFLG      ;
2735 021130  010037  000004                     MOV     R0,@#ERRVEC     ; RESTORE OLD ERR VEC PTR.
2736 021134  005000                             CLR     R0              ; R0 = AR DATA.
2737 021136  012701  172340                     MOV     #KIPAR0,R1      ; R1 - KI REGS PTR.
2738 021142  012761  077406  177740  1$:        MOV     #77406,-40(R1)  ; SET DESCRIPTOR REG.
2739 021150  010021                             MOV     R0,(R1)+        ; SET KIPAR REG.
2740 021152  062700  000200                     ADD     #200,R0         ; BUMP AR DATA BY "4K".
2741 021156  020027  002000                     CMP     R0,#2000        ; AT "I/O"?
2742 021162  001367                             BNE     1$              ; NO.
2743 021164  012741  177600                     MOV     #177600,-(R1)   ; YES. SET KTPAR7 FOR I/O.
2744 021170  000405                             BR      9$
2745
2746 021172  012716  021200             2$:     MOV     #6$,(SP)        ; SET UP RETURN
2747 021176  000002                             RTI                     ; RTI TO NEXT LOCATION
2748
2749 021200  010037  000004             6$:     MOV     R0,@#ERRVEC     ; RESTORE OLD ERR VEC PTR.
2750
2751 021204  000207                     9$:     RTS     PC
2752                                ;+
2753                                ;       SUBROUTINE TO SET EXTENDED FEATURES SWITCH
2754                                ;
2755                                ;       Requires that SOFINIT and WRTCHR have been done previous to call.
2756                                ;
2757                                ;
2758                                ;INPUTS:
2759                                ;       R5      CURRENT UNIT NUMBER
2760                                ;OUTPUTS:
2761                                ;       The Extended Features Switch is set.
2762                                ;
2763                                ;-
2764
2765 021206                         INVERT::
2766
```

```
2767 021206  005737  002226                    TST     EXTFEA                  ; IS SWITCH SET?
2768 021212  001020                            BNE     1$                      ; YES,EXIT STAGE RIGHT!(or the next one outa town!)
2769 021214  012737  100206  021260            MOV     #100206,CMDPKT          ; WRT SUB-SYS MEM CMD
2770 021222  012737  021270  021262            MOV     #WSMBK,CMDPKT+2         ; MSG BUF ADDR
2771 021230  012737  000006  021266            MOV     #6,CMDPKT+6             ; BYTE COUNT
2772 021236  012737  100010  021270            MOV     #100010,WSMBK           ; INVERT THE SWITCH
2773 021244  012704  021260                    MOV     #CMDPKT,R4              ; SET CMDPKT INTO R4
2774 021250  004737  010662                    JSR     PC,WRTCHR               ; DO IT
2775 021254  000207                    1$:     RTS     PC                      ; RETURN
2776
2777                                           ;       COMMAND PACKET.
2778
2779         021260                            .       =       <.+3>&177774    ;MUST BE ON MOD 4 BOUNDRY.
2780
2781 021260  000000                    CMDPKT:: 0                              ;1ST WORD IS TSO5 COMMAND.
2782 021262  000000                             0                              ;2ND WORD IS THE BUFFER LOW ADDRESS.
2783 021264  000000                             0                              ;3RD WORD IS THE BUFFER HIGH ADDRESS.
2784 021266  000000                             0                              ;4TH WORD IS THE BYTE/RECORD/FILE COUNT.
2785
2786                                           ;       WRITE SUB-SYSTEM MEMORY CHARACTERISTIC BLOCK.
2787
2788 021270  000000                    WSMBK::  0                              ;1ST WORD:: SEL 0
2789 021272  000000                             0                              ;2ND WORD:: SEL 2
2790 021274  000000                             0                              ;3RD WORD:: SEL 4
2791                                            .EVEN
2792                                           ;+
2793                                           ;       SUBROUTINE TO CHECK WETHER OR NOT WE'LL TEST NXM
2794                                           ;
2795                                           ;
2796                                           ;INPUTS:
2797                                           ;OUTPUTS:
2798                                           ;       The NXMFLG is set if we can test.
2799                                           ;       The NXMLO and NXMHI addresses are setup.
2800                                           ;-
2801
2802 021276                                    MEMCK::
2803
2804 021276                                            SAVREG                  ;SAVE THE REGISTERS
2805 021302  005037  003136                            CLR     NXMFLG          ;CLEAR THE FLAG
2806 021306  005037  003140                            CLR     NXMLO           ;CLEAR THE TEST ADDRESS LO
2807 021312  005037  003142                            CLR     NXMHI           ;CLEAR THE TEST ADDRESS HI
2808 021316  005737  003146                            TST     T23B            ;IS IT A 11/23B?
2809 021322  001407                                    BEQ     1$              ;NO
2810 021324  023727  002120  007777                    CMP     L$HIME,#7777    ; GREATER THAN 128K
2811 021332  103406                                    BLO     2$              ; NO
2812 021334  004737  021452                            JSR     PC,NXMTST       ;SETUP THE ADDRESS
2813 021340  000427                                    BR      13$             ;SET THE FLAG AND EXIT
2814 021342  005737  003144                    1$:     TST     T23A            ;IS IT A 11/23A?
2815 021346  001413                                    BEQ     4$              ;NO
2816 021350  023727  002120  005777            2$:     CMP     L$HIME,#5777    ;GREATER THAN 96K
2817 021356  101023                                    BHI     14$             ;YES,23A/23B WITH 128K MEMORY
2818 021360  023727  002120  003777                    CMP     L$HIME,#3777    ;GREATER THAN 64K BUT LESS THAN 92K?
2819 021366  103403                                    BLO     4$              ;NO, CHECK 24K
2820 021370  004737  021452                            JSR     PC,NXMTST       ;SETUP THE ADDRESS
2821 021374  000411                                    BR      13$             ;SET THE FLAG AND EXIT
2822 021376  023727  002120  001577            4$:     CMP     L$HIME,#1577    ;GREATER THAN 24K BUT LESS THAN 64K?
2823 021404  103410                                    BLO     14$             ;NO, TELL THEM AND EXIT WITH FLAG CLEAR
```

```
2824 021406  004737  021452            JSR     PC,NXMTST           ;SETUP THE ADDRESS
2825 021412  062737  000077  003142    ADD     #77,NXMHI           ;FOOL THE 11/02 & 11/03
2826 021420  005237  003136      13$:  INC     NXMFLG              ;SET THE FLAG
2827 021424  000411              BR      15$                       ;EXIT
2828 021426  000410              14$:  BR      15$                 ;NOP FOR PRINTOUT
2829 021430                     PRINTF  @NOMEM                      ;TELL THEM & EXIT ***NO PRINT*****
     021430  012746  005460      MOV     @NOMEM,-(SP)
     021434  012746  000001      MOV     #1,-(SP)
     021440  010600              MOV     SP,R0
     021442  104417              TRAP    C$PNTF
     021444  062706  000004      ADD     #4,SP
2830 021450  000207              15$:  RTS     PC                  ;RETURN
2831
2832                             ;*
2833                             ;       SUBROUTINE TO SETUP THE NXM ADDRESS FOR TESTING
2834                             ;
2835                             ;OUTPUTS:NXMLO,NXMHI              ;SETUP WITH NXM ADDRESS
2836                             ;
2837                             ;-
2838
2839 021452  013701  002120      NXMTST: MOV     L$HIME,R1           ;GET TOP OF MEMORY
2840 021456  062701  000200              ADD     #200,R1             ;MAKE IT I/O BLOCK OR OTHER NXM
2841 021462  042701  000177              BIC     #177,R1
2842 021466  010102              MOV     R1,R2                       ;RESAVE RESULTS
2843         000006              .REPT   6
2844                             ASL     R1                          ;PUT IN PLACE FOR XFER
2845                             .ENDR
2846 021504  010137  003140      MOV     R1,NXMLO                    ;SAVE TEST ADDRESS LOW
2847         000012              .REPT   10.
2848                             ASR     R2                          ;PUT IN PLACE FOR XFER
2849                             .ENDR
2850 021534  042702  177700      BIC     #177700,R2                  ;DON'T WANT ILA!
2851 021540  010237  003142      MOV     R2,NXMHI                    ;SAVE TEST ADDRESS HIGH
2852 021544  000207              RTS     PC                          ;RETURN
2853
2854
2855
2856 021546                      ENDMOD
```

```
                                        .TITLE  TSV4 - MISCELLANEOUS SECTIONS
                                        BGNMOD  TSV4
021546                          TSV4::
021546
```

```
                                                .SBTTL  PROTECTION TABLE
                                                BGNPROT
                                        L$PROT::
                                                .WORD   -1, -1, -1, -1          ;NO DEVICE PROTECTION REQUIRED.
                                                ENDPROT
```

```
                        .SBTTL  INITIALIZE SECTION

                        ;++
                        ;THE INITIALIZE SECTION CONTAINS THE CODING THAT IS PERFORMED
                        ;AT THE BEGINNING OF EACH PASS.
                        ;
                        ;IF "START" OR "RESTART", SET QUICK-PASS FLAG AND BUS-INIT.
                        ;IF "CONTINUE", NOTHING IS REQUIRED.
                        ;
                        ;--
                        ;+
                        ;INSERT TEMPORARY JUMP TO ODT
                        ;-
                                BGNINIT
021556                  L$INIT::
021556  005037  002226  40$:    CLR     EXTFEA
021562  005037  003136          CLR     NXMFLG
021566  012737  006360  002200  MOV     @EPRT1,EPRTSW           ;SET UP PRIMARY MESSAGE FOR REPLACEMENT
021574  005037  003154          CLR     SIFLAG                  ;CLEAR "SOFT INIT" FLAG
021600  005037  003134          CLR     KTENABLE                ;CLEAR TEST ABOVE 28K FLAG
021604  005037  002302          CLR     RAMSIZ                  ;CLEAR RAM SIZE FOR RAMERR ROUTINE
021610                          READEF  @EF.CONTINUE
021610  012700  000036          MOV     @EF.CONTINUE,R0
021614  104447                  TRAP    C$REFG
021616                          BNCOMPLETE 1$
021616  103023                  BCC     1$
021620  023737  002202  002012  CMP     UNITN,L$UNIT            ;UNIT IN RANGE?
021626  103070                  BHIS    4$                      ;BR IF NO.
021630  005737  003112          TST     DUFLG                   ;DROPPED UNIT?
021634  100472                  BMI     NXTU                    ;BR IF YES
021636  013701  002202          MOV     UNITN,R1
021642  006301                  ASL     R1
021644  005761  003176          TST     ERTABL(R1)
021650  001516                  BEQ     SETU
021652  032761  040000  003176  BIT     @BIT14,ERTABL(R1)       ;DROPPED?
021660  001060                  BNE     NXTU
021662                          EXIT    INIT                    ;DO NOTHING IF "CONTINUE".
021662  104432                  TRAP    C$EXIT
021664  000416                  .WORD   L10030-.
021666                  1$:     READEF  @EF.NEW
021666  012700  000035          MOV     @EF.NEW,R0
021672  104447                  TRAP    C$REFG
021674                          BNCOMPLETE NXTU                 ;TAKE NEXT UNIT IF NOT NEW PASS.
021674  103052                  BCC     NXTU
021676                          READEF  @EF.START
021676  012700  000040          MOV     @EF.START,R0
021702  104447                  TRAP    C$REFG
021704                          BCOMPLETE 2$
021704  103404                  BCS     2$
021706                          READEF  @EF.RESTART
021706  012700  000037          MOV     @EF.RESTART,R0
021712  104447                  TRAP    C$REFG
021714                          BNCOMPLETE 31$
021714  103031                  BCC     31$
021716                  2$:                                     ;1ST PASS, BUS-INIT...
021716                          BRESET                          ;BUS RESET.
021716  104433                  TRAP    C$RESET
```

```
     022720  005037  002214                  CLR     TSTCNT                  ;NUMBER OF TESTS RUN IN PASS
     022724  005037  002222                  CLR     FATFLG                  ;CLEAR FATAL ERROR COUNT
     022730  005037  003144                  CLR     T23A                    ;CLEAR 11/23A FLAG
     022734  005037  003146                  CLR     T23B                    ;CLEAR 11/23B FLAG
                                     ;       MOV     #340,-(SP)
                                     ;       MOV     #20$,-(SP)              ;RETURN TO DEBUGGER
                                     ;       JMP     0.ODT           ;;@@ENTER THE DEBUGGER
     021740  005037  003400                  CLR     SKIPT           ;CLEAR THE SUBTEST "SKIPPER"
     021744                          20$:
     021744  012737  177777  002204          MOV     #-1,QVP                 ;...QUICK VERIFY...
     021752  004737  020630                  JSR     PC,ENVIRN               ;SET ENVIRONMENT.
     021756  004737  021054                  JSR     PC,KTINIT               ;INITIALIZE KT MEMORY MANAGEMENT
     021762  012700  003176                  MOV     #ERTABL,R0
     021766  005020                  30$:    CLR     (R0)+                   ;CLEAR THE ERROR TABLE
     021770  020027  003376                  CMP     R0,#ERTABE
     021774  103774                          BLO     30$
     021776  000404                          BR      4$
     022000  005037  002204          31$:    CLR     QVP
     022004  000137  022054                  JMP     PASRPT                  ;GO REPORT THE STATUS

     022010                          4$:
     022010  012737  177777  002202  NEWPAS: MOV     #-1,UNITN               ;INIT UNIT NUMBER...
     022016  005037  002220                  CLR     DEVCNT                  ;CLEAR COUNT OF DEVICES RUNNING
     022022                          NXTU:   BREAK
     022022  104422                          TRAP    C$BRK
     022024  005237  002202                  INC     UNITN                   ;...AND SET NEXT UNIT NUMBER.
     022030  023737  002202  002012          CMP     UNITN,L$UNIT
     022036  103423                          BLO     SETU
     022040  012737  177777  003112          MOV     #-1,DUFLG
     022046  000401                          BR      11$
     022050                                  DOCLN                           ;ABORT, NO MORE UNITS.
     022050  104444                          TRAP    C$DCLN
     022052  000240                  11$:    NOP
     022054                          PASRPT:
     022054  023727  002012  000001          CMP     L$UNIT,#1               ;HOW MANY UNITS SELECTED?
     022062  101752                          BLOS    NEWPAS                  ;BR IF ONLY 1
     022064  005737  002220                  TST     DEVCNT                  ;ARE ANY STILL RUNNING?
     022070  001747                          BEQ     NEWPAS                  ;BR IF NO
     022072                                  RFLAGS  R0
     022072  104421                          TRAP    C$RFLA
     022074  032700  000100                  BIT     #ISR,R0                 ;SHOULD WE PRINT STATISTICS
     022100  001343                          BNE     NEWPAS                  ;BR IF NO

     022102                                  DORPT
     022102  104424                          TRAP    C$DRPT
     022104  000741                          BR      NEWPAS
     022106                          10$:

     022106                          SETU:   GPHARD  UNITN,R0                ;GET UNIT N P-TABLE POINTER.
     022106  013700  002202                  MOV     UNITN,R0
     022112  104442                          TRAP    C$GPHRD
     022114                                  BNCOMPLETE NXTU                 ;BR IF UNIT NOT AVAILABLE.
     022114  103342                          BCC     NXTU
     022116  005037  003112                  CLR     DUFLG                   ;CLEAR "DROPPED" FLAG.
     022122  005237  002220                  INC     DEVCNT
     022126  012001                          MOV     (R0)+,R1                ;GET 1ST REGISTER ADDRESS.
     022130  010137  002206                  MOV     R1,CSRADDR              ;ADDRESS OF REGISTERS OF UNIT UNDER TEST
```

INITIALIZE SECTION

```
                        MOV     (R0)+,R1                ;GET VECTOR ADDRESS.
                        ;MOV    (R0),R2                 ;GET INTERRUPT PRIORITY
                        ;MOV    R2,IPRI                 ;SET INTERRUPT PRIORITY.
                        MOV     R1,IVEC                 ;SET INTERRUPT VECTOR POINTER...
                        MOV     #INTR,(R1)+             ;...VECTOR...
                        MOV     IPRI,(R1)+              ;...AND PRIORITY.

                1$:
                ;       TST     QVP             ;1ST PASS ??
                ;       BEQ     5$              ;NO, SKIP THE PASS 1 STUFF.

                ;
                ;1ST PASS, CHECK THAT DEVICE ADDRESSES ARE VALID, AND
                ;THAT THE DISPLAY STATUS IS PROPERLY INITIALIZED.
                ;
                        MOV     UNITN,R1
                        ASL     R1
                        BIS     #BIT15,ERTABL(R1)       ;SAY DEVICE RUNNING
                        CLR     EXTA                    ;CLEAR ERROR EXTENSION FLAG.
                        CMP     L$UNIT,#1               ;ARE WE TESTING MULTIPLE UNITS?
                        BLOS    10$                     ;BR IF NO.
                        RFLAGS  R0                      ;YES -- GET OPERATOR FLAGS.
                        TRAP    C$RFLA
                        BIT     #PNT,R0                 ;SHOULD WE PRINT UNIT #?
                        BEQ     10$                     ;BR IF NOT.
                        PRINTF  #PUNIT,UNITN            ;PRINT THE UNIT #
                        MOV     UNITN,-(SP)
                        MOV     #PUNIT,-(SP)
                        MOV     #2,-(SP)
                        MOV     SP,R0
                        TRAP    C$PNTF
                        ADD     #6,SP
                10$:
                        CLR     NODEV
                        MOV     CSRADDR,R1              ;ADDRESS OF FIRST REGISTER
                        MOV     R1,R2                   ;START OF REGISTERS
                        ADD     #TSSR,R2                ;ADDRESS OF TSSR REGISTER
                        JSR     PC,XNXM                 ;TEST BOTH CONTROLLER REGISTERS...
                        BCC     2$                      ;...AND BR IF ALL OK.
                        MOV     R1,NODEV                ;FLAG DEVICE AS NON-EXISTENT
                        MOV     #-1,DUFLG               ;DROP THIS UNIT.
                2$:
                ;
                ;FINALLY, SET CPU PRIORITY AND WE'RE DONE.
                ;
                5$:     SETPRI  #PRI00          ;ENABLE INTERRUPTS.
                        MOV     #PRI00,R0
                        TRAP    C$SPRI
                        ENDINIT
                L10030:
                        TRAP    C$INIT

                PUNIT:  .ASCIZ  /%N%N%A***** TESTING UNIT %D2%A *****/
                        .EVEN
```

```
                                        .SBTTL  ADD AND DROP UNITS SECTIONS

                                ;++
                                ; THE ADD-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
                                ; TO BE (A) ADDED TO THE TEST LIST FOR THE FIRST TIME,
                                ;    OR (B) RE-INSERTED IF IT HAD BEEN PREVIOUSLY DROPPED.
                                ;--
022352                                  BGNAU
022352                          L$AU::
022352  010001                          MOV     R0,R1                   ; GET UNIT TO BE ADDED (R0)
022354  006301                          ASL     R1                      ; MAKE IT A WORD INDEX
022356  052761  100000  003176          BIS     #100000,ERTABL(R1)      ; SET THE "ACTIVE" BIT
022364  042761  040000  003176          BIC     #40000,ERTABL(R1)       ; CLEAR THE "DROPPED" BIT
022372                                  PRINTF  #1$,R0
022372  010046                          MOV     R0,-(SP)
022374  012746  022420                  MOV     #1$,-(SP)
022400  012746  000002                  MOV     #2,-(SP)
022404  010600                          MOV     SP,R0
022406  104417                          TRAP    C$PNTF
022410  062706  000006                  ADD     #6,SP
022414                                  EXIT    AU
022414  000167                          .WORD   J$JMP
022416  000026                          .WORD   L10031-2-.
022420     045     116     045  1$:     .ASCIZ  /%N%A  UNIT %D%A ADDED/
                                        .EVEN

022446                                  ENDAU           ; UNUSED.
022446                          L10031:
022446  104452                          TRAP    C$AU

                                ;++
                                ; THE DROP-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
                                ; TO BE REMOVED FROM THE TEST LIST.
                                ;
                                ; SUPVSR DOES THE "DROPPING".  THIS IS JUST TO TELL THE MAN.
                                ; "DROPPED" UNITS ARE RE-SELECTED ON OPERATOR "STA" OR "ADD"
                                ; COMMAND, OTHERWISE REMAIN INACTIVE.  THE "DISPLAY" COMMAND
                                ; WILL PRINT ALL DROPPED UNITS, AND THE P-TABLES OF THOSE
                                ; WHICH ARE STILL ACTIVE.
                                ; UPON ENTRY, R0 CONTAINS THE UNIT TO BE DROPPED.

022450                                  BGNDU
022450                          L$DU::
022450  012737  177777  003112          MOV     #-1,DUFLG
022456  010001                          MOV     R0,R1
022460  006301                          ASL     R1
022462  052761  140000  003176          BIS     #140000,ERTABL(R1)      ; SAY DROPPED
022470  000240  000240  000240          240,240,240                     ; ?????????
022476                                  PRINTF  #1$,R0
022476  010046                          MOV     R0,-(SP)
022500  012746  022524                  MOV     #1$,-(SP)
022504  012746  000002                  MOV     #2,-(SP)
022510  010600                          MOV     SP,R0
022512  104417                          TRAP    C$PNTF
022514  062706  000006                  ADD     #6,SP
022520                                  EXIT    DU
022520  000167                          .WORD   J$JMP
022522  000030                          .WORD   L10032-2-.
```

```
    195 022524     045     116     045 1$:     .ASCIZ  /%N%A  UNIT %D%A DROPPED/
    196                                .EVEN
    197 022554                         ENDDU
        022554                     L10032:
        022554  104453                       TRAP    C$DU
    198                            ;++
    199                            ; AUTO-DROP CODE SECTION.
    200                            ;--
    201 022556                         BGNAUTO
        022556                     L$AUTO::
    202 022556  013705  002206             MOV     CSRADDR,R5          ;POINT TO DEVICE REGISTER
    203 022562  012703  000550             MOV     #360.,R3            ;ENOUGH TIME FOR 2400' REEL TO REWIND
    204 022566  004737  016250         10$:JSR     PC,WAITF            ;WAIT FOR SSR TO SET
    205 022572  103420                 BCS     20$                 ;LEAVE WHEN SSR IS SET
    206 022574                         DELAY   250.                ;WAIT FOR .25 SECONDS
        022574  012727  000372             MOV     #250.,(PC)+          .
        022600  000000                     .WORD   0
        022602  013727  002116             MOV     L$DLY,(PC)+
        022606  000000                     .WORD   0
        022610  005367  177772             DEC     -6(PC)
        022614  001375                     BNE     .-4
        022616  005367  177756             DEC     -22(PC)
        022622  001367                     BNE     .-20
    207 022624  005303                     DEC     R3                  ;BUMP COUNTER DOWN
    208 022626  001357                     BNE     10$                 ;KEEP GOING
    209 022630  004737  017202             JSR     PC,CKDROP           ;TRY AND DROP UNIT
    210 022634                         20$:
    211 022634                         ENDAUTO                     ; UNUSED.
        022634                     L10033:
        022634  104461                       TRAP    C$AUTO
```

```
                                        .SBTTL  CLEAN-UP AND REPORT CODING SECTIONS


                                ;**
                                ; THE CLEANUP CODING SECTION CONTAINS THE CODING THAT IS
                                ; EXECUTED AT THE END OF EACH PASS (OR SUB-PASS).
                                ; USE TO RETURN DEVICE UNDER TEST TO A NEUTRAL STATE.
                                ;--
022636                                  BGNCLN
022636                          L$CLEAN::
022636  013705  002206                  MOV     CSRADDR,R5              ;POINT TO DEVICE REGISTER
022642  005737  003112                  TST     DUFLG           ;"DROPPED" FLAG IS SET ON...
022646  100405                          BMI     1$              ;...AND GROSS CONTROLLER FAULT...
                                                                ;...DON'T TRY TO XCT CLEANUP CODE.

022650  012765  000000  000002          MOV     #0,TSSR(R5)     ;DO SOFT INIT
022656  004737  016250                  JSR     PC,WAITF
022662                          1$:
022662                          2$:     ENDCLN
022662                          L10034:
022662  104412                          TRAP    C$CLEAN
                                ;**
                                ; THE REPORT CODING SECTION CONTAINS THE
                                ; "PRINTS" CALLS THAT GENERATE STATISTICAL REPORTS.
                                ;--
022664                                  BGNRPT
022664                          L$RPT::
022664                                  PRINTS  #DEVSUM
022664  012746  023126                  MOV     #DEVSUM,-(SP)
022670  012746  000001                  MOV     #1,-(SP)
022674  010600                          MOV     SP,R0
022676  104416                          TRAP    C$PNTS
022700  062706  000004                  ADD     #4,SP
022704  010246                          MOV     R2,-(SP)
022706  010346                          MOV     R3,-(SP)
022710  010446                          MOV     R4,-(SP)
022712  012704  003176                  MOV     #ERTABL,R4      ; GET START OF ERROR TABLE.
022716  005003                          CLR     R3              ; CLEAR UNIT NUMBER
022720  011402                  1$:     MOV     (R4),R2         ; GET ERROR TABLE ENTRY & TEST IT.
022722  001467                          BEQ     4$              ; ZERO IF UNIT NOT RUN
022724  100066                          BPL     4$
022726  032702  040000                  BIT     #BIT14,R2       ; WAS UNIT DROPPED?
022732  001015                          BNE     2$              ; BR IF YES
022734  042702  170000                  BIC     #^C7777,R2      ; GET ERROR COUNT FIELD
022740                                  PRINTS  #DEVONL,R3,R2   ; PRINT
022740  010246                          MOV     R2,-(SP)
022742  010346                          MOV     R3,-(SP)
022744  012746  023163                  MOV     #DEVONL,-(SP)
022750  012746  000003                  MOV     #3,-(SP)
022754  010600                          MOV     SP,R0
022756  104416                          TRAP    C$PNTS
022760  062706  000010                  ADD     #10,SP
022764  000446                          BR      4$
022766  020227  160000          2$:     CMP     R2,#160000      ; WAS UNIT NON-EXISTENT?
022772  001012                          BNE     3$              ; BR IF NO
022774                                  PRINTS  #DEVNXR,R3
022774  010346                          MOV     R3,-(SP)
022776  012746  023233                  MOV     #DEVNXR,-(SP)
```

```
                023002  012746  000002                  MOV     #2,-(SP)
                023006  010600                          MOV     SP,R0
                023010  104416                          TRAP    C$PNTS
                023012  062706  000006                  ADD     #6,SP
    252         023016  000431                          BR      4$
    253         023020  020227  160001          3$:     CMP     R2,#160001      ; WAS UNIT NOT READY AT STARTUP?
    254         023024  001012                          BNE     30$             ; BR IF NO.
    255         023026                                  PRINTS  #DEVNRD,R3
                023026  010346                          MOV     R3,-(SP)
                023030  012746  023315                  MOV     #DEVNRD,-(SP)
                023034  012746  000002                  MOV     #2,-(SP)
                023040  010600                          MOV     SP,R0
                023042  104416                          TRAP    C$PNTS
                023044  062706  000006                  ADD     #6,SP
    256         023050  000414                          BR      4$
    257         023052  042702  170000          30$:    BIC     #^C7777,R2
    258         023056                                  PRINTS  #DEVDRO,R3,R2
                023056  010246                          MOV     R2,-(SP)
                023060  010346                          MOV     R3,-(SP)
                023062  012746  023376                  MOV     #DEVDRO,-(SP)
                023066  012746  000003                  MOV     #3,-(SP)
                023072  010600                          MOV     SP,R0
                023074  104416                          TRAP    C$PNTS
                023076  062706  000010                  ADD     #10,SP
    259         023102  062704  000002          4$:     ADD     #2,R4
    260         023106  005203                          INC     R3
    261         023110  020427  003376                  CMP     R4,#ERTABE
    262         023114  103701                          BLO     1$
    263         023116  012604                          MOV     (SP)+,R4
    264         023120  012603                          MOV     (SP)+,R3
    265         023122  012602                          MOV     (SP)+,R2
    266         023124                                  ENDRPT          ; UNUSED.
                023124                          L10035:
                023124  104425                          TRAP    C$RPT
    267
    268         023126      045     116     045 DEVSUM: .ASCIZ  /%N%ADEVICE STATUS SUMMARY:%N/
    269         023163      045     101     040 DEVONL: .ASCIZ  /%A  UNIT %D3%A   ONLINE,  ERRORS = %D%N/
    270         023233      045     101     040 DEVNXR: .ASCIZ  /%A  UNIT %D3%A   DROPPED, NON-EXISTENT REGISTER%N/
    271         023315      045     101     040 DEVNRD: .ASCIZ  /%A  UNIT %D3%A   DROPPED, NOT READY AT STARTUP%N/
    272         023376      045     101     040 DEVDRO: .ASCIZ  /%A  UNIT %D3%A   DROPPED, ERRORS = %D%N/
    273                                             .EVEN
    274
    275         023446                              ENDMOD
    276
```

```
                                .TITLE  TSV5 - HARDWARE TESTS
                                BGNMOD  TSV5
023446                  TSV5::
```

```
                                .SBTTL  TEST  1: INITIALIZE AFTER WRITE CHARACTERISTICS
                        ;+
                        ; TEST DESCRIPTION:
                        ;
                        ;       This test verifies that a Hardware Initialize command
                        ;       invoked after a Write Characteristics command sets up
                        ;       the Command, Message and Characteristic image blocks
                        ;       in the controller ram correctly.
                        ;
                        ; TEST STEPS:
                        ;
                        ;       REPEAT FOR LOOPCNT
                        ;         BEGIN
                        ;               Do WRITE CHARACTERISTICS command.
                        ;               If the NBA bit in the TSSR register is NOT=0 then Print Error.
                        ;               Write to TSSR register to soft initialize the controller
                        ;               If controller RAM 310-377 NOT=0 then Print Error
                        ;         END
                        ;--


 023446                         BGNTST
 023446                                                                  T1::
 023446  012700  024102         MOV     #TST13ID,R0             ;ASCII MESSAGE TO IDENTIFY TEST
 023452  004737  016510         JSR     PC,TSTSETUP             ;DO INITIAL TEST SETUP
 023456  012737  000012  002216 MOV     #10.,LOOPCNT            ;PERFORM 10 ITERATIONS
 023464                 T13LOOP:
 023464  004737  024356         JSR     PC,T13REST              ;SET PACKET TO START-UP VALUES

 023470  012703  002764         MOV     #TSTBLK+10.,R3          ;START OF TEST DATA
 023474  012704  024040         MOV     #T13PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
 023500  012764  000010  000006 MOV     #8.,PKBCNT(R4)          ;START WITH MINIMUM ALLOWABLE VALUE
 023506                 5$:
 023506  004737  015774         JSR     PC,SOFINIT              ;WRITE TO TSSR TO SOFT INITIALIZE
 023512  103405                 BCS     10$                     ;BR IF SOFT INIT OKAY
 023514  010001                 MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
 023516                         ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL DURING INIT
 023516  104455                                                          TRAP    C$ERDF
 023520  000144                                                          .WORD   100
 023522  003652                                                          .WORD   SFIERR
 023524  012034                                                          .WORD   SFIMSG

                        ;Do WRITE CHARACTERISTICS command.
 023526  005037  002222 10$:    CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
 023532  010465  000000         MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
 023536  004737  016336         JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
 023542                         FORCERROR       12$                     ;@@FORCE ERROR IF FORCER=1
 023556  103407                 BCS     15$                     ;BR IF CARRY SET (GOOD RETURN)
 023560  010001                 MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
 023562                         NEXT.ERRNO
 023562                 12$:    ERRDF   ERRNO,T13SSR,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
 023562  104455                                                          TRAP    C$ERDF
 023564  000145                                                          .WORD   101
 023566  024267                                                          .WORD   T13SSR
 023570  012046                                                          .WORD   PKTSSR
 023572  005237  002222         INC     FATFLG                  ;SET FATAL ERROR FLAG
 023576                 15$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
```

```
023576  104406                                                                      TRAP    C$CLP1
023600  016501  000002          MOV     TSSR(R5),R1             ;GET THE CONTENTS OF TSSR
023604  012702  000200          MOV     #SSR,R2                 ;EXPECTED CONTENTS OF TSSR
023610  032701  000100          BIT     #OFL,R1                 ;IS OFF-LINE BIT SET ?
023614  001402                  BEQ     25$                     ;BRANCH IF NOT OFF-LINE
023616  052702  000100          BIS     #OFL,R2                 ;SET OFF-LINE IN EXPECTED DATA

                        ;If the NBA bit in the TSSR register is NOT=0 then Print Error.
023622                  25$:
023622                          FORCERROR       27$                     ;@@D
023636  020201                  CMP     R2,R1                   ;DOES EXPECTED MATCH RECEIVED ?
023640  001404                  BEQ     30$                     ;OKAY IF MATCH
023642                          NEXT.ERRNO
023642                  27$:    ERRHRD  ERRNO,T13NBA,PKTSSR     ;NBA NOT ZERO
023642  104456                                                                      TRAP    C$ERHRD
023644  000146                                                                      .WORD   102
023646  024214                                                                      .WORD   T13NBA
023650  012046                                                                      .WORD   PKTSSR
023652                  30$:    CKLOOP                          ;LOOP ON ERROR ?
023652  104406                                                                      TRAP    C$CLP1

                        ;Write to TSSR register to soft initialize the controller
023654                  40$:
023654  004737  015774          JSR     PC,SOFINIT              ;WRITE TO TSSR TO SOFT INITIALIZE
023660                          FORCERROR       42$                     ;@@D
023674  103405                  BCS     50$                     ;BR IF SOFT INIT OKAY
023676  010001                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
023700                          NEXT.ERRNO
023700                  42$:    ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL DURING INIT
023700  104455                                                                      TRAP    C$ERDF
023702  000147                                                                      .WORD   103
023704  003652                                                                      .WORD   SFIERR
023706  012034                                                                      .WORD   SFIMSG

                        ;If controller RAM 310-377 NOT=0 then Print Error
023710  012704  000310  50$:    MOV     #310,R4                 ;START WITH LOC 310
023714  005002                  CLR     R2                      ;MEMORY EXPECTED SHOULD BE 000000
023716  105065  000000          CLRB    TSDB(R5)                ;SET MAINTENANCE MODE
023722  004737  016336          JSR     PC,CHKTSSR              ;WAIT FOR SSR READY
023726  010465  000000  60$:    MOV     R4,TSDB(R5)             ;SELECT RAM ADDRESS
023732  004737  016336          JSR     PC,CHKTSSR              ;WAIT FOR SSR READY
023736  116501  000000          MOVB    TSBA(R5),R1             ;READ LOC CONTENTS
023742                          FORCERROR       62$,NOTSSR              ;@@D
023752  120102                  CMPB    R1,R2                   ;CHECK MEMORY FOR 000000
023754  001406                  BEQ     70$                     ;BRANCH IF DATA OKAY
023756                          NEXT.ERRNO
023756                  62$:    ERRDF   ERRNO,T13MEM,RAMEXP     ;MEMORY NOT ZERO AFTER INIT.
023756  104455                                                                      TRAP    C$ERDF
023760  000150                                                                      .WORD   104
023762  024155                                                                      .WORD   T13MEM
023764  015530                                                                      .WORD   RAMEXP
023766  005237  002222          INC     FATFLG                  ;SET THE FATAL ERROR FLAG
023772                  70$:    CKLOOP
023772  104406                                                                      TRAP    C$CLP1
023774                          ESCAPE  TST                     ;EXIT ON FATAL ERROR
023774  104410                                                                      TRAP    C$ESCAPE
023776  000426                                                                      .WORD   L10036-.
```

```
                                32$:    INC     R4                      ;LOOK AT NEXT RAM LOC.
024000  005204
024002  020427  000400                  CMP     R4,#400                 ;AT TOP OF RAM ADDRESS SPACE
024006  001347                          BNE     60$                     ;BRANCH TILL ALL MEMORY TESTED

024010  005737  002222                  TST     FATFLG                  ;ANY FATAL ERRORS ?
024014  001402                          BEQ     160$                    ;BRANCH IF NOT
024016  004737  017202                  JSR     PC,CKDROP               ;TRY TO DROP THE UNIT
024022  004737  016456          160$:   JSR     PC,TSTLOOP              ;DONE ALL ITERATIONS?
024026  103002                          BCC     165$                    ;BR IF YES
024030  000137  023464                  JMP     T13LOOP                 ;LOOP UNTIL ITERATION COUNT DONE
024034                          165$:
024034                          EXIT    TST
024034  104432                                                          TRAP    C$EXIT
024036  000366                                                          .WORD   L10036-.

                                ;+
                                ;LOCAL STORAGE FOR THIS TEST
                                ;-

024040                          T13PACKET:
024040  100004                          .WORD   100004                  ;COMMAND PACKET FOR TEST
024042  024050                          .WORD   T13DATA                 ;WRITE CHARACTERISTICS COMMAND, WITH ACK
024044  000000                          .WORD   0                       ;ADDRESS OF CHARACTERISTICS BLOCK
024046  000010                          .WORD   8.                      ;STARTING VALUE OF BLOCK SIZE

024050                          T13DATA:                                ;CHARACTERISTICS DATA BLOCK
024050  024062                          .WORD   T13BFR                  ;ADDRESS OF MESSAGE BUFFER
024052  000000                          .WORD   0
024054  000016                          .WORD   14.                     ;LENGTH OF MESSAGE BUFFER
024056  000000  000000                  .WORD   0,0

024062                          T13BFR: .BLKW   8.                      ;MESSAGE BUFFER
                                ;LOCAL TEXT MESSAGES FOR TEST
                                ;-

024102  111     156     151     TST13ID:        .ASCIZ  'Initialization After WRITE CHARACTERISTICS'
024155  111     156     143     T13MEM: .ASCIZ  'Incorrect RAM Data After Init'
                                        .EVEN
024214  127     122     111     T13NBA: .ASCIZ  'WRITE CHARACTERISTICS Command Not Accepted'
024267  103     157     156     T13SSR: .ASCIZ  'Contents of TSSR Incorrect After WRITE CHARACTERISTICS'

                                ;+
                                ;
                                ;ROUTINE TO RESTORE COMMAND PACKET TO START-UP (DEFAULT) VALUES
                                ;
                                ;-

                                .EVEN

024356                          T13REST:
024356                                  SAVREG                          ;SAVE THE REGISTERS
024362  012701  024040                  MOV     #T13PACKET,R1           ;START OF THE PACKET
024366  012721  100004                  MOV     #100004,(R1)+           ;WRITE CHARACTERISTICS WITH ACK
```

```
                                        MOV     #T13DATA,(R1)+  ;ADDRESS OF CHAR DATA BLOCK
                                        CLR     (R1)+           ;EXTENDED ADDRESS
                                        MOV     #8.,(R1)+       ;SIZE OF DATA BLOCK IN BYTES
                                        MOV     #T13BFR,(R1)+   ;ADDRESS OF MESSAGE BUFFER
                                        CLR     (R1)+
                                        MOV     #14.,(R1)+      ;LENGTH OF MESSAGE BUFFER
                                        CLR     (R1)+
                                        CLR     (R1)
                                        RTS     PC              ;RETURN
                                        ENDTST
                                                                                L10036:
                                                                                        TRAP    C$ETST

                                        .SBTTL  TEST 2: BASIC WRITE SUBSYSTEM MEMORY COMMAND
                                ;+
                                ;
                                ;THIS TEST VERIFIES THAT THE WRITE SUBSYSTEM MEMORY COMMAND WITH A
                                ;BSELO SELECT CODE OF 0 (NO-OP) EXECUTES CORRECTLY. IT ALSO
                                ;VERIFIES THAT A WRITE SUBSYSTEM MEMORY COMMAND WITH A NON-ZERO
                                ;MODE FIELD IS REJECTED. THE TEST FURTHER VERIFIES MICROPROGRAM
                                ;COMMAND DECODING AND HANDLING SEQUENCES.
                                ;
                                ;-
                                        BGNTST
                                                                                T2::
                                        MOV     #TST14ID,R0             ;ASCII MESSAGE TO IDENTIFY TEST
                                        JSR     PC,TSTSETUP             ;DO INITIAL TEST SETUP
                                        MOV     #20.,LOOPCNT            ;PERFORM 20 ITERATIONS
                                T14LOOP:
                                        BGNSUB                          ;/////////////// BEGIN SUBTEST ///////////////
                                                                                T2.1:
                                                                                        TRAP    C$BSUB
                                        JSR     PC,T14REST              ;SET PACKET TO INITIAL VALUES
                                        JSR     PC,T14RST               ;SET PACKET TO INITIAL VALUES
                                        SETPRI  #PRI00                  ;LOWER PRIORITY TO ALLOW INTERRUPTS
                                                                                MOV     #PRI00,R0
                                                                                TRAP    C$SPRI
                                5$:
                                        BGNSEG                          ;>>>>>>>>>>>>> BEGIN SEGMENT >>>>>>>>>>>>>
                                                                                TRAP    C$BSEG
                                        JSR     PC,SOFINIT              ;DO SOFT INIT OF CONTROLLER
                                        BCS     10$                     ;BR IF SOFT INIT = OK
                                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
                                        ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL ERROR DURING INIT
                                                                                TRAP    C$ERDF
                                                                                .WORD   201
                                                                                .WORD   SFIERR
                                                                                .WORD   SFIMSG
                                10$:
                                        MOV     #T14PK2,R4              ;SUBROUTINE NEEDS PACKET ADDRESS
                                        JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
                                        BCS     11$                     ;BR, IF COMMAND ISSUED OK
                                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
                                        ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
                                                                                TRAP    C$ERHRD
                                                                                .WORD   202
                                                                                .WORD   WRTMSG
```

```
    024530  012034                                                                          .WORD   SFIMSG
229 024532                              11$:
230 024532  005037  002222                      CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
231 024536  005037  002224                      CLR     INTRECV                 ;CLEAR INTERRUPT RECEIVED FLAG
232 024542  012704  025160                      MOV     #T14PACKET,R4           ;SET UP NEW WRT. SUBSYS MEM. COMMAND
233 024546  010465  000000                      MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS
234 024552  004737  016336                      JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
235 024556  103407                              BCS     15$                     ;BR IF CARRY SET (GOOD RETURN)
236 024560  010001                              MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
240 024562                                      ERRDF   ERRNO,T14SSR,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
    024562  104455                                                                          TRAP    C$ERDF
    024564  000313                                                                          .WORD   203
    024566  025773                                                                          .WORD   T14SSR
    024570  012046                                                                          .WORD   PKTSSR
241 024572  005237  002222                      INC     FATFLG                  ;SET FATAL ERROR FLAG
242 024576                              15$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
    024576  104406                                                                          TRAP    C$CLP1
243 024600                                      ESCAPE  SEG                     ;BY-PASS SUBTEST IF FATAL ERROR
    024600  104410                                                                          TRAP    C$ESCAPE
    024602  000074                                                                          .WORD   10000$-.
244 024604  005737  002224                      TST     INTRECV                 ;DID AN INTERRUPT OCCUR ?
245 024610  001004                              BNE     22$                     ;BRANCH IF YES
249 024612                                      ERRHRD  ERRNO,T14NINT,PKTSSR
    024612  104456                                                                          TRAP    C$ERHRD
    024614  000314                                                                          .WORD   204
    024616  026063                                                                          .WORD   T14NINT
    024620  012046                                                                          .WORD   PKTSSR
250 024622  016501  000002          22$:        MOV     TSSR(R5),R1             ;GET THE CONTENTS OF TSSR
251 024626  012702  000200                      MOV     #SSR,R2                 ;EXPECTED CONTENTS OF TSSR
252 024632  032701  000100                      BIT     #OFL,R1                 ;IS OFF-LINE BIT SET ?
253 024636  001402                              BEQ     25$                     ;BRANCH IF NOT OFF-LINE
254 024640  052702  000100                      BIS     #OFL,R2                 ;SET OFF-LINE IN EXPECTED DATA
255 024644  020201                      25$:    CMP     R2,R1                   ;DOES EXPECTED MATCH RECEIVED ?
256 024646  001404                              BEQ     30$                     ;OKAY IF MATCH
260 024650                                      ERRHRD  ERRNO,T14NBA,PKTSSR     ;NBA NOT ZERO
    024650  104456                                                                          TRAP    C$ERHRD
    024652  000315                                                                          .WORD   205
    024654  025622                                                                          .WORD   T14NBA
    024656  012046                                                                          .WORD   PKTSSR
261 024660                              30$:
262 024660  004737  011114          35$:        JSR     PC,CKRAM                ;CHECK RAM TO MEMORY
263 024664  103405                              BCS     59$                     ;RAM OK GO ON
267 024666                                      ERRHRD  ERRNO,PKTRAM,RAMERR     ;THEY DON'T MATCH
    024666  104456                                                                          TRAP    C$ERHRD
    024670  000316                                                                          .WORD   206
    024672  004745                                                                          .WORD   PKTRAM
    024674  015510                                                                          .WORD   RAMERR
268 024676                                      ENDSEG                          ;<<<<<<<<<<<<<< END SEGMENT <<<<<<<<<<<<<
    024676                                                                          10000$:
    024676  104405                                                                          TRAP    C$ESEG
269
270
271 024700                              59$:    ENDSUB                          ;\\\\\\\\\\\\\\ END SUBTEST \\\\\\\\\\\\\\
    024700                                                                          L10040:
    024700  104403                                                                          TRAP    C$ESUB
272
273 024702  005737  002222                      TST     FATFLG                  ;ANY FATAL ERRORS ?
```

```
274 024706  001402                    BEQ     60$                 ;BRANCH IF NOT
275 024710  004737  017202              JSR     PC,CKDROP           ;TRY TO DROP THE UNIT
276 024714                          60$:
277                                 ;*
278                                 ;
279                                 ;TEST 2, SUBTEST 2
280                                 ;
281                                 ;CHECK THAT NON-ZERO MODE BITS BEING SET CAUSES
282                                 ;WRITE SUBSYSTEM MEMORY COMMAND TO BE REJECTED
283                                 ;
284                                 ;-
285
286 024714                          BGNSUB                          ;////////////// BEGIN SUBTEST //////////////
    024714                                                                      T2.2:
    024714  104402                                                             TRAP    C$BSUB
287
288 024716                          SETPRI  #PRI00                  ;LOWER PRIORITY TO ALLOW INTERRUPTS
    024716  012700  000000                                                      MOV     #PRI00,R0
    024722  104441                                                             TRAP    C$SPRI
289 024724  012704  025600          5$:     MOV     #T14PK2,R4      ;GET THE ADDRESS OF COMMAND PACKET
290 024730  004737  026306          JSR     PC,T14REST              ;RESTORE PACKET TO STARTING VALUES
291 024734  004737  026344          JSR     PC,T14RST               ;RESTORE PACKET TO STARTING VALUES
292 024740                          BGNSEG                          ;>>>>>>>>>>>>> BEGIN SEGMENT >>>>>>>>>>>>>
    024740  104404                                                             TRAP    C$BSEG
293
294 024742  004737  015774          JSR     PC,SOFINIT              ;DO SOFT INIT OF CONTROLLER
295 024746  103405                  BCS     10$                     ;BR IF SOFT INIT = OK
299 024750  010001                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
300 024752                          ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL ERROR DURING INIT
    024752  104455                                                             TRAP    C$ERDF
    024754  000317                                                             .WORD   207
    024756  003652                                                             .WORD   SFIERR
    024760  012034                                                             .WORD   SFIMSG
301 024762                          10$:
302 024762  004737  010662          JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
303 024766  103405                  BCS     11$                     ;BR, IF COMMAND ISSUED OK
307 024770  010001                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
308 024772                          ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE SUBSYSTEM MEMORY FAILED
    024772  104456                                                             TRAP    C$ERHRD
    024774  000320                                                             .WORD   208
    024776  005056                                                             .WORD   WRTMSG
    025000  012034                                                             .WORD   SFIMSG
309 025002                          11$:
310 025002  005037  002224          CLR     INTRECV                 ;CLEAR INTERRUPT RECEIVED FLAG
311 025006  012704  025160          MOV     #T14PACKET,R4           ;SET-UP WITH WRT SUBSYS MEM PACKET
312 025012  052714  007000          BIS     #007000,(R4)            ;NON-ZERO COMMAND MODE BITS
313 025016  010465  000000          MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS
314 025022  004737  016250          JSR     PC,WAITF                ;WAIT FOR SSR TO SET
315 025026  103405                  BCS     15$                     ;BR IF CARRY SET (GOOD RETURN)
316 025030  010001                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
320 025032                          ERRDF   ERRNO,T14SSR,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
    025032  104455                                                             TRAP    C$ERDF
    025034  000321                                                             .WORD   209
    025036  025773                                                             .WORD   T14SSR
    025040  012046                                                             .WORD   PKTSSR
321 025042                          15$:    CKLOOP                  ;LOOP ON ERROR, IF FLAG SET
    025042  104406                                                             TRAP    C$CLP1
```

```
    322 025044                          ESCAPE  SEG                     ;BY-PASS CHECKS IF FATAL ERROR
        025044  104410                                                              TRAP    C$ESCAPE
        025046  000074                                                              .WORD   10000$-.
    323 025050  005737  002224          TST     INTRECV                 ;DID AN INTERRUPT OCCUR ?
    324 025054  001004                  BNE     22$                     ;BRANCH IF YES
    328 025056                          ERRHRD  ERRNO,T14NINT,PKTSSR
        025056  104456                                                              TRAP    C$ERHRD
        025060  000322                                                              .WORD   210
        025062  026063                                                              .WORD   T14NINT
        025064  012046                                                              .WORD   PKTSSR
    329 025066  016501  000002  22$:    MOV     TSSR(R5),R1             ;GET THE CONTENTS OF TSSR
    330 025072  012702  100206          MOV     #SC!SSR!TSREJ,R2        ;EXPECTED CONTENTS OF TSSR
    331 025076  032701  000100          BIT     #OFL,R1                 ;IS OFF-LINE BIT SET ?
    332 025102  001402                  BEQ     25$                     ;BRANCH IF NOT OFF-LINE
    333 025104  052702  000100          BIS     #OFL,R2                 ;SET OFF-LINE IN EXPECTED DATA
    334 025110  020201  25$:    CMP     R2,R1                   ;DOES EXPECTED MATCH RECEIVED ?
    335 025112  001404                  BEQ     30$                     ;OKAY IF MATCH
    339 025114                          ERRHRD  ERRNO,T142REJ,PKTSSR    ;COMMAND NOT REJECTED
        025114  104456                                                              TRAP    C$ERHRD
        025116  000323                                                              .WORD   211
        025120  025676                                                              .WORD   T142REJ
        025122  012046                                                              .WORD   PKTSSR
    340 025124                  30$:
    341 025124  004737  011114  35$:    JSR     PC,CKRAM                ;CHECK RAM TO MEMORY
    342 025130  103405                  BCS     59$                     ;RAM OK GO ON
    346 025132                          ERRHRD  ERRNO,PKTRAM,RAMERR     ;THEY DON'T MATCH
        025132  104456                                                              TRAP    C$ERHRD
        025134  000324                                                              .WORD   212
        025136  004745                                                              .WORD   PKTRAM
        025140  015510                                                              .WORD   RAMERR
    347 025142                          ENDSEG                          ;<<<<<<<<<<<<< END SEGMENT <<<<<<<<<<<<<
        025142                                                                  10000$:
        025142  104405                                                              TRAP    C$ESEG
    348
    349 025144                  59$:    ENDSUB                          ;\\\\\\\\\\\\\ END SUBTEST \\\\\\\\\\\\\
        025144                                                                  L10041:
        025144  104403                                                              TRAP    C$ESUB
    350 025146                          EXIT    TST                     ;ALL DONE THIS TEST
        025146  104432                                                              TRAP    C$EXIT
        025150  001246                                                              .WORD   L10037-.
    351
    352                         ;+
    353                         ;LOCAL STORAGE FOR THIS TEST
    354                         ;-
    355
    357         025160                  .=<.+10>&177770
    359 025160                  T14PACKET:                              ;COMMAND PACKET FOR TEST
    360 025160  100206                  .WORD   100206                  ;WRITE SUBSYSTEM MEM. COMMAND, WITH IE, ACK
    361 025162  025170                  .WORD   T14DATA                 ;ADDRESS OF CHARACTERISTICS BLOCK
    362 025164  000000                  .WORD   0
    363 025166  000006                  .WORD   6.                      ;STARTING VALUE OF BLOCK SIZE
    364 025170                  T14DATA:                                ;CHARACTERISTICS DATA BLOCK
    365 025170     000          T14BS0: .BYTE   0                       ;BSEL0 BYTE
    366 025171     000          T14BS1: .BYTE   0                       ;BSEL1 BYTE
    367 025172  000000          T14BS2: .WORD   0                       ;BSEL1 WORD
    368 025174  000000                  .WORD   0                       ;DATA
    369 025176                  T14BFR: .BLKW   128.                    ;MESSAGE BUFFER
```

```
                        .=<.+10>&177770
025600                  T14PK2:                 ;COMMAND PACKET FOR TEST
025600  100204                  .WORD   100204  ;WRITE CHARA. MEM. CMND., WITH IE, ACK
025602  025610                  .WORD   T14DTA  ;ADDRESS OF SELECT DATA BLOCK
025604  000000                  .WORD   0
025606  000010                  .WORD   8.      ;STARTING VALUE OF BLOCK SIZE

025610                  T14DTA:                 ;SELECT DATA BLOCK
025610  025176                  .WORD   T14BFR  ;ADDRESS OF MESSAGE BUFFER
025612  000000                  .WORD   0
025614  000400                  .WORD   256.    ;LENGTH OF MESSAGE BUFFER
025616  000000  000000          .WORD   0,0

                        ;+
                        ;LOCAL TEXT MESSAGES FOR TEST
                        ;-
025622  127  122  111  T14NBA: .ASCIZ  'WRITE SUBSYSTEM MEMORY Command Not Accepted'
025676  127  122  111  T142REJ:        .ASCIZ  'WRITE SUBSYSTEM MEMORY Not Rejected With Non-Zero Mode Field'
025773  103  157  156  T14SSR: .ASCIZ  'Contents of TSSR Incorrect After WRITE SUBSYSTEM MEMORY'
026063  105  170  160  T14NINT:        .ASCIZ  'Expected Interrupt Not Received On WRITE SUBSYSTEM MEMORY'
026155  111  156  143  T14TSBA:        .ASCIZ  'Incorrect TSBA Address After WRITE SUBSYSTEM MEMORY'
026241  102  141  163  TST14ID:        .ASCIZ  'Basic WRITE SUBSYSTEM MEMORY Command'
                        .EVEN


                        ;+
                        ;ROUTINE TO RESTORE COMMAND PACKET TO START-UP (DEFAULT) VALUES
                        ;WRITE SUBSYSTEM MEMORY COMMAND
                        ;
                        ;-

026306                  T14REST:
026306                          SAVREG                  ;SAVE THE REGISTERS
026312  012701  025160          MOV     #T14PACKET,R1   ;START OF THE PACKET
026316  012721  100206          MOV     #100206,(R1)+   ;WRITE SUBSYSTEM MEM. WITH ACK, IE
026322  012721  025170          MOV     #T14DATA,(R1)+  ;ADDRESS OF DATA BLOCK
026326  005021                  CLR     (R1)+           ;EXTENDED ADDRESS
026330  012721  000006          MOV     #6.,(R1)+       ;SIZE OF DATA BLOCK IN BYTES
026334  005021                  CLR     (R1)+           ;CLEAR BSEL0 AND BSEL1
026336  005021                  CLR     (R1)+           ;CLEAR SEL2
026340  005011                  CLR     (R1)            ;CLEAR DATA AREA
026342  000207                  RTS     PC              ;RETURN

026344                  T14RST:
026344                          SAVREG                  ;SAVE THE REGISTERS
026350  012701  025600          MOV     #T14PK2,R1      ;START OF THE PACKET
026354  012721  100204          MOV     #100204,(R1)+   ;WRITE CHARA. WITH ACK, IE
026360  012721  025610          MOV     #T14DTA,(R1)+   ;ADDRESS OF CHARAISTICS DATA BLOCK
026364  005021                  CLR     (R1)+           ;EXTENDED ADDRESS
026366  012721  000010          MOV     #8.,(R1)+       ;SIZE OF DATA BLOCK IN BYTES
```

```
TSV5 - HARDWARE TESTS   MACRO M1113  06-FEB-84 17:14                    SEQ 103
TEST 2: BASIC WRITE SUBSYSTEM MEMORY COMMAND

    429 026372  012721  025176          MOV     #T14BFR,(R1)+       ;MESSAGE BUFFER ADDRESS
    430 026376  005021                  CLR     (R1)+
    431 026400  012721  000400          MOV     #256.,(R1)+         ;LENGTH OF MESSAGE BUFFER
    432 026404  005021                  CLR     (R1)+
    433 026406  005011                  CLR     (R1)
    434 026410  005037  025176          CLR     T14BFR              ;CLEAR 1ST LOC IN MESSAGE BUFFER
    435 026414  000207                  RTS     PC                  ;RETURN
    436 026416                          ENDTST
        026416                                              L10037:
        026416  104401                                              TRAP    C$ETST
```

```
                                .SBTTL  TEST  3: DMA MEMORY ADDRESSING

                              ;++
                              ; TEST 3
                              ;
                              ; TEST DESCRIPTION
                              ;
                              ;       This test verifies that the controller can properly address and
                              ;       access all available CPU memory (other than that occupied by the
                              ;       diagnostic and diagnostic supervisor code) for both reading (DATI)
                              ;       and writing (DATO). Verified are the LSI-11 Bus drivers for all
                              ;       available address lines. Up to this point only 16 bits have been
                              ;       used for DMA transfers.
                              ;
                              ; TEST STEPS
                              ;
                              ;  REPEAT FROM 1 TO LOOPCNT
                              ;    BEGIN
                              ;       Do Subtest 1 - Verify GET STATUS selected locations
                              ;       Do Subtest 2 - Verify message packets selected locations
                              ;       Do Subtest 3 - Verify Characteristic data selected locations
                              ;       Do Subtest 4 - Verify NXM to selected invalid addresses
                              ;    END
                              ;
                              ;--

026420                                BGNTST
026420                                                                  T3::
026420  012700  030470                MOV     #TST12ID,R0             ;ASCII MESSAGE TO IDENTIFY TEST
026424  004737  016510                JSR     PC,TSTSETUP             ;DO INITIAL TEST SETUP
026430  012737  000012  002216        MOV     #10.,LOOPCNT            ;PERFORM 10 ITERATIONS
026436  005237  003150                INC     T3BFLG                  ;SET TEST FLAG
026442  004737  021276                JSR     PC,MEMCK                ;CHECK MEMORY

026446                              T12LOOP:                          ;LOOP ON TEST LABEL

                                .SBTTL  TEST 3: SUBTEST 1: GET STATUS SELECTED LOCATIONS
                              ;++
                              ; TEST 3: SUBTEST 1:
                              ;
                              ; SUBTEST DESCRIPTION:
                              ;
                              ;       This subtest verifies the controller can fetch a get status
                              ;       command from all available memory locations.
                              ;       Two word blocks are tested one at a time by first setting
                              ;       all available memory to a background pattern of 125252.
                              ;       A Get Status command is then executed to various addresses in
                              ;       each available memory 4k word block. The various addresses
                              ;       are determined by floating a 1 then a 0 through the address bits.
                              ;
                              ; TEST STEPS:
                              ;
                              ;    BEGIN
                              ;       Write to TSSR to soft initialize
                              ;       Do a WRITE CHARACTERISTICS to setup a message buffer
                              ;
```

```
                                ;       REPEAT FOR SELECTED VALID ADDRESSES IN DIAGNOSTIC FREE SPACE AND ABOVE 32K
                                ;         BEGIN
                                ;               Get a valid modulo-4 test address
                                ;               Do a GET STATUS command from the test address
                                ;         END
                                ;    END
                                ;--
                                        BGNSUB                          ;////////////// BEGIN SUBTEST //////////
026446                                                                                      T3.1:
026446  104402                                                                                    TRAP    C$BSUB

                                ;Write to TSSR to soft initialize
                                        JSR     PC,SOFINIT              ;DO SOFT INIT OF CONTROLLER
                                        BCS     15$                     ;BR IF SOFT INIT = OK
                                        NEXT.ERRNO
                                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
                                        ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL ERROR DURING INIT
026460  104455                                                                                 TRAP    C$ERDF
026462  000455                                                                                 .WORD   301
026464  003652                                                                                 .WORD   SFIERR
026466  012034                                                                                 .WORD   SFIMSG

                                ;Do a WRITE CHARACTERISTICS to setup a message buffer
026470                          15$:
026470  012704  030260                  MOV     #T12PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
026474  004737  031640                  JSR     PC,T12SWRT              ;RESTORE PACKET TO STARTING VALUES
026500  005037  003134                  CLR     KTENABLE                ;TURN OFF KT-11
026504  010465  000000                  MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS
026510  004737  016336                  JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
026514                                  FORCERROR       17$
026530  103405                          BCS     20$                     ;BR IF SSR SET IN CHKTSSR
026532  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
026534                                  NEXT.ERRNO
026534                          17$:    ERRDF   ERRNO,T12WRTSSR,PKTSSR  ;DEVICE FATAL SSR FAILED TO SET
026534  104455                                                                                 TRAP    C$ERDF
026536  000456                                                                                 .WORD   302
026540  030572                                                                                 .WORD   T12WRTSSR
026542  012046                                                                                 .WORD   PKTSSR

                                ;Verify a Get Status can be fetched from each address
                                ;Get a valid modulo-4 test address
                                ;Do a GET STATUS command from the test address
026544  005037  002222          20$:    CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
026550  005037  030330                  CLR     T12KT                   ;TEST ABOVE 28K SWITCH
026554  012702  030334                  MOV     #T12BLK,R2              ;POINT TO TEST PATTERN TABLE
026560                          T121LOOP:
026560  005037  003134                  CLR     KTENABLE                ;TURN OFF ABOVE 28K TEST FLAG
026564  012201                          MOV     (R2)+,R1                ;GET TEST PATTERN ADDRESS
026566  005000                          CLR     R0                      ;ASSUME NO TEST ABOVE 28K
026570  005737  030330                  TST     T12KT                   ;TEST ABOVE 28K THIS TIME?
026574  001407                          BEQ     25$                     ;BR IF NO
026576  016200  177776                  MOV     -2(R2),R0               ;GET TEST PATTERN AGAIN
026602  042700  177774                  BIC     #^C<A1716>,R0           ;SAVE 18 BIT ADDRESS ONLY
026606  012737  000001  003134          MOV     #1,KTENABLE             ;TURN ON ABOVE 28K TEST FLAG
026614  004737  031336          25$:    JSR     PC,T12CONVERT           ;CONVERT TEST PATTERN TO TEST ADDRESS
```

```
545 026620  103034                        BCC     65$                     ;BR IF INVALID PACKET ADDRESS
546 026622  013704  030324                MOV     T12LOADD,R4             ;COPY CURRENT PACKET LOW ADDRESS
547 026626  013703  030322                MOV     T12HIADD,R3             ;COPY CURRENT PACKET HIGH ADDRESS
548 026632  004737  031706                JSR     PC,T12SETGET            ;SETUP CURRENT PACKET TO GET STATUS
549 026636  042703  177774                BIC     #^C<A1716>,R3           ;SAVE ADDRESS BITS 17-16
550 026642  050304                        BIS     R3,R4                   ;SETUP 18 BIT PACKET ADDRESS
551 026644  004737  017274                JSR     PC,KTOFF                ;TURN OFF KT-11
552 026650  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
553 026654  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
554 026660                                FORCERROR       32$
555 026674  103405                        BCS     40$                     ;BR IF SSR SET IN CHKTSSR
556 026676  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
557 026700                                NEXT.ERRNO
558 026700                          32$:  ERRDF   ERRNO,T12GETSSR,PKTGETS ;DEVICE FATAL SSR FAILED TO SET
    026700  104455                                                                  TRAP    C$ERDF
    026702  000457                                                                  .WORD   303
    026704  030516                                                                  .WORD   T12GETSSR
    026706  012064                                                                  .WORD   PKTGETS
559 026710                          40$:  CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
    026710  104406                                                                  TRAP    C$CLP1
560 026712                          65$:
561 026712                                FORCEXIT        80$
562 026722  020227  030466                CMP     R2,#T12TBE              ;DONE ALL TSTBLK TEST PATTERNS?
563 026726  103002                        BHIS    70$                     ;BR IF YES
564 026730  000137  026560                JMP     T121LOOP                ;DO ANOTHER MODULO- 4 ADDRESS
565 026734  005737  030330          70$:  TST     T12KT                   ;DONE ABOVE 28K TESTING TOO?
566 026740  003012                        BGT     80$                     ;BR IF YES
567 026742  005737  003132                TST     KTFLG                   ;ANY MEMORY ABOVE 28K ON SYSTEM?
568 026746  001407                        BEQ     80$                     ;BR IF NO
569 026750  012737  000001  030330        MOV     #1,T12KT                ;SET SWITCH
570 026756  012702  030334                MOV     #T12BLK,R2              ;RESET TEST PATTERN TABLE
571 026762  000137  026560                JMP     T121LOOP                ;DO ABOVE 28K TESTING
572 026766  004737  017274          80$:  JSR     PC,KTOFF                ;TURN OFF KT11
573 026772                                ENDSUB                          ;\\\\\\\\\\\\\\ END SUBTEST \\\\\\\\\\\\\\
    026772                                                                          L10043:
    026772  104403                                                                      TRAP    C$ESUB
574 026774  005737  002222                TST     FATFLG                  ;ANY FATAL ERRORS ?
575 027000  001402                        BEQ     100$                    ;BRANCH IF NOT
576 027002  004737  017202                JSR     PC,CKDROP               ;TRY TO DROP THE UNIT
577 027006                          100$:
578
579                                       .SBTTL  TEST 3: SUBTEST 2: MESSAGE PACKETS TO SELECTED LOCATIONS
580                                 ;**
581                                 ; TEST 3: SUBTEST 2:
582                                 ;
583                                 ; SUBTEST DESCRIPTION:
584                                 ;
585                                 ;       This subtest verifies the controller can deposit message packets
586                                 ;       to all available memory locations.
587                                 ;       Write Characteristics commands are executed with message
588                                 ;       buffer addresses set to various addresses in each available
589                                 ;       memory location.
590                                 ;       The various addresses are determined by floating a 1 then a 0
591                                 ;       through the address bits.
592                                 ;
593                                 ; TEST STEPS:
594                                 ;
```

```
                                ;    BEGIN
                                ;       Write to TSSR to soft initialize
                                ;       Do a WRITE CHARACTERISTICS to setup a message buffer to compare
                                ;
                                ;       REPEAT FOR SELECTED ADDRESSES IN DIAGNOSTIC FREE SPACE AND ABOVE 32K
                                ;         BEGIN
                                ;               Get a valid modulo-4 test address
                                ;               Set the packet message buffer to the TEST ADDRESS
                                ;               Do a WRITE CHARACTERISTICS
                                ;               Restore the test message buffer to background pattern
                                ;         END
                                ;    END
                                ;--

027006                                  BGNSUB                          ;////////////// BEGIN SUBTEST //////////
027006                                                                                  T3.2:
027006  104402                                                                          TRAP    C$BSUB

                                ;Write to TSSR to soft initialize
027010  004737  015774                  JSR     PC,SOFINIT              ;DO SOFT INIT OF CONTROLLER
027014  103405                          BCS     15$                     ;BR IF SOFT INIT = OK
027016                                  NEXT.ERRNO
027016  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
027020                                  ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL ERROR DURING INIT
027020  104455                                                                          TRAP    C$ERDF
027022  000460                                                                          .WORD   304
027024  003652                                                                          .WORD   SFIERR
027026  012034                                                                          .WORD   SFIMSG

                                ;Do a WRITE CHARACTERISTICS to setup a message buffer to compare
027030                          15$:
027030  012704  030260                  MOV     #T12PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
027034  004737  031640                  JSR     PC,T12SWRT              ;SET PACKET TO WRITE CHARACTERISTICS
027040  004737  017274                  JSR     PC,KTOFF                ;TURN OFF KT-11
027044  010465  000000                  MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS
027050  004737  016336                  JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
027054                                  FORCERROR       17$
027070  103405                          BCS     20$                     ;BR IF SSR SET IN CHKTSSR
027072  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
027074                                  NEXT.ERRNO
027074                          17$:    ERRDF   ERRNO,T12WRTSSR,PKTSSR  ;DEVICE FATAL SSR FAILED TO SET
027074  104455                                                                          TRAP    C$ERDF
027076  000461                                                                          .WORD   305
027100  030572                                                                          .WORD   T12WRTSSR
027102  012046                                                                          .WORD   PKTSSR

                                ;Get a valid modulo-4 test address
                                ;Set the packet message buffer to the test address
                                ;Do a WRITE CHARACTERISTICS
027104  005037  002222          20$:    CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
027110  012703  030334                  MOV     #T12BLK,R3              ;POINT TO TEST PATTERN TABLE
027114                          T122LOOP:
027114  012301                          MOV     (R3)+,R1                ;GET TEST PATTERN ADDRESS
027116  010100                          MOV     R1,R0                   ;GET ADDRESS ALL "18 BITS"
027120  042700  177774                  BIC     #177774,R0              ;LEAVE ONLY A17 AND A16
027124  042701  000003                  BIC     #3,R1                   ;GET RID OF A17 AND A16
```

```
642 027130  004737  031336                  JSR     PC,T12CONVERT           ;CONVERT TEST PATTERN TO TEST ADDRESS
643 027134  103402                          BCS     25$                     ;BR IF VALID MESSAGE BUFFER ADDRESS
644 027136  000137  027234                  JMP     150$                    ;GET ANOTHER TEST PATTERN TO TRY
645 027142  012704  030260          25$:    MOV     #T12PACKET,R4           ;SET THE COMMAND PACKET ADDRESS
646 027146  004737  031640                  JSR     PC,T12SWRT              ;SETUP T12PACKET TO WRITE CHAR.
647 027152  013737  030324  030270          MOV     T12LOADD,T12DATA        ;SETUP LOW ORDER MESSAGE BUFFER ADD.
648 027160  013737  030322 .030272          MOV     T12HIADD,T12DATA+2      ;SETUP HIGH ORDER MESSAGE BUFFER ADD.
649 027166  004737  017274                  JSR     PC,KTOFF                ;TURN OFF KT-11
650 027172  010465  000000                  MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
651 027176  004737  016336                  JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
652 027202                                  FORCERROR       32$
653 027216  103405                          BCS     50$                     ;BR IF SSR SET IN CHKTSSR
654 027220  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
655 027222                                  NEXT.ERRNO
656 027222                          32$:    ERRDF   ERRNO,T12WRTSSR,PKTSSR  ;DEVICE FATAL SSR FAILED TO SET
    027222  104455                                                                  TRAP    C$ERDF
    027224  000462                                                                  .WORD   306
    027226  030572                                                                  .WORD   T12WRTSSR
    027230  012046                                                                  .WORD   PKTSSR
657 027232                          50$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
    027232  104406                                                                  TRAP    C$CLP1
658 027234                          150$:
659 027234                                  FORCEXIT        160$
660 027244  020327  030466                  CMP     R3,#T12TBE              ;DONE ALL TST12BLK TEST PATTERNS?
661 027250  103002                          BHIS    160$                    ;BR IF YES
662 027252  000137  027114                  JMP     T122LOOP                ;DO ANOTHER MODULO- 4 ADDRESS
663 027256  004737  017274          160$:   JSR     PC,KTOFF                ;TURN OFF KT11
664 027262                                  ENDSUB                          ;\\\\\\\\\\\\\ END SUBTEST \\\\\\\\\\\\\
    027262                                                                          L10044:
    027262  104403                                                                  TRAP    C$ESUB
665 027264  005737  002222                  TST     FATFLG                  ;ANY FATAL ERRORS ?
666 027270  001402                          BEQ     180$                    ;BRANCH IF NOT
667 027272  004737  017202                  JSR     PC,CKDROP               ;TRY TO DROP THE UNIT
668 027276                          180$:
669
670
671
672                                         .SBTTL  TEST 3: SUBTEST 3: CHARACTERISTIC DATA SELECTED LOCATIONS
673                                 ;++
674                                 ; TEST 3: SUBTEST 3:
675                                 ;
676                                 ; SUBTEST DESCRIPTION:
677                                 ;
678                                 ;       This subtest verifies the controller can fetch a
679                                 ;       Write Characteristics data block from all available
680                                 ;       memory locations.
681                                 ;       Write Characteristics commands are executed with
682                                 ;       characteristic data blocks at various memory addresses.
683                                 ;       The various memory addresses are determined by floating
684                                 ;       a 1 then a 0 through the address bits.
685                                 ;
686                                 ; TEST STEPS:
687                                 ;
688                                 ;    BEGIN
689                                 ;       Write to TSSR to soft initialize
690                                 ;
691                                 ;       REPEAT FOR SELECTED VALID ADDRESSES IN DIAGNOSTIC FREE SPACE AND ABOVE 32K
```

```
                                ;         BEGIN
                                ;               Get a valid test address
                                ;               Set the test packet characteristics data pointer to the
                                ;                 test address.
                                ;               Store expected characteristic data in test address block
                                ;               Do a WRITE CHARACTERISTIC command
                                ;         END
                                ;    END
                                ;--

027276                                  BGNSUB                          ;////////////// BEGIN SUBTEST //////////
027276                                                                                  T3.3:
027276  104402                                                                          TRAP    C$BSUB

                                ;Write to TSSR to soft initialize
027300  004737  015774                  JSR     PC,SOFINIT              ;DO SOFT INIT OF CONTROLLER
027304  103405                          BCS     20$                     ;BR IF SOFT INIT = OK
027306                                  NEXT.ERRNO
027306  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
027310                                  ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL ERROR DURING INIT
027310  104455                                                                          TRAP    C$ERDF
027312  000463                                                                          .WORD   307
027314  003652                                                                          .WORD   SFIERR
027316  012034                                                                          .WORD   SFIMSG

                                ;Get a valid test address
027320  005037  002222            20$:    CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
027324  005037  030330                    CLR     T12KT                   ;TEST ABOVE 28K SWITCH
027330  012703  030334                    MOV     #T12BLK,R3              ;POINT TO TEST PATTERN TABLE
027334                          T123LOOP:
027334  005037  003134                    CLR     KTENABLE                ;TURN OFF ABOVE 28K TEST FLAG
027340  012301                          MOV     (R3)+,R1                ;GET TEST PATTERN ADDRESS
027342  010100                          MOV     R1,R0                   ;GET ADDRESS ALL "18 BITS"
027344  042700  177774                BIC     #177774,R0              ;LEAVE ONLY A17 AND A16
027350  042701  000003                BIC     #3,R1                   ;GET RID OF A17 AND A16
027354  005737  030330                TST     T12KT                   ;TEST ABOVE 28K THIS TIME?
027360  001407                          BEQ     25$                     ;BR IF NO
027362  016300  177776                MOV     -2(R3),R0               ;GET TEST PATTERN AGAIN
027366  042700  177774                BIC     #^C<A1716>,R0           ;SAVE 18 BIT ADDRESS ONLY
027372  012737  000001  003134        MOV     #1,KTENABLE             ;TURN ON ABOVE 28K TEST FLAG
027400  004737  031336            25$:    JSR     PC,T12CONVERT           ;CONVERT TEST PATTERN TO TEST ADDRESS
027404  103402                          BCS     30$                     ;BR IF VALID TEST ADDRESS
027406  000137  027510                    JMP     60$                     ;GET NEXT TEST PATTERN
                                ;Set the test packet characteristics data pointer to the test address
027412  012704  030260            30$:    MOV     #T12PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
027416  004737  031640                    JSR     PC,T12SWRT              ;RESTORE PACKET TO STARTING VALUES
027422  013764  030324  000002            MOV     T12LOADD,PKLOW(R4)      ;STORE CHAR. DATA PTR LOW ADDRESS
027430  013764  030322  000004            MOV     T12HIADD,PKHI(R4)       ;STORE CHAR. DATA PTR HIGH ADDRESS
027436  004737  031750                    JSR     PC,T12CHAR              ;STORE EXPECTED DATA IN DATA BLOCK
                                ;Do a WRITE CHARACTERISTIC command
027442  004737  017274                    JSR     PC,KTOFF                ;TURN OFF KT-11
027446  010465  000000                    MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
027452  004737  016336                    JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
027456                                  FORCERROR       32$
027472  103405                          BCS     40$                     ;BR IF SSR SET IN CHKTSSR
027474  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
```

```
TSV5 - HARDWARE TESTS   MACRO M1113  06-FEB-84 17:14                                    SEQ 110
TEST 3: SUBTEST 3: CHARACTERISTIC DATA SELECTED LOCATIONS

    743 027476                                  NEXT.ERRNO
    744 027476                          32$:    ERRDF   ERRNO,T12WRTSSR,PKTSSR  ;DEVICE FATAL SSR FAILED TO SET
        027476  104455                                                              TRAP    C$ERDF
        027500  000464                                                              .WORD   308
        027502  030572                                                              .WORD   T12WRTSSR
        027504  012046                                                              .WORD   PKTSSR
    745 027506                          40$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
        027506  104406                                                              TRAP    C$CLP1
    746 027510                          60$:
    747 027510  020327  030466                  CMP     R3,@T12TBE              ;DONE ALL TSTBLK TEST PATTERNS?
    748 027514  103002                          BHIS    65$                     ;BR IF YES
    749 027516  000137  027334                  JMP     T123LOOP                ;DO ANOTHER MODULO- 4 ADDRESS
    750 027522  005737  030330          65$:    TST     T12KT                   ;DONE ABOVE 28K TESTING TOO?
    751 027526  003012                          BGT     70$                     ;BR IF YES
    752 027530  005737  003132                  TST     KTFLG                   ;ANY MEMORY ABOVE 28K ON SYSTEM?
    753 027534  001407                          BEQ     70$                     ;BR IF NO
    754 027536  012737  000001  030330          MOV     @1,T12KT                ;SET SWITCH
    755 027544  012703  030334                  MOV     @T12BLK,R3              ;RESET TEST PATTERN TABLE
    756 027550  000137  027334                  JMP     T123LOOP                ;DO ABOVE 28K TESTING
    757 027554  004737  017274          70$:    JSR     PC,KTOFF                ;TURN OFF KT11
    758 027560                                  ENDSUB                          ;\\\\\\\\\\\\\ END SUBTEST \\\\\\\\\\\
        027560                                                                      L10045:
        027560  104403                                                              TRAP    C$ESUB
    759 027562  005737  002222                  TST     FATFLG                  ;ANY FATAL ERRORS ?
    760 027566  001402                          BEQ     75$                     ;BRANCH IF NOT
    761 027570  004737  017202                  JSR     PC,CKDROP               ;TRY TO DROP THE UNIT
    762 027574                          75$:
    763
    764                                         .SBTTL  TEST 3: SUBTEST 4: NXM TO SELECTED INVALID ADDRESSES
    765                                 ;++
    766                                 ; TEST 3: SUBTEST 4:
    767                                 ;
    768                                 ; SUBTEST DESCRIPTION:
    769                                 ;
    770                                 ;       This subtest verifies the NXM error bit in the TSSR
    771                                 ;       register is set when attempting to fetch data (a characteristic
    772                                 ;       data block) from selected nonexistent locations.
    773                                 ;       If NXM fails to set it is likely that an LSI-11 Bus driver is
    774                                 ;       failing to assert an address line.
    775                                 ;       Addresses tested include all combinations of high-order address
    776                                 ;       bits (i.e bits 16-21).
    777                                 ;       ********************************************************************
    778                                 ;                               CAUTION
    779                                 ;
    780                                 ;               The LSI BUS drivers for all available address lines(16-21)
    781                                 ;       are only checked when running on a 11/23B system with more than
    782                                 ;       128K words of memory!
    783                                 ;       ********************************************************************
    784                                 ;
    785                                 ; TEST STEPS:
    786                                 ;
    787                                 ;    BEGIN
    788                                 ;       Write to TSSR to soft initialize
    789                                 ;       Do a write characteristic command
    790                                 ;       Invert the extended features switch
    791                                 ;
    792                                 ;       REPEAT FOR SELECTED NON-EXISTENT MEMORY ADDRESSES
```

```
                                ;       BEGIN
                                ;           Get an invalid test address
                                ;           Set the test packet characteristics data pointer to the
                                ;             test address.
                                ;           Do a WRITE CHARACTERISTIC command
                                ;           If TSSR register NXM bit not set then print error message
                                ;       END
                                ;   END
                                ;--

027574                              BGNSUB                          ;////////////// BEGIN SUBTEST //////////
027574                                                                      T3.4:
027574  104402                                                              TRAP    C$BSUB

027576  005737  003144              TST     T23A                    ;26-APR-83 REV B - CHK FOR 23A CPU
027602  001406                      BEQ     5$                      ;26-APR-83 REV B - BR, IF NOT 23A
027604  023727  002120  007777      CMP     L$HIME,#7777            ;26-APR-83 REV B - CHK FOR > 256KB
027612  103402                      BLO     5$                      ;26-APR-83 REV B - BR, IF < 256KB
027614  000137  030206              JMP     NOEXTF                  ;26-APR-83 REV B - JMP OVER 256KB
027620                          5$:
027620  005737  003136              TST     NXMFLG                  ;GOT ENOUGH MEMORY?
027624  001002                      BNE     10$                     ;IF SET STAY
027626  000137  030206              JMP     NOEXTF                  ;LEAVE IF NOT SET

                                ;Write to TSSR to soft initialize

027632  004737  015774          10$:JSR     PC,SOFINIT              ;DO SOFT INIT OF CONTROLLER
027636  103405                      BCS     11$                     ;BR IF SOFT INIT = OK
027640                              NEXT.ERRNO
027640  010001                      MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
027642                              ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL ERROR DURING INIT
027642  104455                                                              TRAP    C$ERDF
027644  000465                                                              .WORD   309
027646  003652                                                              .WORD   SFIERR
027650  012034                                                              .WORD   SFIMSG

                                ;Do a WRITE CHARACTERISTIC command so to invert switch

027652                          11$:CKLOOP                          ;LOOP IF SELECTED
027652  104406                                                              TRAP    C$CLP1
027654  012704  030260              MOV     #T12PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
027660  004737  031640              JSR     PC,T12SWRT              ;RESTORE PACKET TO STARTING VALUES
027664  005037  003134              CLR     KTENABLE                ;TURN OFF KT-11
027670  010465  000000              MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS
027674  004737  016336              JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
027700                              FORCERROR       15$
027714  103405                      BCS     17$                     ;BR IF SSR SET IN CHKTSSR
027716  010001                      MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
027720                              NEXT.ERRNO
027720                          15$:ERRDF   ERRNO,T12WRTSSR,PKTSSR  ;DEVICE FATAL SSR FAILED TO SET
027720  104455                                                              TRAP    C$ERDF
027722  000466                                                              .WORD   310
027724  030572                                                              .WORD   T12WRTSSR
027726  012046                                                              .WORD   PKTSSR
027730                          17$:CKLOOP                          ;LOOP IF SELECTED
027730  104406                                                              TRAP    C$CLP1
```

```
TSV5 - HARDWARE TESTS   MACRO M1113  06-FEB-84 17:14                                SEQ 112
TEST 3: SUBTEST 4: NXM TO SELECTED INVALID ADDRESSES

    838 027732  004737  021206                  JSR     PC,INVERT               ;INVERT THE SWITCH
    839
    840                                 ;Get an invalid test address
    841
    842 027736  005037  002222          20$:    CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
    843 027742                          25$:
    844 027742  013737  003142  030322          MOV     NXMHI,T12HIADD          ;SAVE TEST ADDRESS HIGH
    845 027750  013737  003140  030324          MOV     NXMLO,T12LOADD          ;SAVE TEST ADDRESS LOW
    846 027756                          T124LOOP:
    847
    848                                 ;Set the test packet characteristics data pointer to the
    849                                 ;  test address.
    850
    851 027756  012704  030260          30$:    MOV     #T12PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
    852 027762  004737  031640                  JSR     PC,T12SWRT              ;RESTORE PACKET TO STARTING VALUES
    853 027766  013764  030324  000002          MOV     T12LOADD,PKLOW(R4)      ;STORE CHAR. DATA PTR LOW ADDRESS
    854 027774  013764  030322  000004          MOV     T12HIADD,PKHI(R4)       ;STORE CHAR. DATA PTR HIGH ADDRESS
    855
    856                                 ;Do a WRITE CHARACTERISTIC command
    857 030002  004737  017274                  JSR     PC,KTOFF                ;TURN OFF KT-11
    858 030006  010465  000000                  MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
    859 030012  004737  016250                  JSR     PC,WAITF                ;WAIT FOR SSR TO SET
    860 030016                                  FORCERROR       32$
    861 030032  103407                          BCS     40$                     ;BR IF SSR SET IN CHKTSSR
    862 030034  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
    863 030036                                  NEXT.ERRNO
    864 030036                          32$:    ERRDF   ERRNO,T12WRTSSR,PKTSSR  ;DEVICE FATAL SSR FAILED TO SET
        030036  104455                                                                  TRAP    C$ERDF
        030040  000467                                                                  .WORD   311
        030042  030572                                                                  .WORD   T12WRTSSR
        030044  012046                                                                  .WORD   PKTSSR
    865 030046  005237  002222                  INC     FATFLG                  ;SET FATAL ERROR FLAG
    866 030052                          40$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
        030052  104406                                                                  TRAP    C$CLP1
    867 030054                                  FORCERROR       45$,NOTSSR
    868 030064                                  ESCAPE  SUB                     ;BY-PASS SUBTEST IF FATAL ERROR
        030064  104410                                                                  TRAP    C$ESCAPE
        030066  000124                                                                  .WORD   L10046-.
    869                                 ;If TSSR register NXM bit not set then print error message
    870 030070                          45$:
    871 030070  016501  000002                  MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
    872 030074                                  FORCERROR       52$
    873 030110  032701  004000                  BIT     #NXM,R1                 ;NXM SET?
    874 030114  001012                          BNE     60$                     ;BR IF YES
    875 030116                                  NEXT.ERRNO
    876 030116  013737  030324  002240  52$:    MOV     T12LOADD,ERRLO          ;MEMORY TEST ADDRESS LOW
    877 030124  013737  030322  002236          MOV     T12HIADD,ERRHI          ;MEMORY TEST ADDRESS HIGH
    878 030132                                  ERRHRD  ERRNO,T12NXM,ADDSSR     ;REPORT ADDRESS AND TSSR ERROR
        030132  104456                                                                  TRAP    C$ERHRD
        030134  000470                                                                  .WORD   312
        030136  031227                                                                  .WORD   T12NXM
        030140  012126                                                                  .WORD   ADDSSR
    879
    880 030142                          60$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
        030142  104406                                                                  TRAP    C$CLP1
    881 030144                                  FORCEXIT        90$
    882 030154  005737  003144                  TST     T23A                    ;IS IT A 11/23A?
```

```
                                        BNE     90$             ;YES WERE DONE
                                        MOV     T12HIADD,R0     ;GET CURRENT HIGH ADDRESS
                                65$:    INC     R0              ;GET NEXT ADDRESS
                                        CMP     R0,#77          ;DONE A21-A16?
                                        BHI     90$             ;BR IF YES
                                75$:    MOV     R0,T12HIADD     ;SETUP NEW HIGH ORDER ADDRESS
                                        JMP     T124LOOP        ;DO ANOTHER NON-EXISTENT ADDRESS
                                90$:
                                NOEXTF:
                                        JSR     PC,KTOFF        ;TURN OFF KT11
                                        ENDSUB                  ;\\\\\\\\\\\\\ END SUBTEST \\\\\\\\\\\
                                                                L10046:
                                                                        TRAP    C$ESUB
                                        TST     FATFLG          ;ANY FATAL ERRORS ?
                                        BEQ     100$            ;BRANCH IF NOT
                                        JSR     PC,CKDROP       ;TRY TO DROP THE UNIT
                                100$:   JSR     PC,TSTLOOP      ;SHOULD WE DO ITERATIONS?
                                        BCC     105$            ;BR IF NO
                                        JMP     T12LOOP         ;LOOP UNTIL ITERATION COUNT DONE
                                105$:
                                        JSR     PC,KTOFF        ;TURN OFF MEMORY MANAGEMENT
                                        CLR     T38FLG          ;CLEAR TEST FLAG
                                        EXIT    TST             ;ALL DONE THIS TEST
                                                                        TRAP    C$EXIT
                                                                        .WORD   L10042-.


                                ;+
                                ;LOCAL STORAGE FOR THIS TEST
                                ;-

                                        .=<.+10>&177770
                                T12PACKET:                      ;COMMAND PACKET FOR TEST
                                        .WORD   100004          ;WRITE CHARACTERISTICS COMMAND, WITH ACK
                                        .WORD   T12DATA         ;ADDRESS OF CHARACTERISTICS BLOCK
                                        .WORD   0
                                        .WORD   8.              ;STARTING VALUE OF BLOCK SIZE

                                T12DATA:                        ;CHARACTERISTICS DATA BLOCK
                                        .WORD   T12BFR          ;LOW ADDRESS OF MESSAGE BUFFER
                                        .WORD   0               ;HIGH ORDER OF MESSAGE BUFFER
                                        .WORD   14.             ;LENGTH OF MESSAGE BUFFER

                                T12BFR: .BLKW   8.              ;MESSAGE BUFFER

                                T12HIADD:       .WORD   0       ;HIGH ADDRESS
                                T12LOADD:       .WORD   0       ;LOW ADDRESS
                                T12PAR6:        .WORD   0       ;ADDRESS IN PAR FORMAT
                                T12KT:          .WORD   0       ;TEST ABOVE 28K SWITCH
                                T124TST:        .WORD   0       ;ADDRESS TEST BIT
                                ;+
                                ;
                                ;TABLE OF ADDRESSES
                                ;
                                ;-
                                T12BLK: .WORD   000001
```

```
    938 030336  000002                          .WORD   000002
    939 030340  000003                          .WORD   000003
    940 030342  000005                          .WORD   000005
    941 030344  000006                          .WORD   000006
    942 030346  000007                          .WORD   000007
    943 030350  000011                          .WORD   000011
    944 030352  000012                          .WORD   000012
    945 030354  000013                          .WORD   000013
    946 030356  000021                          .WORD   000021
    947 030360  000022                          .WORD   000022
    948 030362  000023                          .WORD   000023
    949 030364  000041                          .WORD   000041
    950 030366  000042                          .WORD   000042
    951 030370  000043                          .WORD   000043
    952 030372  000101                          .WORD   000101
    953 030374  000102                          .WORD   000102
    954 030376  000103                          .WORD   000103
    955 030400  000201                          .WORD   000201
    956 030402  000202                          .WORD   000202
    957 030404  000203                          .WORD   000203
    958 030406  000401                          .WORD   000401
    959 030410  000402                          .WORD   000402
    960 030412  000403                          .WORD   000403
    961 030414  001001                          .WORD   001001
    962 030416  001002                          .WORD   001002
    963 030420  001003                          .WORD   001003
    964 030422  002001                          .WORD   002001
    965 030424  002002                          .WORD   002002
    966 030426  002003                          .WORD   002003
    967 030430  004001                          .WORD   004001
    968 030432  004002                          .WORD   004002
    969 030434  004003                          .WORD   004003
    970 030436  010001                          .WORD   010001
    971 030440  010002                          .WORD   010002
    972 030442  010003                          .WORD   010003
    973 030444  020001                          .WORD   020001
    974 030446  020002                          .WORD   020002
    975 030450  020003                          .WORD   020003
    976 030452  040001                          .WORD   040001
    977 030454  040002                          .WORD   040002
    978 030456  040003                          .WORD   040003
    979 030460  100001                          .WORD   100001
    980 030462  100002                          .WORD   100002
    981 030464  100003                          .WORD   100003
    982 030466  177777              T12TBE:    .WORD           177777
    983                                         ;+
    984                                         ;LOCAL TEXT MESSAGES FOR TEST
    985                                         ;-
    986
    987 030470      104     115     101 T12TID:         .ASCIZ  'DMA Memory Addressing'
    988 030516      103     157     156 T12GETSSR:      .ASCIZ  'Contents of TSSR Incorrect After GET STATUS'
    989 030572      103     157     156 T12WRTSSR:      .ASCIZ  'Contents of TSSR Incorrect After WRITE CHARACTERISTICS'
    990 030661      115     145     163 T12MSGBUF:      .ASCIZ  'Message Buffer Contents Incorrect After WRITE CHARACTERISTICS'
    991 030757      102     141     143 T12BKGND:       .ASCIZ  'Background Pattern Disturbed By WRITE CHARACTERISTICS'
    992 031045      105     170     160 T12NINT:        .ASCIZ  'Expected Interrupt Not Received On WRITE CHARACTERISTICS'
    993 031136      127     162     151 T12DPR:         .ASCIZ  'Write Characteristic data in ram does not match expected'
    994 031227      124     123     123 T12NXM:         .ASCIZ  'TSSR NXM bit failed to set when non-existent memory address specifi
ed'
```

```
                                        .EVEN


                                ;+
                                ;ROUTINE TO CONVERT A TEST PATTERN TO A VALID ADDRESS IN DIAGNOSTIC FREE SPACE
                                ;       DIAGNOSTIC FREE SPACE IS BETWEEN THE END OF THE DIAGNOSTIC AND THE
                                ;       BEGINNING OF THE SUPERVISOR. THIS IS ALWAYS BELOW 24K.
                                ;       IF MEMORY ABOVE 28K SPECIFIED (VIA R1) THEN PAR 6 IS SET
                                ;       TO THE RELOCATION BASE.
                                ;
                                ; INPUTS:
                                ;
                                ;       R0      HIGH ORDER ADDRESS BITS
                                ;       R1      LOW ORDER ADDRESS BITS
                                ;
                                ; OUPTUTS:
                                ;       T12PAR6 = ADDRESS BIASED TO PAR6 IF >28K UNDER TEST
                                ;       T12HIADD = HIGH ORDER ADDRESS IN NON PAR6 FORMAT
                                ;       T12LOADD = LOW ORDER ADDRESS IN NON PAR6 FORMAT
                                ;       C BIT = 1 IF GOOD ADDRESS RETURNED
                                ;       C BIT = 0 IF TEST PATTERN DID NOT YIELD A VALID ADDRESS
                                ;-
031336                          T12CONVERT:
031336                                  SAVREG                          ;SAVE R1-R5 UNTIL NEXT RETURN
031342  005037  030324                   CLR     T12LOADD                ;CLEAR LOW ADDRESS
031346  005037  030322                   CLR     T12HIADD                ;CLEAR HIGH ADDRESS
031352  005037  030326                   CLR     T12PAR6                 ;CLEAR PAR6 BIASED ADDRESS
031356  042701  170000                   BIC     #^C<7777>,R1            ;FORCE TO LOWER 12 BITS OF ADDRESS
031362  010005                          MOV     R0,R5                   ;SAVE HIGH ORDER ADDRESS BITS
031364  004737  017274                   JSR     PC,KTOFF                ;SHUTOFF MEMORY MANAGEMENT
031370  013702  003124                   MOV     FREE,R2                 ;GET FIRST FREE ADDRESS
031374  062702  000020                   ADD     #16.,R2                 ;IN CASE TEST PATTERN=0
031400  060102                          ADD     R1,R2                   ;ADD IN TEST PATTERN
031402  042702  000003                   BIC     #3,R2                   ;MAKE IT MODULO-4
031406  013703  003130           25$:    MOV     FREEHI,R3               ;GET LAST FREE ADDRESS
031412  162703  000020                   SUB     #16.,R3                 ;SAVE AT LEAST 8 WORDS (IN CASE MESSAGE BUFFER)
031416  010237  030324                   MOV     R2,T12LOADD             ;SAVE POSSIBLE LOW ADDRESS
031422  010237  030326                   MOV     R2,T12PAR6              ;SAVE IT IN PAR6 BIASED TOO
031426  020203                          CMP     R2,R3                   ;IS THIS ADDRESS ABOVE FREE SPACE?
031430  101007                          BHI     35$                     ;BR IF YES
031432  020237  003124                   CMP     R2,FREE                 ;IS IT IN FREE SPACE?
031436  103007                          BHIS    50$                     ;BR IF YES- ITS GOOD
031440  005737  003134                   TST     KTENABLE                ;TESTING ABOVE 28K?
031444  001004                          BNE     50$                     ;BR IF YES
031446  000424                          BR      90$                     ;BR IF NOT IN FREE SPACE
031450  162702  000020           35$:    SUB     #16.,R2                 ;FORCE FIT THE TEST PATTERN
031454  000754                          BR      25$                     ;TRY THIS TEST PATTERN ADDRESS
031456                          50$:
031456  005737  003134                   TST     KTENABLE                ;TESTING ABOVE 28K?
031462  001420                          BEQ     100$                    ;BR IF NO
031464  005737  003132                   TST     KTFLG                   ;ANY MEMORY ABOVE 28K?
031470  001413                          BEQ     90$                     ;BR IF NO
031472  004737  017256                   JSR     PC,KTON                 ;TURN ON MEMORY MANAGEMENT
031476  010500                          MOV     R5,R0                   ;GET HIGH ORDER ADDRESS
031500  010037  030322                   MOV     R0,T12HIADD             ;SAVE POSSIBLE HIGH ADDRESS
031504  010201                          MOV     R2,R1                   ;GET COMPUTED LOW ORDER ADDRESS
031506  004737  017316                   JSR     PC,SETMAP               ;RETURN PAR6 BIASED ADDRESS IN R0
```

```
1052 031512  010037  030326                MOV     R0,T12PAR6      ;COPY PAR6 BIASED ADDRESS
1053 031516  103403                        BCS     105$            ;BR IF VALID ADDRESS
1054 031520  000241                90$:    CLC                     ;CLR C BIT FOR FAILURE
1055 031522  000401                        BR      105$            ;
1056 031524  000261                100$:   SEC                     ;SET SUCCESS
1057 031526  000207                105$:   RTS     PC              ;RETURN
1058
1059
1060                                ;*
1061                                ;
1062                                ;ROUTINE TO READ THE FIRST 2 BYTES FROM RAM
1063                                ;MEMORY AND COMPARE THIS DATA TO A COMMAND PACKET.
1064                                ;
1065                                ;INPUT:
1066                                ;
1067                                ;       R4      ADDRESS OF THE COMMAND PACKET
1068                                ;       R5      FIRST DEVICE UNIBUS ADDRESS
1069                                ;
1070                                ;OUTPUT:
1071                                ;
1072                                ;       CARRY   SET - RAM MATCHES PACKET
1073                                ;               CLR - RAM DOES NOT MATCH PACKET
1074                                ;
1075                                ;IMPLICIT OUTPUT:
1076                                ;
1077                                ;       THE TABLE RAMDATA IS FILLED WITH THE
1078                                ;       DATA HELD IN RAM.
1079                                ;       RAMSIZ  SET TO 2 FOR PRAMPKT ROUTINE
1080                                ;
1081                                ;SIDE EFFECTS:
1082                                ;
1083                                ;       THE SUBSYSTEM IS LEFT IN MAINTENANCE MODE
1084                                ;
1085                                ;-
1086 031530                        T12CKRAM::
1087 031530                                SAVREG                          ;SAVE THE GENERAL REGISTERS
1088 031534  012701  002242                MOV     #RAMDATA,R1             ;ADDRESS TO SAVE THE RAM DATA
1089 031540  012702  000201                MOV     #RMPKTBEG,R2            ;BYTE ADDRESS OF FIRST RAM DATA
1090 031544  005003                        CLR     R3                      ;CLEAR THE ERROR FLAG
1091 031546  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR
1092 031552  112765  000000  000000        MOVB    #0,TSDB(R5)             ;SET MAINTENANCE MODE
1093 031560  004737  016336        10$:    JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
1094 031564  010265  000000                MOV     R2,TSDB(R5)             ;SELECT NEXT RAM ADDRESS
1095 031570  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
1096 031574  116511  000000                MOVB    TSBA(R5),(R1)           ;READ THE RAM DATA
1097 031600  122124                        CMPB    (R1)+,(R4)+             ;COMPARE TO EXPECTED
1098 031602  001401                        BEQ     20$                     ;BRANCH IF OK
1099 031604  005203                        INC     R3                      ;SET ERROR FLAG
1100 031606  005202                20$:    INC     R2                      ;ADDRESS OF NEXT RAM LOCATION
1101 031610  020227  000203                CMP     R2,#RMPKTBEG+2          ;DONE 2 BYTES?
1102 031614  002761                        BLT     10$                     ;BR IF NO
1103 031616  005703                        TST     R3                      ;WAS AN ERROR FOUND ?
1104 031620  001402                        BEQ     30$                     ;BRANCH IF NOT
1105 031622  000241                        CLC                             ;CLEAR CARRY TO SHOW ERROR
1106 031624  000401                        BR      50$                     ;AND EXIT
1107 031626  000261                30$:    SEC                             ;SHOW GOOD COMPARE
1108 031630  012737  000002  002302  50$:    MOV     #2,RAMSIZ               ;SETUP RAMSIZ
```

```
1109 031636  000207                        RTS     PC                      ;RETURN
1110
1111                                    ;+
1112                                    ;
1113                                    ;ROUTINE TO SETUP PACKET TO WRITE CHARACTERISTICS
1114                                    ;-
1115
1116 031640                             T12SWRT:
1117 031640                                     SAVREG                          ;SAVE THE REGISTERS
1118 031644  012701  030260                        MOV     #T12PACKET,R1       ;START OF THE PACKET
1119 031650  012721  100004                        MOV     #100004,(R1)+       ;WRITE CHARACTERISTICS WITH ACK
1120 031654  012721  030270                        MOV     #T12DATA,(R1)+      ;ADDRESS OF CHAR DATA BLOCK
1121 031660  005021                                CLR     (R1)+               ;EXTENDED ADDRESS
1122 031662  012721  000010                        MOV     #8.,(R1)+           ;SIZE OF DATA BLOCK IN BYTES
1123 031666  012721  030302                        MOV     #T12BFR,(R1)+       ;ADDRESS OF MESSAGE BUFFER
1124 031672  005021                                CLR     (R1)+
1125 031674  012721  000016                        MOV     #14.,(R1)+          ;LENGTH OF MESSAGE BUFFER
1126 031700  005021                                CLR     (R1)+
1127 031702  005011                                CLR     (R1)
1128 031704  000207                                RTS     PC                  ;RETURN
1129                                    ;+
1130                                    ;
1131                                    ;ROUTINE TO SETUP A GET STATUS COMMAND PACKET AT CURRENT PACKET ADDRESS
1132                                    ;
1133                                    ;       R3      HIGH ORDER PACKET ADDRESS
1134                                    ;       R4      LOW ORDER PACKET ADDRESS
1135                                    ;       NOTE: R3 IS IGNORED IF KTENABLE FLAG CLEAR
1136                                    ;
1137                                    ;-
1138
1139 031706                             T12SETGET:
1140 031706                                     SAVREG                          ;SAVE THE REGISTERS
1141 031712  010401                                MOV     R4,R1               ;GET LOW ORDER ADDRESS
1142 031714  005737  003134                        TST     KTENABLE            ;TESTING ABOVE 28K?
1143 031720  001404                                BEQ     10$                 ;BR IF NO
1144 031722  010300                                MOV     R3,R0               ;GET HIGH ORDER ADDRESS
1145 031724  004737  017316                        JSR     PC,SETMAP           ;RETURN ADDRESS BIASED TO PAR6 IN R0
1146 031730  010001                                MOV     R0,R1               ;GET ADDRESS
1147 031732  012700  000017             10$:       MOV     #P.GETSTATUS,R0     ;GET STATUS COMMAND CODE NO IE
1148 031736  052700  100000                        BIS     #P.ACK,R0           ;SET ACK
1149 031742  010021                                MOV     R0,(R1)+            ;STORE GET STATUS IN PACKET
1150 031744  005021                                CLR     (R1)+               ;CLEAR UNUSED WORD
1151 031746  000207                                RTS     PC                  ;RETURN
1152
1153
1154                                    ;+
1155                                    ;
1156                                    ;ROUTINE TO SETUP A CHARACTERISTIC DATA BLOCK AT A TEST ADDRESS
1157                                    ;
1158                                    ;-
1159 031750                             T12CHAR:
1160 031750                                     SAVREG                          ;SAVE R1-R5 UNTIL NEXT RETURN
1161 031754  012700  030270                        MOV     #T12DATA,R0         ;GET T12PACKET DATA POINTER
1162 031760  013701  030324                        MOV     T12LOADD,R1         ;ASSUME NOT ABOVE 28K
1163 031764  005737  003134                        TST     KTENABLE            ;TESTING ABOVE 28K?
1164 031770  001402                                BEQ     10$                 ;BR IF NO
1165 031772  013701  030326                        MOV     T12PAR6,R1          ;SET TEST ADDRESS A     28K
```

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TSV5 - HARDWARE TESTS   MACRO M1113  06-FEB-84 17:14                    SEQ 118
TEST 3: SUBTEST 4: NXM TO SELECTED INVALID ADDRESSES

   1166 031776  012021                10$:    MOV     (R0)+,(R1)+     ;STORE DATA WORD 1
   1167 032000  012021                        MOV     (R0)+,(R1)+     ;STORE DATA WORD 2
   1168 032002  012021                        MOV     (R0)+,(R1)+     ;STORE DATA WORD 3
   1169 032004  012021                        MOV     (R0)+,(R1)+     ;STORE DATA WORD 4
   1170 032006  012021                        MOV     (R0)+,(R1)+     ;STORE DATA WORD 5
   1171 032010  000207                        RTS     PC              ;RETURN
   1172
   1173 032012                                ENDTST
        032012                                                      L10042:
        032012  104401                                                  TRAP    C$ETST
```

```
                                        .SBTTL  TEST  4: RAM EXERCISER TEST
                                ;+
                                ;
                                ;THIS TEST USES THE READ AND WRITE RAM (BOTH SINGLE AND 256
                                ;LOCATIONS) SELECT CODES OF THE WRITE SUBSYSTEM MEMORY COMMAND
                                ;TO EXERCISE THE CONTROLLER'S RAM MEMORY AND DMA LOGIC
                                ;
                                ;-
                                        BGNTST
                                                                                T4::

                                        TST     TSTCNT                  ;CHECK FOR RUN MODE
                                        BEQ     10$                     ;BR, IF NOT ONLY PROGRAM RUN
                                        INC     SKIPT                   ;SET SKIP SW
                                10$:    MOV     #TST15ID,R0             ;ASCII MESSAGE TO IDENTIFY TEST
                                        JSR     PC,TSTSETUP             ;DO INITIAL TEST SETUP
                                        MOV     #5,LOOPCNT              ;PERFORM 5 ITERATIONS
                                T15LOOP:
                                ;
                                ;
                                ;TEST 4, SUBTEST 1
                                ;
                                ;       THIS SUBTEST WRITES THE ADDRESS (8 BITS) INTO THE
                                ;       RAM MEMORY SINGLE WORD (8 BITS) MODE
                                ;
                                ;-
                                        BGNSUB                          ;////////////// BEGIN SUBTEST //////////////
                                                                                T4.1:
                                                                                TRAP    C$BSUB
                                        SETPRI  #PRI00                  ;LOWER PRIORITY TO ALLOW INTERRUPTS
                                                                                MOV     #PRI00,R0
                                                                                TRAP    C$SPRI
                                        TST     SKIPT                   ;SHOULD WE SKIP THIS SUBTEST
                                        BEQ     10$                     ;BR, IF NOW SKIP REQUIRED
                                        JMP     50$                     ;SKIP SUBTEST
                                10$:    JSR     PC,T15REST              ;SET COMMAND PACKET
                                        JSR     PC,T15RT2               ;SET UP OTHER COMMAND PACKET
                                        JSR     PC,SOFINIT              ;DO INITIALIZE ON CONTROLLER
                                        BCS     20$                     ;BR IF INIT WAS OK
                                        MOV     R0,R1                   ;CONTENTS OF TSSR REGISTER
                                        ERRDF   ERRNO,SFIERR,SFIMSG     ;FATAL ERROR TSSR WAS NOT OK
                                                                                TRAP    C$ERDF
                                                                                .WORD   401
                                                                                .WORD   SFIERR
                                                                                .WORD   SFIMSG
                                20$:
                                        MOV     #T15PACKET,R4           ;SUBROUTINE NEEDS PACKET ADDRESS
                                        JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
                                        BCS     23$                     ;BR, IF COMMAND ISSUED OK
                                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
                                        ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
                                                                                TRAP    C$ERHRD
                                                                                .WORD   402
                                                                                .WORD   WRTMSG
                                                                                .WORD   SFIMSG
```

```
1229 032142  012703  000400          23$:   MOV     #256.,R3          ;STARTING ADDRESS FOR RAM WRITE
1230 032146  112737  000001  034101         MOVB    #1,T15BS1         ;SIZE OF TRANSFER
1231 032154  112737  000002  034100         MOVB    #2,T15BS0         ;WRITE RAM "COMMAND"
1232 032162                          25$:
1233 032162  010337  034102                 MOV     R3,T15S2          ;ADDRESS FOR RAM
1234 032166  012704  034070                 MOV     #T15PK2,R4        ;WRITE SUBSYS MEM PACKET
1235 032172  110337  034104                 MOVB    R3,T15S3          ;DATA FOR WRITE (ADDRESS)
1236 032176  010465  000000                 MOV     R4,TSDB(R5)       ;ISSUE COMMAND
1237 032202  004737  016336                 JSR     PC,CHKTSSR        ;WAIT FOR SSR
1238 032206  103407                         BCS     30$               ;BR, IF NO ERROR
1239 032210  010001                         MOV     R0,R1             ;ERROR, SAVE TSSR
1243 032212                                 ERRHRD  ERRNO,T15SSR,PKTSSR ;TSSR NOT CORRECT AFTER WRITE SUB MEM
     032212  104456                                                         TRAP    C$ERHRD
     032214  000623                                                         .WORD   403
     032216  034106                                                         .WORD   T15SSR
     032220  012046                                                         .WORD   PKTSSR
1244 032222                                 ESCAPE  SUB                   ;DON'T CONTINUE IF ERROR ON WRITE
     032222  104410                                                         TRAP    C$ESCAPE
     032224  000122                                                         .WORD   L10050-.
1245 032226                          30$:   CKLOOP                        ;SCOPE LOOP
     032226  104406                                                         TRAP    C$CLP1
1246
1247
1248 032230  005203                         INC     R3                ;NEXT ADDRESS
1249 032232  020327  010000                 CMP     R3,#10000         ;END OF RAM MEMORY CHECK
1250 032236  001351                         BNE     25$               ;LOOP TILL ALL RAM WRITTEN
1251 032240  005002                         CLR     R2                ;CLEAR OUT R2 HIGH BITS
1252 032242  005303                         DEC     R3                ;SET BACK TO 7777
1253 032244  110337  034104          40$:   MOVB    R3,T15S3          ;GET DATA PATTERN BACK IN SHAPE
1254 032250  010337  034102                 MOV     R3,T15S2          ;ADDRESS FOR RAM READ
1255 032254  112737  000001  034100         MOVB    #1,T15BS0         ;READ RAM COMMAND
1256 032262  010465  000000                 MOV     R4,TSDB(R5)       ;SEND OUT PACKET ADDRESS TO CONTR.
1257 032266  004737  016336                 JSR     PC,CHKTSSR        ;WAIT FOR READY, NON-AMBIGUOUS
1258 032272  103405                         BCS     43$               ;BR, IF NO PROBLEM
1259 032274  010001                         MOV     R0,R1             ;SAVE TSSR
1263 032276                                 ERRDF   ERRNO,T15SSR,PKTSSR ;TSSR NOT CORRECT
     032276  104455                                                         TRAP    C$ERDF
     032300  000624                                                         .WORD   404
     032302  034106                                                         .WORD   T15SSR
     032304  012046                                                         .WORD   PKTSSR
1264 032306                          43$:   CKLOOP                        ;SCOPE LOOP
     032306  104406                                                         TRAP    C$CLP1
1265 032310  013701  033432                 MOV     T15BFR+20,R1      ;GET RAM READ DATA
1266 032314  010302                         MOV     R3,R2             ;SET UP FOR COMPARE
1267 032316  120102                         CMPB    R1,R2             ;CHECK WITH DATA WRITTEN
1268 032320  001404                         BEQ     45$               ;BR IF OK, DATA IN = DATA OUT
1272 032322                                 ERRHRD  ERRNO,T15AM4,EXPBREC ;WRITTEN DATA NOT = TO READ
     032322  104456                                                         TRAP    C$ERHRD
     032324  000625                                                         .WORD   405
     032326  034365                                                         .WORD   T15AM4
     032330  015502                                                         .WORD   EXPBREC
1273 032332                          45$:   CKLOOP                        ;SCOPE LOOP
     032332  104406                                                         TRAP    C$CLP1
1274 032334  005303                         DEC     R3                ;DROP DATA COUNTER (PATTERN)
1275 032336  020327  000377                 CMP     R3,#255.          ;AT BOTTOM YET
1276 032342  001340                         BNE     40$               ;BR, IF MORE TO CHECK
1277 032344                          50$:   CKLOOP                        ;SCOPE LOOP
```

```
        032344  104406                                                                        TRAP    C$CLP1
   1278 032346                                       ENDSUB                         ;\\\\\\\\\\\\\ END SUBTEST \\\\\\\\\\\\\
        032346                                                                           L10050:
        032346  104403                                                                        TRAP    C$ESUB
   1279
   1280
   1281 032350                                       BGNSUB                         ;///////////// BEGIN SUBTEST ////////////
        032350                                                                           T4.2:
        032350  104402                                                                        TRAP    C$BSUB
   1282
   1283                                    ;*
   1284                                    ;
   1285                                    ;TEST 4, SUBTEST 2
   1286                                    ;
   1287                                    ;
   1288                                    ;         THIS SUBTEST WRITES RAM WITH ALL ZEROS
   1289                                    ;         THEN WALKS AN ALL ONES WORD DOWN THROUGH MEMORY
   1290                                    ;
   1291 032352  004737  034472                       JSR     PC,T15REST             ;RESTORE PACKET FOR WRITE CHARA
   1292 032356  004737  034544                       JSR     PC,T15RT2              ;RESTORE PACKET FOR WRT SUB SYS MEM
   1293 032362  004737  015774                       JSR     PC,SOFINIT             ;DO INITIALIZE ON CONTROLLER
   1294 032366  103405                               BCS     20$                    ;BR IF INIT WAS OK
   1298 032370  010001                               MOV     R0,R1                  ;CONTENTS OF TSSR REGISTER
   1299 032372                                       ERRDF   ERRNO,SFIERR,SFIMSG    ;FATAL ERROR TSSR WAS NOT OK
        032372  104455                                                                        TRAP    C$ERDF
        032374  000626                                                                        .WORD   406
        032376  003652                                                                        .WORD   SFIERR
        032400  012034                                                                        .WORD   SFIMSG
   1300 032402                             20$:
   1301 032402  012704  033370                       MOV     #T15PACKET,R4          ;SUBROUTINE NEEDS PACKET ADDRESS
   1302 032406  004737  010662                       JSR     PC,WRTCHR              ;ISSUE WRITE CHARACTERISTICS
   1303 032412  103405                               BCS     25$                    ;BR, IF COMMAND ISSUED OK
   1307 032414  010001                               MOV     R0,R1                  ;SAVE CONTENTS OF TSSR
   1308 032416                                       ERRHRD  ERRNO,WRTMSG,SFIMSG    ;WRITE CHARACTERISTISC FAILED
        032416  104456                                                                        TRAP    C$ERHRD
        032420  000627                                                                        .WORD   407
        032422  005056                                                                        .WORD   WRTMSG
        032424  012034                                                                        .WORD   SFIMSG
   1309 032426                             25$:
   1310 032426  112737  000001  034101               MOVB    #1,T15BS1              ;SET SIZE OF TRANSFER 1 BYTE
   1311 032434  012704  034070                       MOV     #T15PK2,R4             ;SET NEW PACKET ADDRESS
   1312 032440  012703  000400                       MOV     #256.,R3               ;STARTING ADDRESS IN RAM
   1313 032444  112737  000002  034100               MOVB    #2,T15BS0              ;WRITE RAM COMMAND
   1314 032452  105037  034104                       CLRB    T15S3                  ;SET DATA TO 000
   1315 032456  010337  034102             30$:      MOV     R3,T15S2               ;ADDRESS TO PACKET DATA AREA
   1316 032462  010465  000000                       MOV     R4,TSDB(R5)            ;SEND OUT PACKET ADDRESS
   1317 032466  004737  016336                       JSR     PC,CHKTSSR             ;WAIT FOR SSR
   1318 032472  103405                               BCS     33$                    ;BR, IF NO PROBLEM
   1319 032474  010001                               MOV     R0,R1                  ;SAVE TSSR
   1323 032476                                       ERRHRD  ERRNO,T15SSR,PKTSSR    ;TSSR NOT CORRECT
        032476  104456                                                                        TRAP    C$ERHRD
        032500  000630                                                                        .WORD   408
        032502  034106                                                                        .WORD   T15SSR
        032504  012046                                                                        .WORD   PKTSSR
   1324 032506                             33$:      CKLOOP                         ;SCOPE LOOP
        032506  104406                                                                        TRAP    C$CLP1
   1325
```

.TEST 4: RAM EXERCISER TEST

```
1326
1327 032510  005203                    INC     R3                      ;NEXT ADDRESS
1328 032512  020327  010000             CMP     R3,#10000               ;END OF RAM MEMORY CHECK
1329 032516  001357                    BNE     30$                     ;BR, MORE RAM TO GO
1330 032520  005303              35$:  DEC     R3                      ;SET BACK TO 7777
1331 032522  005002              40$:  CLR     R2                      ;SET TO ALL ZEROS
1332 032524  112737  000001  034100   MOVB    #1,T15BS0               ;READ RAM COMMAND
1333 032532  010337  034102           MOV     R3,T15S2                ;ADDRESS TO BE READ TO PACKET DATA
1334 032536  010465  000000           MOV     R4,TSDB(R5)             ;SEND OUT PACKET ADDRESS
1335 032542  004737  016336           JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
1336 032546  103405                   BCS     41$                     ;BR, IF ALL IS WELL
1337 032550  010001                   MOV     R0,R1                   ;SAVE TSSR
1341 032552                           ERRHRD  ERRNO,T15SSR,PKTSSR     ;TSSR NOT CORRECT
     032552  104456                                                           TRAP    C$ERHRD
     032554  000631                                                           .WORD   409
     032556  034106                                                           .WORD   T15SSR
     032560  012046                                                           .WORD   PKTSSR
1342 032562                     41$:  CKLOOP                          ;SCOPE LOOP
     032562  104406                                                           TRAP    C$CLP1
1343 032564  013701  033432           MOV     T15BFR+20,R1            ;PICK UP READ DATA
1344 032570  120102                   CMPB    R1,R2                   ;BOTH SHOULD BE 00000000 BINARY
1345 032572  001404                   BEQ     42$                     ;BR, IF DATA IS GOOD
1349 032574                           ERRHRD  ERRNO,T15AM3,EXPBREC    ;CHARACTERISTICS DATA NOT CORRECT
     032574  104456                                                           TRAP    C$ERHRD
     032576  000632                                                           .WORD   410
     032600  034263                                                           .WORD   T15AM3
     032602  015502                                                           .WORD   EXPBREC
1350 032604                     42$:  CKLOOP                          ;SCOPE LOOPER
     032604  104406                                                           TRAP    C$CLP1
1351 032606  012702  000377           MOV     #000377,R2              ;SET ALL ONES WORD
1352 032612  112737  000002  034100   MOVB    #2,T15BS0               ;WRITE RAM COMMAND
1353 032620  112737  000377  034104   MOVB    #000377,T15S3           ;ALL ONES PATTERN
1354 032626  010465  000000           MOV     R4,TSDB(R5)             ;PASS PACKET ADDRESS TO CONTR.
1355 032632  004737  016336           JSR     PC,CHKTSSR              ;WAIT FOR SSR
1356 032636  103405                   BCS     43$                     ;BR, IF OK (NO ERROR)
1357 032640  010001                   MOV     R0,R1                   ;SAVE TSSR
1361 032642                           ERRHRD  ERRNO,T15SSR,PKTSSR     ;TSSR NOT CORRECT
     032642  104456                                                           TRAP    C$ERHRD
     032644  000633                                                           .WORD   411
     032646  034106                                                           .WORD   T15SSR
     032650  012046                                                           .WORD   PKTSSR
1362 032652                     43$:  CKLOOP                          ;SCOPE LOOP
     032652  104406                                                           TRAP    C$CLP1
1363 032654  112737  000001  034100   MOVB    #1,T15BS0               ;SET UP FOR RAM READ
1364 032662  010465  000000           MOV     R4,TSDB(R5)             ;ISSUE RAM READ
1365 032666  004737  016336           JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
1366 032672  103405                   BCS     44$                     ;BR, IF OK (NO ERROR)
1367 032674  010001                   MOV     R0,R1                   ;SAVE TSSR
1371 032676                           ERRDF   ERRNO,T15SSR,PKTSSR     ;TSSR NOT CORRECT
     032676  104455                                                           TRAP    C$ERDF
     032700  000634                                                           .WORD   412
     032702  034106                                                           .WORD   T15SSR
     032704  012046                                                           .WORD   PKTSSR
1372 032706  013701  033432     44$:  MOV     T15BFR+20,R1            ;PICK UP REC'D DATA
1373 032712  120102                   CMPB    R1,R2                   ;CHECK WITH DATA WRITTEN
1374 032714  001404                   BEQ     45$                     ;BR IF OK, DATA IN = DATA OUT
1378 032716                           ERRHRD  ERRNO,T15AM2,EXPBREC    ;WRITTEN DATA NOT = TO READ
```

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TSV5 - HARDWARE TESTS   MACRO M1113  06-FEB-84 17:14                                SEQ 123
TEST  4: RAM EXERCISER TEST

        032716  104456                                                          TRAP    C$ERHRD
        032720  000635                                                          .WORD   413
        032722  034162                                                          .WORD   T15AM2
        032724  015502                                                          .WORD   EXPBREC
  1379  032726                          45$:    CKLOOP                          ;SCOPE LOOP
        032726  104406                                                          TRAP    C$CLP1
  1380  032730  005303                          DEC     R3                      ;DROP RAM ADDRESS POINTER
  1381  032732  020327  000377                CMP     R3,#255.                ;AT START YET
  1382  032736  001271                        BNE     40$                     ;BR, IF MORE RAM TO CHECK
  1383
  1384  032740                                ENDSUB                          ;\\\\\\\\\\\\\ END SUBTEST \\\\\\\\\\\\\
        032740                                                                  L10051:
        032740  104403                                                          TRAP    C$ESUB
  1385
  1386  032742                                BGNSUB                          ;////////////// BEGIN SUBTEST //////////////
        032742                                                                  T4.3:
        032742  104402                                                          TRAP    C$BSUB
  1387                                  ;*
  1388                                  ;
  1389                                  ;TEST 4, SUBTEST 3
  1390                                  ;
  1391                                  ;
  1392                                  ;       THIS SUBTEST WRITES RAM WITH ALL ONES
  1393                                  ;       THEN WALKS AN ALL ZEROS WORD DOWN THROUGH MEMORY
  1394                                  ;
  1395  032744  005737  003400                  TST     SKIPT                   ;CHECK RUN MODE
  1396  032750  001402                          BEQ     10$                     ;BR, IF NO SKIP
  1397  032752  000137  033346                  JMP     50$                     ;SKIP SUBTEST
  1398  032756  004737  034472          10$:    JSR     PC,T15REST              ;RESTORE PACKET FOR WRITE CHARA
  1399  032762  004737  034544                  JSR     PC,T15RT2               ;RESTORE PACKET FOR WRT SUB SYS MEM
  1400  032766  004737  015774                  JSR     PC,SOFINIT              ;DO INITIALIZE ON CONTROLLER
  1401  032772  103405                          BCS     20$                     ;BR IF INIT WAS OK
  1405  032774  010001                          MOV     R0,R1                   ;CONTENTS OF TSSR REGISTER
  1406  032776                                  ERRDF   ERRNO,SFIERR,SFIMSG     ;FATAL ERROR TSSR WAS NOT OK
        032776  104455                                                          TRAP    C$ERDF
        033000  000636                                                          .WORD   414
        033002  003652                                                          .WORD   SFIERR
        033004  012034                                                          .WORD   SFIMSG
  1407  033006                          20$:
  1408  033006  012704  033370                  MOV     #T15PACKET,R4           ;SUBROUTINE NEEDS PACKET ADDRESS
  1409  033012  004737  010662                  JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
  1410  033016  103405                          BCS     25$                     ;BR, IF COMMAND ISSUED OK
  1414  033020  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
  1415  033022                                  ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
        033022  104456                                                          TRAP    C$ERHRD
        033024  000637                                                          .WORD   415
        033026  005056                                                          .WORD   WRTMSG
        033030  012034                                                          .WORD   SFIMSG
  1416  033032                          25$:
  1417  033032  112737  000001  034101          MOVB    #1,T15BS1               ;SET SIZE TO 1 BYTE
  1418  033040  012704  034070                  MOV     #T15PK2,R4              ;SET NEW PACKET ADDRESS
  1419  033044  012703  000400                  MOV     #256.,R3                ;STARTING ADDRESS IN RAM
  1420  033050  112737  000002  034100          MOVB    #2,T15BS0               ;WRITE RAM COMMAND
  1421  033056  112737  000377  034104          MOVB    #377,T15S3              ;SET DATA TO 377
  1422  033064  010337  034102          30$:    MOV     R3,T15S2                ;ADDRESS TO PACKET DATA AREA
  1423  033070  010465  000000                  MOV     R4,TSDB(R5)             ;SEND OUT PACKET ADDRESS
  1424  033074  004737  016336                  JSR     PC,CHKTSSR              ;WAIT FOR SSR
```

```
1425 033100  103405                        BCS     33$                 ;BR, IF NO PROBLEM
1426 033102  010001                        MOV     R0,R1               ;SAVE TSSR
1430 033104                                ERRHRD  ERRNO,T15SSR,PKTSSR ;TSSR NOT CORRECT
     033104  104456                                                            TRAP    C$ERHRD
     033106  000640                                                            .WORD   416
     033110  034106                                                            .WORD   T15SSR
     033112  012046                                                            .WORD   PKTSSR
1431 033114                         33$:    CKLOOP                      ;SCOPE LOOP
     033114  104406                                                            TRAP    C$CLP1
1432
1433
1434 033116  005203                        INC     R3                  ;NEXT ADDRESS
1435 033120  020327  010000                CMP     R3,#10000           ;END OF RAM MEMORY CHECK
1436 033124  001357                        BNE     30$                 ;BR, MORE RAM TO GO
1437 033126  005303                 35$:   DEC     R3                  ;SET BACK TO 7777
1438 033130  112702  000377           40$:   MOVB    #377,R2             ;SET TO ALL ONES
1439 033134  112737  000001  034100        MOVB    #1,T15BS0           ;READ RAM COMMAND
1440 033142  010337  034102                MOV     R3,T15S2            ;ADDRESS TO BE READ TO PACKET DATA
1441 033146  010465  000000                MOV     R4,TSDB(R5)         ;SEND OUT PACKET ADDRESS
1442 033152  004737  016336                JSR     PC,CHKTSSR          ;WAIT FOR SSR TO SET
1443 033156  103405                        BCS     41$                 ;BR, IF ALL IS WELL
1444 033160  010001                        MOV     R0,R1               ;SAVE TSSR
1448 033162                                ERRHRD  ERRNO,T15SSR,PKTSSR ;TSSR NOT CORRECT
     033162  104456                                                            TRAP    C$ERHRD
     033164  000641                                                            .WORD   417
     033166  034106                                                            .WORD   T15SSR
     033170  012046                                                            .WORD   PKTSSR
1449 033172                         41$:    CKLOOP                      ;SCOPE LOOP
     033172  104406                                                            TRAP    C$CLP1
1450 033174  013701  033432                MOV     T15BFR+20,R1        ;PICK UP READ DATA
1451 033200  120102                        CMPB    R1,R2               ;BOTH SHOULD BE 11111111 BINARY
1452 033202  001404                        BEQ     42$                 ;BR, IF DATA IS GOOD
1456 033204                                ERRHRD  ERRNO,T15AM3,EXPBREC ;CHARACTERISTICS DATA NOT CORRECT
     033204  104456                                                            TRAP    C$ERHRD
     033206  000642                                                            .WORD   418
     033210  034263                                                            .WORD   T15AM3
     033212  015502                                                            .WORD   EXPBREC
1457 033214  012702  000377           42$:   MOV     #000377,R2          ;SET ALL ONES WORD
1458 033220  012737  000002  034100        MOV     #2,T15BS0           ;WRITE RAM COMMAND
1459 033226  112737  000377  034104        MOVB    #000377,T15S3       ;ALL ONES PATTERN
1460 033234  010465  000000                MOV     R4,TSDB(R5)         ;PASS PACKET ADDRESS TO CONTR.
1461 033240  004737  016336                JSR     PC,CHKTSSR          ;WAIT FOR SSR
1462 033244  103405                        BCS     43$                 ;BR, IF OK (NO ERROR)
1463 033246  010001                        MOV     R0,R1               ;SAVE TSSR
1467 033250                                ERRHRD  ERRNO,T15SSR,PKTSSR ;TSSR NOT CORRECT
     033250  104456                                                            TRAP    C$ERHRD
     033252  000643                                                            .WORD   419
     033254  034106                                                            .WORD   T15SSR
     033256  012046                                                            .WORD   PKTSSR
1468 033260                         43$:    CKLOOP                      ;SCOPE LOOP
     033260  104406                                                            TRAP    C$CLP1
1469 033262  112737  000001  034100        MOVB    #1,T15BS0           ;SET UP FOR RAM READ
1470 033270  010465  000000                MOV     R4,TSDB(R5)         ;ISSUE RAM READ
1471 033274  004737  016336                JSR     PC,CHKTSSR          ;WAIT FOR SSR TO SET
1472 033300  103405                        BCS     44$                 ;BR, IF OK (NO ERROR)
1473 033302  010001                        MOV     R0,R1               ;SAVE TSSR
1477 033304                                ERRHRD  ERRNO,T15SSR,PKTSSR ;TSSR NOT CORRECT
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TSV5 - HARDWARE TESTS   MACRO M1113  06-FEB-84 17:14                                SEQ 125
TEST  4: RAM EXERCISER TEST

        033304  104456                                                          TRAP    C$ERHRD
        033306  000644                                                          .WORD   420
        033310  034106                                                          .WORD   T15SSR
        033312  012046                                                          .WORD   PKTSSR
1478    033314  013701  033432        44$:    MOV     T15BFR+20,R1            ;PICK UP REC'D DATA
1479    033320  120102                CMPB    R1,R2                           ;CHECK WITH DATA WRITTEN
1480    033322  001404                BEQ     45$                             ;BR IF OK, DATA IN = DATA OUT
1484    033324                        ERRHRD  ERRNO,T15AM2,EXPBREC            ;WRITTEN DATA NOT = TO READ
        033324  104456                                                          TRAP    C$ERHRD
        033326  000645                                                          .WORD   421
        033330  034162                                                          .WORD   T15AM2
        033332  015502                                                          .WORD   EXPBREC
1485    033334                        45$:    CKLOOP                          ;SCOPE LOOP
        033334  104406                                                          TRAP    C$CLP1
1486    033336  005303                DEC     R3                              ;DROP RAM ADDRESS POINTER
1487    033340  020327  000377        CMP     R3,#255.                        ;AT START YET
1488    033344  001271                BNE     40$                             ;BR, IF MORE RAM TO CHECK
1489
1490    033346                        50$:
1491    033346                        ENDSUB                                  ;\\\\\\\\\\\\\ END SUBTEST \\\\\\\\\\\\\
        033346                                                                L10052:
        033346  104403                                                          TRAP    C$ESUB
1492
1493    033350  004737  016456        JSR     PC,TSTLOOP                      ;DO WE NEED TO ITERATE TEST ?
1494    033354  103002                BCC     63$                             ;BRANCH IF NOT
1495    033356  000137  032044        JMP     T15LOOP                         ;EXECUTE AGAIN
1496    033362                        63$:    EXIT    TST                     ;ALL DONE THIS TEST
        033362  104432                                                          TRAP    C$EXIT
        033364  001216                                                          .WORD   L10047-.
1497                                  ;+
1498                                  ;LOCAL STORAGE FOR THIS TEST
1499                                  ;-
1500
1502            033370                        .=<.+10>&177770
1504    033370                        T15PACKET:                              ;COMMAND PACKET FOR TEST
1505    033370  100204                        .WORD   100204                  ;WRITE CHARACTERISTICS COMMAND, WITH IE, ACK
1506    033372  033400                        .WORD   T15DATA                 ;ADDRESS OF CHARACTERISTICS BLOCK
1507    033374  000000                        .WORD   0
1508    033376  000010                        .WORD   8.                      ;STARTING VALUE OF BLOCK SIZE
1509    033400                        T15DATA:                                ;CHARACTERISTICS DATA BLOCK
1510    033400  033412                        .WORD   T15BFR                  ;ADDRESS OF MESSAGE BUFFER
1511    033402  000000                        .WORD   0
1512    033404  000400                        .WORD   256.                    ;LENGTH OF MESSAGE BUFFER
1513    033406  000000  000000                .WORD   0,0
1514    033412                        T15BFR: .BLKW   150.                    ;MESSAGE BUFFER
1515                                  ;
1516                                  ;WRITE SUBSYSTEM MEMORY COMMAND PACKET
1517                                  ;
1519            034070                        .=<.+10>&177770
1521    034070                        T15PK2:
1522    034070  100206                        .WORD   100206                  ;WRITE SUB SYS MEM COMMAND, IE AND ACK
1523    034072  034100                        .WORD   T15BF2                  ;ADDRESS OF SELECT BLOCK DATA
1524    034074  000000                        .WORD   0
1525    034076  000006                        .WORD   6.                      ;SIZE OF DATA PACKET
1526
1527                                          .EVEN
1528    034100                        T15BF2:
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```
1529 034100     000                 T15BS0: .BYTE   0                       ;BSEL0 AREA
1530 034101     000                 T15BS1: .BYTE   0                       ;BSEL1 AREA
1531 034102  000000                 T15S2:  .WORD   0                       ;SEL 2 AREA
1532 034104  000000                 T15S3:  .WORD   0                       ;DATA AREA
1533
1534
1535
1536
1537                                ;+
1538                                ;LOCAL TEXT MESSAGES FOR TEST
1539                                ;-
1540
1541 034106     127     122     111 T15SSR: .ASCIZ  'WRITE SUBSYSTEM MEMORY Command Not Accepted'
1542 034162     127     122     111 T15AM2: .ASCIZ  'WRITE SUBSYSTEM MEMORY COMMAND Failed On All Ones Word Read Back'
1543 034263     127     122     111 T15AM3: .ASCIZ  'WRITE SUBSYSTEM MEMORY COMMAND Failed On All Zeros Word Read Back'
1544 034365     127     122     111 T15AM4: .ASCIZ  'WRITE SUBSYSTEM MEMORY COMMAND Failed On Address Test'
1545 034453     122     101     115 TST15ID:        .ASCIZ  'RAM Exerciser'
1546                                        .EVEN
1547                                ;+
1548                                ;
1549                                ;ROUTINE TO RESTORE COMMAND PACKET TO START-UP (DEFAULT) VALUES
1550                                ;WRITE SUBSYSTEM MEMORY COMMAND
1551                                ;
1552                                ;-
1553
1554 034472                         T15REST:
1555 034472                                 SAVREG                          ;SAVE THE REGISTERS
1556 034476  012701  033370                MOV     #T15PACKET,R1           ;START OF THE PACKET
1557 034502  012721  100204                MOV     #100204,(R1)+           ;WRITE SUBSYSTEM MEM. WITH ACK, IE
1558 034506  012721  033400                MOV     #T15DATA,(R1)+          ;ADDRESS OF CHARAISTICS DATA BLOCK
1559 034512  005021                        CLR     (R1)+                   ;EXTENDED ADDRESS
1560 034514  012721  000010                MOV     #8.,(R1)+               ;SIZE OF DATA BLOCK IN BYTES
1561 034520  012721  033412                MOV     #T15BFR,(R1)+           ;ADDRESS OF MESSAGE BUFFER
1562 034524  005021                        CLR     (R1)+
1563 034526  012721  000400                MOV     #256.,(R1)+             ;LENGTH OF MESSAGE BUFFER
1564 034532  005021                        CLR     (R1)+
1565 034534  005011                        CLR     (R1)
1566 034536  005037  033412                CLR     T15BFR                  ;CLEAR 1ST LOC IN MESSAGE BUFFER
1567 034542  000207                        RTS     PC                      ;RETURN
1568
1569
1570 034544                         T15RT2:
1571 034544                                 SAVREG                          ;SAVE THE REGISTERS
1572 034550  012701  034070                MOV     #T15PK2,R1              ;START OF THE PACKET
1573 034554  012721  100206                MOV     #100206,(R1)+           ;WRITE SUBSYSTEM MEM. WITH ACK, IE
1574 034560  012721  034100                MOV     #T15BF2,(R1)+           ;ADDRESS OF DATA BLOCK
1575 034564  005021                        CLR     (R1)+                   ;EXTENDED ADDRESS
1576 034566  012721  000006                MOV     #6.,(R1)+               ;SIZE OF DATA BLOCK IN BYTES
1577 034572  005021                        CLR     (R1)+
1578 034574  005021                        CLR     (R1)+
1579 034576  005011                        CLR     (R1)
1580 034600  000207                        RTS     PC                      ;RETURN
1581 034602                                 ENDTST
     034602                                                         L10047:
     034602  104401                                                       TRAP    C$ETST
```

```
                                        .SBTTL  TEST  5: EXTENDED FEATURES SWITCH AND TIMERS A,B
                                ;++
                                ; TEST DESCRIPTION:
                                ;
                                ;       This test verifies the Invert Extended Features function
                                ;       can logically invert the Extended features switch and
                                ;       that the internal timers A and B operate correctly.
                                ;
                                ; TEST STEPS:
                                ;
                                ;  REPEAT FOR LOOPCNT
                                ;    BEGIN
                                ;       Do Subtest 1    - Verify Extended Features Switch
                                ;       Do Subtest 2    - Verify Timers A,B
                                ;    END
                                ;--


034604                                  BGNTST
034604                                                                          T5::
034604  012700  036662                    MOV     #TST16ID,R0             ;ASCII MESSAGE TO IDENTIFY TEST
034610  004737  016510                    JSR     PC,TSTSETUP             ;DO INITIAL TEST SETUP
034614  012737  000012  002216            MOV     #10.,LOOPCNT            ;PERFORM 10 ITERATIONS
034622                          T16LOOP:

                                        .SBTTL  TEST  5: SUBTEST 1: VERIFY EXTENDED FEATURES TEST

                                ;++
                                ; TEST 5: SUBTEST 1:
                                ;
                                ; SUBTEST DESCRIPTION:
                                ;
                                ;       This subtest verifies that the Invert Sense of Extended features
                                ;       Switch function (Write Subsystem Memory,Write Misc command)
                                ;       operates properly.
                                ;       First the state of the Extended Features switch is read in the
                                ;       message packet supplied by the write characteristics command.
                                ;       Then, the sense of the switch is logically inverted.
                                ;       A Write characteristics command is executed and it is verified
                                ;       that the Extended status register (XST4) is returned when
                                ;       in Extended mode, and not returned if not in extended mode.
                                ;       The subtest also verifies that specifying a Message Buffer
                                ;       address with any of bits 21-19 ,set will cause the command to
                                ;       be rejected.
                                ;
                                ; TEST STEPS:
                                ;
                                ;
                                ; BEGIN
                                ;       Write to TSSR register to soft initialize the controller
                                ;       Do WRITE CHARACTERISTICS to check for Extended Features Switch
                                ;       IF Extended Features Hardware Switch CLEAR
                                ;       THEN
                                ;         (* Verify Extended Features switch can be Inverted to SET *)
                                ;         Do Write Subsystem Write Miscellaneous to SET Extended Features.
                                ;         DO a WRITE CHARACTERISTICS with an extended characteristic word
                                ;         Compare the controller ram to the extended characteristic word
```

```
1643                                    ;       If Data word in controller ram NOT= to word sent  Then Print Error
1644                                    ;       If Message Buffer Data Length NOT= 12.  Then Print Error
1645                                    ;     ELSE
1646                                    ;       (* Verify Extended Features switch can be Inverted to CLEAR *)
1647                                    ;       Do Write Subsystem Write Miscellaneous to CLEAR Extended Features.
1648                                    ;       Do a WRITE CHARACTERISTICS without an extended characteristic word
1649                                    ;       If Message Buffer Data Length NOT= 10.  Then Print Error
1650                                    ;     END-IF
1651                                    ;     (* Verify Function Reject when Message Buffer 21-19 are non-zero *)
1652                                    ;     Write to TSSR register to soft initialize the controller
1653                                    ;     REPEAT FOR MESSAGE BUFFER ADDRESS bits <21:19> FROM 0 TO 7
1654                                    ;      DO a WRITE CHARACTERISTICS with a message address bit<21:19> non-zero
1655                                    ;      If TSSR termination code NOT= Function Reject  Then Print Error
1656                                    ;     END-REPEAT
1657                                    ; END
1658                                    ;--
1659 034622                                    BGNSUB                          ;////////////// BEGIN SUBTEST //////////
      034622                                                                          T5.1:
      034622  104402                                                                   TRAP    C$BSUB
1660
1661
1662 034624                            5$:
1663                                    ;     Write to TSSR register to soft initialize the controller
1664 034624  004737  015774                    JSR     PC,SOFINIT              ;WRITE TO TSSR TO SOFT INITIALIZE
1665 034630  103405                            BCS     10$                     ;BR IF SOFT INIT OKAY
1666 034632  010001                            MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
1667 034634                                    ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL DURING INIT
      034634  104455                                                                  TRAP    C$ERDF
      034636  000764                                                                  .WORD   500
      034640  003652                                                                  .WORD   SFIERR
      034642  012034                                                                  .WORD   SFIMSG
1668                                    ;     Do WRITE CHARACTERISTICS to check for Extended Features Switch
1669 034644  004737  040030            10$:    JSR     PC,T16REST              ;RESTORE PACKET DEFAULTS
1670 034650  005037  002222                    CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
1671 034654  012704  040210                    MOV     #T16PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
1672 034660  004737  010662                    JSR     PC,WRTCHR               ;DO WRITE CHARACTERISTICS COMMAND
1673 034664                                    FORCERROR       12$                     ;@@DFORCE ERROR IF FORCER=1
1674 034700  103407                            BCS     15$                     ;BR IF CARRY SET (GOOD RETURN)
1675 034702  010001                            MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
1676 034704                                    NEXT.ERRNO
1677 034704                            12$:    ERRDF   ERRNO,T16SSR,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
      034704  104455                                                                  TRAP    C$ERDF
      034706  000765                                                                  .WORD   501
      034710  036732                                                                  .WORD   T16SSR
      034712  012046                                                                  .WORD   PKTSSR
1678 034714  005237  002222                    INC     FATFLG                  ;SET FATAL ERROR FLAG
1679 034720                            15$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
      034720  104406                                                                  TRAP    C$CLP1
1680
1681                                    ;     If Extended Features Hardware Switch Clear then:
1682                                    ;       (* Verify Extended Features switch can be Inverted to SET *)
1683                                    ;       REPEAT FOR TEST PATTERNS IN TSTBLK TABLE
1684 034722  012701  040232                    MOV     #T16BFR,R1              ;MESSAGE BUFFER ADDRESS
1685 034726  032761  000200  000012            BIT     #X2.EXTF,XST2(R1)       ;EXTENDED FEATURES SWITCH CLEAR?
1686 034734  001402                            BEQ     20$                     ;BR IF YES
1687 034736  000137  035306                    JMP     200$                    ;
1688 034742  012703  002764            20$:    MOV     #TSTBLK+10.,R3          ;START OF TEST DATA
```

```
                                        ;       Do Write Subsystem Write Miscellaneous to SET Extended Features.
                                        ;
035746  004737  040170                          JSR     PC,T16SEXT              ;SETUP PACKET FOR WRITE MISC INVERT
035752  012704  040260                          MOV     #T16PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
035756  010465  000000                          MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
035762  004737  016336                          JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
035766                                          FORCERROR       32$                     ;@@DFORCE ERROR IF FORCER=1
035002  103407                                  BCS     40$                     ;BR IF CARRY SET (GOOD RETURN)
035004  010001                                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
035006                                          NEXT.ERRNO
035006                                  32$:    ERRDF   ERRNO,T162SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
035006  104455                                                                          TRAP    C$ERDF
035010  000766                                                                          .WORD   502
035012  036767                                                                          .WORD   T162SSR
035014  012046                                                                          .WORD   PKTSSR
035016  005237  002222                          INC     FATFLG                  ;SET FATAL ERROR FLAG
035022                                  40$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
035022  104406                                                                          TRAP    C$CLP1
                                        ;
                                        ;         DO a WRITE CHARACTERISTICS with an extended characteristic word
035024  012737  125252  002312                    MOV     #125252,DATA            ;SETUP TEST DATA FOR EXTENDED WORD
035032  012704  040210                          MOV     #T16PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
035036  012764  000020  000006                    MOV     #16.,PKBCNT(R4)         ;STORE MESSAGE PACKET SIZE
035044  013737  002312  040230                    MOV     DATA,T16DATA+10         ;STORE TEST DATA IN EXTENDED WORD
035052  004737  010662                          JSR     PC,WRTCHR               ;DO WRITE CHARACTERISTICS COMMAND
035056                                          FORCERROR       42$                     ;@@DFORCE ERROR IF FORCER=1
035072  103407                                  BCS     50$                     ;BR IF CARRY SET (GOOD RETURN)
035074  010001                                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
035076                                          NEXT.ERRNO
035076                                  42$:    ERRDF   ERRNO,T16SSR,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
035076  104455                                                                          TRAP    C$ERDF
035100  000767                                                                          .WORD   503
035102  036732                                                                          .WORD   T16SSR
035104  012046                                                                          .WORD   PKTSSR
035106  005237  002222                          INC     FATFLG                  ;SET FATAL ERROR FLAG
035112                                  50$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
035112  104406                                                                          TRAP    C$CLP1
                                        ;         If the TSBA Address Register NOT= Expected  Then Print Error
035114  016501  000000                          MOV     TSBA(R5),R1             ;GET TSBA REGISTER CONTENTS
035120  012702  040232                          MOV     #T16BFR,R2              ;START OF THE DATA BUFFER
035124  062702  000020                  62$:    ADD     #16.,R2                 ;EXPECTED CONTENTS OF TSBA
035130                                          FORCERROR       72$,NOTSSR              ;@@DFORCE ERROR IF FORCER=1
035140  020102                                  CMP     R1,R2                   ;COMPARE EXPECTED TO RECEIVED
035142  001404                                  BEQ     80$                     ;ERROR IF NOT EQUAL
035144                                          NEXT.ERRNO
035144                                  72$:    ERRHRD  ERRNO,T16TSBA,EXPREC    ;PRINT THE ERROR & EXPD/RECV
035144  104456                                                                          TRAP    C$ERHRD
035146  000770                                                                          .WORD   504
035150  037100                                                                          .WORD   T16TSBA
035152  015474                                                                          .WORD   EXPREC
035154                                  80$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
035154  104406                                                                          TRAP    C$CLP1
                                        ;         Compare the controller ram to the extended characteristic word
                                        ;         If Data word in controller ram NOT= to word sent  Then Print Error
035156  012704  040220                          MOV     #T16DATA,R4             ;GET CHARACTERISTIC DATA ADDRESS
035162  004737  011224                          JSR     PC,CKRAM2               ;DOES RAM DATA EQUAL DATA SENT?
035166                                          FORCERROR       92$                     ;@@DFORCE ERROR IF FORCER=1
```

```
1731 035202  103404                    BCS     100$                    ;BR IF YES
1732 035204                            NEXT.ERRNO
1733 035204                    92$:    ERRHRD  ERRNO,PKTRAM,RAMERR     ;REPORT THE RAM ERROR(S)
     035204  104456                                                            TRAP    C$ERHRD
     035206  000771                                                            .WORD   505
     035210  004745                                                            .WORD   PKTRAM
     035212  015510                                                            .WORD   RAMERR
1734 035214                    100$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     035214  104406                                                            TRAP    C$CLP1
1735                           ;         If Message Buffer Data Length NOT= 12.  Then Print Error
1736 035216  012702  040232              MOV     #T16BFR,R2              ;GET MESSAGE BUFFER ADDRESS
1737 035222  016201  000002              MOV     2(R2),R1                ;GET RECV DATA FIELD LENGTH
1738 035226  012702  000014              MOV     #12.,R2                 ;GET EXPD DATA FIELD LENGTH
1739 035232                              FORCERROR       112$,NOTSSR             ;@@DFORCE ERROR IF FORCER=1
1740 035242  020102                      CMP     R1,R2                   ;COMPARE EXPECTED TO RECEIVED
1741 035244  001404                      BEQ     120$                    ;ERROR IF NOT EQUAL
1742 035246                              NEXT.ERRNO
1743 035246                    112$:   ERRHRD  ERRNO,T16LEN,EXPREC     ;PRINT THE ERROR & EXPD/RECV
     035246  104456                                                            TRAP    C$ERHRD
     035250  000772                                                            .WORD   506
     035252  037202                                                            .WORD   T16LEN
     035254  015474                                                            .WORD   EXPREC
1744 035256                    120$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     035256  104406                                                            TRAP    C$CLP1
1745
1746 035260  004737  015774              JSR     PC,SOFINIT              ;WRITE TO TSSR TO SOFT INITIALIZE
1747 035264  103405                      BCS     125$                    ;BR IF SOFT INIT OKAY
1748 035266  010001                      MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
1749 035270                              ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL DURING INIT
     035270  104455                                                            TRAP    C$ERDF
     035272  000772                                                            .WORD   506
     035274  003652                                                            .WORD   SFIERR
     035276  012034                                                            .WORD   SFIMSG
1750 035300                    125$:   CKLOOP                          ;LOOP IF SELECTED
     035300  104406                                                            TRAP    C$CLP1
1751 035302  000137  035466              JMP     300$                    ;
1752
1753                           ;    (* Verify Extended Features switch can be Inverted to CLEAR *)
1754 035306                    200$:
1755
1756 035306  004737  040170              Do Write Subsystem Write Miscellaneous to CLEAR Extended Features.
1757 035312  012704  040260              JSR     PC,T16SEXT              ;SETUP PACKET FOR WRITE MISC INVERT
1758 035316  010465  000000              MOV     #T16PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
1759 035322  004737  016336              MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
1760 035326                              JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
1761 035342  103407                      FORCERROR       232$                    ;@@DFORCE ERROR IF FORCER=1
1762 035344  010001                      BCS     240$                    ;BR IF CARRY SET (GOOD RETURN)
1763 035346                              MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
1764 035346                              NEXT.ERRNO
     035346  104455                    232$:   ERRDF   ERRNO,T162SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     035350  000773                                                            TRAP    C$ERDF
     035352  036767                                                            .WORD   507
     035354  012046                                                            .WORD   T162SSR
1765 035356  005237  002222                                                    .WORD   PKTSSR
1766 035362                              INC     FATFLG                  ;SET FATAL ERROR FLAG
     035362  104406                    240$:   CKLOOP                  ;LOOP ON ERROR, IF FLAG SET
                                                                               TRAP    C$CLP1
1767
```

```
1768                                    ;       DO a WRITE CHARACTERISTICS without an extended characteristic word
1769 035364  012704  040210             MOV     #T16PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
1770 035370  012764  000016  000006     MOV     #14.,PKBCNT(R4)         ;STORE MESSAGE PACKET SIZE
1771 035376  004737  010662             JSR     PC,WRTCHR               ;DO WRITE CHARACTERISTICS COMMAND
1772 035402                             FORCERROR       242$                    ;@@DFORCE ERROR IF FORCER=1
1773 035416  103407                     BCS     250$                    ;BR IF CARRY SET (GOOD RETURN)
1774 035420  010001                     MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
1775 035422                             NEXT.ERRNO
1776 035422                             242$:   ERRDF   ERRNO,T16SSR,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
     035422  104455                                                             TRAP    C$ERDF
     035424  000774                                                             .WORD   508
     035426  036732                                                             .WORD   T16SSR
     035430  012046                                                             .WORD   PKTSSR
1777 035432  005237  002222             INC     FATFLG                  ;SET FATAL ERROR FLAG
1778 035436                             250$:   CKLOOP                  ;LOOP ON ERROR, IF FLAG SET
     035436  104406                                                             TRAP    C$CLP1
1779                                    ;       If Message Buffer Data Length NOT= 10.  Then Print Error
1780 035440  013701  040234             MOV     T16BFR+2,R1             ;GET RECV DATA FIELD LENGTH
1781 035444  012702  000012             MOV     #10.,R2                 ;GET EXPD DATA FIELD LENGTH
1782 035450  020102                     CMP     R1,R2                   ;COMPARE EXPECTED TO RECEIVED
1783 035452  001404                     BEQ     270$                    ;ERROR IF NOT EQUAL
1784 035454                             NEXT.ERRNO
1785 035454                             262$:   ERRHRD  ERRNO,T16LEN,EXPREC     ;PRINT THE ERROR & EXPD/RECV
     035454  104456                                                             TRAP    C$ERHRD
     035456  000775                                                             .WORD   509
     035460  037202                                                             .WORD   T16LEN
     035462  015474                                                             .WORD   EXPREC
1786 035464                             270$:   CKLOOP                  ;LOOP ON ERROR, IF FLAG SET
     035464  104406                                                             TRAP    C$CLP1
1787
1788
1789                                    ;       (* Verify Function Reject when Message Buffer 21-19 are non-zero *)
1790                                    ;       Write to TSSR register to soft initialize the controller
1791 035466                             300$:
1792                                    ;       REPEAT FOR MESSAGE BUFFER ADDRESS bits <21:19> FROM 0 TO 7
1793 035466  012737  000001  002312     320$:   MOV     #1,DATA                 ;START AT BITS<21:19>=001
1794                                    ;       DO a WRITE CHARACTERISTICS with a message address bit<21:19> non-zero
1795 035474                             325$:
1796 035474  012704  040210                     MOV     #T16PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
1797 035500  012764  000016  000006             MOV     #14.,PKBCNT(R4)         ;STORE MESSAGE PACKET SIZE
1798 035506  013700  002312                     MOV     DATA,R0                 ;GET TEST DATA
1799         000003                             .REPT   3
1800                                            ASL     R0                      ;SHIFT INTO BITS 21:19
1801                                            .ENDR
1802 035520  010037  040222                     MOV     R0,T16DATA+2            ;STORE BUFFER ADDRESS BITS 21:19
1803 035524  010465  000000                     MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
1804 035530  004737  016250                     JSR     PC,WAITF                ;WAIT FOR SSR
1805 035534                                     FORCERROR       342$                    ;@@DFORCE ERROR IF FORCER=1
1806 035550  103407                             BCS     350$                    ;BR IF CARRY SET (GOOD RETURN)
1807 035552  010001                             MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
1808 035554                                     NEXT.ERRNO
1809 035554                             342$:   ERRDF   ERRNO,T16SSR,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
     035554  104455                                                                     TRAP    C$ERDF
     035556  000776                                                                     .WORD   510
     035560  036732                                                                     .WORD   T16SSR
     035562  012046                                                                     .WORD   PKTSSR
1810 035564  005237  002222                     INC     FATFLG                  ;SET FATAL ERROR FLAG
```

```
1811 035570                                350$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     035570  104406                                                                        TRAP    C$CLP1
1812
1813                                       ;       If TSSR termination code NOT= Function Reject  Then Print Error
1814 035572  016501  000002                        MOV     TSSR(R5),R1             ;GET RECV TSSR
1815 035576  010102                                MOV     R1,R2                   ;COPY RECV TSSR
1816 035600  042702  000016                        BIC     #TERCLS,R2              ;CLEAR TC<2:0> EXPD
1817 035604  052702  000006                        BIS     #TSREJ,R2               ;SET EXPD TC<2:0>= FUNCTION REJECT
1818 035610                                        FORCERROR       352$,NOTSSR             ;@@FORCE ERROR IF FORCER=1
1819 035620  020102                                CMP     R1,R2                   ;EXPD EQUAL RECV?
1820 035622  001404                                BEQ     360$                    ;BR IF YES
1821 035624                                        NEXT.ERRNO
1822 035624                                352$:   ERRHRD  ERRNO,T16REJ,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
     035624  104456                                                                        TRAP    C$ERHRD
     035626  000777                                                                        .WORD   511
     035630  037314                                                                        .WORD   T16REJ
     035632  012046                                                                        .WORD   PKTSSR
1823 035634                                360$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     035634  104406                                                                        TRAP    C$CLP1
1824 035636                                        FORCEXIT        370$
1825 035646  005237  002312                        INC     DATA                    ;GET NEXT TST PATTERN
1826 035652  023727  002312  000007                CMP     DATA,#7                 ;DONE ALL DATA?
1827 035660  101002                                BHI     370$                    ;BR IF YES
1828 035662  000137  035474                        JMP     325$                    ;DO ANOTHER TEST PATTERN
1829                                       ;       END-REPEAT
1830 035666                                370$:
1831 035666                                        ENDSUB                          ;////////////// END SUBTEST //////////
     035666                                                                                L10054:
     035666  104403                                                                        TRAP    C$ESUB
1832
1833 035670  005737  002222                        TST     FATFLG                  ;ANY FATAL ERRORS ?
1834 035674  001402                                BEQ     460$                    ;BRANCH IF NOT
1835 035676  004737  017202                        JSR     PC,CKDROP               ;TRY TO DROP THE UNIT
1836 035702                                460$:
1837
1838
1839
1840
1841
1842                                               .SBTTL  TEST  5: SUBTEST 2: VERIFY TIMERS A,B
1843
1844                                       ;**
1845                                       ; TEST 5: SUBTEST 2:
1846                                       ;
1847                                       ; SUBTEST DESCRIPTION:
1848                                       ;
1849                                       ;       This subtest verifies that timers A,B can be reset
1850                                       ;       and that Timer A is twice the frequency of Timer B.
1851                                       ;       Timer A has a period of 25 microseconds and Timer B
1852                                       ;       has a period of 50 microseconds. The timers are
1853                                       ;       checked at 1, 28, 53, and 78 micoseconds.
1854                                       ;
1855                                       ; TEST STEPS:
1856                                       ;
1857                                       ;
1858                                       ;       Write to TSSR register to soft initialize the controller
1859                                       ;       Do WRITE CHARACTERISTICS to setup a Message Buffer
```

```
                                  ;       (* Verify Timers A,B after RESET TIMER with 0 microsecond delay *)
                                  ;       Do a Write Control RESET TIMER with 1 microsecond delay
                                  ;       Do a Write Subsystem READ STATUS
                                  ;       If Timer A NOT= 0  Then Print Error
                                  ;       If Timer B NOT= 0  Then Print Error
                                  ;       (* Verify Timers A,B after RESET TIMER with 28 microsecond delay *)
                                  ;       Do a Write Control RESET TIMER with 28 microsecond delay
                                  ;       If Timer A NOT= 1  Then Print Error
                                  ;       If Timer B NOT= 1  Then Print Error
                                  ;       Do a Write Control RESET TIMER with 53 microsecond delay
                                  ;       If Timer A NOT= 0  Then Print Error
                                  ;       If Timer B NOT= 1  Then Print Error
                                  ;       Do a Write Control RESET TIMER with 78 microsecond delay
                                  ;       If Timer A NOT= 1  Then Print Error
                                  ;       If Timer B NOT= 0  Then Print Error
                                  ;--
035702                                    BGNSUB                          ;///////////// BEGIN SUBTEST //////////
035702                                                                               T5.2:
035702  104402                                                                    TRAP    C$BSUB
                                  ;       Write to TSSR register to soft initialize the controller
035704                            5$:
035704  004737  015774                    JSR     PC,SOFINIT              ;WRITE TO TSSR TO SOFT INITIALIZE
035710  103405                            BCS     10$                     ;BR IF SOFT INIT OKAY
035712  010001                            MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
035714                                    ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL DURING INIT
035714  104455                                                                    TRAP    C$ERDF
035716  000777                                                                    .WORD   511
035720  003652                                                                    .WORD   SFIERR
035722  012034                                                                    .WORD   SFIMSG
                                  ;       Do WRITE CHARACTERISTICS to setup a Message Buffer
035724  004737  040030            10$:    JSR     PC,T16REST              ;RESTORE PACKET DEFAULTS
035730  005037  002222                    CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
035734  012704  040210                    MOV     #T16PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
035740  012764  000010  000006            MOV     #8.,PKBCNT(R4)          ;MESSAGE PACKET SIZE NO EXTEND
035746  004737  010662                    JSR     PC,WRTCHR               ;DO WRITE CHARACTERISTICS COMMAND
035752                                    FORCERROR       12$                     ;@@FORCE ERROR IF FORCER=1
035766  103407                            BCS     15$                     ;BR IF CARRY SET (GOOD RETURN)
035770  010001                            MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
035772                                    NEXT,ERRNO
035772                            12$:    ERRDF   ERRNO,T16SSR,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
035772  104455                                                                    TRAP    C$ERDF
035774  001000                                                                    .WORD   512
035776  036732                                                                    .WORD   T16SSR
036000  012046                                                                    .WORD   PKTSSR
036002  005237  002222                    INC     FATFLG                  ;SET FATAL ERROR FLAG
036006                            15$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
036006  104406                                                                    TRAP    C$CLP1

                                  ;       (* Verify Timers A,B after RESET TIMER with 1 microsecond delay *)
                                  ;       Do a Write Control RESET TIMER with 1 microsecond delay
036010  012700  000001                    MOV     #MS.RSD,R0              ;RESET TIMER COMMAND
036014  013701  036652                    MOV     T16D01,R1               ;1 MICROSECOND DELAY
036020  004737  040142                    JSR     PC,T16WMISC             ;SETUP T16PK2 COMMAND PACKET
036024  012704  040260                    MOV     #T16PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
036030  010465  000000                    MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
036034  004737  016336                    JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
036040                                    FORCERROR       32$                     ;@@FORCE ERROR IF FORCER=1
```

```
1906 036054  103407                    BCS     40$                     ;BR IF CARRY SET (GOOD RETURN)
1907 036056  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
1908 036060                            NEXT.ERRNO
1909 036060                    32$:    ERRDF   ERRNO,T162SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     036060  104455                                                            TRAP    C$ERDF
     036062  001001                                                            .WORD   513
     036064  036767                                                            .WORD   T162SSR
     036066  012046                                                            .WORD   PKTSSR
1910 036070  005237  002222            INC     FATFLG                  ;SET FATAL ERROR FLAG
1911 036074                    40$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     036074  104406                                                            TRAP    C$CLP1
1912                           ;       If Timer A NOT= 0  Then Print Error
1913                           ;       If Timer B NOT= 0  Then Print Error
1914 036076  005002                    CLR     R2                      ;INIT EXPD
1915 036100  042702  000010            BIC     #S2.ATIM,R2             ;TIMER A EXPD=0
1916 036104  042702  000004            BIC     #S2.BTIM,R2             ;TIMER B EXPD=0
1917 036110  012700  040252            MOV     #T16BFSTA,R0            ;GET RECV READ STATUS
1918 036114  016001  000002            MOV     2(R0),R1                ;GET RECV BYTE 2
1919 036120  042701  177763            BIC     #^C<S2.ATIM!S2.BTIM>,R1 ;SAVE TIMER A:B RECV ONLY
1920 036124                            FORCERROR       72$,NOTSSR      ;@@D
1921 036134  020201                    CMP     R2,R1                   ;EXPD EQUAL RECV?
1922 036136  001404                    BEQ     80$                     ;BR IF YES
1923 036140                            NEXT.ERRNO
1924 036140                    72$:    ERRHRD  ERRNO,T16TO1,TIMEXP     ;REPORT ERROR
     036140  104456                                                            TRAP    C$ERHRD
     036142  001002                                                            .WORD   514
     036144  037431                                                            .WORD   T16TO1
     036146  015552                                                            .WORD   TIMEXP
1925 036150                    80$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     036150  104406                                                            TRAP    C$CLP1
1926
1927                           ;       Do a Write Control RESET TIMER with 28 microsecond delay
1928 036152  012700  000001            MOV     #MS.RSD,R0              ;RESET TIMER COMMAND
1929 036156  013701  036654            MOV     T16D28,R1               ;28 MICROSECOND DELAY
1930 036162  004737  040142            JSR     PC,T16WMISC             ;SETUP T16PK2 COMMAND PACKET
1931 036166  012704  040260            MOV     #T16PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
1932 036172  010465  000000            MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
1933 036176  004737  016336            JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
1934 036202                            FORCERROR       112$                    ;@@DFORCE ERROR IF FORCER=1
1935 036216  103407                    BCS     120$                    ;BR IF CARRY SET (GOOD RETURN)
1936 036220  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
1937 036222                            NEXT.ERRNO
1938 036222                    112$:   ERRDF   ERRNO,T162SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     036222  104455                                                            TRAP    C$ERDF
     036224  001003                                                            .WORD   515
     036226  036767                                                            .WORD   T162SSR
     036230  012046                                                            .WORD   PKTSSR
1939 036232  005237  002222            INC     FATFLG                  ;SET FATAL ERROR FLAG
1940 036236                    120$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     036236  104406                                                            TRAP    C$CLP1
1941                           ;       If Timer A NOT= 1  Then Print Error
1942                           ;       If Timer B NOT= 1  Then Print Error
1943 036240  005002                    CLR     R2                      ;INIT EXPD
1944 036242  052702  000010            BIS     #S2.ATIM,R2             ;TIMER A EXPD=1
1945 036246  052702  000004            BIS     #S2.BTIM,R2             ;TIMER B EXPD=1
1946 036252  012700  040252            MOV     #T16BFSTA,R0            ;GET RECV READ STATUS
1947 036256  016001  000002            MOV     2(R0),R1                ;GET RECV BYTE 2
```

```
TSV5 - HARDWARE TESTS   MACRO M1113  06-FEB-84 17:14                                SEQ 135
TEST  5: SUBTEST 2: VERIFY TIMERS A,B

 1948 036262  042701  177763          BIC     #^C<S2.ATIM!S2.BTIM>,R1 ;SAVE TIMER A:B RECV ONLY
 1949 036266                          FORCERROR       172$,NOTSSR     ;@@D
 1950 036276  020201                  CMP     R2,R1                   ;EXPD EQUAL RECV?
 1951 036300  001404                  BEQ     180$                    ;BR IF YES
 1952 036302                          NEXT.ERRNO
 1953 036302                  172$:   ERRHRD  ERRNO,T16T28,TIMEXP     ;REPORT ERROR
      036302  104456                                                          TRAP    C$ERHRD
      036304  001004                                                          .WORD   516
      036306  037530                                                          .WORD   T16T28
      036310  015552                                                          .WORD   TIMEXP
 1954 036312                  180$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
      036312  104406                                                          TRAP    C$CLP1
 1955
 1956                         ;       Do a Write Control RESET TIMER with 53 microsecond delay
 1957 036314  012700  000001          MOV     #MS.RSD,R0              ;RESET TIMER COMMAND
 1958 036320  013701  036656          MOV     T16D53,R1               ;53 MICROSECOND DELAY
 1959 036324  004737  040142          JSR     PC,T16WMISC             ;SETUP T16PK2 COMMAND PACKET
 1960 036330  012704  040260          MOV     #T16PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
 1961 036334  010465  000000          MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
 1962 036340  004737  016336          JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
 1963 036344                          FORCERROR       212$                    ;@@DFORCE ERROR IF FORCER=1
 1964 036360  103407                  BCS     220$                    ;BR IF CARRY SET (GOOD RETURN)
 1965 036362  010001                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
 1966 036364                          NEXT.ERRNO
 1967 036364                  212$:   ERRDF   ERRNO,T162SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
      036364  104455                                                          TRAP    C$ERDF
      036366  001005                                                          .WORD   517
      036370  036767                                                          .WORD   T162SSR
      036372  012046                                                          .WORD   PKTSSR
 1968 036374  005237  002222          INC     FATFLG                  ;SET FATAL ERROR FLAG
 1969 036400                  220$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
      036400  104406                                                          TRAP    C$CLP1
 1970
 1971                         ;       If Timer A NOT= 0  Then Print Error
 1972 036402  005002          ;       If Timer B NOT= 1  Then Print Error
 1973 036404  042702  000010          CLR     R2                      ;INIT EXPD
 1974 036410  052702  000004          BIC     #S2.ATIM,R2             ;TIMER A EXPD=0
 1975 036414  012700  040252          BIS     #S2.BTIM,R2             ;TIMER B EXPD=1
 1976 036420  016001  000002          MOV     #T16BFSTA,R0            ;GET RECV READ STATUS
 1977 036424  042701  177763          MOV     2(R0),R1                ;GET RECV BYTE 2
 1978 036430                          BIC     #^C<S2.ATIM!S2.BTIM>,R1 ;SAVE TIMER A:B RECV ONLY
 1979 036440  020201                  FORCERROR       272$,NOTSSR     ;@@D
 1980 036442  001404                  CMP     R2,R1                   ;EXPD EQUAL RECV?
 1981 036444                          BEQ     280$                    ;BR IF YES
 1982 036444                          NEXT.ERRNO
 1983 036454                  272$:   ERRHRD  ERRNO,T16T53,TIMEXP     ;REPORT ERROR
      036444  104456                                                          TRAP    C$ERHRD
      036446  001006                                                          .WORD   518
      036450  037630                                                          .WORD   T16T53
      036452  015552                                                          .WORD   TIMEXP
      036454                  280$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
      036454  104406                                                          TRAP    C$CLP1
 1984
 1985 036456  012700  000001          MOV     #MS.RSD,R0              ;RESET TIMER COMMAND
 1986 036462  013701  036660          MOV     T16D78,R1               ;78 MICROSECOND DELAY
 1987 036466  004737  040142          JSR     PC,T16WMISC             ;SETUP T16PK2 COMMAND PACKET
 1988 036472  012704  040260          MOV     #T16PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
 1989 036476  010465  000000          MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
```

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TSV5 - HARDWARE TESTS   MACRO M1113  06-FEB-84 17:14                                    SEQ 136
TEST  5: SUBTEST 2: VERIFY TIMERS A,B

 1990 036502  004737  016336                 JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
 1991 036506                                 FORCERROR       312$                    ;@@DFORCE ERROR IF FORCER=1
 1992 036522  103407                         BCS     320$                    ;BR IF CARRY SET (GOOD RETURN)
 1993 036524  010001                         MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
 1994 036526                                 NEXT.ERRNO
 1995 036526                          312$:  ERRDF   ERRNO,T162SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
      036526  104455                                                                TRAP    C$ERDF
      036530  001007                                                                .WORD   519
      036532  036767                                                                .WORD   T162SSR
      036534  012046                                                                .WORD   PKTSSR
 1996 036536  005237  002222                 INC     FATFLG                  ;SET FATAL ERROR FLAG
 1997 036542                          320$:  CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
      036542  104406                                                                TRAP    C$CLP1
 1998                                 ;      If Timer A NOT= 1  Then Print Error
 1999                                 ;      If Timer B NOT= 0  Then Print Error
 2000 036544  005002                         CLR     R2                      ;INIT EXPD
 2001 036546  052702  000010                 BIS     #S2.ATIM,R2             ;TIMER A EXPD=1
 2002 036552  042702  000004                 BIC     #S2.BTIM,R2             ;TIMER B EXPD=0
 2003 036556  012700  040252                 MOV     #T16BFSTA,R0            ;GET RECV READ STATUS
 2004 036562  016001  000002                 MOV     2(R0),R1                ;GET RECV BYTE 2
 2005 036566  042701  177763                 BIC     #^C<S2.ATIM!S2.BTIM>,R1 ;SAVE TIMER A:B RECV ONLY
 2006 036572                                 FORCERROR       372$,NOTSSR     ;@@D
 2007 036602  020201                         CMP     R2,R1                   ;EXPD EQUAL RECV?
 2008 036604  001404                         BEQ     380$                    ;BR IF YES
 2009 036606                                 NEXT.ERRNO
 2010 036606                          372$:  ERRHRD  ERRNO,T16T78,TIMEXP     ;REPORT ERROR
      036606  104456                                                                TRAP    C$ERHRD
      036610  001010                                                                .WORD   520
      036612  037730                                                                .WORD   T16T78
      036614  015552                                                                .WORD   TIMEXP
 2011 036616                          380$:  CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
      036616  104406                                                                TRAP    C$CLP1
 2012
 2013 036620                                 ENDSUB                          ;////////////// END SUBTEST //////////
      036620                                                                          L10055:
      036620  104403                                                                  TRAP    C$ESUB
 2014
 2015 036622  005737  002222                 TST     FATFLG                  ;ANY FATAL ERRORS ?
 2016 036626  001402                         BEQ     460$                    ;BRANCH IF NOT
 2017 036630  004737  017202                 JSR     PC,CKDROP               ;TRY TO DROP THE UNIT
 2018 036634  004737  016456          460$:  JSR     PC,TSTLOOP              ;SHOULD WE DO ITERATIONS?
 2019 036640  103002                         BCC     465$                    ;BR IF NO
 2020 036642  000137  034622                 JMP     T16LOOP                 ;LOOP UNTIL ITERATIONS DONE
 2021 036646                          465$:
 2022
 2023
 2024 036646                                 EXIT    TST                     ;////////// EXIT TEST //////////
      036646  104432                                                                TRAP    C$EXIT
      036650  001524                                                                .WORD   L10053-.
 2025
 2026
 2027                                 ;+
 2028                                 ;LOCAL STORAGE FOR THIS TEST
 2029                                 ;-
 2030 036652  000001                  T16D01:        .WORD   1               ;1 MICROSECOND DELAY (ACTUALLY .8 MIC)
 2031 036654  000040                  T16D28:        .WORD   40              ;28 MICROSECOND DELAY (.8 MICROS PER)
 2032 036656  000076                  T16D53:        .WORD   76              ;53 MICROSECOND
```

```
2033 036660  000142                  T16D78:         .WORD   142             ;78 MICROSECOND
2034                                 ;+
2035                                 ;LOCAL TEXT MESSAGES FOR TEST
2036                                 ;-
2037
2038 036662      105     170     164 TST16ID:        .ASCIZ  'Extended Features Switch and Timers A,B'
2039 036732      127     122     111 T16SSR: .ASCIZ  'WRITE CHARACTERISTICS Failed'
2040 036767      127     122     111 T162SSR:.ASCIZ  'WRITE SUBSYSTEM (Write Misc) Failed'
2041 037033      127     122     111 T163SSR:.ASCIZ  'WRITE SUBSYSTEM (Read Status) Failed'
2042 037100      102     165     163 T16TSBA:.ASCIZ  'Bus Address Register (TSBA) Incorrect after Write Characteristics'
2043 037202      104     141     164 T16LEN:.ASCIZ   'Data Field Length in Message Buffer Incorrect after Write Characteristics'
2044 037314      124     123     123 T16REJ:.ASCIZ   'TSSR Function Reject Not Returned When Non-Existent Buffer Address Specifie
d'
2045 037431      124     151     155 T16T01:.ASCIZ   'Timer A,B Incorrect after Reset Timer with 1 microsecond Delay'
2046 037530      124     151     155 T16T28:.ASCIZ   'Timer A,B Incorrect after Reset Timer with 28 microsecond Delay'
2047 037630      124     151     155 T16T53:.ASCIZ   'Timer A,B Incorrect after Reset Timer with 53 microsecond Delay'
2048 037730      124     151     155 T16T78:.ASCIZ   'Timer A,B Incorrect after Reset Timer with 78 microsecond Delay'
2049                                         .EVEN
2050
2051                                 ;+
2052                                 ; SET DEFAULT PACKET
2053                                 ;-
2054 040030                          T16REST:
2055 040030  012700  040210                 MOV     #T16PACKET,R0           ;PACKET ADDRESS
2056 040034  012720  100004                 MOV     #100004,(R0)+           ;WRITE CHARACTERISTICS WITH ACK
2057 040040  012720  040220                 MOV     #T16DATA,(R0)+          ;ADDRESS OF CHAR DATA BLOCK
2058 040044  005020                         CLR     (R0)+                   ;EXTENDED ADDRESS
2059 040046  012720  000012                 MOV     #10.,(R0)+              ;SIZE OF MESSAGE PACKET
2060 040052  012720  040232                 MOV     #T16BFR,(R0)+           ;MESSAGE BUFFER ADDRESS
2061 040056  005020                         CLR     (R0)+                   ;CLEAR EXTENDED BUFFER ADDRESS
2062 040060  012720  000024                 MOV     #20.,(R0)+              ;LENGTH OF MESSAGE BUFFER
2063 040064  005020                         CLR     (R0)+                   ;CLEAR ESS,ENB,EAI,ERI
2064 040066  005010                         CLR     (R0)                    ;CLEAR EXTENDED FEATURES WORD
2065 040070  005037  040232                 CLR     T16BFR                  ;CLEAR 1ST LOCATION IN MESSAGE BUFFER
2066 040074  000207                         RTS     PC                      ;
2067
2068                                 ;+
2069                                 ; CLEAR MESSAGE BUFFER
2070                                 ;-
2071 040076                          T16CLRBUF:                              ;
2072 040076                                 SAVREG                          ;SAVE R1-R5 UNTIL NEXT RETURN
2073 040102  012701  040232                 MOV     #T16BFR,R1              ;GET MESSAGE BUFFER ADDRESS
2074 040106  012702  000026                 MOV     #T16BEND-T16BFR,R2      ;SIZE OF MESSAGE BUFFER IN BYTES
2075 040112  105021                 10$:    CLRB    (R1)+                   ;CLEAR A BYTE
2076 040114  005302                         DEC     R2                      ;DONE?
2077 040116  003375                         BGT     10$                     ;BR IF NO
2078 040120  000207                         RTS     PC                      ;RETURN
2079
2080                                 ;+
2081                                 ; SETUP T16PK2 PACKET FOR READ STATUS
2082                                 ;-
2083 040122                          T16SRD:
2084 040122  004737  040076                 JSR     PC,T16CLRBUF            ;CLEAR MESSAGE BUFFER
2085 040126  012700  040270                 MOV     #T16DT2,R0              ;WRITE SUBSYSTEM DATA BUFFER
2086 040132  112720  000005                 MOVB    #PW.RDSTATUS,(R0)+      ;STORE READ STATUS COMMAND IN BSEL0
2087 040136  105010                         CLRB    (R0)                    ;CLEAR BSEL1
2088 040140  000207                         RTS     PC                      ;RETURN
2089
```

```
                                        ;*
                                        ; SETUP T16PK2 PACKET FOR WRITE MISC.
                                        ;
                                        ; INPUT:
                                        ;       R0      CONTAINS WRITE MISC FUNCTION CODE (BSEL1)
                                        ;       R1      CONTAINS DELAY (TIMES 800 NS) FOR BSEL2
                                        ;-
040142                                  T16WMISC:
040142                                          SAVREG                          ;SAVE R1-R5 UNITL NEXT RETURN
040146  004737  040076                          JSR     PC,T16CLRBUF            ;CLEAR MESSAGE BUFFER
040152  012702  040270                          MOV     @T16DT2,R2              ;WRITE SUBSYSTEM DATA BUFFER
040156  112722  000010                          MOVB    @PW.WMISC,(R2)+         ;STORE WRITE MISCELLANEOUS IN BSEL0
040162  110022                                  MOVB    R0,(R2)+                ;STORE WRITE MISC CODE IN BSEL1
040164  110112                                  MOVB    R1,(R2)                 ;STORE DELAY (RESET TIMER) IN BSEL2
040166  000207                                  RTS     PC                      ;RETURN
                                        ;*
                                        ; SETUP T16PK2 PACKET FOR WRITE MISC. INVERT EXTENDED FEATURES SWITCH
                                        ;-
040170                                  T16SEXT:
040170  012700  040270                          MOV     @T16DT2,R0              ;WRITE SUBSYSTEM DATA BUFFER
040174  112720  000010                          MOVB    @PW.WMISC,(R0)+         ;STORE WRITE MISCELLANEOUS IN BSEL0
040200  112710  000200                          MOVB    @MS.EXT,(R0)            ;STORE INVERT EXTENDED FEATURES IN BSEL1
040204  000207                                  RTS     PC                      ;RETURN


        040210                                  .=<.+10>&177770
                                        ;
                                        ;WRITE CHARACTERISTICS COMMAND PACKET
                                        ;
040210                                  T16PACKET:                              ;COMMAND PACKET FOR TEST
040210  100004                                  .WORD   100004                  ;WRITE CHARACTERISTICS COMMAND, WITH ACK
040212  040220                                  .WORD   T16DATA                 ;ADDRESS OF CHARACTERISTICS BLOCK
040214  000000                                  .WORD   0
040216  000012                                  .WORD   10.                     ;MESSAGE PACKET SIZE

040220                                  T16DATA:                                ;CHARACTERISTICS DATA BLOCK
040220  040232                                  .WORD   T16BFR                  ;ADDRESS OF MESSAGE BUFFER
040222  000000                                  .WORD   0
040224  000024                                  .WORD   20.                     ;LENGTH OF MESSAGE BUFFER
040226  000000                                  .WORD   0                       ;ESS,ENB,EAI,ERI
040230  000000                                  .WORD   0                       ;EXTENDED FEATURES WORD


                                        ;MESSAGE BUFFER

040232                                  T16BFR:                                 ;BEGIN MESSAGE BUFFER
040232  000000                                  .WORD   0                       ;MESSAGE TYPE
040234  000000                                  .WORD   0                       ;DATA FIELD LENGTH
040236  000000                                  .WORD   0                       ;RBPCR
040240  000000                                  .WORD   0                       ;XST0
040242  000000                                  .WORD   0                       ;XST1
040244  000000                                  .WORD   0                       ;XST2
040246  000000                                  .WORD   0                       ;XST3
040250  000000                                  .WORD   0                       ;XST4 (ALWAYS PRESENT FOR WRITE SUBSYSTEM
```

```
2149 040252                          T16BFSTA: .BLKB 6.                  ;READ STATUS AND WRITE FIFO BUFFER
2150 040260                          T16BEND:                            ;END OF MESSAGE BUFFER
2151                                 ;
2152                                 ;WRITE SUBSYSTEM READ STATUS COMMAND PACKET
2153                                 ;
2157 040260                          T16PK2:
2158 040260  100006                         .WORD   P.WRTSUB!P.ACK       ;WRITE SUBSYSTEM WITH ACK
2159 040262  040270                         .WORD   T16DT2               ;LOW ADDRESS OF DATA BLOCK
2160 040264  000000                         .WORD   0                    ;HIGH ADDRESS OF DATA BLOCK
2161 040266  000012                         .WORD   10.                  ;MINIMUM MESSAGE PACKET SIZE
2162
2163 040270                          T16DT2:                             ;DATA BLOCK
2164 040270     000                         .BYTE   0                    ;BSEL0
2165 040271     000                         .BYTE   0                    ;BSEL1
2166 040272  000000                         .WORD   0                    ;SEL2
2167 040274                                 .BLKB   64.                  ;WRITE FIFO DATA OUTPUT BUFFER
2168
2169                                 ENDTST
2170 040374                                                      L10053:
     040374                                                              TRAP    C$ETST
     040374  104401
```

```
                                        .SBTTL  TEST  6: FIFO EXERCISER
                                ;++
                                ; TEST DESCRIPTION:
                                ;
                                ;       This test uses the Write Subsystem Memory command to
                                ;       verify the controller's FIFO and associated status and
                                ;       control logic.
                                ;
                                ; TEST STEPS:
                                ;
                                ;  REPEAT FOR LOOPCNT
                                ;    BEGIN
                                ;       Do Subtest 1    - FIFO Initialize status test
                                ;       Do Subtest 2    - FIFO Write Single Byte test
                                ;       Do Subtest 3    - FIFO Write Multiple Bytes test
                                ;       Do Subtest 4    - FIFO Verify ILW Status test
                                ;       Do Subtest 5    - FIFO Input Ready test
                                ;       Do Subtest 6    - FIFO Verify Reset FIFO test
                                ;    END
                                ;--


040376                                  BGNTST
040376                                                                  T6::
040376  012700  046626                  MOV     #TST17ID,R0             ;ASCII MESSAGE TO IDENTIFY TEST
040402  004737  016510                  JSR     PC,TSTSETUP             ;DO INITIAL TEST SETUP
040406  012737  000012  002216          MOV     #10.,LOOPCNT            ;PERFORM 10 ITERATIONS
040414  004737  017274                  JSR     PC,KTOFF                ;SHUT OFF MEMORY MANAGEMENT
040420  005037  003134                  CLR     KTENABLE                ;REALLY SHUT DOWN KT-11
040424                          T17LOOP:


                                        .SBTTL  TEST  6: SUBTEST 1: FIFO INITIALIZE STATUS TEST
                                ;++
                                ; TEST 6: SUBTEST 1:
                                ;
                                ; SUBTEST DESCRIPTION:
                                ;
                                ;       This test verifies, by using the Read Status select code,
                                ;       that the FIFO status is in the correct initial state after
                                ;       the controller is initialized (Input Ready TRUE,
                                ;       Output Ready and Data In Miss FALSE). These status
                                ;       signals are checked by the controller's self-test
                                ;       sequence, so this subtest is actually more of a partial
                                ;       check of the Read Status function than the FIFO status.
                                ;
                                ; TEST STEPS:
                                ;
                                ;    BEGIN
                                ;       Write to TSSR to soft initialize
                                ;       Do a WRITE CHARACTERISTICS to setup a message buffer
                                ;       Do a WRITE SUBSYSTEM Read Status
                                ;       If Input Ready  NOT=1   Then Print Error
                                ;       If Output Ready NOT=0   Then Print Error
                                ;       If Data In Miss NOT=0   Then Print Error
                                ;    END
```

```
                                        ;--
                                        BGNSUB                          ;////////////// BEGIN SUBTEST //////////
                                                                                        T6.1:
040424  104402                                                                          TRAP    C$BSUB
                                        ;       Write to TSSR register to soft initialize the controller
                                        5$:
040426  004737  015774                  JSR     PC,SOFINIT              ;WRITE TO TSSR TO SOFT INITIALIZE
040432  103405                          BCS     10$                     ;BR IF SOFT INIT OKAY
040434  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
040436                                  ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL DURING INIT
040436  104455                                                                          TRAP    C$ERDF
040440  001130                                                                          .WORD   600
040442  003652                                                                          .WORD   SFIERR
040444  012034                                                                          .WORD   SFIMSG
                                        ;       Do a WRITE CHARACTERISTICS to setup a message buffer
040446  005037  002222          10$:    CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
040452  012704  050220                  MOV     #T17PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
040456  004737  010662                  JSR     PC,WRTCHR               ;DO WRITE CHARACTERISTICS COMMAND
040462                                  FORCERROR       42$                     ;@@FORCE ERROR IF FORCER=1
040476  103407                          BCS     50$                     ;BR IF CARRY SET (GOOD RETURN)
040500  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
040502                                  NEXT.ERRNO
040502                          42$:    ERRDF   ERRNO,T17SSR,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
040502  104455                                                                          TRAP    C$ERDF
040504  001131                                                                          .WORD   601
040506  046645                                                                          .WORD   T17SSR
040510  012046                                                                          .WORD   PKTSSR
040512  005237  002222                  INC     FATFLG                  ;SET FATAL ERROR FLAG
040516                          50$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
040516  104406                                                                          TRAP    C$CLP1
                                        ;       Do a Write Subsystem READ STATUS
040520  004737  050004                  JSR     PC,T17SRD               ;SETUP PACKET FOR READ STATUS
040524  012704  050370                  MOV     #T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
040530  010465  000000                  MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
040534  004737  016336                  JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
040540                                  FORCERROR       62$                     ;@@FORCE ERROR IF FORCER=1
040554  103407                          BCS     70$                     ;BR IF CARRY SET (GOOD RETURN)
040556  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
040560                                  NEXT.ERRNO
040560                          62$:    ERRDF   ERRNO,T173SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
040560  104455                                                                          TRAP    C$ERDF
040562  001132                                                                          .WORD   602
040564  046746                                                                          .WORD   T173SSR
040566  012046                                                                          .WORD   PKTSSR
040570  005237  002222                  INC     FATFLG                  ;SET FATAL ERROR FLAG
040574                          70$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
040574  104406                                                                          TRAP    C$CLP1
                                        ;       Set WORDS 0-7  of expd message buffer = to recv since not testing
040576  004737  050166                  JSR     PC,T17SETEXP            ;SET WORDS 0-7 EXPD=RECV
040602  012701  046422                  MOV     #T17EXSTA,R1            ;GET EXPECTED READ STATUS
040606  012702  050262                  MOV     #T17BFSTA,R2            ;GET RECV READ STATUS
040612  012221                          MOV     (R2)+,(R1)+             ;SET EXPD WORD #8 = RECV TEMP
040614  011211                          MOV     (R2),(R1)               ;SET EXPD WORD #9 = RECV TEMP
040616  052711  000020                  BIS     #S2.INRDY,(R1)          ;SET EXP INPUT READY= TRUE
040622  042711  000040                  BIC     #S2.OUTRDY,(R1)         ;SET EXP OUTPUT READY= FALSE
```

```
TSV5 - HARDWARE TESTS   MACRO M1113  06-FEB-84 17:14                                SEQ 142
TEST  6: SUBTEST 1: FIFO INITIALIZE STATUS TEST

 2273 040626  042711  000200                 BIC     #S2.DIM,(R1)            ;SET EXP DATA IN MISS = FALSE
 2274                                ;        If Input Ready NOT=1 then Print Error
 2275                                ;        If Output Ready NOT=0 or Data in Miss NOT=0 Then Print Error
 2276 040632  005000                         CLR     R0                      ;HIGH RECV ADDRESS FOR CKMSG2
 2277 040634  012701  050242                 MOV     #T17BFR,R1              ;LOW RECV ADDRESS FOR CKMSG2
 2278 040640  012702  046402                 MOV     #T17EXP,R2              ;EXPD ADDRESS
 2279 040644  012703  000024                 MOV     #20.,R3                 ;NUMBER OF BYTES TO COMPARE
 2280 040650  004737  011500                 JSR     PC,CKMSG2               ;EXPD EQUAL RECV?
 2281 040654                                 FORCERROR       82$,NOTSSR      ;@@D
 2282 040664  103404                         BCS     90$                     ;BR IF YES
 2283 040666                                 NEXT.ERRNO
 2284 040666                         82$:    ERRHRD  ERRNO,T171CMP,MSGSTAT   ;REPORT ERROR
      040666  104456                                                                 TRAP    C$ERHRD
      040670  001133                                                                 .WORD   603
      040672  047165                                                                 .WORD   T171CMP
      040674  012350                                                                 .WORD   MSGSTAT
 2285 040676                         90$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
      040676  104406                                                                 TRAP    C$CLP1
 2286
 2287 040700                                 ENDSUB                          ;////////////// END SUBTEST //////////
      040700                                                                     L10057:
      040700  104403                                                                TRAP    C$ESUB
 2288
 2289 040702  005737  002222                 TST     FATFLG                  ;ANY FATAL ERRORS ?
 2290 040706  001402                         BEQ     160$                    ;BRANCH IF NOT
 2291 040710  004737  017202                 JSR     PC,CKDROP               ;TRY TO DROP THE UNIT
 2292 040714                         160$:
 2293
 2294                                        .SBTTL  TEST  6: SUBTEST 2: FIFO WRITE SINGLE BYTE TEST
 2295
 2296                                ;++
 2297                                ; TEST 6: SUBTEST 2:
 2298                                ;
 2299                                ; SUBTEST DESCRIPTION:
 2300                                ;
 2301                                ;       This subtest verifies the ability of the FIFO to correctly
 2302                                ;       pass a single data byte from input to output. For each
 2303                                ;       of 256 data values (0-377 octal) the following is done:
 2304                                ;               1. Initial FIFO status is checked
 2305                                ;               2. The Write FIFO function, specifying a count of
 2306                                ;                  one byte to be written is executed.
 2307                                ;               3. Read Status is executed and FIFO status is checked.
 2308                                ;               4. Read FIFO is executed and the data and final status
 2309                                ;                  is checked.
 2310                                ;
 2311                                ; TEST STEPS:
 2312                                ;
 2313                                ; BEGIN
 2314                                ;       Write to TSSR to soft initialize
 2315                                ;       Do a WRITE CHARACTERISTICS to setup a message buffer
 2316                                ;       Do a Write Subsystem READ STATUS
 2317                                ;       If Input Ready  NOT=1   Then Print Error
 2318                                ;       If Output Ready NOT=0   Then Print Error
 2319                                ;       If Data In Miss NOT=0   Then Print Error
 2320                                ;
 2321                                ;  REPEAT FOR DATA FROM 0 TO 377 OCTAL
 2322                                ;    BEGIN
```

```
                                ;       Do a Write Subsystem WRITE NPR to set tape direction out
                                ;       Do a Write Subsystem WRITE FIFO with byte count equal to 1
                                ;       Do a Write Subsystem READ STATUS
                                ;       If Input Ready  NOT=1   Then Print Error
                                ;       If Output Ready NOT=1   Then Print Error
                                ;       If Data In Miss NOT=0   Then Print Error
                                ;       Do Write Subsystem READ FIFO with byte count equal to 1
                                ;       If Data read from FIFO NOT= to Data sent Then Print Error
                                ;       Do a Write Subsystem READ STATUS
                                ;       If Input Ready  NOT=1   Then Print Error
                                ;       If Output Ready NOT=0   Then Print Error
                                ;       If Data In Miss NOT=0   Then Print Error
                                ;    END
                                ;  END
                                ;--
040714                                  BGNSUB                          ;////////////// BEGIN SUBTEST //////////
040714                                                                                  T6.2:
040714  104402                                                                          TRAP    C$BSUB

                                ;       Write to TSSR register to soft initialize the controller
                                5$:
040716  004737  015774                  JSR     PC,SOFINIT              ;WRITE TO TSSR TO SOFT INITIALIZE
040722  103405                          BCS     10$                     ;BR IF SOFT INIT OKAY
040724  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
040726                                  ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL DURING INIT
040726  104455                                                                          TRAP    C$ERDF
040730  001133                                                                          .WORD   603
040732  003652                                                                          .WORD   SFIERR
040734  012034                                                                          .WORD   SFIMSG

                                ;       Do a WRITE CHARACTERISTICS to setup a message buffer
040736  005037  002222          10$:    CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
040742  012704  050220                  MOV     #T17PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
040746  004737  010662                  JSR     PC,WRTCHR               ;DO WRITE CHARACTERISTICS COMMAND
040752                                  FORCERROR       42$                     ;@@DFORCE ERROR IF FORCER=1
040766  103407                          BCS     50$                     ;BR IF CARRY SET (GOOD RETURN)
040770  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
040772                                  NEXT.ERRNO
040772                          42$:    ERRDF   ERRNO,T17SSR,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
040772  104455                                                                          TRAP    C$ERDF
040774  001134                                                                          .WORD   604
040776  046645                                                                          .WORD   T17SSR
041000  012046                                                                          .WORD   PKTSSR
041002  005237  002222                  INC     FATFLG                  ;SET FATAL ERROR FLAG
041006                          50$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
041006  104406                                                                          TRAP    C$CLP1

                                ;       Do a Write Subsystem READ STATUS
041010  004737  050004                  JSR     PC,T17SRD               ;SETUP PACKET FOR READ STATUS
041014  012704  050370                  MOV     #T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
041020  010465  000000                  MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
041024  004737  016336                  JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
041030                                  FORCERROR       62$                     ;@@DFORCE ERROR IF FORCER=1
041044  103407                          BCS     70$                     ;BR IF CARRY SET (GOOD RETURN)
041046  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
041050                                  NEXT.ERRNO
041050                          62$:    ERRDF   ERRNO,T173SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
041050  104455                                                                          TRAP    C$ERDF
041052  001135                                                                          .WORD   605
```

```
                041054  046746                                                          .WORD   T173SSR
                041056  012046                                                          .WORD   PKTSSR
2367            041060  005237  002222          INC     FATFLG                  ;SET FATAL ERROR FLAG
2368            041064                  70$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
                041064  104406                                                          TRAP    C$CLP1
2369                            ;       Set WORDS 0-7 of expd message buffer = to recv since not testing
2370            041066  004737  050166          JSR     PC,T17SETEXP            ;SET WORDS 0-7 EXPD=RECV
2371            041072  012701  046422          MOV     #T17EXSTA,R1            ;GET EXPECTED READ STATUS
2372            041076  012702  050262          MOV     #T17BFSTA,R2            ;GET RECV READ STATUS
2373            041102  012221                  MOV     (R2)+,(R1)+             ;SET EXPD WORD #8 = RECV TEMP
2374            041104  011211                  MOV     (R2),(R1)               ;SET EXPD WORD #9 = RECV TEMP
2375            041106  052711  000020          BIS     #S2.INRDY,(R1)          ;SET EXP INPUT READY= TRUE
2376            041112  042711  000040          BIC     #S2.OUTRDY,(R1)         ;SET EXP OUTPUT READY= FALSE
2377            041116  042711  000200          BIC     #S2.DIM,(R1)            ;SET EXP DATA IN MISS = FALSE
2378                            ;       If Input Ready NOT=1 then Print Error
2379                            ;       If Output Ready NOT=0 or Data in Miss NOT=0 Then Print Error
2380            041122  005000                  CLR     R0                      ;HIGH RECV ADDRESS FOR CKMSG2
2381            041124  012701  050242          MOV     #T17BFR,R1              ;LOW RECV ADDRESS FOR CKMSG2
2382            041130  012702  046402          MOV     #T17EXP,R2              ;EXPD ADDRESS
2383            041134  012703  000024          MOV     #20.,R3                 ;NUMBER OF BYTES TO COMPARE
2384            041140  004737  011500          JSR     PC,CKMSG2               ;EXPD EQUAL RECV?
2385            041144                          FORCERROR       82$,NOTSSR      ;@@D
2386            041154  103404                  BCS     90$                     ;BR IF YES
2387            041156                          NEXT.ERRNO
2388            041156                  82$:    ERRHRD  ERRNO,T171CMP,MSGSTAT   ;REPORT ERROR
                041156  104456                                                          TRAP    C$ERHRD
                041160  001136                                                          .WORD   606
                041162  047165                                                          .WORD   T171CMP
                041164  012350                                                          .WORD   MSGSTAT
2389            041166                  90$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
                041166  104406                                                          TRAP    C$CLP1
2390
2391                            ;  Repeat for DATA from 0 to 377
2392            041170  012737  000000  002312          MOV     #0,DATA                 ;GET FIRST DATA
2393            041176                  100$:                                   ;REPEAT LABEL
2394                            ;       Do a Write Subsystem WRITE NPR to set tape direction out
2395            041176  012700  000100          MOV     #NP.OUT,R0              ;SET TAPE DIRECTION OUT
2396            041202  004737  050046          JSR     PC,T17SNPR              ;SETUP T17PK2 FOR WRITE NPR
2397            041206  012704  050370          MOV     #T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
2398            041212  010465  000000          MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
2399            041216  004737  016336          JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
2400            041222                          FORCERROR       102$                    ;@@DFORCE ERROR IF FORCER=1
2401            041236  103407                  BCS     105$                    ;BR IF CARRY SET (GOOD RETURN)
2402            041240  010001                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
2403            041242                          NEXT.ERRNO
2404            041242                  102$:   ERRDF   ERRNO,T174SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
                041242  104455                                                                  TRAP    C$ERDF
                041244  001137                                                                  .WORD   607
                041246  047013                                                                  .WORD   T174SSR
                041250  012046                                                                  .WORD   PKTSSR
2405            041252  005237  002222          INC     FATFLG                  ;SET FATAL ERROR FLAG
2406            041256                  105$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
                041256  104406                                                                  TRAP    C$CLP1
2407                            ;       Do a Write Subsystem WRITE FIFO with byte count equal to 1
2408            041260  012700  000001          MOV     #1,R0                   ;WRITE 1 BYTE
2409            041264  012701  002312          MOV     #DATA,R1                ;FIFO WRITE DATA ADDRESS
2410            041270  004737  050072          JSR     PC,T17WFIF              ;SETUP T17PK2 FOR WRITE FIFO
```

```
2411 041274  012704  050370                MOV     #T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
2412 041300  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
2413 041304  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
2414 041310                                FORCERROR       107$                    ;@@DFORCE ERROR IF FORCER=1
2415 041324  103407                        BCS     110$                    ;BR IF CARRY SET (GOOD RETURN)
2416 041326  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
2417 041330                                NEXT.ERRNO
2418 041330                        107$:   ERRDF   ERRNO,T175SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     041330  104455                                                                TRAP    C$ERDF
     041332  001140                                                                .WORD   608
     041334  047056                                                                .WORD   T175SSR
     041336  012046                                                                .WORD   PKTSSR
2419 041340  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
2420 041344                        110$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     041344  104406                                                                TRAP    C$CLP1
2421
2422                               ;       Do a Write Subsystem READ STATUS
2423 041346  004737  050004                JSR     PC,T17SRD               ;SETUP PACKET FOR READ STATUS
2424 041352  012704  050370                MOV     #T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
2425 041356  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
2426 041362  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
2427 041366                                FORCERROR       112$                    ;@@DFORCE ERROR IF FORCER=1
2428 041402  103407                        BCS     120$                    ;BR IF CARRY SET (GOOD RETURN)
2429 041404  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
2430 041406                                NEXT.ERRNO
2431 041406                        112$:   ERRDF   ERRNO,T173SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     041406  104455                                                                TRAP    C$ERDF
     041410  001141                                                                .WORD   609
     041412  046746                                                                .WORD   T173SSR
     041414  012046                                                                .WORD   PKTSSR
2432 041416  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
2433 041422                        120$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     041422  104406                                                                TRAP    C$CLP1
2434
2435 041424  004737  050166                JSR     PC,T17SETEXP            ;SET WORDS 0-7 EXPD=RECV
2436 041430  012701  046422                MOV     #T17EXSTA,R1            ;GET EXPECTED READ STATUS
2437 041434  012702  050262                MOV     #T17BFSTA,R2            ;GET RECV READ STATUS
2438 041440  012221                        MOV     (R2)+,(R1)+             ;SET EXPD WORD #8 = RECV TEMP
2439 041442  011211                        MOV     (R2),(R1)               ;SET EXPD WORD #9 = RECV TEMP
2440 041444  052711  000020                BIS     #S2.INRDY,(R1)          ;SET EXP INPUT READY= 1
2441 041450  052711  000040                BIS     #S2.OUTRDY,(R1)         ;SET EXP OUTPUT READY= 1
2442 041454  042711  000200                BIC     #S2.DIM,(R1)            ;SET EXP DATA IN MISS = 0
2443
2444                               ;       If Input Ready NOT=1 then Print Error
2445 041460  005000                ;       If Output Ready NOT=1 or Data in Miss NOT=0 Then Print Error
2446 041462  012701  050242                CLR     R0                      ;HIGH RECV ADDRESS FOR CKMSG2
2447 041466  012702  046402                MOV     #T17BFR,R1              ;LOW RECV ADDRESS FOR CKMSG2
2448 041472  012703  000024                MOV     #T17EXP,R2              ;EXPD ADDRESS
2449 041476  004737  011500                MOV     #20.,R3                 ;NUMBER OF BYTES TO COMPARE
2450 041502                                JSR     PC,CKMSG2               ;EXPD EQUAL RECV?
2451 041512  103404                        FORCERROR       132$,NOTSSR             ;@@D
2452 041514                                BCS     140$                    ;BR IF YES
2453 041514                                NEXT.ERRNO
     041514  104456                132$:   ERRHRD  ERRNO,T173CMP,MSGSTAT   ;REPORT ERROR
     041516  001142                                                                TRAP    C$ERHRD
     041520  047343                                                                .WORD   610
     041522  012350                                                                .WORD   T173CMP
                                                                                    .WORD   MSGSTAT
```

```
2454 041524                    140$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     041524  104406                                                                  TRAP    C$CLP1
2455
2456                            ;       Do Write Subsystem READ FIFO with byte count equal to 1
2457 041526  012700  000001            MOV     #1,R0                   ;SET READ BYTE COUNT
2458 041532  004737  050126            JSR     PC,T17RFIF              ;SETUP T17PK2 FOR READ FIFO
2459 041536  012704  050370            MOV     #T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
2460 041542  010465  000000            MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
2461 041546  004737  016336            JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
2462 041552                            FORCERROR       142$                    ;@@DFORCE ERROR IF FORCER=1
2463 041566  103407                    BCS     150$                    ;BR IF CARRY SET (GOOD RETURN)
2464 041570  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
2465 041572                            NEXT.ERRNO
2466 041572                    142$:   ERRDF   ERRNO,T176SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     041572  104455                                                                  TRAP    C$ERDF
     041574  001143                                                                  .WORD   611
     041576  047122                                                                  .WORD   T176SSR
     041600  012046                                                                  .WORD   PKTSSR
2467 041602  005237  002222            INC     FATFLG                  ;SET FATAL ERROR FLAG
2468 041606                    150$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     041606  104406                                                                  TRAP    C$CLP1
2469
2470 041610  004737  050166            JSR     PC,T17SETEXP            ;SET WORDS 0-7 EXPD=RECV
2471 041614  012701  046422            MOV     #T17EXSTA,R1            ;GET EXPECTED READ STATUS
2472 041620  012702  050262            MOV     #T17BFSTA,R2            ;GET RECV READ STATUS
2473 041624  013721  002312            MOV     DATA,(R1)+              ;SET EXPD WORD #8 = COUNT DATA
2474 041630  011211                    MOV     (R2),(R1)               ;SET EXPD WORD #9 = RECV (NOT TESTING)
2475                            ;       If Data read from FIFO NOT= to Data sent Then Print Error
2476                            ;       The data is in WORD #8 of the message buffer
2477 041632  005000                    CLR     R0                      ;HIGH RECV ADDRESS FOR CKMSG2
2478 041634  012701  050242            MOV     #T17BFR,R1              ;LOW RECV ADDRESS FOR CKMSG2
2479 041640  012702  046402            MOV     #T17EXP,R2              ;EXPD ADDRESS
2480 041644  012703  000022            MOV     #18.,R3                 ;NUMBER OF BYTES TO COMPARE
2481 041650  004737  011500            JSR     PC,CKMSG2               ;EXPD EQUAL RECV?
2482 041654                            FORCERROR       152$,NOTSSR     ;@@D
2483 041664  103404                    BCS     160$                    ;BR IF YES
2484 041666                            NEXT.ERRNO
2485 041666                    152$:   ERRHRD  ERRNO,T172CMP,MSGSUB    ;REPORT ERROR
     041666  104456                                                                  TRAP    C$ERHRD
     041670  001144                                                                  .WORD   612
     041672  047247                                                                  .WORD   T172CMP
     041674  013742                                                                  .WORD   MSGSUB
2486 041676                    160$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     041676  104406                                                                  TRAP    C$CLP1
2487
2488                            ;       Do a Write Subsystem READ STATUS
2489 041700  004737  050004            JSR     PC,T17SRD               ;SETUP PACKET FOR READ STATUS
2490 041704  012704  050370            MOV     #T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
2491 041710  010465  000000            MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
2492 041714  004737  016336            JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
2493 041720                            FORCERROR       162$                    ;@@DFORCE ERROR IF FORCER=1
2494 041734  103407                    BCS     170$                    ;BR IF CARRY SET (GOOD RETURN)
2495 041736  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
2496 041740                            NEXT.ERRNO
2497 041740                    162$:   ERRDF   ERRNO,T173SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     041740  104455                                                                  TRAP    C$ERDF
     041742  001145                                                                  .WORD   613
```

```
                                                                        .WORD   T173SSR
                                                                        .WORD   PKTSSR
2498 041750  005237  002222                INC     FATFLG              ;SET FATAL ERROR FLAG
2499 041754                         170$:   CKLOOP                      ;LOOP ON ERROR, IF FLAG SET
     041754  104406                                                     TRAP    C$CLP1
2500                                ;       Set WORDS 0-7 of expd message buffer = to recv since not testing
2501 041756  004737  050166                JSR     PC,T17SETEXP        ;SET WORDS 0-7 EXPD=RECV
2502 041762  012701  046422                MOV     #T17EXSTA,R1        ;GET EXPECTED READ STATUS
2503 041766  012702  050262                MOV     #T17BFSTA,R2        ;GET RECV READ STATUS
2504 041772  012221                        MOV     (R2)+,(R1)+         ;SET EXPD WORD #8 = RECV TEMP
2505 041774  011211                        MOV     (R2),(R1)           ;SET EXPD WORD #9 = RECV TEMP
2506 041776  052711  000020                BIS     #S2.INRDY,(R1)      ;SET EXP INPUT READY= 1
2507 042002  042711  000040                BIC     #S2.OUTRDY,(R1)     ;SET EXP OUTPUT READY= 0
2508 042006  042711  000200                BIC     #S2.DIM,(R1)        ;SET EXP DATA IN MISS = 0
2509                                ;       If Input Ready NOT=1 then Print Error
2510                                ;       If Output Ready NOT=0 or Data in Miss NOT=0 Then Print Error
2511 042012  005000                        CLR     R0                  ;HIGH RECV ADDRESS FOR CKMSG2
2512 042014  012701  050242                MOV     #T17BFR,R1          ;LOW RECV ADDRESS FOR CKMSG2
2513 042020  012702  046402                MOV     #T17EXP,R2          ;EXPD ADDRESS
2514 042024  012703  000024                MOV     #20.,R3             ;NUMBER OF BYTES TO COMPARE
2515 042030  004737  011500                JSR     PC,CKMSG2           ;EXPD EQUAL RECV?
2516 042034                                FORCERROR       172$,NOTSSR ;@@D
2517 042044  103404                        BCS     180$                ;BR IF YES
2518 042046                                NEXT.ERRNO
2519 042046                         172$:  ERRHRD  ERRNO,T174CMP,MSGSTAT ;REPORT ERROR
     042046  104456                                                     TRAP    C$ERHRD
     042050  001146                                                     .WORD   614
     042052  047427                                                     .WORD   T174CMP
     042054  012350                                                     .WORD   MSGSTAT
2520 042056                         180$:  CKLOOP                      ;LOOP ON ERROR, IF FLAG SET
     042056  104406                                                     TRAP    C$CLP1
2521 042060                                FORCEXIT        205$        ;@@D
2522 042070  005237  002312                INC     DATA                ;GET NEXT TEST DATA
2523 042074  023727  002312  000377        CMP     DATA,#377           ;DONE 0 TO 377?
2524 042102  101002                        BHI     205$                ;BR IF YES
2525 042104  000137  041176                JMP     100$                ;DO ANOTHER TEST PATTERN
2526 042110                         205$:
2527
2528 042110                                ENDSUB                      ;////////////// END SUBTEST //////////
     042110                                                                     L10060:
     042110  104403                                                             TRAP    C$ESUB
2529
2530 042112  005737  002222                TST     FATFLG              ;ANY FATAL ERRORS ?
2531 042116  001402                        BEQ     260$                ;BRANCH IF NOT
2532 042120  004737  017202                JSR     PC,CKDROP           ;TRY TO DROP THE UNIT
2533 042124                         260$:
2534
2535                                       .SBTTL  TEST  6: SUBTEST 3: FIFO WRITE MULTIPLE BYTES TEST
2536
2537                                ;++
2538                                ; TEST 6: SUBTEST 3:
2539                                ;
2540                                ; SUBTEST DESCRIPTION:
2541                                ;
2542                                ;       This subtest verifies the ability of the FIFO to correctly
2543                                ;       pass a multiple data bytes from input to output.
2544                                ;       The following sequence is done with various data patterns
```

```
                        ;       and byte counts from 2 to 64.
                        ;               1. Initial FIFO status is checked
                        ;               2. The Write FIFO function.
                        ;               3. Read Status is executed and FIFO status is checked.
                        ;               4. Read FIFO is executed and the data and final status
                        ;                  is checked.
                        ;
                        ; TEST STEPS:
                        ;
                        ; BEGIN
                        ;       Write to TSSR to soft initialize
                        ;       Do a WRITE CHARACTERISTICS to setup a message buffer
                        ;       Do a Write Subsystem READ STATUS
                        ;       If Input Ready  NOT=1   Then Print Error
                        ;       If Output Ready NOT=0   Then Print Error
                        ;       If Data In Miss NOT=0   Then Print Error
                        ;       If Last Word    NOT=0   Then Print Error
                        ;  REPEAT FOR DATA 0 TO 377, 377 TO 0, FLOATING 1'S,0'S AND ALL 1'S/0'S
                        ;  REPEAT FOR BYTE COUNT 2 TO 64 DECIMAL
                        ;    BEGIN
                        ;       Do a Write Subsystem WRITE NPR to set tape direction out
                        ;       Do a Write Subsystem WRITE FIFO
                        ;       Do a Write Subsystem READ STATUS
                        ;       If Input Ready  NOT=1   Then Print Error
                        ;       If Output Ready NOT=1   Then Print Error
                        ;       If Data In Miss NOT=0   Then Print Error
                        ;       If Last Word    NOT=0   Then Print Error
                        ;       Do Write Subsystem READ FIFO
                        ;       If Data read from FIFO NOT= to Data sent Then Print Error
                        ;       Do a Write Subsystem READ STATUS
                        ;       If Input Ready  NOT=1   Then Print Error
                        ;       If Output Ready NOT=0   Then Print Error
                        ;       If Data In Miss NOT=0   Then Print Error
                        ;       If Last Word    NOT=0   Then Print Error
                        ;    END
                        ;  END
                        ;--
042124                          BGNSUB                          ;////////////// BEGIN SUBTEST //////////
042124                                                                  T6.3:
042124  104402                                                          TRAP    C$BSUB
                        ;
                        ;       Write to TSSR register to soft initialize the controller
042126                  5$:
042126  004737  015774          JSR     PC,SOFINIT              ;WRITE TO TSSR TO SOFT INITIALIZE
042132  103405                  BCS     10$                     ;BR IF SOFT INIT OKAY
042134  010001                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
042136                          ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL DURING INIT
042136  104455                                                          TRAP    C$ERDF
042140  001146                                                          .WORD   614
042142  003652                                                          .WORD   SFIERR
042144  012034                                                          .WORD   SFIMSG
                        ;       Do a WRITE CHARACTERISTICS to setup a message buffer
042146  005037  002222  10$:    CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
042152  012704  050220          MOV     #T17PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
042156  004737  010662          JSR     PC,WRTCHR               ;DO WRITE CHARACTERISTICS COMMAND
042162                          FORCERROR       42$                     ;@@FORCE ERROR IF FORCER=1
042176  103407                  BCS     50$                     ;BR IF CARRY SET (GOOD RETURN)
```

```
2596 042200  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
2597 042202                            NEXT.ERRNO
2598 042202                    42$:    ERRDF   ERRNO,T17SSR,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
     042202  104455                                                            TRAP    C$ERDF
     042204  001147                                                            .WORD   615
     042206  046645                                                            .WORD   T17SSR
     042210  012046                                                            .WORD   PKTSSR
2599 042212  005237  002222            INC     FATFLG                  ;SET FATAL ERROR FLAG
2600 042216                    50$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     042216  104406                                                            TRAP    C$CLP1
2601                           ;       Do a Write Subsystem READ STATUS
2602 042220  004737  050004            JSR     PC,T17SRD               ;SETUP PACKET FOR READ STATUS
2603 042224  012704  050370            MOV     #T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
2604 042230  010465  000000            MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
2605 042234  004737  016336            JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
2606 042240                            FORCERROR       62$                     ;@@DFORCE ERROR IF FORCER=1
2607 042254  103407                    BCS     70$                     ;BR IF CARRY SET (GOOD RETURN)
2608 042256  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
2609 042260                            NEXT.ERRNO
2610 042260                    62$:    ERRDF   ERRNO,T173SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     042260  104455                                                            TRAP    C$ERDF
     042262  001150                                                            .WORD   616
     042264  046746                                                            .WORD   T173SSR
     042266  012046                                                            .WORD   PKTSSR
2611 042270  005237  002222            INC     FATFLG                  ;SET FATAL ERROR FLAG
2612 042274                    70$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     042274  104406                                                            TRAP    C$CLP1
2613                           ;       Set WORDS 0-7 of expd message buffer = to recv since not testing
2614 042276  004737  050166            JSR     PC,T17SETEXP            ;SET WORDS 0-7 EXPD=RECV
2615 042302  012701  046422            MOV     #T17EXSTA,R1            ;GET EXPECTED READ STATUS
2616 042306  012702  050262            MOV     #T17BFSTA,R2            ;GET RECV READ STATUS
2617 042312  012221                    MOV     (R2)+,(R1)+             ;SET EXPD WORD #8 = RECV TEMP
2618 042314  011211                    MOV     (R2),(R1)               ;SET EXPD WORD #9 = RECV TEMP
2619 042316  052711  000020            BIS     #S2.INRDY,(R1)          ;SET EXP INPUT READY=  1
2620 042322  042711  000040            BIC     #S2.OUTRDY,(R1)         ;SET EXP OUTPUT READY=  0
2621 042326  042711  000200            BIC     #S2.DIM,(R1)            ;SET EXP DATA IN MISS = 0
2622 042332  042711  000100            BIC     #S2.ILW,(R1)            ;SET EXP LAST WORD (ILW)=0
2623                           ;       If Input Ready NOT=1 then Print Error
2624                           ;       If Output Ready NOT=0 or Data in Miss NOT=0 Then Print Error
2625                           ;       If Last Word    NOT=0   Then Print Error
2626 042336  005000                    CLR     R0                      ;HIGH RECV ADDRESS FOR CKMSG2
2627 042340  012701  050242            MOV     #T17BFR,R1              ;LOW RECV ADDRESS FOR CKMSG2
2628 042344  012702  046402            MOV     #T17EXP,R2              ;EXPD ADDRESS
2629 042350  012703  000024            MOV     #20.,R3                 ;NUMBER OF BYTES TO COMPARE
2630 042354  004737  011500            JSR     PC,CKMSG2               ;EXPD EQUAL RECV?
2631 042360                            FORCERROR       82$,NOTSSR      ;@@D
2632 042370  103404                    BCS     90$                     ;BR IF YES
2633 042372                            NEXT.ERRNO
2634 042372                    82$:    ERRHRD  ERRNO,T171CMP,MSGSTAT   ;REPORT ERROR
     042372  104456                                                            TRAP    C$ERHRD
     042374  001151                                                            .WORD   617
     042376  047165                                                            .WORD   T171CMP
     042400  012350                                                            .WORD   MSGSTAT
2635 042402                    90$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     042402  104406                                                            TRAP    C$CLP1
2636
2637
```

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2638
2639                                    ;  REPEAT FOR BYTE COUNT 2 TO 64 DECIMAL
2640                                    ;  TSTFLAG =1 FOR INCREMENT TEST PATTERN
2641                                    ;           =2 FOR DECREMENT TEST PATTERN
2642                                    ;           =3 FOR TSTBLK TABLE PATTERN
2643 042404  012737  000001  002314            MOV     #1,TSTFLAG              ;TEST PATTERN FLAG
2644 042412                             95$:
2645 042412  012737  000002  002310            MOV     #2,COUNT                ;GET FIRST BYTE COUNT
2646 042420                             100$:
2647                                    ;       Do a Write Subsystem WRITE NPR to set tape direction out
2648 042420  012700  000100                    MOV     #NP.OUT,R0              ;SET TAPE DIRECTION OUT
2649 042424  004737  050046                    JSR     PC,T17SNPR              ;SETUP T17PK2 FOR WRITE NPR
2650 042430  012704  050370                    MOV     #T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
2651 042434  010465  000000                    MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
2652 042440  004737  016336                    JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
2653 042444                                    FORCERROR       102$                    ;@@DFORCE ERROR IF FORCER=1
2654 042460  103407                            BCS     105$                    ;BR IF CARRY SET (GOOD RETURN)
2655 042462  010001                            MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
2656 042464                                    NEXT.ERRNO
2657 042464                             102$:  ERRDF   ERRNO,T174SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     042464  104455                                                                    TRAP    C$ERDF
     042466  001152                                                                    .WORD   618
     042470  047013                                                                    .WORD   T174SSR
     042472  012046                                                                    .WORD   PKTSSR
2658 042474  005237  002222                    INC     FATFLG                  ;SET FATAL ERROR FLAG
2659 042500                             105$:  CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     042500  104406                                                                    TRAP    C$CLP1
2660                                    ;       Do a Write Subsystem WRITE FIFO
2661 042502  004737  050146                    JSR     PC,T17CLEXP             ;CLEAR EXPD BUFFER
2662 042506  012701  046524                    MOV     #T17WFDATA,R1           ;EXPD WRITE FIFO DATA BUFFER
2663 042512  013702  002310                    MOV     COUNT,R2                ;TEST PATTERN SIZE
2664 042516  022737  000001  002314            CMP     #1,TSTFLAG              ;INCREMENT PATTERN THIS TIME THRU?
2665 042524  001005                            BNE     115$                    ;BR IF NO
2666 042526  005000                            CLR     R0                      ;INCREMENT TEST PATTERN
2667 042530  110021                     110$:  MOVB    R0,(R1)+                ;STORE INCREMENT TEST BYTE
2668 042532  005200                            INC     R0                      ;SET NEXT PATTERN
2669 042534  005302                            DEC     R2                      ;DONE?
2670 042536  003374                            BGT     110$                    ;BR IF NO
2671 042540  022737  000002  002314     115$:  CMP     #2,TSTFLAG              ;DECREMENT PATTERN THIS TIME THRU?
2672 042546  001006                            BNE     125$                    ;BR IF NO
2673 042550  012700  000377                    MOV     #377,R0                 ;DECREMENT TEST PATTERN
2674 042554  110021                     120$:  MOVB    R0,(R1)+                ;STORE DECREMENT TEST BYTE
2675 042556  005300                            DEC     R0                      ;SET NEXT PATTERN
2676 042560  005302                            DEC     R2                      ;DONE?
2677 042562  003374                            BGT     120$                    ;BR IF NO
2678 042564  022737  000003  002314     125$:  CMP     #3,TSTFLAG              ;TSTBLK PATTERNS THIS TIME THRU?
2679 042572  001005                            BNE     135$                    ;BR IF NO
2680 042574  012700  002752                    MOV     #TSTBLK,R0              ;FLOAT 1'S/0'S ETC. TEST TABLE
2681 042600  112021                     130$:  MOVB    (R0)+,(R1)+             ;STORE A TSTBLK BYTE
2682 042602  005302                            DEC     R2                      ;DONE?
2683 042604  003375                            BGT     130$                    ;BR IF NO
2684 042606                             135$:
2685 042606  013700  002310                    MOV     COUNT,R0                ;FIFO BYTE COUNT
2686 042612  012701  046524                    MOV     #T17WFDATA,R1           ;FIFO WRITE DATA ADDRESS
2687 042616  004737  050072                    JSR     PC,T17WFIF              ;SETUP T17PK2 FOR WRITE FIFO
2688 042622  012704  050370                    MOV     #T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
2689 042626  010465  000000                    MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
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042632  004737  016336          JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
042636                          FORCERROR       142$                    ;@@DFORCE ERROR IF FORCER=1
042652  103407                  BCS     150$                    ;BR IF CARRY SET (GOOD RETURN)
042654  010001                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
042656                          NEXT.ERRNO
042656                  142$:   ERRDF   ERRNO,T175SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
042656  104455                                                          TRAP    C$ERDF
042660  001153                                                          .WORD   619
042662  047056                                                          .WORD   T175SSR
042664  012046                                                          .WORD   PKTSSR
042666  005237  002222          INC     FATFLG                  ;SET FATAL ERROR FLAG
042672                  150$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
042672  104406                                                          TRAP    C$CLP1


                        ;       Do a Write Subsystem READ STATUS
042674  004737  050004          JSR     PC,T17SRD               ;SETUP PACKET FOR READ STATUS
042700  012704  050370          MOV     #T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
042704  010465  000000          MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
042710  004737  016336          JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
042714                          FORCERROR       157$                    ;@@DFORCE ERROR IF FORCER=1
042730  103407                  BCS     160$                    ;BR IF CARRY SET (GOOD RETURN)
042732  010001                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
042734                          NEXT.ERRNO
042734                  157$:   ERRDF   ERRNO,T173SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
042734  104455                                                          TRAP    C$ERDF
042736  001154                                                          .WORD   620
042740  046746                                                          .WORD   T173SSR
042742  012046                                                          .WORD   PKTSSR
042744  005237  002222          INC     FATFLG                  ;SET FATAL ERROR FLAG
042750                  160$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
042750  104406                                                          TRAP    C$CLP1


                        ;       Set WORDS 0-7 of expd message buffer = to recv since not testing
042752  004737  050166          JSR     PC,T17SETEXP            ;SET WORDS 0-7 EXPD=RECV
042756  012701  046422          MOV     #T17EXSTA,R1            ;GET EXPECTED READ STATUS
042762  012702  050262          MOV     #T17BFSTA,R2            ;GET RECV READ STATUS
042766  012221                  MOV     (R2)+,(R1)+             ;SET EXPD WORD #8 = RECV TEMP
042770  011211                  MOV     (R2),(R1)               ;SET EXPD WORD #9 = RECV TEMP
042772  052711  000020          BIS     #S2.INRDY,(R1)          ;SET EXP INPUT READY= 1
042776  052711  000040          BIS     #S2.OUTRDY,(R1)         ;SET EXP OUTPUT READY= 1
043002  042711  000200          BIC     #S2.DIM,(R1)            ;SET EXP DATA IN MISS = 0
043006  042711  000100          BIC     #S2.ILW,(R1)            ;SET EXP LAST WORD (ILW)=0
                        ;       If Input Ready NOT=1 then Print Error
                        ;       If Output Ready NOT=1 or Data in Miss NOT=0 Then Print Error
043012  005000                  CLR     R0                      ;HIGH RECV ADDRESS FOR CKMSG2
043014  012701  050242          MOV     #T17BFR,R1              ;LOW RECV ADDRESS FOR CKMSG2
043020  012702  046402          MOV     #T17EXP,R2              ;EXPD ADDRESS
043024  012703  000024          MOV     #20.,R3                 ;NUMBER OF BYTES TO COMPARE
043030  004737  011500          JSR     PC,CKMSG2               ;EXPD EQUAL RECV?
043034                          FORCERROR       162$,NOTSSR     ;@@D
043044  103404                  BCS     170$                    ;BR IF YES
043046                          NEXT.ERRNO
043046                  162$:   ERRHRD  ERRNO,T173CMP,MSGSTAT   ;REPORT ERROR
043046  104456                                                          TRAP    C$ERHRD
043050  001155                                                          .WORD   621
043052  047343                                                          .WORD   T173CMP
043054  012350                                                          .WORD   MSGSTAT
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 2733 043056                        170$:  CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
      043056  104406                                                                 TRAP    C$CLP1
 2734
 2735                                ;      Do Write Subsystem READ FIFO
 2736 043060  013700  002310               MOV     COUNT,R0                ;SET READ BYTE COUNT
 2737 043064  004737  050126               JSR     PC,T17RFIF              ;SETUP T17PK2 FOR READ FIFO
 2738 043070  012704  050370               MOV     #T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
 2739 043074  010465  000000               MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
 2740 043100  004737  016336               JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
 2741 043104                               FORCERROR       172$                    ;@@DFORCE ERROR IF FORCER=1
 2742 043120  103407                       BCS     180$                    ;BR IF CARRY SET (GOOD RETURN)
 2743 043122  010001                       MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
 2744 043124                               NEXT.ERRNO
 2745 043124                        172$:  ERRDF   ERRNO,T176SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
      043124  104455                                                                 TRAP    C$ERDF
      043126  001156                                                                 .WORD   622
      043130  047122                                                                 .WORD   T176SSR
      043132  012046                                                                 .WORD   PKTSSR
 2746 043134  005237  002222               INC     FATFLG                  ;SET FATAL ERROR FLAG
 2747 043140                        180$:  CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
      043140  104406                                                                 TRAP    C$CLP1
 2748
 2749                                ;      If Data read from FIFO NOT= to Data sent Then Print Error
 2750 043142  005000                       CLR     R0                      ;HIGH RECV ADDRESS FOR CKMSG2
 2751 043144  012702  046524               MOV     #T17WFDATA,R2           ;GET EXPECTED ADDRESS FOR CKMSG2
 2752 043150  012701  050262               MOV     #T17BFSTA,R1            ;GET RECEIVED ADDRESS FOR CKMSG2
 2753 043154  013703  002310               MOV     COUNT,R3                ;NUMBER OF BYTES TO COMPARE
 2754 043160  004737  011500               JSR     PC,CKMSG2               ;EXPD EQUAL RECV?
 2755 043164                               FORCERROR       192$,NOTSSR             ;@@D
 2756 043174  103406                       BCS     200$                    ;BR IF YES
 2757 043176                               NEXT.ERRNO
 2758 043176  013701  002310        192$:  MOV     COUNT,R1                ;GET BYTE COUNT
 2759 043202                               ERRHRD  ERRNO,T175CMP,FIFEXP    ;REPORT ERROR
      043202  104456                                                                 TRAP    C$ERHRD
      043204  001157                                                                 .WORD   623
      043206  047512                                                                 .WORD   T175CMP
      043210  012170                                                                 .WORD   FIFEXP
 2760 043212                        200$:  CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
      043212  104406                                                                 TRAP    C$CLP1
 2761
 2762                                ;      Do a Write Subsystem READ STATUS
 2763 043214  004737  050004               JSR     PC,T17SRD               ;SETUP PACKET FOR READ STATUS
 2764 043220  012704  050370               MOV     #T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
 2765 043224  010465  000000               MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
 2766 043230  004737  016336               JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
 2767 043234                               FORCERROR       212$                    ;@@DFORCE ERROR IF FORCER=1
 2768 043250  103407                       BCS     220$                    ;BR IF CARRY SET (GOOD RETURN)
 2769 043252  010001                       MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
 2770 043254                               NEXT.ERRNO
 2771 043254                        212$:  ERRDF   ERRNO,T173SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
      043254  104455                                                                 TRAP    C$ERDF
      043256  001160                                                                 .WORD   624
      043260  046746                                                                 .WORD   T173SSR
      043262  012046                                                                 .WORD   PKTSSR
 2772 043264  005237  002222               INC     FATFLG                  ;SET FATAL ERROR FLAG
 2773 043270                        220$:  CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
      043270  104406                                                                 TRAP    C$CLP1
```

```
2774                                    ;       Set WORDS 0-7 of expd message buffer = to recv since not testing
2775 043272  004737  050166             JSR     PC,T17SETEXP            ;SET WORDS 0-7 EXPD=RECV
2776 043276  012701  046422             MOV     #T17EXSTA,R1            ;GET EXPECTED READ STATUS
2777 043302  012702  050262             MOV     #T17BFSTA,R2            ;GET RECV READ STATUS
2778 043306  012221                     MOV     (R2)+,(R1)+             ;SET EXPD WORD #8 = RECV TEMP
2779 043310  011211                     MOV     (R2),(R1)               ;SET EXPD WORD #9 = RECV TEMP
2780 043312  052711  000020             BIS     #S2.INRDY,(R1)          ;SET EXP INPUT READY= 1
2781 043316  042711  000040             BIC     #S2.OUTRDY,(R1)         ;SET EXP OUTPUT READY= 0
2782 043322  042711  000200             BIC     #S2.DIM,(R1)            ;SET EXP DATA IN MISS = 0
2783 043326  042711  000100             BIC     #S2.ILW,(R1)            ;SET EXP LAST WORD (ILW)=0
2784                                    ;       If Input Ready NOT=1 then Print Error
2785                                    ;       If Output Ready NOT=0 or Data in Miss NOT=0 Then Print Error
2786 043332  005000                     CLR     R0                      ;HIGH RECV ADDRESS FOR CKMSG2
2787 043334  012701  050242             MOV     #T17BFR,R1              ;LOW RECV ADDRESS FOR CKMSG2
2788 043340  012702  046402             MOV     #T17EXP,R2              ;EXPD ADDRESS
2789 043344  012703  000024             MOV     #20.,R3                 ;NUMBER OF BYTES TO COMPARE
2790 043350  004737  011500             JSR     PC,CKMSG2               ;EXPD EQUAL RECV?
2791 043354                             FORCERROR       232$,NOTSSR     ;@@D
2792 043364  103404                     BCS     240$                    ;BR IF YES
2793 043366                             NEXT.ERRNO
2794 043366                     232$:   ERRHRD  ERRNO,T174CMP,MSGSTAT   ;REPORT ERROR
     043366  104456                                                                    TRAP    C$ERHRD
     043370  001161                                                                    .WORD   625
     043372  047427                                                                    .WORD   T174CMP
     043374  012350                                                                    .WORD   MSGSTAT
2795 043376                     240$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     043376  104406                                                                    TRAP    C$CLP1
2796 043400                             FORCEXIT        250$            ;@@D
2797 043410  005237  002310             INC     COUNT                   ;GET NEXT BYTE COUNT
2798 043414  023727  002310  000077     CMP     COUNT,#77               ;DONE 0 TO 77
2799 043422  101002                     BHI     250$                    ;BR IF YES
2800 043424  000137  042420             JMP     100$                    ;DO ANOTHER BYTE COUNT
2801 043430  005237  002314     250$:   INC     TSTFLAG                 ;GET NEXT TEST PATTERN CODE
2802 043434  023727  002314  000003     CMP     TSTFLAG,#3              ;DONE INC,DEC,TSTBLK PATTERNS?
2803 043442  101002                     BHI     255$                    ;BR IF YES
2804 043444  000137  042412             JMP     95$                     ;DO ANOTHER TEST PATTERN
2805 043450                     255$:
2806 043450                             ENDSUB                          ;////////////// END SUBTEST //////////
     043450                                                                        L10061:
     043450  104403                                                                    TRAP    C$ESUB
2807
2808 043452  005737  002222             TST     FATFLG                  ;ANY FATAL ERRORS ?
2809 043456  001402                     BEQ     260$                    ;BRANCH IF NOT
2810 043460  004737  017202             JSR     PC,CKDROP               ;TRY TO DROP THE UNIT
2811 043464                     260$:
2812
2813
2814
2815                                            .SBTTL  TEST  6: SUBTEST 4: FIFO Verify ILW Status
2816
2817                                    ;++
2818                                    ; TEST 6: SUBTEST 4:
2819                                    ;
2820                                    ; SUBTEST DESCRIPTION:
2821                                    ;
2822                                    ;       This subtest verifies that reading the FIFO when it is
2823                                    ;       empty causes the Last Word (ILW) status to assert.
```

```
                                        ;
                                        ; TEST STEPS:
                                        ;
                                        ; BEGIN
                                        ;       Write to TSSR to soft initialize
                                        ;       Do Write Subsystem READ FIFO with byte count equal to 1
                                        ;       Do a Write Subsystem READ STATUS
                                        ;       If Input Ready  NOT=1   Then Print Error
                                        ;       If Output Ready NOT=0   Then Print Error
                                        ;       If Data In Miss NOT=0   Then Print Error
                                        ;       If Last Word (ILW) NOT=1 Then Print Error
                                        ;    END
                                        ;--
043464                                          BGNSUB                          ;////////////// BEGIN SUBTEST //////////
043464                                                                                  T6.4:
043464  104402                                                                            TRAP    C$BSUB

                                        ;       Write to TSSR register to soft initialize the controller
043466                                  5$:
043466  004737  015774                          JSR     PC,SOFINIT              ;WRITE TO TSSR TO SOFT INITIALIZE
043472  103405                                  BCS     10$                     ;BR IF SOFT INIT OKAY
043474  010001                                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
043476                                          ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL DURING INIT
043476  104455                                                                          TRAP    C$ERDF
043500  001161                                                                          .WORD   625
043502  003652                                                                          .WORD   SFIERR
043504  012034                                                                          .WORD   SFIMSG

                                        ;       Do a WRITE CHARACTERISTICS to setup a message buffer
043506  005037  002222                  10$:    CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
043512  012704  050220                          MOV     #T17PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
043516  004737  010662                          JSR     PC,WRTCHR               ;DO WRITE CHARACTERISTICS COMMAND
043522                                          FORCERROR       42$                     ;@@DFORCE ERROR IF FORCER=1
043536  103407                                  BCS     50$                     ;BR IF CARRY SET (GOOD RETURN)
043540  010001                                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
043542                                          NEXT.ERRNO
043542                                  42$:    ERRDF   ERRNO,T17SSR,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
043542  104455                                                                          TRAP    C$ERDF
043544  001162                                                                          .WORD   626
043546  046645                                                                          .WORD   T17SSR
043550  012046                                                                          .WORD   PKTSSR
043552  005237  002222                          INC     FATFLG                  ;SET FATAL ERROR FLAG
043556                                  50$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
043556  104406                                                                          TRAP    C$CLP1

                                        ;       Do Write Subsystem READ FIFO with byte count equal to 1
043560  012700  000001                          MOV     #1,R0                   ;SET READ BYTE COUNT
043564  004737  050126                          JSR     PC,T17RFIF              ;SETUP T17PK2 FOR READ FIFO
043570  012704  050370                          MOV     #T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
043574  010465  000000                          MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
043600  004737  016336                          JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
043604                                          FORCERROR       142$                    ;@@DFORCE ERROR IF FORCER=1
043620  103407                                  BCS     150$                    ;BR IF CARRY SET (GOOD RETURN)
043622  010001                                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
043624                                          NEXT.ERRNO
043624                                  142$:   ERRDF   ERRNO,T176SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
043624  104455                                                                          TRAP    C$ERDF
043626  001163                                                                          .WORD   627
```

```
TSV5 - HARDWARE TESTS   MACRO M1113  06-FEB-84 17:14                                SEQ 155
TEST  6: SUBTEST 4: FIFO VERIFY ILW STATUS

      043630  047122                                                                .WORD   T176SSR
      043632  012046                                                                .WORD   PKTSSR
 2868 043634  005237  002222              INC     FATFLG                  ;SET FATAL ERROR FLAG
 2869 043640                      150$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
      043640  104406                                                                TRAP    C$CLP1
 2870
 2871                             ;       Do a Write Subsystem READ STATUS
 2872 043642  004737  050004              JSR     PC,T17SRD               ;SETUP PACKET FOR READ STATUS
 2873 043646  012704  050370              MOV     #T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
 2874 043652  010465  000000              MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
 2875 043656  004737  016336              JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
 2876 043662                              FORCERROR       162$                    ;@@DFORCE ERROR IF FORCER=1
 2877 043676  103407                      BCS     170$                    ;BR IF CARRY SET (GOOD RETURN)
 2878 043700  010001                      MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
 2879 043702                              NEXT.ERRNO
 2880 043702                      162$:   ERRDF   ERRNO,T173SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
      043702  104455                                                                TRAP    C$ERDF
      043704  001164                                                                .WORD   628
      043706  046746                                                                .WORD   T173SSR
      043710  012046                                                                .WORD   PKTSSR
 2881 043712  005237  002222              INC     FATFLG                  ;SET FATAL ERROR FLAG
 2882 043716                      170$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
      043716  104406                                                                TRAP    C$CLP1
 2883                             ;       Set WORDS 0-7 of expd message buffer = to recv since not testing
 2884 043720  004737  050166              JSR     PC,T17SETEXP            ;SET WORDS 0-7 EXPD=RECV
 2885 043724  012701  046422              MOV     #T17EXSTA,R1            ;GET EXPECTED READ STATUS
 2886 043730  012702  050262              MOV     #T17BFSTA,R2            ;GET RECV READ STATUS
 2887 043734  012221                      MOV     (R2)+,(R1)+             ;SET EXPD WORD #8 = RECV TEMP
 2888 043736  011211                      MOV     (R2),(R1)               ;SET EXPD WORD #9 = RECV TEMP
 2889 043740  052711  000020              BIS     #S2.INRDY,(R1)          ;SET EXP INPUT READY= 1
 2890 043744  042711  000040              BIC     #S2.OUTRDY,(R1)         ;SET EXP OUTPUT READY= 0
 2891 043750  042711  000200              BIC     #S2.DIM,(R1)            ;SET EXP DATA IN MISS = 0
 2892 043754  052711  000100              BIS     #S2.ILW,(R1)            ;SET EXP LAST WORD (ILW)=1
 2893                             ;       If Input Ready NOT=1 then Print Error
 2894                             ;       If Output Ready NOT=0 or Data in Miss NOT=0 Then Print Error
 2895                             ;       If Last Word (ILW) NOT=1 Then Print Error
 2896 043760  005000                      CLR     R0                      ;HIGH RECV ADDRESS FOR CKMSG2
 2897 043762  012701  050242              MOV     #T17BFR,R1              ;LOW RECV ADDRESS FOR CKMSG2
 2898 043766  012702  046402              MOV     #T17EXP,R2              ;EXPD ADDRESS
 2899 043772  012703  000024              MOV     #20.,R3                 ;NUMBER OF BYTES TO COMPARE
 2900 043776  004737  011500              JSR     PC,CKMSG2               ;EXPD EQUAL RECV?
 2901 044002                              FORCERROR       172$,NOTSSR             ;@@D
 2902 044012  103404                      BCS     180$                    ;BR IF YES
 2903 044014                              NEXT.ERRNO
 2904 044014                      172$:   ERRHRD  ERRNO,T176CMP,MSGSTAT   ;REPORT ERROR
      044014  104456                                                                TRAP    C$ERHRD
      044016  001165                                                                .WORD   629
      044020  047566                                                                .WORD   T176CMP
      044022  012350                                                                .WORD   MSGSTAT
 2905 044024                      180$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
      044024  104406                                                                TRAP    C$CLP1
 2906
 2907 044026                              ENDSUB                          ;////////////// END SUBTEST //////////
      044026                                                                  L10062:
      044026  104403                                                                TRAP    C$ESUB
 2908
 2909 044030  005737  002222              TST     FATFLG                  ;ANY FATAL ERRORS ?
```

```
 2910 044034  001402                    BEQ     260$                    ;BRANCH IF NOT
 2911 044036  004737  017202            JSR     PC,CKDROP               ;TRY TO DROP THE UNIT
 2912 044042                        260$:
 2913
 2914
 2915                                    .SBTTL  TEST  6: SUBTEST 5: FIFO Verify Input Ready
 2916
 2917                                ;++
 2918                                ; TEST 6: SUBTEST 5:
 2919                                ;
 2920                                ; SUBTEST DESCRIPTION:
 2921                                ;
 2922                                ;       This subtest verifies that writing 64. bytes into the FIFO
 2923                                ;       without reading any out causes the Input Ready status to
 2924                                ;       negate. The Subtest then verfiies that writing a 65th byte
 2925                                ;       into the FIFO causes the Data In Miss status to assert.
 2926                                ;       Next it is verified that the original 64 bytes can be read
 2927                                ;       out correctly and that the data has not been corrupted.
 2928                                ;
 2929                                ; TEST STEPS:
 2930                                ;
 2931                                ; BEGIN
 2932                                ;       Write to TSSR to soft initialize
 2933                                ;       Do a WRITE CHARACTERISTICS to setup a message buffer
 2934                                ;       Do a Write Subsystem WRITE NPR to set tape direction out
 2935                                ;       Do a Write Subsystem WRITE FIFO 64. bytes incrementing pattern
 2936                                ;       Do a Write Subsystem READ STATUS
 2937                                ;       If Input Ready  NOT=0   Then Print Error
 2938                                ;       If Output Ready NOT=1   Then Print Error
 2939                                ;       If Data In Miss NOT=0   Then Print Error
 2940                                ;       Do a Write Subsystem WRITE FIFO 1 byte for a total of 65. written
 2941                                ;       Do a Write Subsystem READ STATUS
 2942                                ;       If Input Ready  NOT=0   Then Print Error
 2943                                ;       If Output Ready NOT=1   Then Print Error
 2944                                ;       If Data In Miss NOT=1   Then Print Error
 2945                                ;       Do Write Subsystem READ FIFO
 2946                                ;       If Data read from FIFO NOT= to Data sent Then Print Error
 2947                                ;       Do a Write Subsystem READ STATUS
 2948                                ;       If Input Ready  NOT=1   Then Print Error
 2949                                ;       If Output Ready NOT=0   Then Print Error
 2950                                ;       If Data In Miss NOT=1   Then Print Error
 2951                                ; END
 2952                                ;--
 2953 044042                            BGNSUB                          ;////////////// BEGIN SUBTEST //////////
      044042                                                                  T6.5:
      044042  104402                                                            TRAP    C$BSUB
 2954
 2955                                ;       Write to TSSR register to soft initialize the controller
 2956 044044                        5$:
 2957 044044  004737  015774            JSR     PC,SOFINIT              ;WRITE TO TSSR TO SOFT INITIALIZE
 2958 044050  103405                    BCS     10$                     ;BR IF SOFT INIT OKAY
 2959 044052  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
 2960 044054                            ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL DURING INIT
      044054  104455                                                            TRAP    C$ERDF
      044056  001165                                                            .WORD   629
      044060  003652                                                            .WORD   SFIERR
      044062  012034                                                            .WORD   SFIMSG
```

```
2961                                    ;       Do a WRITE CHARACTERISTICS to setup a message buffer
2962 044064  005037  002222             10$:    CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
2963 044070  012704  050220                     MOV     #T17PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
2964 044074  004737  010662                     JSR     PC,WRTCHR               ;DO WRITE CHARACTERISTICS COMMAND
2965 044100                                     FORCERROR       42$                     ;@@DFORCE ERROR IF FORCER=1
2966 044114  103407                             BCS     50$                     ;BR IF CARRY SET (GOOD RETURN)
2967 044116  010001                             MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
2968 044120                                     NEXT.ERRNO
2969 044120                             42$:    ERRDF   ERRNO,T17SSR,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
     044120  104455                                                                     TRAP    C$ERDF
     044122  001166                                                                     .WORD   630
     044124  046645                                                                     .WORD   T17SSR
     044126  012046                                                                     .WORD   PKTSSR
2970 044130  005237  002222                     INC     FATFLG                  ;SET FATAL ERROR FLAG
2971 044134                             50$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     044134  104406                                                                     TRAP    C$CLP1
2972
2973                                    ;       Do a Write Subsystem WRITE NPR to set tape direction out
2974 044136  012700  000100             100$:   MOV     #NP.OUT,R0              ;SET TAPE DIRECTION OUT
2975 044142  004737  050046                     JSR     PC,T17SNPR              ;SETUP T17PK2 FOR WRITE NPR
2976 044146  012704  050370                     MOV     #T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
2977 044152  010465  000000                     MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
2978 044156  004737  016336                     JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
2979 044162                                     FORCERROR       102$                    ;@@DFORCE ERROR IF FORCER=1
2980 044176  103407                             BCS     105$                    ;BR IF CARRY SET (GOOD RETURN)
2981 044200  010001                             MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
2982 044202                                     NEXT.ERRNO
2983 044202                             102$:   ERRDF   ERRNO,T174SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     044202  104455                                                                     TRAP    C$ERDF
     044204  001167                                                                     .WORD   631
     044206  047013                                                                     .WORD   T174SSR
     044210  012046                                                                     .WORD   PKTSSR
2984 044212  005237  002222                     INC     FATFLG                  ;SET FATAL ERROR FLAG
2985 044216                             105$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     044216  104406                                                                     TRAP    C$CLP1
2986
2987
2988 044220  012737  000100  002310     ;       Do a Write Subsystem WRITE FIFO 64. bytes incrementing pattern
                                                MOV     #64.,COUNT              ;WRITE 64 BYTES
2989 044226  012701  046524                     MOV     #T17WFDATA,R1           ;EXPD WRITE FIFO DATA BUFFER
2990 044232  012702  000100                     MOV     #64.,R2                 ;TEST PATTERN SIZE
2991 044236  005000                             CLR     R0                      ;INCREMENT TEST PATTERN
2992 044240  110021                     110$:   MOVB    R0,(R1)+                ;STORE INCREMENT TEST BYTE
2993 044242  005200                             INC     R0                      ;SET NEXT PATTERN
2994 044244  005302                             DEC     R2                      ;DONE?
2995 044246  003374                             BGT     110$                    ;BR IF NO
2996 044250  013700  002310                     MOV     COUNT,R0                ;FIFO BYTE COUNT
2997 044254  012701  046524                     MOV     #T17WFDATA,R1           ;FIFO WRITE DATA ADDRESS
2998 044260  004737  050072                     JSR     PC,T17WFIF              ;SETUP T17PK2 FOR WRITE FIFO
2999 044264  012704  050370                     MOV     #T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
3000 044270  010465  000000                     MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
3001 044274  004737  016336                     JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
3002 044300                                     FORCERROR       142$                    ;@@DFORCE ERROR IF FORCER=1
3003 044314  103407                             BCS     150$                    ;BR IF CARRY SET (GOOD RETURN)
3004 044316  010001                             MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
3005 044320                                     NEXT.ERRNO
3006 044320                             142$:   ERRDF   ERRNO,T175SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     044320  104455                                                                     TRAP    C$ERDF
```

```
     044322  001170                                                          .WORD   632
     044324  047056                                                          .WORD   T175SSR
     044326  012046                                                          .WORD   PKTSSR
3007 044330  005237  002222          INC     FATFLG                  ;SET FATAL ERROR FLAG
3008 044334                  150$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     044334  104406                                                          TRAP    C$CLP1
3009
3010                         ;       Do a Write Subsystem READ STATUS
3011                         ;       If Input Ready  NOT=0   Then Print Error
3012                         ;       If Output Ready NOT=1   Then Print Error
3013                         ;       If Data In Miss NOT=0   Then Print Error
3014 044336  004737  050004          JSR     PC,T17SRD               ;SETUP PACKET FOR READ STATUS
3015 044342  012704  050370          MOV     #T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
3016 044346  010465  000000          MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
3017 044352  004737  016336          JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
3018 044356                          FORCERROR       157$                    ;@@DFORCE ERROR IF FORCER=1
3019 044372  103407                  BCS     160$                    ;BR IF CARRY SET (GOOD RETURN)
3020 044374  010001                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
3021 044376                          NEXT.ERRNO
3022 044376                  157$:   ERRDF   ERRNO,T173SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     044376  104455                                                          TRAP    C$ERDF
     044400  001171                                                          .WORD   633
     044402  046746                                                          .WORD   T173SSR
     044404  012046                                                          .WORD   PKTSSR
3023 044406  005237  002222          INC     FATFLG                  ;SET FATAL ERROR FLAG
3024 044412                  160$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     044412  104406                                                          TRAP    C$CLP1
3025                         ;       Set WORDS 0-7 of expd message buffer = to recv since not testing
3026 044414  004737  050166          JSR     PC,T17SETEXP            ;SET WORDS 0-7 EXPD=RECV
3027 044420  012701  046422          MOV     #T17EXSTA,R1            ;GET EXPECTED READ STATUS
3028 044424  012702  050262          MOV     #T17BFSTA,R2            ;GET RECV READ STATUS
3029 044430  012221                  MOV     (R2)+,(R1)+             ;SET EXPD WORD #8 = RECV TEMP
3030 044432  011211                  MOV     (R2),(R1)               ;SET EXPD WORD #9 = RECV TEMP
3031 044434  042711  000020          BIC     #S2.INRDY,(R1)          ;SET EXP INPUT READY= 0
3032 044440  052711  000040          BIS     #S2.OUTRDY,(R1)         ;SET EXP OUTPUT READY= 1
3033 044444  042711  000200          BIC     #S2.DIM,(R1)            ;SET EXP DATA IN MISS = 0
3034 044450  005000                  CLR     R0                      ;HIGH RECV ADDRESS FOR CKMSG2
3035 044452  012701  050242          MOV     #T17BFR,R1              ;LOW RECV ADDRESS FOR CKMSG2
3036 044456  012702  046402          MOV     #T17EXP,R2              ;EXPD ADDRESS
3037 044462  012703  000024          MOV     #20.,R3                 ;NUMBER OF BYTES TO COMPARE
3038 044466  004737  011500          JSR     PC,CKMSG2               ;EXPD EQUAL RECV?
3039 044472                          FORCERROR       162$,NOTSSR     ;@@D
3040 044502  103404                  BCS     170$                    ;BR IF YES
3041 044504                          NEXT.ERRNO
3042 044504                  162$:   ERRHRD  ERRNO,T173CMP,MSGSTAT   ;REPORT ERROR
     044504  104456                                                          TRAP    C$ERHRD
     044506  001172                                                          .WORD   634
     044510  047343                                                          .WORD   T173CMP
     044512  012350                                                          .WORD   MSGSTAT
3043 044514                  170$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     044514  104406                                                          TRAP    C$CLP1
3044
3045
3046                         ;       Do a Write Subsystem WRITE FIFO 1 byte for a total of 65. written
3047 044516  012700  000001          MOV     #1,R0                   ;FIFO BYTE COUNT
3048 044522  012701  046524          MOV     #T17WFDATA,R1           ;FIFO WRITE DATA ADDRESS
3049 044526  004737  050072          JSR     PC,T17WFIF              ;SETUP T17PK2 FOR WRITE FIFO
```

```
3050 044532  012704  050370                MOV     #T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
3051 044536  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
3052 044542  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
3053 044546                                FORCERROR       172$                    ;@@DFORCE ERROR IF FORCER=1
3054 044562  103407                        BCS     180$                    ;BR IF CARRY SET (GOOD RETURN)
3055 044564  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
3056 044566                                NEXT.ERRNO
3057 044566                        172$:   ERRDF   ERRNO,T175SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     044566  104455                                                                TRAP    C$ERDF
     044570  001173                                                                .WORD   635
     044572  047056                                                                .WORD   T175SSR
     044574  012046                                                                .WORD   PKTSSR
3058 044576  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
3059 044602                        180$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     044602  104406                                                                TRAP    C$CLP1
3060
3061                               ;       Do a Write Subsystem READ STATUS
3062                               ;       If Input Ready  NOT=0   Then Print Error
3063                               ;       If Output Ready NOT=1   Then Print Error
3064                               ;       If Data In Miss NOT=1   Then Print Error
3065 044604  004737  050004                JSR     PC,T17SRD               ;SETUP PACKET FOR READ STATUS
3066 044610  012704  050370                MOV     #T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
3067 044614  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
3068 044620  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
3069 044624                                FORCERROR       187$                    ;@@DFORCE ERROR IF FORCER=1
3070 044640  103407                        BCS     190$                    ;BR IF CARRY SET (GOOD RETURN)
3071 044642  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
3072 044644                                NEXT.ERRNO
3073 044644                        187$:   ERRDF   ERRNO,T173SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     044644  104455                                                                TRAP    C$ERDF
     044646  001174                                                                .WORD   636
     044650  046746                                                                .WORD   T173SSR
     044652  012046                                                                .WORD   PKTSSR
3074 044654  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
3075 044660                        190$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     044660  104406                                                                TRAP    C$CLP1
3076
3077 044662  004737  050166                JSR     PC,T17SETEXP            ;SET WORDS 0-7 EXPD=RECV
3078 044666  012701  046422                MOV     #T17EXSTA,R1            ;GET EXPECTED READ STATUS
3079 044672  012702  050262                MOV     #T17BFSTA,R2            ;GET RECV READ STATUS
3080 044676  012221                        MOV     (R2)+,(R1)+             ;SET EXPD WORD #8 = RECV TEMP
3081 044700  011211                        MOV     (R2),(R1)               ;SET EXPD WORD #9 = RECV TEMP
3082 044702  042711  000020                BIC     #S2.INRDY,(R1)          ;SET EXP INPUT READY= 0
3083 044706  052711  000040                BIS     #S2.OUTRDY,(R1)         ;SET EXP OUTPUT READY= 1
3084 044712  052711  000200                BIS     #S2.DIM,(R1)            ;SET EXP DATA IN MISS = 1
3085 044716  005000                        CLR     R0                      ;HIGH RECV ADDRESS FOR CKMSG2
3086 044720  012701  050242                MOV     #T17BFR,R1              ;LOW RECV ADDRESS FOR CKMSG2
3087 044724  012702  046402                MOV     #T17EXP,R2              ;EXPD ADDRESS
3088 044730  012703  000024                MOV     #20.,R3                 ;NUMBER OF BYTES TO COMPARE
3089 044734  004737  011500                JSR     PC,CKMSG2               ;EXPD EQUAL RECV?
3090 044740                                FORCERROR       192$,NOTSSR             ;@@D
3091 044750  103404                        BCS     200$                    ;BR IF YES
3092 044752                                NEXT.ERRNO
3093 044752                        192$:   ERRHRD  ERRNO,T173CMP,MSGSTAT   ;REPORT ERROR
     044752  104456                                                                TRAP    C$ERHRD
     044754  001175                                                                .WORD   637
     044756  047343                                                                .WORD   T173CMP
```

```
044760  012350                                                                      .WORD   MSGSTAT
044762                        200$:   CKLOOP                            ;LOOP ON ERROR, IF FLAG SET
044762  104406                                                                      TRAP    C$CLP1

                              ;       Do Write Subsystem READ FIFO
044764  013700  002310                MOV     COUNT,R0                  ;SET READ BYTE COUNT
044770  004737  050126                JSR     PC,T17RFIF                ;SETUP T17PK2 FOR READ FIFO
044774  012704  050370                MOV     #T17PK2,R4                ;GET WRITE SUBSYSTEM COMMAND PACKET
045000  010465  000000                MOV     R4,TSDB(R5)               ;SET THE PACKET ADDRESS TO EXECUTE
045004  004737  016336                JSR     PC,CHKTSSR                ;WAIT FOR SSR TO SET
045010                                FORCERROR       212$                      ;@@DFORCE ERROR IF FORCER=1
045024  103407                        BCS     220$                      ;BR IF CARRY SET (GOOD RETURN)
045026  010001                        MOV     R0,R1                     ;SAVE CONTENTS OF TSSR
045030                                NEXT,ERRNO
045030                        212$:   ERRDF   ERRNO,T176SSR,PKTSSR      ;DEVICE FATAL SSR FAILED TO SET
045030  104455                                                                      TRAP    C$ERDF
045032  001176                                                                      .WORD   638
045034  047122                                                                      .WORD   T176SSR
045036  012046                                                                      .WORD   PKTSSR
045040  005237  002222                INC     FATFLG                    ;SET FATAL ERROR FLAG
045044                        220$:   CKLOOP                            ;LOOP ON ERROR, IF FLAG SET
045044  104406                                                                      TRAP    C$CLP1


                              ;       If Data read from FIFO NOT= to Data sent Then Print Error
045046  005000                        CLR     R0                        ;HIGH RECV ADDRESS FOR CKMSG2
045050  012702  046524                MOV     #T17WFDATA,R2             ;GET EXPECTED ADDRESS FOR CKMSG2
045054  012701  050262                MOV     #T17BFSTA,R1              ;GET RECEIVED ADDRESS FOR CKMSG2
045060  013703  002310                MOV     COUNT,R3                  ;NUMBER OF BYTES TO COMPARE
045064  004737  011500                JSR     PC,CKMSG2                 ;EXPD EQUAL RECV?
045070                                FORCERROR       232$,NOTSSR       ;@@D
045100  103406                        BCS     240$                      ;BR IF YES
045102                                NEXT,ERRNO
045102  013701  002310        232$:   MOV     COUNT,R1                  ;GET BYTE COUNT
045106                                ERRHRD  ERRNO,T175CMP,FIFEXP      ;REPORT ERROR
045106  104456                                                                      TRAP    C$ERHRD
045110  001177                                                                      .WORD   639
045112  047512                                                                      .WORD   T175CMP
045114  012170                                                                      .WORD   FIFEXP
045116                        240$:   CKLOOP                            ;LOOP ON ERROR, IF FLAG SET
045116  104406                                                                      TRAP    C$CLP1


                              ;       Do a Write Subsystem READ STATUS
                              ;       If Input Ready  NOT=1   Then Print Error
                              ;       If Output Ready NOT=0   Then Print Error
                              ;       If Data In Miss NOT=1   Then Print Error
045120  004737  050004                JSR     PC,T17SRD                 ;SETUP PACKET FOR READ STATUS
045124  012704  050370                MOV     #T17PK2,R4                ;GET WRITE SUBSYSTEM COMMAND PACKET
045130  010465  000000                MOV     R4,TSDB(R5)               ;SET THE PACKET ADDRESS TO EXECUTE
045134  004737  016336                JSR     PC,CHKTSSR                ;WAIT FOR SSR TO SET
045140                                FORCERROR       252$                      ;@@DFORCE ERROR IF FORCER=1
045154  103407                        BCS     260$                      ;BR IF CARRY SET (GOOD RETURN)
045156  010001                        MOV     R0,R1                     ;SAVE CONTENTS OF TSSR
045160                                NEXT,ERRNO
045160                        252$:   ERRDF   ERRNO,T173SSR,PKTSSR      ;DEVICE FATAL SSR FAILED TO SET
045160  104455                                                                      TRAP    C$ERDF
045162  001200                                                                      .WORD   640
045164  046746                                                                      .WORD   T173SSR
045166  012046                                                                      .WORD   PKTSSR
```

```
3135 045170  005237  002222                    INC     FATFLG                  ;SET FATAL ERROR FLAG
3136 045174                             260$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     045174  104406                                                                    TRAP    C$CLP1
3137                                    ;       Set WORDS 0-7 of expd message buffer = to recv since not testing
3138 045176  004737  050166                    JSR     PC,T17SETEXP            ;SET WORDS 0-7 EXPD=RECV
3139 045202  012701  046422                    MOV     #T17EXSTA,R1            ;GET EXPECTED READ STATUS
3140 045206  012702  050262                    MOV     #T17BFSTA,R2            ;GET RECV READ STATUS
3141 045212  012221                            MOV     (R2)+,(R1)+             ;SET EXPD WORD #8 = RECV TEMP
3142 045214  011211                            MOV     (R2),(R1)               ;SET EXPD WORD #9 = RECV TEMP
3143 045216  052711  000020                    BIS     #S2.INRDY,(R1)          ;SET EXP INPUT READY= 1
3144 045222  042711  000040                    BIC     #S2.OUTRDY,(R1)         ;SET EXP OUTPUT READY= 0
3145 045226  052711  000200                    BIS     #S2.DIM,(R1)            ;SET EXP DATA IN MISS = 1
3146 045232  005000                            CLR     R0                      ;HIGH RECV ADDRESS FOR CKMSG2
3147 045234  012701  050242                    MOV     #T17BFR,R1              ;LOW RECV ADDRESS FOR CKMSG2
3148 045240  012702  046402                    MOV     #T17EXP,R2              ;EXPD ADDRESS
3149 045244  012703  000024                    MOV     #20.,R3                 ;NUMBER OF BYTES TO COMPARE
3150 045250  004737  011500                    JSR     PC,CKMSG2               ;EXPD EQUAL RECV?
3151 045254                                    FORCERROR       272$,NOTSSR     ;@@D
3152 045264  103404                            BCS     280$                    ;BR IF YES
3153 045266                                    NEXT.ERRNO
3154 045266                             272$:   ERRHRD  ERRNO,T174CMP,MSGSTAT   ;REPORT ERROR
     045266  104456                                                                    TRAP    C$ERHRD
     045270  001201                                                                    .WORD   641
     045272  047427                                                                    .WORD   T174CMP
     045274  012350                                                                    .WORD   MSGSTAT
3155 045276                             280$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     045276  104406                                                                    TRAP    C$CLP1
3156
3157 045300                                    ENDSUB                          ;////////////// END SUBTEST //////////
     045300                                                                  L10063:
     045300  104403                                                                    TRAP    C$ESUB
3158
3159 045302  005737  002222                    TST     FATFLG                  ;ANY FATAL ERRORS ?
3160 045306  001402                            BEQ     300$                    ;BRANCH IF NOT
3161 045310  004737  017202                    JSR     PC,CKDROP               ;TRY TO DROP THE UNIT
3162 045314                             300$:
3163
3164
3165
3166                                            .SBTTL  TEST  6: SUBTEST 6: FIFO Verify Reset FIFO Test
3167
3168                                    ;++
3169                                    ; TEST 6: SUBTEST 6:
3170                                    ;
3171                                    ; SUBTEST DESCRIPTION:
3172                                    ;
3173                                    ;       This subtest verifies that the Reset FIFO function within
3174                                    ;       the Write Miscellaneous Control 1 function initializes
3175                                    ;       the FIFO to correct intial status. The following steps
3176                                    ;       are performed:
3177                                    ;               1. Reset an already initialized FIFO and check for
3178                                    ;                  proper status.
3179                                    ;               2. Write a varying number of bytes (1-65.) into the
3180                                    ;                  FIFO and verify that after each block of bytes is
3181                                    ;                  written the FIFO can be be reset to it's initial
3182                                    ;                  state.
3183                                    ;
```

```
                                ; TEST STEPS:
                                ;
                                ; BEGIN
                                ;       Write to TSSR to soft initialize
                                ;       Do a WRITE CHARACTERISTICS to setup a message buffer
                                ;       Do a Write Subsystem Write Misc to Reset FIFO
                                ;       Do a Write Subsystem READ STATUS
                                ;       If all Tape Status 2 (ICER,IFMK,IHER) flip-flop
                                ;         signals NOT=0 Then Print Error
                                ;       Do a Write Subsystem WRITE NPR to set tape direction out
                                ;
                                ;  REPEAT FOR BYTE COUNT 1 TO 65.
                                ;    BEGIN
                                ;       Do a Write Subsystem WRITE FIFO with the current byte count
                                ;       Do a Write Subsystem Write Misc to Reset FIFO
                                ;       Do a Write Subsystem READ STATUS
                                ;       If all Tape Status 2 (ICER,IFMK,IHER) flip-flop
                                ;         signals NOT=0 Then Print Error
                                ;    END
                                ;--
045314                                  BGNSUB                  ;////////////// BEGIN SUBTEST //////////
045314                                                                          T6.6:
045314  104402                                                                  TRAP    C$BSUB

                                ;       Write to TSSR register to soft initialize the controller
045316                          5$:
045316  004737  015774                  JSR     PC,SOFINIT      ;WRITE TO TSSR TO SOFT INITIALIZE
045322  103405                          BCS     10$             ;BR IF SOFT INIT OKAY
045324  010001                          MOV     R0,R1           ;SAVE CONTENTS OF TSSR
045326                                  ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL DURING INIT
045326  104455                                                          TRAP    C$ERDF
045330  001201                                                          .WORD   641
045332  003652                                                          .WORD   SFIERR
045334  012034                                                          .WORD   SFIMSG

                                ;       Do a WRITE CHARACTERISTICS to setup a message buffer
045336  005037  002222          10$:    CLR     FATFLG          ;CLEAR FATAL ERROR FLAG
045342  012704  050220                  MOV     #T17PACKET,R4   ;GET THE ADDRESS OF COMMAND PACKET
045346  004737  010662                  JSR     PC,WRTCHR       ;DO WRITE CHARACTERISTICS COMMAND
045352                                  FORCERROR       42$             ;@@DFORCE ERROR IF FORCER=1
045366  103407                          BCS     50$             ;BR IF CARRY SET (GOOD RETURN)
045370  010001                          MOV     R0,R1           ;SAVE CONTENTS OF TSSR
045372                                  NEXT.ERRNO
045372                          42$:    ERRDF   ERRNO,T17SSR,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
045372  104455                                                          TRAP    C$ERDF
045374  001202                                                          .WORD   642
045376  046645                                                          .WORD   T17SSR
045400  012046                                                          .WORD   PKTSSR
045402  005237  002222                  INC     FATFLG          ;SET FATAL ERROR FLAG
045406                          50$:    CKLOOP                  ;LOOP ON ERROR, IF FLAG SET
045406  104406                                                          TRAP    C$CLP1

                                ;       Do a Write Subsystem Write Misc to Reset FIFO
045410  004737  050024                  JSR     PC,T17RSFIF     ;SETUP PKT FOR WRITE MISC RESET FIFO
045414  012704  050370                  MOV     #T17PK2,R4      ;GET WRITE SUBSYSTEM COMMAND PACKET
045420  010465  000000                  MOV     R4,TSDB(R5)     ;SET THE PACKET ADDRESS TO EXECUTE
045424  004737  016336                  JSR     PC,CHKTSSR      ;WAIT FOR SSR TO SET
045430                                  FORCERROR       62$             ;@@DFORCE ERROR IF FORCER=1
045444  103407                          BCS     70$             ;BR IF CARRY SET (GOOD RETURN)
```

```
3230 045446  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
3231 045450                            NEXT.ERRNO
3232 045450                    62$:    ERRDF   ERRNO,T172SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     045450  104455                                                            TRAP    C$ERDF
     045452  001203                                                            .WORD   643
     045454  046702                                                            .WORD   T172SSR
     045456  012046                                                            .WORD   PKTSSR
3233 045460  005237  002222            INC     FATFLG                  ;SET FATAL ERROR FLAG
3234 045464                    70$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     045464  104406                                                            TRAP    C$CLP1
3235
3236                           ;       Do a Write Subsystem READ STATUS
3237                           ;       If all Tape Status 2 (ICER,IFMK,IHER) flip-flop
3238                           ;         signals NOT=0 Then Print Error
3239 045466  004737  050004            JSR     PC,T17SRD               ;SETUP PACKET FOR READ STATUS
3240 045472  012704  050370            MOV     @T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
3241 045476  010465  000000            MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
3242 045502  004737  016336            JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
3243 045506                            FORCERROR       77$                     ;@@DFORCE ERROR IF FORCER=1
3244 045522  103407                    BCS     80$                     ;BR IF CARRY SET (GOOD RETURN)
3245 045524  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
3246 045526                            NEXT.ERRNO
3247 045526                    77$:    ERRDF   ERRNO,T173SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     045526  104455                                                            TRAP    C$ERDF
     045530  001204                                                            .WORD   644
     045532  046746                                                            .WORD   T173SSR
     045534  012046                                                            .WORD   PKTSSR
3248 045536  005237  002222            INC     FATFLG                  ;SET FATAL ERROR FLAG
3249 045542                    80$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     045542  104406                                                            TRAP    C$CLP1
3250 045544  004737  050166            JSR     PC,T17SETEXP            ;SET WORDS 0-7 EXPD=RECV (NOT TESTING)
3251 045550  012701  046422            MOV     @T17EXSTA,R1            ;GET EXPECTED READ STATUS
3252 045554  012702  050262            MOV     @T17BFSTA,R2            ;GET RECV READ STATUS
3253 045560  011211                    MOV     (R2),(R1)               ;SET EXPD WORD @8 = RECV TEMP
3254 045562  042711  002000            BIC     @S1.ICER,(R1)           ;SET EXPD ICER  =0
3255 045566  042711  001000            BIC     @S1.IFMK,(R1)           ;SET EXPD IFMK  =0
3256 045572  042711  000400            BIC     @S1.IHER,(R1)           ;SET EXPD IHER  =0
3257 045576  016261  000002  000002    MOV     2(R2),2(R1)             ;SET EXPD WORD @9 = RECV (NOT TESTING)
3258 045604  005000                    CLR     R0                      ;HIGH RECV ADDRESS FOR CKMSG2
3259 045606  012701  050242            MOV     @T17BFR,R1              ;LOW RECV ADDRESS FOR CKMSG2
3260 045612  012702  046402            MOV     @T17EXP,R2              ;EXPD ADDRESS
3261 045616  012703  000024            MOV     @20.,R3                 ;NUMBER OF BYTES TO COMPARE
3262 045622  004737  011500            JSR     PC,CKMSG2               ;EXPD EQUAL RECV?
3263 045626                            FORCERROR       92$,NOTSSR      ;@@D
3264 045636  103404                    BCS     100$                    ;BR IF YES
3265 045640                            NEXT.ERRNO
3266 045640                    92$:    ERRHRD  ERRNO,T177CMP,MSGSTAT   ;REPORT ERROR
     045640  104456                                                            TRAP    C$ERHRD
     045642  001205                                                            .WORD   645
     045644  047674                                                            .WORD   T177CMP
     045646  012350                                                            .WORD   MSGSTAT
3267 045650                    100$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     045650  104406                                                            TRAP    C$CLP1
3268
3269                           ;       Do a Write Subsystem WRITE NPR to set tape direction out
3270 045652  012700  000100            MOV     @NP.OUT,R0              ;SET TAPE DIRECTION OUT
3271 045656  004737  050046            JSR     PC,T17SNPR              ;SETUP T17PK2 FOR WRITE NPR
```

```
TSV5 - HARDWARE TESTS   MACRO M1113  06-FEB-84 17:14                                    SEQ 164
TEST  6: SUBTEST 6: FIFO VERIFY RESET FIFO TEST

 3272 045662  012704  050370                MOV     @T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
 3273 045666  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
 3274 045672  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
 3275 045676                                FORCERROR       112$                    ;@@DFORCE ERROR IF FORCER=1
 3276 045712  103407                        BCS     120$                    ;BR IF CARRY SET (GOOD RETURN)
 3277 045714  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
 3278 045716                                NEXT.ERRNO
 3279 045716                        112$:   ERRDF   ERRNO,T174SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
      045716  104455                                                                   TRAP    C$ERDF
      045720  001206                                                                   .WORD   646
      045722  047013                                                                   .WORD   T174SSR
      045724  012046                                                                   .WORD   PKTSSR
 3280 045726  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
 3281 045732                        120$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
      045732  104406                                                                   TRAP    C$CLP1
 3282
 3283                               ;       Setup incrementing pattern in FIFO data buffer
 3284 045734  012701  046422                MOV     @T17EXSTA,R1            ;EXPD WRITE FIFO DATA BUFFER
 3285 045740  012702  000100                MOV     #64.,R2                 ;TEST PATTERN SIZE
 3286 045744  005000                        CLR     R0                      ;INCREMENT TEST PATTERN
 3287 045746  110021                130$:   MOVB    R0,(R1)+                ;STORE INCREMENT TEST BYTE
 3288 045750  005200                        INC     R0                      ;SET NEXT PATTERN
 3289 045752  005302                        DEC     R2                      ;DONE?
 3290 045754  003374                        BGT     130$                    ;BR IF NO
 3291
 3292                               ;  REPEAT FOR BYTE COUNT 1 TO 65.
 3293 045756  012737  000001  002310        MOV     #1,COUNT                ;GET FIRST BYTE COUNT
 3294                               ;       Do a Write Subsystem WRITE FIFO with the current byte count
 3295 045764                        150$:                                   ;REPEAT LOOP LABEL
 3296 045764  013700  002310                MOV     COUNT,R0                ;FIFO BYTE COUNT
 3297 045770  012701  046422                MOV     @T17EXSTA,R1            ;FIFO WRITE DATA ADDRESS
 3298 045774  004737  050072                JSR     PC,T17WFIF              ;SETUP T17PK2 FOR WRITE FIFO
 3299 046000  012704  050370                MOV     @T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
 3300 046004  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
 3301 046010  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
 3302 046014                                FORCERROR       152$                    ;@@DFORCE ERROR IF FORCER=1
 3303 046030  103407                        BCS     160$                    ;BR IF CARRY SET (GOOD RETURN)
 3304 046032  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
 3305 046034                                NEXT.ERRNO
 3306 046034                        152$:   ERRDF   ERRNO,T175SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
      046034  104455                                                                   TRAP    C$ERDF
      046036  001207                                                                   .WORD   647
      046040  047056                                                                   .WORD   T175SSR
      046042  012046                                                                   .WORD   PKTSSR
 3307 046044  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
 3308 046050                        160$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
      046050  104406                                                                   TRAP    C$CLP1
 3309
 3310                               ;       Do a Write Subsystem Write Misc to Reset FIFO
 3311 046052  004737  050024                JSR     PC,T17RSFIF             ;SETUP PKT FOR WRITE MISC RESET FIFO
 3312 046056  012704  050370                MOV     @T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
 3313 046062  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
 3314 046066  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
 3315 046072                                FORCERROR       162$                    ;@@DFORCE ERROR IF FORCER=1
 3316 046106  103407                        BCS     170$                    ;BR IF CARRY SET (GOOD RETURN)
 3317 046110  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
 3318 046112                                NEXT.ERRNO
```

```
3319 046112                          162$:  ERRDF   ERRNO,T172SSR,PKTSSR   ;DEVICE FATAL SSR FAILED TO SET
     046112  104455                                                              TRAP    C$ERDF
     046114  001210                                                              .WORD   648
     046116  046702                                                              .WORD   T172SSR
     046120  012046                                                              .WORD   PKTSSR
3320 046122  005237  002222                 INC     FATFLG                     ;SET FATAL ERROR FLAG
3321 046126                          170$:  CKLOOP                             ;LOOP ON ERROR, IF FLAG SET
     046126  104406                                                              TRAP    C$CLP1
3322
3323                                 ;      Do a Write Subsystem READ STATUS
3324                                 ;      If all Tape Status 2 (ICER,IFMK,IHER) flip-flop
3325                                 ;        signals NOT=0 Then Print Error
3326 046130  004737  050004                 JSR     PC,T17SRD                  ;SETUP PACKET FOR READ STATUS
3327 046134  012704  050370                 MOV     #T17PK2,R4                 ;GET WRITE SUBSYSTEM COMMAND PACKET
3328 046140  010465  000000                 MOV     R4,TSDB(R5)                ;SET THE PACKET ADDRESS TO EXECUTE
3329 046144  004737  016336                 JSR     PC,CHKTSSR                 ;WAIT FOR SSR TO SET
3330 046150                                 FORCERROR       177$                    ;@@DFORCE ERROR IF FORCER=1
3331 046164  103407                         BCS     180$                       ;BR IF CARRY SET (GOOD RETURN)
3332 046166  010001                         MOV     R0,R1                      ;SAVE CONTENTS OF TSSR
3333 046170                                 NEXT.ERRNO
3334 046170                          177$:  ERRDF   ERRNO,T173SSR,PKTSSR   ;DEVICE FATAL SSR FAILED TO SET
     046170  104455                                                              TRAP    C$ERDF
     046172  001211                                                              .WORD   649
     046174  046746                                                              .WORD   T173SSR
     046176  012046                                                              .WORD   PKTSSR
3335 046200  005237  002222                 INC     FATFLG                     ;SET FATAL ERROR FLAG
3336 046204                          180$:  CKLOOP                             ;LOOP ON ERROR, IF FLAG SET
     046204  104406                                                              TRAP    C$CLP1
3337 046206  004737  050166                 JSR     PC,T17SETEXP               ;SET WORDS 0-7 EXPD=RECV (NOT TESTING)
3338 046212  012701  046422                 MOV     #T17EXSTA,R1               ;GET EXPECTED READ STATUS
3339 046216  012702  050262                 MOV     #T17BFSTA,R2               ;GET RECV READ STATUS
3340 046222  011211                         MOV     (R2),(R1)                  ;SET EXPD WORD #8 = RECV TEMP
3341 046224  042711  002000                 BIC     #S1.ICER,(R1)              ;SET EXPD ICER  =0
3342 046230  042711  001000                 BIC     #S1.IFMK,(R1)              ;SET EXPD IFMK  =0
3343 046234  042711  000400                 BIC     #S1.IHER,(R1)              ;SET EXPD IHER  =0
3344 046240  016261  000002  000002         MOV     2(R2),2(R1)                ;SET EXPD WORD #9 = RECV (NOT TESTING)
3345 046246  005000                         CLR     R0                         ;HIGH RECV ADDRESS FOR CKMSG2
3346 046250  012701  050242                 MOV     #T17BFR,R1                 ;LOW RECV ADDRESS FOR CKMSG2
3347 046254  012702  046402                 MOV     #T17EXP,R2                 ;EXPD ADDRESS
3348 046260  012703  000024                 MOV     #20.,R3                    ;NUMBER OF BYTES TO COMPARE
3349 046264  004737  011500                 JSR     PC,CKMSG2                  ;EXPD EQUAL RECV?
3350 046270                                 FORCERROR       192$,NOTSSR        ;@@D
3351 046300  103404                         BCS     200$                       ;BR IF YES
3352 046302                                 NEXT.ERRNO
3353 046302                          192$:  ERRHRD  ERRNO,T177CMP,MSGSTAT  ;REPORT ERROR
     046302  104456                                                              TRAP    C$ERHRD
     046304  001212                                                              .WORD   650
     046306  047674                                                              .WORD   T177CMP
     046310  012350                                                              .WORD   MSGSTAT
3354 046312                          200$:  CKLOOP                             ;LOOP ON ERROR, IF FLAG SET
     046312  104406                                                              TRAP    C$CLP1
3355
3356
3357 046314                          250$:
3358 046314                                 FORCEXIT        260$
3359 046324  005237  002310                 INC     COUNT                      ;GET NEXT BYTE COUNT
3360 046330  023727  002310  000101         CMP     COUNT,#65.                 ;DONE ALL BYTES?
```

```
3361 046336  101002                    BHI     260$            ;BR IF YES
3362 046340  000137  045764            JMP     150$            ;DO ANOTHER BYTE COUNT
3363 046344                    260$:
3364
3365 046344                            ENDSUB                  ;////////////// END SUBTEST //////////
     046344                                                                    L10064:
     046344  104403                                                                    TRAP    C$ESUB
3366
3367 046346  005737  002222            TST     FATFLG          ;ANY FATAL ERRORS ?
3368 046352  001402                    BEQ     300$            ;BRANCH IF NOT
3369 046354  004737  017202            JSR     PC,CKDROP       ;TRY TO DROP THE UNIT
3370 046360  004737  016456    300$:   JSR     PC,TSTLOOP      ;DO ITERATIONS?
3371 046364  103002                    BCC     305$            ;BR IF NO
3372 046366  000137  040424            JMP     T17LOOP         ;LOOP UNTIL ITERATIONS DONE
3373 046372                    305$:
3374
3375 046372                            EXIT    TST             ;////////// EXIT TEST //////////
     046372  104432                                                                    TRAP    C$EXIT
     046374  002112                                                                    .WORD   L10056-.
3376
3377
3378                           ;+
3379                           ;LOCAL STORAGE FOR THIS TEST
3380                           ;-
3381
3382
3383 046376                    T17MSK:                         ;MASK OF UNTESTED BITS IN READ STATUS BYTES
3384                                                           ;UNTESTED BITS ARE SET TO 1
3385 046376      377                   .BYTE   ^C<000>         ;BYTE 0 MASK
3386 046377      037                   .BYTE   ^C<340>         ;BYTE 1 MASK (PARERR,IRESV2,IRESV1)
3387 046400      360                   .BYTE   ^C<017>         ;BYTE 2 (TIMER A,TIMER B,UNDEFINED<1:0>)
3388 046401      000                   .BYTE   0               ;MAKE IT EVEN
3389
3390 046402                    T17EXP:                         ;BEGIN EXPECTED DATA BUFFER
3391 046402  000000                    .WORD   0               ;MESSAGE TYPE
3392 046404  000000                    .WORD   0               ;DATA FIELD LENGTH
3393 046406  000000                    .WORD   0               ;RBPCR
3394 046410  000000                    .WORD   0               ;XST0
3395 046412  000000                    .WORD   0               ;XST1
3396 046414  000000                    .WORD   0               ;XST2
3397 046416  000000                    .WORD   0               ;XST3
3398 046420  000000                    .WORD   0               ;XST4 (ALWAYS PRESENT FOR WRITE SUB.)
3399 046422                    T17EXSTA: .BLKB 66.             ;EXPECTED READ STATUS AND WRITE FIFO DATA
3400 046524                    T17EXEND:                               ;END EXPECTED DATA BUFFER
3401
3402 046524                    T17WFDATA: .BLKB 66.            ;WRITE FIFO EXPECTED DATA BUFFER
3403
3404                           ;+
3405                           ;LOCAL TEXT MESSAGES FOR TEST
3406                           ;-
3407
3408 046626      106      111      106  TST17ID:        .ASCIZ  'FIFO Exerciser'
3409 046645      127      122      111  T17SSR: .ASCIZ  'WRITE CHARACTERISTICS Failed'
3410 046702      127      122      111  T172SSR:.ASCIZ  'WRITE SUBSYSTEM (Write Misc) Failed'
3411 046746      127      122      111  T173SSR:.ASCIZ  'WRITE SUBSYSTEM (Read Status) Failed'
3412 047013      127      122      111  T174SSR:.ASCIZ  'WRITE SUBSYSTEM (Write Npr) Failed'
3413 047056      127      122      111  T175SSR:.ASCIZ  'WRITE SUBSYSTEM (Write FIFO) Failed'
```

```
3414 047122  127  122  111  T176SSR:.ASCIZ  'WRITE SUBSYSTEM (Read FIFO) Failed'
3415 047165  106  111  106  T171CMP:.ASCIZ  'FIFO Status in WORD #9 Incorrect after Initialize'
3416 047247  122  145  141  T172CMP:.ASCIZ  'Read FIFO Data not equal to Write FIFO , Data is in WORD #8'
3417 047343  106  111  106  T173CMP:.ASCIZ  'FIFO Status (In WORD #9) Incorrect after WRITE FIFO'
3418 047427  106  111  106  T174CMP:.ASCIZ  'FIFO Status (In WORD #9) Incorrect after READ FIFO'
3419 047512  122  145  141  T175CMP:.ASCIZ  'Read FIFO Data not equal to Write FIFO Data'
3420 047566  106  111  106  T176CMP:.ASCIZ  'FIFO Status (In WORD #9) Incorrect after READ FIFO from an Empty FIFO'
3421 047674  106  111  106  T177CMP:.ASCIZ  'FIFO Status (In WORD #9) Incorrect after RESET FIFO'
3422                                         .EVEN
3423
3424                                 ;+
3425                                 ; CLEAR MESSAGE BUFFER
3426                                 ;-
3427 047760                          T17CLRBUF:                                      ;
3428 047760                                  SAVREG                                  ;SAVE R1-R5 UNTIL NEXT RETURN
3429 047764  012701  050242                  MOV     #T17BFR,R1                      ;GET MESSAGE BUFFER ADDRESS
3430 047770  012702  000120                  MOV     #T17BEND-T17BFR,R2              ;SIZE OF MESSAGE BUFFER IN BYTES
3431 047774  105021                  10$:    CLRB    (R1)+                           ;CLEAR A BYTE
3432 047776  005302                          DEC     R2                              ;DONE?
3433 050000  003375                          BGT     10$                             ;BR IF NO
3434 050002  000207                          RTS     PC                              ;RETURN
3435
3436                                 ;+
3437                                 ; SETUP T17PK2 PACKET FOR READ STATUS
3438                                 ;-
3439 050004                          T17SRD:
3440 050004  004737  047760                  JSR     PC,T17CLRBUF                    ;CLEAR MESSAGE BUFFER
3441 050010  012700  050400                  MOV     #T17DT2,R0                      ;WRITE SUBSYSTEM DATA BUFFER
3442 050014  112720  000005                  MOVB    #PW.RDSTATUS,(R0)+              ;STORE READ STATUS COMMAND IN BSEL0
3443 050020  105010                          CLRB    (R0)                            ;CLEAR BSEL1
3444 050022  000207                          RTS     PC                              ;RETURN
3445
3446                                 ;+
3447                                 ; SETUP T17PK2 PACKET FOR WRITE MISC RESET FIFO
3448                                 ;-
3449 050024                          T17RSFIF:
3450 050024  004737  047760                  JSR     PC,T17CLRBUF                    ;CLEAR MESSAGE BUFFER
3451 050030  012700  050400                  MOV     #T17DT2,R0                      ;WRITE SUBSYSTEM DATA BUFFER
3452 050034  112720  000010                  MOVB    #PW.WMISC,(R0)+                 ;STORE WRITE MISCELLANEOUS IN BSEL0
3453 050040  112710  000030                  MOVB    #MS.RSFIF!MS.RSTAP,(R0)         ;STORE BSEL1 CLEAR FIFO CODES
3454 050044  000207                          RTS     PC                              ;RETURN
3455
3456                                 ;+
3457                                 ; SETUP T17PK2 PACKET FOR WRITE NPR
3458                                 ;
3459                                 ; INPUT:
3460                                 ;       R0 CONTAINS BSEL1 NPR DATA
3461                                 ;
3462                                 ;       SETS NP.WRP SINCE IF 0 IT WRITES WRONG PARITY.
3463                                 ;-
3464 050046                          T17SNPR:
3465 050046  004737  047760                  JSR     PC,T17CLRBUF                    ;CLEAR MESSAGE BUFFER
3466 050052  012701  050400                  MOV     #T17DT2,R1                      ;WRITE SUBSYSTEM DATA BUFFER
3467 050056  112721  000011                  MOVB    #PW.WNPR,(R1)+                  ;STORE WRITE NPR IN BSEL0
3468 050062  052700  000020                  BIS     #NP.WRP,R0                      ;DON'T WRITE WRONG PARITY
3469 050066  110011                          MOVB    R0,(R1)                         ;STORE NPR DATA IN BSEL1
3470 050070  000207                          RTS     PC                              ;RETURN
```

```
3471
3472                                    ;+
3473                                    ; SETUP T17PK2 PACKET FOR WRITE FIFO
3474                                    ;
3475                                    ; INPUT:
3476                                    ;       R0 CONTAINS BYTE COUNT
3477                                    ;       R1 CONTAINS DATA PATTERN BLOCK ADDRESS
3478                                    ;-
3479 050072                            T17WFIF:
3480 050072                                    SAVREG                          ;SAVE R1-R5 UNTIL NEXT RETURN
3481 050076  004737  047760                    JSR     PC,T17CLRBUF            ;CLEAR MESSAGE BUFFER
3482 050102  012702  050400                    MOV     #T17DT2,R2              ;WRITE SUBSYSTEM DATA BUFFER
3483 050106  112722  000004                    MOVB    #PW.WFIFO,(R2)+         ;STORE WRITE FIFO IN BSEL0
3484 050112  110022                            MOVB    R0,(R2)+                ;STORE BYTE COUNT IN BSEL1
3485 050114  005022                            CLR     (R2)+                   ;CLEAR SEL2 (UNUSED)
3486 050116  112122                    10$:    MOVB    (R1)+,(R2)+             ;STORE DATA PATTERN BYTE
3487 050120  005300                            DEC     R0                      ;DONE ALL BYTES?
3488 050122  003375                            BGT     10$                     ;BR IF NO
3489 050124  000207                            RTS     PC                      ;RETURN
3490
3491                                    ;+
3492                                    ; SETUP T17PK2 PACKET FOR READ FIFO
3493                                    ;
3494                                    ; INPUT:
3495                                    ;       R0 CONTAINS SEL2 BYTE COUNT
3496                                    ;-
3497 050126                            T17RFIF:
3498 050126  004737  047760                    JSR     PC,T17CLRBUF            ;CLEAR MESSAGE BUFFER
3499 050132  012701  050400                    MOV     #T17DT2,R1              ;WRITE SUBSYSTEM DATA BUFFER
3500 050136  112721  000003                    MOVB    #PW.RFIFO,(R1)+         ;STORE READ FIFO IN BSEL0
3501 050142  110021                            MOVB    R0,(R1)+                ;STORE BYTE COUNT IN BSEL1
3502 050144  000207                            RTS     PC                      ;RETURN
3503                                    ;+
3504                                    ; CLEAR EXPECTED DATA MESSAGE BUFFER
3505                                    ;-
3506 050146                            T17CLEXP:
3507 050146  012701  046402                    MOV     #T17EXP,R1              ;GET EXPD ADDRESS
3508 050152  012700  000122                    MOV     #T17EXEND-T17EXP,R0     ;GET EXPD SIZE
3509 050156  105021                    10$:    CLRB    (R1)+                   ;CLEAR A BYTE
3510 050160  005300                            DEC     R0                      ;DONE?
3511 050162  003375                            BGT     10$                     ;BR IF NO
3512 050164  000207                            RTS     PC                      ;RETURN
3513
3514                                    ;+
3515                                    ;Set WORDS 0-7 of expd message buffer = to recv since not testing
3516                                    ;-
3517 050166                            T17SETEXP:
3518 050166  012702  046402                    MOV     #T17EXP,R2              ;GET EXPD
3519 050172  012703  050242                    MOV     #T17BFR,R3              ;GET READ STATUS RECV BUFFER
3520 050176  012700  000010                    MOV     #8.,R0                  ;SET WORDS 0-7 EXP=RECV
3521 050202  012322                    5$:     MOV     (R3)+,(R2)+             ;SET EXPD=RECV
3522 050204  005300                            DEC     R0                      ;DONE WORDS 0-7 WORDS?
3523 050206  003375                            BGT     5$                      ;BR IF NO
3524 050210  000207                            RTS     PC                      ;RETURN
3525
3527         050220                            .=<.+10>&177770
3529                                    ;
```

```
3530                                    ;WRITE CHARACTERISTICS COMMAND PACKET
3531                                    ;
3532 050220                             T17PACKET:                              ;COMMAND PACKET FOR TEST
3533 050220  100004                             .WORD   100004                  ;WRITE CHARACTERISTICS COMMAND, WITH ACK
3534 050222  050230                             .WORD   T17DATA                 ;ADDRESS OF CHARACTERISTICS BLOCK
3535 050224  000000                             .WORD   0
3536 050226  000012                             .WORD   10.                     ;MINIMUM MESSAGE PACKET SIZE
3537
3538 050230                             T17DATA:                                ;CHARACTERISTICS DATA BLOCK
3539 050230  050242                             .WORD   T17BFR                  ;ADDRESS OF MESSAGE BUFFER
3540 050232  000000                             .WORD   0
3541 050234  000024                             .WORD   20.                     ;LENGTH OF MESSAGE BUFFER
3542 050236  000000                             .WORD   0                       ;ESS,ENB,EAI,ERI
3543 050240  000000                             .WORD   0                       ;EXTENDED FEATURES UNIT NO. ETC.
3544
3545
3546                                    ;MESSAGE BUFFER FOR ALL TEST 6 COMMANDS
3547
3548 050242                             T17BFR:                                 ;BEGIN MESSAGE BUFFER
3549 050242  000000                             .WORD   0                       ;MESSAGE TYPE
3550 050244  000000                             .WORD   0                       ;DATA FIELD LENGTH
3551 050246  000000                             .WORD   0                       ;RBPCR
3552 050250  000000                             .WORD   0                       ;XST0
3553 050252  000000                             .WORD   0                       ;XST1
3554 050254  000000                             .WORD   0                       ;XST2
3555 050256  000000                             .WORD   0                       ;XST3
3556 050260  000000                             .WORD   0                       ;XST4 (ALWAYS PRESENT FOR WRITE SUBSYSTEM
3557 050262                             T17BFSTA: .BLKB 64.                     ;READ STATUS AND WRITE FIFO BUFFER
3558 050362                             T17BEND:                                ;END OF MESSAGE BUFFER
3559                                    ;
3560                                    ;WRITE SUBSYSTEM READ STATUS COMMAND PACKET
3561                                    ;
3563         050370                             .=<.+10>&177770
3565 050370                             T17PK2:
3566 050370  100006                             .WORD   P.WRTSUB!P.ACK          ;WRITE SUBSYSTEM WITH ACK
3567 050372  050400                             .WORD   T17DT2                  ;LOW ADDRESS OF DATA BLOCK
3568 050374  000000                             .WORD   0                       ;HIGH ADDRESS OF DATA BLOCK
3569 050376  000012                             .WORD   10.                     ;MINIMUM MESSAGE PACKET SIZE
3570
3571 050400                             T17DT2:                                 ;DATA BLOCK
3572 050400     000                             .BYTE   0                       ;BSEL0
3573 050401     000                             .BYTE   0                       ;BSEL1
3574 050402  000000                             .WORD   0                       ;SEL2
3575 050404                                     .BLKB   66.                     ;WRITE FIFO DATA OUTPUT BUFFER
3576
3577 050506                                     ENDTST
     050506                                                             L10056:
     050506  104401                                                             TRAP    C$ETST
3578
3579                                            .SBTTL  TEST  7: STATIC TRANSPORT BUS INTERFACE TEST
3580                                    ;+
3581                                    ; TEST DESCRIPTION:
3582                                    ;
3583                                    ;
3584                                    ; TEST STEPS:
3585                                    ;
3586                                    ;    REPEAT FOR LOOPCNT
```

```
                                        ;       BEGIN
                                        ;       Write to TSSR register to soft initialize the controller
                                        ;       Do WRITE CHARACTERISTICS to check for Extended Features Switch
                                        ;       If Extended Features Hardware Switch Clear then:
                                        ;         Do Write Subsystem Write Miscellaneous to Set Extended Features.
                                        ;       Do WRITE CHARACTERISTICS to select reserved unit 7
                                        ;       Do a Write Subsystem READ STATUS
                                        ;       If any transport interface signals are asserted then Print Error
                                        ;       END
                                        ;--


 050510                                         BGNTST
 050510                                                                                 T7::
 050510  012700  051216                         MOV     #TST18ID,R0             ;ASCII MESSAGE TO IDENTIFY TEST
 050514  004737  016510                         JSR     PC,TSTSETUP             ;DO INITIAL TEST SETUP
 050520  012737  000012  002216                 MOV     #10.,LOOPCNT            ;PERFORM 10 ITERATIONS
 050526                                 T18LOOP:
                                        ;       Write to TSSR register to soft initialize the controller
 050526                                 5$:
 050526  004737  015774                         JSR     PC,SOFINIT              ;WRITE TO TSSR TO SOFT INITIALIZE
 050532  103405                                 BCS     10$                     ;BR IF SOFT INIT OKAY
 050534  010001                                 MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
 050536                                         ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL DURING INIT
 050536  104455                                                                         TRAP    C$ERDF
 050540  001274                                                                         .WORD   700
 050542  003652                                                                         .WORD   SFIERR
 050544  012034                                                                         .WORD   SFIMSG

                                        ;       Do WRITE CHARACTERISTICS to check for Extended Features Switch
 050546  005037  002222                 10$:    CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
 050552  012704  051700                         MOV     #T18PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
 050556  004737  010662                         JSR     PC,WRTCHR               ;DO WRITE CHARACTERISTICS COMMAND
 050562                                         FORCERROR       12$                     ;@@FORCE ERROR IF FORCER=1
 050576  103407                                 BCS     15$                     ;BR IF CARRY SET (GOOD RETURN)
 050600  010001                                 MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
 050602                                         NEXT,ERRNO
 050602                                 12$:    ERRDF   ERRNO,T18SSR,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
 050602  104455                                                                         TRAP    C$ERDF
 050604  001275                                                                         .WORD   701
 050606  051255                                                                         .WORD   T18SSR
 050610  012046                                                                         .WORD   PKTSSR
 050612  005237  002222                         INC     FATFLG                  ;SET FATAL ERROR FLAG
 050616                                 15$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
 050616  104406                                                                         TRAP    C$CLP1


                                        ;       If Extended Features Hardware Switch Clear then:
                                        ;         Do Write Subsystem Write Miscellaneous to Set Extended Features.
 050620  012701  051722                         MOV     #T18BFR,R1              ;MESSAGE BUFFER ADDRESS
 050624  032761  000200  000012                 BIT     #X2.EXTF,XST2(R1)       ;EXTENDED FEATURES SWITCH SET?
 050632  001026                                 BNE     30$                     ;BR IF YES
 050634  004737  051546                         JSR     PC,T18SMISC             ;SETUP PACKET FOR WRITE MISCELLANEOUS
 050640  012704  051750                         MOV     #T18PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
 050644  010465  000000                         MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
 050650  004737  016336                         JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
 050654                                         FORCERROR       22$                     ;@@FORCE ERROR IF FORCER=1
 050670  103407                                 BCS     30$                     ;BR IF CARRY SET (GOOD RETURN)
```

```
ISV5 - HARDWARE TESTS  MACRO M1113  06-FEB-84 17:14                                SEQ 171
TEST  7: STATIC TRANSPORT BUS INTERFACE TEST

3638 050672  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
3639 050674                                NEXT.ERRNO
3640 050674                          22$:  ERRDF   ERRNO,T182SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     050674  104455                                                              TRAP    C$ERDF
     050676  001276                                                              .WORD   702
     050700  051312                                                              .WORD   T182SSR
     050702  012046                                                              .WORD   PKTSSR
3641 050704  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
3642 050710                          30$:  CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     050710  104406                                                              TRAP    C$CLP1
3643
3644
3645                                 ;     Do WRITE CHARACTERISTICS to select reserved unit 7
3646 050712  005037  002222                CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
3647 050716  012704  051700                MOV     @T18PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
3648 050722  004737  010662                JSR     PC,WRTCHR               ;DO WRITE CHARACTERISTICS COMMAND
3649 050726                                FORCERROR       42$                     ;@@DFORCE ERROR IF FORCER=1
3650 050742  103407                        BCS     50$                     ;BR IF CARRY SET (GOOD RETURN)
3651 050744  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
3652 050746                                NEXT.ERRNO
3653 050746                          42$:  ERRDF   ERRNO,T18SSR,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
     050746  104455                                                              TRAP    C$ERDF
     050750  001277                                                              .WORD   703
     050752  051255                                                              .WORD   T18SSR
     050754  012046                                                              .WORD   PKTSSR
3654 050756  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
3655 050762                          50$:  CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     050762  104406                                                              TRAP    C$CLP1
3656
3657                                 ;     Clear message buffer
3658 050764  012701  051722                MOV     @T18BFR,R1              ;GET MESSAGE BUFFER ADDRESS
3659 050770  013700  051714                MOV     T18DATA+4,R0            ;SIZE OF MESSAGE BUFFER IN BYTES
3660 050774  105021                  60$:  CLRB    (R1)+                   ;CLEAR A BYTE
3661 050776  005300                        DEC     R0                      ;DONE?
3662 051000  003375                        BGT     60$                     ;BR IF NO
3663
3664 051002  004737  051526          ;     Do a Write Subsystem READ STATUS
                                           JSR     PC,T18SRD               ;SETUP PACKET FOR READ STATUS
3665 051006  012704  051750                MOV     @T18PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
3666 051012  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
3667 051016  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
3668 051022                                FORCERROR       62$                     ;@@DFORCE ERROR IF FORCER=1
3669 051036  103407                        BCS     70$                     ;BR IF CARRY SET (GOOD RETURN)
3670 051040  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
3671 051042                                NEXT.ERRNO
3672 051042                          62$:  ERRDF   ERRNO,T183SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     051042  104455                                                              TRAP    C$ERDF
     051044  001300                                                              .WORD   704
     051046  051356                                                              .WORD   T183SSR
     051050  012046                                                              .WORD   PKTSSR
3673 051052  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
3674 051056                          70$:  CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     051056  104406                                                              TRAP    C$CLP1
3675
3676
3677                                 ;     Set first 8 words of expd message buffer = to recv since not testing
3678                                 ;     Set unused bits in Read Status expd equal rcvd
3679 051060  004737  051570                JSR     PC,T18SETEXP            ;SET SOME EXPD TO RECV
```

```
3680
3681 051064  005000                    ;       If any transport interface signals are asserted then Print Error
3682 051066  012701  051722                    CLR     R0                      ;HIGH RECV ADDRESS FOR CKMSG2
3683 051072  012702  051166                    MOV     #T18BFR,R1              ;LOW RECV ADDRESS FOR CKMSG2
3684 051076  012703  000012                    MOV     #T18EXP,R2              ;EXPD ADDRESS
3685 051102  004737  011500                    MOV     #10.,R3                 ;NUMBER OF WORDS TO COMPARE
3686 051106                                    JSR     PC,CKMSG2               ;EXPD EQUAL RECV?
3687 051116  103404                            FORCERROR       82$,NOTSSR      ;BSD
3688 051120                                    BCS     90$                     ;BR IF YES
3689 051120                                    NEXT.ERRNO
     051120  104456                    82$:    ERRHRD  ERRNO,T18CMP,MSGSTAT    ;REPORT ERROR
     051122  001301                                                                    TRAP    C$ERHRD
     051124  051423                                                                    .WORD   705
     051126  012350                                                                    .WORD   T18CMP
3690 051130                                                                         .WORD   MSGSTAT
     051130  104406                    90$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
3691                                                                                TRAP    C$CLP1
3692 051132  005737  002222                    TST     FATFLG                  ;ANY FATAL ERRORS ?
3693 051136  001402                            BEQ     160$                    ;BRANCH IF NOT
3694 051140  004737  017202                    JSR     PC,CKDROP               ;TRY TO DROP THE UNIT
3695 051144  004737  016456            160$:   JSR     PC,TSTLOOP              ;DO ITERATIONS?
3696 051150  103002                            BCC     165$                    ;BR IF NO
3697 051152  000137  050526                    JMP     T18LOOP                 ;LOOP UNTIL ITERATIONS DONE
3698 051156                            165$:
3699 051156                                    EXIT    TST
     051156  104432                                                                TRAP    C$EXIT
     051160  000606                                                                .WORD   L10065-.
3700
3701
3702                                    ;+
3703                                    ;LOCAL STORAGE FOR THIS TEST
3704                                    ;-
3705
3706 051162                            T18MSK:                                 ;MASK OF UNUSED BITS IN READ STATUS BYTES
3707 051162      377                           .BYTE   ^C<000>                 ;BYTE 0 MASK
3708 051163      037                           .BYTE   ^C<340>                 ;BYTE 1
3709 051164      100                           .BYTE   ^C<277>                 ;BYTE 2
3710 051165      000                           .BYTE   0                       ;MAKE IT EVEN
3711
3712 051166                            T18EXP:                                 ;EXPECTED DATA BUFFER
3713 051166  000000                           .WORD   0                       ;MESSAGE TYPE
3714 051170  000000                           .WORD   0                       ;DATA FIELD LENGTH
3715 051172  000000                           .WORD   0                       ;RBPCR
3716 051174  000000                           .WORD   0                       ;XST0
3717 051176  000000                           .WORD   0                       ;XST1
3718 051200  000000                           .WORD   0                       ;XST2
3719 051202  000000                           .WORD   0                       ;XST3
3720 051204  000000                           .WORD   0                       ;XST4 (ALWAYS PRESENT FOR WRITE SUB)
3721 051206  000000                           .WORD   0                       ;READ STATUS BYTE 1/0
3722 051210  000000                           .WORD   0                       ;READ STATUS BYTE 2
3723
3724 051212      377     020           T18XS:  .BYTE   377,020                 ;READ STATUS BYTE 0/1 EXPECTED BASE
3725 051214  000000                           .WORD   0                       ;READ STATUS BYTE 2 EXPECTED BASE
3726
3727                                    ;+
3728                                    ;LOCAL TEXT MESSAGES FOR TEST
3729                                    ;-
```

```
3730
3731 051216      123      164      141  TST18ID:        .ASCIZ  'Static Transport Bus Interface'
3732 051255      127      122      111  T18SSR: .ASCIZ  'WRITE CHARACTERISTICS Failed'
3733 051312      127      122      111  T182SSR:.ASCIZ  'WRITE SUBSYSTEM (Write Misc) Failed'
3734 051356      127      122      111  T183SSR:.ASCIZ  'WRITE SUBSYSTEM (Read Status) Failed'
3735 051423      124      162      141  T18CMP: .ASCIZ  'Transport Bus Interface Signals NOT Negated After Unit 7 Selected'
3736                                                    .EVEN
3737
3738                                                ;+
3739                                                ; SETUP T18PK2 PACKET FOR READ STATUS
3740                                                ;-
3741 051526                                         T18SRD:
3742 051526                                                 SAVREG                          ;SAVE R1-R5 UNTIL NEXT RETURN
3743 051532  012700  051760                                MOV     #T18DT2,R0              ;WRITE SUBSYSTEM DATA BUFFER
3744 051536  112720  000005                                MOVB    #PW.RDSTATUS,(R0)+      ;STORE READ STATUS COMMAND IN BSEL0
3745 051542  105010                                        CLRB    (R0)                    ;CLEAR BSEL1
3746 051544  000207                                        RTS     PC                      ;RETURN
3747
3748                                                ;+
3749                                                ; SETUP T18PK2 PACKET FOR WRITE MISC.
3750                                                ;-
3751 051546                                         T18SMISC:
3752 051546                                                 SAVREG                          ;SAVE R1-R5 UNTIL NEXT RETURN
3753 051552  012700  051760                                MOV     #T18DT2,R0              ;WRITE SUBSYSTEM DATA BUFFER
3754 051556  112720  000010                                MOVB    #PW.WMISC,(R0)+         ;STORE WRITE MISCELLANEOUS IN BSEL0
3755 051562  112710  000200                                MOVB    #MS.EXT,(R0)            ;STORE INVERT EXTENDED FEATURES IN BSEL1
3756 051566  000207                                        RTS     PC                      ;RETURN
3757
3758                                                ;+
3759                                                ;Set first 8 words of expd message buffer = to recv since not testing
3760                                                ;       Set unused bits in Read Status expd equal rcvd
3761                                                ;-
3762 051570                                         T18SETEXP:
3763 051570  012702  051166                                MOV     #T18EXP,R2              ;GET EXPD
3764 051574  012703  051722                                MOV     #T18BFR,R3              ;GET READ STATUS RECV BUFFER
3765 051600  012700  000010                                MOV     #8.,R0                  ;SET FIRST 8 WORDS EXP=RECV
3766 051604  012322                                5$:     MOV     (R3)+,(R2)+             ;SET EXPD=RECV
3767 051606  005300                                        DEC     R0                      ;DONE FIRST 8 WORDS?
3768 051610  003375                                        BGT     5$                      ;BR IF NO
3769 051612  012701  051162                                MOV     #T18MSK,R1              ;GET UNUSED BIT MASK
3770 051616  013712  051212                                MOV     T18XS,(R2)              ;SETUP BASE EXPECTED BYTE 1/0
3771 051622  013762  051214  000002                        MOV     T18XS+2,2(R2)           ;SETUP BASE EXPECTED BYTE 2
3772 051630  011300                                        MOV     (R3),R0                 ;GET RECV BYTE 1 AND BYTE 0
3773 051632  041100                                        BIC     (R1),R0                 ;CLEAR ALL BUT UNUSED
3774 051634  040012                                        BIC     R0,(R2)                 ;CLEAR UNUSED IN EXP
3775 051636  050012                                        BIS     R0,(R2)                 ;SET UNUSED EXPD=RECV FOR COMPARE
3776 051640  016300  000002                                MOV     2(R3),R0                ;GET RECV BYTE 2
3777 051644  046100  000002                                BIC     2(R1),R0                ;CLEAR ALL BUT UNUSED
3778 051650  040062  000002                                BIC     R0,2(R2)                ;CLEAR UNUSED IN EXPD
3779 051654  050062  000002                                BIS     R0,2(R2)                ;SET UNUSED EXPD=RECV FOR COMPARE
3780 051660  105062  000003                                CLRB    3(R2)                   ;CLEAR EXPD BYTE 3 (UNUSED)
3781 051664  105063  000003                                CLRB    3(R3)                   ;CLEAR RECV BYTE 3 (UNUSED)
3782 051670  000207                                        RTS     PC                      ;RETURN
3783
3785         051700                                         .=<.+10>&177770
3787                                                ;
3788                                                ;WRITE CHARARTERISTICS COMMAND PACKET
```

```
3789                                    ;
3790 051700                             T18PACKET:                      ;COMMAND PACKET FOR TEST
3791 051700  100004                             .WORD   100004          ;WRITE CHARACTERISTICS COMMAND, WITH ACK
3792 051702  051710                             .WORD   T18DATA         ;ADDRESS OF CHARACTERISTICS BLOCK
3793 051704  000000                             .WORD   0
3794 051706  000012                             .WORD   10.             ;MESSAGE PACKET MINIMUM SIZE
3795
3796 051710                             T18DATA:                        ;CHARACTERISTICS DATA BLOCK
3797 051710  051722                             .WORD   T18BFR          ;ADDRESS OF MESSAGE BUFFER
3798 051712  000000                             .WORD   0
3799 051714  000024                             .WORD   20.             ;LENGTH OF MESSAGE BUFFER
3800 051716  000000                             .WORD   0               ;ESS,ENB,EAI,ERI
3801 051720  000007                             .WORD   7               ;SELECT RESERVED UNIT 7
3802
3803
3804 051722                             T18BFR:                         ;MESSAGE BUFFER
3805 051722  000000                             .WORD   0               ;MESSAGE TYPE
3806 051724  000000                             .WORD   0               ;DATA FIELD LENGTH
3807 051726  000000                             .WORD   0               ;RBPCR
3808 051730  000000                             .WORD   0               ;XST0
3809 051732  000000                             .WORD   0               ;XST1
3810 051734  000000                             .WORD   0               ;XST2
3811 051736  000000                             .WORD   0               ;XST3
3812 051740  000000                             .WORD   0               ;XST4 (ALWAYS PRESENT FOR WRITE SUBSYSTEM
3813 051742  000000                             .WORD   0               ;READ STATUS BYTE 1/0 RETURNED
3814 051744  000000                             .WORD   0               ;READ STATUS BYTE 2
3815                                    ;
3816                                    ;WRITE SUBSYSTEM READ STATUS COMMAND PACKET
3817                                    ;
3819         051750                             .=<.+10>&177770
3821 051750                             T18PK2:
3822 051750  100006                             .WORD   P.WRTSUB!P.ACK          ;WRITE SUBSYSTEM WITH ACK
3823 051752  051760                             .WORD   T18DT2                  ;LOW ADDRESS OF DATA BLOCK
3824 051754  000000                             .WORD   0                       ;HIGH ADDRESS OF DATA BLOCK
3825 051756  000010                             .WORD   8.                      ;BUFFER EXTENT
3826
3827 051760                             T18DT2:                         ;DATA BLOCK
3828 051760     000                             .BYTE   0               ;BSEL0
3829 051761     000                             .BYTE   0               ;BSEL1
3830 051762  000000                             .WORD   0               ;SEL2
3831 051764  000000                             .WORD   0               ;DATA
3832
3833
3834 051766                                     ENDTST
     051766                                                                     L10065:
     051766  104401                                                                    TRAP    C$ETST
3835                                    .SBTTL  TEST  8: TRANSPORT BUS INTERFACE LOOPBACK TEST
3836                                    ;++
3837                                    ; TEST DESCRIPTION:
3838                                    ;
3839                                    ;       This test verifies the controller's Transport Bus
3840                                    ;       drivers, receivers, and signal loopback logic. Note
3841                                    ;       that the Static Transport Bus test must have run
3842                                    ;       correctly for this test to provide meaningful results.
3843                                    ;
3844                                    ; TEST STEPS:
3845                                    ;
```

```
                                ;  REPEAT FOR LOOPCNT
                                ;    BEGIN
                                ;       Do Subtest 1    - Loopback Control signals test
                                ;       Do Subtest 2    - Loopback Read/Write signals test
                                ;       Do Subtest 3    - Loopback Write Strobe test
                                ;       Do Subtest 4    - Loopback Read Strobe test
                                ;    END
                                ;--


051770                                  BGNTST
051770                                                                          T8::
051770  012700  060202                   MOV     #TST19ID,R0             ;ASCII MESSAGE TO IDENTIFY TEST
051774  004737  016510                   JSR     PC,TSTSETUP             ;DO INITIAL TEST SETUP
052000  012737  000012  002216           MOV     #10.,LOOPCNT            ;PERFORM 10 ITERATIONS
052006                                  T19LOOP:

                                        .SBTTL  TEST  8: SUBTEST 1: LOOPBACK CONTROL SIGNAL TEST

                                ;**
                                ; TEST 8: SUBTEST 1:
                                ;
                                ; SUBTEST DESCRIPTION:
                                ;
                                ;       This subtest verifies the Transport Control loopback
                                ;       path can transmit and receive correctly. The
                                ;       control signals are all loopback signals other
                                ;       than the read/write data (IW<7:0> and IR<7:0>).
                                ;
                                ; TEST STEPS:
                                ;
                                ;       The loopback signals IFAD,ITAD0,ITAD1 are the tape unit select
                                ;       lines. Since reserved unit 7 must remain selected these signals
                                ;       are always set low. This further means the signals they drive
                                ;       (ISPEED,IRDY,IONL) are only tested in the low state.
                                ;
                                ; BEGIN
                                ;       Write to TSSR register to soft initialize the controller
                                ;       Do WRITE CHARACTERISTICS to check for Extended Features Switch
                                ;       If Extended Features Hardware Switch Clear then:
                                ;         Do Write Subsystem Write Miscellaneous to Set Extended Features.
                                ;       Do WRITE CHARACTERISTICS to select reserved unit 7 and setup BUFFER
                                ;       Do a Write Subsystem WRITE NPR to set tape direction out and Loopback
                                ;       Do Write Subsystem Write Control to CLEAR loopback signals group 1.
                                ;       Do Write Subsystem Write Format to CLEAR loopback signals group 2.
                                ;        (the loopback signals have to be cleared here due to the flip-flops
                                ;         that are set on a 1 to 0 transition (IHER,IFMK,ICER))
                                ;       Do a Write Subsystem Write Misc to Reset Tape Status F-FLOPS
                                ;       Do a Write Subsystem READ STATUS
                                ;       If all Tape Status 2 (ICER,IFMK,IHER) flip-flop
                                ;         signals NOT=0 Then Print Error
                                ;
                                ;  REPEAT FOR ALL TEST PATTERNS IN TSTBLK TABLE
                                ;    BEGIN
                                ;       Do Write Subsystem Write Control to Drive loopback signals group 1.
                                ;       Do Write Subsystem Write Format to Drive loopback signals group 2.
                                ;       Do a Write Subsystem READ STATUS
```

```
                                ;       If loopback data NOT= data sent Then Print Error
                                ;       Do a Write Subsystem Write Misc to Reset Tape Status F-FLOPS
                                ;       Do a Write Subsystem READ STATUS
                                ;       If all Tape Status 2 (ICER,IFMK,IHER) flip-flop
                                ;         signals NOT=0 Then Print Error
                                ;    END
                                ;--
052006                                  BGNSUB                          ;////////////// BEGIN SUBTEST //////////
052006                                                                                    T8.1:
052006  104402                                                                            TRAP    C$BSUB

                                ;       Write to TSSR register to soft initialize the controller
052010                          5$:
052010  004737  015774                  JSR     PC,SOFINIT              ;WRITE TO TSSR TO SOFT INITIALIZE
052014  103405                          BCS     10$                     ;BR IF SOFT INIT OKAY
052016  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
052020                                  ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL DURING INIT
052020  104455                                                                            TRAP    C$ERDF
052022  001440                                                                          .WORD   800
052024  003652                                                                          .WORD   SFIERR
052026  012034                                                                          .WORD   SFIMSG

                                ;       Do WRITE CHARACTERISTICS to check for Extended Features Switch
052030  005037  002222          10$:    CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
052034  012704  062330                  MOV     #T19PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
052040  004737  010662                  JSR     PC,WRTCHR               ;DO WRITE CHARACTERISTICS COMMAND
052044                                  FORCERROR       12$                     ;@@DFORCE ERROR IF FORCER=1
052060  103407                          BCS     15$                     ;BR IF CARRY SET (GOOD RETURN)
052062  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
052064                                  NEXT.ERRNO
052064                          12$:    ERRDF   ERRNO,T19SSR,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
052064  104455                                                                            TRAP    C$ERDF
052066  001441                                                                          .WORD   801
052070  060243                                                                          .WORD   T19SSR
052072  ^12046                                                                          .WORD   PKTSSR
052074  ⌄05237  002222                  INC     FATFLG                  ;SET FATAL ERROR FLAG
052100                          15$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
052100  104406                                                                          TRAP    C$CLP1

                                ;       If Extended Features Hardware Switch Clear then:
                                ;         Do Write Subsystem Write Miscellaneous to Set Extended Features.
052102  012701  062352                  MOV     #T198FR,R1              ;MESSAGE BUFFER ADDRESS
052106  032761  000200  000012          BIT     #X2.EXTF,XST2(R1)       ;EXTENDED FEATURES SWITCH SET?
052114  001026                          BNE     30$                     ;BR IF YES
052116  004737  062202                  JSR     PC,T19SEXT              ;SETUP PACKET FOR WRITE MISC INVERT
052122  012704  062500                  MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
052126  010465  000000                  MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
052132  004737  016336                  JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
052136                                  FORCERROR       22$                     ;@@DFORCE ERROR IF FORCER=1
052152  103407                          BCS     30$                     ;BR IF CARRY SET (GOOD RETURN)
052154  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
052156                                  NEXT.ERRNO
052156                          22$:    ERRDF   ERRNO,T192SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
052156  104455                                                                            TRAP    C$ERDF
052160  001442                                                                          .WORD   802
052162  060300                                                                          .WORD   T192SSR
052164  012046                                                                          .WORD   PKTSSR
052166  005237  002222                  INC     FATFLG                  ;SET FATAL ERROR FLAG
052172                          30$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
```

```
052172  104406                                                                  TRAP    C$CLP1
                                ;       Do WRITE CHARACTERISTICS to select reserved unit 7
052174  005037  002222                  CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
052200  012704  062330                  MOV     #T19PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
052204  004737  010662                  JSR     PC,WRTCHR               ;DO WRITE CHARACTERISTICS COMMAND
052210                                  FORCERROR       42$                     ;@@FORCE ERROR IF FORCER=1
052224  103407                          BCS     50$                     ;BR IF CARRY SET (GOOD RETURN)
052226  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
052230                                  NEXT.ERRNO
052230                          42$:    ERRDF   ERRNO,T19SSR,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
052230  104455                                                                  TRAP    C$ERDF
052232  001443                                                                  .WORD   803
052234  060243                                                                  .WORD   T19SSR
052236  012046                                                                  .WORD   PKTSSR
052240  005237  002222                  INC     FATFLG                  ;SET FATAL ERROR FLAG
052244                          50$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
052244  104406                                                                  TRAP    C$CLP1
                                ;       Do a Write Subsystem WRITE NPR to set tape direction out and Loopback
052246  012700  000100                  MOV     #NP.OUT,R0              ;SET TAPE DIRECTION OUT
052252  052700  000040                  BIS     #NP.LOOP,R0             ;SET LOOPBACK ENABLE
052256  004737  062042                  JSR     PC,T19SNPR              ;SETUP T19PK2 FOR WRITE NPR .
052262  012704  062500                  MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
052266  010465  000000                  MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
052272  004737  016336                  JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
052276                                  FORCERROR       62$                     ;@@FORCE ERROR IF FORCER=1
052312  103407                          BCS     70$                     ;BR IF CARRY SET (GOOD RETURN)
052314  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
052316                                  NEXT.ERRNO
052316                          62$:    ERRDF   ERRNO,T194SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
052316  104455                                                                  TRAP    C$ERDF
052320  001444                                                                  .WORD   804
052322  060411                                                                  .WORD   T194SSR
052324  012046                                                                  .WORD   PKTSSR
052326  005237  002222                  INC     FATFLG                  ;SET FATAL ERROR FLAG
052332                          70$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
052332  104406                                                                  TRAP    C$CLP1
                                ;       Do Write Subsystem Write Control to CLEAR loopback signals group 1.
                                ;       Do Write Subsystem Write Format to CLEAR loopback signals group 2.
                                ;        (the loopback signals have to be cleared here due to the flip-flops
                                ;          that are set on a 1 to 0 transition (IHER,IFMK,ICER))
052334  005000                          CLR     R0                      ;WRITE 0'S
052336  042700  000200                  BIC     #WC.IFAD,R0             ;IFAD MUST  ALWAYS =0
052342  042700  000100                  BIC     #WC.I0TAD,R0            ;ITAD0 MUST ALWAYS =0
052346  042700  000040                  BIC     #WC.I1TAD,R0            ;ITAD1 MUST ALWAYS =0
052352  004737  062142                  JSR     PC,T19WCTL              ;SETUP PACKET FOR WRITE CONTROL
052356  012704  062500                  MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
052362  010465  000000                  MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
052366  004737  016336                  JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
052372                                  FORCERROR       82$                     ;@@FORCE ERROR IF FORCER=1
052406  103407                          BCS     90$                     ;BR IF CARRY SET (GOOD RETURN)
052410  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
052412                                  NEXT.ERRNO
052412                          82$:    ERRDF   ERRNO,T197SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
052412  104455                                                                  TRAP    C$ERDF
052414  001445                                                                  .WORD   805
052416  060563                                                                  .WORD   T197SSR
052420  012046                                                                  .WORD   PKTSSR
```

```
3990 052422  005237  002222          INC     FATFLG                  ;SET FATAL ERROR FLAG
3991 052426                  90$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     052426  104406                                                          TRAP    C$CLP1
3992 052430  005000          CLR     R0                              ;SET FORMAT DRIVE DATA=0
3993 052432  004737  062162  JSR     PC,T19WFMT                      ;SETUP PACKET FOR WRITE FORMAT
3994 052436  012704  062500  MOV     #T19PK2,R4                      ;GET WRITE SUBSYSTEM COMMAND PACKET
3995 052442  010465  000000  MOV     R4,TSDB(R5)                     ;SET THE PACKET ADDRESS TO EXECUTE
3996 052446  004737  016336  JSR     PC,CHKTSSR                      ;WAIT FOR SSR TO SET
3997 052452                  FORCERROR       102$                            ;@@DFORCE ERROR IF FORCER=1
3998 052466  103407          BCS     110$                            ;BR IF CARRY SET (GOOD RETURN)
3999 052470  010001          MOV     R0,R1                           ;SAVE CONTENTS OF TSSR
4000 052472                  NEXT.ERRNO
4001 052472                  102$:   ERRDF   ERRNO,T198SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     052472  104455                                                          TRAP    C$ERDF
     052474  001446                                                          .WORD   806
     052476  060632                                                          .WORD   T198SSR
     052500  012046                                                          .WORD   PKTSSR
4002 052502  005237  002222          INC     FATFLG                  ;SET FATAL ERROR FLAG
4003 052506                  110$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     052506  104406                                                          TRAP    C$CLP1
4004                         ;       Do a Write Subsystem Write Misc to Reset Tape Status F-FLOPS
4005 052510  004737  062020          JSR     PC,T19RSFIF             ;SETUP PKT FOR WRITE MISC Reset Tape Status F-FLOPS
4006 052514  012704  062500          MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
4007 052520  010465  000000          MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
4008 052524  004737  016336          JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
4009 052530                          FORCERROR       122$                    ;@@DFORCE ERROR IF FORCER=1
4010 052544  103407                  BCS     130$                    ;BR IF CARRY SET (GOOD RETURN)
4011 052546  010001                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4012 052550                          NEXT.ERRNO
4013 052550                  122$:   ERRDF   ERRNO,T192SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     052550  104455                                                          TRAP    C$ERDF
     052552  001447                                                          .WORD   807
     052554  060300                                                          .WORD   T192SSR
     052556  012046                                                          .WORD   PKTSSR
4014 052560  005237  002222          INC     FATFLG                  ;SET FATAL ERROR FLAG
4015 052564                  130$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     052564  104406                                                          TRAP    C$CLP1
4016                         ;       Do a Write Subsystem READ STATUS
4017                         ;       If all Tape Status 2 (ICER,IFMK,IHER) flip-flop
4018                         ;         signals NOT=0 Then Print Error
4019 052566  004737  062000          JSR     PC,T19SRD               ;SETUP PACKET FOR READ STATUS
4020 052572  012704  062500          MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
4021 052576  010465  000000          MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
4022 052602  004737  016336          JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
4023 052606                          FORCERROR       132$                    ;@@DFORCE ERROR IF FORCER=1
4024 052622  103407                  BCS     140$                    ;BR IF CARRY SET (GOOD RETURN)
4025 052624  010001                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4026 052626                          NEXT.ERRNO
4027 052626                  132$:   ERRDF   ERRNO,T193SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     052626  104455                                                          TRAP    C$ERDF
     052630  001450                                                          .WORD   808
     052632  060344                                                          .WORD   T193SSR
     052634  012046                                                          .WORD   PKTSSR
4028 052636  005237  002222          INC     FATFLG                  ;SET FATAL ERROR FLAG
4029 052642                  140$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     052642  104406                                                          TRAP    C$CLP1
4030 052644  004737  062240          JSR     PC,T19SETEXP            ;SET WORDS 0-7 EXPD=RECV (NOT TESTING)
```

```
4031 052650  012701  060102                MOV     #T19EXSTA,R1            ;GET EXPECTED READ STATUS
4032 052654  012702  062372                MOV     #T19BFSTA,R2            ;GET RECV READ STATUS
4033 052660  011211                        MOV     (R2),(R1)               ;SET EXPD WORD #8 = RECV TEMP
4034 052662  042711  002000                BIC     #S1.ICER,(R1)           ;SET EXPD ICER  =0
4035 052666  042711  001000                BIC     #S1.IFMK,(R1)           ;SET EXPD IFMK  =0
4036 052672  042711  000400                BIC     #S1.IHER,(R1)           ;SET EXPD IHER  =0
4037 052676  016261  000002  000002        MOV     2(R2),2(R1)             ;SET EXPD WORD #9 = RECV (NOT TESTING)
4038 052704  005000                        CLR     R0                      ;HIGH RECV ADDRESS FOR CKMSG2
4039 052706  012701  062352                MOV     #T19BFR,R1              ;LOW RECV ADDRESS FOR CKMSG2
4040 052712  012702  060062                MOV     #T19EXP,R2              ;EXPD ADDRESS
4041 052716  012703  000024                MOV     #20.,R3                 ;NUMBER OF BYTES TO COMPARE
4042 052722  004737  011500                JSR     PC,CKMSG2               ;EXPD EQUAL RECV?
4043 052726                                FORCERROR       152$,NOTSSR     ;@@D
4044 052736  103404                        BCS     160$                    ;BR IF YES
4045 052740                                NEXT.ERRNO
4046 052740                        152$:   ERRHRD  ERRNO,T197CMP,MSGLOOP   ;REPORT ERROR
     052740  104456                                                                TRAP    C$ERHRD
     052742  001451                                                                .WORD   809
     052744  061303                                                                .WORD   T197CMP
     052746  013064                                                                .WORD   MSGLOOP
4047 052750                        160$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     052750  104406                                                                TRAP    C$CLP1
4048                               ; REPEAT FOR ALL TEST PATTERNS IN TSTBLK TABLE
4049 052752  005037  060014                CLR     T19PREV                 ;INIT 1-0 TRANSITION FLAG
4050 052756  012703  002752                MOV     #TSTBLK,R3              ;GET FIRST PATTERN ADDRESS
4051 052762  012300                200$:   MOV     (R3)+,R0                ;GET A TEST PATTERN
4052 052764  010337  002316                MOV     R3,TSTPTR               ;SAVE POINTER INTO TSTBLK
4053 052770  042700  000200                BIC     #WC.IFAD,R0             ;IFAD MUST  ALWAYS =0
4054 052774  042700  000100                BIC     #WC.IOTAD,R0            ;ITADO MUST ALWAYS =0
4055 053000  042700  000040                BIC     #WC.I1TAD,R0            ;ITAD1 MUST ALWAYS =0
4056 053004  010037  002312                MOV     R0,DATA                 ;SET DATA PATTERN
4057                               ;       Do Write Subsystem Write Control to Drive loopback signals group 1.
4058                               ;@@D    CALL T19CNVT TO SETUP WRITE CONTROL PATTERN
4059 053010  013700  002312                MOV     DATA,R0                 ;GET TEST PATTERN
4060 053014  004737  062264                JSR     PC,T19CNVT              ;CONVERT PATTERN TO CONTROL DRIVE MASK
4061                                                                       ;R0 CONTAINS WRITE CONTROL DATA HERE
4062 053020  004737  062142                JSR     PC,T19WCTL              ;SETUP PACKET FOR WRITE CONTROL
4063 053024  012704  062500                MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
4064 053030  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
4065 053034  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
4066 053040                                FORCERROR       212$                    ;@@DFORCE ERROR IF FORCER=1
4067 053054  103407                        BCS     220$                    ;BR IF CARRY SET (GOOD RETURN)
4068 053056  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4069 053060                                NEXT.ERRNO
4070 053060                        212$:   ERRDF   ERRNO,T197SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     053060  104455                                                                TRAP    C$ERDF
     053062  001452                                                                .WORD   810
     053064  060563                                                                .WORD   T197SSR
     053066  012046                                                                .WORD   PKTSSR
4071 053070  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
4072 053074                        220$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     053074  104406                                                                TRAP    C$CLP1
4073
4074                               ;       Do Write Subsystem Write Format to Drive loopback signals group 2.
4075                               ;@@D    CALL T19CNVT TO SETUP WRITE CONTROL PATTERN
4076 053076  013700  002312                MOV     DATA,R0                 ;GET TEST PATTERN
4077 053102  004737  062264                JSR     PC,T19CNVT              ;CONVERT PATTERN TO FORMAT DRIVE MASK
```

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4078 053106  000300                    SWAB    R0                      ;WRITE FORMAT DATA RETURNED IN HIGH BYTE
4079 053110  004737  062162            JSR     PC,T19WFMT              ;SETUP PACKET FOR WRITE FORMAT
4080 053114  012704  062500            MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
4081 053120  010465  000000            MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
4082 053124  004737  016336            JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
4083 053130                            FORCERROR       232$                    ;@@DFORCE ERROR IF FORCER=1
4084 053144  103407                    BCS     240$                    ;BR IF CARRY SET (GOOD RETURN)
4085 053146  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4086 053150                            NEXT.ERRNO
4087 053150                    232$:   ERRDF   ERRNO,T198SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     053150  104455                                                            TRAP    C$ERDF
     053152  001453                                                            .WORD   811
     053154  060632                                                            .WORD   T198SSR
     053156  012046                                                            .WORD   PKTSSR
4088 053160  005237  002222            INC     FATFLG                  ;SET FATAL ERROR FLAG
4089 053164                    240$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     053164  104406                                                            TRAP    C$CLP1
4090                           ;       Do a Write Subsystem READ STATUS
4091 053166  004737  062000            JSR     PC,T19SRD               ;SETUP PACKET FOR READ STATUS
4092 053172  012704  062500            MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
4093 053176  010465  000000            MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
4094 053202  004737  016336            JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
4095 053206                            FORCERROR       252$                    ;@@DFORCE ERROR IF FORCER=1
4096 053222  103407                    BCS     260$                    ;BR IF CARRY SET (GOOD RETURN)
4097 053224  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4098 053226                            NEXT.ERRNO
4099 053226                    252$:   ERRDF   ERRNO,T193SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     053226  104455                                                            TRAP    C$ERDF
     053230  001454                                                            .WORD   812
     053232  060344                                                            .WORD   T193SSR
     053234  012046                                                            .WORD   PKTSSR
4100 053236  005237  002222            INC     FATFLG                  ;SET FATAL ERROR FLAG
4101 053242                    260$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     053242  104406                                                            TRAP    C$CLP1
4102                           ;       If loopback data NOT= data sent Then Print Error
4103 053244  004737  062240            JSR     PC,T19SETEXP            ;SET WORDS 0-7 EXPD=RECV (NOT TESTING)
4104 053250  012701  060102            MOV     #T19EXSTA,R1            ;GET EXPECTED READ STATUS
4105 053254  012702  062372            MOV     #T19BFSTA,R2            ;GET RECV READ STATUS
4106 053260  013711  002312            MOV     DATA,(R1)               ;SET EXPD WORD #8 TO TEST DATA FIRST
4107 053264  013700  060014            MOV     T19PREV,R0              ;GET PREVIOUS DATA PATTERN
4108 053270  013703  002312            MOV     DATA,R3                 ;GET CURRENT PATTERN
4109 053274  012704  000400            MOV     #S1.IHER,R4             ;SETUP IHER EXPECTED
4110 053300  040411                    BIC     R4,(R1)                 ;SET EXPD IHER  =0
4111 053302  030400                    BIT     R4,R0                   ;PREVIOUS =1?
4112 053304  001403                    BEQ     275$                    ;BR IF NO
4113 053306  030403                    BIT     R4,R3                   ;CURRENT  =0?
4114 053310  001001                    BNE     275$                    ;BR IF NO
4115 053312  050411                    BIS     R4,(R1)                 ;SET EXPD IHER  =1
4116 053314  012704  001000    275$:   MOV     #S1.IFMK,R4             ;SETUP IFMK EXPECTED
4117 053320  040411                    BIC     R4,(R1)                 ;SET EXPD IFMK  =0
4118 053322  030400                    BIT     R4,R0                   ;PREVIOUS =1?
4119 053324  001403                    BEQ     280$                    ;BR IF NO
4120 053326  030403                    BIT     R4,R3                   ;CURRENT  =0?
4121 053330  001001                    BNE     280$                    ;BR IF NO
4122 053332  050411                    BIS     R4,(R1)                 ;SET EXPD IFMK  =1
4123 053334  012704  002000    280$:   MOV     #S1.ICER,R4             ;SETUP ICER EXPECTED
4124 053340  040411                    BIC     R4,(R1)                 ;SET EXPD ICER  =0
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4125 053342  030400                        BIT     R4,R0                   ;PREVIOUS =1?
4126 053344  001403                        BEQ     285$                    ;BR IF NO
4127 053346  030403                        BIT     R4,R3                   ;CURRENT  =0?
4128 053350  001001                        BNE     285$                    ;BR IF NO
4129 053352  050411                        BIS     R4,(R1)                 ;SET EXPD ICER  =1
4130 053354  011100                285$:   MOV     (R1),R0                 ;GET EXPD WORD
4131                                ;       If previous IIDENT=1 and current is IIDENT=1 then EXPD= 0 else 1
4132 053356  012704  004000                MOV     #S1.IIDENT,R4           ;IIDENT
4133 053362  050400                        BIS     R4,R0                   ;ASSUME EXPD=1
4134 053364  030437  060014                BIT     R4,T19PREV              ;PREVIOUS IIDENT=1?
4135 053370  001403                        BEQ     288$                    ;BR IF NO
4136 053372  030403                        BIT     R4,R3                   ;IS CURRENT IIDENT=1?
4137 053374  001401                        BEQ     288$                    ;BR IF NO
4138 053376  040400                        BIC     R4,R0                   ;SET EXPD=0
4139 053400  052700  040000          288$: BIS     #S1.I2RES,R0            ;IRESV2 EXPD ALWAYS=1
4140 053404  052700  020000                BIS     #S1.I1RES,R0            ;IRESV1 EXPD ALWAYS=1
4141 053410  042700  100000                BIC     #S1.PARERR,R0           ;IGNORE PARERR
4142 053414  032712  100000                BIT     #S1.PARERR,(R2)         ;IS PARERR SET IN RECV?
4143 053420  001402                        BEQ     290$                    ;BR IF NO
4144 053422  052700  100000                BIS     #S1.PARERR,R0           ;SET IN EXPD
4145 053426  010011                290$:   MOV     R0,(R1)                 ;SETUP FINAL EXPD IN WORD #8
4146 053430  016261  000002  000002        MOV     2(R2),2(R1)             ;SET EXPD WORD #9 = RECV (NOT TESTING)
4147 053436  005000                        CLR     R0                      ;HIGH RECV ADDRESS FOR CKMSG2
4148 053440  012701  062352                MOV     #T19BFR,R1              ;LOW RECV ADDRESS FOR CKMSG2
4149 053444  012702  060062                MOV     #T19EXP,R2              ;EXPD ADDRESS
4150 053450  012703  000024                MOV     #20.,R3                 ;NUMBER OF BYTES TO COMPARE
4151 053454  004737  011500                JSR     PC,CKMSG2               ;EXPD EQUAL RECV?
4152 053460                                FORCERROR       302$,NOTSSR     ;@@D
4153 053470  103404                        BCS     310$                    ;BR IF YES
4154 053472                                NEXT.ERRNO
4155 053472                        302$:   ERRHRD  ERRNO,T198CMP,MSGLOOP   ;REPORT ERROR
     053472  104456                                                        TRAP    C$ERHRD
     053474  001455                                                        .WORD   813
     053476  061371                                                        .WORD   T198CMP
     053500  013064                                                        .WORD   MSGLOOP
4156 053502                        310$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     053502  104406                                                        TRAP    C$CLP1
4157                               ;       Do a Write Subsystem Write Misc to Reset Tape Status F-FLOPS
4158 053504  004737  062020                JSR     PC,T19RSFIF             ;SETUP PKT FOR WRITE MISC Reset STATUS
4159 053510  012704  062500                MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
4160 053514  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
4161 053520  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
4162 053524                                FORCERROR       322$                    ;@@DFORCE ERROR IF FORCER=1
4163 053540  103407                        BCS     330$                    ;BR IF CARRY SET (GOOD RETURN)
4164 053542  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4165 053544                                NEXT.ERRNO
4166 053544                        322$:   ERRDF   ERRNO,T192SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     053544  104455                                                        TRAP    C$ERDF
     053546  001456                                                        .WORD   814
     053550  060300                                                        .WORD   T192SSR
     053552  012046                                                        .WORD   PKTSSR
4167 053554  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
4168 053560                        330$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     053560  104406                                                        TRAP    C$CLP1
4169                               ;       Do a Write Subsystem READ STATUS
4170 053562  004737  062000                JSR     PC,T19SRD               ;SETUP PACKET FOR READ STATUS
4171 053566  012704  062500                MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
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4172 053572  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
4173 053576  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
4174 053602                                FORCERROR       342$                    ;@@DFORCE ERROR IF FORCER=1
4175 053616  103407                        BCS     350$                    ;BR IF CARRY SET (GOOD RETURN)
4176 053620  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4177 053622                                NEXT.ERRNO
4178 053622                        342$:   ERRDF   ERRNO,T193SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     053622  104455                                                                TRAP    C$ERDF
     053624  001457                                                                .WORD   815
     053626  060344                                                                .WORD   T193SSR
     053630  012046                                                                .WORD   PKTSSR
4179 053632  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
4180 053636                        350$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     053636  104406                                                                TRAP    C$CLP1
4181 053640  004737  062240                JSR     PC,T19SETEXP            ;SET WORDS 0-7 EXPD=RECV (NOT TESTING)
4182 053644  012701  060102                MOV     #T19EXSTA,R1            ;GET EXPECTED READ STATUS
4183 053650  012702  062372                MOV     #T19BFSTA,R2            ;GET RECV READ STATUS
4184 053654  011211                        MOV     (R2),(R1)               ;SET EXPD WORD #8 = RECV TEMP
4185 053656  042711  002000                BIC     #S1.ICER,(R1)           ;SET EXPD ICER  =0
4186 053662  042711  001000                BIC     #S1.IFMK,(R1)           ;SET EXPD IFMK  =0
4187 053666  042711  000400                BIC     #S1.IHER,(R1)           ;SET EXPD IHER  =0
4188 053672  016261  000002  000002        MOV     2(R2),2(R1)             ;SET EXPD WORD #9 = RECV (NOT TESTING)
4189 053700  005000                        CLR     R0                      ;HIGH RECV ADDRESS FOR CKMSG2
4190 053702  012701  062352                MOV     #T19BFR,R1              ;LOW RECV ADDRESS FOR CKMSG2
4191 053706  012702  060062                MOV     #T19EXP,R2              ;EXPD ADDRESS
4192 053712  012703  000024                MOV     #20.,R3                 ;NUMBER OF BYTES TO COMPARE
4193 053716  004737  011500                JSR     PC,CKMSG2               ;EXPD EQUAL RECV?
4194 053722                                FORCERROR       362$,NOTSSR             ;@@D
4195 053732  103404                        BCS     370$                    ;BR IF YES
4196 053734                                NEXT.ERRNO
4197 053734                        362$:   ERRHRD  ERRNO,T197CMP,MSGSTAT   ;REPORT ERROR
     053734  104456                                                                TRAP    C$ERHRD
     053736  001460                                                                .WORD   816
     053740  061303                                                                .WORD   T197CMP
     053742  012350                                                                .WORD   MSGSTAT
4198 053744                        370$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     053744  104406                                                                TRAP    C$CLP1
4199
4200 053746  013737  002312  060014        MOV     DATA,T19PREV            ;SETUP PREVIOUS DATA FOR EXPD CALC.
4201 053754  013703  002316                MOV     TSTPTR,R3               ;RESTORE CURRENT TSTBLK POINTER
4202 053760  020327  003062                CMP     R3,#TBLEND              ;END OF TSTBLK?
4203 053764  103002                        BHIS    400$                    ;BR IF YES
4204 053766  000137  052762                JMP     200$                    ;DO NEXT TSTBLK PATTERN
4205 053772                        400$:
4206
4207 053772                                ENDSUB                          ;////////////// END SUBTEST //////////
     053772                                                                L10067:
     053772  104403                                                                TRAP    C$ESUB
4208
4209 053774  005737  002222                TST     FATFLG                  ;ANY FATAL ERRORS ?
4210 054000  001402                        BEQ     460$                    ;BRANCH IF NOT
4211 054002  004737  017202                JSR     PC,CKDROP               ;TRY TO DROP THE UNIT
4212 054006                        460$:
4213
4214
4215
4216
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                                        .SBTTL  TEST  8: SUBTEST 2: LOOPBACK READ/WRITE SIGNALS TEST

                                ;**
                                ; TEST 8: SUBTEST 2:
                                ;
                                ; SUBTEST DESCRIPTION:
                                ;
                                ;       This subtest verifies the Read/Write data loopback path.
                                ;       The Read/Write data signals are IR<7:0> and IW<7:0>
                                ;       respectively.
                                ;
                                ; TEST STEPS:
                                ;
                                ;
                                ;  REPEAT FOR ALL TEST PATTERNS IN TSTBLK TABLE
                                ;    BEGIN
                                ;       Write to TSSR register to soft initialize the controller
                                ;       Do WRITE CHARACTERISTICS to check for Extended Features Switch
                                ;       If Extended Features Hardware Switch Clear then:
                                ;         Do Write Subsystem Write Miscellaneous to Set Extended Features.
                                ;       Do WRITE CHARACTERISTICS to select reserved unit 7 and setup BUFFER
                                ;       Do a Write Subsystem WRITE NPR to set tape direction out and Loopback
                                ;       Do a WRITE NPR to set loopback and tape direction OUT
                                ;       Do a WRITE FIFO with byte count equal to 1 and Tape direction OUT
                                ;       Do a READ FIFO with tape direction OUT to load tape out write latch
                                ;       Do a WRITE NPR to set loopback and tape direction IN
                                ;       Do a WRITE FIFO with byte count equal to 1 and Tape direction IN
                                ;         to strobe loopback data into FIFO.
                                ;       Do a READ FIFO with tape direction IN to read data
                                ;       If Data read from FIFO NOT= to Data sent Then Print Error
                                ;       Do a Write Subsystem READ STATUS
                                ;       If Input Ready  NOT=1   Then Print Error
                                ;       If Output Ready NOT=0   Then Print Error
                                ;       If Data In Miss NOT=0   Then Print Error
                                ;    END
                                ;--
054006                                  BGNSUB                          ;////////////// BEGIN SUBTEST //////////
                                                                                        T8.2:
054006  104402                                                                  TRAP    C$BSUB
                                ;       Write to TSSR register to soft initialize the controller
                                5$:
054010  004737  015774                  JSR     PC,SOFINIT              ;WRITE TO TSSR TO SOFT INITIALIZE
054014  103405                          BCS     10$                     ;BR IF SOFT INIT OKAY
054016  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
054020                                  ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL DURING INIT
054020  104455                                                                  TRAP    C$ERDF
054022  001460                                                                  .WORD   816
054024  003652                                                                  .WORD   SFIERR
054026  012034                                                                  .WORD   SFIMSG
                                ;       Do WRITE CHARACTERISTICS to check for Extended Features Switch
054030  005037  002222          10$:    CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
054034  012704  062330                  MOV     #T19PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
054040  004737  010662                  JSR     PC,WRTCHR               ;DO WRITE CHARACTERISTICS COMMAND
054044                                  FORCERROR       12$                     ;@@DFORCE ERROR IF FORCER=1
054060  103407                          BCS     15$                     ;BR IF CARRY SET (GOOD RETURN)
054062  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
```

```
                                        NEXT.ERRNO
                                12$:    ERRDF   ERRNO,T19SSR,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
                                                                                TRAP    C$ERDF
                                                                                .WORD   817
                                                                                .WORD   T19SSR
                                                                                .WORD   PKTSSR
                                        INC     FATFLG                  ;SET FATAL ERROR FLAG
                                15$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
                                                                                TRAP    C$CLP1
                                ;       If Extended Features Hardware Switch Clear then:
                                ;         Do Write Subsystem Write Miscellaneous to Set Extended Features.
                                        MOV     #T19BFR,R1              ;MESSAGE BUFFER ADDRESS
                                        BIT     #X2.EXTF,XST2(R1)       ;EXTENDED FEATURES SWITCH SET?
                                        BNE     30$                     ;BR IF YES
                                        JSR     PC,T19SEXT              ;SETUP PACKET FOR WRITE MISC INVERT
                                        MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
                                        MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
                                        JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
                                        FORCERROR       22$                     ;@@DFORCE ERROR IF FORCER=1
                                        BCS     30$                     ;BR IF CARRY SET (GOOD RETURN)
                                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
                                        NEXT.ERRNO
                                22$:    ERRDF   ERRNO,T192SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
                                                                                TRAP    C$ERDF
                                                                                .WORD   818
                                                                                .WORD   T192SSR
                                                                                .WORD   PKTSSR
                                        INC     FATFLG                  ;SET FATAL ERROR FLAG
                                30$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
                                                                                TRAP    C$CLP1
                                ;       Do WRITE CHARACTERISTICS to select reserved unit 7
                                        MOV     #T19PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
                                        JSR     PC,WRTCHR               ;DO WRITE CHARACTERISTICS COMMAND
                                        FORCERROR       42$                     ;@@DFORCE ERROR IF FORCER=1
                                        BCS     50$                     ;BR IF CARRY SET (GOOD RETURN)
                                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
                                        NEXT.ERRNO
                                42$:    ERRDF   ERRNO,T19SSR,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
                                                                                TRAP    C$ERDF
                                                                                .WORD   819
                                                                                .WORD   T19SSR
                                                                                .WORD   PKTSSR
                                        INC     FATFLG                  ;SET FATAL ERROR FLAG
                                50$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
                                                                                TRAP    C$CLP1


                                ;  REPEAT FOR ALL TEST PATTERNS IN TSTBLK TABLE
                                        MOV     #TSTBLK,R3              ;GET FIRST PATTERN ADDRESS
                                100$:   MOV     (R3)+,DATA              ;GET A TEST PATTERN
                                        BIC     #^C<377>,DATA           ;DATA IS BYTE
                                        MOV     R3,TSTPTR               ;SETUP CURRENT TSTBLK POINTER

                                ;       Do a WRITE NPR to set loopback and tape direction OUT
                                        MOV     #NP.OUT,R0              ;SET TAPE DIRECTION OUT
                                        BIS     #NP.LOOP,R0             ;SET LOOPBACK
                                        JSR     PC,T19SNPR              ;SETUP T19PK2 FOR WRITE NPR
                                        MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
```

```
4310 054304  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
4311 054310  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
4312 054314                                FORCERROR       102$                    ;@@DFORCE ERROR IF FORCER=1
4313 054330  103407                        BCS     105$                    ;BR IF CARRY SET (GOOD RETURN)
4314 054332  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4315 054334                                NEXT.ERRNO
4316 054334                        102$:   ERRDF   ERRNO,T194SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     054334  104455                                                                TRAP    C$ERDF
     054336  001464                                                                .WORD   820
     054340  060411                                                                .WORD   T194SSR
     054342  012046                                                                .WORD   PKTSSR
4317 054344  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
4318 054350                        105$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     054350  104406                                                                TRAP    C$CLP1
4319
4320 054352  012700  000001        ;       Do a WRITE FIFO with byte count equal to 1 and Tape direction OUT
4321 054356  012701  002312                MOV     #1,R0                   ;WRITE 1 BYTE
4322 054362  004737  062106                MOV     #DATA,R1                ;FIFO WRITE DATA ADDRESS
4323 054366  012704  062500                JSR     PC,T19WFIF              ;SETUP T19PK2 FOR WRITE FIFO
4324 054372  010465  000000                MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
4325 054376  004737  016336                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
4326 054402                                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
4327 054416  103407                        FORCERROR       107$                    ;@@DFORCE ERROR IF FORCER=1
4328 054420  010001                        BCS     110$                    ;BR IF CARRY SET (GOOD RETURN)
4329 054422                                MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4330 054422                                NEXT.ERRNO
     054422  104455                107$:   ERRDF   ERRNO,T195SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     054424  001465                                                                TRAP    C$ERDF
     054426  060454                                                                .WORD   821
     054430  012046                                                                .WORD   T195SSR
4331 054432  005237  002222                                                        .WORD   PKTSSR
4332 054436                                INC     FATFLG                  ;SET FATAL ERROR FLAG
     054436  104406                110$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
4333                                                                               TRAP    C$CLP1
4334 054440  012700  000001        ;       Do a READ FIFO with tape direction OUT to load tape out write latch
4335 054444  004737  062066                MOV     #1,R0                   ;SET READ BYTE COUNT
4336 054450  012704  062500                JSR     PC,T19RFIF              ;SETUP T19PK2 FOR READ FIFO
4337 054454  010465  000000                MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
4338 054460  004737  016336                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
4339 054464                                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
4340 054500  103407                        FORCERROR       122$                    ;@@DFORCE ERROR IF FORCER=1
4341 054502  010001                        BCS     130$                    ;BR IF CARRY SET (GOOD RETURN)
4342 054504                                MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4343 054504                                NEXT.ERRNO
     054504  104455                122$:   ERRDF   ERRNO,T196SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     054506  001466                                                                TRAP    C$ERDF
     054510  060520                                                                .WORD   822
     054512  012046                                                                .WORD   T196SSR
4344 054514  005237  002222                                                        .WORD   PKTSSR
4345 054520                                INC     FATFLG                  ;SET FATAL ERROR FLAG
     054520  104406                130$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
4346                                                                               TRAP    C$CLP1
4347 054522  005000                ;       Do a WRITE NPR to set loopback and tape direction IN
4348 054524  052700  000040                CLR     R0                      ;CLR NP.OUT TO SET TAPE DIRECTION IN
4349 054530  004737  062042                BIS     #NP.LOOP,R0             ;SET LOOPBACK
4350 054534  012704  062500                JSR     PC,T19SNPR              ;SETUP T19PK2 FOR WRITE NPR
4351 054540  010465  000000                MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
                                           MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
```

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4352 054544  004737  016336          JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
4353 054550                          FORCERROR       142$                    ;@@DFORCE ERROR IF FORCER=1
4354 054564  103407                  BCS     150$                    ;BR IF CARRY SET (GOOD RETURN)
4355 054566  010001                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4356 054570                          NEXT.ERRNO
4357 054570                  142$:   ERRDF   ERRNO,T194SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     054570  104455                                                          TRAP    C$ERDF
     054572  001467                                                          .WORD   823
     054574  060411                                                          .WORD   T194SSR
     054576  012046                                                          .WORD   PKTSSR
4358 054600  005237  002222          INC     FATFLG                  ;SET FATAL ERROR FLAG
4359 054604                  150$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     054604  104406                                                          TRAP    C$CLP1
4360
4361 054606  012700  000001          ;       Do a WRITE FIFO with byte count equal to 1 and Tape direction IN
4362 054612  012701  002312          MOV     #1,R0                   ;WRITE 1 BYTE
4363 054616  004737  062106          MOV     #DATA,R1                ;FIFO WRITE DATA ADDRESS
4364 054622  012704  062500          JSR     PC,T19WFIF              ;SETUP T19PK2 FOR WRITE FIFO
4365 054626  010465  000000          MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
4366 054632  004737  016336          MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
4367 054636                          JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
4368 054652  103407                  FORCERROR       162$                    ;@@DFORCE ERROR IF FORCER=1
4369 054654  010001                  BCS     170$                    ;BR IF CARRY SET (GOOD RETURN)
4370 054656                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4371 054656                          NEXT.ERRNO
     054656  104455                  162$:   ERRDF   ERRNO,T195SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     054660  001470                                                          TRAP    C$ERDF
     054662  060454                                                          .WORD   824
     054664  012046                                                          .WORD   T195SSR
4372 054666  005237  002222                                                  .WORD   PKTSSR
4373 054672                          INC     FATFLG                  ;SET FATAL ERROR FLAG
     054672  104406          170$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
4374                                                                         TRAP    C$CLP1
4375                                 ;       Do a READ FIFO with tape direction IN to read data
4376 054674  012700  000001          ;       If Data read from FIFO NOT= to Data sent Then Print Error
4377 054700  004737  062066          MOV     #1,R0                   ;SET READ BYTE COUNT
4378 054704  012704  062500          JSR     PC,T19RFIF              ;SETUP T19PK2 FOR READ FIFO
4379 054710  010465  000000          MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
4380 054714  004737  016336          MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
4381 054720                          JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
4382 054734  103407                  FORCERROR       182$                    ;@@DFORCE ERROR IF FORCER=1
4383 054736  010001                  BCS     190$                    ;BR IF CARRY SET (GOOD RETURN)
4384 054740                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4385 054740                          NEXT.ERRNO
     054740  104455          182$:   ERRDF   ERRNO,T196SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     054742  001471                                                          TRAP    C$ERDF
     054744  060520                                                          .WORD   825
     054746  012046                                                          .WORD   T196SSR
4386 054750  005237  002222                                                  .WORD   PKTSSR
4387 054754                          INC     FATFLG                  ;SET FATAL ERROR FLAG
     054754  104406          190$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
4388 054756  004737  062240                                                  TRAP    C$CLP1
4389 054762  012701  060102          JSR     PC,T19SETEXP            ;SET WORDS 0-7 EXPD=RECV (NOT TESTING)
4390 054766  012702  062372          MOV     #T19EXSTA,R1            ;GET EXPECTED READ STATUS
4391 054772  013711  002312          MOV     #T19BFSTA,R2            ;GET RECV READ STATUS
4392 054776  016261  000002  000002  MOV     DATA,(R1)               ;SET EXPD WORD #8 = DATA
4393 055004  005000                  MOV     2(R2),2(R1)             ;SET EXPD WORD #9 = RECV (NOT TESTING)
                                     CLR     R0                      ;HIGH RECV ADDRESS FOR CKMSG2
```

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4394 055006  012701  062352          MOV     #T19BFR,R1              ;LOW RECV ADDRESS FOR CKMSG2
4395 055012  012702  060062          MOV     #T19EXP,R2              ;EXPD ADDRESS
4396 055016  012703  000022          MOV     #18.,R3                 ;NUMBER OF BYTES TO COMPARE
4397 055022  004737  011500          JSR     PC,CKMSG2               ;EXPD EQUAL RECV?
4398 055026                          FORCERROR       202$,NOTSSR     ;@@D
4399 055036  103404                  BCS     210$                    ;BR IF YES
4400 055040                          NEXT.ERRNO
4401 055040                  202$:   ERRHRD  ERRNO,T199CMP,MSGSUB    ;REPORT ERROR
     055040  104456                                                          TRAP    C$ERHRD
     055042  001472                                                          .WORD   826
     055044  061460                                                          .WORD   T199CMP
     055046  013742                                                          .WORD   MSGSUB
4402 055050                  210$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     055050  104406                                                          TRAP    C$CLP1
4403                                 ;       Do a Write Subsystem READ STATUS
4404                                 ;       If Input Ready  NOT=1   Then Print Error
4405                                 ;       If Output Ready NOT=0   Then Print Error
4406                                 ;       If Data In Miss NOT=0   Then Print Error
4407 055052  004737  062000          JSR     PC,T19SRD               ;SETUP PACKET FOR READ STATUS
4408 055056  012704  062500          MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
4409 055062  010465  000000          MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
4410 055066  004737  016336          JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
4411 055072                          FORCERROR       212$                    ;@@DFORCE ERROR IF FORCER=1
4412 055106  103407                  BCS     220$                    ;BR IF CARRY SET (GOOD RETURN)
4413 055110  010001                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4414 055112                          NEXT.ERRNO
4415 055112                  212$:   ERRDF   ERRNO,T193SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     055112  104455                                                          TRAP    C$ERDF
     055114  001473                                                          .WORD   827
     055116  060344                                                          .WORD   T193SSR
     055120  012046                                                          .WORD   PKTSSR
4416 055122  005237  002222          INC     FATFLG                  ;SET FATAL ERROR FLAG
4417 055126                  220$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     055126  104406                                                          TRAP    C$CLP1
4418 055130  004737  062240          JSR     PC,T19SETEXP            ;SET WORDS 0-7 EXPD=RECV (NOT TESTING)
4419 055134  012701  060102          MOV     #T19EXSTA,R1            ;GET EXPECTED READ STATUS
4420 055140  012702  062372          MOV     #T198FSTA,R2            ;GET RECV READ STATUS
4421 055144  012221                  MOV     (R2)+,(R1)+             ;SET EXPD WORD #8 = RECV TEMP
4422 055146  011211                  MOV     (R2),(R1)               ;SET EXPD WORD #9 = RECV TEMP
4423 055150  052711  000020          BIS     #S2.INRDY,(R1)          ;SET EXP INPUT READY= 1
4424 055154  042711  000040          BIC     #S2.OUTRDY,(R1)         ;SET EXP OUTPUT READY= 0
4425 055160  042711  000200          BIC     #S2.DIM,(R1)            ;SET EXP DATA IN MISS = 0
4426 055164  005000                  CLR     R0                      ;HIGH RECV ADDRESS FOR CKMSG2
4427 055166  012701  062352          MOV     #T198FR,R1              ;LOW RECV ADDRESS FOR CKMSG2
4428 055172  012702  060062          MOV     #T19EXP,R2              ;EXPD ADDRESS
4429 055176  012703  000024          MOV     #20.,R3                 ;NUMBER OF BYTES TO COMPARE
4430 055202  004737  011500          JSR     PC,CKMSG2               ;EXPD EQUAL RECV?
4431 055206                          FORCERROR       232$,NOTSSR     ;@@D
4432 055216  103404                  BCS     240$                    ;BR IF YES
4433 055220                          NEXT.ERRNO
4434 055220                  232$:   ERRHRD  ERRNO,T196CMP,MSGSTAT   ;REPORT ERROR
     055220  104456                                                          TRAP    C$ERHRD
     055222  001474                                                          .WORD   828
     055224  061220                                                          .WORD   T196CMP
     055226  012350                                                          .WORD   MSGSTAT
4435 055230                  240$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     055230  104406                                                          TRAP    C$CLP1
```

```
                                        FORCEXIT        255$            ;@@D
055242  013703  002316                MOV     TSTPTR,R3               ;RESTORE CURRENT TSTBLK POINTER
055246  020327  003062                CMP     R3,@TBLEND              ;END OF TSTBLK?
055252  103002                        BHIS    255$                    ;BR IF YES
055254  000137  054246                JMP     100$                    ;DO ANOTHER TSTBLK PATTERN
055260                          255$:
                                        ENDSUB                          ;////////////// END SUBTEST //////////
055260                                                                                  L10070:
055260  104403                                                                                  TRAP    C$ESUB
055262  005737  002222                TST     FATFLG                  ;ANY FATAL ERRORS ?
055266  001402                        BEQ     260$                    ;BRANCH IF NOT
055270  004737  017202                JSR     PC,CKDROP               ;TRY TO DROP THE UNIT
055274                          260$:


                                        .SBTTL  TEST  8: SUBTEST 3: LOOPBACK WRITE STROBE TEST

                                ;++
                                ; TEST 8: SUBTEST 3:
                                ;
                                ; SUBTEST DESCRIPTION:
                                ;
                                ;       This subtest verifies the Write Strobe loopback path
                                ;       can strobe data from the FIFO to the Data lines.
                                ;       The signal IRESV3 drives IWSTR (write strobe) to write
                                ;       data from the FIFO to the tape data out latch.
                                ;
                                ; TEST STEPS:
                                ;
                                ;
                                ;  REPEAT FOR ALL TEST PATTERNS IN TSTBLK TABLE
                                ;    BEGIN
                                ;       Write to TSSR register to soft initialize the controller
                                ;       Do WRITE CHARACTERISTICS to check for Extended Features Switch
                                ;       If Extended Features Hardware Switch Clear then:
                                ;         Do Write Subsystem Write Miscellaneous to Set Extended Features.
                                ;       Do WRITE CHARACTERISTICS to select reserved unit 7 and setup BUFFER
                                ;       Do a Write Subsystem WRITE NPR to set tape direction out and Loopback
                                ;       Do a WRITE NPR to set loopback and tape direction OUT
                                ;       Do a WRITE FORMAT to set IRESV3==>IWSTR = 1
                                ;       Do a WRITE FIFO with byte count equal to 1 and Tape direction OUT
                                ;       Do a WRITE FORMAT to set IRESV3==>IWSTR = 0 to load write data latch
                                ;       Do a WRITE FORMAT to set IRESV3==>IWSTR = 1
                                ;       Do a WRITE NPR to set loopback and tape direction IN
                                ;       Do a WRITE FIFO with byte count equal to 1 and Tape direction IN
                                ;         to strobe loopback data into FIFO.
                                ;       Do a READ FIFO with tape direction IN to read data
                                ;       If Data read from FIFO NOT= to Data sent Then Print Error
                                ;    END
                                ;--
055274                                  BGNSUB                          ;////////////// BEGIN SUBTEST //////////
055274                                                                                  T8.3:
```

```
055274  104402                                                                    TRAP     C$BSUB
                                     ;      Write to TSSR register to soft initialize the controller
055276                               5$:
055276  004737  015774                      JSR     PC,SOFTINIT                     ;WRITE TO TSSR TO SOFT INITIALIZE
055302  103405                              BCS     10$                             ;BR IF SOFT INIT OKAY
055304  010001                              MOV     R0,R1                           ;SAVE CONTENTS OF TSSR
055306                                      ERRDF   ERRNO,SFIERR,SFIMSG             ;DEVICE FATAL DURING INIT
055306  104455                                                                    TRAP     C$ERDF
055310  001474                                                                    .WORD    828
055312  003652                                                                    .WORD    SFIERR
055314  012034                                                                    .WORD    SFIMSG
                                     ;      Do WRITE CHARACTERISTICS to check for Extended Features Switch
055316  005037  002222               10$:   CLR     FATFLG                          ;CLEAR FATAL ERROR FLAG
055322  012704  062330                      MOV     #T19PACKET,R4                   ;GET THE ADDRESS OF COMMAND PACKET
055326  004737  010662                      JSR     PC,WRTCHR                       ;DO WRITE CHARACTERISTICS COMMAND
055332                                      FORCERROR       12$                         ,@@DFORCE ERROR IF FORCER=1
055346  103407                              BCS     15$                             ;BR IF CARRY SET (GOOD RETURN)
055350  010001                              MOV     R0,R1                           ;SAVE CONTENTS OF TSSR
055352                                      NEXT.ERRNO
055352                               12$:   ERRDF   ERRNO,T19SSR,PKTSSR             ;DEVICE FATAL SSR FAILED TO SET
055352  104455                                                                    TRAP     C$ERDF
055354  001475                                                                    .WORD    829
055356  060243                                                                    .WORD    T19SSR
055360  012046                                                                    .WORD    PKTSSR
055362  005237  002222                      INC     FATFLG                          ;SET FATAL ERROR FLAG
055366                               15$:   CKLOOP                                  ;LOOP ON ERROR, IF FLAG SET
055366  104406                                                                    TRAP     C$CLP1
                                     ;      If Extended Features Hardware Switch Clear then:
                                     ;        Do Write Subsystem Write Miscellaneous to Set Extended Features.
055370  012701  062352                      MOV     #T19BFR,R1                      ;MESSAGE BUFFER ADDRESS
055374  032761  000200  000012              BIT     #X2.EXTF,XST2(R1)               ;EXTENDED FEATURES SWITCH SET?
055402  001026                              BNE     30$                             ;BR IF YES
055404  004737  062202                      JSR     PC,T19SEXT                      ;SETUP PACKET FOR WRITE MISC INVERT
055410  012704  062500                      MOV     #T19PK2,R4                      ;GET WRITE SUBSYSTEM COMMAND PACKET
055414  010465  000000                      MOV     R4,TSDB(R5)                     ;SET THE PACKET ADDRESS TO EXECUTE
055420  004737  016336                      JSR     PC,CHKTSSR                      ;WAIT FOR SSR TO SET
055424                                      FORCERROR       22$                         ;@@DFORCE ERROR IF FORCER=1
055440  103407                              BCS     30$                             ;BR IF CARRY SET (GOOD RETURN)
055442  010001                              MOV     R0,R1                           ;SAVE CONTENTS OF TSSR
055444                                      NEXT.ERRNO
055444                               22$:   ERRDF   ERRNO,T192SSR,PKTSSR            ;DEVICE FATAL SSR FAILED TO SET
055444  104455                                                                    TRAP     C$ERDF
055446  001476                                                                    .WORD    830
055450  060300                                                                    .WORD    T192SSR
055452  012046                                                                    .WORD    PKTSSR
055454  005237  002222                      INC     FATFLG                          ;SET FATAL ERROR FLAG
055460                               30$:   CKLOOP                                  ;LOOP ON ERROR, IF FLAG SET
055460  104406                                                                    TRAP     C$CLP1
                                     ;      Do WRITE CHARACTERISTICS to select reserved unit 7
055462  012704  062330                      MOV     #T19PACKET,R4                   ;GET THE ADDRESS OF COMMAND PACKET
055466  004737  010662                      JSR     PC,WRTCHR                       ;DO WRITE CHARACTERISTICS COMMAND
055472                                      FORCERROR       42$                         ;@@DFORCE ERROR IF FORCER=1
055506  103407                              BCS     50$                             ;BR IF CARRY SET (GOOD RETURN)
055510  010001                              MOV     R0,R1                           ;SAVE CONTENTS OF TSSR
055512                                      NEXT.ERRNO
055512                               42$:   ERRDF   ERRNO,T19SSR,PKTSSR             ;DEVICE FATAL SSR FAILED TO SET
055512  104455                                                                    TRAP     C$ERDF
```

```
                                                                                .WORD   831
                                                                                .WORD   T19SSR
                                                                                .WORD   PKTSSR
4531 055522  005237  002222                INC     FATFLG                      ;SET FATAL ERROR FLAG
4532 055526                          50$:   CKLOOP                              ;LOOP ON ERROR, IF FLAG SET
     055526  104406                                                            TRAP    C$CLP1
4533
4534                                 ;  REPEAT FOR ALL TEST PATTERNS IN TSTBLK TABLE
4535 055530  012703  002752                MOV     #TSTBLK,R3                  ;GET FIRST PATTERN ADDRESS
4536 055534  012337  002312          100$: MOV     (R3)+,DATA                  ;GET A TEST PATTERN
4537 055540  042737  177400  002312        BIC     #^C<377>,DATA               ;DATA IS BYTE
4538 055546  010337  002316                MOV     R3,TSTPTR                   ;SETUP CURRENT TSTBLK POINTER
4539                                 ;      Do a WRITE NPR to set loopback and tape direction OUT
4540 055552  012700  000100                MOV     #NP.OUT,R0                  ;SET TAPE DIRECTION OUT
4541 055556  052700  000040                BIS     #NP.LOOP,R0                 ;SET LOOPBACK
4542 055562  004737  062042                JSR     PC,T19SNPR                  ;SETUP T19PK2 FOR WRITE NPR
4543 055566  012704  062500                MOV     #T19PK2,R4                  ;GET WRITE SUBSYSTEM COMMAND PACKET
4544 055572  010465  000000                MOV     R4,TSDB(R5)                 ;SET THE PACKET ADDRESS TO EXECUTE
4545 055576  004737  016336                JSR     PC,CHKTSSR                  ;WAIT FOR SSR TO SET
4546 055602                                FORCERROR       102$                        ;@@DFORCE ERROR IF FORCER=1
4547 055616  103407                        BCS     105$                        ;BR IF CARRY SET (GOOD RETURN)
4548 055620  010001                        MOV     R0,R1                       ;SAVE CONTENTS OF TSSR
4549 055622                                NEXT.ERRNO
4550 055622                          102$: ERRDF   ERRNO,T194SSR,PKTSSR        ;DEVICE FATAL SSR FAILED TO SET
     055622  104455                                                            TRAP    C$ERDF
     055624  001500                                                            .WORD   832
     055626  060411                                                            .WORD   T194SSR
     055630  012046                                                            .WORD   PKTSSR
4551 055632  005237  002222                INC     FATFLG                      ;SET FATAL ERROR FLAG
4552 055636                          105$: CKLOOP                              ;LOOP ON ERROR, IF FLAG SET
     055636  104406                                                            TRAP    C$CLP1
4553                                 ;      Do a WRITE FORMAT to set IRESV3==>IWSTR = 1
4554 055640  012700  000002                MOV     #WF.I3RES,R0                ;IRESV3==>IWSTR=1
4555 055644  004737  062162                JSR     PC,T19WFMT                  ;SETUP T9PK2 FOR WRITE FORMAT
4556 055650  012704  062500                MOV     #T19PK2,R4                  ;GET WRITE SUBSYSTEM COMMAND PACKET
4557 055654  010465  000000                MOV     R4,TSDB(R5)                 ;SET THE PACKET ADDRESS TO EXECUTE
4558 055660  004737  016336                JSR     PC,CHKTSSR                  ;WAIT FOR SSR TO SET
4559 055664                                FORCERROR       112$                        ;@@DFORCE ERROR IF FORCER=1
4560 055700  103407                        BCS     120$                        ;BR IF CARRY SET (GOOD RETURN)
4561 055702  010001                        MOV     R0,R1                       ;SAVE CONTENTS OF TSSR
4562 055704                                NEXT.ERRNO
4563 055704                          112$: ERRDF   ERRNO,T198SSR,PKTSSR        ;DEVICE FATAL SSR FAILED TO SET
     055704  104455                                                            TRAP    C$ERDF
     055706  001501                                                            .WORD   833
     055710  060632                                                            .WORD   T198SSR
     055712  012046                                                            .WORD   PKTSSR
4564 055714  005237  002222                INC     FATFLG                      ;SET FATAL ERROR FLAG
4565 055720                          120$: CKLOOP                              ;LOOP ON ERROR, IF FLAG SET
     055720  104406                                                            TRAP    C$CLP1
4566                                 ;      Do a WRITE FIFO with byte count equal to 1 and Tape direction OUT
4567 055722  012700  000001                MOV     #1,R0                       ;WRITE 1 BYTE
4568 055726  012701  002312                MOV     #DATA,R1                    ;FIFO WRITE DATA ADDRESS
4569 055732  004737  062106                JSR     PC,T19WFIF                  ;SETUP T19PK2 FOR WRITE FIFO
4570 055736  012704  062500                MOV     #T19PK2,R4                  ;GET WRITE SUBSYSTEM COMMAND PACKET
4571 055742  010465  000000                MOV     R4,TSDB(R5)                 ;SET THE PACKET ADDRESS TO EXECUTE
4572 055746  004737  016336                JSR     PC,CHKTSSR                  ;WAIT FOR SSR TO SET
4573 055752                                FORCERROR       132$                        ;@@DFORCE ERROR IF FORCER=1
```

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4574 055766  103407                    BCS     140$                    ;BR IF CARRY SET (GOOD RETURN)
4575 055770  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4576 055772                            NEXT.ERRNO
4577 055772                    132$:   ERRDF   ERRNO,T195SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     055772  104455                                                            TRAP    C$ERDF
     055774  001502                                                            .WORD   834
     055776  060454                                                            .WORD   T195SSR
     056000  012046                                                            .WORD   PKTSSR
4578 056002  005237  002222            INC     FATFLG                  ;SET FATAL ERROR FLAG
4579 056006                    140$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     056006  104406                                                            TRAP    C$CLP1
4580                           ;       Do a WRITE FORMAT to set IRESV3==>IWSTR = 0
4581 056010  005000            CLR     R0                              ;SET IRESV3==>IWSTR=0
4582 056012  004737  062162    JSR     PC,T19WFMT                      ;SETUP T9PK2 FOR WRITE FORMAT
4583 056016  012704  062500    MOV     #T19PK2,R4                      ;GET WRITE SUBSYSTEM COMMAND PACKET
4584 056022  010465  000000    MOV     R4,TSDB(R5)                     ;SET THE PACKET ADDRESS TO EXECUTE
4585 056026  004737  016336    JSR     PC,CHKTSSR                      ;WAIT FOR SSR TO SET
4586 056032                    FORCERROR       152$                            ;@@DFORCE ERROR IF FORCER=1
4587 056046  103407            BCS     160$                            ;BR IF CARRY SET (GOOD RETURN)
4588 056050  010001            MOV     R0,R1                           ;SAVE CONTENTS OF TSSR
4589 056052                    NEXT.ERRNO
4590 056052                    152$:   ERRDF   ERRNO,T198SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     056052  104455                                                            TRAP    C$ERDF
     056054  001503                                                            .WORD   835
     056056  060632                                                            .WORD   T198SSR
     056060  012046                                                            .WORD   PKTSSR
4591 056062  005237  002222            INC     FATFLG                  ;SET FATAL ERROR FLAG
4592 056066                    160$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     056066  104406                                                            TRAP    C$CLP1
4593                           ;       Do a WRITE FORMAT to set IRESV3==>IWSTR = 1
4594 056070  012700  000002            MOV     #WF.I3RES,R0            ;IRESV3==>IWSTR=1
4595 056074  004737  062162    JSR     PC,T19WFMT                      ;SETUP T9PK2 FOR WRITE FORMAT
4596 056100  012704  062500    MOV     #T19PK2,R4                      ;GET WRITE SUBSYSTEM COMMAND PACKET
4597 056104  010465  000000    MOV     R4,TSDB(R5)                     ;SET THE PACKET ADDRESS TO EXECUTE
4598 056110  004737  016336    JSR     PC,CHKTSSR                      ;WAIT FOR SSR TO SET
4599 056114                    FORCERROR       172$                            ;@@DFORCE ERROR IF FORCER=1
4600 056130  103407            BCS     180$                            ;BR IF CARRY SET (GOOD RETURN)
4601 056132  010001            MOV     R0,R1                           ;SAVE CONTENTS OF TSSR
4602 056134                    NEXT.ERRNO
4603 056134                    172$:   ERRDF   ERRNO,T198SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     056134  104455                                                            TRAP    C$ERDF
     056136  001504                                                            .WORD   836
     056140  060632                                                            .WORD   T198SSR
     056142  012046                                                            .WORD   PKTSSR
4604 056144  005237  002222            INC     FATFLG                  ;SET FATAL ERROR FLAG
4605 056150                    180$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     056150  104406                                                            TRAP    C$CLP1
4606
4607                           ;       Do a WRITE NPR to set loopback and tape direction IN
4608 056152  005000            CLR     R0                              ;CLR NP.OUT TO SET TAPE DIRECTION IN
4609 056154  052700  000040    BIS     #NP.LOOP,R0                     ;SET LOOPBACK
4610 056160  004737  062042    JSR     PC,T19SNPR                      ;SETUP T19PK2 FOR WRITE NPR
4611 056164  012704  062500    MOV     #T19PK2,R4                      ;GET WRITE SUBSYSTEM COMMAND PACKET
4612 056170  010465  000000    MOV     R4,TSDB(R5)                     ;SET THE PACKET ADDRESS TO EXECUTE
4613 056174  004737  016336    JSR     PC,CHKTSSR                      ;WAIT FOR SSR TO SET
4614 056200                    FORCERROR       182$                            ;@@DFORCE ERROR IF FORCER=1
4615 056214  103407            BCS     190$                            ;BR IF CARRY SET (GOOD RETURN)
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                                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
                                        NEXT.ERRNO
                                182$:   ERRDF   ERRNO,T194SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
056220  104455                                                                    TRAP    C$ERDF
056222  001505                                                                    .WORD   837
056224  060411                                                                    .WORD   T194SSR
056226  012046                                                                    .WORD   PKTSSR
                                        INC     FATFLG                  ;SET FATAL ERROR FLAG
                                190$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
056234  104406                                                                    TRAP    C$CLP1
                                ;       Do a WRITE FIFO with byte count equal to 1 and Tape direction IN
056236  012700  000001                MOV     #1,R0                   ;WRITE 1 BYTE
056242  012701  002312                MOV     #DATA,R1                ;FIFO WRITE DATA ADDRESS
056246  004737  062106                JSR     PC,T19WFIF              ;SETUP T19PK2 FOR WRITE FIFO
056252  012704  062500                MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
056256  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
056262  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
056266                                FORCERROR       202$                    ;@@DFORCE ERROR IF FORCER=1
056302  103407                        BCS     210$                    ;BR IF CARRY SET (GOOD RETURN)
056304  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
056306                                NEXT.ERRNO
                                202$:   ERRDF   ERRNO,T195SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
056306  104455                                                                    TRAP    C$ERDF
056310  001506                                                                    .WORD   838
056312  060454                                                                    .WORD   T195SSR
056314  012046                                                                    .WORD   PKTSSR
056316  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
                                210$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
056322  104406                                                                    TRAP    C$CLP1
                                ;       Do a READ FIFO with tape direction IN to read data
056324  012700  000001                MOV     #1,R0                   ;SET READ BYTE COUNT
056330  004737  062066                JSR     PC,T19RFIF              ;SETUP T19PK2 FOR READ FIFO
056334  012704  062500                MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
056340  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
056344  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
056350                                FORCERROR       222$                    ;@@DFORCE ERROR IF FORCER=1
056364  103407                        BCS     230$                    ;BR IF CARRY SET (GOOD RETURN)
056366  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
056370                                NEXT.ERRNO
                                222$:   ERRDF   ERRNO,T196SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
056370  104455                                                                    TRAP    C$ERDF
056372  001507                                                                    .WORD   839
056374  060520                                                                    .WORD   T196SSR
056376  012046                                                                    .WORD   PKTSSR
056400  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
                                230$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
056404  104406                                                                    TRAP    C$CLP1
                                ;       If Data read from FIFO NOT= to Data sent Then Print Error
056406  004737  062240                JSR     PC,T19SETEXP            ;SET WORDS 0-7 EXPD=RECV (NOT TESTING)
056412  012701  060102                MOV     #T19EXSTA,R1            ;GET EXPECTED READ STATUS
056416  012702  062372                MOV     #T19BFSTA,R2            ;GET RECV READ STATUS
056422  013711  002312                MOV     DATA,(R1)               ;SET EXPD WORD #8 = DATA
056426  016261  000002  000002        MOV     2(R2),2(R1)             ;SET EXPD WORD #9 = RECV (NOT TESTING)
056434  005000                        CLR     R0                      ;HIGH RECV ADDRESS FOR CKMSG2
056436  012701  062352                MOV     #T19BFR,R1              ;LOW RECV ADDRESS FOR CKMSG2
056442  012702  060062                MOV     #T19EXP,R2              ;EXPD ADDRESS
056446  012703  000022                MOV     #18.,R3                 ;NUMBER OF BYTES TO COMPARE
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4658 056452  004737  011500                JSR     PC,CKMSG2               ;EXPD EQUAL RECV?
4659 056456                                FORCERROR       242$,NOTSSR     ;@@D
4660 056466  103404                        BCS     250$                    ;BR IF YES
4661 056470                                NEXT.ERRNO
4662 056470                        242$:   ERRHRD  ERRNO,T19WSTR,MSGSUB    ;REPORT ERROR
     056470  104456                                                        TRAP    C$ERHRD
     056472  001510                                                        .WORD   840
     056474  061543                                                        .WORD   T19WSTR
     056476  013742                                                        .WORD   MSGSUB
4663 056500                        250$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     056500  104406                                                        TRAP    C$CLP1
4664
4665
4666 056502                                FORCEXIT        255$            ;@@D
4667 056512  013703  002316                MOV     TSTPTR,R3               ;RESTORE CURRENT TSTBLK POINTER
4668 056516  020327  003062                CMP     R3,#TBLEND              ;END OF TSTBLK?
4669 056522  103002                        BHIS    255$                    ;BR IF YES
4670 056524  000137  055534                JMP     100$                    ;DO ANOTHER TSTBLK PATTERN
4671 056530                        255$:
4672
4673 056530                                ENDSUB                          ;////////////// END SUBTEST //////////
     056530                                                                L10071:
     056530  104403                                                        TRAP    C$ESUB
4674
4675 056532  005737  002222                TST     FATFLG                  ;ANY FATAL ERRORS ?
4676 056536  001402                        BEQ     260$                    ;BRANCH IF NOT
4677 056540  004737  017202                JSR     PC,CKDROP               ;TRY TO DROP THE UNIT
4678 056544                        260$:
4679                                       .SBTTL  TEST  8: SUBTEST 4 LOOPBACK READ STROBE TEST
4680
4681                                       ;++
4682                                       ; TEST 8: SUBTEST 4:
4683                                       ;
4684                                       ; SUBTEST DESCRIPTION:
4685                                       ;
4686                                       ;       This subtest verifies the Read Strobe loopback path
4687                                       ;       can strobe the data from the Data lines to the FIFO.
4688                                       ;       The signal IRESV4 drives IRSTR (read strobe) to write
4689                                       ;       from the data lines to the FIFO.
4690                                       ;
4691                                       ; TEST STEPS:
4692                                       ;
4693                                       ;
4694                                       ;  REPEAT FOR ALL TEST PATTERNS IN TSTBLK TABLE
4695                                       ;    BEGIN
4696                                       ;       Write to TSSR register to soft initialize the controller
4697                                       ;       Do WRITE CHARACTERISTICS to check for Extended Features Switch
4698                                       ;       If Extended Features Hardware Switch Clear then:
4699                                       ;         Do Write Subsystem Write Miscellaneous to Set Extended Features.
4700                                       ;       Do WRITE CHARACTERISTICS to select reserved unit 7 and setup BUFFER
4701                                       ;       Do a Write Subsystem WRITE NPR to set tape direction out and Loopback
4702                                       ;       Do a WRITE NPR to set loopback and tape direction OUT
4703                                       ;       Do a WRITE FORMAT to set IRESV4==>IRSTR = 1
4704                                       ;       Do a WRITE FIFO with byte count equal to 1 and Tape direction OUT
4705                                       ;       Do a READ FIFO with tape direction OUT to load tape out write latch
4706                                       ;       Do a WRITE NPR to set loopback and tape direction IN
4707                                       ;       Do a WRITE FORMAT to set IRESV4==>IRSTR = 0 to write loop data to FIFO
```

```
                                        ;       Do a WRITE FORMAT to set IRESV4==>IRSTR = 1
                                        ;         (to strobe loopback data into FIFO.)
                                        ;       Do a READ FIFO with tape direction IN to read data
                                        ;       If Data read from FIFO NOT= to Data sent Then Print Error
                                        ;   END
                                        ;--
056544                                          BGNSUB                          ;////////////// BEGIN SUBTEST //////////
056544                                                                                  T8.4:
056544  104402                                                                          TRAP    C$BSUB
                                        ;       Write to TSSR register to soft initialize the controller
056546                                  5$:
056546  004737  015774                          JSR     PC,SOFINIT              ;WRITE TO TSSR TO SOFT INITIALIZE
056552  103405                                  BCS     10$                     ;BR IF SOFT INIT OKAY
056554  010001                                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
056556                                          ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL DURING INIT
056556  104455                                                                          TRAP    C$ERDF
056560  001510                                                                          .WORD   840
056562  003652                                                                          .WORD   SFIERR
056564  012034                                                                          .WORD   SFIMSG
                                        ;       Do WRITE CHARACTERISTICS to check for Extended Features Switch
056566  005037  002222                  10$:    CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
056572  012704  062330                          MOV     #T19PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
056576  004737  010662                          JSR     PC,WRTCHR               ;DO WRITE CHARACTERISTICS COMMAND
056602                                          FORCERROR       12$                     ;@@DFORCE ERROR IF FORCER=1
056616  103407                                  BCS     15$                     ;BR IF CARRY SET (GOOD RETURN)
056620  010001                                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
056622                                          NEXT.ERRNO
056622                                  12$:    ERRDF   ERRNO,T19SSR,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
056622  104455                                                                          TRAP    C$ERDF
056624  001511                                                                          .WORD   841
056626  060243                                                                          .WORD   T19SSR
056630  012046                                                                          .WORD   PKTSSR
056632  005237  002222                          INC     FATFLG                  ;SET FATAL ERROR FLAG
056636                                  15$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
056636  104406                                                                          TRAP    C$CLP1
                                        ;       If Extended Features Hardware Switch Clear then:
                                        ;         Do Write Subsystem Write Miscellaneous to Set Extended Features.
056640  012701  062352                          MOV     #T19BFR,R1              ;MESSAGE BUFFER ADDRESS
056644  032761  000200  000012                BIT     #X2.EXTF,XST2(R1)       ;EXTENDED FEATURES SWITCH SET?
056652  001026                                  BNE     30$                     ;BR IF YES
056654  004737  062202                          JSR     PC,T19SEXT              ;SETUP PACKET FOR WRITE MISC INVERT
056660  012704  062500                          MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
056664  010465  000000                          MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
056670  004737  016336                          JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
056674                                          FORCERROR       22$                     ;@@DFORCE ERROR IF FORCER=1
056710  103407                                  BCS     30$                     ;BR IF CARRY SET (GOOD RETURN)
056712  010001                                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
056714                                          NEXT.ERRNO
056714                                  22$:    ERRDF   ERRNO,T192SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
056714  104455                                                                          TRAP    C$ERDF
056716  001512                                                                          .WORD   842
056720  060300                                                                          .WORD   T192SSR
056722  012046                                                                          .WORD   PKTSSR
056724  005237  002222                          INC     FATFLG                  ;SET FATAL ERROR FLAG
056730                                  30$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
056730  104406                                                                          TRAP    C$CLP1
                                        ;       Do WRITE CHARACTERISTICS to select reserved unit 7
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4749 056732  012704  062330                MOV     #T19PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
4750 056736  004737  010662                JSR     PC,WRTCHR               ;DO WRITE CHARACTERISTICS COMMAND
4751 056742                                FORCERROR       42$                     ;@@DFORCE ERROR IF FORCER=1
4752 056756  103407                        BCS     50$                     ;BR IF CARRY SET (GOOD RETURN)
4753 056760  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4754 056762                                NEXT.ERRNO
4755 056762                        42$:    ERRDF   ERRNO,T19SSR,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
     056762  104455                                                                TRAP    C$ERDF
     056764  001513                                                                .WORD   843
     056766  060243                                                                .WORD   T19SSR
     056770  012046                                                                .WORD   PKTSSR
4756 056772  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
4757 056776                        50$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     056776  104406                                                                TRAP    C$CLP1
4758
4759                               ;  REPEAT FOR ALL TEST PATTERNS IN TSTBLK TABLE
4760 057000  012703  002752                MOV     #TSTBLK,R3              ;GET FIRST PATTERN ADDRESS
4761 057004  012337  002312        100$:   MOV     (R3)+,DATA              ;GET A TEST PATTERN
4762 057010  042737  177400  002312        BIC     #^C<377>,DATA           ;DATA IS BYTE
4763 057016  010337  002316                MOV     R3,TSTPTR               ;SETUP CURRENT TSTBLK POINTER
4764                               ;       Do a WRITE NPR to set loopback and tape direction OUT
4765 057022  012700  000100                MOV     #NP.OUT,R0              ;SET TAPE DIRECTION OUT
4766 057026  052700  000040                BIS     #NP.LOOP,R0             ;SET LOOPBACK
4767 057032  004737  062042                JSR     PC,T19SNPR              ;SETUP T19PK2 FOR WRITE NPR
4768 057036  012704  062500                MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
4769 057042  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
4770 057046  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
4771 057052                                FORCERROR       102$                    ;@@DFORCE ERROR IF FORCER=1
4772 057066  103407                        BCS     105$                    ;BR IF CARRY SET (GOOD RETURN)
4773 057070  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4774 057072                                NEXT.ERRNO
4775 057072                        102$:   ERRDF   ERRNO,T194SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     057072  104455                                                                TRAP    C$ERDF
     057074  001514                                                                .WORD   844
     057076  060411                                                                .WORD   T194SSR
     057100  012046                                                                .WORD   PKTSSR
4776 057102  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
4777 057106                        105$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     057106  104406                                                                TRAP    C$CLP1
4778
4779 057110  012700  000001        ;       Do a WRITE FORMAT to set IRESV4==>IRSTR = 1
4780 057114  004737  062162                MOV     #WF.I4RES,R0            ;IRESV4==>IRSTR=1
4781 057120  012704  062500                JSR     PC,T19WFMT              ;SETUP T9PK2 FOR WRITE FORMAT
4782 057124  010465  000000                MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
4783 057130  004737  016336                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
4784 057134                                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
4785 057150  103407                        FORCERROR       112$                    ;@@DFORCE ERROR IF FORCER=1
4786 057152  010001                        BCS     120$                    ;BR IF CARRY SET (GOOD RETURN)
4787 057154                                MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4788 057154                                NEXT.ERRNO
     057154  104455                    112$:   ERRDF   ERRNO,T198SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     057156  001515                                                                TRAP    C$ERDF
     057160  060632                                                                .WORD   845
     057162  012046                                                                .WORD   T198SSR
4789 057164  005237  002222                                                        .WORD   PKTSSR
4790 057170                                INC     FATFLG                  ;SET FATAL ERROR FLAG
     057170  104406                    120$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
                                                                                TRAP    C$CLP1
```

```
4791
4792 057172  012700  000001          ;       Do a WRITE FIFO with byte count equal to 1 and Tape direction OUT
4793 057176  012701  002312                  MOV     #1,R0                   ;WRITE 1 BYTE
4794 057202  004737  062106                  MOV     #DATA,R1                ;FIFO WRITE DATA ADDRESS
4795 057206  012704  062500                  JSR     PC,T19WFIF              ;SETUP T19PK2 FOR WRITE FIFO
4796 057212  010465  000000                  MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
4797 057216  004737  016336                  MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
4798 057222                                  JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
                                             FORCERROR       132$                    ;@@DFORCE ERROR IF FORCER=1
4799 057236  103407                          BCS     140$                    ;BR IF CARRY SET (GOOD RETURN)
4800 057240  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4801 057242                                  NEXT.ERRNO
4802 057242                          132$:   ERRDF   ERRNO,T195SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     057242  104455                                                                      TRAP    C$ERDF
     057244  001516                                                                      .WORD   846
     057246  060454                                                                      .WORD   T195SSR
     057250  012046                                                                      .WORD   PKTSSR
4803 057252  005237  002222                  INC     FATFLG                  ;SET FATAL ERROR FLAG
4804 057256                          140$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     057256  104406                                                                      TRAP    C$CLP1
4805                                 ;       Do a READ FIFO with tape direction OUT to load tape out write latch
4806 057260  012700  000001                  MOV     #1,R0                   ;SET READ BYTE COUNT
4807 057264  004737  062066                  JSR     PC,T19RFIF              ;SETUP T19PK2 FOR READ FIFO
4808 057270  012704  062500                  MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
4809 057274  010465  000000                  MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
4810 057300  004737  016336                  JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
                                             FORCERROR       152$                    ;@@DFORCE ERROR IF FORCER=1
4811 057304
4812 057320  103407                          BCS     160$                    ;BR IF CARRY SET (GOOD RETURN)
4813 057322  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4814 057324                                  NEXT.ERRNO
4815 057324                          152$:   ERRDF   ERRNO,T196SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     057324  104455                                                                      TRAP    C$ERDF
     057326  001517                                                                      .WORD   847
     057330  060520                                                                      .WORD   T196SSR
     057332  012046                                                                      .WORD   PKTSSR
4816 057334  005237  002222                  INC     FATFLG                  ;SET FATAL ERROR FLAG
4817 057340                          160$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     057340  104406                                                                      TRAP    C$CLP1
4818
4819 057342  005000                  ;       Do a WRITE NPR to set loopback and tape direction IN
4820 057344  052700  000040                  CLR     R0                      ;CLR NP.OUT TO SET TAPE DIRECTION IN
4821 057350  004737  062042                  BIS     #NP.LOOP,R0             ;SET LOOPBACK
4822 057354  012704  062500                  JSR     PC,T19SNPR              ;SETUP T19PK2 FOR WRITE NPR
4823 057360  010465  000000                  MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
4824 057364  004737  016336                  MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
4825 057370                                  JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
                                             FORCERROR       182$                    ;@@DFORCE ERROR IF FORCER=1
4826 057404  103407                          BCS     190$                    ;BR IF CARRY SET (GOOD RETURN)
4827 057406  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4828 057410                                  NEXT.ERRNO
4829 057410                          182$:   ERRDF   ERRNO,T194SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     057410  104455                                                                      TRAP    C$ERDF
     057412  001520                                                                      .WORD   848
     057414  060411                                                                      .WORD   T194SSR
     057416  012046                                                                      .WORD   PKTSSR
4830 057420  005237  002222                  INC     FATFLG                  ;SET FATAL ERROR FLAG
4831 057424                          190$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     057424  104406                                                                      TRAP    C$CLP1
4832                                 ;       Do a WRITE FORMAT to set IRESV4-->IRSTR = 0
```

```
4833 057426  005000                    CLR     R0                      ;SET IRESV4-->IRSTR=0
4834 057430  004737  062162            JSR     PC,T19WFMT              ;SETUP T9PK2 FOR WRITE FORMAT
4835 057434  012704  062500            MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
4836 057440  010465  000000            MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
4837 057444  004737  016336            JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
4838 057450                            FORCERROR       202$                    ;@@DFORCE ERROR IF FORCER=1
4839 057464  103407                    BCS     210$                    ;BR IF CARRY SET (GOOD RETURN)
4840 057466  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4841 057470                            NEXT.ERRNO
4842 057470                    202$:   ERRDF   ERRNO,T'98SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     057470  104455                                                            TRAP    C$ERDF
     057472  001521                                                            .WORD   849
     057474  060632                                                            .WORD   T198SSR
     057476  012046                                                            .WORD   PKTSSR
4843 057500  005237  002222            INC     FATFLG                  ;SET FATAL ERROR FLAG
4844 057504                    210$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     057504  104406                                                            TRAP    C$CLP1
4845                           ;       Do a WRITE FORMAT to set IRESV4-->IRSTR = 1
4846 057506  012700  000001            MOV     #WF.I4RES,R0            ;IRESV4-->IRSTR=1
4847 057512  004737  062162            JSR     PC,T19WFMT              ;SETUP T9PK2 FOR WRITE FORMAT
4848 057516  012704  062500            MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
4849 057522  010465  000000            MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
4850 057526  004737  016336            JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
4851 057532                            FORCERROR       222$                    ;@@DFORCE ERROR IF FORCER=1
4852 057546  103407                    BCS     230$                    ;BR IF CARRY SET (GOOD RETURN)
4853 057550  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4854 057552                            NEXT.ERRNO
4855 057552                    222$:   ERRDF   ERRNO,T198SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     057552  104455                                                            TRAP    C$ERDF
     057554  001522                                                            .WORD   850
     057556  060632                                                            .WORD   T198SSR
     057560  012046                                                            .WORD   PKTSSR
4856 057562  005237  002222            INC     FATFLG                  ;SET FATAL ERROR FLAG
4857 057566                    230$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     057566  104406                                                            TRAP    C$CLP1
4858                           ;       Do a READ FIFO with tape direction IN to read data
4859 057570  012700  000001            MOV     #1,R0                   ;SET READ BYTE COUNT
4860 057574  004737  062066            JSR     PC,T19RFIF              ;SETUP T19PK2 FOR READ FIFO
4861 057600  012704  062500            MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
4862 057604  010465  000000            MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
4863 057610  004737  016336            JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
4864 057614                            FORCERROR       282$                    ;@@DFORCE ERROR IF FORCER=1
4865 057630  103407                    BCS     290$                    ;BR IF CARRY SET (GOOD RETURN)
4866 057632  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4867 057634                            NEXT.ERRNO
4868 057634                    282$:   ERRDF   ERRNO,T196SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     057634  104455                                                            TRAP    C$ERDF
     057636  001523                                                            .WORD   851
     057640  060520                                                            .WORD   T196SSR
     057642  012046                                                            .WORD   PKTSSR
4869 057644  005237  002222            INC     FATFLG                  ;SET FATAL ERROR FLAG
4870 057650                    290$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     057650  104406                                                            TRAP    C$CLP1
4871                           ;       If Data read from FIFO NOT= to Data sent Then Print Error
4872 057652  004737  062240            JSR     PC,T19SETEXP            ;SET WORDS 0-7 EXPD=RECV (NOT TESTING)
4873 057656  012701  060102            MOV     #T19EXSTA,R1            ;GET EXPECTED READ STATUS
4874 057662  012702  062372            MOV     #T19BFSTA,R2            ;GET RECV READ STATUS
```

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4875 057666  013711  002312                MOV     DATA,(R1)                ;SET EXPD WORD #8 = DATA
4876 057672  016261  000002  000002        MOV     2(R2),2(R1)              ;SET EXPD WORD #9 = RECV (NOT TESTING)
4877 057700  005000                        CLR     R0                       ;HIGH RECV ADDRESS FOR CKMSG2
4878 057702  012701  062352                MOV     #T19BFR,R1               ;LOW RECV ADDRESS FOR CKMSG2
4879 057706  012702  060062                MOV     #T19EXP,R2               ;EXPD ADDRESS
4880 057712  012703  000022                MOV     #18.,R3                  ;NUMBER OF BYTES TO COMPARE
4881 057716  004737  011500                JSR     PC,CKMSG2                ;EXPD EQUAL RECV?
4882 057722                                FORCERROR       302$,NOTSSR      ;@@D
4883 057732  103404                        BCS     310$                     ;BR IF YES
4884 057734                                NEXT.ERRNO
4885 057734                        302$:   ERRHRD  ERRNO,T19RSTR,MSGSUB     ;REPORT ERROR
     057734  104456                                                                TRAP    C$ERHRD
     057736  001524                                                                .WORD   852
     057740  061650                                                                .WORD   T19RSTR
     057742  013742                                                                .WORD   MSGSUB
4886 057744                        310$:   CKLOOP                           ;LOOP ON ERROR, IF FLAG SET
     057744  104406                                                                TRAP    C$CLP1
4887
4888
4889 057746                                FORCEXIT        355$             ;@@D
4890 057756  013703  002316                MOV     TSTPTR,R3                ;RESTORE CURRENT TSTBLK POINTER
4891 057762  020327  003062                CMP     R3,#TBLEND               ;END OF TSTBLK?
4892 057766  103002                        BHIS    355$                     ;BR IF YES
4893 057770  000137  057004                JMP     100$                     ;DO ANOTHER TSTBLK PATTERN
4894 057774                        355$:
4895
4896 057774                                ENDSUB                           ;////////////// END SUBTEST //////////
     057774                                                                        L10072:
     057774  104403                                                                TRAP    C$ESUB
4897
4898 057776  005737  002222                TST     FATFLG                   ;ANY FATAL ERRORS ?
4899 060002  001402                        BEQ     360$                     ;BRANCH IF NOT
4900 060004  004737  017202                JSR     PC,CKDROP                ;TRY TO DROP THE UNIT
4901 060010                        360$:
4902
4903 060010                                EXIT    TST                      ;////////// EXIT TEST //////////
     060010  104432                                                                TRAP    C$EXIT
     060012  002602                                                                .WORD   L10066-.
4904
4905
4906                                ;+
4907                                ;LOCAL STORAGE FOR THIS TEST
4908                                ;-
4909
4910 060014  000000                T19PREV:        .WORD   0                ;DRIVE SIGNAL 1-0 TRANSITION FLAG
4911                                ;+
4912                                ; LOOPBACK DRIVE SIGNAL TABLE
4913                                ; THIS TABLE IS USED BY T19CNVT TO SETUP
4914                                ; A DRIVE PATTERN FROM THE TEST DATA INPUT PATTERN.
4915                                ;
4916                                ; WRITE CONTROL SIGNALS ARE OF FORM WC.XXX
4917                                ; WRITE FORMAT SIGNALS ARE OF FORM WF.XXXX
4918                                ;-
4919 060016                        T19BFCTL:                                ;WRITE CONTROL DRIVE SIGNALS
4920 060016  000001                        WC.IGO                           ;IGO-->IFPT     DATA<0>
4921 060020  000002                        WC.IFEN                          ;IFEN-->IFBY    DATA<1>
4922 060022  000004                        WC.IRWU                          ;IRWU-->IRWD    DATA<2>
```

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4923 060024  000010                        WC.IREW          ;IREW==>IDBY    DATA<3>
4924 060026  002000                        WF.IERASE*256.   ;IFAD==>ILDP    DATA<4>
4925 060030  000040                        WC.I1TAD         ;ITAD1==>IONL   DATA<5>
4926 060032  000100                        WC.IOTAD         ;ITADO==>IRDY   DATA<6>
4927 060034  000200                        WC.IFAD          ;IERASE==>ISPEED DATA<7>
4928 060036  004000                        WF.IEDIT*256.    ;IEDIT==>IHER   DATA<8>
4929 060040  010000                        WF.IWFM*256.     ;IWFM==>IFMK    DATA<9>
4930 060042  020000                        WF.IREV*256.     ;IREV==>ICER    DATA<10>
4931 060044  040000                        WF.IWRT*256.     ;IWRT==>IIDENT  DATA<11>
4932 060046  100000                        WF.IHISP*256.    ;IHISP==>IEOT   DATA<12>
4933 060050  000000                        .WORD   0        ;IRESV2 (UNUSED)DATA<13>
4934 060052  000000                        .WORD   0        ;IRESV1 (UNUSED)DATA<14>
4935 060054  000000                        .WORD   0        ;PARERR (UNTESTED)DATA<15>
4936
4937 060056                        T19MSK:                  ;MASK OF UNTESTED BITS IN READ STATUS BYTES
4938                                                        ;UNTESTED BITS ARE SET TO 1
4939 060056      377                       .BYTE   ^C<000>  ;BYTE 0 MASK
4940 060057      037                       .BYTE   ^C<340>  ;BYTE 1 MASK (PARERR,IRESV2,IRESV1)
4941 060060      360                       .BYTE   ^C<017>  ;BYTE 2 (TIMER A,TIMER B,UNDEFINED<1:0>)
4942 060061      000                       .BYTE   0        ;MAKE IT EVEN
4943
4944 060062                        T19EXP:                  ;BEGIN EXPECTED DATA BUFFER
4945 060062  000000                        .WORD   0        ;MESSAGE TYPE
4946 060064  000000                        .WORD   0        ;DATA FIELD LENGTH
4947 060066  000000                        .WORD   0        ;RBPCR
4948 060070  000000                        .WORD   0        ;XST0
4949 060072  000000                        .WORD   0        ;XST1
4950 060074  000000                        .WORD   0        ;XST2
4951 060076  000000                        .WORD   0        ;XST3
4952 060100  000000                        .WORD   0        ;XST4 (ALWAYS PRESENT FOR WRITE SUB.)
4953 060102                        T19EXSTA: .BLKB 64.      ;EXPECTED READ STATUS AND WRITE FIFO DATA
4954 060202                        T19EXEND:                        ;END EXPECTED DATA BUFFER
4955                               ;+
4956                               ;LOCAL TEXT MESSAGES FOR TEST
4957                               ;-
4958
4959 060202  124  162  141  TST19ID:        .ASCIZ  'Transport Bus Interface Loopback'
4960 060243  127  122  111  T19SSR:  .ASCIZ  'WRITE CHARACTERISTICS Failed'
4961 060300  127  122  111  T192SSR:.ASCIZ  'WRITE SUBSYSTEM (Write Misc) Failed'
4962 060344  127  122  111  T193SSR:.ASCIZ  'WRITE SUBSYSTEM (Read Status) Failed'
4963 060411  127  122  111  T194SSR:.ASCIZ  'WRITE SUBSYSTEM (Write Npr) Failed'
4964 060454  127  122  111  T195SSR:.ASCIZ  'WRITE SUBSYSTEM (Write FIFO) Failed'
4965 060520  127  122  111  T196SSR:.ASCIZ  'WRITE SUBSYSTEM (Read FIFO) Failed'
4966 060563  127  122  111  T197SSR:.ASCIZ  'WRITE SUBSYSTEM (Write Control) Failed'
4967 060632  127  122  111  T198SSR:.ASCIZ  'WRITE SUBSYSTEM (Write Format) Failed'
4968 060700  106  111  106  T191CMP:.ASCIZ  'FIFO Status in WORD #9 Incorrect after Initialize'
4969 060762  122  145  141  T192CMP:.ASCIZ  'Read FIFO Data not equal to Write FIFO , Data is in WORD #8'
4970 061056  124  141  160  T193CMP:.ASCIZ  'Tape Status 2 (in WORD #8) Incorrect after RESET TAPE'
4971 061144  122  145  141  T195CMP:.ASCIZ  'Read FIFO Data not equal to Write FIFO Data'
4972 061220  106  111  106  T196CMP:.ASCIZ  'FIFO Status (in WORD #9) Incorrect after READ FIFO'
4973 061303  124  141  160  T197CMP:.ASCIZ  'Tape Status 2 (in WORD #8) Incorrect after RESET TAPE'
4974 061371  103  157  156  T198CMP:.ASCIZ  'Control Signal Loopback Data Error, Data is in WORD #8'
4975 061460  122  145  141  T199CMP:.ASCIZ  'Read/Write Loopback Data Error, Data is in WORD #8'
4976 061543  114  157  157  T19WSTR:.ASCIZ  'Loopback Data Error when strobed by Write strobe, Data is in WORD #8'
4977 061650  114  157  157  T19RSTR:.ASCIZ  'Loopback Data Error when strobed by Read Strobe, Data is in WORD #8'
4978
4979                                    .EVEN
```

```
4980
4981                                    ;+
4982                                    ; CLEAR MESSAGE BUFFER
4983                                    ;-
4984 061754                             T19CLRBUF:                                      ;
4985 061754                                     SAVREG                                  ;SAVE R1-R5 UNTIL NEXT RETURN
4986 061760  012701  062352                     MOV     #T19BFR,R1                      ;GET MESSAGE BUFFER ADDRESS
4987 061764  012702  000120                     MOV     #T19BEND-T19BFR,R2              ;SIZE OF MESSAGE BUFFER IN BYTES
4988 061770  105021                     10$:    CLRB    (R1)+                           ;CLEAR A BYTE
4989 061772  005302                             DEC     R2                              ;DONE?
4990 061774  003375                             BGT     10$                             ;BR IF NO
4991 061776  000207                             RTS     PC                              ;RETURN
4992
4993                                    ;+
4994                                    ; SETUP T19PK2 PACKET FOR READ STATUS
4995                                    ;-
4996 062000                             T19SRD:
4997 062000  004737  061754                     JSR     PC,T19CLRBUF                    ;CLEAR MESSAGE BUFFER
4998 062004  012700  062510                     MOV     #T19DT2,R0                      ;WRITE SUBSYSTEM DATA BUFFER
4999 062010  112720  000005                     MOVB    #PW.RDSTATUS,(R0)+              ;STORE READ STATUS COMMAND IN BSEL0
5000 062014  105010                             CLRB    (R0)                            ;CLEAR BSEL1
5001 062016  000207                             RTS     PC                              ;RETURN
5002
5003                                    ;+
5004                                    ; SETUP T19PK2 PACKET FOR WRITE MISC Reset Tape Status F-FLOPS
5005                                    ;-
5006 062020                             T19RSFIF:
5007 062020  004737  061754                     JSR     PC,T19CLRBUF                    ;CLEAR MESSAGE BUFFER
5008 062024  012700  062510                     MOV     #T19DT2,R0                      ;WRITE SUBSYSTEM DATA BUFFER
5009 062030  112720  000010                     MOVB    #PW.WMISC,(R0)+                 ;STORE WRITE MISCELLANEOUS IN BSEL0
5010 062034  112710  000030                     MOVB    #MS.RSFIF!MS.RSTAP,(R0)         ;STORE BSEL1 CLEAR FIFO CODES
5011 062040  0002C7                             RTS     PC                              ;RETURN
5012
5013                                    ;+
5014   .                                ; SETUP T19PK2 PACKET FOR WRITE NPR
5015                                    ;
5016                                    ; INPUT:
5017                                    ;       R0 CONTAINS BSEL1 NPR DATA
5018                                    ;
5019                                    ;       SETS NP.WRP SINCE IF 0 IT WRITES WRONG PARITY.
5020                                    ;-
5021 062042                             T19SNPR:
5022 062042  004737  061754                     JSR     PC,T19CLRBUF                    ;CLEAR MESSAGE BUFFER
5023 062046  012701  062510                     MOV     #T19DT2,R1                      ;WRITE SUBSYSTEM DATA BUFFER
5024 062052  112721  000011                     MOVB    #PW.WNPR,(R1)+                  ;STORE WRITE NPR IN BSEL0
5025 062056  052700  000020                     BIS     #NP.WRP,R0                      ;DON'T WRITE WRONG PARITY
5026 062062  110011                             MOVB    R0,(R1)                         ;STORE NPR DATA IN BSEL1
5027 062064  000207                             RTS     PC                              ;RETURN
5028
5029                                    ;+
5030                                    ; SETUP T19PK2 PACKET FOR READ FIFO
5031                                    ;
5032                                    ; INPUT:
5033                                    ;       R0 CONTAINS SEL2 BYTE COUNT
5034                                    ;-
5035 062066                             T19RFIF:
5036 062066  004737  061754                     JSR     PC,T19CLRBUF                    ;CLEAR MESSAGE BUFFER
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5037 062072  012701  062510                MOV     #T19DT2,R1              ;WRITE SUBSYSTEM DATA BUFFER
5038 062076  112721  000003                MOVB    #PW.RFIFO,(R1)+         ;STORE READ FIFO IN BSELO
5039 062102  110021                        MOVB    R0,(R1)+                ;STORE BYTE COUNT IN BSEL1
5040 062104  000207                        RTS     PC                      ;RETURN
5041                                ;+
5042                                ; SETUP T19PK2 PACKET FOR WRITE FIFO
5043                                ;
5044                                ; INPUT:
5045                                ;       R0 CONTAINS BYTE COUNT
5046                                ;       R1 CONTAINS DATA PATTERN BLOCK ADDRESS
5047                                ;-
5048 062106                        T19WFIF:
5049 062106                                SAVREG                          ;SAVE R1-R5 UNTIL NEXT RETURN
5050 062112  004737  061754                JSR     PC,T19CLRBUF            ;CLEAR MESSAGE BUFFER
5051 062116  012702  062510                MOV     #T19DT2,R2              ;WRITE SUBSYSTEM DATA BUFFER
5052 062122  112722  000004                MOVB    #PW.WFIFO,(R2)+         ;STORE WRITE FIFO IN BSELO
5053 062126  110022                        MOVB    R0,(R2)+                ;STORE BYTE COUNT IN BSEL1
5054 062130  005022                        CLR     (R2)+                   ;CLEAR SEL2 (UNUSED)
5055 062132  112122                10$:    MOVB    (R1)+,(R2)+             ;STORE DATA PATTERN BYTE
5056 062134  005300                        DEC     R0                      ;DONE ALL BYTES?
5057 062136  003375                        BGT     10$                     ;BR IF NO
5058 062140  000207                        RTS     PC                      ;RETURN
5059                                ;+
5060                                ; SETUP T19PK2 FOR WRITE CONTROL
5061                                ;
5062                                ; INPUT:
5063                                ;       R0 CONTAINS DRIVING DATA PATTERN
5064                                ;-
5065 062142                        T19WCTL:
5066 062142  004737  061754                JSR     PC,T19CLRBUF            ;CLEAR MESSAGE BUFFER
5067 062146  012701  062510                MOV     #T19DT2,R1              ;WRITE SUBSYSTEM DATA BUFFER
5068 062152  112721  000006                MOVB    #PW.WCTL,(R1)+          ;STORE WRITE CONTROL IN BSELO
5069 062156  110021                        MOVB    R0,(R1)+                ;STORE DATA WORD IN BSEL1
5070 062160  000207                        RTS     PC                      ;RETURN
5071                                ;+
5072                                ; SETUP T19PK2 FOR WRITE FORMAT TRANSPORT REGISTER
5073                                ;
5074                                ; INPUT:
5075                                ;       R0 CONTAINS DRIVING DATA PATTERN
5076                                ;-
5077 062162                        T19WFMT:
5078 062162  004737  061754                JSR     PC,T19CLRBUF            ;CLEAR MESSAGE BUFFER
5079 062166  012701  062510                MOV     #T19DT2,R1              ;WRITE SUBSYSTEM DATA BUFFER
5080 062172  112721  000007                MOVB    #PW.WFMT,(R1)+          ;STORE WRITE FORMAT IN BSELO
5081 062176  110021                        MOVB    R0,(R1)+                ;STORE DATA WORD IN BSEL1
5082 062200  000207                        RTS     PC                      ;RETURN
5083                                ;+
5084                                ; SETUP T19PK2 PACKET FOR WRITE MISC. INVERT EXTENDED FEATURES SWITCH
5085                                ;-
5086 062202                        T19SEXT:
5087 062202  012700  062510                MOV     #T19DT2,R0              ;WRITE SUBSYSTEM DATA BUFFER
5088 062206  112720  000010                MOVB    #PW.WMISC,(R0)+         ;STORE WRITE MISCELLANEOUS IN BSELO
5089 062212  112710  000200                MOVB    #MS.EXT,(R0)            ;STORE INVERT EXTENDED FEATURES IN BSEL1
5090 062216  000207                        RTS     PC                      ;RETURN
5091                                ;+
5092                                ; CLEAR EXPECTED DATA MESSAGE BUFFER
5093                                ;-
```

```
5094 062220                        T19CLEXP:
5095 062220  012701  060062              MOV     #T19EXP,R1              ;GET EXPD ADDRESS
5096 062224  012700  000120              MOV     #T19EXEND-T19EXP,R0     ;GET EXPD SIZE
5097 062230  105021              10$:    CLRB    (R1)+                   ;CLEAR A BYTE
5098 062232  005300                      DEC     R0                      ;DONE?
5099 062234  003375                      BGT     10$                     ;BR IF NO
5100 062236  000207                      RTS     PC                      ;RETURN
5101
5102                               ;+
5103                               ;Set WORDS 0-7 of expd message BUFFER = to recv since not testing
5104                               ;-
5105 062240                        T19SETEXP:
5106 062240  012702  060062              MOV     #T19EXP,R2              ;GET EXPD
5107 062244  012703  062352              MOV     #T19BFR,R3              ;GET READ STATUS RECV BUFFER
5108 062250  012700  000010              MOV     #8.,R0                  ;SET WORDS 0-7 EXP=RECV
5109 062254  012322              5$:     MOV     (R3)+,(R2)+             ;SET EXPD=RECV
5110 062256  005300                      DEC     R0                      ;DONE WORDS 0-7 WORDS?
5111 062260  003375                      BGT     5$                      ;BR IF NO
5112 062262  000207                      RTS     PC                      ;RETURN
5113
5114                               ;+
5115                               ; CONVERT A TEST PATTERN DATA WORD TO LOOPBACK DRIVE SIGNALS
5116                               ;
5117                               ; INPUTS:
5118                               ;
5119                               ;       R0      TEST PATTERN
5120                               ;
5121                               ; IMPLICIT INPUTS:
5122                               ;
5123                               ;       T19BFCTL  - CONTAINS WRITE CONTROL / WRITE FORMAT CONVERSION BITS
5124                               ;
5125                               ; OUTPUTS:
5126                               ;
5127                               ;       R0      - LOW BYTE CONTAINS WRITE CONTROL DATA
5128                               ;               - HIGH BYTE CONTAINS WRITE FORMAT DATA
5129                               ;-
5130 062264                        T19CNVT:
5131 062264                              SAVREG                          ;SAVE R1-R5 UNTIL NEXT RETURN
5132 062270  012701  060016              MOV     #T19BFCTL,R1            ;CONVERSION TABLE ADDRESS
5133 062274  005002                      CLR     R2                      ;INIT RESULT OF CONVERSION
5134 062276  012703  000020              MOV     #16.,R3                 ;BIT COUNT
5135 062302  006000              10$:    ROR     R0                      ;IS THIS BIT EQUAL TO 1?
5136 062304  103001                      BCC     20$                     ;BR IF NO
5137 062306  051102                      BIS     (R1),R2                 ;SET CONVERTED BIT
5138 062310  005721              20$:    TST     (R1)+                   ;POINT TO NEXT BIT IN CONVERSION TABLE
5139 062312  005303                      DEC     R3                      ;DONE?
5140 062314  003372                      BGT     10$                     ;BR IF NO
5141 062316  010200                      MOV     R2,R0                   ;COPY RESULT
5142 062320  000207                      RTS     PC                      ;RETURN
5143
5144
5145
5147         062330                       .=<.+10>&177770
5149                               ;
5150                               ;WRITE CHARACTERISTICS COMMAND PACKET
5151                               ;
5152 062330                        T19PACKET:                              ;COMMAND PACKET FOR TEST
```

```
5153 062330  100004                    .WORD   100004          ;WRITE CHARACTERISTICS COMMAND, WITH ACK
5154 062332  062340                    .WORD   T19DATA         ;ADDRESS OF CHARACTERISTICS BLOCK
5155 062334  000000                    .WORD   0
5156 062336  000012                    .WORD   10.             ;MINIMUM MESSAGE PACKET SIZE
5157
5158 062340                    T19DATA:                        ;CHARACTERISTICS DATA BLOCK
5159 062340  062352                    .WORD   T19BFR          ;ADDRESS OF MESSAGE BUFFER
5160 062342  000000                    .WORD   0
5161 062344  000024                    .WORD   20.             ;LENGTH OF MESSAGE BUFFER
5162 062346  000000                    .WORD   0               ;ESS,ENB,EAI,ERI
5163 062350  000007                    .WORD   7               ;EXTENDED FEATURES UNIT NO.
5164
5165
5166                           ;MESSAGE BUFFER FOR ALL TEST 8 COMMANDS
5167
5168 062352                    T19BFR:                         ;BEGIN MESSAGE BUFFER
5169 062352  000000                    .WORD   0               ;MESSAGE TYPE
5170 062354  000000                    .WORD   0               ;DATA FIELD LENGTH
5171 062356  000000                    .WORD   0               ;RBPCR
5172 062360  000000                    .WORD   0               ;XST0
5173 062362  000000                    .WORD   0               ;XST1
5174 062364  000000                    .WORD   0               ;XST2
5175 062366  000000                    .WORD   0               ;XST3
5176 062370  000000                    .WORD   0               ;XST4 (ALWAYS PRESENT FOR WRITE SUBSYSTEM
5177 062372                    T19BFSTA: .BLKB  64.            ;READ STATUS AND WRITE FIFO BUFFER
5178 062472                    T19BEND:                        ;END OF MESSAGE BUFFER
5179                           ;
5180                           ;WRITE SUBSYSTEM READ STATUS COMMAND PACKET
5181                           ;
5183         062500                    .=<.+10>&177770
5185 062500                    T19PK2:
5186 062500  100006                    .WORD   P.WRTSUB!P.ACK  ;WRITE SUBSYSTEM WITH ACK
5187 062502  062510                    .WORD   T19DT2          ;LOW ADDRESS OF DATA BLOCK
5188 062504  000000                    .WORD   0               ;HIGH ADDRESS OF DATA BLOCK
5189 062506  000012                    .WORD   10.             ;MINIMUM MESSAGE PACKET SIZE
5190
5191 062510                    T19DT2:                         ;DATA BLOCK
5192 062510     000                    .BYTE   0               ;BSEL0
5193 062511     000                    .BYTE   0               ;BSEL1
5194 062512  000000                    .WORD   0               ;SEL2
5195 062514                            .BLKB   64.             ;WRITE FIFO DATA OUTPUT BUFFER
5196
5197
5198 062614                    ENDTST
     062614                                                                    L10066:
     062614  104401                                                                    TRAP    C$ETST
5199                                   .SBTTL  TEST  9: READ/WRITE DATA PARITY TEST
5200                           ;++
5201                           ; TEST DESCRIPTION:
5202                           ;
5203                           ;       This test verifies that the Write Data Parity generator
5204                           ;       and the Read Data Parity checker operate properly. The
5205                           ;       Transport Bus signal loopback mode is enabled and a
5206                           ;       Set Wrong parity function is executed. Then various
5207                           ;       Write Subsystem Memory functions are performed to
5208                           ;       write data to and from the FIFO in loopback mode.
5209                           ;       The program then checks to insure a Read Data parity
```

```
                                ;       error occurred.
                                ;       A Reset FIFO is done and the Read Data parity
                                ;       error bit is again tested to insure it cleared.
                                ;       Finally a Clear wrong parity function is done
                                ;       and it is verified the data word can pass in loopback
                                ;       mode without setting Read Data parity error.
                                ;
                                ; TEST STEPS:
                                ;
                                ;  REPEAT FOR LOOPCNT
                                ;    BEGIN
                                ;       Write to TSSR register to soft initialize the controller
                                ;       Do WRITE CHARACTERISTICS to check for Extended Features Switch
                                ;       If Extended Features Hardware Switch Clear then:
                                ;         Do Write Subsystem Write Miscellaneous to Set Extended Features.
                                ;       Do WRITE CHARACTERISTICS to select reserved unit 7 and setup BUFFER
                                ;  REPEAT FOR ALL TEST PATTERNS IN TSTBLK TABLE
                                ;    BEGIN
                                ;       (* Verify Write Wrong Parity Sets Parity Error *)
                                ;       Do a WRITE NPR to set loopback and tape direction OUT
                                ;             and SET Write Wrong Parity.
                                ;       Do a WRITE FORMAT  to set IRESV4==>IRSTR = 1 (sets read strobe high)
                                ;       Do a WRITE FIFO with byte count equal to 1 and Tape direction OUT
                                ;       Do a READ FIFO with tape direction OUT to load tape out write latch
                                ;         (this is when wrong parity (IWP) is set)
                                ;       Do a WRITE FORMAT  to set IRESV4==>IRSTR = 0 (sets read strobe low)
                                ;            (Read Strobe sets PAR IN H [Parity Error])
                                ;       Do a WRITE FORMAT  to set IRESV4==>IRSTR = 1 (sets read strobe high)
                                ;       Do a Write Subsystem READ STATUS
                                ;       If Read Data parity error NOT=1  Then Print Error
                                ;       Do a Write Misc to RESET FIFO
                                ;       Do a Write Subsystem READ STATUS
                                ;       If Read Data parity error NOT=0  Then Print Error
                                ;
                                ;       (* Verify Data can be transferred without a Parity Error *)
                                ;       Do a WRITE FORMAT  to set IRESV4==>IRSTR = 1 (sets read strobe high)
                                ;       Do a WRITE NPR to set loopback and tape direction OUT
                                ;             and CLEAR Write Wrong Parity.
                                ;       Do a WRITE FIFO with byte count equal to 1 and Tape direction OUT
                                ;       Do a READ FIFO with tape direction OUT to load tape out write latch
                                ;       Do a WRITE FORMAT  to set IRESV4==>IRSTR = 0 (sets read strobe low)
                                ;            (Read Strobe should NOT set PAR IN H [Parity Error] here)
                                ;       Do a WRITE FORMAT  to set IRESV4==>IRSTR = 1 (sets read strobe high)
                                ;       Do a Write Subsystem READ STATUS
                                ;       If Read Data parity error NOT=0  Then Print Error
                                ;
                                ;    END
                                ;--
                                
062616                                  BGNTST
062616                                                                          T9::
062616  012700  065202                  MOV     #TST20ID,R0             ;ASCII MESSAGE TO IDENTIFY TEST
062622  004737  016510                  JSR     PC,TSTSETUP             ;DO INITIAL TEST SETUP
062626  012737  000012  002216          MOV     #10.,LOOPCNT            ;PERFORM 10 ITERATIONS
062634                          T20LOOP:
```

```
5270 062634                             BGNSUB                                  ;///////////// BEGIN SUBTEST //////////
     062634                                                                                      T9.1:
     062634  104402                                                                                   TRAP    C$BSUB
5271                                ;   Write to TSSR register to soft initialize the controller
5272 062636                         5$:
5273 062636  004737  015774             JSR     PC,SOFINIT                      ;WRITE TO TSSR TO SOFT INITIALIZE
5274 062642  103405                     BCS     10$                             ;BR IF SOFT INIT OKAY
5275 062644  010001                     MOV     R0,R1                           ;SAVE CONTENTS OF TSSR
5276 062646                             ERRDF   ERRNO,SFIERR,SFIMSG             ;DEVICE FATAL DURING INIT
     062646  104455                                                                                   TRAP    C$ERDF
     062650  001604                                                                                   .WORD   900
     062652  003652                                                                                   .WORD   SFIERR
     062654  012034                                                                                   .WORD   SFIMSG
5277                                ;   Do WRITE CHARACTERISTICS to check for Extended Features Switch
5278 062656  005037  002222     10$:    CLR     FATFLG                          ;CLEAR FATAL ERROR FLAG
5279 062662  012704  066400             MOV     #T20PACKET,R4                   ;GET THE ADDRESS OF COMMAND PACKET
5280 062666  004737  010662             JSR     PC,WRTCHR                       ;DO WRITE CHARACTERISTICS COMMAND
5281 062672                             FORCERROR       12$                             ;@@FORCE ERROR IF FORCER=1
5282 062706  103407                     BCS     15$                             ;BR IF CARRY SET (GOOD RETURN)
5283 062710  010001                     MOV     R0,R1                           ;SAVE CONTENTS OF TSSR
5284 062712                             NEXT.ERRNO
5285 062712                     12$:    ERRDF   ERRNO,T20SSR,PKTSSR             ;DEVICE FATAL SSR FAILED TO SET
     062712  104455                                                                                   TRAP    C$ERDF
     062714  001605                                                                                   .WORD   901
     062716  065231                                                                                   .WORD   T20SSR
     062720  012046                                                                                   .WORD   PKTSSR
5286 062722  005237  002222             INC     FATFLG                          ;SET FATAL ERROR FLAG
5287 062726                     15$:    CKLOOP                                  ;LOOP ON ERROR, IF FLAG SET
     062726  104406                                                                                   TRAP    C$CLP1
5288                                ;   If Extended Features Hardware Switch Clear then:
5289                                ;     Do Write Subsystem Write Miscellaneous to Set Extended Features.
5290 062730  012701  066422             MOV     #T20BFR,R1                      ;MESSAGE BUFFER ADDRESS
5291 062734  032761  000200  000012     BIT     #X2.EXTF,XST2(R1)               ;EXTENDED FEATURES SWITCH SET?
5292 062742  001026                     BNE     30$                             ;BR IF YES
5293 062744  004737  066316             JSR     PC,T20SEXT                      ;SETUP PACKET FOR WRITE MISC INVERT
5294 062750  012704  066550             MOV     #T20PK2,R4                      ;GET WRITE SUBSYSTEM COMMAND PACKET
5295 062754  010465  000000             MOV     R4,TSDB(R5)                     ;SET THE PACKET ADDRESS TO EXECUTE
5296 062760  004737  016336             JSR     PC,CHKTSSR                      ;WAIT FOR SSR TO SET
5297 062764                             FORCERROR       22$                             ;@@FORCE ERROR IF FORCER=1
5298 063000  103407                     BCS     30$                             ;BR IF CARRY SET (GOOD RETURN)
5299 063002  010001                     MOV     R0,R1                           ;SAVE CONTENTS OF TSSR
5300 063004                             NEXT.ERRNO
5301 063004                     22$:    ERRDF   ERRNO,T202SSR,PKTSSR            ;DEVICE FATAL SSR FAILED TO SET
     063004  104455                                                                                   TRAP    C$ERDF
     063006  001606                                                                                   .WORD   902
     063010  065266                                                                                   .WORD   T202SSR
     063012  012046                                                                                   .WORD   PKTSSR
5302 063014  005237  002222             INC     FATFLG                          ;SET FATAL ERROR FLAG
5303 063020                     30$:    CKLOOP                                  ;LOOP ON ERROR, IF FLAG SET
     063020  104406                                                                                   TRAP    C$CLP1
5304                                ;   Do WRITE CHARACTERISTICS to select reserved unit 7
5305 063022  012704  066400             MOV     #T20PACKET,R4                   ;GET THE ADDRESS OF COMMAND PACKET
5306 063026  004737  010662             JSR     PC,WRTCHR                       ;DO WRITE CHARACTERISTICS COMMAND
5307 063032                             FORCERROR       42$                             ;@@FORCE ERROR IF FORCER=1
5308 063046  103407                     BCS     50$                             ;BR IF CARRY SET (GOOD RETURN)
5309 063050  010001                     MOV     R0,R1                           ;SAVE CONTENTS OF TSSR
5310 063052                             NEXT.ERRNO
```

```
 5311 063052                          42$:   ERRDF   ERRNO,T20SSR,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
      063052  104455                                                          TRAP    C$ERDF
      063054  001607                                                          .WORD   903
      063056  065231                                                          .WORD   T20SSR
      063060  012046                                                          .WORD   PKTSSR
 5312 063062  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
 5313 063066                          50$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
      063066  104406                                                          TRAP    C$CLP1
 5314
 5315
 5316                                 ;  REPEAT FOR ALL TEST PATTERNS IN TSTBLK TABLE
 5317 063070  012703  002752                MOV     #TSTBLK,R3              ;GET FIRST PATTERN ADDRESS
 5318 063074  012337  002312          100$: MOV     (R3)+,DATA              ;GET A TEST PATTERN
 5319 063100  042737  177400  002312       BIC     #^C<377>,DATA           ;DATA IS BYTE
 5320 063106  010337  002316                MOV     R3,TSTPTR               ;SETUP CURRENT TSTBLK POINTER
 5321                                 ;      Do a WRITE NPR to set loopback and tape direction OUT and
 5322                                 ;               and SET Write Wrong Parity.
 5323 063112  012700  000100                MOV     #NP.OUT,R0              ;SET TAPE DIRECTION OUT
 5324 063116  052700  000040                BIS     #NP.LOOP,R0             ;SET LOOPBACK
 5325 063122  042700  000020                BIC     #NP.WRP,R0              ;SET WRITE WRONG PARITY (INVERTED)
 5326 063126  004737  066166                JSR     PC,T20WNPR              ;SETUP T20PK2 FOR WRITE NPR
 5327 063132  012704  066550                MOV     #T20PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
 5328 063136  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
 5329 063142  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
 5330 063146                                FORCERROR       102$                    ;@@DFORCE ERROR IF FORCER=1
 5331 063162  103407                        BCS     105$                    ;BR IF CARRY SET (GOOD RETURN)
 5332 063164  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
 5333 063166                                NEXT.ERRNO
 5334 063166                          102$: ERRDF   ERRNO,T204SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
      063166  104455                                                          TRAP    C$ERDF
      063170  001610                                                          .WORD   904
      063172  065377                                                          .WORD   T204SSR
      063174  012046                                                          .WORD   PKTSSR
 5335 063176  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
 5336 063202                          105$: CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
      063202  104406                                                          TRAP    C$CLP1
 5337                                 ;      Do a WRITE FORMAT  to set IRESV4==>IRSTR = 1 (sets read strobe high)
 5338 063204  012700  000001                MOV     #WF.I4RES,R0            ;IRESV4==>IRSTR = 1
 5339 063210  004737  066262                JSR     PC,T20WFMT              ;SETUP T20PK2 FOR WRITE FORMAT
 5340 063214  012704  066550                MOV     #T20PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
 5341 063220  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
 5342 063224  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSP TO SET
 5343 063230                                FORCERROR       112$                    ;@@F ORCE ERROR IF FORCER=1
 5344 063244  103407                        BCS     120$                    ;BR IF CARR  SET (GOOD RETURN)
 5345 063246  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
 5346 063250                                NEXT.ERRNO
 5347 063250                          112$: ERRDF   ERRNO,T208SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
      063250  104455                                                          TRAP    C$ERDF
      063252  001611                                                          .WORD   905
      063254  065551                                                          .WORD   T208SSR
      063256  012046                                                          .WORD   PKTSSR
 5348 063260  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
 5349 063264                          120$: CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
      063264  104406                                                          TRAP    C$CLP1
 5350                                 ;      Do a WRITE FIFO with byte count equal to 1 and Tape direction OUT
 5351 063266  012700  000001                MOV     #1,R0                   ;WRITE 1 BYTE
 5352 063272  012701  002312                MOV     #DATA,R1                ;FIFO WRITE DATA ADDRESS
```

```
5353 063276  004737  066226                JSR     PC,T20WFIF              ;SETUP T20PK2 FOR WRITE FIFO
5354 063302  012704  066550                MOV     #T20PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
5355 063306  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
5356 063312  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
5357 063316                                FORCERROR       152$                    ;@@DFORCE ERROR IF FORCER=1
5358 063332  103407                        BCS     160$                    ;BR IF CARRY SET (GOOD RETURN)
5359 063334  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
5360 063336                                NEXT.ERRNO
5361 063336                        152$:   ERRDF   ERRNO,T205SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     063336  104455                                                                TRAP    C$ERDF
     063340  001612                                                                .WORD   906
     063342  065442                                                                .WORD   T205SSR
     063344  012046                                                                .WORD   PKTSSR
5362 063346  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
5363 063352                        160$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     063352  104406                                                                TRAP    C$CLP1
5364                               ;       Do a READ FIFO with tape direction OUT to load tape out write latch
5365                               ;         (this is when wrong parity (IWP) is set)
5366 063354  012700  000001                MOV     #1,R0                   ;SET READ BYTE COUNT
5367 063360  004737  066206                JSR     PC,T20RFIF              ;SETUP T20PK2 FOR READ FIFO
5368 063364  012704  066550                MOV     #T20PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
5369 063370  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
5370 063374  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
5371 063400                                FORCERROR       172$                    ;@@DFORCE ERROR IF FORCER=1
5372 063414  103407                        BCS     180$                    ;BR IF CARRY SET (GOOD RETURN)
5373 063416  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
5374 063420                                NEXT.ERRNO
5375 063420                        172$:   ERRDF   ERRNO,T206SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     063420  104455                                                                TRAP    C$ERDF
     063422  001613                                                                .WORD   907
     063424  065506                                                                .WORD   T206SSR
     063426  012046                                                                .WORD   PKTSSR
5376 063430  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
5377 063434                        180$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     063434  104406                                                                TRAP    C$CLP1
5378                               ;       Do a WRITE FORMAT  to set IRESV4==>IRSTR = 0 (sets read strobe low)
5379                               ;               (Read Strobe sets PAR IN H [Parity Error])
5380 063436  005000                        CLR     R0                      ;IRESV4==>IRSTR = 0
5381 063440  004737  066262                JSR     PC,T20WFMT              ;SETUP T20PK2 FOR WRITE FORMAT
5382 063444  012704  066550                MOV     #T20PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
5383 063450  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
5384 063454  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
5385 063460                                FORCERROR       192$                    ;@@DFORCE ERROR IF FORCER=1
5386 063474  103407                        BCS     200$                    ;BR IF CARRY SET (GOOD RETURN)
5387 063476  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
5388 063500                                NEXT.ERRNO
5389 063500                        192$:   ERRDF   ERRNO,T208SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     063500  104455                                                                TRAP    C$ERDF
     063502  001614                                                                .WORD   908
     063504  065551                                                                .WORD   T208SSR
     063506  012046                                                                .WORD   PKTSSR
5390 063510  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
5391 063514                        200$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     063514  104406                                                                TRAP    C$CLP1
5392                               ;       Do a WRITE FORMAT  to set IRESV4==>IRSTR = 1 (sets read strobe high)
5393 063516  012700  000001                MOV     #WF.I4RES,R0            ;IRESV4==>IRSTR = 1
5394 063522  004737  066262                JSR     PC,T20WFMT              ;SETUP T20PK2 FOR WRITE FORMAT
```

```
5395 063526  012704  066550          MOV     #T20PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
5396 063532  010465  000000          MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
5397 063536  004737  016336          JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
5398 063542                          FORCERROR       212$                    ;@@DFORCE ERROR IF FORCER=1
5399 063556  103407                  BCS     220$                    ;BR IF CARRY SET (GOOD RETURN)
5400 063560  010001                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
5401 063562                          NEXT.ERRNO
5402 063562                  212$:   ERRDF   ERRNO,T208SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     063562  104455                                                          TRAP    C$ERDF
     063564  001615                                                          .WORD   909
     063566  065551                                                          .WORD   T208SSR
     063570  012046                                                          .WORD   PKTSSR
5403 063572  005237  002222          INC     FATFLG                  ;SET FATAL ERROR FLAG
5404 063576                  220$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     063576  104406                                                          TRAP    C$CLP1
5405                                 ;       Do a Write Subsystem READ STATUS
5406 063600  004737  066146          JSR     PC,T20SRD               ;SETUP PACKET FOR READ STATUS
5407 063604  012704  066550          MOV     #T20PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
5408 063610  010465  000000          MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
5409 063614  004737  016336          JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
5410 063620                          FORCERROR       232$                    ;@@DFORCE ERROR IF FORCER=1
5411 063634  103407                  BCS     240$                    ;BR IF CARRY SET (GOOD RETURN)
5412 063636  010001                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
5413 063640                          NEXT.ERRNO
5414 063640                  232$:   ERRDF   ERRNO,T203SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     063640  104455                                                          TRAP    C$ERDF
     063642  001616                                                          .WORD   910
     063644  065332                                                          .WORD   T203SSR
     063646  012046                                                          .WORD   PKTSSR
5415 063650  005237  002222          INC     FATFLG                  ;SET FATAL ERROR FLAG
5416 063654                  240$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     063654  104406                                                          TRAP    C$CLP1
5417                                 ;       If Read Data parity error NOT=1  Then Print Error
5418 063656  004737  066354          JSR     PC,T20SETEXP            ;SET WORDS 0-7 EXPD=RECV (NOT TESTING)
5419 063662  012701  065102          MOV     #T20EXSTA,R1            ;GET EXPECTED READ STATUS
5420 063666  012702  066442          MOV     #T208FSTA,R2            ;GET RECV READ STATUS
5421 063672  011211                  MOV     (R2),(R1)               ;SET EXPD WORD #8 = RECV TEMP
5422 063674  016261  000002  000002  MOV     2(R2),2(R1)             ;SET EXPD WORD #9 = RECV (NOT TESTED)
5423 063702  052711  100000          BIS     #S1.PARERR,(R1)         ;SET EXP PAR ERR  =1
5424 063706  005000                  CLR     R0                      ;HIGH RECV ADDRESS FOR CKMSG2
5425 063710  012701  066422          MOV     #T208FR,R1              ;LOW RECV ADDRESS FOR CKMSG2
5426 063714  012702  065062          MOV     #T20EXP,R2              ;EXPD ADDRESS
5427 063720  012703  000024          MOV     #20.,R3                 ;NUMBER OF BYTES TO COMPARE
5428 063724  004737  011500          JSR     PC,CKMSG2               ;EXPD EQUAL RECV?
5429 063730                          FORCERROR       252$,NOTSSR             ;@@D
5430 063740  103404                  BCS     260$                    ;BR IF YES
5431 063742                          NEXT.ERRNO
5432 063742                  252$:   ERRHRD  ERRNO,T20SWP,MSGSTAT    ;REPORT ERROR
     063742  104456                                                          TRAP    C$ERHRD
     063744  001617                                                          .WORD   911
     063746  065617                                                          .WORD   T20SWP
     063750  012350                                                          .WORD   MSGSTAT
5433 063752                  260$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     063752  104406                                                          TRAP    C$CLP1
5434                                 ;       Do a Write Misc to RESET FIFO
5435 063754  012700  000020          MOV     #MS.RSFIF,R0            ;SET RESET FIFO COMMAND
5436 063760  004737  066302          JSR     PC,T20WMISC             ;SETUP T20PK2 FOR WRITE MISC
```

```
5437 063764  012704  066550                MOV     @T20PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
5438 063770  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
5439 063774  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
5440 064000                                FORCERROR       282$                    ;@@DFORCE ERROR IF FORCER=1
5441 064014  103407                        BCS     290$                    ;BR IF CARRY SET (GOOD RETURN)
5442 064016  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
5443 064020                                NEXT.ERRNO
5444 064020                        282$:   ERRDF   ERRNO,T202SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     064020  104455                                                                  TRAP    C$ERDF
     064022  001620                                                                  .WORD   912
     064024  065266                                                                  .WORD   T202SSR
     064026  012046                                                                  .WORD   PKTSSR
5445 064030  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
5446 064034                        290$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     064034  104406                                                                  TRAP    C$CLP1
5447                               ;       Do a Write Subsystem READ STATUS
5448                               ;       If Read Data parity error NOT=0  Then Print Error
5449 064036  004737  066354                JSR     PC,T20SETEXP            ;SET WORDS 0-7 EXPD=RECV (NOT TESTING)
5450 064042  012701  065102                MOV     @T20EXSTA,R1            ;GET EXPECTED READ STATUS
5451 064046  012702  066442                MOV     @T20BFSTA,R2            ;GET RECV READ STATUS
5452 064052  011211                        MOV     (R2),(R1)               ;SET EXPD WORD @8 = RECV TEMP
5453 064054  016261  000002  000002        MOV     2(R2),2(R1)             ;SET EXPD WORD @9 = RECV (NOT TESTED)
5454 064062  042711  100000                BIC     @S1.PARERR,(R1)         ;SET EXP PAR ERR  =0
5455 064066  005000                        CLR     R0                      ;HIGH RECV ADDRESS FOR CKMSG2
5456 064070  012701  066422                MOV     @T20BFR,R1              ;LOW RECV ADDRESS FOR CKMSG2
5457 064074  012702  065062                MOV     @T20EXP,R2              ;EXPD ADDRESS
5458 064100  012703  000024                MOV     @20.,R3                 ;NUMBER OF BYTES TO COMPARE
5459 064104  004737  011500                JSR     PC,CKMSG2               ;EXPD EQUAL RECV?
5460 064110                                FORCERROR       302$,NOTSSR             ;@@D
5461 064120  103404                        BCS     320$                    ;BR IF YES
5462 064122                                NEXT.ERRNO
5463 064122                        302$:   ERRHRD  ERRNO,T20RSF,MSGSTAT    ;REPORT ERROR
     064122  104456                                                                  TRAP    C$ERHRD
     064124  001621                                                                  .WORD   913
     064126  065726                                                                  .WORD   T20RSF
     064130  012350                                                                  .WORD   MSGSTAT
5464 064132                        320$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     064132  104406                                                                  TRAP    C$CLP1
5465                               ;       (* Verify Data can be transferred without a Parity Error *)
5466                               ;       Do a WRITE FORMAT  to set IRESV4-->IRSTR = 1 (sets read strobe high)
5467 064134  012700  000001                MOV     @WF.I4RES,R0            ;IRESV4-->IRSTR = 1
5468 064140  004737  066262                JSR     PC,T20WFMT              ;SETUP T20PK2 FOR WRITE FORMAT
5469 064144  012704  066550                MOV     @T20PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
5470 064150  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
5471 064154  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
5472 064160                                FORCERROR       332$                    ;@@DFORCE ERROR IF FORCER=1
5473 064174  103407                        BCS     340$                    ;BR IF CARRY SET (GOOD RETURN)
5474 064176  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
5475 064200                                NEXT.ERRNO
5476 064200                        332$:   ERRDF   ERRNO,T208SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     064200  104455                                                                  TRAP    C$ERDF
     064202  001622                                                                  .WORD   914
     064204  065551                                                                  .WORD   T208SSR
     064206  012046                                                                  .WORD   PKTSSR
5477 064210  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
5478 064214                        340$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     064214  104406                                                                  TRAP    C$CLP1
```

```
5479                                    ;       Do a WRITE NPR to set loopback and tape direction OUT and
5480                                    ;               and CLEAR Write Wrong Parity.
5481 064216  012700  000100                        MOV     #NP.OUT,R0              ;SET TAPE DIRECTION OUT
5482 064222  052700  000040                        BIS     #NP.LOOP,R0             ;SET LOOPBACK
5483 064226  052700  000020                        BIS     #NP.WRP,R0              ;CLEAR WRITE WRONG PARITY (INVERTED)
5484 064232  004737  066166                        JSR     PC,T20WNPR              ;SETUP T20PK2 FOR WRITE NPR
5485 064236  012704  066550                        MOV     #T20PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
5486 064242  010465  000000                        MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
5487 064246  004737  016336                        JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
5488 064252                                        FORCERROR       352$                    ;@@DFORCE ERROR IF FORCER=1
5489 064266  103407                                BCS     360$                    ;BR IF CARRY SET (GOOD RETURN)
5490 064270  010001                                MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
5491 064272                                        NEXT.ERRNO
5492 064272                             352$:      ERRDF   ERRNO,T204SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     064272  104455                                                                                 TRAP    C$ERDF
     064274  001623                                                                                 .WORD   915
     064276  065377                                                                                 .WORD   T204SSR
     064300  012046                                                                                 .WORD   PKTSSR
5493 064302  005237  002222                        INC     FATFLG                  ;SET FATAL ERROR FLAG
5494 064306                             360$:      CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     064306  104406                                                                                 TRAP    C$CLP1
5495                                    ;       Do a WRITE FIFO with byte count equal to 1 and Tape direction OUT
5496 064310  012700  000001                        MOV     #1,R0                   ;WRITE 1 BYTE
5497 064314  012701  002312                        MOV     #DATA,R1                ;FIFO WRITE DATA ADDRESS
5498 064320  004737  066226                        JSR     PC,T20WFIF              ;SETUP T20PK2 FOR WRITE FIFO
5499 064324  012704  066550                        MOV     #T20PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
5500 064330  010465  000000                        MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
5501 064334  004737  016336                        JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
5502 064340                                        FORCERROR       372$                    ;@@DFORCE ERROR IF FORCER=1
5503 064354  103407                                BCS     380$                    ;BR IF CARRY SET (GOOD RETURN)
5504 064356  010001                                MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
5505 064360                                        NEXT.ERRNO
5506 064360                             372$:      ERRDF   ERRNO,T205SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     064360  104455                                                                                 TRAP    C$ERDF
     064362  001624                                                                                 .WORD   916
     064364  065442                                                                                 .WORD   T205SSR
     064366  012046                                                                                 .WORD   PKTSSR
5507 064370  005237  002222                        INC     FATFLG                  ;SET FATAL ERROR FLAG
5508 064374                             380$:      CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     064374  104406                                                                                 TRAP    C$CLP1
5509                                    ;       Do a READ FIFO with tape direction OUT to load tape out write latch
5510 064376  012700  000001                        MOV     #1,R0                   ;SET READ BYTE COUNT
5511 064402  004737  066206                        JSR     PC,T20RFIF              ;SETUP T20PK2 FOR READ FIFO
5512 064406  012704  066550                        MOV     #T20PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
5513 064412  010465  000000                        MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
5514 064416  004737  016336                        JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
5515 064422                                        FORCERROR       392$                    ;@@DFORCE ERROR IF FORCER=1
5516 064436  103407                                BCS     400$                    ;BR IF CARRY SET (GOOD RETURN)
5517 064440  010001                                MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
5518 064442                                        NEXT.ERRNO
5519 064442                             392$:      ERRDF   ERRNO,T206SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     064442  104455                                                                                 TRAP    C$ERDF
     064444  001625                                                                                 .WORD   917
     064446  065506                                                                                 .WORD   T206SSR
     064450  012046                                                                                 .WORD   PKTSSR
5520 064452  005237  002222                        INC     FATFLG                  ;SET FATAL ERROR FLAG
5521 064456                             400$:      CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
```

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064456  104406                                                                  TRAP    C$CLP1
5522                            ;       Do a WRITE FORMAT  to set IRESV4-->IRSTR = 0 (sets read strobe low)
5523                            ;               (Read Strobe sets PAR IN H [Parity Error])
5524 064460  005000                        CLR     R0                      ;IRESV4-->IRSTR = 0
5525 064462  004737  066262                JSR     PC,T20WFMT              ;SETUP T20PK2 FOR WRITE FORMAT
5526 064466  012704  066550                MOV     @T20PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
5527 064472  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
5528 064476  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
5529 064502                                FORCERROR       412$                    ;@@DFORCE ERROR IF FORCER=1
5530 064516  103407                        BCS     420$                    ;BR IF CARRY SET (GOOD RETURN)
5531 064520  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
5532 064522                                NEXT.ERRNO
5533 064522                     412$:      ERRDF   ERRNO,T208SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
064522  104455                                                                  TRAP    C$ERDF
064524  001626                                                                  .WORD   918
064526  065551                                                                  .WORD   T208SSR
064530  012046                                                                  .WORD   PKTSSR
5534 064532  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
5535 064536                     420$:      CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
064536  104406                                                                  TRAP    C$CLP1
5536                            ;       Do a WRITE FORMAT  to set IRESV4-->IRSTR = 1 (sets read strobe high)
5537 064540  012700  000001                MOV     @WF.I4RES,R0            ;IRESV4-->IRSTR = 1
5538 064544  004737  066262                JSR     PC,T20WFMT              ;SETUP T20PK2 FOR WRITE FORMAT
5539 064550  012704  066550                MOV     @T20PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
5540 064554  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
5541 064560  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
5542 064564                                FORCERROR       432$                    ;@@DFORCE ERROR IF FORCER=1
5543 064600  103407                        BCS     440$                    ;BR IF CARRY SET (GOOD RETURN)
5544 064602  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
5545 064604                                NEXT.ERRNO
5546 064604                     432$:      ERRDF   ERRNO,T208SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
064604  104455                                                                  TRAP    C$ERDF
064606  001627                                                                  .WORD   919
064610  065551                                                                  .WORD   T208SSR
064612  012046                                                                  .WORD   PKTSSR
5547 064614  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
5548 064620                     440$:      CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
064620  104406                                                                  TRAP    C$CLP1
5549
5550                            ;       Do a Write Subsystem READ STATUS
5551 064622  004737  066146                JSR     PC,T20SRD               ;SETUP PACKET FOR READ STATUS
5552 064626  012704  066550                MOV     @T20PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
5553 064632  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
5554 064636  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
5555 064642                                FORCERROR       452$                    ;@@DFORCE ERROR IF FORCER=1
5556 064656  103407                        BCS     460$                    ;BR IF CARRY SET (GOOD RETURN)
5557 064660  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
5558 064662                                NEXT.ERRNO
5559 064662                     452$:      ERRDF   ERRNO,T203SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
064662  104455                                                                  TRAP    C$ERDF
064664  001630                                                                  .WORD   920
064666  065332                                                                  .WORD   T203SSR
064670  012046                                                                  .WORD   PKTSSR
5560 064672  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
5561 064676                     460$:      CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
064676  104406                                                                  TRAP    C$CLP1
5562                            ;       If Read Data parity error NOT=0  Then Print Error
```

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5563 064700  004737  066354                    JSR     PC,T20SETEXP            ;SET WORDS 0-7 EXPD=RECV (NOT TESTING)
5564 064704  012701  065102                    MOV     @T20EXSTA,R1            ;GET EXPECTED READ STATUS
5565 064710  012702  066442                    MOV     @T20BFSTA,R2            ;GET RECV READ STATUS
5566 064714  011211                            MOV     (R2),(R1)               ;SET EXPD WORD @8 = RECV TEMP
5567 064716  016261  000002  000002            MOV     2(R2),2(R1)             ;SET EXPD WORD @9 = RECV (NOT TESTED)
5568 064724  042711  100000                    BIC     @S1.PARERR,(R1)         ;SET EXP PAR ERR  =0
5569 064730  005000                            CLR     R0                      ;HIGH RECV ADDRESS FOR CKMSG2
5570 064732  012701  066422                    MOV     @T20BFR,R1              ;LOW RECV ADDRESS FOR CKMSG2
5571 064736  012702  065062                    MOV     @T20EXP,R2              ;EXPD ADDRESS
5572 064742  012703  000024                    MOV     @20.,R3                 ;NUMBER OF BYTES TO COMPARE
5573 064746  004737  011500                    JSR     PC,CKMSG2               ;EXPD EQUAL RECV?
5574 064752                                    FORCERROR       472$,NOTSSR     ;@@D
5575 064762  103404                            BCS     480$                    ;BR IF YES
5576 064764                                    NEXT.ERRNO
5577 064764                            472$:   ERRHRD  ERRNO,T20CWP,MSGSTAT    ;REPORT ERROR
     064764  104456                                                                    TRAP    C$ERHRD
     064766  001631                                                                    .WORD   921
     064770  066027                                                                    .WORD   T20CWP
     064772  012350                                                                    .WORD   MSGSTAT
5578 064774                            480$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     064774  104406                                                                    TRAP    C$CLP1
5579
5580 064776                                    FORCEXIT        555$            ;@@D
5581 065006  013703  002316                    MOV     TSTPTR,R3               ;RESTORE CURRENT TSTBLK POINTER
5582 065012  020327  003062                    CMP     R3,@TBLEND              ;END OF TSTBLK?
5583 065016  103002                            BHIS    555$                    ;BR IF YES
5584 065020  000137  063074                    JMP     100$                    ;DO ANOTHER TSTBLK PATTERN
5585 065024                            555$:
5586
5587 065024                                    ENDSUB                          ;////////////// END SUBTEST //////////
     065024                                                                            L10074:
     065024  104403                                                                     TRAP    C$ESUB
5588
5589 065026  005737  002222                    TST     FATFLG                  ;ANY FATAL ERRORS ?
5590 065032  001402                            BEQ     560$                    ;BRANCH IF NOT
5591 065034  004737  017202                    JSR     PC,CKDROP               ;TRY TO DROP THE UNIT
5592 065040                            560$:
5593 065040  004737  016456                    JSR     PC,TSTLOOP              ;DO ITERATIONS?
5594 065044  103002                            BCC     565$                    ;BR IF NO
5595 065046  000137  050526                    JMP     T18LOOP                 ;LOOP UNTIL ITERATIONS DONE
5596 065052                            565$:
5597 065052                                    EXIT    TST                     ;////////// EXIT TEST //////////
     065052  104432                                                                    TRAP    C$EXIT
     065054  001610                                                                    .WORD   L10073-.
5598
5599
5600                                    ;+
5601                                    ;LOCAL STORAGE FOR THIS TEST
5602                                    ;-
5603
5604
5605 065056                            T20MSK:                                 ;MASK OF UNTESTED BITS IN READ STATUS
5606                                                                            ;UNTESTED BITS ARE SET TO 1
5607 065056      377                           .BYTE   ^C<000>                 ;BYTE 0 MASK
5608 065057      037                           .BYTE   ^C<340>                 ;BYTE 1 MASK (PARERR,IRESV2,IRESV1)
5609 065060      360                           .BYTE   ^C<017>                 ;BYTE 2 (TIMER A,TIMER B,UNDEFINED<1:0>)
5610 065061      000                           .BYTE   0                       ;MAKE IT EVEN
```

```
5611
5612 065062                                    T20EXP:                         ;BEGIN EXPECTED DATA BUFFER
5613 065062  000000                                .WORD   0                   ;MESSAGE TYPE
5614 065064  000000                                .WORD   0                   ;DATA FIELD LENGTH
5615 065066  000000                                .WORD   0                   ;RBPCR
5616 065070  000000                                .WORD   0                   ;XST0
5617 065072  000000                                .WORD   0                   ;XST1
5618 065074  000000                                .WORD   0                   ;XST2
5619 065076  000000                                .WORD   0                   ;XST3
5620 065100  000000                                .WORD   0                   ;XST4 (ALWAYS PRESENT FOR WRITE SUB.)
5621 065102                                    T20EXSTA: .BLKB 64.             ;EXPECTED READ STATUS AND WRITE FIFO DATA
5622 065202                                    T20EXEND:                               ;END EXPECTED DATA BUFFER
5623                                           ;+
5624                                           ;LOCAL TEXT MESSAGES FOR TEST
5625                                           ;-
5626
5627 065202      122      145      141  TST20ID:        .ASCIZ  'Read/Write Data Parity'
5628 065231      127      122      111  T20SSR: .ASCIZ  'WRITE CHARACTERISTICS Failed'
5629 065266      127      122      111  T202SSR:.ASCIZ  'WRITE SUBSYSTEM (Write Misc) Failed'
5630 065332      127      122      111  T203SSR:.ASCIZ  'WRITE SUBSYSTEM (Read Status) Failed'
5631 065377      127      122      111  T204SSR:.ASCIZ  'WRITE SUBSYSTEM (Write Npr) Failed'
5632 065442      127      122      111  T205SSR:.ASCIZ  'WRITE SUBSYSTEM (Write FIFO) Failed'
5633 065506      127      122      111  T206SSR:.ASCIZ  'WRITE SUBSYSTEM (Read FIFO) Failed'
5634 065551      127      122      111  T208SSR:.ASCIZ  'WRITE SUBSYSTEM (Write Format) Failed'
5635 065617      122      145      141  T20SWP: .ASCIZ  'Read Data Parity Error (PARERR) Failed to Set after Write Wrong Parity'
5636 065726      122      145      141  T20RSF: .ASCIZ  'Read Data Parity Error (PARERR) Failed to Clear after RESET FIFO'
5637 066027      122      145      141  T20CWP: .ASCIZ  'Read Data Parity Error (PARERR) occurred in Data Loopback'
5638                                               .EVEN
5639
5640                                           ;+
5641                                           ; CLEAR MESSAGE BUFFER
5642                                           ;-
5643 066122                                    T20CLRBUF:                      ;
5644 066122                                            SAVREG                  ;SAVE R1-R5 UNTIL NEXT RETURN
5645 066126  012701  066422                            MOV     @T20BFR,R1      ;GET MESSAGE BUFFER ADDRESS
5646 066132  012702  000120                            MOV     @T20BEND-T20BFR,R2 ;SIZE OF MESSAGE BUFFER IN BYTES
5647 066136  105021                            10$:    CLRB    (R1)+           ;CLEAR A BYTE
5648 066140  005302                                    DEC     R2              ;DONE?
5649 066142  003375                                    BGT     10$             ;BR IF NO
5650 066144  000207                                    RTS     PC              ;RETURN
5651
5652                                           ;+
5653                                           ; SETUP T20PK2 PACKET FOR READ STATUS
5654                                           ;-
5655 066146                                    T20SRD:
5656 066146  004737  066122                            JSR     PC,T20CLRBUF    ;CLEAR MESSAGE BUFFER
5657 066152  012700  066560                            MOV     @T20DT2,R0      ;WRITE SUBSYSTEM DATA BUFFER
5658 066156  112720  000005                            MOVB    @PW.RDSTATUS,(R0)+ ;STORE READ STATUS COMMAND IN BSEL0
5659 066162  105010                                    CLRB    (R0)            ;CLEAR BSEL1
5660 066164  000207                                    RTS     PC              ;RETURN
5661
5662
5663                                           ;+
5664                                           ; SETUP T20PK2 PACKET FOR WRITE NPR
5665                                           ;
5666                                           ; INPUT:
5667                                           ;       R0 CONTAINS BSEL1 NPR DATA
```

```
5668                                    ;
5669                                    ;-
5670 066166                             T20WNPR:
5671 066166  004737  066122                    JSR     PC,T20CLRBUF            ;CLEAR MESSAGE BUFFER
5672 066172  012701  066560                    MOV     #T20DT2,R1              ;WRITE SUBSYSTEM DATA BUFFER
5673 066176  112721  000011                    MOVB    #PW.WNPR,(R1)+          ;STORE WRITE NPR IN BSEL0
5674 066202  110011                            MOVB    R0,(R1)                 ;STORE NPR DATA IN BSEL1
5675 066204  000207                            RTS     PC                      ;RETURN
5676
5677                                    ;+
5678                                    ; SETUP T20PK2 PACKET FOR READ FIFO
5679                                    ;
5680                                    ; INPUT:
5681                                    ;       R0 CONTAINS SEL2 BYTE COUNT
5682                                    ;-
5683 066206                             T20RFIF:
5684 066206  004737  066122                    JSR     PC,T20CLRBUF            ;CLEAR MESSAGE BUFFER
5685 066212  012701  066560                    MOV     #T20DT2,R1              ;WRITE SUBSYSTEM DATA BUFFER
5686 066216  112721  000003                    MOVB    #PW.RFIFO,(R1)+         ;STORE READ FIFO IN BSEL0
5687 066222  110021                            MOVB    R0,(R1)+                ;STORE BYTE COUNT IN BSEL1
5688 066224  000207                            RTS     PC                      ;RETURN
5689                                    ;+
5690                                    ; SETUP T20PK2 PACKET FOR WRITE FIFO
5691                                    ;
5692                                    ; INPUT:
5693                                    ;       R0 CONTAINS BYTE COUNT
5694                                    ;       R1 CONTAINS DATA PATTERN BLOCK ADDRESS
5695                                    ;-
5696 066226                             T20WFIF:
5697 066226                                    SAVREG                          ;SAVE R1-R5 UNTIL NEXT RETURN
5698 066232  004737  066122                    JSR     PC,T20CLRBUF            ;CLEAR MESSAGE BUFFER
5699 066236  012702  066560                    MOV     #T20DT2,R2              ;WRITE SUBSYSTEM DATA BUFFER
5700 066242  112722  000004                    MOVB    #PW.WFIFO,(R2)+         ;STORE WRITE FIFO IN BSEL0
5701 066246  110022                            MOVB    R0,(R2)+                ;STORE BYTE COUNT IN BSEL1
5702 066250  005022                            CLR     (R2)+                   ;CLEAR SEL2 (UNUSED)
5703 066252  112122                    10$:    MOVB    (R1)+,(R2)+             ;STORE DATA PATTERN BYTE
5704 066254  005300                            DEC     R0                      ;DONE ALL BYTES?
5705 066256  003375                            BGT     10$                     ;BR IF NO
5706 066260  000207                            RTS     PC                      ;RETURN
5707
5708                                    ;+
5709                                    ; SETUP T20PK2 FOR WRITE FORMAT TRANSPORT REGISTER
5710                                    ;
5711                                    ; INPUT:
5712                                    ;       R0 CONTAINS DRIVING DATA PATTERN
5713                                    ;-
5714 066262                             T20WFMT:
5715 066262  004737  066122                    JSR     PC,T20CLRBUF            ;CLEAR MESSAGE BUFFER
5716 066266  012701  066560                    MOV     #T20DT2,R1              ;WRITE SUBSYSTEM DATA BUFFER
5717 066272  112721  000007                    MOVB    #PW.WFMT,(R1)+          ;STORE WRITE FORMAT IN BSEL0
5718 066276  110021                            MOVB    R0,(R1)+                ;STORE DATA WORD IN BSEL1
5719 066300  000207                            RTS     PC                      ;RETURN
5720                                    ;+
5721                                    ; SETUP T20PK2 PACKET FOR WRITE MISC.
5722                                    ;
5723                                    ;       R0 CONTAINS WRITE MISC DATA
5724                                    ;-
```

```
5725 066302                                T20WMISC:
5726 066302  012701  066560                       MOV     #T20DT2,R1          ;WRITE SUBSYSTEM DATA BUFFER
5727 066306  112721  000010                       MOVB    #PW.WMISC,(R1)+     ;STORE WRITE MISCELLANEOUS IN BSEL0
5728 066312  110011                               MOVB    R0,(R1)             ;STORE INVERT EXTENDED FEATURES IN BSEL1
5729 066314  000207                               RTS     PC                  ;RETURN
5730                                       ;+
5731                                       ; SETUP T20PK2 PACKET FOR WRITE MISC. INVERT EXTENDED FEATURES SWITCH
5732                                       ;-
5733 066316                                T20SEXT:
5734 066316  012700  066560                       MOV     #T20DT2,R0          ;WRITE SUBSYSTEM DATA BUFFER
5735 066322  112720  000010                       MOVB    #PW.WMISC,(R0)+     ;STORE WRITE MISCELLANEOUS IN BSEL0
5736 066326  112710  000200                       MOVB    #MS.EXT,(R0)        ;STORE INVERT EXTENDED FEATURES IN BSEL1
5737 066332  000207                               RTS     PC                  ;RETURN
5738                                       ;+
5739                                       ; CLEAR EXPECTED DATA MESSAGE BUFFER
5740                                       ;-
5741 066334                                T20CLEXP:
5742 066334  012701  065062                       MOV     #T20EXP,R1          ;GET EXPD ADDRESS
5743 066340  012700  000120                       MOV     #T20EXEND-T20EXP,R0 ;GET EXPD SIZE
5744 066344  105021                        10$:   CLRB    (R1)+               ;CLEAR A BYTE
5745 066346  005300                               DEC     R0                  ;DONE?
5746 066350  003375                               BGT     10$                 ;BR IF NO
5747 066352  000207                               RTS     PC                  ;RETURN
5748
5749                                       ;+
5750                                       ;Set WORDS 0-7 of expd message BUFFER = to recv since not testing
5751                                       ;-
5752 066354                                T20SETEXP:
5753 066354  012702  065062                       MOV     #T20EXP,R2          ;GET EXPD
5754 066360  012703  066422                       MOV     #T20BFR,R3          ;GET READ STATUS RECV BUFFER
5755 066364  012700  000010                       MOV     #8.,R0              ;SET WORDS 0-7 EXP=RECV
5756 066370  012322                        5$:    MOV     (R3)+,(R2)+         ;SET EXPD=RECV
5757 066372  005300                               DEC     R0                  ;DONE WORDS 0-7 WORDS?
5758 066374  003375                               BGT     5$                  ;BR IF NO
5759 066376  000207                               RTS     PC                  ;RETURN
5760
5761
5762
5766
5767                                       ;
5768                                       ;WRITE CHARACTERISTICS COMMAND PACKET
5769 066400                                ;
5770 066400  100004                       T20PACKET:                          ;COMMAND PACKET FOR TEST
5771 066402  066410                               .WORD   100004              ;WRITE CHARACTERISTICS COMMAND, WITH ACK
5772 066404  000000                               .WORD   T20DATA             ;ADDRESS OF CHARACTERISTICS BLOCK
5773 066406  000012                               .WORD   0
5774                                               .WORD   10.                 ;MINIMUM MESSAGE PACKET SIZE
5775 066410
5776 066410  066422                       T20DATA:                            ;CHARACTERISTICS DATA BLOCK
5777 066412  000000                               .WORD   T20BFR              ;ADDRESS OF MESSAGE BUFFER
5778 066414  000024                               .WORD   0
5779 066416  000000                               .WORD   20.                 ;LENGTH OF MESSAGE BUFFER
5780 066420  000007                               .WORD   0                   ;ESS,ENB,EAI,ERI
5781                                               .WORD   7                   ;EXTENDED FEATURES UNIT NO.
5782
5783                                       ;MESSAGE BUFFER FOR ALL TEST 17 COMMANDS
5784
```

```
5785 066422                          T20BFR:                         ;BEGIN MESSAGE BUFFER
5786 066422  000000                          .WORD   0               ;MESSAGE TYPE
5787 066424  000000                          .WORD   0               ;DATA FIELD LENGTH
5788 066426  000000                          .WORD   0               ;RBPCR
5789 066430  000000                          .WORD   0               ;XST0
5790 066432  000000                          .WORD   0               ;XST1
5791 066434  000000                          .WORD   0               ;XST2
5792 066436  000000                          .WORD   0               ;XST3
5793 066440  000000                          .WORD   0               ;XST4 (ALWAYS PRESENT FOR WRITE SUBSYSTEM
5794 066442                          T20BFSTA: .BLKB 64.               ;READ STATUS AND WRITE FIFO BUFFER
5795 066542                          T20BEND:                        ;END OF MESSAGE BUFFER
5796                                 ;
5797                                 ;WRITE SUBSYSTEM READ STATUS COMMAND PACKET
5798                                 ;
5800         066550                          .=<.+10>&177770
5802 066550                          T20PK2:
5803 066550  100006                          .WORD   P.WRTSUB!P.ACK          ;WRITE SUBSYSTEM WITH ACK
5804 066552  066560                          .WORD   T20DT2                  ;LOW ADDRESS OF DATA BLOCK
5805 066554  000000                          .WORD   0                       ;HIGH ADDRESS OF DATA BLOCK
5806 066556  000012                          .WORD   10.                     ;MINIMUM MESSAGE PACKET SIZE
5807
5808 066560                          T20DT2:                         ;DATA BLOCK
5809 066560     000                          .BYTE   0               ;BSEL0
5810 066561     000                          .BYTE   0               ;BSEL1
5811 066562  000000                          .WORD   0               ;SEL2
5812 066564                                  .BLKB   64.             ;WRITE FIFO DATA OUTPUT BUFFER
5813
5814
5815 066664                                  ENDTST
     066664                                                                  L10073:
     066664  104401                                                                TRAP    C$ETST
5816                                 .SBTTL  TEST 10: MANUAL INTERVENTION
5817
5818                                 ;THE MANUAL INTERVENTION TEST IS A STANDALONE ROUTINE (NOT REALLY A "TEST")
5819                                 ;THAT ALLOWS THE OPERATOR TO CHECK OUT VARIOUS ELEMENTS AND FUNCTIONS OF
5820                                 ;THE SUBSYSTEM THAT CANNOT BE MANIPULATED BY THE PROGRAM ALONE. WHEN
5821                                 ;THIS ROUTINE IS STARTED, IT FIRST PRINTS OUT A MENU OF SELECTABLE
5822                                 ;SUBTESTS AND THEN WAITS FOR THE OPERATOR TO TYPE IN A SELECTION CODE.
5823                                 ;THE ONLY WAYS TO EXIT THIS ROUTINE AND RETURN TO THE DIAGNOSTIC SUPERVISOR
5824                                 ;ARE BY TYPING <CTRL-C> OR SELECTING CODE 7.
5825                                 ;SELECTION CODES AND SUBROUTINES ARE:
5826                                 ;
5827                                 ;
5828                                 ;       CODE    ROUTINE
5829                                 ;
5830                                 ;         0     HELP. PRINTS THIS MENU.
5831                                 ;         1     TURN ON ALL M7196 LED INDICATORS
5832                                 ;         2     TURN OFF ALL M7196 LED INDICATORS
5833                                 ;         3     OFFLINE/ONLINE ATTENTION TEST
5834                                 ;         4     WRITE-PROTECT TEST
5835                                 ;         5     INITIATE TRANSPORT SERVO EXERCISER
5836                                 ;         6     PRINT EXTENDED TRANSPORT STATUS
5837                                 ;         7     EXIT (RETURN TO SUPERVISOR)
5838                                 ;
5839                                 ;
5840                                 ;EACH MENU ITEM CORRESPONDS TO A SUBTEST, AS FOLLOWS:
5841                                 ;
```

```
5842                            ;
5843                            ;
5844                            ;PRINTS OUT THE MENU ON THE CONSOLE TERMINAL.
5845                            ;
5846                            ;
5847                            ;CAUSES ALL THREE LED INDICATORS ON THE M7196 MODULE
5848                            ;TO BE ILLUMINATED. AFTER INITIATING THIS ROUTINE, THE OPERATOR
5849                            ;SHOULD OBSERVE THE LED'S AND VERIFY THAT THEY ARE INDEED ALL LIT.
5850                            ;THIS ROUTINE FIRST USES THE WRITE SUBSYSTEM MEMORY COMMAND TO
5851                            ;SET THE FORCE WRONG PARITY FLIP-FLOP, WHICH SERVES TO DRIVE THE
5852                            ;"PROCESSOR NOT OK" LED. THEN IT ENTERS A LOOP THAT CONTINUALLY
5853                            ;WRITES THE LOW BYTE OF TSDB AND READS THE TSSR. THESE LATTER TWO
5854                            ;OPERATIONS WILL CAUSE THE "NOT SSR" AND "DRIVING BUS" LED'S TO
5855                            ;GLOW -- THEY ARE NOT REALLY LIT AT ALL TIMES BUT SHOULD APPEAR
5856                            ;REASONABLY VISIBLE.
5857                            ;
5858                            ;
5859                            ;INITIALIZES THE CONTROLLER TO CAUSE ALL LED'S TO
5860                            ;EXTINGUISH.
5861                            ;
5862                            ;
5863                            ;
5864                            ;
5865                            ;THIS ROUTINE INITIALIZES THE CONTROLLER, ISSUES A
5866                            ;WRITE CHARACTERISTICS COMMAND TO ENABLE ATTENTION INTERRUPTS,
5867                            ;ISSUES A MESSAGE BUFFER RELEASE COMMAND, PRINTS A MESSAGE ON THE
5868                            ;CONSOLE TERMINAL INSTRUCTING THE OPERATOR TO TOGGLE THE ON-LINE
5869                            ;SWITCH ON THE TRANSPORT, THEN WAITS FOR AN ATTENTION INTERRUPT.
5870                            ;EACH TIME THE TRANSPORT TRANSITIONS FROM ON-LINE TO OFF-LINE OR
5871                            ;VICE-VERSA, AN ATTENTION INTERRUPT SHOULD BE GENERATED. THE PROGRAM
5872                            ;WILL REPORT THE INTERRUPT AND THE CURRENT STATE OF THE TRANSPORT.
5873                            ;THE OPERATOR SHOULD VERIFY THAT THE REPORTED STATE MATCHES THE
5874                            ;STATE INDICATED BY THE LED ON THE FRONT PANEL OF THE TRANSPORT.
5875                            ;IN ADDITION, WHEN THE TRANSPORT IS PLACED OFF-LINE, THE PROGRAM
5876                            ;ISSUES A SEQUENCE OF TAPE-MOTION COMMANDS (READ, WRITE, POSITION, ETC.
5877                            ;AND VERIFIES THAT, FOR EACH COMMAND, FUNCTION REJECT TERMINATION
5878                            ;RESULTS, ALONG WITH THE NON-EXECUTABLE FUNCTION (NEF) ERROR BIT BEING
5879                            ;SET.
5880                            ;
5881                            ;THIS ROUTINE INSTRUCTS THE OPERATOR TO MOUNT A SCRATCH
5882                            ;TAPE REEL THAT DOES NOT HAVE A WRITE-ENABLE RING INSTALLED, THEN
5883                            ;WAITS FOR THE OPERATOR TO RESPOND THAT THIS HAS BEEN ACCOMPLISHED.
5884                            ;UPON THE RESPONSE, THE PROGRAM VERIFIES THAT THE TRANSPORT SHOWS
5885                            ;A WRITE-PROTECTED STATUS, THEN ATTEMPTS TO WRITE DATA ON THE
5886                            ;TAPE AND EXPECTS THE APPROPRIATE ERROR TERMINATION INDICATING THAT
5887                            ;THE WRITE FUNCTION COULD NOT BE PERFORMED BECAUSE THE REEL IS
5888                            ;WRITE-PROTECTED.  IF THE APPROPRIATE TERMINATION IS NOT RECEIVED,
5889                            ;AN ERROR IS REPORTED.
5890                            ;
5891                            ;
5892                            ;
5893                            ;INSTRUCTS THE OPERATOR TO PLACE THE TAPE TRANSPORT(S)
5894                            ;ON-LINE (IF ANY ARE OFF-LINE) THEN ATTEMPTS TO PERFORM AN EXTENDED
5895                            ;STATUS READOUT.  FOR EACH TRANSPORT EQUIPPED WITH THIS FEATURE,
5896                            ;THE PROGRAM FORMATS AND PRINTS OUT THE RESULTING STATUS. IF THE
5897                            ;TRANSPORT IS NOT EQUIPPED WITH THIS FEATURE, A MESSAGE INDICATING
5898                            ;SUCH IS ISSUED.
```

```
5899                                    ;
5900                                    ;
5901                                    ;
5902                                    ;
5903 066666                             BGNTST
     066666                                                         T10::
5908 066666                             RFLAGS  R0              ;GET OPERATOR FLAGS
     066666  104421                                                     TRAP    C$RFLA
5909 066670  001403                     BEQ     21$             ;BR, IF OK TO RUN
5910 066672  012700  072250             MOV     #T38NE,R0       ;"TEST NOT EXECUTED"
5911 066676  000402                     BR      3$              ;JUMP IF NOT FIRST TEST
5912 066700                          21$:
5913 066700  012700  073365             MOV     #T38ID,R0       ;TEST ID MESSAGE
5914 066704  004737  016510          3$: JSR     PC,TSTSETUP     ;DO THE COMMON SETUP
5915 066710  004737  020500             JSR     PC,CHKMAN       ;IS MANUAL INTERVENTION ALLOWED?
5916 066714  103402                     BCS     22$             ;BR, IF MANUAL INTER ALLOWED
5917 066716  000137  071450             JMP     64$             ;JUMP IF NOT ALLOWED
5918 066722                          22$:
5922 066722  005037  002222          2$: CLR     FATFLG          ;CLEAR THE FATAL ERROR FLAG
5923 066726  012737  176750  071462     MOV     #65000.,T38DLY  ;SET UP DELAY COUNTER
5924 066734  004737  015774          5$: JSR     PC,SOFINIT      ;DO A SOFT INIT
5925 066740  103427                     BCS     23$             ;BRANCH IF OK
5926 066742  010001                     MOV     R0,R1           ;CONTENTS OF TSSR REGISTER
5927 066744  032701  000200             BIT     #SSR,R1         ;CHECK FOR TSSR SET
5928 066750  001023                     BNE     23$             ;KEEP GOING IF NOT SET
5929 066752                             DELAY   250             ;CALL DELAY ROUTINE
     066752  012727  000250                                             MOV     #250.,(PC)+
     066756  000000                                                     .WORD   0
     066760  013727  002116                                             MOV     L$DLY,(PC)+
     066764  000000                                                     .WORD   0
     066766  005367  177772                                             DEC     -6(PC)
     066772  001375                                                     BNE     .-4
     066774  005367  177756                                             DEC     -22(PC)
     067000  001367                                                     BNE     .-20
5930 067002  005337  071462                 DEC     T38DLY          ;BUMP COUNTER DOWN
5931 067006  001352                         BNE     5$              ;BR, IF MORE TIME LEFT
5932 067010                                 ERRDF   ERRNO,SFIERR,SFIMSG     ;REPORT FATAL ERROR
     067010  104455                                                     TRAP    C$ERDF
     067012  001751                                                     .WORD   1001
     067014  003652                                                     .WORD   SFIERR
     067016  012034                                                     .WORD   SFIMSG
5933 067020  012700  073412          23$:   MOV     #MIMENU,R0      ;MENU OF MANUAL INTERVENTIONS
5934 067024  012701  000006                 MOV     #6,R1           ;MAXIMUM ALLOWED SELECTION
5935 067030  004737  020256                 JSR     PC,GETSEL       ;GO GET THE OPERATORS SELECTION
5936 067034  010004                         MOV     R0,R4           ;GET NUMBER FROM ROUTINE
5937 067036  006304                         ASL     R4              ;CONVERT TO WORD OFFSET
5938 067040  000174  067044                 JMP     @6$(R4)         ;JUMP TO PROPER LOOP
5939 067044  066722                  6$:    .WORD   2$              ;RETYPE THE MENU
5940 067046  067062                         .WORD   10$             ; 1 TURN ON LED'S
5941 067050  067344                         .WORD   15$             ; 2 TURN OFF LED'S
5942 067052  067576                         .WORD   20$             ; 3 ONLINE ATTENTION
5943 067054  070232                         .WORD   25$             ; 4 WRITE PROTECT
5944 067056  071166                         .WORD   35$             ; 5 EXTENDED TRANSPORT STATUS
5945 067060  071444                         .WORD   63$             ; 6 LEAVE THE TEST
5946 067062                          10$:   PRINTF  #T38MS2         ;TELL OPERATOR TO CNTRL-C FOR EXIT
     067062  012746  073261                                             MOV     #T38MS2,-(SP)
     067066  012746  000001                                             MOV     #1,-(SP)
```

```
TSV5 - HARDWARE TESTS   MACRO M1113  06-FEB-84 17:14                                SEQ 219
TEST 10: MANUAL INTERVENTION

        067072  010600                                                          MOV     SP,R0
        067074  104417                                                          TRAP    C$PNTF
        067076  062706  000004                                                  ADD     #4,SP
  5947  067102  004737  074016              JSR     PC,T38REST          ;SET PACKET TO INITIAL VALUES
  5948  067106  004737  015774              JSR     PC,SOFINIT          ;DO SOFT INIT OF CONTROLLER
  5949  067112  103405                      BCS     100$                ;BR IF SOFT INIT = OK
  5953  067114  010001                      MOV     R0,R1               ;SAVE CONTENTS OF TSSR
  5954  067116                              ERRDF   ERRNO,SFIERR,SFIMSG ;DEVICE FATAL ERROR DURING INIT
        067116  104455                                                          TRAP    C$ERDF
        067120  001752                                                          .WORD   1002
        067122  003652                                                          .WORD   SFIERR
        067124  012034                                                          .WORD   SFIMSG
  5955  067126  013737  002202  072210 100$:   MOV     UNITN,T38DSW        ;SET UNIT NUMBER
  5956
  5957  067134  012704  072170              MOV     #T38PK2,R4          ;SUBROUTINE NEEDS PACKET ADDRESS
  5958  067140  004737  010662              JSR     PC,WRTCHR           ;ISSUE WRITE CHARACTERISTICS
  5959  067144  103405                      BCS     110$                ;BR, IF COMMAND ISSUED OK
  5963  067146  010001                      MOV     R0,R1               ;SAVE CONTENTS OF TSSR
  5964  067150                              ERRHRD  ERRNO,WRTMSG,SFIMSG ;WRITE CHARACTERISTISC FAILED
        067150  104456                                                          TRAP    C$ERHRD
        067152  001753                                                          .WORD   1003
        067154  005056                                                          .WORD   WRTMSG
        067156  012034                                                          .WORD   SFIMSG
  5965  067160                      110$:
  5966  067160  112737  000000  071501      MOVB    #0,T38BS1           ;CLEAR BIT #4
  5967  067166  112737  000011  071500      MOVB    #11,T38BSO          ;WRITE MISC COMMAND
  5968  067174  012704  071470              MOV     #T38PACKET,R4       ;SET UP NEW WRT. SUBSYS MEM. COMMAND
  5969                              ;
  5970                              ;NOTE: THIS COMMAND TURNS ON THE PROCESSOR FAIL LED
  5971                              ;
  5972  067200  010465  000000              MOV     R4,TSDB(R5)         ;SET THE PACKET ADDRESS
  5973  067204  004737  016336              JSR     PC,CHKTSSR          ;WAIT FOR SSR TO SET
  5974  067210  103405                      BCS     150$                ;BR IF CARRY SET (GOOD RETURN)
  5975  067212  010001                      MOV     R0,R1               ;SAVE CONTENTS OF TSSR
  5979  067214                              ERRDF   ERRNO,T38SSR,PKTSSR ;DEVICE FATAL SSR FAILED TO SET
        067214  104455                                                          TRAP    C$ERDF
        067216  001754                                                          .WORD   1004
        067220  072666                                                          .WORD   T38SSR
        067222  012046                                                          .WORD   PKTSSR
  5980  067224                      150$:   CKLOOP                      ;LOOP ON ERROR, IF FLAG SET
        067224  104406                                                          TRAP    C$CLP1
  5981  067226                              SETPRI  #PRI07              ;RAISE THE PRIORITY
        067226  012700  000340                                                  MOV     #PRI07,R0
        067232  104441                                                          TRAP    C$SPRI
  5982  067234  005037  071454              CLR     TTION2              ;ASSUME INTERRUPTS ARE ENABLED
  5983  067240  032737  000100  177560      BIT     #100,@#TTICSR       ;ARE TTI INTERRUPTS ON ?
  5984  067246  001005                      BNE     701$                ;BRANCH IF YES
  5985  067250  005237  071454              INC     TTION2              ;FLAG SET IF INTERRUPTS OFF
  5986  067254  052737  000100  177560      BIS     #100,@#TTICSR       ;ENABLE INTERRUPTS
  5987  067262  012701  000060      701$:   MOV     #TTIVEC,R1          ;START OF TTI VECTORS
  5988  067266  011137  071456              MOV     (R1),TVSAV2         ;SAVE THE CURRENT TTI VECTOR
  5989  067272  012721  070750              MOV     #590$,(R1)+         ;SET NEW INTERRUPT ROUTINE
  5990  067276  011137  071460              MOV     (R1),TPSAV2         ;SAVE THE VECTOR PRIORITY
  5991  067302  012711  000340              MOV     #PRI07,(R1)         ;USE PRIORITY SEVEN
  5992  067306                              SETPRI  #PRI00              ;LOWER INTERRUPT BR LEVEL
        067306  012700  000000                                                  MOV     #PRI00,R0
        067312  104441                                                          TRAP    C$SPRI
```

```
 5993 067314  012701  177777            MOV     #-1,R1                  ;DATA TO WRITE TO TSDB
 5994 067320  000240              12$:   NOP                             ;ALLOW OPERATOR TO TYPE ^C
 5995 067322  012702  001750            MOV     #1000.,R2               ;SET-UP INNER LOOP
 5996 067326  110165  000000      14$:   MOVB    R1,TSDB(R5)             ;WRITE DATA TO TSDB
 5997 067332  016500  000002            MOV     TSSR(R5),R0             ;READ TSSR
 5998 067336  005302                    DEC     R2                      ;REDUCE INNER COUNT
 5999 067340  001372                    BNE     14$                     ;LOOP TILL EXPIRES
 6000 067342  000766                    BR      12$                     ;LOOP UNTIL HALTED
 6001
 6002 067344                      15$:   PRINTF  #T38MS2                 ;TYPE CNTL C TO EXIT
      067344  012746  073261                                                    MOV     #T38MS2,-(SP)
      067350  012746  000001                                                    MOV     #1,-(SP)
      067354  010600                                                            MOV     SP,R0
      067356  104417                                                            TRAP    C$PNTF
      067360  062706  000004                                                    ADD     #4,SP
 6003 067364  004737  015774            JSR     PC,SOFINIT              ;DO SOFT INIT OF CONTROLLER
 6004 067370  103405                    BCS     200$                    ;BR IF SOFT INIT = OK
 6008 067372  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
 6009 067374                            ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL ERROR DURING INIT
      067374  104455                                                            TRAP    C$ERDF
      067376  001755                                                            .WORD   1005
      067400  003652                                                            .WORD   SFIERR
      067402  012034                                                            .WORD   SFIMSG
 6010 067404                      200$:
 6011 067404  013737  002202  072210        MOV     UNITN,T38DSW            ;SET UNIT NUMBER
 6012 067412  012704  072170            MOV     #T38PK2,R4              ;SUBROUTINE NEEDS PACKET ADDRESS
 6013 067416  004737  010662            JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
 6014 067422  103405                    BCS     210$                    ;BR, IF COMMAND ISSUED OK
 6018 067424  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
 6019 067426                            ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
      067426  104456                                                            TRAP    C$ERHRD
      067430  001756                                                            .WORD   1006
      067432  005056                                                            .WORD   WRTMSG
      067434  012034                                                            .WORD   SFIMSG
 6020                             ;*****************************************************************
 6021                             ;
 6022                             ;       THIS WRITE SUB-SYSTEM MEMORY COMMAND JUST HOLDS THE LEDS OFF
 6023                             ;
 6024                             ;*****************************************************************
 6025 067436                      210$:
 6026 067436  112737  000000  071501        MOVB    #0,T38BS1               ;CLEAR BIT #4
 6027 067444  112737  000025  071500        MOVB    #25,T38BS0              ;STOP DRIVE TEST 22
 6028 067452  012704  071470            MOV     #T38PACKET,R4           ;SET UP NEW WRT. SUBSYS MEM. COMMAND
 6029 067456  010465  000000            MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS
 6030 067462  004737  016336            JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
 6031 067466  103405                    BCS     250$                    ;BR IF CARRY SET (GOOD RETURN)
 6032 067470  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
 6036 067472                            ERRDF   ERRNO,T38SSR,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
      067472  104455                                                            TRAP    C$ERDF
      067474  001757                                                            .WORD   1007
      067476  072666                                                            .WORD   T38SSR
      067500  012046                                                            .WORD   PKTSSR
 6037 067502                      250$:  CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
      067502  104406                                                            TRAP    C$CLP1
 6038 067504                            SETPRI  #PRI07                  ;RAISE THE PRIORITY
      067504  012700  000340                                                    MOV     #PRI07,R0
      067510  104441                                                            TRAP    C$SPRI
```

```
6039 067512  005037  071454                    CLR     TTION2          ;ASSUME INTERRUPTS ARE ENABLED
6040 067516  032737  000100  177560            BIT     #100,@#TTICSR   ;ARE TTI INTERRUPTS ON ?
6041 067524  001005                            BNE     710$            ;BRANCH IF YES
6042 067526  005237  071454                    INC     TTION2          ;FLAG SET IF INTERRUPTS OFF
6043 067532  052737  000100  177560            BIS     #100,@#TTICSR   ;ENABLE INTERRUPTS
6044 067540  012701  000060          710$:     MOV     #TTIVEC,R1      ;START OF TTI VECTORS
6045 067544  011137  071456                    MOV     (R1),TVSAV2     ;SAVE THE CURRENT TTI VECTOR
6046 067550  012721  070750                    MOV     #590$,(R1)+     ;SET NEW INTERRUPT ROUTINE
6047 067554  011137  071460                    MOV     (R1),TPSAV2     ;SAVE THE VECTOR PRIORITY
6048 067560  012711  000340                    MOV     #PRI07,(R1)     ;USE PRIORITY SEVEN
6049 067564                                    SETPRI  #PRI00          ;LOWER INTERRUPT BR LEVEL
     067564  012700  000000                                                    MOV     #PRI00,R0
     067570  104441                                                           TRAP    C$SPRI
6050 067572  000240          260$:     NOP                             ;ALLOW CNTL C
6051 067574  000776                    BR      260$                    ;LOOP UNTIL STOPPED
6052
6053
6054 067576                    20$:     PRINTF  #T38MS2                 ;TELL'EM WHAT TO TYPE
     067576  012746  073261                                                    MOV     #T38MS2,-(SP)
     067602  012746  000001                                                    MOV     #1,-(SP)
     067606  010600                                                           MOV     SP,R0
     067610  104417                                                           TRAP    C$PNTF
     067612  062706  000004                                                    ADD     #4,SP
6055 067616                                    SETPRI  #PRI00          ;LOWER PRIORITY TO ALLOW INTERRUPTS
     067616  012700  000000                                                    MOV     #PRI00,R0
     067622  104441                                                           TRAP    C$SPRI
6056 067624  005037  002224                    CLR     INTRECV         ;CLEAR INTERRUPT RECEIVED FLAG
6057 067630  004737  015774                    JSR     PC,SOFINIT      ;DO SOFT INIT OF CONTROLLER
6058 067634  103405                            BCS     300$            ;BR IF SOFT INIT = OK
6062 067636  010001                            MOV     R0,R1           ;SAVE CONTENTS OF TSSR
6063 067640                                    ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL ERROR DURING INIT
     067640  104455                                                           TRAP    C$ERDF
     067642  001760                                                           .WORD   1008
     067644  003652                                                           .WORD   SFIERR
     067646  012034                                                           .WORD   SFIMSG
6064 067650          300$:
6065 067650  013737  002202  072210                MOV     UNITN,T38DSW    ;SET UNIT NUMBER IN PACKET
6066 067656  012737  000040  072206                MOV     #BIT5,T38EAI    ;ENABLE ATTENTION INTERRUPTS
6067 067664  012704  072170                        MOV     #T38PK2,R4      ;SUBROUTINE NEEDS PACKET ADDRESS
6068 067670  004737  010662                        JSR     PC,WRTCHR       ;ISSUE WRITE CHARACTERISTICS
6069 067674  103405                                BCS     310$            ;BR. IF COMMAND ISSUED OK
6073 067676  010001                                MOV     R0,R1           ;SAVE CONTENTS OF TSSR
6074 067700                                        ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
     067700  104456                                                               TRAP    C$ERHRD
     067702  001761                                                               .WORD   1009
     067704  005056                                                               .WORD   WRTMSG
     067706  012034                                                               .WORD   SFIMSG
6075 067710          310$:
6076 067710  012704  072220                        MOV     #T38PK3,R4      ;SET UP NEW PACKET FOR MESS BUF REL
6077 067714  010465  000000                        MOV     R4,TSDB(R5)     ;MESSAGE BUFFER RELEASE,ACK,CVC=1 CMD
6078 067720  004737  016250                        JSR     PC,WAITF        ;WAIT FOR SSR TO SET
6079 067724  005002                                CLR     R2              ;MAKE SURE ALL IS CLEAR
6080 067726  016501  000002                        MOV     TSSR(R5),R1     ;GET TSSR STATUS
6081 067732  032701  000100                        BIT     #OFL,R1         ;IS OFL SET
6082 067736  001402                                BEQ     320$            ;BR. IF OFL IS NOT SET
6083 067740  052702  000100                        BIS     #OFL,R2         ;SET OFL IN EXPECTED
6084 067744  052702  000200          320$:     BIS     #SSR,R2         ;SET UP EXPECTED
```

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6085 067750  020201                        CMP     R2,R1           ;IS EVERYTHING OK
6086 067752  001404                        BEQ     350$            ;BR, IF ALL IS WELL
6090 067754                                ERRHRD  ERRNO,T38SST,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
     067754  104456                                                        TRAP    C$ERHRD
     067756  001762                                                        .WORD   1010
     067760  073076                                                        .WORD   T38SST
     067762  012046                                                        .WORD   PKTSSR
6091 067764                        350$:   CKLOOP                  ;LOOP ON ERROR, IF FLAG SET
     067764  104406                                                        TRAP    C$CLP1
6092 067766                                PRINTF  @T38MS1         ;TELL OPERATOR TO TOGGLE SWITCH
     067766  012746  073166                                                MOV     @T38MS1,-(SP)
     067772  012746  000001                                                MOV     #1,-(SP)
     067776  010600                                                        MOV     SP,R0
     070000  104417                                                        TRAP    C$PNTF
     070002  062706  000004                                                ADD     #4,SP
6093 070006                                PRINTF  @T38MS2         ;TELL OPERATOR TO DO ^C TO EXIT
     070006  012746  073261                                                MOV     @T38MS2,-(SP)
     070012  012746  000001                                                MOV     #1,-(SP)
     070016  010600                                                        MOV     SP,R0
     070020  104417                                                        TRAP    C$PNTF
     070022  062706  000004                                                ADD     #4,SP
6094 070026                                SETPRI  @PRI07          ;RAISE THE PRIORITY
     070026  012700  000340                                                MOV     @PRI07,R0
     070032  104441                                                        TRAP    C$SPRI
6095 070034  005037  071454                CLR     TTION2          ;ASSUME INTERRUPTS ARE ENABLED
6096 070040  032737  000100  177560        BIT     #100,@#TTICSR   ;ARE TTI INTERRUPTS ON ?
6097 070046  001005                        BNE     720$            ;BRANCH IF YES
6098 070050  005237  071454                INC     TTION2          ;FLAG SET IF INTERRUPTS OFF
6099 070054  052737  000100  177560        BIS     #100,@#TTICSR   ;ENABLE INTERRUPTS
6100 070062  012701  000060        720$:   MOV     #TTIVEC,R1      ;START OF TTI VECTORS
6101 070066  011137  071456                MOV     (R1),TVSAV2     ;SAVE THE CURRENT TTI VECTOR
6102 070072  012721  070750                MOV     #590$,(R1)+     ;SET NEW INTERRUPT ROUTINE
6103 070076  011137  071460                MOV     (R1),TPSAV2     ;SAVE THE VECTOR PRIORITY
6104 070102  012711  000340                MOV     #PRI07,(R1)     ;USE PRIORITY SEVEN
6105 070106                                SETPRI  #PRI00          ;LOWER INTERRUPT BR LEVEL
     070106  012700  000000                                                MOV     #PRI00,R0
     070112  104441                                                        TRAP    C$SPRI
6106 070114  000240        360$:   NOP                             ;ALLOW CONTROL C
6107 070116  005737  002224                TST     INTRECV         ;DID AN INTERRUPT OCCUR ?
6108 070122  001001                        BNE     370$            ;BRANCH IF YES
6109 070124  000773                        BR      360$            ;WAIT SOME MORE FOR INTERRUPT
6110 070126        370$:   PRINTF  @T38INT                 ;"INTERRUPT RECEIVED"
     070126  012746  072756                                                MOV     @T38INT,-(SP)
     070132  012746  000001                                                MOV     #1,-(SP)
     070136  010600                                                        MOV     SP,R0
     070140  104417                                                        TRAP    C$PNTF
     070142  062706  000004                                                ADD     #4,SP
6111 070146  016501  000002                MOV     TSSR(R5),R1     ;READ TSSR STATUS
6112 070152  032701  000100                BIT     #OFL,R1         ;CHECK THE OFF-LINE BIT
6113 070156  001011                        BNE     380$            ;BR, IF DRIVE IS OFF-LINE
6114 070160                                PRINTF  @T380NL         ; "DRIVE IS NOW ON-LINE"
     070160  012746  073006                                                MOV     @T380NL,-(SP)
     070164  012746  000001                                                MOV     #1,-(SP)
     070170  010600                                                        MOV     SP,R0
     070172  104417                                                        TRAP    C$PNTF
     070174  062706  000004                                                ADD     #4,SP
6115 070200  000410                        BR      390$            ;ALMOST DONE
```

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6116 070202
     070202  012746  073042          380$:   PRINTF   #T380FL                 ;"DRIVE IS NOW OFF-LINE"
     070206  012746  000001                                                            MOV     #T380FL,-(SP)
     070212  010600                                                                   MOV     #1,-(SP)
     070214  104417                                                                   MOV     SP,R0
     070216  062706  000004                                                           TRAP    C$PNTF
6117 070222  005037  002224          390$:   CLR     INTRECV                 ;CLEAR INTERRUPT FLAG
6118 070226  000137  067650                  JMP     300$                    ;TRY AGAIN
6119 070232                          25$:    GMANIL  T38MSG,T38DAT,-1,NO     ;WAIT FOR OPERATOR TO MOUNT TAPE
     070232  104443                                                                   ADD     #4,SP
     070234  000404                                                                   TRAP    C$GMAN
     070236  074014                                                                   BR      10000$
     070240  000120                                                                   .WORD   T38DAT
     070242  073325                                                                   .WORD   T$CODE
     070244  177777                                                                   .WORD   T38MSG
     070246                                                                           .WORD   -1
6120 070246                                  BNCOMPLETE 25$                  10000$: ;RETRY IF ERROR
     070246  103371                                                                   BCC     25$
6121 070250  005737  074014              TST     T38DAT                  ;DID OPERATOR SAY 'YES' ?
6122 070254  001002                      BNE     27$                     ;BRANCH IF YES
6123 070256  000137  066722              JMP     2$                      ;RETURN TO MAIN MENU
6124 070262                          27$:
6125 070262  004737  015774              JSR     PC,SOFINIT              ;DO SOFT INIT OF CONTROLLER
6126 070266  103405                      BCS     400$                    ;BR IF SOFT INIT = OK
6130 070270  010001                      MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
6131 070272                              ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL ERROR DURING INIT
     070272  104455                                                                   TRAP    C$ERDF
     070274  001763                                                                   .WORD   1011
     070276  003652                                                                   .WORD   SFIERR
     070300  012034                                                                   .WORD   SFIMSG
6132 070302                          400$:   CKLOOP                          ;LOOP IF SELECTED
     070302  104406                                                                   TRAP    C$CLP1
6133 070304  013737  002202  072210      MOV     UNITN,T38DSW            ;SET UNIT NUMBER
6134 070312  012704  072170              MOV     #T38PK2,R4              ;SUBROUTINE NEEDS PACKET ADDRESS
6135 070316  004737  010662              JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
6136 070322  103405                      BCS     410$                    ;BR, IF COMMAND ISSUED OK
6140 070324  010001                      MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
6141 070326                              ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
     070326  104456                                                                   TRAP    C$ERHRD
     070330  001764                                                                   .WORD   1012
     070332  005056                                                                   .WORD   WRTMSG
     070334  012034                                                                   .WORD   SFIMSG
6142 070336                          410$:   CKLOOP                          ;LOOP IF SELECTED
     070336  104406                                                                   TRAP    C$CLP1
6143 070340  013701  071514              MOV     T38BFR+6,R1             ;PICK UP XSTO CONTENTS
6144 070344  010102                      MOV     R1,R2                   ;SET UP EXPECTED
6145 070346  052702  000004              BIS     #BIT2,R2                ;SET UP THE WRITE LOCKED BIT
6146 070352  020102                      CMP     R1,R2                   ;ARE THEY CORRECT
6147 070354  001406                      BEQ     430$                    ;BR, IF ALL IS WELL (OK)
6151 070356                              ERRHRD  ERRNO,T38WRL,EXPREC     ;"WRITE LOCKED BIT IS NOT SET ETC."
     070356  104456                                                                   TRAP    C$ERHRD
     070360  001765                                                                   .WORD   1013
     070362  072504                                                                   .WORD   T38WRL
     070364  015474                                                                   .WORD   EXPREC
6152 070366  005237  002222              INC     FATFLG                  ;SET FATAL FLAG
6153 070372                          430$:   CKLOOP                          ;LOOP IF SELECTED
     070372  104406                                                                   TRAP    C$CLP1
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6154 070374  005737  002222                    TST     FATFLG                  ;WAS THE DRIVE NOT WRITE LOCKED
6155 070400  001402                            BEQ     435$                    ;BR, IF FLAG NOT SET
6156 070402  000137  066722                    JMP     2$                      ;RE-WRITE MENU
6157 070406  017737  112512  072242  435$:     MOV     @FREE,T38WR             ;SET UP WRITE BUFFER ADDRESS
6158 070414  012704  072240                    MOV     #T38PK4,R4              ;GET PACKET ADDRESS
6159 070420  010465  000000                    MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS
6160 070424  004737  016250                    JSR     PC,WAITF                ;WAIT FOR SSR TO SET
6161 070430  016501  000002                    MOV     TSSR(R5),R1             ;GET TSSR
6162 070434  012702  100206                    MOV     #SC!SSR!BIT1!BIT2,R2    ;SET UP EXPECTED
6163 070440  020102                            CMP     R1,R2                   ;ARE THEY EQUAL (CORRECT)
6164 070442  001404                            BEQ     440$                    ;BR, IF CORRECT STATUS
6168 070444                                    ERRHRD  ERRNO,T38WRT,PKTSSR     ;"TSSR INCORRECT AFTER WRITE COMMAND
     070444  104456                                                                    TRAP    C$ERHRD
     070446  001766                                                                    .WORD   1014
     070450  072420                                                                    .WORD   T38WRT
     070452  012046                                                                    .WORD   PKTSSR
6169 070454                            440$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     070454  104406                                                                    TRAP    C$CLP1
6170 070456  013701  071514                    MOV     T38BFR+6,R1             ;READ XSTO CONTENTS
6171 070462  010102                            MOV     R1,R2                   ;SET UPR EXPECTED
6172 070464  052702  004000                    BIS     #BIT11,R2               ;SET THE WRITE LOCK ERROR BIT (XSTO)
6173 070470  020102                            CMP     R1,R2                   ;WAS THE BIT SET
6174 070472  001404                            BEQ     450$                    ;BR, IF IT WAS (GOOD)
6178 070474                                    ERRHRD  ERRNO,T38WLE,EXPREC     ;"WRITE LOCK ERROR BIT NOT SET"
     070474  104456                                                                    TRAP    C$ERHRD
     070476  001767                                                                    .WORD   1015
     070500  072545                                                                    .WORD   T38WLE
     070502  015474                                                                    .WORD   EXPREC
6179 070504                            450$:   CKLOOP                          ;LOOP IF SELECTED
     070504  104406                                                                    TRAP    C$CLP1
6180 070506  000137  066722                    JMP     2$                      ;GO BACK TO MENU
6181
6182                                   ;*************************************************************************
6183                                   ;       SERVO EXERCISER NO LONGER USED
6184                                   ;*************************************************************************
6185 070512                            30$:
6186 070512                                    PRINTB  #T38MS3                 ;"EXE ANY OTHER MENU SELECTION TO STOP
     070512  012746  072325                                                             MOV     #T38MS3,-(SP)
     070516  012746  000001                                                             MOV     #1,-(SP)
     070522  010600                                                                     MOV     SP,R0
     070524  104414                                                                     TRAP    C$PNTB
     070526  062706  000004                                                             ADD     #4,SP
6187 070532  004737  074016                    JSR     PC,T38REST              ;SET PACKET TO INITIAL VALUES
6188 070536  004737  015774                    JSR     PC,SOFINIT              ;DO SOFT INIT OF CONTROLLER
6189 070542  103405                            BCS     500$                    ;BR IF SOFT INIT = OK
6193 070544  010001                            MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
6194 070546                                    ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL ERROR DURING INIT
     070546  104455                                                                    TRAP    C$ERDF
     070550  001770                                                                    .WORD   1016
     070552  003652                                                                    .WORD   SFIERR
     070554  012034                                                                    .WORD   SFIMSG
6195 070556  013737  002202  072210  500$:     MOV     UNITN,T38DSW            ;SET UNIT NUMBER
6196 070564  012704  072170                    MOV     #T38PK2,R4              ;SUBROUTINE NEEDS PACKET ADDRESS
6197 070570  004737  010662                    JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
6198 070574  103405                            BCS     510$                    ;BR, IF COMMAND ISSUED OK
6202 070576  010001                            MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
6203 070600                                    ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
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                                                                        TRAP    C$ERHRD
                                                                        .WORD   1017
                                                                        .WORD   WRTMSG
                                                                        .WORD   SFIMSG
 070600  104456
 070602  001771
 070604  005056
 070606  012034
6204 070610                             510$:
6205 070610  112737  000000  071501             MOVB    #0,T38BS1       ;CLEAR BIT #4
6206 070616  112737  000020  071500             MOVB    #20,T38BSO      ;EXECUTE DRIVE TEST 22
6207 070624  012704  071470                     MOV     #T38PACKET,R4   ;SET UP NEW WRT. SUBSYS MEM. COMMAND
6208 070630  010465  000000                     MOV     R4,TSDB(R5)     ;SET THE PACKET ADDRESS
6209 070634  004737  016336                     JSR     PC,CHKTSSR      ;WAIT FOR SSR TO SET
6210 070640  103405                             BCS     550$            ;BR IF CARRY SET (GOOD RETURN)
6211 070642  010001                             MOV     R0,R1           ;SAVE CONTENTS OF TSSR
6215 070644                                     ERRDF   ERRNO,T38SSR,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
 070644  104455                                                        TRAP    C$ERDF
 070646  001772                                                        .WORD   1018
 070650  072666                                                        .WORD   T38SSR
 070652  012046                                                        .WORD   PKTSSR
6216 070654                             550$:   CKLOOP                  ;LOOP ON ERROR, IF FLAG SET
 070654  104406                                                        TRAP    C$CLP1
6217 070656                                     SETPRI  #PRIO7          ;RAISE THE PRIORITY
 070656  012700  000340                                                MOV     #PRIO7,R0
 070662  104441                                                        TRAP    C$SPRI
6218 070664  005037  071454                     CLR     TTION2          ;ASSUME INTERRUPTS ARE ENABLED
6219 070670  032737  000100  177560             BIT     #100,@#TTICSR   ;ARE TTI INTERRUPTS ON ?
6220 070676  001005                             BNE     555$            ;BRANCH IF YES
6221 070700  005237  071454                     INC     TTION2          ;FLAG SET IF INTERRUPTS OFF
6222 070704  052737  000100  177560             BIS     #100,@#TTICSR   ;ENABLE INTERRUPTS
6223 070712  012701  000060             555$:   MOV     #TTIVEC,R1      ;START OF TTI VECTORS
6224 070716  011137  071456                     MOV     (R1),TVSAV2     ;SAVE THE CURRENT TTI VECTOR
6225 070722  012721  070750                     MOV     #590$,(R1)+     ;SET NEW INTERRUPT ROUTINE
6226 070726  011137  071460                     MOV     (R1),TPSAV2     ;SAVE THE VECTOR PRIORITY
6227 070732  012711  000340                     MOV     #PRIO7,(R1)     ;USE PRIORITY SEVEN
6228 070736                                     SETPRI  #PRIOO          ;LOWER INTERRUPT BR LEVEL
 070736  012700  000000                                                MOV     #PRIOO,R0
 070742  104441                                                        TRAP    C$SPRI
6229 070744  000240                     560$:   NOP                     ;LOOP AWHILE
6230 070746  000776                             BR      560$            ;STAY IN "TIGHT" LOOP
6231
6232                                    ;+
6233                                    ;PROCESS CONSOLE INTERRUPTS
6234                                    ;-
6235 070750  010046                     590$:   MOV     R0,-(SP)        ;SAVE WORK REGISTER
6236 070752  113700  177562                     MOVB    @#TTIBFR,R0     ;GET THE OPERATOR INPUT
6237 070756  042700  000200                     BIC     #200,R0         ;STRIP OFF PARITY BIT
6238 070762  122700  000015                     CMPB    #15,R0          ;IS IT A CARRIAGE RETURN ?
6239 070766  001075                             BNE     591$            ;JUST EXIT IF NOT
6240 070770  012766  066722  000002             MOV     #2$,2(SP)       ;RETURN TO MASTER MENU
6241 070776  005066  000004                     CLR     4(SP)           ;FORCE PRIORTY 0
6242 071002  013737  071456  000060             MOV     TVSAV2,@#TTIVEC ;RESTORE VECTOR
6243 071010  013737  071460  000062             MOV     TPSAV2,@#TTIVEC+2       ;RESTORE SUPER PRIORTY
6244 071016  112737  000025  071500             MOVB    #25,T38BSO      ;STOP DRIVE TEST 22
6245 071024  112737  000000  071501             MOVB    #0,T38BS1       ;CLEAR BS1
6246 071032  012704  071470                     MOV     #T38PACKET,R4   ;SET UP NEW WRT. SUBSYS MEM. COMMAND
6247 071036  010465  000000                     MOV     R4,TSDB(R5)     ;SET THE PACKET ADDRESS
6248 071042  012737  176750  071462             MOV     #65000.,T38DLY  ;SET UP DELAY COUNTER
6249 071050  004737  016250             592$:   JSR     PC,WAITF        ;DO A WAIT FOR SSR
6250 071054  016501  000002                     MOV     TSSR(R5),R1     ;CONTENTS OF TSSR REGISTER
```

```
6251 071060  032701  000200            BIT     #SSR,R1          ;CHECK FOR TSSR SET
6252 071064  001017                    BNE     595$             ;KEEP GOING IF NOT SET
6253 071066                            DELAY   250              ;CALL DELAY ROUTINE
     071066  012727  000250                                             MOV     #250,(PC)+
     071072  000000                                                     .WORD   0
     071074  013727  002116                                             MOV     L$DLY,(PC)+
     071100  000000                                                     .WORD   0
     071102  005367  177772                                             DEC     -6(PC)
     071106  001375                                                     BNE     .-4
     071110  005367  177756                                             DEC     -22(PC)
     071114  001367                                                     BNE     .-20
6254 071116  005337  071462            DEC     T38DLY           ;BUMP COUNTER DOWN
6255 071122  001352                    BNE     592$             ;BR, IF MORE TIME LEFT
6256 071124  004737  016336  595$:     JSR     PC,CHKTSSR       ;WAIT FOR SSR TO SET
6257 071130  103405                    BCS     580$             ;BR IF CARRY SET (GOOD RETURN)
6258 071132  010001                    MOV     R0,R1            ;SAVE CONTENTS OF TSSR
6262 071134                            ERRDF   ERRNO,T38SSR,PKTSSR ;DEVICE FATAL SSR FAILED TO SET
     071134  104455                                                     TRAP    C$ERDF
     071136  001773                                                     .WORD   1019
     071140  072666                                                     .WORD   T38SSR
     071142  012046                                                     .WORD   PKTSSR
6263 071144                    580$:   CKLOOP                   ;LOOP ON ERROR, IF FLAG SET
     071144  104406                                                     TRAP    C$CLP1
6264 071146  005737  071454            TST     TTION2           ;ARE SUPER INTERRUPTS ENABLED
6265 071152  001403                    BEQ     591$             ;BR, IF YES
6266 071154  042737  000100  177560    BIC     #100,@#TTICSR    ;RESTORE REGISTER
6267 071162  012600            591$:   MOV     (SP)+,R0         ;RESTORE REGISTER
6268 071164  000002                    RTI                      ;RETURN
6269 071166                    35$:
6270 071166  004737  074016            JSR     PC,T38REST       ;SET PACKET TO INITIAL VALUES
6271 071172  004737  015774            JSR     PC,SOFINIT       ;DO SOFT INIT OF CONTROLLER
6272 071176  103405                    BCS     600$             ;BR IF SOFT INIT = OK
6276 071200  010001                    MOV     R0,R1            ;SAVE CONTENTS OF TSSR
6277 071202                            ERRDF   ERRNO,SFIERR,SFIMSG ;DEVICE FATAL ERROR DURING INIT
     071202  104455                                                     TRAP    C$ERDF
     071204  001774                                                     .WORD   1020
     071206  003652                                                     .WORD   SFIERR
     071210  012034                                                     .WORD   SFIMSG
6278 071212                    600$:   CKLOOP                   ;LOOP IF SELECTED
     071212  104406                                                     TRAP    C$CLP1
6279 071214  012701  071506            MOV     #T38BFR,R1       ;ADDRESS OF MESSAGE BUFFER
6280 071220  012702  125252            MOV     #125252,R2       ;ALTERNATING 1'S AND 0'S
6281
6282 071224  010221            601$:   MOV     R2,(R1)+         ;CLEAR OUT THE MESSAGE BUFFER
6283 071226  022701  072162            CMP     #T38EB,R1        ;END OF BUFFER YET
6284 071232  001401                    BEQ     605$             ;BR, IF AT END OF BUFFER
6285 071234  000773                    BR      601$             ;NOT AT END KEEP GOING
6286 071236  013737  002202  072210  605$:   MOV     UNITN,T38DSW     ;SET UNIT NUMBER
6287 071244  012704  072170            MOV     #T38PK2,R4       ;SUBROUTINE NEEDS PACKET ADDRESS
6288 071250  004737  010662            JSR     PC,WRTCHR        ;ISSUE WRITE CHARACTERISTICS
6289 071254  103405                    BCS     610$             ;BR, IF COMMAND ISSUED OK
6293 071256  010001                    MOV     R0,R1            ;SAVE CONTENTS OF TSSR
6294 071260                            ERRHRD  ERRNO,WRTMSG,SFIMSG ;WRITE CHARACTERISTISC FAILED
     071260  104456                                                     TRAP    C$ERHRD
     071262  001775                                                     .WORD   1021
     071264  005056                                                     .WORD   WRTMSG
     071266  012034                                                     .WORD   SFIMSG
```

```
071270                            610$:  CKLOOP                            ;LOOP IF SELECTED
071270  104406                                                                          TRAP    C$CLP1
071272  112737  000000  071501           MOVB    #0,T38BS1                  ;CLEAR BIT #4
071300  112737  000024  071500           MOVB    #24,T38BS0                 ;READ EXTENDED DRIVE STATUS
071306  012704  071470                   MOV     #T38PACKET,R4              ;SET UP NEW WRT. SUBSYS MEM. COMMAND
071312  010465  000000                   MOV     R4,TSDB(R5)                ;SET THE PACKET ADDRESS
071316  012737  000144  071462           MOV     #100.,T38DLY               ;SET UP DELAY ROUTINE
071324  004737  016250            620$:  JSR     PC,WAITF                   ;WAIT AWHILE FOR SSR TO SET
071330  016501  000002                   MOV     TSSR(R5),R1                ;SEE IF IT REALLY DID
071334  032701  000200                   BIT     #SSR,R1                    ;JUST CHECK THAT BIT
071340  001017                           BNE     630$                       ;BR, IF SSR IS SET
071342                                   DELAY   250                        ;DELAY ABOUT .25 SEC
071342  012727  000250                                                                  MOV     #250,(PC)+
071346  000000                                                                          .WORD   0
071350  013727  002116                                                                  MOV     L$DLY,(PC)+
071354  000000                                                                          .WORD   0
071356  005367  177772                                                                  DEC     -6(PC)
071362  001375                                                                          BNE     .-4
071364  005367  177756                                                                  DEC     -22(PC)
071370  001367                                                                          BNE     .-20
071372  005337  071462                   DEC     T38DLY                     ;START DELAY COUNT DOWN
071376  001352                           BNE     620$                       ;BR, IF COUNTER IS NOT AT DONE
071400  004737  016336            630$:  JSR     PC,CHKTSSR                 ;WAIT FOR SSR TO SET
071404  103405                           BCS     650$                       ;BR IF CARRY SET (GOOD RETURN)
071406  010001                           MOV     R0,R1                      ;SAVE CONTENTS OF TSSR
071410                                   ERRDF   ERRNO,T38SSR,PKTSSR        ;DEVICE FATAL SSR FAILED TO SET
071410  104455                                                                          TRAP    C$ERDF
071412  001776                                                                          .WORD   1022
071414  072666                                                                          .WORD   T38SSR
071416  012046                                                                          .WORD   PKTSSR
071420                            650$:  CKLOOP                            ;LOOP ON ERROR, IF FLAG SET
071420  104406                                                                          TRAP    C$CLP1
071422  012700  071526                   MOV     #T38BFR+20,R0              ;MESSAGE BUFFER ADDRESS
071426  005001                           CLR     R1                         ;NO HIGH ORDER ADDRESS BITS
071430  005037  003134                   CLR     KTENABLE                   ;NO KT11 STUFF EITHER
071434  004737  074054                   JSR     PC,T38MBP                  ;GO PRINT MESSAGE BUFFER CONTENTS
071440  000137  066722                   JMP     2$                         ;GO BACK TO MENU


071444  000137  000200            63$:   JMP     200                        ;REALLY RETURN TO THE SUPERVISOR
071450                            64$:   EXIT    TST                        ;LEAVE TEST
071450  104432                                                                          TRAP    C$EXIT
071452  003054                                                                          .WORD   L10075-.


                                  ;+
                                  ;LOCAL TEXT MESSAGES FOR TEST
                                  ;-

                                  ;LOCAL STORAGE FOR THIS TEST
                                  ;-
                                  ;+
                                  ;LOCAL STORAGE FOR THIS TEST
                                  ;-

071454  000000                    TTION2:         .WORD   0                 ;WORD SET IF SUPERVISOR TTI INTER OFF
071456  000000                    TVSAV2: .WORD   0                 ;SAVE TTI VECTOR
071460  000000                    TPSAV2: .WORD   0                 ;SAVE TTI PRIORITY
```

```
6339
6340 071462  000000                T38DLY: .WORD   0                       ;DELAY COUNTER FOR TEST
6342         071470                        .=<.+10>&177770
6344 071470                        T38PACKET:                              ;COMMAND PACKET FOR TEST
6345 071470  140006                        .WORD   140006                  ;WRITE SUBSYSTEM MEM. CMD,  ACK,CVC=1
6346 071472  071500                        .WORD   T38TAD                  ;ADDRESS OF CHARACTERISTICS BLOCK
6347 071474  000000                        .WORD   0
6348 071476  000012                        .WORD   10.                     ;STARTING VALUE OF BLOCK SIZE
6349 071500                        T38TAD:                         ;CHARACTERISTICS DATA BLOCK
6350 071500     000                T38BS0: .BYTE   0                       ;BSEL0 BYTE
6351 071501     000                T38BS1: .BYTE   0                       ;BSEL1 BYTE
6352 071502  000000                T38BS2: .WORD   0                       ;BSEL1 WORD
6353 071504  000000                        .WORD   0                       ;DATA
6354 071506                        T38BFR: .BLKW   150.                    ;MESSAGE BUFFER
6355 072162  000000                T38EB:  .WORD                           ;END OF BUFFER ADDRESS
6356
6357
6359         072170                        .=<.+10>&177770
6361 072170                        T38PK2:                                 ;COMMAND PACKET FOR TEST
6362 072170  140004                        .WORD   140004                  ;WRITE CHARA. MEM. CMND.,  ACK,CVC=1
6363 072172  072200                        .WORD   T38DTA                  ;ADDRESS OF SELECT DATA BLOCK
6364 072174  000000                        .WORD   0
6365 072176  000012                        .WORD   10.                     ;STARTING VALUE OF BLOCK SIZE
6366
6367
6368 072200                        T38DTA:                                 ;SELECT DATA BLOCK
6369 072200  071506                        .WORD   T38BFR                  ;ADDRESS OF MESSAGE BUFFER
6370 072202  000000                        .WORD   0
6371 072204  000400                        .WORD   256.                    ;LENGTH OF MESSAGE BUFFER
6372 072206  000000                T38EAI: .WORD   0                       ;EAI BIT WORD
6373 072210  000000                T38DSW: .WORD   0                       ;DRIVE SELECT WORD ETC
6375         072220                        .=<.+10>&177770
6377 072220  140212                T38PK3: .WORD   140212                  ;MESSAGE BUFFER RELEASE COMMAND
6378 072222  000000                        .WORD   0                       ;NOT USED
6379 072224  000000                        .WORD   0                       ;NOT USED
6380 072226  000000                        .WORD   0                       ;NOT USED
6381 072230  000000                        .WORD   0                       ;NOT USED
6382                               ;
6383                               ;WRITE TAPE PACKET
6384                               ;
6386         072240                        .=<.+10>&177770
6388 072240  140005                T38PK4: .WORD   140005                  ;WRITE, ACK, CVC=1 COMMAND
6389 072242  000000                T38WR:  .WORD   0                       ;ADDRESS OF WRITE BUFFER
6390 072244  000000                        .WORD   0                       ;MORE ADDRESS OF WRITE BUFFER
6391 072246  000400                T38SIZ: .WORD   256.                    ;SIZE OF RECORD
6392
6393
6394
6395
6396                               ;+
6397                               ;LOCAL TEXT MESSAGES FOR TEST
6398                               ;-
6399
6400
6401
6402
6403
```

```
6404 072250      123      164      141  T38NE:   .ASCIZ  'Stand-alone Manual Intervention Not Executed'
6405 072325      045      116      045  T38MS3:  .ASCIZ  '%N%A Type <RETURN> To Stop Servo Exerciser, Return To Menu'
6406 072420      124      123      123  T38WRT:  .ASCIZ  'TSSR Not Correct After WRITE, With WRITE PROTECT On'
6407 072504      127      122      111  T38WRL:  .ASCIZ  'WRITE LOCKED Bit Not Set In XSTO'
6408 072545      127      122      111  T38WLE:  .ASCIZ  'WRITE LOCK ERROR Bit Not Set In XSTO'
6409 072612      127      122      111  T38NBA:  .ASCIZ  'WRITE SUBSYSTEM MEMORY Command Not Accepted'
6410 072666      103      157      156  T38SSR:  .ASCIZ  'Contents of TSSR Incorrect After WRITE SUBSYSTEM MEMORY'
6411 072756      045      116      045  T38INT:  .ASCIZ  '%N%A Interrupt Received'
6412 073006      045      116      045  T38ONL:  .ASCIZ  '%N%A Drive Is Now   ON-LINE'
6413 073042      045      116      045  T38OFL:  .ASCIZ  '%N%A Drive Is Now  OFF-LINE'
6414 073076      103      157      156  T38SST:  .ASCIZ  'Contents Of TSSR Incorrect After MESSAGE BUFFER RELEASE'
6415 073166      045      116      045  T38MS1:  .ASCIZ  '%N%AToggle ON-LINE Switch to Generate ATTENTION Interrupts'
6416 073261      045      116      045  T38MS2:  .ASCIZ  '%N%AType RETURN To Return To Menu%N'
6417 073325      111      163      040  T38MSG:  .ASCIZ  'Is Write-Protected Tape Mounted'
6418 073365      115      141      156  T38ID:   .ASCIZ  'Manual Intervention'
6419                                               .EVEN
6420 073412  073436  073510  073536  MIMENU:  .WORD   1$,2$,3$,4$,5$,6$
6421 073426  073705  073750  074013           .WORD   8$,9$,10$,0
6422
6423 073436      012      123      105  1$:      .ASCIZ  <12>'SELECT OPERATION FROM FOLLOWING OPTIONS:'
6424 073510      012      011      060  2$:      .ASCIZ  <12>'    0       Display This Menu'
6425 073536      011      061      011  3$:      .ASCIZ  '        1       Turn On All M7196 LED''s'
6426 073570      011      062      011  4$:      .ASCIZ  '        2       Turn Off All M7196 LED''s'
6427 073623      011      063      011  5$:      .ASCIZ  '        3       Offline/Online Attention'
6428 073657      011      064      011  6$:      .ASCIZ  '        4       Write Protect Test'
6429 073705      011      065      011  8$:      .ASCIZ  '        5       Print Extended Transport Status'
6430 073750      011      066      011  9$:      .ASCIZ  '        6       Return to Diagnostic Supervisor'
6431 074013      000              10$:      .ASCIZ  ''
6432                                               .EVEN
6433
6434                                    ;+
6435                                    ;LOCAL STORAGE FOR THIS TEST
6436                                    ;-
6437
6438 074014  000000                    T38DAT: .WORD   0               ;LOGICAL RESPONSE TO QUESTION
6439 074016                            T38REST:
6440 074016                                    SAVREG                  ;SAVE THE REGISTERS
6441 074022  012701  071470                     MOV     #T38PACKET,R1   ;START OF THE PACKET
6442 074026  012721  140206                     MOV     #140206,(R1)+   ;WRITE SUBSYSTEM MEM. WITH ACK,CVC=1
6443 074032  012721  071500                     MOV     #T38TAD,(R1)+   ;ADDRESS OF DATA BLOCK
6444 074036  005021                             CLR     (R1)+           ;EXTENDED ADDRESS
6445 074040  012721  000006                     MOV     #6.,(R1)+       ;SIZE OF DATA BLOCK IN BYTES
6446 074044  005021                             CLR     (R1)+           ;CLEAR BSEL0 AND BSEL1
6447 074046  005021                             CLR     (R1)+           ;CLEAR SEL2
6448 074050  005011                             CLR     (R1)            ;CLEAR DATA AREA
6449 074052  000207                             RTS     PC              ;RETURN
6450
6451
6452                                    ;+
6453                                    ;
6454                                    ;THIS ROUTINE PRINTS THE CONTENTS OF
6455                                    ;THE 256 BYTE MESSAGE BUFFER RETURNED BY THE
6456                                    ;TSV-05.
6457                                    ;
6458                                    ;INPUT:
6459                                    ;
6460                                    ;       R0      LOW ORDER ADDRESS OF MESSAGE BUFFER
```

```
                                        ;       R1      HIGH ORDER ADDRESS OF MESSAGE BUFFER
                                        ;       NOTE: R1 IS IGNORED IF KTENABLE FLAG IS CLEAR
                                        ;
                                        ;
                                        ;-

                                        T38MBP:
074054                                          SAVREG                          ;SAVE THE REGISTERS
074054  010005                                  MOV     R0,R5                   ;SAVE LOW ORDER ADDRESS
074060  005737  003134                          TST     KTENABLE                ;ADDRESS ABOVE 28K?
074062  001001                                  BNE     910$                    ;BR IF YES
074066  005001                                  CLR     R1                      ;SET HIGH ORDER ADDRESS TO 0
074070  010103                          910$:   MOV     R1,R3                   ;SAVE HIGH ORDER ADDRESS
074072  006100                                  ROL     R0                      ;SHIFT BIT15 TO C BIT
074074  006101                                  ROL     R1                      ;SHIFT TO HIGH ORDER FOR PRINTOUT
074076                                          PRINTX  #T38AS0,R1,R5           ;PRINT MESSAGE BUFFER ADDRESS
074100  010546                                                                          MOV     R5,-(SP)
074102  010146                                                                          MOV     R1,-(SP)
074104  012746  074356                                                                 MOV     #T38AS0,-(SP)
074110  012746  000003                                                                 MOV     #3,-(SP)
074114  010600                                                                         MOV     SP,R0
074116  104415                                                                         TRAP    C$PNTX
074120  062706  000010                                                                 ADD     #10,SP
074124                                          PRINTX  #T38AS1                 ;PRINT HEADER FOR CONTENTS
074124  012746  074423                                                                 MOV     #T38AS1,-(SP)
074130  012746  000001                                                                 MOV     #1,-(SP)
074134  010600                                                                         MOV     SP,R0
074136  104415                                                                         TRAP    C$PNTX
074140  062706  000004                                                                 ADD     #4,SP
074144  010501                                  MOV     R5,R1                   ;COPY LOW ORDER ADDRESS
074146  010300                                  MOV     R3,R0                   ;COPY HIGH ORDER ADDRESS
074150  001403                                  BEQ     913$                    ;BR IF NOT ABOVE 28K
074152  004737  017316                          JSR     PC,SETMAP               ;SETUP PAR ADDRESS IN R0
074156  010005                                  MOV     R0,R5                   ;GET PAR FORMAT ADDRESS ABOVE 28K
074160  010537  074524                  913$:   MOV     R5,T38CNT               ;HOLD ADDRESS
074164  011504                          911$:   MOV     (R5),R4                 ;GET BUFFER ENTRY
074166  022704  125252                          CMP     #125252,R4              ;CHECK FOR NO LOAD CONDITION
074172  001417                                  BEQ     912$                    ;BR, IF BUFFER WASN'T LOADED
074174  010403                                  MOV     R4,R3                   ;MAKE COPY
074176  042704  170377                          BIC     #170377,R4              ;ONLY BITS 11,10,9 AND 8 ARE SAVED
074202  000241                                  CLC                             ;CLEAR CARRY
074204  006004                                  ROR     R4                      ;11 TO 10 BIT POSITION
074206  006004                                  ROR     R4                      ;10 TO 9 BIT POSITION
074210  006004                                  ROR     R4                      ;9 TO 8 BIT POSITON
074212  006004                                  ROR     R4                      ;8 TO 7 BIT POSITION
074214  042703  177760                          BIC     #177760,R3              ;ONLY BITS 3,2,1 AND 0 ARE SAVED
074220  060403                                  ADD     R4,R3                   ;"OR'EM TOGETHER
074222  010325                                  MOV     R3,(R5)+                ;PUT BACK IN BUFFER
074224  020527  072162                          CMP     R5,#T38EB               ;END OF BUFFER YET
074230  001355                                  BNE     911$                    ;BR, IF NOT AT END YET
074232  013705  074524                  912$:   MOV     T38CNT,R5               ;PUT ADDRESS BACK
074236  012704  000001                          MOV     #1,R4                   ;START BYTE NUMBER AT ONE
074242                                  915$:   PRINTX  #T38ASN,R4,(R5)+                ;PRT MEM BUFFER W/NEWLINE
074242  012546                                                                          MOV     (R5)+,-(SP)
074244  010446                                                                         MOV     R4,-(SP)
074246  012746  074500                                                                 MOV     #T38ASN,-(SP)
074252  012746  000003                                                                 MOV     #3,-(SP)
```

```
                074256  010600                                                          MOV     SP,R0
                074260  104415                                                          TRAP    C$PNTX
                074262  062706  000010                                                  ADD     #10,SP
    6502        074266  005037  074524          CLR     T38CNT                  ;CLEAR COUNTER
    6503        074272  000412                  BR      921$                    ;SKIP OTHER PRINT
    6504        074274                  920$:   PRINTX  #T38ASC,R4,(R5)+        ;PRINT THE CONTENTS OF MEMORY BUFFER
                074274  012546                                                          MOV     (R5)+,-(SP)
                074276  010446                                                          MOV     R4,-(SP)
                074300  012746  074461                                                  MOV     #T38ASC,-(SP)
                074304  012746  000003                                                  MOV     #3,-(SP)
                074310  010600                                                          MOV     SP,R0
                074312  104415                                                          TRAP    C$PNTX
                074314  062706  000010                                                  ADD     #10,SP
    6505        074320  005237  074524          921$:   INC     T38CNT                  ;BUMP COUNTER
    6506        074324  005204                  INC     R4              ;NUMBER OF THE NEXT
    6507        074326  020427  000200          CMP     R4,#128.                ;DONE ALL YET ?
    6508        074332  003010                  BGT     50$             ;BRANCH IF ALL DONE
    6509        074334  023727  074524  000004  CMP     T38CNT,#4               ;DONE FOUR YET
    6510        074342  001401                  BEQ     925$                    ;BR. IF THREE DONE
    6511        074344  000753                  BR      920$            ;KEEP GOING
    6512        074346  005037  074524  925$:   CLR     T38CNT                  ;CLEAR COUNTER
    6513        074352  000733                  BR      915$                    ;PRINT WITH NEW LINE
    6514        074354  000207          50$:    RTS     PC                      ;RETURN
    6515
    6516        074356      045     116     045 T38AS0: .ASCIZ  '<N><A Message Buffer Address = <01><05>'
    6517        074423      045     116     045 T38AS1: .ASCIZ  '<N><A Message Buffer Contents:'
    6518        074461      045     101     040 T38ASC: .ASCIZ  '<A  <D4><A: <03>'
    6519        074500      045     116     045 T38ASN: .ASCIZ  '<N><A Byte<D4><A: <03>'
    6520                                            .EVEN
    6521        074524  000000          T38CNT: .WORD                           ;COUNTER FOR PRINT
    6522        074526                          ENDTST
                074526                                                                  L10075:
                074526  104401                                                                  TRAP    C$ETST
    6523                                    .SBTTL  TEST 11: CONFIGURATION TYPEOUT
    6524
    6525                            ;THIS IS A STANDALONE ROUTINE THAT PRINTS OUT ON THE CONSOLE TERMINAL
    6526                            ;THE CONFIGURATION OF THE M7196 MODULE AND TSV05 SUBSYSTEM. SPECIFICALLY,
    6527                            ;THE FOLLOWING INFORMATION IS PRESENTED:
    6528                            ;
    6529                            ;
    6530                            ; 1.0 STATE OF THE EXTENDED FEATURES SWITCH ON THE M7196: ON (EXTENDED
    6531                            ;     FEATURES ENABLED) OR OFF (EXTENDED FEATURES DISABLED).
    6532                            ;
    6533                            ; 2.0 STATE OF THE BUFFERING ENABLE SWITCH ON THE M7196: ON
    6534                            ;     (BUFFERING ENABLED) OR OFF (BUFFERING DISABLED).
    6535                            ;
    6536                            ; 3.0 MICROCODE REVSION LEVEL OF THE M7196.
    6537                            ;
    6538                            ; 4.0 NUMBER OF TAPE TRANSPORTS CONNECTED TO THE CONTROLLER.
    6539                            ;
    6540                            ; 5.0 UNIT SELECT CODE AND STATE (ONLINE/OFFLINE, WRITE ENABLED/PROTECTED)
    6541                            ;     OF EACH CONNECTED TRANSPORT. IN ADDITION, THE PROGRAM WILL INDICATE,
    6542                            ;     FOR EACH ON-LINE TRANSPORT, WHETHER OR NOT IT IS EQUIPPED WITH THE
    6543                            ;     EXTENDED TAPE STATUS READOUT FEATURE.
    6544                            ;
    6545                            ;
    6546                            ;THE OPERATOR IS EXPECTED TO READ THE PRINTOUT AND VERIFY THAT IT MATCHES
```

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                        ;THE ACTUAL CONFIGURATION AT HAND.  IF, FOR EXAMPLE, THE PROGRAM INDICATES
                        ;THAT IT "SEES" TWO TRANSPORTS CONNECTED WHEN IN FACT ONLY ONE IS PRESENT,
                        ;THE OPERATOR MUST INTERPRET THIS AS AN ERROR AND ATTEMPT TO FIND THE
                        ;CAUSE (BAD CABLE, FAULTY UNIT-SELECT DECODING IN THE TRANSPORT, ETC.).
                        ;[SINCE THE CONTROLLER CAN ONLY ACCESS UNIT 0 IF IT IS IN "STANDARD"
                        ;MODE, THE PROGRAM WILL FORCE THE MODULE INTO EXTENDED MODE VIA THE
                        ;WRITE SUBSYSTEM MEMORY COMMAND IN ORDER TO SCAN FOR CONNECTED TRANSPORTS.]
                        ;
                        ;
                        ;THIS ROUTINE, WHEN ITS ACTIONS ARE COMPLETED, WILL EXIT BACK TO THE
                        ;DIAGNOSTIC SUPERVISOR SO THAT IF ADDITIONAL UNITS (CONTROLLERS) ARE
                        ;SELECTED (E.G., FROM THE INITIAL STARTUP DIALOG), THE ROUTINE WILL BE
                        ;REENTERED SO THAT THEIR CONFIGURATIONS CAN BE PRINTED.
                        ;
074530                          BGNTST
074530                                                                  T11::
074530                          RFLAGS  R0                      ;GET OPERATOR FLAGS
074530  104421                                                          TRAP    C$RFLA
074532  001403                  BEQ     10$                     ;BR, IF OK TO RUN
074534  012700  076523          MOV     #T39NE,R0               ;"TEST NOT EXECUTED"
074540  000402                  BR      11$                     ;JUMP OUT OF TEST IF NOT
074542  012700  077652  10$:    MOV     #TST39ID,R0             ;TEST ID MESSAGE
074546  004737  016510  11$:    JSR     PC,TSTSETUP             ;DO THE COMMON SETUP
074552  004737  020500          JSR     PC,CHKMAN               ;IS MANUAL INTERVENTION ALLOWED?
074556  103402                  BCS     20$                     ;BR, IF MANUAL INTERVENTION ALLOWED
074560  000137  075740          JMP     64$                     ;JUMP TO OUT IF NOT
074564                  20$:
074564  004737  015774          JSR     PC,SOFINIT              ;DO SOFT INIT OF CONTROLLER
074570  103405                  BCS     25$                     ;BR IF SOFT INIT = OK
074572  010001                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
074574                          ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL ERROR DURING INIT
074574  104455                                                          TRAP    C$ERDF
074576  002115                                                          .WORD   1101
074600  003652                                                          .WORD   SFIERR
074602  012034                                                          .WORD   SFIMSG
074604                  25$:    CKLOOP                                  ;LOOP IF SELECTED
074604  104406                                                          TRAP    C$CLP1
074606  013737  002202  076470          MOV     UNITN,T39DSW    ;SET UNIT NUMBER
074614  012704  076450                  MOV     #T39PK2,R4      ;SUBROUTINE NEEDS PACKET ADDRESS
074620  004737  010662                  JSR     PC,WRTCHR       ;ISSUE WRITE CHARACTERISTICS
074624  103405                          BCS     50$             ;BR, IF COMMAND ISSUED OK
074626  010001                          MOV     R0,R1           ;SAVE CONTENTS OF TSSR
074630                                  ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
074630  104456                                                          TRAP    C$ERHRD
074632  002116                                                          .WORD   1102
074634  005056                                                          .WORD   WRTMSG
074636  012034                                                          .WORD   SFIMSG
074640                  50$:    CKLOOP                          ;LOOP IF SELECTED
074640  104406                                                          TRAP    C$CLP1
074642  013701  076000                  MOV     T39BFR+12,R1    ;GET XST2 STATUS FROM MESSAGE BUFFER
074646                                  PRINTX  #T39SFS         ;"STATE OF EXTENDED FEATURES SW ="
074646  012746  077371                                                  MOV     #T39SFS,-(SP)
074652  012746  000001                                                  MOV     #1,-(SP)
074656  010600                                                          MOV     SP,R0
074660  104415                                                          TRAP    C$PNTX
074662  062706  000004                                                  ADD     #4,SP
074666  032701  000200                  BIT     #BIT7,R1        ;CHECK STATE OF E.F.S.
```

```
6597 074672  001011                    BNE     100$                ;BR, IF EXT. FEA. SW. IS ON
6598 074674                            PRINTX  #T390FF             ;" OFF"
     074674  012746  077515                                                MOV     #T390FF,-(SP)
     074700  012746  000001                                                MOV     #1,-(SP)
     074704  010600                                                        MOV     SP,R0
     074706  104415                                                        TRAP    C$PNTX
     074710  062706  000004                                                ADD     #4,SP
6599 074714  000410                    BR      110$                ;SKIP OTHER PRINT STATEMENT
6600 074716                    100$:   PRINTX  #T390N              ;" ON "
     074716  012746  077524                                                MOV     #T390N,-(SP)
     074722  012746  000001                                                MOV     #1,-(SP)
     074726  010600                                                        MOV     SP,R0
     074730  104415                                                        TRAP    C$PNTX
     074732  062706  000004                                                ADD     #4,SP
6601 074736                    110$:   PRINTX  #T39SBS             ;"STATE OF BUFFERING SWITCH ="
     074736  012746  077443                                                MOV     #T39SBS,-(SP)
     074742  012746  000001                                                MOV     #1,-(SP)
     074746  010600                                                        MOV     SP,R0
     074750  104415                                                        TRAP    C$PNTX
     074752  062706  000004                                                ADD     #4,SP
6602 074756  032701  000100            BIT     #BIT6,R1            ;CHECK STATE OF BUFFERING SW
6603 074762  001011                    BNE     120$                ;BR, IF BUFFERING IS ON
6604 074764                            PRINTX  #T390FF             ;" OFF"
     074764  012746  077515                                                MOV     #T390FF,-(SP)
     074770  012746  000001                                                MOV     #1,-(SP)
     074774  010600                                                        MOV     SP,R0
     074776  104415                                                        TRAP    C$PNTX
     075000  062706  000004                                                ADD     #4,SP
6605 075004  000410                    BR      130$                ;SKIP OTHER PRINT STATEMENT
6606 075006                    120$:   PRINTX  #T390N              ;" ON "
     075006  012746  077524                                                MOV     #T390N,-(SP)
     075012  012746  000001                                                MOV     #1,-(SP)
     075016  010600                                                        MOV     SP,R0
     075020  104415                                                        TRAP    C$PNTX
     075022  062706  000004                                                ADD     #4,SP
6607 075026  042701  177700    130$:   BIC     #177700,R1          ;ONLY LEAVE MICROCODE REV LEVEL
6608 075032  010137  077610            MOV     R1,T39RL            ;LOAD UP REV LEVEL
6609 075036                            PRINTX  #T39MCL,T39RL       ;"MICROCODE REVISION LEVEL =000XXX"
     075036  013746  077610                                                MOV     T39RL,-(SP)
     075042  012746  077533                                                MOV     #T39MCL,-(SP)
     075046  012746  000002                                                MOV     #2,-(SP)
     075052  010600                                                        MOV     SP,R0
     075054  104415                                                        TRAP    C$PNTX
     075056  062706  000006                                                ADD     #6,SP
6610 075062  004737  015774            JSR     PC,SOFINIT          ;DO SOFT INIT OF CONTROLLER
6611 075066  103405                    BCS     140$                ;BR IF SOFT INIT = OK
6615 075070  010001                    MOV     R0,R1               ;SAVE CONTENTS OF TSSR
6616 075072                            ERRDF   ERRNO,SFIERR,SFIMSG ;DEVICE FATAL ERROR DURING INIT
     075072  104455                                                        TRAP    C$ERDF
     075074  002117                                                        .WORD   1103
     075076  003652                                                        .WORD   SFIERR
     075100  012034                                                        .WORD   SFIMSG
6617 075102                    140$:   CKLOOP                              ;LOOP IF SELECTED
     075102  104406                                                        TRAP    C$CLP1
6618 075104  013737  002202  076470        MOV     UNITN,T39DSW        ;SET UNIT NUMBER
6619 075112  012704  076450            MOV     #T39PK2,R4          ;SUBROUTINE NEEDS PACKET ADDRESS
6620 075116  004737  010662            JSR     PC,WRTCHR           ;ISSUE WRITE CHARACTERISTICS
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6621 075122  103405                    BCS     150$                    ;BR, IF COMMAND ISSUED OK
6625 075124  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
6626 075126                            ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
     075126  104456                                                            TRAP    C$ERHRD
     075130  002120                                                            .WORD   1104
     075132  005056                                                            .WORD   WRTMSG
     075134  012034                                                            .WORD   SFIMSG
6627 075136                    150$:   CKLOOP                          ;LOOP IF SELECTED
     075136  104406                                                            TRAP    C$CLP1
6628 075140  005737  002226            TST     EXTFEA                  ;CHECK FOR EXTENDED FEATURES SW SWITCH
6629 075144  001036                    BNE     174$                    ;BR IF SWITCH IS ON
6630 075146  112737  000200  075761    MOVB    @200,T39BS1             ;WRITE MISCELLANEOUS CONT/READ STATUS
6631 075154  112737  000010  075760    MOVB    @10,T39BSO              ;FUNCTION SELECTION BIT (TURN ON EXTFEA HW SWITCH)
6632 075162  012704  075750            MOV     @T39PACKET,R4           ;WRITE SUBSYS MEM PACKET
6633 075166  010465  000000            MOV     R4,TSDB(R5)             ;ISSUE COMMAND
6634 075172  004737  016336            JSR     PC,CHKTSSR              ;WAIT FOR SSR
6635 075176  103405                    BCS     160$                    ;BR, IF NO ERROR
6636 075200  010001                    MOV     R0,R1                   ;ERROR, SAVE TSSR
6640 075202                            ERRHRD  ERRNO,T39NBA,PKTSSR     ;TSSR NOT CORRECT AFTER WRT. MISCELLANEOUS
     075202  104456                                                            TRAP    C$ERHRD
     075204  002121                                                            .WORD   1105
     075206  077225                                                            .WORD   T39NBA
     075210  012046                                                            .WORD   PKTSSR
6641 075212                    160$:   CKLOOP                          ;LOOP IF SELECTED
     075212  104406                                                            TRAP    C$CLP1
6642 075214  012704  076450            MOV     @T39PK2,R4              ;SUBROUTINE NEEDS PACKET ADDRESS
6643                           ;*****************************************************************
6644                           ;
6645                           ;WRITE CHARACTERISTICS COMMAND (CALL TO WRTCHR)
6646                           ;
6647                           ;*****************************************************************
6648
6649 075220  004737  010662            JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
6650 075224  103405                    BCS     170$                    ;BR, IF COMMAND ISSUED OK
6654 075226  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
6655 075230                            ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
     075230  104456                                                            TRAP    C$ERHRD
     075232  002122                                                            .WORD   1106
     075234  005056                                                            .WORD   WRTMSG
     075236  012034                                                            .WORD   SFIMSG
6656 075240                    170$:   CKLOOP                          ;SCOPE LOOP
     075240  104406                                                            TRAP    C$CLP1
6657 075242  005037  002202    174$:   CLR     UNITN                   ;SET TO DRIVE 0
6658 075246  013737  002202  076470  175$:   MOV     UNITN,T39DSW            ;SET UNIT NUMBER
6659 075254  012704  076450            MOV     @T39PK2,R4              ;SUBROUTINE NEEDS PACKET ADDRESS
6660 075260  004737  010662            JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
6661 075264  103405                    BCS     180$                    ;BR, IF COMMAND ISSUED OK
6665 075266  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
6666 075270                            ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
     075270  104456                                                            TRAP    C$ERHRD
     075272  002123                                                            .WORD   1107
     075274  005056                                                            .WORD   WRTMSG
     075276  012034                                                            .WORD   SFIMSG
6667 075300                    180$:   CKLOOP                          ;LOOP IF SELECTED
     075300  104406                                                            TRAP    C$CLP1
6668
6669 075302  016501  000002    190$:   MOV     TSSR(R5),R1             ;GET TSSR STATUS
```

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6670 075306  032701  000100                    BIT     #OFL,R1                 ;CHECK FOR OFF-LINE
6671 075312  001414                            BEQ     200$                    ;BR, IF DRIVE IS ON-LINE
6672 075314                                    PRINTX  #T39OF2,UNITN           ;"DRIVE NUMBER XX IS OFF-LINE"
     075314  013746  002202                                                                            MOV     UNITN,-(SP)
     075320  012746  076764                                                                            MOV     #T39OF2,-(SP)
     075324  012746  000002                                                                            MOV     #2,-(SP)
     075330  010600                                                                                    MOV     SP,R0
     075332  104415                                                                                    TRAP    C$PNTX
     075334  062706  000006                                                                            ADD     #6,SP
6673 075340  000137  075674                    JMP     250$                    ;DO NOT TRY TO GET ANYMORE INFO.
6674 075344                            200$:   PRINTX  #T39ON2,UNITN           ;"DRIVE NUMBER XX IS ON-LINE"
     075344  013746  002202                                                                            MOV     UNITN,-(SP)
     075350  012746  077030                                                                            MOV     #T39ON2,-(SP)
     075354  012746  000002                                                                            MOV     #2,-(SP)
     075360  010600                                                                                    MOV     SP,R0
     075362  104415                                                                                    TRAP    C$PNTX
     075364  062706  000006                                                                            ADD     #6,SP
6675 075370  013701  075774                    MOV     T39BFR+6,R1             ;READ EXTENDED STATUS (XSTO)
6676 075374  032701  000004                    BIT     #BIT2,R1                ;IS DRIVE WTITE PROTECTED
6677 075400  001013                            BNE     210$                    ;BR, IF WRITE PROTECTED
6678 075402                                    PRINTX  #T39WPN,UNITN           ;"DRIVE NUMBER IS NOT WRT PRO"
     075402  013746  002202                                                                            MOV     UNITN,-(SP)
     075406  012746  077146                                                                            MOV     #T39WPN,-(SP)
     075412  012746  000002                                                                            MOV     #2,-(SP)
     075416  010600                                                                                    MOV     SP,R0
     075420  104415                                                                                    TRAP    C$PNTX
     075422  062706  000006                                                                            ADD     #6,SP
6679 075426  000412                            BR      220$                    ;SKIP OVER
6680 075430                            210$:   PRINTX  #T39WRT,UNITN           ;"DRIVE NUMBER XX IS WRT PRO"
     075430  013746  002202                                                                            MOV     UNITN,-(SP)
     075434  012746  077073                                                                            MOV     #T39WRT,-(SP)
     075440  012746  000002                                                                            MOV     #2,-(SP)
     075444  010600                                                                                    MOV     SP,R0
     075446  104415                                                                                    TRAP    C$PNTX
     075450  062706  000006                                                                            ADD     #6,SP
6681 075454  012737  125252  076066    220$:   MOV     #125252,T39BFR+100      ;SET 1 LOC TO KNOWN VALUE
6682 075462  112737  000000  075761            MOVB    #0,T39BS1               ;EXTENDED TAPE STATUS
6683 075470  112737  000024  075760            MOVB    #24,T39BS0              ;EXTENDED TAPE STATUS
6684 075476  012704  075750                    MOV     #T39PACKET,R4           ;WRITE SUBSYS MEM PACKET
6685 075502  010465  000000                    MOV     R4,TSDB(R5)             ;ISSUE COMMAND
6686 075506  012737  000144  075744            MOV     #100.,T39DLY            ;SET UP DELAY ROUTINE
6687 075514  004737  016250            222$:   JSR     PC,WAITF                ;WAIT AWHILE FOR SSR TO SET
6688 075520  016501  000002                    MOV     TSSR(R5),R1             ;SEE IF IT REALLY DID
6689 075524  032701  000200                    BIT     #SSR,R1                 ;JUST CHECK THAT BIT
6690 075530  001017                            BNE     225$                    ;BR, IF SSR IS SET
6691 075532                                    DELAY   250                     ;DELAY ABOUT .25 SEC
     075532  012727  000250                                                                            MOV     #250,(PC)+
     075536  000000                                                                                    .WORD   0
     075540  013727  002116                                                                            MOV     L$DLY,(PC)+
     075544  000000                                                                                    .WORD   0
     075546  005367  177772                                                                            DEC     -6(PC)
     075552  001375                                                                                    BNE     .-4
     075554  005367  177756                                                                            DEC     -22(PC)
     075560  001367                                                                                    BNE     .-20
6692 075562  005337  075744                    DEC     T39DLY                  ;START DELAY COUNT DOWN
6693 075566  001352                            BNE     222$                    ;BR, IF COUNTER IS NOT AT DONE
6694 075570  004737  016336            225$:   JSR     PC,CHKTSSR              ;WAIT FOR SSR
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6695 075574  103405                        BCS     230$                ;BR, IF NO ERROR
6696 075576  010001                        MOV     R0,R1               ;ERROR, SAVE TSSR
6700 075600                                ERRHRD  ERRNO,T39NBA,PKTSSR ;TSSR NOT CORRECT AFTER WRT. MISCELLANEOUS
     075600  104456                                                       TRAP    C$ERHRD
     075602  002124                                                       .WORD   1108
     075604  077225                                                       .WORD   T39NBA
     075606  012046                                                       .WORD   PKTSSR
6701 075610                         230$:  CKLOOP                      ;LOOP IF SELECTED
     075610  104406                                                       TRAP    C$CLP1
6702 075612  023727  076066  125252        CMP     T39BFR+100,#125252  ;DID LOC GET OVER WRITTEN
6703 075620  001013                        BNE     240$                ;BR, IF IT DIDN'T GET ETC.
6704 075622                                PRINTX  #T39ETN,UNITN       ;"DRIVE DOESN'T HAVE EXT TAPE STATUS
     075622  013746  002202                                               MOV     UNITN,-(SP)
     075626  012746  076671                                               MOV     #T39ETN,-(SP)
     075632  012746  000002                                               MOV     #2,-(SP)
     075636  010600                                                       MOV     SP,R0
     075640  104415                                                       TRAP    C$PNTX
     075642  062706  000006                                               ADD     #6,SP
6705 075646  000412                        BR      250$                ;SKIP OVER
6706 075650                         240$:  PRINTX  #T39ETS,UNITN       ;"DRIVE HAS EXT TAPE STATUS"
     075650  013746  002202                                               MOV     UNITN,-(SP)
     075654  012746  076602                                               MOV     #T39ETS,-(SP)
     075660  012746  000002                                               MOV     #2,-(SP)
     075664  010600                                                       MOV     SP,R0
     075666  104415                                                       TRAP    C$PNTX
     075670  062706  000006                                               ADD     #6,SP
6707 075674  005237  002202        250$:  INC     UNITN               ;BUMP DRIVE NUMBER
6708 075700  023727  002202  000003        CMP     UNITN,#3            ;AT END OF DRIVES YET
6709 075706  001402                        BEQ     63$                 ;BR, IF NO MORE DRIVES
6710 075710  000137  075246                JMP     175$                ;DO NEXT DRIVE
6711 075714                         63$:   PRINTX  #T39NFL                 ;NEW LINE
     075714  012746  076520                                               MOV     #T39NFL,-(SP)
     075720  012746  000001                                               MOV     #1,-(SP)
     075724  010600                                                       MOV     SP,R0
     075726  104415                                                       TRAP    C$PNTX
     075730  062706  000004                                               ADD     #4,SP
6712 075734  000137  000200                JMP     200                 ;RETURN TO SUPERVISOR
6713 075740                         64$:   EXIT    TST                 ;EXIT THIS SECTION
     075740  104432                                                       TRAP    C$EXIT
     075742  001736                                                       .WORD   L10076-.
6714                                ;+
6715                                ;LOCAL TEXT MESSAGES FOR TEST
6716                                ;-
6717
6718                                ;LOCAL STORAGE FOR THIS TEST
6719                                ;-
6720
6721 075744  000000                T39DLY: .WORD   0                      ;DELAY COUNTER FOR TEST
6723         075750                        .=<.+10>&177770
6725 075750                         T39PACKET:                         ;COMMAND PACKET FOR TEST
6726 075750  140006                        .WORD   140006              ;WRITE SUBSYSTEM MEM. CMD.  ACK,CVC=1
6727 075752  075760                        .WORD   T39TAD              ;ADDRESS OF CHARACTERISTICS BLOCK
6728 075754  000000                        .WORD   0
6729 075756  000012                        .WORD   10.                 ;STARTING VALUE OF BLOCK SIZE
6730 075760                         T39TAD:                        ;CHARACTERISTICS DATA BLOCK
6731 075760     000                T39BS0: .BYTE   0                   ;BSEL0 BYTE
6732 075761     000                T39BS1: .BYTE   0                   ;BSEL1 BYTE
```

```
6733 075762  000000                T39BS2: .WORD   0                       ;BSEL1 WORD
6734 075764  000000                        .WORD   0                       ;DATA
6735 075766                        T39BFR: .BLKW   150.                    ;MESSAGE BUFFER
6736
6737
6739         076450                        .=<.+10>&177770
6741 076450                        T39PK2:
6742 076450  140004                        .WORD   140004                  ;COMMAND PACKET FOR TEST
6743 076452  076460                        .WORD   T39DTA                  ;WRITE CHARA. MEM. CMND.,  ACK,CVC=1
6744 076454  000000                        .WORD   0                       ;ADDRESS OF SELECT DATA BLOCK
6745 076456  000012                        .WORD   10.                     ;STARTING VALUE OF BLOCK SIZE
6746
6747
6748 076460                        T39DTA:                                 ;SELECT DATA BLOCK
6749 076460  075766                        .WORD   T39BFR                  ;ADDRESS OF MESSAGE BUFFER
6750 076462  000000                        .WORD   0
6751 076464  000400                        .WORD   256.                    ;LENGTH OF MESSAGE BUFFER
6752 076466  000000                T39EAI: .WORD   0                       ;EAI BIT WORD
6753 076470  000000                T39DSW: .WORD   0                       ;DRIVE SELECT WORD ETC
6755         076500                        .=<.+10>&177770
6757 076500  140012                T39PK3: .WORD   140012                  ;MESSAGE BUFFER RELEASE COMMAND
6758 076502  000000                        .WORD   0                       ;NOT USED
6759                                ;
6760                                ;WRITE TAPE PACKET
6761                                ;
6763         076510                        .=<.+10>&177770
6765 076510  140005                T39PK4: .WORD   140005                  ;WRITE, ACK, CVC=1 COMMAND
6766 076512  000000                T39WR:  .WORD   0                       ;ADDRESS OF WRITE BUFFER
6767 076514  000000                        .WORD   0                       ;MORE ADDRESS OF WRITE BUFFER
6768 076516  000400                T39SIZ: .WORD   256.                    ;SIZE OF RECORD
6769
6770
6771
6772
6773                                ;+
6774                                ;LOCAL TEXT MESSAGES FOR TEST
6775                                ;-
6776
6777
6778
6779
6780 076520  045  116  000  T39NFL: .ASCIZ  '%N'
6781 076523  123  164  141  T39NE:  .ASCIZ  'Stand-alone Configuration Typeout Not Executed'
6782 076602  045  116  045  T39ETS: .ASCIZ  '%N%A Extended Tape Status Availiable, Drive Number %D2'
6783 076671  045  116  045  T39ETN: .ASCIZ  '%N%A Extended Tape Status NOT Availiable, Drive Number %D2'
6784 076764  045  116  045  T39OF2: .ASCIZ  '%N%A Drive Number %D2%A Is Off-Line'
6785 077030  045  116  045  T39ON2: .ASCIZ  '%N%A Drive Number %D2%A Is On-Line'
6786 077073  045  116  045  T39WRT: .ASCIZ  '%N%A Drive Number %D2%A Is Write Protected'
6787 077146  045  116  045  T39WPN: .ASCIZ  '%N%A Drive Number %D2%A Is NOT Write Protected'
6788 077225  127  122  111  T39NBA: .ASCIZ  'WRITE SUBSYSTEM MEMORY Command Not Accepted'
6789 077301  103  157  156  T39SSR: .ASCIZ  'Contents of TSSR Incorrect After WRITE SUBSYSTEM MEMORY'
6790
6791 077371  045  116  045  T39SFS: .ASCIZ  '%N%A State Of Extended Features Switch  ='
6792 077443  045  116  045  T39SBS: .ASCIZ  '%N%A State Of Buffering Switch          ='
6793 077515  045  101  040  T39OFF: .ASCIZ  '%A OFF'
6794 077524  045  101  040  T39ON:  .ASCIZ  '%A ON '
6795 077533  045  116  045  T39MCL: .ASCIZ  '%N%A M7196 Microcode Revision Level     =%O2'
```

```
6796                                            .EVEN
6797 077610  000000                 T39RL:     .WORD   0
6798                                            .EVEN
6799                                            .EVEN
6800
6801                                ;+
6802                                ;LOCAL STORAGE FOR THIS TEST
6803                                ;-
6804
6805 077612  000000                 T39DAT:    .WORD   0               ;LOGICAL RESPONSE TO QUESTION
6806 077614                         T39REST:
6807 077614                                    SAVREG                  ;SAVE THE REGISTERS
6808 077620  012701  075750                    MOV     #T39PACKET,R1   ;START OF THE PACKET
6809 077624  012721  140006                    MOV     #140006,(R1)+   ;WRITE SUBSYSTEM MEM. WITH ACK,CVC=1
6810 077630  012721  075760                    MOV     #T39TAD,(R1)+   ;ADDRESS OF DATA BLOCK
6811 077634  005021                            CLR     (R1)+           ;EXTENDED ADDRESS
6812 077636  012721  000006                    MOV     #6.,(R1)+       ;SIZE OF DATA BLOCK IN BYTES
6813 077642  005021                            CLR     (R1)+           ;CLEAR BSELO AND BSEL1
6814 077644  005021                            CLR     (R1)+           ;CLEAR SEL2
6815 077646  005011                            CLR     (R1)            ;CLEAR DATA AREA
6816 077650  000207                            RTS     PC              ;RETURN
6817
6818                                ;+
6819                                ;LOCAL TEXT MESSAGES FOR TEST
6820                                ;-
6821
6822 077652     103     157     156 TST39ID:           .ASCIZ  'Configuration Typeout'
6823                                            .EVEN
6824 077700                                    ENDTST
     077700                                                                L10076:
     077700  104401                                                              TRAP    C$ETST
6825
6826                                .SBTTL  TEST 12: SCOPE LOOPS
6827
6828
6829                            ;+
6830                            ;
6831                            ;
6832                            ;       THIS IS A STANDALONE ROUTINE PROVIDING A NUMBER OF TIGHT "SCOPE
6833                            ;       LOOPS" USEFUL FOR DEBUGGING BASIC REGISTER ACCESS PROBLEMS WITH
6834                            ;       THE M7196 MODULE.  THESE SCOPE LOOPS CAN BE USED WHEN THE NORMAL
6835                            ;       "LOOP ON ERROR" OR "LOOP ON TEST (SUBTEST)" FACILITIES DON'T
6836                            ;       SEEM TO ALLOW THE OPERATOR TO ZERO IN A PROBLEM IN THE EARLY
6837                            ;       TESTS (I.E. THE HARDWARE MAY NOT BE RESPONDING TO A REGISTER
6838                            ;       ACCESS, CAUSING A BUS ERROR TRAP, EVEN THOUGH THE DEVICE ADDRESS
6839                            ;       SELECTED BY THE PROGRAM MATCHES THE CONFIGURATION SET UP IN THE
6840                            ;       HARDWARE DIP SWITCHES).  THE FOLLOWING MENU OF SCOPE LOOPS ARE
6841                            ;       AVAILABLE:
6842                            ;
6843                            ;               CODE    SCOPE LOOP
6844                            ;
6845                            ;                 0     HELP. PRINT THIS MENU.
6846                            ;                 1     TSBA READ ACCESS
6847                            ;                 2     TSSR READ ACCESS
6848                            ;                 3     INITIALIZE (TSSR WRITE ACCESS)
6849                            ;                 4     TSDB HIGH BYTE WRITE ACCESS
6850
```

```
                                ;               5     TSDB LOW BYTE WRITE ACCESS
                                ;               6     TSDB MAINTENANCE-MODE WORD WRITE ACCESS
                                ;               7     TSDBX (TSSR HIGH BYTE) WRITE ACCESS
                                ;                       (EXTENDED FEATURES SWITCH MUST BE ON
                                ;                         TO USE SELECTION CODE 7)
                                ;               8     EXIT (RETURN TO SUPERVISOR)
                                ;
                                ;       FOR SCOPE LOOPS THAT WRITE INTO REGISTERS, THE PROGRAM PROMPTS
                                ;       THE OPERATOR FOR THE DATA TO BE WRITTEN.  TYPING <RETURN> CAUSES
                                ;       AN EXIT FROM THE SCOPE LOOP BACK TO MENU LEVEL.
                                ;
                                ;-

                                        BGNTST
                                                                                T12::
                                        RFLAGS  R0              ;GET OPERATOR FLAGS
                                                                                TRAP    C$RFLA
                                        BEQ     1$              ;BR, IF OK TO RUN
                                        MOV     #T40NE,R0       ;"TEST NOT EXECUTED"
                                        BR      100$            ;JUST EXIT IF NOT
                                1$:     MOV     #TST40ID,R0     ;TEST ID MESSAGE
                                100$:   JSR     PC,TSTSETUP     ;DO THE COMMON SETUP
                                        JSR     PC,CHKMAN       ;SEE IF MANUAL INTERVENTION ALLOWED
                                        BCS     2$              ;CARRY SET IF INTERVENTION ALLOWED
                                        JMP     64$             ;EXIT IF NO MANUAL INTERVENTION
                                2$:     JSR     PC,SOFINIT      ;DO A SOFT INIT
                                        BCS     5$              ;BRANCH IF OK
                                        MOV     R0,R1           ;CONTENTS OF TSSR REGISTER
                                        ERRDF   ERRNO,SFIERR,SFIMSG     ;REPORT FATAL ERROR
                                                                                TRAP    C$ERDF
                                                                                .WORD   1201
                                                                                .WORD   SFIERR
                                                                                .WORD   SFIMSG
                                5$:     MOV     #SCMENU,R0      ;MENU OF SCOPE LOOP SELECTIONS
                                        MOV     #8.,R1          ;MAXIMUM ALLOWED SELECTION
                                        JSR     PC,GETSEL       ;GO GET THE OPERATORS SELECTION
                                        TST     R0              ;WAS ZERO SPECIFIED ?
                                        BEQ     2$              ;REPEAT MENU IF YES.
                                        CMP     R0,#7           ;EXTENDED TSSR ?
                                        BNE     3$              ;BRANCH IF NOT
                                        TST     EXTFEA                  ;CHECK FOR EXTENDED FEATURES SET
                                        BNE     3$              ;BR, IF IT IS ON
                                        PRINTF  #EXFMSG         ;WARN OPERATOR EXTENDED FEATURES CLEAR
                                                                                MOV     #EXFMSG,-(SP)
                                                                                MOV     #1,-(SP)
                                                                                MOV     SP,R0
                                                                                TRAP    C$PNTF
                                                                                ADD     #4,SP
                                        JMP     2$              ;GO BACK TO BASIC MENU
                                3$:     MOV     R0,R4           ;SAVE THE MENU SELECTION
                                        SETPRI  #PRI07          ;RAISE THE PRIORITY
                                                                                MOV     #PRI07,R0
                                                                                TRAP    C$SPRI
                                        CLR     TTION           ;ASSUME INTERRUPTS ARE ENABLED
                                        BIT     #100,@#TTICSR   ;ARE TTI INTERRUPTS ON ?
                                        BNE     4$              ;BRANCH IF YES
```

```
6902 100062  005237  100426                 INC     TTION           ;FLAG SET IF INTERRUPTS OFF
6903 100066  052737  000100  177560         BIS     #100,@#TTICSR   ;ENABLE INTERRUPTS
6904 100074  012701  000060          4$:    MOV     #TTIVEC,R1      ;START OF TTI VECTORS
6905 100100  011137  100430                 MOV     (R1),TVECSAV    ;SAVE THE CURRENT TTI VECTOR
6906 100104  012721  100330                 MOV     #60$,(R1)+      ;SET NEW INTERRUPT ROUTINE
6907 100110  011137  100432                 MOV     (R1),TPRISAV    ;SAVE THE VECTOR PRIORITY
6908 100114  012711  000340                 MOV     #PRI07,(R1)     ;USE PRIORITY SEVEN
6909 100120                                 SETPRI  #PRI00          ;LOWER INTERRUPT BR LEVEL
     100120  012700  000000                                                 MOV     #PRI00,R0
     100124  104441                                                         TRAP    C$SPRI
6910 100126  006304                         ASL     R4              ;CONVERT TO WORD OFFSET
6911 100130  000174  100134                 JMP     @6$(R4)         ;JUMP TO PROPER LOOP
6912 100134  077736          6$:    .WORD   2$              ;RETYPE THE MENU
6913 100136  100156                 .WORD   10$             ;TSBA READ ACCESS
6914 100140  100166                 .WORD   15$             ;TSSR READ ACCESS
6915 100142  100200                 .WORD   20$             ;TSSR WRITE ACCESS
6916 100144  100220                 .WORD   25$             ;TSDB HIGH BYTE WRITE ACCESS
6917 100146  100244                 .WORD   30$             ;TSDB LOW BYTE WRITE ACCESS
6918 100150  100270                 .WORD   35$             ;TSDB MAINTENANCE MODE
6919 100152  100310                 .WORD   40$             ;TSDBX WRITE ACCESS
6920 100154  100422                 .WORD   65$             ;LEAVE THE TEST
6921
6922
6923 100156  105065  000000          10$:   CLRB    TSDB(R5)        ;ENTER MAINTENANCE MODE
6924 100162  011500          12$:   MOV     (R5),R0         ;READ TSBA REGISTER
6925 100164  000776                 BR      12$             ;LOOP UNTIL HALTED
6926
6927
6928 100166  012703  000002          15$:   MOV     #TSSR,R3        ;ADDRESS OF TSSR REGISTER
6929 100172  060503                 ADD     R5,R3           ;POINT TO TSV05'S REGISTERS
6930 100174  011300          18$:   MOV     (R3),R0         ;READ TSSR REGISTER
6931 100176  000776                 BR      18$             ;LOOP UNTIL STOPPED
6932
6933 100200  004737  020174          20$:   JSR     PC,GETPAT       ;READ THE DATA PATTERN
6934 100204  010001                 MOV     R0,R1           ;DATA PATTERN FOR LOOP
6935 100206  012703  000002                 MOV     #TSSR,R3        ;ADDRESS OF TSSR
6936 100212  060503                 ADD     R5,R3           ;POINT TO TSV05'S REGISTERS
6937 100214  010113          22$:   MOV     R1,(R3)         ;WRITE DATA TO TSSR
6938 100216  000776                 BR      22$             ;LOOP
6939
6940
6941 100220  105065  000000          25$:   CLRB    TSDB(R5)        ;ENTER MAINTENANCE MODE
6942 100224  004737  020174                 JSR     PC,GETPAT       ;READ THE DATA PATTERN
6943 100230  010001                 MOV     R0,R1           ;DATA PATTERN FOR LOOP
6944 100232  012703  000001                 MOV     #TSDBH,R3       ;ADDRESS OF HIGH BYTE OF TSDB
6945 100236  060503                 ADD     R5,R3           ;POINT TO TSV05'S REGISTERS
6946 100240  110113          27$:   MOVB    R1,(R3)         ;WRITE THE DATA TO TSDB, HIGH BYTE
6947 100242  000776                 BR      27$             ;LOOP UNTIL STOPPED
6948
6949
6950 100244  105065  000000          30$:   CLRB    TSDB(R5)        ;ENTER MAINTENANCE MODE
6951 100250  004737  020174                 JSR     PC,GETPAT       ;READ THE DATA PATTERN
6952 100254  010001                 MOV     R0,R1           ;DATA PATTERN FOR LOOP
6953 100256  012703  000000                 MOV     #TSDB,R3        ;ADDRESS OF TSSR
6954 100262  060503                 ADD     R5,R3           ;POINT TO TSV05'S REGISTERS
6955 100264  110113          32$:   MOVB    R1,(R3)         ;WRITE DATA TO TSSR, LOW BYTE
6956 100266  000776                 BR      32$             ;LOOP UNTIL HALTED BY OPERATOR
```

```
                                35$:    JSR     PC,GETPAT               ;READ THE DATA PATTERN
                                        MOV     R0,R1                   ;DATA PATTERN FOR LOOP
                                        MOV     #TSDB,R3                ;SELECT TSDB
                                        ADD     R5,R3                   ;POINT TO TSV05'S REGISTERS
                                37$:    MOV     R1,(R3)                 ;WRITE THE DATA PATTERN

                                        BR      37$                     ;LOOP UNTIL HALTED

                                40$:    JSR     PC,GETPAT               ;READ THE DATA PATTERN
                                        MOV     R0,R1                   ;SAVE THE DATA PATTERN
                                        MOV     #TSSRH,R3               ;BYTE ADDRESS OF TSSR, HIGH BYTE
                                        ADD     R5,R3                   ;POINT TO TSV05'S REGISTERS
                                42$:    MOVB    R1,(R3)                 ;WRITE THE DATA TO REGISTER
                                        BR      42$                     ;LOOP UNTIL HALTED


                                ;+
                                ;PROCESS CONSOLE INTERRUPTS
                                ;-

                                60$:    MOV     R0,-(SP)                ;SAVE WORK REGISTER
                                        MOVB    @#TTIBFR,R0             ;GET THE OPERATOR INPUT
                                        BIC     #200,R0                 ;STRIP OFF PARITY BIT
                                        CMPB    #15,R0                  ;IS IT A CARRIAGE RETURN ?
                                        BNE     61$                     ;JUST EXIT IF NOT
                                        MOV     #2$,2(SP)               ;RETURN TO MASTER MENU
                                        CLR     4(SP)                   ;FORCE PRIORITY ZERO
                                        MOV     TVECSAV,@#TTIVEC        ;RESTORE SUPERVISOR VECTOR
                                        MOV     TPRISAV,@#TTIVEC+2      ;RESTORE SUPERVISOR PRIORITY
                                        TST     TTION                   ;ARE SUPERVISOR INTERRUPTS ENABLED ?
                                        BEQ     61$                     ;BRANCH IF YES
                                        BIC     #100,@#TTICSR           ;TURN OFF TTI INTERRUPTS
                                61$:    MOV     (SP)+,R0                ;RESTORE REGISTER
                                        RTI                             ;RETURN FROM INTERUPT

                                64$:
                                63$:    EXIT    TST                     ;EXIT THE TEST
                                                                                        TRAP    C$EXIT
                                                                                        .WORD   L10077-.
                                65$:    JMP     200                     ;RETURN TO SUPERVISOR


                                ;+
                                ;LOCAL STORAGE FOR THIS TEST
                                ;-

                                TTION:          .WORD   0               ;WORD SET IF SUPERVISOR TTI INTER OFF
                                TVECSAV:        .WORD   0               ;SAVE TTI VECTOR
                                TPRISAV:        .WORD   0               ;SAVE TTI PRIORITY


                                ;+
                                ;MENU FOR OPERATOR INPUT FOR SCOPE LOOPS
                                ;-

                                        .EVEN
                                SCMENU: .WORD   1$,2$,3$,4$,5$,6$
```

```
TSV5 - HARDWARE TESTS   MACRO M1113  06-FEB-84 17:14                    SEQ 242
TEST 12: SCOPE LOOPS

7012 100450  100740  100776  101044          .WORD   7$,8$,9$,10$,11$,12$,0
7013
7014
7015 100466    012     123     105  1$:      .ASCIZ  <12>'SELECT SCOPE LOOP FROM FOLLOWING OPTIONS:'
7016 100541    012     011     060  2$:      .ASCIZ  <12>'    0       Display This Menu'
7017 100567    011     061     011  3$:      .ASCIZ  '        1       TSBA Read Access'
7018 100613    011     062     011  4$:      .ASCIZ  '        2       TSSR Read Access'
7019 100637    011     063     011  5$:      .ASCIZ  '        3       Initialize (TSSR Write Access)'
7020 100701    011     064     011  6$:      .ASCIZ  '        4       TSDB High Byte Write Access'
7021 100740    011     065     011  7$:      .ASCIZ  '        5       TSDB Low Byte Write Access'
7022 100776    011     066     011  8$:      .ASCIZ  '        6       TSDB Maintenance Mode Write Access'
7023 101044    011     067     011  9$:      .ASCIZ  '        7       TSDBX (TSSR High Byte) Write Access'
7024 101113    011     070     011  10$:     .ASCIZ  '        8       Return to Diagnostic Supervisor'
7025 101156    000             011  11$:     .ASCIZ  ''
7026 101157    124     171     160  12$:     .ASCIZ  'Type RETURN To Stop Scope Loops'
7027 101217    045     116     045  EXFMSG:  .ASCIZ  '%N%A *** Extended Features Switch Not On *** '
7028 101275    123     164     141  T40NE:   .ASCIZ  'Stand-alone Scope Loops Not Executed'
7029 101342    123     143     157  TST40ID:         .ASCIZ  'Scope Loops'
7030
7031 101356                                  .EVEN
     101356                                  ENDTST
     101356                                                          L10077:
     101356  104401                                                          TRAP    C$ETST
7032 101360                                  ENDMOD
```

```
                                        .TITLE  TSV6 - PARAMETER CODING

                                        BGNMOD  TSV6
                                TSV6::

                                        .SBTTL  HARDWARE PARAMETER CODING SECTION

                                ;**
                                ; THE HARDWARE PARAMETER CODING SECTION CONTAINS MACROS
                                ; THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES.  THE
                                ; MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
                                ; INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES.  THE
                                ; MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
                                ; WITH THE OPERATOR.
                                ;--
                                        BGNHRD
101360  000010                          .WORD L10100-L$HARD/2
101362                          L$HARD::

                                        GPRMA   HPM1,0,0,160010,177776,YES      ;GET TSBA/TSDB REGISTER ADDRESS.
101362  000031                          .WORD   T$CODE
101364  101402                          .WORD   HPM1
101366  160010                          .WORD   T$LOLIM
101370  177776                          .WORD   T$HILIM
                                        GPRMA   HPM2,2,0,0,776,YES              ;GET VECTOR ADDRESS.
101372  001031                          .WORD   T$CODE
101374  101436                          .WORD   HPM2
101376  000000                          .WORD   T$LOLIM
101400  000776                          .WORD   T$HILIM
                                        ;GPRMD  HPM3,4,0,340,0,7,YES            ;GET INTERRUPT PRIORITY.
                                        ENDHRD
                                        .EVEN
101402                          L10100:
101402  104     105     126     HPM1:   .ASCIZ  'DEVICE ADDRESS (TSBA/TSDB) '
101436  111     116     124     HPM2:   .ASCIZ  'INTERRUPT VECTOR    '
101462  111     116     124     HPM3:   .ASCIZ  'INTERRUPT PRIORITY     '
                                        .EVEN
```

```
                                        .SBTTL  SOFTWARE PARAMETER CODING SECTION

                                ;++
                                ; THE SOFTWARE PARAMETER CODING SECTION CONTAINS MACROS
                                ; THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES.  THE
                                ; MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
                                ; INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES.  THE
                                ; MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
                                ; WITH THE OPERATOR.
                                ;--
101512                                  BGNSFT
101512  000003                          .WORD L10101-L$SOFT/2
101514                          L$SOFT::
                                ;       GPRML   SPM1,0,-1,YES                   ; GET TRANSPORT TEST FLAG.
101514                                  GPRML   SPM4,2,-1,YES                   ; GET ITERATION CONTROL.
101514  001130                          .WORD   T$CODE
101516  101552                          .WORD   SPM4
101520  177777                          .WORD   -1
                                ;       GPRMD   SPM6,4,D,7777,0,7777,YES        ; GET LOCAL ERROR LIMIT
                                ;       GPRMD   SPM7,6,D,7777,0,7777,YES        ; GET GLOBAL ERROR LIMIT
101522                                  ENDSFT
                                        .EVEN
101522                          L10101:

101522      105     116     101 SPM1:   .ASCIZ  'ENABLE TRANSPORT TESTS '
101552      111     116     110 SPM4:   .ASCIZ  'INHIBIT ITERATIONS     '
101602      120     105     122 SPM6:   .ASCIZ  'PER TEST ERROR LIMIT   '
101632      120     105     122 SPM7:   .ASCIZ  'PER UNIT ERROR LIMIT   '
                                        .SBTTL  PATCH AREA

                                ;
                                ; FINALLY A GENEROUS PATCH AREA.
                                ;
                                ; AND AN ADJUSTMENT TO ACCOUNT FOR THE "LASTAD BIT7" HACK
                                ; DESCRIBED IN "SUPPRG.MEM" (FOR REV C).
                                ;

101662                          PATCH::

101662                                  .BLKW   32.

        102000                          .=.!377+1
102000                                  LASTAD          ;SET LAST USED ADDRESS.
                                        .EVEN
102000  000000                         .WORD   0
102002  000000                         .WORD   0
102004                          L$LAST::
102004                                  ENDMOD
        000001                          .END
```

TSV6 - PARAMETER CODING MACRO M1113 06-FEB-84 17:14 SEQ 245
SYMBOL TABLE

```
ADDSSR  012126 G    C$AU  = 000052    DEVDRO  023376      FREEHI  003130      INTCPC  016150
ADR   = 000020 G    C$AUTO= 000061    DEVNRD  023315      FRESIZ  003126 G    INTFLA  016145
AMBTSS  006635      C$BRK = 000022    DEVNXR  023233      FUSI    004117      INTMAS  016144
ASSEMB= 000010      C$BSEG= 000004    DEVONL  023163      F$AU  = 000015      INTR    016216 G
A1716 = 000003      C$BSUB= 000002    DEVSUM  023126      F$AUTO= 000020      INTREC  002224 G
BADDAT  003156 G    C$CEFG= 000045    DFPTBL  002156 G    F$BGN = 000040      INTVEC  016146
BADSSR  015700 G    C$CLCK= 000062    DIAGMC= 000000      F$CLEA= 000007      INTX    004300
BDVPCR= 177520 G    C$CLEA= 000012    DICEB = 000001      F$DU  = 000016      INVERT  021206 G
BENBSW  002230 G    C$CLOS= 000035    DSBINT  016204      F$END = 000041      IOKCKI= 000200
BIE   = 040000      C$CLP1= 000006    DUAD12  004643      F$HARD= 000004      IOKSTP= 000001
BIT0  = 000001 G    C$CVEC= 000036    DUFLG   003112 G    F$HW  = 000013      IPRI    002212 G
BIT00 = 000001 G    C$DCLN= 000044    DUMMY   003062      F$INIT= 000006      ISR   = 000100 G
BIT01 = 000002 G    C$DODU= 000051    EF.CON= 000036 G    F$JMP = 000050      IVEC    002210 G
BIT02 = 000004 G    C$DRPT= 000024    EF.NEW= 000035 G    F$MOD = 000000      IXE   = 004000 G
BIT03 = 000010 G    C$DU  = 000053    EF.PWR= 000034 G    F$MSG = 000011      I$AU  = 000041
BIT04 = 000020 G    C$EDIT= 000003    EF.RES= 000037 G    F$PROT= 000021      I$AUTO= 000041
BIT05 = 000040 G    C$ERDF= 000055    EF.STA= 000040 G    F$PWR = 000017      I$CLN = 000041
BIT06 = 000100 G    C$ERHR= 000056    EMAXDU  016777      F$RPT = 000012      I$DU  = 000041
BIT07 = 000200 G    C$ERRO= 000060    EN    = 000000      F$SEG = 000003      I$HRD = 000041
BIT08 = 000400 G    C$ERSF= 000054    ENAINT  016152      F$SOFT= 000005      I$INIT= 000041
BIT09 = 001000 G    C$ERSO= 000057    ENVIRN  020630      F$SRV = 000010      I$MOD = 000041
BIT1  = 000002 G    C$ESCA= 000010    EPRTSW  002200 G    F$SUB = 000002      I$MSG = 000041
BIT10 = 002000 G    C$ESEG= 000005    EPRT1   006360      F$SW  = 000014      I$PROT= 000040
BIT11 = 004000 G    C$ESUB= 000003    EPRT2   006360      F$TEST= 000001      I$PTAB= 000041
BIT12 = 010000 G    C$ETST= 000001    ERCM    011733      GDDAT   003160 G    I$PWR = 000041
BIT13 = 020000 G    C$EXIT= 000032    ERRHI   002236 G    GERRMA  002174 G    I$RPT = 000041
BIT14 = 040000 G    C$GETB= 000026    ERRK    016756      GETPAT  020174 G    I$SEG = 000041
BIT15 = 100000 G    C$GETW= 000027    ERRLO   002240 G    GETSEL  020256 G    I$SETU= 000041
BIT2  = 000004 G    C$GMAN= 000043    ERRNO = 002261      G$CNTO= 000200      I$SFT = 000041
BIT3  = 000010 G    C$GPHR= 000042    ERRVEC= 000004 G    G$DELM= 000372      I$SRV = 000041
BIT4  = 000020 G    C$GPLO= 000030    ERTABE  003376      G$DISP= 000003      I$SUB = 000041
BIT5  = 000040 G    C$GPRI= 000040    ERTABL  003176      G$EXCP= 000400      I$TST = 000041
BIT6  = 000100 G    C$INIT= 000011    ESUM    016760      G$HILI= 000002      J$JMP = 000167
BIT7  = 000200 G    C$INLP= 000020    EVL   = 000004 G    G$LOLI= 000001      KIPAR0= 172340
BIT8  = 000400 G    C$MANI= 000050    EXBCNT= 000010      G$NO  = 000000      KIPAR1= 172342
BIT9  = 001000 G    C$MEM = 000031    EXFMSG  101217      G$OFFS= 000400      KIPAR2= 172344
BOE   = 000400 G    C$MSG = 000023    EXPBRE  015502 G    G$OFSI= 000376      KIPAR3= 172346
BRINIT  004457      C$OPEN= 000034    EXPD    002232 G    G$PRMA= 000001      KIPAR4= 172350
BSEL0 = 000000      C$PNTB= 000014    EXPGOT  004533      G$PRMD= 000002      KIPAR5= 172352
BSEL1 = 000001      C$PNTF= 000017    EXPGT2  004567      G$PRML= 000000      KIPAR6= 172354
CHKAMB  016044      C$PNTS= 000016    EXPMSG  002322 G    G$RADA= 000140      KIPAR7= 172356
CHKMAN  020500 G    C$PNTX= 000015    EXPREC  015474 G    G$RADB= 000000      KIPDR0= 172300
CHKTSS  016336      C$QIO = 000377    EXTA    005772      G$RADD= 000040      KIPDR1= 172302
CKDROP  017202      C$RDBU= 000007    EXTEND  005770      G$RADL= 000120      KIPDR2= 172304
CKEMAX  017102      C$REFG= 000047    EXTFEA  002226 G    G$RADO= 000020      KIPDR3= 172306
CKMSG   011360 G    C$RESE= 000033    E$END = 002100      G$XFER= 000004      KIPDR4= 172310
CKMSG2  011500 G    C$REVI= 000003    E$LOAD= 000035      G$YES = 000010      KIPDR5= 172312
CKRAM   011114 G    C$RFLA= 000021    FATERR= 000060      HIADDR= 001400      KIPDR6= 172314
CKRAM2  011224 G    C$RPT = 000025    FATFLG  002222 G    HOE   = 100000 G    KIPDR7= 172316
CMDPKT  021260 G    C$SEFG= 000046    FERCM   011722      HPM1    101402      KTENAB  003134 G
CMPMEM  017660      C$SPRI= 000041    FIFEXP  012170 G    HPM2    101436      KTFLG   003132 G
CONFIG  017250      C$SVEC= 000037    FIF1MS  012242      HPM3    101462      KTINIT  021054
COUNT   002310 G    C$TPRI= 000013    FIF2MS  012311      IBE   = 010000 G    KTOFF   017274
CSRADD  002206 G    DATA    002312 G  FILLME  017422      IDU   = 000040 G    KTON    017256
CTAB    003164 G    DATASC  020232    FNOINT  004215      IER   = 020000 G    LERRMA  002172 G
CTABE   003176 G    DEBUGM  011632    FORCER  002176 G    IFAULT  004256      LERRNO= 000000
CTABM   003164 G    DEVCNT  002220 G  FREE    003124 G    INCERK  017044      LISTAL= 000001
```

TSV6 - PARAMETER CODING MACRO M1113 06-FEB-84 17:14 SEQ 246
SYMBOL TABLE

```
LOE    = 040000 G      L$UNIT  002012 G      L10071  056530         OFL    = 000100        PRMNO   002320 G
LOOPCN  002216 G       L10000  002164         L10072  057774         ONEFIL= 000000         PRMSGE  014552 G
LOOPCO  013126         L10001  002176         L10073  066664         O$APTS= 000000         PRMSGO  014732
LOOPFL  003162 G       L10002  005766         L10074  065024         O$AU   = 000001         PRMSG1  014777
LOT    = 000010 G      L10003  012044         L10075  074526         O$BGNR= 000001         PRMSG2  015035
L$ACP   002110 G       L10004  012062         L10076  077700         O$BGNS= 000001         PROASC  014420
L$APT   002036 G       L10005  012100         L10077  101356         O$DU   = 000001         PR1ASC  014465
L$AU    022352 G       L10006  012106         L10100  101402         O$ERRT= 000000         PST32W  003152 G
L$AUT   002070 G       L10007  012124         L10101  101522         O$GNSW= 000001         PUNIT   022304
L$AUTO  022556 G       L10010  012142         MEMADD  013754 G       O$POIN= 000001         PW.D11= 000021
L$CCP   002106 G       L10011  012166         MEMCK   021276 G       O$SETU= 000000         PW.D13= 000022
L$CLEA  022636 G       L10012  012240         MENASC  020447         PASRPT  022054         PW.D22= 000020
L$CO    002032 G       L10013  012410         MENERR  020374         PATCH   101662 G       PW.NOP= 000000
L$DEPO  002011 G       L10014  013124         MENRES  020476         PATDAT  020230         PW.NO1= 000023
L$DESC  003410 G       L10015  013752         MIMENU  073412         PC.ERA= 002400         PW.RDE= 000024
L$DESP  002076 G       L10016  013774         MMVEC  = 000250         PC.IER= 002000         PW.RDR= 000001
L$DEVP  002060 G       L10017  015500         MSA.FR= 000006         PC.NOO= 001000         PW.RDS= 000005
L$DISP  002124 G       L10020  015506         MSA.NO= 000000         PC.REL= 000000         PW.RFI= 000003
L$DLY   002116 G       L10021  015514         MSA.NR= 000004         PC.REW= 000400         PW.WCT= 000006
L$DTP   002040 G       L10022  015526         MSA.VO= 000002         PKBCNT= 000006         PW.WFI= 000004
L$DTYP  002034 G       L10023  015550         MSGEXP  012144 G       PKHI   = 000004         PW.WFM= 000007
L$DU    022450 G       L10024  015576         MSGLOO  013064 G       PKLOW  = 000002         PW.WMI= 000010
L$DUT   002072 G       L10025  015736         MSGSTA  012350 G       PKTADD  007554         PW.WNP= 000011
L$DVTY  003402 G       L10026  016246         MSGSUB  013742 G       PKTFRM  007516         PW.WTR= 000002
L$EF    002052 G       L10030  022302         MS.ATT= 000006         PKTGET  012064 G       P.ACK  = 100000
L$ENVI  002044 G       L10031  022446         MS.EXT= 000200         PKTMES  012110 G       P.CMD  = 000037
L$ETP   002102 G       L10032  022554         MS.RSD= 000001         PKTRAM  004745 G       P.CONT= 000012
L$EXP1  002046 G       L10033  022634         MS.RSF= 000020         PKTSSR  012046 G       P.CVC  = 040000
L$EXP4  002064 G       L10034  022662         MS.RST= 000010         PNT    = 001000 G       P.FMT  = 000140
L$EXP5  002066 G       L10035  023124         M8186   005554         PRAMPK  013776         P.FORM= 000011
L$HARD  101362 G       L10036  024424         M8189   005645         PRASC   014523         P.GETS= 000017
L$HIME  002120 G       L10037  026416         NBA    = 002000         PRBEXP  015470         P.IE   = 000200
L$HPCP  002016 G       L10040  024700         NEWPAS  022010         PRBMSG  015336         P.INIT= 000013
L$HPTP  002022 G       L10041  025144         NODEV   003114 G       PRBREC  015472         P.MODE= 007400
L$HW    002156 G       L10042  032012         NOEXTF  030206         PRBTOT  015423         P.OPP  = 020000
L$ICP   002104 G       L10043  026772         NOINIT  004335         PRBYTE  015122 G       P.POSI= 000010
L$INIT  021556 G       L10044  027262         NOINTR  004221         PRI    = 002000 G       P.READ= 000001
L$LADP  002026 G       L10045  027560         NOITS   002170 G       PRIADD  010160         P.SWB  = 010000
L$LAST  102004 G       L10046  030212         NOMAN   020534         PRIAO   010230         P.WRIT= 000005
L$LOAD  002100 G       L10047  034602         NOMEM   005460         PRIBXO  007612 G       P.WRTC= 000004
L$LUN   002074 G       L10050  032346         NP.IR  = 000200         PRIEQU  010060         P.WRTS= 000006
L$MREV  002050 G       L10051  032740         NP.LOO= 000040         PRIPKT  007370 G       QVP     002204 G
L$NAME  002000 G       L10052  033346         NP.OUT= 000100         PRIRAM  010066         RAMASC  014156
L$PRIO  002042 G       L10053  040374         NP.WRP= 000020         PRITAD  010274         RAMDAT  002242 G
L$PROT  021546 G       L10054  035666         NSI     004152         PRITSS  006024         RAMERR  015510 G
L$PRT   002112 G       L10055  036620         NSINIT  004407         PRITO   010356         RAMEXP  015530 G
L$REPP  002062 G       L10056  050506         NUL     004527         PRIT1   010421         RAMFOR  010116
L$REV   002010 G       L10057  040700         NULCR   004530         PRIXOR  007742 G       RAMSIZ  002302 G
L$RPT   022664 G       L10060  042110         NXM    = 004000         PRIO0  = 000000 G       RAMTAD  015516 G
L$SOFT  101514 G       L10061  043450         NXMFLG  003136 G       PRIO1  = 000040 G       RCVHIA  002304 G
L$SPC   002056 G       L10062  044026         NXMHI   003142 G       PRIO2  = 000100 G       RCVLOA  002306 G
L$SPCP  002020 G       L10063  045300         NXMLO   003140 G       PRIO3  = 000140 G       RDERR   005206
L$SPTP  002024 G       L10064  046344         NXMTST  021452         PRIO4  = 000200 G       RECMSG  002466 G
L$STA   002030 G       L10065  051766         NXR     003740         PRIO5  = 000240 G       RECV    002234 G
L$SW    002166 G       L10066  062614         NXRERR  005736 G       PRIO6  = 000300 G       REGSAV  020140
L$TEST  002114 G       L10067  053772         NXRX    003777         PRIO7  = 000340 G       RETERR  005372
L$TIML  002014 G       L10070  055260         NXTU    022022         PRMESS  014242         REWIND  011014 G
```

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SYMBOL TABLE

```
RMCHBE= 000167          S1.IID= 004000          TST40I  101342          T10     066666 G        T15BFR  033412
RMCHEN= 000200          S1.I1R= 020000          TSV2    002000 G        T11     074530 G        T15BF2  034100
RMMSGB= 000215          S1.I2R= 040000          TSV3    002176 G        T12     077702 G        T15BS0  034100
RMMSGE= 000234          S1.PAR= 100000          TSV4    021546 G        T12BFR  030302          T15BS1  034101
RMPKTB= 000201          S2.ATI= 000010          TSV5    023446 G        T12BKG  030757          T15DAT  033400
RMPKTE= 000210          S2.BTI= 000004          TSV6    101360 G        T12BLK  030334          T15LOO  032044
RMR   = 010000          S2.DIM= 000200          TTIBFR= 177562 G        T12CHA  031750          T15PAC  033370
RWPACK  011110          S2.ILW= 000100          TTICSR= 177560 G        T12CKR  031530 G        T15PK2  034070
SC    = 100000          S2.INR= 000020          TTION   100426          T12CON  031336          T15RES  034472
SCE   = 020000          S2.OUT= 000040          TTION2  071454          T12DAT  030270          T15RT2  034544
SCHERR  005300          S2.UND= 000003          TTIVEC= 000060 G        T12DPR  031136          T15SSR  034106
SCME    005013          TBLEND= 003062 G        TVECSA  100430          T12GET  030516          T15S2   034102
SCMENU  100434          TCOASC  006476          TVSAV2  071456          T12HIA  030322          T15S3   034104
SDELAY  010660          TCOCOD  006676          T$ARGC= 000001          T12KT   030330          T16BEN  040260
SELASC  020442          TEMP1   003116 G        T$CODE= 001130          T12LOA  030324          T16BFR  040232
SELDAT= 000004          TEMP2   003120 G        T$ERRN= 002261          T12LOO  026446          T16BFS  040252
SEL2  = 000002          TERCLS= 000016          T$EXCP= 000000          T12MSG  030661          T16CLR  040076
SETMAP  017316          TESTNO= 000014          T$FLAG= 000040          T12NIN  031045          T16DAT  040220
SETU    022106          TEXASC  006435          T$GMAN= 000000          T12NXM  031227          T16DT2  040270
SFFMSG  012102 G        TFCASC  006537          T$HILI= 000776          T12PAC  030260          T16D01  036652
SFHERR  003705          TIMEXP  015552 G        T$LAST= 000001          T12PAR  030326          T16D28  036654
SFIERR  003652          TIMSGO  015600          T$LOLI= 000000          T12SET  031706          T16D53  036656
SFIMSG  012034 G        TINERR  012021          T$LSYM= 010000          T12SWR  031640          T16D78  036660
SFPTBL  002166 G        TMPBFR  002632 G        T$LTNO= 000014          T12TBE  030466          T16LEN  037202
SIFLAG  003154 G        TNAM    016704          T$NEST= 177777          T12WRT  030572          T16LOO  034622
SIMSG   011766          TPRISA  100432          T$NS0 = 000000          T121LO  026560          T16PAC  040210
SKIPT   003400          TPSAV2  071460          T$NS1 = 000005          T122LO  027114          T16PK2  040260
SOFINI  015774 G        TRANST  002166 G        T$NS2 = 000002          T123LO  027334          T16REJ  037314
SPACE   010466 G        TSBA  = 000000 G        T$NS3 = 000003          T124LO  027756          T16RES  040030
SPM1    101522          TSBAH = 000001 G        T$PTNU= 000000          T124TS  030332          T16SEX  040170
SPM4    101552          TSDB  = 000000 G        T$SAVL= 177777          T13BFR  024062          T16SRD  040122
SPM6    101602          TSDBH = 000001 G        T$SEGL= 177777          T13DAT  024050          T16SSR  036732
SPM7    101632          TSFCOD  007236          T$SEKO= 010000          T13LOO  023464          T16TSB  037100
SR0   = 177572          TSREJ = 000006          T$SUBN= 000000          T13MEM  024155          T16T01  037431
SR1   = 177574          TSSDEF  006606          T$TAGL= 177777          T13NBA  024214          T16T28  037530
SR2   = 177576          TSSR  = 000002 G        T$TAGN= 010102          T13PAC  024040          T16T53  037630
SR3   = 172516          TSSRBI  003502 G        T$TEMP= 000000          T13RES  024356          T16T78  037730
SSR   = 000200          TSSRFO  006415          T$TEST= 000014          T13SSR  024267          T16WMI  040142
STATCO  012412          TSSRH = 000003 G        T$TSTM= 177777          T14BFR  025176          T162SS  036767
SVCGBL= 000000          TSSX    004020          T$TSTS= 000001          T14BS0  025170          T163SS  037033
SVCINS= 000000          TSTBLK  002752 G        T$$AU = 010031          T14BS1  025171          T17BEN  050362
SVCSUB= 000001          TSTCNT  002214 G        T$$AUT= 010033          T14BS2  025172          T17BFR  050242
SVCTAG= 000000          TSTEND  016720          T$$CLE= 010034          T14DAT  025170          T17BFS  050262
SVCTST= 000001          TSTFLA  002314 G        T$$DU = 010032          T14DTA  025610          T17CLE  050146
S$LSYM= 010000          TSTLOO  016456 G        T$$HAR= 010100          T14LOO  024444          T17CLR  047760
S0.IDB= 000010          TSTPTR  002316 G        T$$HW = 010000          T14NBA  025622          T17DAT  050230
S0.IFB= 000002          TSTSET  016510 G        T$$INI= 010030          T14NIN  026063          T17DT2  050400
S0.IFP= 000001          TST12I  030470          T$$MSG= 010025          T14PAC  025160          T17EXE  046524
S0.ILD= 000020          TST13I  024102          T$$PRO= 010027          T14PK2  025600          T17EXP  046402
S0.ION= 000040          TST14I  026241          T$$RPT= 010035          T14RES  026306          T17EXS  046422
S0.IRD= 000100          TST15I  034453          T$$SEG= 010000          T14RST  026344          T17LOO  040424
S0.IRW= 000004          TST16I  036662          T$$SOF= 010101          T14SSR  025773          T17MSK  046376
S0.ISP= 000200          TST17I  046626          T$$SRV= 010026          T14TSB  026155          T17PAC  050220
S1.ICE= 002000          TST18I  051216          T$$SUB= 010074          T142RE  025676          T17PK2  050370
S1.IEO= 010000          TST19I  060202          T$$SW = 010001          T15AM2  034162          T17RFI  050126
S1.IFM= 001000          TST20I  065202          T$$TES= 010077          T15AM3  034263          T17RSF  050024
S1.IME= 000400          TST39I  077652          T1      023446 G        T15AM4  034365          T17SET  050166
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SYMBOL TABLE

```
T17SNP  050046        T19SSR  060243        T3      026420 G      T39NBA  077225        WF.IED= 000010
T17SRD  050004        T19WCT  062142        T38FLG  003150 G      T39NE   076523        WF.IER= 000004
T17SSR  046645        T19WFI  062106        T3.1    026446        T39NFL  076520        WF.IMI= 000200
T17WFD  046524        T19WFM  062162        T3.2    027006        T39OFF  077515        WF.IRE= 000040
T17WFI  050072        T19WST  061543        T3.3    027276        T39OF2  076764        WF.IWF= 000020
T171CM  047165        T191CM  060700        T3.4    027574        T39ON   077524        WF.IWR= 000100
T172CM  047247        T192CM  060762        T38ASC  074461        T39ON2  077030        WF.I3R= 000002
T172SS  046702        T192SS  060300        T38ASN  074500        T39PAC  075750        WF.I4R= 000001
T173CM  047343        T193CM  061056        T38ASO  074356        T39PK2  076450        WRTCMR  010662 G
T173SS  046746        T193SS  060344        T38AS1  074423        T39PK3  076500        WRTERR  005113
T174CM  047427        T194SS  060411        T38BFR  071506        T39PK4  076510        WRTMSG  005056
T174SS  047013        T195CM  061144        T38BSO  071500        T39RES  077614        WSMBK   021270 G
T175CM  047512        T195SS  060454        T38BS1  071501        T39RL   077610        XFERAS  015740
T175SS  047056        T196CM  061220        T38BS2  071502        T39SBS  077443        XNXM    016376
T176CM  047566        T196SS  060520        T38CNT  074524        T39SFS  077371        XORBFO  007674
T176SS  047122        T197CM  061303        T38DAT  074014        T39SIZ  076516        XORFOR  010012
T177CM  047674        T197SS  060563        T38DLY  071462        T39SSR  077301        XST0  = 000006 G
T18BFR  051722        T198CM  061371        T38DSW  072210        T39TAD  075760        XST1  = 000010 G
T18CMP  051423        T198SS  060632        T38DTA  072200        T39WPN  077146        XST2  = 000012 G
T18DAT  051710        T199CM  061460        T38EAI  072206        T39WR   076512        XST3  = 000014 G
T18DT2  051760        T2      024426 G      T38EB   072162        T39WRT  077073        XST4  = 000016 G
T18EXP  051166        T2.1    024444        T38ID   073365        T4      032014 G      XSOBOT= 000002
T18LOO  050526        T2.2    024714        T38INT  072756        T4.1    032044        XSOEOT= 000001
T18MSK  051162        T20BEN  066542        T38MBP  074054        T4.2    032350        XSOIE = 000040
T18PAC  051700        T20BFR  066422        T38MSG  073325        T4.3    032742        XSOILA= 000400
T18PK2  051750        T20BFS  066442        T38MS1  073166        T40NE   101275        XSOILC= 001000
T18SET  051570        T20CLE  066334        T38MS2  073261        T5      034604 G      XSOLET= 020000
T18SMI  051546        T20CLR  066122        T38MS3  072325        T5.1    034622        XSOMOT= 000200
T18SRD  051526        T20CWP  066027        T38NBA  072612        T5.2    035702        XSONEF= 002000
T18SSR  051255        T20DAT  066410        T38NE   072250        T6      040376 G      XSOONL= 000100
T18XS   051212        T20DT2  066560        T38OFL  073042        T6.1    040424        XSOPED= 000010
T182SS  051312        T20EXE  065202        T38ONL  073006        T6.2    040714        XSORLL= 010000
T183SS  051356        T20EXP  065062        T38PAC  071470        T6.3    042124        XSORLS= 040000
T19BEN  062472        T20EXS  065102        T38PK2  072170        T6.4    043464        XSOTMK= 100000
T19BFC  060016        T20LOO  062634        T38PK3  072220        T6.5    044042        XSOVCK= 000020
T19BFR  062352        T20MSK  065056        T38PK4  072240        T6.6    045314        XSOWLE= 004000
T19BFS  062372        T20PAC  066400        T38RES  074016        T7      050510 G      XSOWLK= 000004
T19CLE  062220        T20PK2  066550        T38SIZ  072246        T8      051770 G      XXCOMM  003122 G
T19CLR  061754        T20RFI  066206        T38SSR  072666        T8.1    052006        X$ALWA= 000000
T19CNV  062264        T20RSF  065726        T38SST  073076        T8.2    054006        X$FALS= 000040
T19DAT  062340        T20SET  066354        T38TAD  071500        T8.3    055274        X$OFFS= 000400
T19DT2  062510        T20SEX  066316        T38WLE  072545        T8.4    056544        X$TRUE= 000020
T19EXE  060202        T20SRD  066146        T38WR   072242        T9      062616 G      X1.COR= 020000
T19EXP  060062        T20SSR  065231        T38WRL  072504        T9.1    062634        X1.DLT= 100000
T19EXS  060102        T20SWP  065617        T38WRT  072420        UAM   = 000200 G      X1.MBZ= 017375
T19LOO  052006        T20WFI  066226        T39BFR  075766        UNITN   002202 G      X1.RBP= 000400
T19MSK  060056        T20WFM  066262        T39BSO  075760        UNREC = 000006        X1.SPA= 040000
T19PAC  062330        T20WMI  066302        T39BS1  075761        USI     004123        X1.UNC= 000002
T19PK2  062500        T20WNP  066166        T39BS2  075762        WAITF   016250 G      X2.BUF= 000100
T19PRE  060014        T202SS  065266        T39DAT  077612        WC.IFA= 000200        X2.EXT= 000200
T19RFI  062066        T203SS  065332        T39DLY  075744        WC.IFE= 000002        X2.OPM= 100000
T19RSF  062020        T204SS  065377        T39DSW  076470        WC.IGO= 000001        X2.RCE= 040000
T19RST  061650        T205SS  065442        T39DTA  076460        WC.IRE= 000010        X2.REV= 000077
T19SET  062240        T206SS  065506        T39EAI  076466        WC.IRW= 000004        X2.SPA= 035400
T19SEX  062202        T208SS  065551        T39ETN  076671        WC.IOT= 000100        X2.UNI= 000007
T19SNP  062042        T23A    003144 G      T39ETS  076602        WC.I1T= 000040        X2.WCF= 002000
T19SRD  062000        T23B    003146 G      T39MCL  077533        WC.I5R= 000020        X3.DCK= 000010
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SYMBOL TABLE

X3.MBZ= 000006          X3.REV= 000040          X3.TRF= 000020          X4.MBZ= 017400          X4.TSM= 020000
X3.MDE= 177400          X3.RIB= 000001          X4.HSP= 100000          X4.RCE= 040000          X4.WRC= 000377
X3.OPI= 000100          X3.SPA= 000200

. ABS.   102004     000
         000000     001
ERRORS DETECTED:  0

VIRTUAL MEMORY USED:  31032 WORDS  ( 122 PAGES)
DYNAMIC MEMORY:  20614 WORDS  ( 79 PAGES)
ELAPSED TIME:  00:49:10
CVTSBBO,CVTSBBO.SEQ/-SP=SVC/ML,TSV1B,TSV22B,TSV3B,TSV4,TSV55B,TSV6
.
```