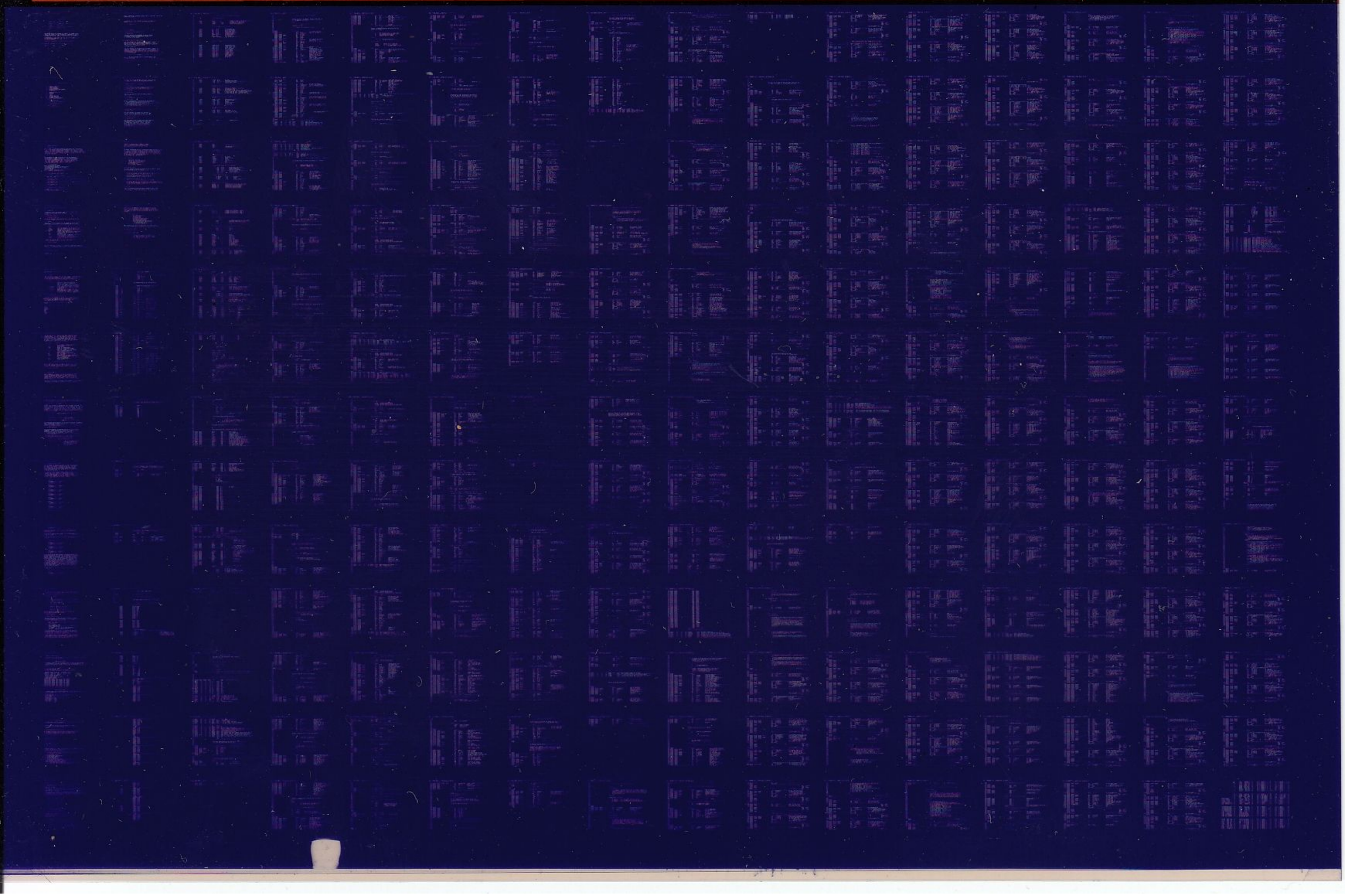
TSV05 TSV05 CTRL LTZ
CVTSBB0

AH-T096B-MC
FICHE 01 OF 02

JUL 1984
digital
Made In USA



TSV05 TSV05 CTRL LTZ
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.REM

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

TABLE OF CONTENTS

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 (O) ?  160000<CR>
        SUB DEVICE # (O) ?  0,1<CR>
        Q FACTOR (O) 0 ?  1,0<CR>

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

        UNIT 7
        CSR ADDRESS (O) ?  160000<CR>
        SUB DEVICE # (O) ?  6,7<CR>
        Q-FACTOR (O) 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 (O) ?  160000<CR>
        SUB DEVICE # (O) ?  0 7<CR>
        Q FACTOR (O) 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>  IHER  <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	14
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 ISSR 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.
                        ;-

                        POINTER BGNSW,BGNSFT,BGNAU,BGNDU,BGNRPT
002000                  HEADER  CVTSB,8.,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.
                ;
                        BGN     DFPTBL          ;DEFAULT HARD P TABLE
002154  000003          .WORD   L10000-L$HW/2
002156                  L$HW::
002156                  DFPTBL::

                        .WORD   172520          ; 1ST (OF 2) REGISTERS.
002156  172520          .WORD   224             ; INTERRUPT VECTOR
002160  000224          .WORD   PRI04           ; INTERRUPT PRIORITY.
002162  000200          ENDHW
002164                  L10000:
002164
```

```
                                .SBTTL  SOFTWARE P TABLE

                        ;++
                        ; THE SOFTWARE P TABLE CONTAINS THE VALUES OF THE PROGRAM
                        ; PARAMETERS THAT CAN BE CHANGED BY THE OPERATOR.
                        ; -
                                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
```

```
                        ;
                        PRIO7== 340
                        PRIO6== 300
                        PRIO5== 240
                        PRIO4== 200
                        PRIO3== 140
                        PRIO2== 100
                        PRIO1== 40
                        PRIO0== 0
                        ;
                        ;OPERATOR FLAG BITS
                        ;
                        EVL==        4
                        LOT==       10
                        ADR==       20
                        IDU==       40
                        ISR==      100
                        UAM==      200
                        BOE==      400
                        PNT==     1000
                        PRI==     2000
                        IXE==     4000
                        IBE==    10000
                        IER==    20000
                        LOE==    40000
                        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
```

```
                        ;*
                        ;BIT DEFINITIONS FOR EXTENDED STATUS REGISTER 2
                        ;(XST2)
                        ;-
100000                  X2.OPM  = BIT15         ;OPERATION IN PROGRESS (TAPE MOVING)
040000                  X2.RCE  = BIT14         ;RAM CHECKSUM ERROR
035400                  X2.SPARE= BIT13+BIT12+BIT11+BIT9+BIT8   ;NOT USED BY TSV05 (ALWAYS=0)
002000                  X2.WCF  = BIT10         ;WRITE CLOCK FAILURE (FIFO NOT EMPTIED BY TRANSPORT)
000200                  X2.EXTF = BIT7          ;IF WRITE CHAR CMD THEN = EXTENDED FEATURES ENABLED
000100                  X2.BUFE = BIT6          ;IF WRITE CHAR CMD THEN = BUFFERING ENABLED
000077                  X2.REV  = 000077        ;IF WRITE CHAR CMD THEN = MICRO-CODE REVISION LEVEL
000007                  X2.UNIT = BIT2+BIT1+BIT0 ;IF GET STATUS THEN = CURRENTLY SELECTED UNIT NO.

                        ;*
                        ;BIT DEFINITIONS FOR EXTENDED STATUS REGISTER 3
                        ;(XST3)
                        ;-
177400                  X3.MDE  = 177400        ;MICRO-DIAGNOSTIC ERROR CODE
000200                  X3.SPARE= BIT7          ;NOT USED BY TSV05
000100                  X3.OPI  = BIT6          ;OPERATION INCOMPLETE
000040                  X3.REV  = BIT5          ;REVERSE
000020                  X3.TRF  = BIT4          ;TRANSPORT RESPONSE FAILURE
000010                  X3.DCK  = BIT3          ;DENSITY CHECK
000006                  X3.MBZ  =BIT2+BIT1      ;NOT USED ALWAYS 0
000001                  X3.RIB  = BIT0          ;REVERSE INTO BOT

                        ;*
                        ;BIT DEFINITIONS FOR EXTENDED STATUS REGISTER 4
                        ;(XST4)
                        ;
100000                  X4.HSP  = BIT15         ;HIGH SPEED
040000                  X4.RCE  = BIT14         ;RETRY COUNT EXCEEDED
020000                  X4.TSM  = BIT13         ;TRANSPORT SPECIAL MODE
017400                  X4.MBZ  = BIT12+BIT11+BIT10+BIT9+BIT8   ;NOT USED ALWAYS 0
000377                  X4.WRC  = 000377        ;WRITE RETRY COUNT FIELD

                        ;*
                        ;
                        ;TSSR TERMINATION CODES (BIT 0 2)
                        ;
                        ;

000006                          TSREJ=  3=2             ;COMMAND REJECTED
000006                          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

                                ;+
                                ;BSEL0 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.ND1311       = 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.IHISP        = BIT7          ;IHISP  - 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
                        ;
                        ;-

                        TSTBLK::
                                .WORD   0               ;ALL ZEROS
                                .WORD   177777          ;ALL ONES
                                .WORD   BIT0            ;DATA FOR WALKING ONES
                                .WORD   BIT1
                                .WORD   BIT2
                                .WORD   BIT3
                                .WORD   BIT4
                                .WORD   BIT5
                                .WORD   BIT6
                                .WORD   BIT7
                                .WORD   BIT8
                                .WORD   BIT9
                                .WORD   BIT10
                                .WORD   BIT11
                                .WORD   BIT12
                                .WORD   BIT13
                                .WORD   BIT14
                                .WORD   BIT15
                                .WORD   ^CBIT0          ;DATA FOR WALKING ZEROS
                                .WORD   ^CBIT1
                                .WORD   ^CBIT2
                                .WORD   ^CBIT3
                                .WORD   ^CBIT4
                                .WORD   ^CBIT5
                                .WORD   ^CBIT6
                                .WORD   ^CBIT7
                                .WORD   ^CBIT8
                                .WORD   ^CBIT9
                                .WORD   ^CBIT10
                                .WORD   ^CBIT11
```

```
                                        .WORD   ↑CBIT12
                                        .WORD   ↑CBIT13
                                        .WORD   ↑CBIT14
                                        .WORD   ↑CBIT15
                                        .WORD   125252          ;ALTERNATING ONES, ZEROS
                                        .WORD   052525          ;ALTERNATING ONES, ZERO OPPOSITE FROM ABOVE
                                TBLEND==.
                                        .SBTTL  CLOBAL 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          T38FLG::        .WORD   0               ;TEST 38 FLAG ↑0
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.
```

```
TSV3   GLOBAL AREAS      MACRO M1113  06-FEB 84 17:14                    SEQ 036
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/
```

```
    627 004215      045     116     045  FNOINT?:        .ASCII  /%N%A/
    628 004221      040     040     116  NOINT?: .ASCIZ  /  NO INTERRUPT WAS GENERATED/
    629 004256      040     040     111  IFAULT:  ASCIZ  /  INTERRUPT FAULT/
    630 004300      045     101     040  INTX:   .ASCIZ  /%A  CPU PC: %O6%A  TSBA: %O6/
    631 004335      040     040     042  NOINIT: .ASCIZ  /  "BUS-INIT" DIDN'T INITIALIZE CONTROLLER/
    632 004407      040     040     042  NSINIT: .ASCIZ  /  "SOFT-INIT" DIDN'T INITIALIZE THE DPU/
    633 004457      040     040     042  BRINIT: .ASCIZ  /  "BUS-RESET" DIDN'T INITIALIZE THE DPU/
    634
    635 004527      000             000  NUL:    .ASCIZ  //
    636 004530      045     116     000  NULCR:  .ASCIZ  /%N/
    637 004533      045     101     040  EXPGOT: .ASCIZ  /%A EXP'D: %O6%A, REC'D: %O6/
    638 004567      045     116     045  EXPGT2: .ASCIZ  /%N%A EXP'D: %O6%A, %O6%N%A REC'D: %O6%A, %O6/
    639 004643      045     101     040  DUAD12: .ASCIZ  /%A REG(W) WRITTEN TO: %O6%A REG(R) READ; EXP'D: %O6%A, REC'D: %O6/
    640 004745      122     101     115  PKTRAM::        .ASCIZ  'RAM Contents Do Not Match Packet Serr'
    641 005013      040     040     103  SCME:   .ASCIZ  /  CONFIG DOESN'T MATCH MFG. MASTER/
    642 005056      127     122     111  WRTMSG: .ASCIZ  'WRITE CHARACTERISTICS Failed'
    643 005113      124     123     123  WRTERR: .ASCIZ  'TSSR Incorrect After WRITE Command, More Bits Set Than SSR'
    644 005206      124     123     123  RDERR:  .ASCIZ  'TSSR Incorrect After READ Command, More Bits Set Than SSR'
    645 005300      106     101     124  SCHERR: .ASCIZ  'FATAL ERROR IN SUBTEST - CHECK TAPE,CABLES,TRANSPORT etc.'
    646 005372      105     122     122  RETERR: .ASCIZ  'ERROR IN SUBTEST - WRITE DATA RETRY FIVE TIMES FAILED'
    647 005460      045     116     045  NOMEM:  .ASCIZ  '%N%A ***** NO NXM ADDRESS--CANNOT TEST NXM TIMEOUT. *****%N'
    648 005554      045     116     045  M8186:  .ASCIZ  '%N%A ****************** 11/23A SYSTEM ******************%N'
    649 005645      045     116     045  M8189:  .ASCIZ  '%N%A ****************** 11/23B SYSTEM ******************%N'
    650                                  .EVEN
    651                                  .SBTTL  GLOBAL ERROR REPORT SECTION
    652
    653                              ;++
    654                              ; THE GLOBAL ERROR REPORT SECTION CONTAINS THE PRINTB AND PRINTX
    655                              ; CALLS THAT ARE USED IN MORE THAN ONE TEST.
    656                              ; ASCII TEXT STRINGS ARE FOUND IN THE GLOBAL TEXT SECTION.
    657                              ;--
    658
    659 005736                       NXRERR: BGNMSG  NXRERR          ;NON EXISTANT DEVICE REGISTER.
        005736                       NXRERR::
    660 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$PNTX
        005756  062706  000006               ADD     #6,SP
    661 005762  004737  005770               JSR     PC,EXTEND       ; PRINT EXTENSION IF REQUIRED.
    662 005766                               ENDMSG
        005766                       L10002:
        005766  104423                       TRAP    C$MSG
    663
    664                              ;
    665                              ; THIS ROUTINE APPENDS A UNIQUE EXTENSION (IF REQUIRED)
    666                              ; TO ANY OF THE ABOVE ERROR SIGNATURES.
    667                              ;
    668 005770  005727               EXTEND: TST     (PC)+
    669 005772  000000               EXTA:   0                       ; 0 = NO EXTENSION.
    670 005774  001402                       BEQ     1$
    671 005776  004777  177770               JSR     PC,@EXTA        ; APPEND EXTENSION TEXT.
    672 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
                ;
                ;-

                PRITSSR:
006024                  SAVREG                          ;SAVE GENERAL REGISTERS
006024 010104           MOV     R1,R4                   ;SAVE THE TSSR CONTENTS
006030                  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     #MIADDR!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   '%NMA *****REPLACE M7196*****'
    746
    756         006415      045     116     045 TSSRFOR:        .ASCIZ   '%NMA TSSR = %06'
    757         006435      045     116     045 TEXASC:         .ASCIZ   '%NMA Extended Address Bits = %06
    758         006476      045     116     045 TCOASC:         .ASCIZ   '%NMA Termination Class Code = %T
    759         006537      045     116     045 TFCASC:         .ASCIZ   '%NMA Fatal Termination Class Code = %T
    760         006606      045     116     045 TSSDEF:         .ASCIZ   '%NMA TSSR Bits Set: %T'
    761         006635      045     116     045 AMBTSSR:        .ASCIZ   '%NMA TSSR Contents Are Ambiguous
    762                                             .EVEN
```

```
763 006676  006716  006741  006767  TCOCOD: .WORD   1$,2$,3$,4$,5$,6$,7$,8$
764 006716     116     157     162  1$:     .ASCIZ  'Normal Termination'
765 006741     124     145     162  2$:     .ASCIZ  'Termination Condition'
766 006767     124     141     160  3$:     .ASCIZ  'Tape Status Alert'
767 007011     106     165     156  4$:     .ASCIZ  'Function Reject'
768 007031     122     145     143  5$:     .ASCIZ  'Recoverable Error - Tape Position One Record Down'
769 007113     122     145     143  6$:     .ASCIZ  'Recoverable Error - Tape Was Not Moved'
770 007162     125     156     162  7$:     .ASCIZ  'Unrecoverable Error'
771 007206     106     141     164  8$:     .ASCIZ  'Fatal Controller Error'
772                                         .EVEN
773
774 007236  007246  007302  007313  TSFCOD: .WORD   1$,2$,3$,4$
775 007246     111     156     164  1$:     .ASCIZ  'Internal Diagnostic Failure'
776 007302     122     145     163  2$:     .ASCIZ  'Reserved'
777 007313     102     165     163  3$:     .ASCIZ  'Bus Interface or Sanity Check Error'
778 007357     122     145     163  4$:     .ASCIZ  'Reserved
779                                         .EVEN
780                                         .SBTTL  PRIPKT  - PRINT THE ADDRESS/CONTENTS OF COMMAND PACKET
781
782                                 ;+
783                                 ;THIS ROUTINE PRINTS THE ADDRESS AND CONTENTS OF A COMMAND PACKET.
784                                 ;THIS ROUTINE IS NORMALLY ONLY CALLED FROM A PRINT ROUTINE.
785                                 ;
786                                 ;INPUT:
787                                 ;
788                                 ;       R0      NUMBER OF WORDS IN PACKET
789                                 ;       R3      HIGH ORDER COMMAND PACKET ADDRESS
790                                 ;       R4      ADDRESS OF COMMAND PACKET
791                                 ;
792                                 ;       NOTE:   R3 IS IGNORED IF THE KTENABLE FLAG IS CLEAR.
793                                 ;-
794
795 007370                          PRIPKT::
796 007370                                  SAVREG                  ;SAVE THE REGISTERS
797 007374  010005                          MOV     R0,R5           ;SAVE NO. OF WORDS IN PACKET
798 007376  005737  003134                  TST     KTENABLE        ;ABOVE 28K UNDER TEST?
799 007402  001001                          BNE     10$             ;BR IF YES
800 007404  005003                          CLR     R3              ;SET HIGH ORDER ADDRESS TO 0
801 007406  010301                  10$:    MOV     R3,R1           ;COPY HIGH ORDER ADDRESS
802 007410  010400                          MOV     R4,R0           ;GET LOWER ADDRESS
803 007412  006100                          ROL     R0              ;SHIFT BIT 15 INTO C BIT
804 007414  006101                          ROL     R1              ;AND INTO HIGH ORDER.
805 007416                                  PRINTB  #PKTADD,R1,R4    ;PRINT PACKET ADDRESS
    007416  010446                          MOV     R4, (SP)
    007420  010146                          MOV     R1, -(SP)
    007422  012746  007554                  MOV     #PKTADD, -(SP)
    007426  012746  000003                  MOV     #3, -(SP)
    007432  010600                          MOV     SP,R0
    007434  104414                          TRAP    C$PNTB
    007436  062706  000010                  ADD     #10,SP
806 007442  010300                  15$:    MOV     R3,R0           ;GET HIGH ORDER ADDRESS
807 007444  001404                          BEQ     20$             ;BR IF NOT ABOVE 28K.
808 007446  010401                          MOV     R4,R1           ;GET LOW ORDER ADDRESS
809 007450  004737  017316                  JSR     PC,SETMAP       ;SETUP PAR6 MAPPING FOR 18 BIT ADDRESS
810 007454  010004                          MOV     R0,R4           ;GET RETURNED PAR6 ADDRESS BIAS
811 007456  005001                  20$:    CLR     R1              ;SAVE WORD NUMBER
812 007460  012402                  25$:    MOV     (R4)+,R2        ;GET PACKET CONTENTS
```

```
TSV3   GLOBAL AREAS     MACRO M1113  06 FEB 84 17:14                                SEQ 043
PRIPKT    PRINT THE ADDRESS/CONTENTS OF COMMAND PACKET

     813 007462                                        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$PNTB
         007502  062706  000010                       ADD     #10,SP
     814 007506  005201                               INC     R1              ;NEXT WORD NUMBER
     815 007510  020105                               CMP     R1,R5           ;DONE ALL PACKET WORDS?
     816 007512  002762                               BLT     25$             ;LOOP TILL ALL DONE
     817 007514  000207                               RTS     PC              ;RETURN
     818
     819 007516      045     116     045  PKTFRM: .ASCIZ  '<N><A Packet Word #<D1><A - <C6>'
     820 007554      045     116     045  PKTADD: .ASCIZ  '<N><A Packet Address - <01><05>'
     821                                               .EVEN
     822                                               .SBTTL  PRIBXOR - PRINT EXPD, RECV AND XOR BYTE
     823
     824                                    ;+
     825                                    ;
     826                                    ;PRINT EXPECTED DATA, RECEIVED DATA, AND XOR OF THE DATA BYTE
     827                                    ;THIS ROUTINE IS NORMALLY CALLED ONLY FOR PRINT ROUTINES.
     828                                    ;
     829                                    ;INPUTS:
     830                                    ;
     831                                    ;       R1      RECEIVED DATA
     832                                    ;       R2      EXPECTED DATA
     833                                    ;
     834                                    ;OUTPUT:
     835                                    ;
     836                                    ;       R0      XOR OF EXPECTED/RECEIVED DATA
     837                                    ;
     838                                    ;-
     839
     840 007612                             PRIBXOR::
     841 007612                                       SAVREG                  ;SAVE THE REGISTERS
     842 007616  010203                               MOV     R2,R3           ;EXPECTED DATA
     843 007620                                       XOR     R1,R3           ;FORM THE EXCLUSIVE OR
     844 007630  012700  177400                       MOV     #^C<377>,R0     ;BYTE MASK
     845 007634  040001                               BIC     R0,R1           ;SAVE LOW BYTE RECV
     846 007636  040002                               BIC     R0,R2           ;SAVE LOW BYTE EXPD
     847 007640  040003                               BIC     R0,R3           ;SAVE LOW BYTE XOR
     848 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
     849 007670  010300                               MOV     R3,R0           ;R0 HAS XOR ON RETURN
     850 007672  000207                               RTS     PC              ;RETURN TO CALLER
     851
     852 007674      045     116     045  XORBFOR:        .ASCIZ  <N><A EXPD: <03><A RECV: <03><A XOR: <03
     853                                               .EVEN
     854                                               .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: %O6%A RECV: %O6%A XOR: %O6'
                                .EVEN
                                .SBTTL  PRIEQU    PRINT BIT NUMBEPS 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
                                ;*
                                ;
                                ;PRIN' 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 = %01%05'
                                        .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:
                                                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
                                ;
                                ;
```

```
                                        ;       R0      THE CONTENTS OF R4 IS MOVED TO R0
                                        ;
                                        ;IMPLICIT OUTPUT:
                                        ;
                                        ;       TAPE HAS BEEN MOVED
                                        ;
                                        ;SIDE EFFECTS:
                                        ;
                                        ;
010466                                  SPACE::
010466                                          SAVREG                          ;SAVE THE GENERAL REGISTERS
010472  012737  000764  010660                  MOV     #500.,SDELAY            ;SET UP DELAY
010500  012737  140010  010650                  MOV     #140010,80$             ;SET UP COMMAND, SPACE FORWARD
010506  005703                                  TST     R3                      ;CHECK FOR DIRECTION
010510  100403                                  BMI     5$                      ;BR, IF REVERSE INDICATED
010512  010337  010652                          MOV     R3,90$                  ;LOAD UP NUMBER OF RECORDS TO SPACE
010516  000407                                  BR      10$                     ;GO DO COMMAND
010520  042703  100000          5$:             BIC     #BIT15,R3               ;CLEAR DIRECTION BIT
010524  010337  010652                          MOV     R3,90$                  ;LOAD UP NUMBER OF RECORDS TO SPACE
010530  052737  000400  010650                  BIS     #BIT8,80$               ;SET REVERSE BIT IN COMMAND PACKET
010536  012704  010650          10$:            MOV     #80$,R4                 ;SET UP R4 WITH PACKET ADDRESS
010542  010465  000000                          MOV     R4,TSDB(R5)             ;SEND OUT COMMAND
010546  004737  016250          15$:            JSR     PC,WAITF                ;WAIT FOR SSR
010552  103420                                  BCS     20$                     ;BR, IF SSR IS SET AND OK
010554                                          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
```

```
TSV3   GLOBAL AREAS     MACRO M1113  06 FEB 84 17:14                                  SEQ 048
SPACE      SPACE RECORDS (FORWARD AND REVERSE) COMMAND

                                        ;
                                        ;
                                        ;
                                        ;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                          SDFLAY: .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:
                                        ;
                                        ;
                                        ;-

010662                                  WRTCHR::
010662                                          SAVREG                          ;SAVE THE GENERAL REGISTERS
010666  005037  002230                          CLR     BENBSW          ;CLEAR BUFFER ENABLE SWITCH
010672  005037  002226                          CLR     EXTFEA                  ;CLEAR EXTENDED FEATURES SW SWITCH
010676  010465  000000                  10$:    MOV     R4,TSDB(R5)             ;SEND OUT COMMAND
010702  004737  016336                          JSR     PC,CHKTSSR              ;WAIT FOR SSR
010706  103401                                  BCS     20$                     ;BR. IF SSR IS SET AND OK
010710  000435                                  BR      60$                     ;BR IF TROUBLE CARRY = CLEAR
010712  016501  000002                  20$:    MOV     TSSR(R5),R1             ;READ TSSR
010716  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                  ; ET 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
```

REWIND POSITION TAPE (REWIND) COMMAND

```
         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
```

```
TSV3   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 011364  010037  002304                 MOV     R0,RCVHIADD             ;SAVE RECV HIGH ADDRESS
1303 011370  010137  002306                 MOV     R1,RCVLOAD              ;SAVE RECV LOW ADDRESS
1304 011374  005737  003134                 TST     KTENABLE                ;TESTING ABOVE 28K?
1305 011400  001403                         BEQ     10$                     ;BR IF NO
1306 011402  004737  017316                 JSR     PC,SETMAP               ;RETURN ADDRESS BIASED TO PAR6 IN R0
1307 011406  010001                         MOV     R0,R1                   ;GET RETURNED ADDRESS BIASED TO PAR6
1308 011410  005004          10$:    CLR     R4                      ;WORD IN BUFFER
1309 011412  005003                         CLR     R3                      ;CLEAR ERROR SEEN FLAG
1310 011414  010205                         MOV     R2,R5                   ;GET EXPD BUFFER ADDRESS
1311 011416  011264  002322          15$:    MOV     (R2),EXPMSG(R4)         ;SAVE EXPD FOR ERROR REPORT
1312 011422  011164  002466                 MOV     (R1),RECMSG(R4)         ;SAVE RECV FOR ERROR REPORT
1313 011426  022221                         CMP     (R2)+,(R1)+             ;EXPD EQUAL RECV?
1314 011430  001401                         BEQ     25$                     ;BR IF YES
1315 011432  005203                         INC     R3                      ;SET ERROR SEEN FLAG
1316 011434  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: .../
1391                                            .EVEN
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                                    ;PRINT ROUTINE TO PRINT THE CONTENTS OF
1414                                    ;TSSR AND A COMMAND PACKET OTHER THAN GET STATUS COMMAND PACKET.
1415                                    ;
1416                                    ;INPUTS:
1417                                    ;
1418                                    ;       R1      TSSR CONTENTS
1419                                    ;       R4      ADDRESS OF COMMAND PACKET
1420                                    ;
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$MSG
1428
1429                                           ;+
1430                                           ;PRINT ROUTINE TO PRINT THE CONTENTS OF
1431                                           ;TSSR AND A GET STATUS COMMAND PACKET.
1432                                           ;
1433                                           ;INPUTS:
1434                                           ;
1435                                           ;       R1      TSSR CONTENTS
1436                                           ;       R4      ADDRESS OF COMMAND PACKET
1437                                           ;
1438                                           ;-
1439
1440 012064                                     BGNMSG  PKTGETS
     012064                                PKTGETS::
1441 012064  004737  006024                        JSR     PC,PRITSSR      ;PRINT THE CONTENTS OF TSSR REGISTER
1442 012070  012700  000002                        MOV     #2,R0           ;NO. OF WORDS IN GET STATUS PACKET
1443 012074  004737  007370                        JSR     PC,PRIPKT       ;PRINT THE CONTENTS OF COMMAND PACKET
1444 012100                                        ENDMSG
     012100                                L10005:
     012100  104423                                TRAP    C$MSC
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
1473 012110  004737  006024                PKTMES::
                                                   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                                               BGNMSG  MSGEXP
1508 012144                                MSGEXP::
     012144                                            MOV     #7,R0           ;ASSUME NO EXT FEATURES
1509 012144  012700  000007                        TST     EXTFEA              ;EXT FEATURES SET?
1510 012150  005737  002226                        BEQ     5$                  ;BR IF NO
1511 012154  001402                                MOV     #8.,R0              ;EXT FEATURE BUFFER IS 8 WORDS
1512 012156  012700  000010                5$:     JSR     PC,PRMSGEXP         ;PRINT EXPD/RECV MESSAGE BUFFERS
1513 012162  004737  014552                        ENDMSG
1514 012166                                L10011:
     012166                                        TRAP    C$MSG
     012166  104423                                .SBTTL  FIFEXP  - PRINT FIFO EXP/RECV DATA
1515                                       ;*
1516                                       ;
1517                                       ;PRINT ROUTINE TO PRINT FIFO EXP/RECV DATA
1518
```

```
                        ;
                        ;       R1      BYTE COUNT
                        ;
                        ;IMPLICIT INPUTS:
                        ;
                        ;       EXPMSG  - EXPECTED MESSAGE BUFFER (CONTAINS FIFO DATA ONLY
                        ;       RECMSG  - RECEIVED MESSAGE BUFFER (CONTAINS FIFO DATA ONLY)
                        ;-
                                BGNMSG  FIFEXP
012170                  FIFEXP::
                                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$PNTX
012206  062706  000006         ADD     #6,SP
012212                          PRINTX  #FIF2MSG        ;PRINT HEADER MSG
012212  012746  012311         MOV     #F1.2MSG,-(SP)
012216  012746  000001         MOV     #1,-(SP)
012222  010600                 MOV     SP,R0
012224  104415                 TRAP    C$PNTX
012226  062706  000004         ADD     #4,SP
012232  010100                 MOV     R1,R0           ;GET BYTE COUNT
012234  004737  015122         JSR     PC,PRBYTEXP     ;PRINT FIFO BYTES IN ERROR
012240                          ENDMSG
012240                  L10012:
012240  104423                 TRAP    C$MSG
012242     045     116     045 FIF1MSG:        .ASCIZ  '<NL>A NUMBER OF BYTES TRANSFERRED = <D2>'
012311     045     116     045 FIF2MSG:        .ASCIZ  '<NL>A FIFO DATA BYTES IN ERROR:'
                                .EVEN
                                .SBTTL  MSGSTAT - PRINT STATUS HEADER AND MESSAGE BUFFERS
                        ;*
                        ;
                        ;PRINT ROUTINE TO PRINT MESSAGE BUFFER EXPD/RECV
                        ;
                        ;
                        ;IMPLICIT INPUTS:
                        ;
                        ;       EXPMSG  - EXPECTED MESSAGE BUFFER
                        ;       RECMSG  - RECEIVED MESSAGE BUFFER
                        ;       RCVHIADD  RECEIVED MESSAGE BUFFER HIGH ORDER ADDRESS
                        ;       RCVLOADD- RECEIVED MESSAGE BUFFER LOW ORDER ADDRESS
                        ;
                                BGNMSG  MSGSTAT
012350                  MSGSTAT::
012350  012701  012412         MOV     #STATCOD,R1     ;ASCII ADDRESS TABLE
012354  012100         10$:    MOV     (R1)+,R0        ;DONE ALL MSG LINES?
012356  001410                 BEQ     20$             ;BR IF YES
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$PNTX
012372  062706  000004         ADD     #4,SP
012376  000766                 BR      10$             ;DO ANOTHER MSG LINE
012400  012700  000012 20$:    MOV     #10.,R0         ;NUMBER OF WORDS IN A READ STATUS BUFFER
```

```
TSV3   GLOBAL AREAS     MACRO M1113  06 FEB 84 17:14                                SEQ 058
MSGSTAT   PRINT STATUS HEADER AND MESSAGE BUFFERS

                                                JSR     PC,PRMSGEXP     ;PRINT EXPD/RECV MESSAGE BUFFERS
                                                ENDMSG
                                        L10013:
                                                TRAP    C$MSG

                                        STATCOD:        .WORD   1$,2$,3$,4$,5$,6$,0
                                        1$:.ASCIZ  '<NL>A Tape Bus Signals in Word #8:'
                                        2$:.ASCIZ  '<NL>A       PARERR<15>  IEOT  <12>  IFMK  <9>  IRDY<6>  IRWD<2>'
                                        3$:.ASCIZ  '<NL>A       IRESV2<14>  IIDENT<11>  IHER  <8>  IONL<5>  IFBY<1>'
                                        4$:.ASCIZ  '<NL>A       IRESV1<13>  ICER  <10>  ISPEED<7>  ILDP<4>  IFPT<0>'
                                        5$:.ASCIZ  '<NL>A Tape Bus Signals in Word #9:'
                                        6$:.ASCIZ  '<NL>A       DATMIS<7>  ILW<6>  OUTRDY<5>  INRDY<4>'
                                                .EVEN

                                                .SBTTL  MSGLOOP - PRINT LOOPBACK HEADER AND MESSAGE BUFFERS
                                        ;+
                                        ;
                                        ;PRINT ROUTINE TO PRINT MESSAGE BUFFER EXPD/RECV
                                        ;
                                        ;IMPLICIT INPUTS:
                                        ;
                                        ;       EXPMSG  - EXPECTED MESSAGE BUFFER
                                        ;       RECMSG  - RECEIVED MESSAGE BUFFER
                                        ;       RCVHIADD- RECEIVED MESSAGE BUFFER HIGH ORDER ADDRESS
                                        ;       RCVLOADD- RECEIVED MESSAGE BUFFER LOW ORDER ADDRESS
                                        ;-
                                                BGNMSG  MSGLOOP
                                        MSGLOOP::
                                        10$:    MOV     #LOOPCOD,R1     ;ASCII ADDRESS TABLE
                                                MOV     (R1)+,R0        ;DONE ALL MSG LINES?
                                                BEQ     20$             ;BR IF YES
                                                PRINTX  R0              ;PRINT STATUS BIT NAMES
                                                MOV     R0,-(SP)
                                                MOV     #1,-(SP)
                                                MOV     SP,R0
                                                TRAP    C$PNTX
                                                ADD     #4,SP
                                                BR      10$             ;DO ANOTHER MSG LINE
                                        20$:    MOV     #10.,R0         ;NUMBER OF WORDS IN A READ STATUS BUFFER
                                                JSR     PC,PRMSGEXP     ;PRINT EXPD/RECV MESSAGE BUFFERS
                                                ENDMSG
                                        L10014:
                                                TRAP    C$MSG

                                        LOOPCOD:        .WORD   1$,2$,3$,4$,5$,6$,7$,0
                                        1$:.ASCIZ  '<NL>A Tape Bus Loopback Signals in Word #8:'
                                        2$:.ASCIZ  '<NL>A       PARERR<15>          IRESV2<14>          IRESV1<13>
                                        3$:.ASCIZ  '<NL>A IHISP=>IEOT<12>   IWRT=>IIDENT<11>   IREV  =>ICER  <10>'
                                        4$:.ASCIZ  '<NL>A IWFM =>IFMK<09>   IEDIT=>IHER <08>   IFAD  =>ISPEED<07>'
                                        5$:.ASCIZ  '<NL>A ITAD0=>IRDY<06>   ITAD1=>IONL <05>   IERASE=>ILDP  <04>'
                                        6$:.ASCIZ  '<NL>A IREW =>IDBY<03>   IRWU =>IRWD <02>   IFEN  =>IFBY  <01>'
                                        7$:.ASCIZ  '<NL>A IGO  =>IFPT<00>'
                                                .EVEN
                                                .SBTTL  MSGSUB   PRINT WRITE SUBSYSTEM MESSAGE BUFFER
                                        ;+
                                        ;
                                        ;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                            MSGSUB::BGNMSG  MSGSUB
     013742
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
```

```
1654                                    ;
1655
1656 013776                             PRAMPKT:
1657 013776                                     SAVREG                          ;SAVE R1-R5 UNTIL NEXT RETURN
1658 014002  012701  002242                     MOV     #RAMDATA,R1             ;DATA FROM THE RAM
1659 014006  005002                             CLR     R2                      ;INIT BYTE NUMBER
1660 014010  122124                     5$:     CMPB    (R1)+,(R4)+             ;COMPARE EXPECTED, RECEIVED
1661 014012  001005                             BNE     7$                      ;BR IF NO MATCH
1662 014014                                     FORCERROR       7$,NOTSSR
1663 014024  000436                             BR      10$                     ;@@D
1664 014026  116105  177777               7$:     MOVB     1(R1),R5               ;GET RECV RAM DATA
1665 014032  116403  177777                     MOVB     1(R4),R3               ;GET EXPD PACKET DATA
1666 014036                                     XOR     R5,R3                   ;XOR EXPD/RECV
1667 014046  042703  177400                     BIC     #177400,R3              ;LOW BYTE ONLY
1668 014052  116137  177777  002234             MOVB    -1(R1),RECV             ;GET RECEIVED RAM DATA
1669 014060  116437  177777  002232             MOVB    -1(R4),EXPD             ;GET EXPECTED RAM DATA
1670 014066                                     PRINTB  #RAMASC,R2,RECV,EXPD,R3
     014066  010346                             MOV     R3,-(SP)
     014070  013746  002232                     MOV     EXPD,-(SP)
     014074  013746  002234                     MOV     RECV,-(SP)
     014100  010246                             MOV     R2,-(SP)
     014102  012746  014156                     MOV     #RAMASC,-(SP)
     014106  012746  000005                     MOV     #5,-(SP)
     014112  010600                             MOV     SP,R0
     014114  104414                             TRAP    C$PNTB
     014116  062706  000014                     ADD     #14,SP
1671 014122  005202                     10$:    INC     R2                      ;UPDATE BYTE COUNT
1672 014124  005737  002302                     TST     RAMSIZ                  ;DEFAULT TO 8.?
1673 014130  001404                             BEQ     15$                     ;BR IF YES
1674 014132  020237  002302                     CMP     R2,RAMSIZ               ;DONE ALL BYTES?
1675 014136  003724                             BLE     5$                      ;BR IF NO
1676 014140  000403                             BR      25$                     ;
1677 014142  020227  000010             15$:    CMP     R2,#8.                  ;DONE DEFAULT NUMBER OF BYTES?
1678 014146  002720                     20$:    BLT     5$                      ;BR IF NO
1679 014150  005037  002302             25$:    CLR     RAMSIZ                  ;SET DEFAULT RAMSIZ
1680 014154  000207                             RTS     PC                      ;RETURN
1681
1682 014156     045     116     045     RAMASC: .ASCIZ  '%N%A  BYTE: %D2%A RAM: %03%A Packet: %03%A XOR:%03
1683                                             .EVEN
1684                                             .SBTTL  PRMESS    PRINT CONTENTS OF MESSAGE BUFFER
1685                                    ;*
1686                                    ;
1687                                    ;THIS ROUTINE PRINTS THE CONTENTS OF
1688                                    ;THE 7 OR 8 WORD MESSAGE BUFFER RETURNED BY THE
1689                                    ;TSV 05.
1690                                    ;
1691                                    ;INPUT:
1692                                    ;
1693                                    ;       R0      LOW ORDER ADDRESS OF MESSAGE BUFFER
1694                                    ;       R1      HIGH ORDER ADDRESS OF MESSAGE BUFFER
1695                                    ;       NOTE: R1 IS IGNORED IF KTENABLE FLAG IS CLEAR
1696                                    ;
1697                                    ;THIS ROUTINE IS NORMALLY CALLED FROM A PRINT ROUTINE
1698                                    ;
1699                                    ;
1700
1701 014242                             PRMESS:
```

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

```
                                PRBTOT: .ASCIZ  '<N><A NUMBER OF BYTES IN ERROR = <D2>'
                                        .EVEN
015470  000000                  PRBEXP: .WORD   0                       ;EXPD
015472  000000                  PRBREC: .WORD   0                       ;RECV
                                        .SBTTL  EXPREC  - PRINT EXPD/RECV WORD DATA
                                ;+
                                ;
                                ;PRINT ROUTINE TO DISPLAY EXPD/RECV DATA
                                ;
                                ;INPUTS:
                                ;
                                ;       R1      RECEIVED DATA
                                ;       R2      EXPECTED DATA
                                ;
                                ;-

                                        BGNMSG  EXPREC
015474                          EXPREC::
015474  004737  007742                  JSR     PC,PRIXOR               ;PRINT THE DATA
                                        ENDMSG
015500                          L10017:
015500  104423                          TRAP    C$MSG
                                        .SBTTL  EXPBREC - PRINT EXPD/RECV BYTE DATA
                                ;+
                                ;
                                ;PRINT ROUTINE TO DISPLAY BYTE EXPD/RECV DATA
                                ;
                                ;
                                ;INPUTS:
                                ;
                                ;       R1      RECEIVED DATA BYTE
                                ;       R2      EXPECTED DATA BYTE
                                ;
                                ;

                                        BGNMSG  EXPBREC
015502                          EXPBREC::
015502  004737  007612                  JSR     PC,PRIBXOR              ;PRINT THE DATA
                                        ENDMSG
015506                          L10020:
015506  104423                          TRAP    C$MSG


                                        .SBTTL  RAMERR    PRINT 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.
```

```
                                ;
                                ;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::
015530
```

```
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  '<CR><LF>A TIMER A STATUS IS IN BIT 3<CR><LF>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$PNTB
                015724  062706  000006                  ADD     #6,SP
     1961       015730  012602                          MOV     (SP)+,R2                ;RESTORE R2
     1962       015732  004737  006024                  JSR     PC,PRITSSR              ;DECODE TSSR CONTE ITS
     1963       015736                                  ENDMSG
                015736                          L10025:
                015736  104423                          TRAP    C$MSG
     1964       015740     045     116     045  XFERASC:        .ASCIZ  '#N#A Data Transferred - #03'
     1965
     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
```

```
                        ;*
                        ;
                        ;THIS ROUTINE TESTS THE CONTENTS OF THE TSSR REGISTER
                        ;FOR AMBIGUITY
                        ;
                        ;INPUT:
                        ;
                        ;       R0      CONTENTS OF TSSR
                        ;
                        ;OUTPUT:
                        ;
                        ;       R0      CONTENTS OF TSSR
                        ;
                        ;       CARRY   SET - NO AMBIGUITY
                        ;               CLR - AMBIGUOUS CONTENTS
                        ;
                        ;-

016044                  CHKAMB:
016044                          SAVREG                  ;SAVE THE GENERAL REGISTERS
016050  010004                  MOV     R0,R4           ;CONTENTS OF TSSR
016052  032700  100000          BIT     #SC,R0          ;IS BIT 15 SET ?
016056  001004                  BNE     5$              ;BRANCH IF YES
016060  032700  174077          BIT     #^C<NBA!OFL!SSR!HIADDR>,R0      ;ANY OTHER BITS SET ?
016064  001023                  BNE     40$             ;MUST BE AN ERROR
016066  000424                  BR      45$             ;RETURN WITH SUCCESS
016070  032700  000200  5$:     BIT     #SSR,R0         ;IS READY BIT SET ?
016074  001011                  BNE     10$             ;BRANCH IF READY BIT IS SET.
016076  032700  000040          BIT     #BIT5,R0        ;IS FATAL ERROR BIT SET ?
016102  001414                  BEQ     40$             ;ERROR IF NOT
016104  042704  177761          BIC     #^CTERCLS,R4    ;CLEAR ALL BUT TERMINATION CODE
016110  020427  000016          CMP     R4,#16          ;ALL THREE BITS MUST BE SET
016114  001007                  BNE     40$             ;ERROR IF NOT SET
016116  000410                  BR      45$             ;OK IF ALL ARE SET
016120  032700  000040  10$:     BIT     #BIT5,R0        ;IS FATAL ERROR BIT SET ?
016124  001405                  BEQ     45$             ;ERROR IF BIT IS SET WITH SSR
016126  032700  000006          BIT     #BIT2!BIT1,R0   ;IS THIS A FUNCTION REJECT
016132  001002                  BNE     45$             ;BR. IF TSSR IS OK
016134  000241  40$:     CLC                             ;AMBIGUOUS CONTENTS
016136  000401                  BR      50$
016140  000261  45$:     SEC                             ;SHOW SUCCESS   NO AMBIGUITY
016142  000207  50$:     RTS     PC                      ;RETURN TO CALLER
                                .SBTTL  ENAINT,DSBINT - ENABLE/DISABLE INTERRUPTS
                        ;
                        ; DEFAULT DISPLAY INTERRUPT HANDLERS.
                        ; IF DISPLAY TIME OUT, REPORT DEV FATAL, AND ABORT PASS.
                        ; OTHERWISE, SAVE CPU REGISTERS AND DISMISS.
                        ;

                        ; BIT DEFINITIONS FOR "INTMASK" AND "INTFLAG" BYTES:
                        ;
                                IOKCKIN=BIT7    ; DON'T CHECK FOR BAD INTERRUPTS    TEST WILL.
                                IOKSTP=BIT0     ; EXPECT "STOP" INTERRUPT.
                        ;
                        ;INTERRUPT MASK  - SAYS EXPECTING INTERRUPTS
016144  000     INTMASK:        .BYTE   0
```

```
                                        ;INTERRUPT FLAG -- SAYS WE GOT ONE (IF POSITIVE)
016145  000                             INTFLAG:        .BYTE   0

                                        ;SAVED INTERRUPT VECTOR:
016146  000000                          INTVEC: .WORD   0
                                        ;SAVE CPU PC
016150  000000                          INICPC: .WORD   0

                                        ;SUBROUTINE TO ENABLE INTERRUPTS:
016152  010046                          ENAINT: MOV     R0,-(SP)        ;SAVE R0
016154  013700  002210                          MOV     IVEC,R0         ;GET POINTER TO VECTORS
016160  012720  016216                          MOV     #INTR,(R0)+     ;SET UP INTERRUPT VECTOR
016164  012720  000340                          MOV     #PRI07,(R0)+
016170  012600                                  MOV     (SP)+,R0        ;RESTORE R0
016172  011646                                  MOV     (SP),-(SP)
016174  012766  000000  000002                  MOV     #0,2(SP)        ;SET CPU TO LEVEL 0
016202  000002                                  RTI

                                        ;SUBROUTINE TO DISABLE INTERRUPTS (RAISE PRIORITY TO LEVEL 7)
016204  011646                          DSBINT: MOV     (SP),-(SP)
016206  012766  000340  000002                  MOV     #PRI07,2(SP)
016214  000002                                  RTI
                                                .SBTTL  INTR    INTERRUPT HANDLERS

016216                                          BGNSRV  INTR            ;DEFINE INTERRUPT ENTRY
016216                                  INTR::
016216  012737  000001  002224                  MOV     #1,INTRECV      ;SET FLAG TO SHOW INTERRUPT RECEIVED
016224  105037  016145                          CLRB    INTFLAG         ;CLEAR FLAG TO SAY WE GOT INTERRUPT
016230  132737  000001  016144                  BITB    #IOKSTP,INTMASK ;EXPECTING STOP INTERRUPT?
016236  001003                                  BNE     1$              ;BR IF YES
016240  152737  000001  016145                  BISB    #IOKSTP,INTFLAG ;NO. SET THE ERROR FLAG.

                                        ;SAVE REGISTERS, MSG BUFFER, ETC.
016246                                  1$:
016246                                          ENDSRV
016246                                  L10026:
016246  000002                                  RTI
                                                .SBTTL  WAITF   - WAIT FOR SUBSYSTEM READY
                                        ;
                                        ; SUBROUTINE TO WAIT FOR THE SUBSYSTEM READY FLAG
                                        ;
                                        ;INPUTS:
                                        ;
                                        ;       R5      ADDRESS OF FIRST DEVICE REGISTER
                                        ;
                                        ;OUTPUTS:
                                        ;
                                        ;       R0      CONTENTS OF LAST TSSR READ
                                        ;       CARRY   SET   READY BIT SET
                                        ;               CLR   TIMEOUT WAITING FOR READY
                                        ;
016250  000401                          WAITF:: BR      1$              ;NOP WHEN SUPER FIXED
016252                                          BREAK                   ; DO A SUPVSR BREAK FIRST.
016252  104422                                  TRAP    C$BRK
016254  012746  011000                  1$:     MOV     #11000,-(SP)    ;25 APRIL-83 REV B    1100 MSEC TIMER
016260  016500  000002                  2$:     MOV     TSSR(R5),R0     ;READ THE TSSR REGISTER
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  QQ2116                          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
                                        ;
                                        ;-

                                        TSTSETUP::
                                                MOV     R0,-(SP)        ;SAVE THE TEST ID MESSAGE
                                                CLR     SIFLAG          ; CLEAR "SOFT INIT" FLAG
                                                CLR     ERRK            ; CLEAR LOCAL ERROR COUNTER.
                                                CLR     EXTA            ; CLEAR ERROR EXTENSION FLAG.
                                                CLRB    INTMASK         ; CLEAR INTERRUPT MASK (CHECK ERROR)
                                                MOV     UNITN,R0        ; GET THE UNIT NUMBER,
                                                ASL     R0              ; ... AND MAKE IT A WORD OFFSET.
                                                TST     NODEV           ; DID STARTUP FIND THE DEVICE?
                                                BEQ     4$              ; BR IF YES
                                                BPL     3$              ; BR IF NOT IDLE
                                                BIS     @160000,ERTABL(R0) ; FLAG ERROR IN THE ERROR TABLE
                                                ERRDF   1,NXR,NXRERR    ; NO DEVICE HERE -  PRINT IT
                                                TRAP    C$ERDF
                                                .WORD   1
                                                .WORD   NXR
                                                .WORD   ``RERR
                                                BR
                                        3$:     BIS         )01,ERTABL(R0)      ; FLAG ERROR IN THE ERROR TABLE
                                                ERRDF       'NIT            ; DEVICE NOT IDLE
                                                TRAP    C$ERDF
                                                .WORD   2
                                                .WORD   NOINIT
                                                .WORD   0
                                        2$:     MOV     @-1,DUFLG       ; DROP THE UNIT
                                                DODU    UNITN
                                                MOV     UNITN,R0
                                                TRAP    C$DODU
                                                DOCLN                   ; ABORT THE PASS
                                                TRAP    C$DCLN
                                                BR      5$

                                        4$:     RFLAGS  R0              ; GET THE OPERATOR FLAGS.
                                                TRAP    C$RFLA
                                                BIT     @PNT,R0         ; PRINT THE TEST NUMBERS?
                                                BEQ     1$              ; BR IF NO
                                                MOV     (SP),R0         ;GET THE ID MESSAGE
                                                PRINTF  @TNAM,R0                ;DISPLAY THE TEST ID
                                                MOV     R0,-(SP)
                                                MOV     @TNAM,-(SP)
                                                MOV     @2,-(SP)
                                                MOV     SP,R0
```

```
TSV3   GLOBAL AREAS     MACRO M1113  06 FEB 84 17:14                                SEQ 073
TSTSETUP   PRINT TEST NAME AND INIT ERROR COUNTS

        016654  104417                          TRAP    C$PNTF
        016656  062706  000006                  ADD     #6,SP
   2269 016662  005237  002214          1$:     INC     TSTCNT          ; BUMP TEST COUNTER.
   2270 016666                                  SETPRI  IPRI            ;PRIORITY THAT OF DEVICE
        016666  013700  002212                  MOV     IPRI,R0
        016672  104441                          TRAP    C$SPRI
   2271 016674  005726                  5$:     TST     (SP)+           ;FIX UP THE STACK
   2272 016676  013705  00220<                  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                                  EMODF   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 A DRESS 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
                                        ;
                                        ;
017422                                  FILLMEM:
017422                                          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 >28< 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 'OUTINE 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     R1,-(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:
```

```
                                        ;
                                        ;       JSR     PC,GETPAT
                                        ;
                                        ;

                                        GETPAT::
                                                SAVREG                  ;SAVE THE GENERAL REGISTERS
020200                                  1$:     GMANID  DAT SC,PATDAT,0,377,0,377,NO
020200  104443                                  TRAP    C$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$HILIM
020220                                  10000$:
020220                                          BNCOMPLETE      1$      ;RETRY IF ERROR
020220  103367                                  BCC     1$
020222  013700  020230                          MOV     PATDAT,R0       ;DATA PATTERN FROM OPERATOR
020226  000207                                  RTS     PC              ;RETURN TO CALLER

                                        ;+
                                        ;LOCAL DATA AREA
                                        ;-

020230  000000                          PATDAT: .WORD   0               ;TEMPORARY STORAGE FOR DATA
020232    105     116     124           DATASC: .ASCIZ  'ENTER DATA PATTERN'
                                                .EVEN
                                                .SBTTL  GETSEL  - ISSUE MENU AND GET OPERATOR RESPONSE
                                        ;+
                                        ;
                                        ;ROUTINE TO ISSUE A MENU AND GET
                                        ;THE OPERATOR'S RESPONSE.
                                        ;
                                        ;INPUTS:
                                        ;
                                        ;       R0      ADDRESS OF ASCIZ STRING OF MENU
                                        ;       R1      MAXIMUM ALLOWABLE OPERATOR RESPONSE
                                        ;
                                        ;OUTPUTS:
                                        ;
                                        ;       R0      NUMBER OF THE OPERATOR'S SELECTION
                                        ;
                                        ;-

020256                                  GETSEL::
020256                                          SAVREG                  ;SAVE GENERAL REGISTERS
020262  010002                                  MOV     R0,R2           ;SAVE THE MENU ADDRESS
020264  010203                          1$:     MOV     R2,R3           ;START OF MENU STRING
020266  005713                          2$:     TST     (R3)            ;END OF ASCII ?
020270  001412                                  BEQ     3$              ;BRANCH IF ALL LINES DISPLAYED
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
```

```
                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  '<ENA *** Menu Selection Too Large ***
          2641  020442     045     116     045  SELASC: .ASCIZ  '<ENT'
          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
```

```
                                        BCOMPLETF 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
```

```
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
2778                                           ;       COMMAND PACKET.
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,23?/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
```

```
TSV4   MISCELLANEOUS SECTIONS   MACRO M1113  06-FEB 84 17:14                    SEQ 085
KTINIT    SETUP KT11 MEMORY MANAGEMENT REGISTERS

       7                                          .TITLE  TSV4   MISCELLANEOUS SECTIONS
       8
       9 021546                                   BGNMOD  TSV4
         021546                          TSV4::
      10
```

```
                                                .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
                                ;-
021556                                  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
```

INITIALIZE SECTION

```
     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.
022136  010137  002210                  MOV     R1,IVEC                 ;SET INTERRUPT VECTOR POINTER...
022142  012721  016216                  MOV     #INTR,(R1)+             ;...VECTOR...
022146  013721  002212                  MOV     IPRI,(R1)+              ;...AND PRIORITY.

022152                          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.
                                ;
022152  013701  002202                  MOV     UNITN,R1
022156  006301                          ASL     R1
022160  052761  100000  003176          BIS     #BIT15,ERTABL(R1)       ;SAY DEVICE RUNNING
022166  005037  005772                  CLR     EXTA                    ;CLEAR ERROR EXTENSION FLAG.
022172  023727  002012  000001          CMP     L$UNIT,#1               ;ARE WE TESTING MULTIPLE UNITS?
022200  101416                          BLOS    10$                     ;BR IF NO.
022202                                  RFLAGS  R0                      ;YES -- GET OPERATOR FLAGS.
022202  104421                          TRAP    C$RFLA
022204  032700  001000                  BIT     #PNT,R0                 ;SHOULD WE PRINT UNIT #?
022210  001412                          BEQ     10$                     ;BR IF NOT.
022212                                  PRINTF  #PUNIT,UNITN            ;PRINT THE UNIT #
022212  013746  002202                  MOV     UNITN,-(SP)
022216  012746  022304                  MOV     #PUNIT,-(SP)
022222  012746  000002                  MOV     #2,-(SP)
022226  010600                          MOV     SP,R0
022230  104417                          TRAP    C$PNTF
022232  062706  000006                  ADD     #6,SP
022236                          10$:
022236  005037  003114                  CLR     NODEV
022242  013701  002206                  MOV     CSRADDR,R1              ;ADDRESS OF FIRST REGISTER
022246  010102                          MOV     R1,R2                   ;START OF REGISTERS
022250  062702  000002                  ADD     #TSSR,R2                ;ADDRESS OF TSSR REGISTER
022254  004737  016376                  JSR     PC,XNXM                 ;TEST BOTH CONTROLLER REGISTERS...
022260  103005                          BCC     2$                      ;...AND BR IF ALL OK.
022262  010137  003114                  MOV     R1,NODEV                ;FLAG DEVICE AS NON-EXISTENT
022266  012737  177777  003112          MOV     # 1,DUFLG               ;DROP THIS UNIT.
022274                          2$:
                                ;
                                ;FINALLY, SET CPU PRIORITY AND WE'RE DONE.
                                ;
022274                          5$:     SETPRI  #PRI00          ;ENABLE INTERRUPTS.
022274  012700  000000                  MOV     #PRI00,R0
022300  104441                          TRAP    C$SPRI
022302                                  ENDINIT
022302                          L10030:
022302  104411                          TRAP    C$INIT

022304     045     116     045  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

                                        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          3$      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  /<LF><LF>DEVICE STATUS SUMMARY:<LF>/
269     023163      045     101     040 DEVONL: .ASCIZ  /<BEL>  UNIT <D3><BEL>    ONLINE,  ERRORS = <D><LF>/
270     023233      045     101     040 DEVNXR: .ASCIZ  /<BEL>  UNIT <D3><BEL>    DROPPED, NON-EXISTENT REGISTER<LF>/
271     023315      045     101     040 DEVNRD: .ASCIZ  /<BEL>  UNIT <D3><BEL>    DROPPED, NOT READY AT STARTUP<LF>/
272     023376      045     101     040 DEVDRO: .ASCIZ  /<BEL>  UNIT <D3><BEL>    DROPPED, ERRORS = <D><LF>/
273                                             .EVEN
274
275     023446                                  ENDMOD
276
```

```
TSV5  HARDWARE TESTS  MACRO M1113  06-FEB-84 17:14                    SEQ 094
CLEAN UP AND REPORT CODING SECTIONS

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

```
                                        .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
                                ;
                                
                                        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$:    CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
023532  010465  000000                  MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
023536  004737  016336                  JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
023542                                  FORCERROR       12$                     ;@@DFORCE 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
```

```
TSV5   HARDWARE TESTS   MACRO M1113  06 FEB 84 17:14                                    SEQ 096
TEST  1: INITIALIZE AFTER WRITE CHARACTERISTICS

     023576  104406                                                                  TRAP    C$CLP1
  79 023600  016501  000002          MOV     TSSR(R5),R1         ;GET THE CONTENTS OF TSSR
  80 023604  012702  000200          MOV     #SSR,R2             ;EXPECTED CONTENTS OF TSSR
  81 023610  032701  000100          BIT     #OFL,R1             ;IS OFF-LINE BIT SET ?
  82 023614  001402                  BEQ     25$                 ;BRANCH IF NOT OFF-LINE
  83 023616  052702  000100          BIS     #OFL,R2             ;SET OFF LINE IN EXPECTED DATA
  84
  85                             ;If the NBA bit in the TSSR register is NOT=0 then Print Error.
  86 023622                      25$:
  87 023622                              FORCERROR       27$                     ;BSD
  88 023636  020201                      CMP     R2,R1               ;DOES EXPECTED MATCH RECEIVED ?
  89 023640  001404                      BEQ     30$                 ;OKAY IF MATCH
  90 023642                              NEXT.ERRNO
  91 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
  92 023652                      30$:    CKLOOP                      ;LOOP ON ERROR ?
     023652  104406                                                                  TRAP    C$CLP1
  93
  94                             ;Write to TSSR register to soft initialize the controller
  95 023654                      40$:
  96 023654  004737  015774              JSR     PC,SOFINIT          ;WRITE TO TSSR TO SOFT INITIALIZE
  97 023660                              FORCERROR       42$
  98 023674  103405                                                      ;BSD
  99 023676  010001                      BCS     50$                 ;BR IF SOFT INIT OKAY
 100 023700                              MOV     R0,R1               ;SAVE CONTENTS OF TSSR
 101 023700                              NEXT.ERRNO
     023700  104455                  42$:    ERRDF   ERRNO,SFIERR,SFIMSG ;DEVICE FATAL DURING INIT
     023702  000147                                                                  TRAP    C$ERDF
     023704  003652                                                                  .WORD   103
     023706  012034                                                                  .WORD   SFIERR
 102                                                                                 .WORD   SFIMSG
 103                            ;If controller RAM 310-377 NOT=0 then Print Error
 104 023710  012704  000310      50$:    MOV     #310,R4             ;START WITH LOC 310
 105 023714  005002                      CLR     R2                  ;MEMORY EXPECTED SHOULD BE 000000
 106 023716  105065  000000              CLRB    TSDB(R5)            ;SET MAINTENANCE MODE
 107 023722  004737  016336              JSR     PC,CHKTSSR          ;WAIT FOR SSR READY
 108 023726  010465  000000      60$:    MOV     R4,TSDB(R5)         ;SELECT RAM ADDRESS
 109 023732  004737  016336              JSR     PC,CHKTSSR          ;WAIT FOR SSR READY
 110 023736  116501  000000              MOVB    TSBA(R5),R1         ;READ LOC CONTENTS
 111 023742                              FORCERROR       62$,NOTSSR
 112 023752  120102                                                     ;BSD
 113 023754  001406                      CMPB    R1,R2               ;CHECK MEMORY FOR 000000
 114 023756                              BEQ     70$                 ;BRANCH IF DATA OKAY
 115 023756                              NEXT.ERRNO
     023756  104455                  62$:    ERRDF   ERRNO,T13MEM,RAMEXP ;MEMORY NOT ZERO AFTER INIT.
     023760  000150                                                                  TRAP    C$ERDF
     023762  024155                                                                  .WORD   104
     023764  015530                                                                  .WORD   T13MEM
 116 023766  005237  002222                                                          .WORD   RAMEXP
 117 023772                              INC     FATFLG              ;SET THE FATAL ERROR FLAG
     023772  104406              70$:    CKLOOP
                                                                                     TRAP    C$CLP1
 118 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:                      ;COMMAND PACKET FOR TEST
024040  100004                                           .WORD   100004          ;WRITE CHARACTERISTICS COMMAND, WITH ACK
024042  024050                                           .WORD   T13DATA         ;ADDRESS OF CHARACTERISTICS BLOCK
024044  000000                                           .WORD   0
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     (P1)+
                                        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::
203 024426  012700  026241              MOV     #TST14ID,R0             ;ASCII MESSAGE TO IDENTIFY TEST
204 024432  004737  016510              JSR     PC,TSTSETUP             ;DO INITIAL TEST SETUP
205 024436  012737  000024  002216      MOV     #20.,LOOPCNT            ;PERFORM 20 ITERATIONS
206 024444                    T14LOOP:
207 024444                              BGNSUB                          ;////////////// BEGIN SUBTEST //////////////
                                                                                T2.1:
                                                                                        TRAP    C$BSUB
208 024446  004737  026306              JSR     PC,T14REST              ;SET PACKET TO INITIAL VALUES
209 024452  004737  026344              JSR     PC,T14RST               ;SET PACKET TO INITIAL VALUES
210 024456                              SETPRI  #PRI00                  ;LOWER PRIORITY TO ALLOW INTERRUPTS
                                                                                MOV     #PRI00,R0
                                                                                TRAP    C$SPRI
211 024464                    5$:
212 024464                              BGNSEG                          ;>>>>>>>>>>>> BEGIN SEGMENT >>>>>>>>>>>>
                                                                                TRAP    C$BSEG
213 024466  004737  015774              JSR     PC,SOFINIT              ;DO SOFT INIT OF CONTROLLER
214 024472  103405                      BCS     10$                     ;BR IF SOFT INIT = OK
218 024474  010001                      MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
219 024476                              ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL ERROR DURING INIT
                                                                                TRAP    C$ERDF
                                                                                .WORD   201
                                                                                .WORD   SFIERR
                                                                                .WORD   SFIMSG
220 024506                    10$:
221 024506  012704  025600              MOV     #T14PK2,R4              ;SUBROUTINE NEEDS PACKET ADDRESS
222 024512  004737  010662              JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
223 024516  103405                      BCS     11$                     ;BR, IF COMMAND ISSUED OK
227 024520  010001                      MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
228 024522                              ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
                                                                                TRAP    C$ERHRD
                                                                                .WORD   202
                                                                                .WORD   WRTMSG
```

```
                                                                                .WORD   SFIMSG
229 024532                              11$:
230 024532  005037  002222                      CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
231 024536  005037  002224                      CLR     INTREC/                 ;CLEAR INTERRUPT RECEIVED FLAG
232 024542  012704  025160                      MOV     #T14PACKET,R4           ;SET UP NEW WRT. SUBSYS MEM. COMMAND
233 024546  010465  000000                      MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS
234 024552  004737  016336                      JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
235 024556  103407                              BCS     15$                     ;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$FRHRD
    024614  000314                                                                     .WORD   204
    024616  026063                                                                     .WORD   T14NINT
    024620  012046                                                                     .WORD   PKTSSR
250 024622  016501  000002      22$:            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      55$:            JSR     PC,CKRAM                ;CHECK RAM TO MEMORY
263 024664  103405                              BCS     59$                     ;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 ?
```

```
TSV5   HARDWARE TESTS   MACRO M1113  06-FEB-84 17:14                                    SEQ 100
TEST 2: BASIC WRITE SUBSYSTEM MEMORY COMMAND

    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
```

```
                                ESCAPE  SEG                     ;BY PASS CHECKS IF FATAL ERROR
025044  104410                                                          TRAP    C$ESCAPE
025046  000074                                                          .WORD   10000$ .
                                TST     INTREC/                 ;DID AN INTERRUPT OCCUR ?
                                BNE     22$                     ;BRANCH IF YES
                                ERRHRD  ERRNO,T14NINT,PKTSSR
025056  104456                                                          TRAP    C$ERHRD
025060  000322                                                          .WORD   210
025062  026063                                                          .WORD   T14NINT
025064  012046                                                          .WORD   PKTSSR
025066  016501  000002        22$:    MOV     TSSR(R5),R1             ;GET THE CONTENTS OF TSSR
025072  012702  100206                MOV     #SC!SSR!TSREJ,R2        ;EXPECTED CONTENTS OF TSSR
025076  032701  000100                BIT     #OFL,R1                 ;IS OFF-LINE BIT SET ?
025102  001402                        BEQ     25$                     ;BRANCH IF NOT OFF LINE
025104  052702  000100                BIS     #OFL,R2                 ;SET OFF LINE IN EXPECTED DATA
025110  020201        25$:    CMP     R2,R1                   ;DOES EXPECTED MATCH RECEIVED ?
025112  001404                        BEQ     30$                     ;OKAY IF MATCH
                                ERRHRD  ERRNO,T142REJ,PKTSSR    ;COMMAND NOT REJECTED
025114  104456                                                          TRAP    C$ERHRD
025116  000323                                                          .WORD   211
025120  025676                                                          .WORD   T142REJ
025122  012046                                                          .WORD   PKTSSR
                        30$:
025124  004737  011114  35$:    JSR     PC,CKRAM                ;CHECK RAM TO MEMORY
025130  103405                        BCS     59$                     ;RAM OK GO ON
                                ERRHRD  ERRNO,PKTRAM,RAMERR     ;THEY DON'T MATCH
025132  104456                                                          TRAP    C$ERHRD
025134  000324                                                          .WORD   212
025136  004745                                                          .WORD   PKTRAM
025140  015510                                                          .WORD   RAMERR
                                ENDSEG                          ;<<<<<<<<<<<<< END SEGMENT <<<<<<<<<<<<<
025142                                                                  10000$:
025142  104405                                                          TRAP    C$ESEG

025144                  59$:    ENDSUB                          ;\\\\\\\\\\\\\ END SUBTEST \\\\\\\\\\\\\
025144                                                                  L10041:
025144  104403                                                          TRAP    C$ESUB
                                EXIT    TST                     ;ALL DONE THIS TEST
025146  104432                                                          TRAP    C$EXIT
025150  001246                                                          .WORD   L10037 .


                        ;+
                        ;LOCAL STORAGE FOR THIS TEST
                        ;

025160                          .=<.+10>&177770
025160                  T14PACKET:                              ;COMMAND PACKET FOR TEST
025160  100206                  .WORD   100206                  ;WRITE SUBSYSTEM MEM. COMMAND, WITH IE, ACK
025162  025170                  .WORD   T14DATA                 ;ADDRESS OF CHARACTERISTICS BLOCK
025164  000000                  .WORD   0
025166  000006                  .WORD   6.                      ;STARTING VALUE OF BLOCK SIZE
025170                  T14DATA:                                ;CHARACTERISTICS DATA BLOCK
025170     000          T14BS0: .BYTE   0                       ;BSEL0 BYTE
025171     000          T14BS1: .BYTE   0                       ;BSEL1 BYTE
025172  000000          T14BS2: .WORD   0                       ;BSEL1 WORD
025174  000000                  .WORD   0                       ;DATA
025176                  T14BFR: .BLKW   128.                    ;MESSAGE BUFFER
```

```
370
371
373           025600                        .=<.+10>&177770
375 025600                            T14PK2:                         ;COMMAND PACKET FOR TEST
376 025600    100204                          .WORD   100204            ;WRITE CHARA. MEM. CMND., WITH IE, ACK
377 025602    025610                          .WORD   T14DTA            ;ADDRESS OF SELECT DATA BLOCK
378 025604    000000                          .WORD   0
379 025606    000010                          .WORD   8.                ;STARTING VALUE OF BLOCK SIZE
380
381
382 025610                            T14DTA:                         ;SELECT DATA BLOCK
383 025610    025176                          .WORD   T14BFR            ;ADDRESS OF MESSAGE BUFFER
384 025612    000000                          .WORD   0
385 025614    000400                          .WORD   256.              ;LENGTH OF MESSAGE BUFFER
386 025616    000000  000000                  .WORD   0,0
387
388
389                                   ;+
390                                   ;LOCAL TEXT MESSAGES FOR TEST
391                                   ;
392
393 025622      127     122     111  T14NBA: .ASCIZ  'WRITE SUBSYSTEM MEMORY Command Not Accepted
394 025676      127     122     111  T142REJ:        .ASCIZ  'WRITE SUBSYSTEM MEMORY Not Rejected With Non Zero Mode Field'
395 025773      103     157     156  T14SSR: .ASCIZ  'Contents of TSSR Incorrect After WRITE SUBSYSTEM MEMORY'
396 026063      105     170     160  T14NINT:        .ASCIZ  'Expected Interrupt Not Received On WRITE SUBSYSTEM MEMORY
397 026155      111     156     143  T14TSBA:        .ASCIZ  'Incorrect TSBA Address After WRITE SUBSYSTEM MEMORY'
398 026241      102     141     163  TST14ID:        .ASCIZ  'Basic WRITE SUBSYSTEM MEMORY Command'
399                                           .EVEN
400
401
402                                   ;+
403                                   ;
404                                   ;ROUTINE TO RESTORE COMMAND PACKET TO START-UP (DEFAULT) VALUES
405                                   ;WRITE SUBSYSTEM MEMORY COMMAND
406                                   ;
407                                   ;
408
409 026306                            T14REST:
410 026306                                    SAVREG                          ;SAVE THE REGISTERS
411 026312    012701  025160                  MOV     @T14PACKET,R1           ;START OF THE PACKET
412 026316    012721  100206                  MOV     @100206,(R1)+           ;WRITE SUBSYSTEM MEM. WITH ACK, IE
413 026322    012721  025170                  MOV     @T14DATA,(R1)+          ;ADDRESS OF DATA BLOCK
414 026326    005021                          CLR     (R1)+                   ;EXTENDED ADDRESS
415 026330    012721  000006                  MOV     @6.,(R1)+               ;SIZE OF DATA BLOCK IN BYTES
416 026334    005021                          CLR     (R1)+                   ;CLEAR BSEL0 AND BSEL1
417 026336    005021                          CLR     (R1)+                   ;CLEAR SEL2
418 026340    005011                          CLR     (R1)                    ;CLEAR DATA AREA
419 026342    000207                          RTS     PC                      ;RETURN
420
421
422 026344                            T14RST:
423 026344                                    SAVREG                          ;SAVE THE REGISTERS
424 026350    012701  025600                  MOV     @T14PK2,R1              ;START OF THE PACKET
425 026354    012721  100204                  MOV     @100204,(R1)+           ;WRITE CHARA. WITH ACK, IE
426 026360    012721  025610                  MOV     @T14DTA,(R1)+           ;ADDRESS OF CHARAISTICS DATA BLOCK
427 026364    005021                          CLR     (R1)+                   ;EXTENDED ADDRESS
428 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 ava lable 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  > 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
                                ;
026446                                  BGNSUB                          ;////////////// BEGIN SUBTEST //////////
026446                                                                                      T3.1:
026446  104402                                                                                      TRAP    C$BSUB
                                ;Write to TSSR to soft initialize
026450  004737  015774                  JSR     PC,SOFINIT              ;DO SOFT INIT OF CONTROLLER
026454  103405                          BCS     15$                     ;BR IF SOFT INIT = OK
026456                                  NEXT.ERRNO
026456  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
026460                                  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
```

```
                                        BCC     65$                     ;BR IF INVALID PACKET ADDRESS
                                        MOV     T12LOADD,R4             ;COPY CURRENT PACKET LOW ADDRESS
                                        MOV     T12HIADD,R3             ;COPY CURRENT PACKET HIGH ADDRESS
                                        JSR     PC,T12SETGET            ;SETUP CURRENT PACKET TO GET STATUS
                                        BIC     #^C<A1716>,R3           ;SAVE ADDRESS BITS 17-16
                                        BIS     R3,R4                   ;SETUP 18 BIT PACKET ADDRESS
                                        JSR     PC,KTOFF                ;TURN OFF KT 11
                                        MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
                                        JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
                                        FORCERROR       32$
                                        BCS     40$                     ;BR IF SSR SET IN CHKTSSR
                                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
                                        NEXT.ERRNO
                                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
                                40$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
026710  104406                                                                  TRAP    C$CLP1
                                65$:
                                        FORCEXIT        80$
026722  020227  030466                   CMP     R2,#T12TBE              ;DONE ALL TSTBLK TEST PATTERNS?
026726  103002                           BHIS    70$                     ;BR IF YES
026730  000137  026560                   JMP     T121LOOP                ;DO ANOTHER MODULO  4 ADDRESS
026734  005737  030330           70$:    TST     T12KT                   ;DONE ABOVE 28K TESTING TOO?
026740  003012                           BGT     80$                     ;BR IF YES
026742  005737  003132                   TST     KTFLG                   ;ANY MEMORY ABOVE 28K ON SYSTEM?
026746  001407                           BEQ     80$                     ;BR IF NO
026750  012737  000001  030330           MOV     #1,T12K*                ;SET SWITCH
026756  012702  030334                   MOV     #T12BLK,R2              ;RESET TEST PATTERN TABLE
026762  000137  026560                   JMP     T121LOOP                ;DO ABOVE 28K TESTING
026766  004737  017274           80$:    JSR     PC,KTOFF                ;TURN OFF KT11
                                        ENDSUB                          ;\\\\\\\\\\\\\\ END SUBTEST \\\\\\\\\\\\\\
                                                                                L10043:
026772  104403                                                                    TRAP    C$ESUB
026774  005737  002222                   TST     FATFLG                  ;ANY FATAL ERRORS ?
027000  001402                           BEQ     100$                    ;BRANCH IF NOT
027002  004737  017202                   JSR     PC,CKDROP               ;TRY TO DROP THE UNIT
027006                          100$:

                                        .SBTTL  TEST 3: SUBTEST 2: MESSAGE PACKETS TO SELECTED LOCATIONS
                                ;**
                                ; TEST 3: SUBTEST 2:
                                ;
                                ; SUBTEST DESCRIPTION:
                                ;
                                ;       This subtest verifies the controller can deposit message packets
                                ;       to all available memory locations.
                                ;       Write Characteristics commands are executed with message
                                ;       buffer addresses set to various addresses in each available
                                ;       memory location.
                                ;       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 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$BSJB

                                ;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                           122LOOP:
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
```

```
TSV5   HARDWARE TESTS   MACRO M1113  06 FEB 84 17:14                                  SEQ 108
TEST 3: SUBTEST 2: MESSAGE PACKETS TO SELECTED LOCATIONS

    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
                                ;
                                        BGNSUB                          ;////////////// BEGIN SUBTEST //////////
027276                                                                                      T3.3:
027276                                                                                          TRAP    C$BSUB
027276  104402
                                ;Write to TSSR to soft initialize
027300  004737  015774                  JSR     PC,SOFINIT              ;DO SOFT INIT OF CONTROLLER
027304  103405                          BCS     20$                     ;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     #T128LK,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
```

```
                                        NEXT.ERRNO
                                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
                                40$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
027506 104406                                                           TRAP    C$CLP1
                                60$:
027510 020327 030466                    CMP     R3,#T12TBE              ;DONE ALL TSTBLK TEST PATTERNS?
027514 103002                           BHIS    65$                     ;BR IF YES
027516 000137 027334                    JMP     T123LOOP                ;DO ANOTHER MODULO- 4 ADDRESS
027522 005737 030330            65$:    TST     T12KT                   ;DONE ABOVE 28K TESTING TOO?
027526 003012                           BGT     70$                     ;BR IF YES
027530 005737 003132                    TST     KTFLG                   ;ANY MEMORY ABOVE 28K ON SYSTEM?
027534 001407                           BEQ     70$                     ;BR IF NO
027536 012737 000001 030330             MOV     #1,T12KT                ;SET SWITCH
027544 012703 030334                    MOV     #T12BLK,R3              ;RESET TEST PATTERN TABLE
027550 000137 027334                    JMP     T123LOOP                ;DO ABOVE 28K TESTING
027554 004737 017274            70$:    JSR     PC,KTOFF                ;TURN OFF KT11
027560                                  ENDSUB                          ;\\\\\\\\\\\\\ END SUBTEST \\\\\\\\\\\
027560                                                                          L10045:
027560 104403                                                           TRAP    C$ESUB
027562 005737 002222                    TST     FATFLG                  ;ANY FATAL ERRORS ?
027566 001402                           BEQ     75$                     ;BRANCH IF NOT
027570 004737 017202                    JSR     PC,CKDROP               ;TRY TO DROP THE UNIT
027574                          75$:
```

```
                        .SBTTL  TEST 3: SUBTEST 4: NXM TO SELECTED INVALID ADDRESSES
;**
; TEST 3: SUBTEST 4:
;
; SUBTEST DESCRIPTION:
;
;       This subtest verifies the NXM error bit in the TSSR
;       register is set when attempting to fetch data (a characteristic
;       data block) from selected nonexistent locations.
;       If NXM fails to set it is likely that an LSI-11 Bus driver is
;       failing to assert an address line.
;       Addresses tested include all combinations of high-order address
;       bits (i.e bits 16-21).
;       ********************************************************************
;                               CAUTION
;
;               The LSI BUS drivers for all available address lines(16-21)
;       are only checked when running on a 11/23B system with more than
;       128K words of memory!
;       ********************************************************************
;
; TEST STEPS:
;
;    BEGIN
;       Write to TSSR to soft initialize
;       Do a write characteristic command
;       Invert the extended features switch
;
;       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  nvert 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
```

```
                                        JSR     PC,INVERT               ;INVERT THE SWITCH

                                ;Get an invalid test address

                                20$:    CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
                                25$:
                                        MOV     NXMHI,T12HIADD          ;SAVE TEST ADDRESS HIGH
                                        MOV     NXMLO,T12LOADD          ;SAVE TEST ADDRESS LOW
                                T124LOOP:

                                ;Set the test packet character st cs data pointer to the
                                ;  test address.

                                30$:    MOV     #T12PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
                                        JSR     PC,T12SWRT              ;RESTORE PACKET TO STARTING VALUES
                                        MOV     T12LOADD,PKLOW(R4)      ;STORE CHAR. DATA PTR LOW ADDRESS
                                        MOV     T12HIADD,PKHI(R4)       ;STORE CHAR. DATA PTR HIGH ADDRESS

                                ;Do a WRITE CHARACTERISTIC command
                                        JSR     PC,KTOFF                ;TURN OFF KT 11
                                        MOV     R4,TSUB(P5)             ;SET THE PACKET ADDRESS TO EXECUTE
                                        JSR     PC,WAITF                ;WAIT FOR SSR TO SET
                                        FORCERROR       32$
                                        BCS     40$                     ;BR IF SSR SET IN CHKTSSR
                                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
                                        NEXT.ERRNO
                                32$:    ERRDF   ERRNO,T12WRTSSR,PKTSSR  ;DEVICE FATAL SSR FAILED TO SET
                                                                                TRAP    C$ERDF
                                                                                .WORD   311
                                                                                .WORD   T12WRTSSR
                                                                                .WORD   PKTSSR
                                        INC     FATFLG                  ;SET FATAL ERROR FLAG
                                40$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
                                                                                TRAP    C$CLP1
                                        FORCERROR       45$,NOTSSR
                                        ESCAPE  SUB                     ;BY PASS SUBTEST IF FATAL ERROR
                                                                                TRAP    C$ESCAPE
                                                                                .WORD   L10046 .

                                ;If TSSR register NXM bit not set then print error message
                                45$:
                                        MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
                                        FORCERROR       52$
                                        BIT     #NXM,R1                 ;NXM SET?
                                        BNE     60$                     ;BR IF YES
                                        NEXT.ERRNO
                                52$:    MOV     T12LOADD,ERRLO          ;MEMORY TEST ADDRESS LOW
                                        MOV     T12HIADD,ERRHI          ;MEMORY TEST ADDRESS HIGH
                                        ERRHRD  ERRNO,T12NXM,ADDSSR     ;REPORT ADDRESS AND TSSR ERROR
                                                                                TRAP    C$ERHRD
                                                                                .WORD   312
                                                                                .WORD   T12NXM
                                                                                .WORD   ADDSSR

                                60$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
                                                                                TRAP    C$CLP1
                                        FORCEXIT        90$
                                        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  ES
                                        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$:
                                                JSR     PC,KTOFF        ;TURN OFF MEMORY MANAGEMENT
                                                CLR     T3BFLG          ;CLEAR TEST FLAG
                                                EXIT    TST             ;ALL DONE THIS TEST
                                                                                        TRAP    C$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
                                                .WORD   0,0

                                        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  TST12ID:          .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 Character'stic data in ram does not match expected'
    994 031227      124     123     123  T12NXM:            ASCIZ  'TSSR NXM bit fa'led to set when non existent memory address spec'fi
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'      8K
```

```
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
```

```
1175
1176                                            .SBTTL  TEST  4: RAM EXERCISER TEST
1177                                    ;*
1178                                    ;
1179                                    ;THIS TEST USES THE READ AND WRITE RAM (BOTH SINGLE AND 256
1180                                    ;LOCATIONS) SELECT CODES OF THE WRITE SUBSYSTEM MEMORY COMMAND
1181                                    ;TO EXERCISE THE CONTROLLER'S RAM MEMORY AND DMA LOGIC
1182                                    ;
1183                                    ;-
1184 032014                                     BGNTST
     032014                                                                     T4::
1185
1186
1191 032014  005737  002214                     TST     TSTCNT                  ;CHECK FOR RUN MODE
1192 032020  001402                             BEQ     10$                     ;BR, IF NOT ONLY PROGRAM RUN
1193 032022  005237  003400                     INC     SKIPT                   ;SET SKIP SW
1194 032026  012700  034453             10$:    MOV     #TST15ID,R0             ;ASCII MESSAGE TO IDENTIFY TEST
1195 032032  004737  016510                     JSR     PC,TSTSETUP             ;DO INITIAL TEST SETUP
1196 032036  012737  000005  002216             MOV     #5,LOOPCNT              ;PERFORM 5 ITERATIONS
1197 032044                             T15LOOP:
1198                                    ;
1199                                    ;
1200                                    ;TEST 4, SUBTEST 1
1201                                    ;
1202                                    ;       THIS SUBTEST WRITES THE ADDRESS (8 BITS) INTO THE
1203                                    ;       RAM MEMORY SINGLE WORD (8 BITS) MODE
1204                                    ;
1205                                    ;-
1206 032044                                     BGNSUB                          ;////////////// BEGIN SUBTEST ////////////,
     032044                                                                             T4.1:
     032044  104402                                                                     TRAP    C$BSUB
1207 032046                                     SETPRI  #PRI00                  ;LOWER PRIORITY TO ALLOW INTERRUPTS
     032046  012700  000000                                                             MOV     #PRI00,R0
     032052  104441                                                                     TRAP    C$SPRI
1208 032054  005737  003400                     TST     SKIPT                   ;SHOULD WE SKIP THIS SUBTEST
1209 032060  001402                             BEQ     10$                     ;BR, IF NOW SKIP REQUIRED
1210 032062  000137  032344                     JMP     50$                     ;SKIP SUBTEST
1211 032066  004737  034472             10$:    JSR     PC,T15REST              ;SET COMMAND PACKET
1212 032072  004737  034544                     JSR     PC,T15RT2               ;SET UP OTHER COMMAND PACKET
1213 032076  004737  015774                     JSR     PC,SOFINIT              ;DO INITIALIZE ON CONTROLLER
1214 032102  103405                             BCS     20$                     ;BR IF INIT WAS OK
1218 032104  010001                             MOV     R0,R1                   ;CONTENTS OF TSSR REGISTER
1219 032106                                     ERRDF   ERRNO,SFIERR,SFIMSG     ;FATAL ERROR TSSR WAS NOT OK
     032106  104455                                                                     TRAP    C$ERDF
     032110  000621                                                                     .WORD   401
     032112  003652                                                                     .WORD   SFIERR
     032114  012034                                                                     .WORD   SFIMSG
1220 032116                             20$:
1221 032116  012704  033370                     MOV     #T15PACKET,R4           ;SUBROUTINE NEEDS PACKET ADDRESS
1222 032122  004737  010662                     JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
1223 032126  103405                             BCS     23$                     ;BR, IF COMMAND ISSUED OK
1227 032130  010001                             MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
1228 032132                                     ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
     032132  104456                                                                     TRAP    C$ERHRD
     032134  000622                                                                     .WORD   402
     032136  005056                                                                     .WORD   WRTMSG
     032140  012034                                                                     .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 177777
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
```

```
TSV5   HARDWARE TESTS   MACRO M1113  06 FEB 84 17:14                                  SEQ 121
TEST  4: RAM EXERCISER TEST

      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
```

```
TSV5   HARDWARE TESTS   MACRO M1113  06-FEB 84 17:14                                  SEQ 122
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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        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
```

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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                    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
```

```
                                                                                    TRAP    C$ERHRD
                                                                                    .WORD   420
                                                                                    .WORD   T15SSR
                                                                                    .WORD   PKTSSR
033304  104456
033306  000644
033310  034106
033312  012046
1478 033314  013701  033432          44$:    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  015456          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:
```

```
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
```

```
                                        ;         If Data word in controller ram NOT= to word sent  Then Print Error
                                        ;         If Message Buffer Data Length NOT= 12.  Then Print Error
                                        ;       ELSE
                                        ;         (* Verify Extended Features switch can be Inverted to CLEAR *)
                                        ;         Do Write Subsystem Write Miscellaneous to CLEAR Extended Features.
                                        ;         Do a WRITE CHARACTERISTICS without an extended characteristic word
                                        ;         If Message Buffer Data Length NOT= 10.  Then Print Error
                                        ;       END-IF
                                        ;       (* Verify Function Reject when Message Buffer 21-19 are non-zero *)
                                        ;       Write to TSSR register to soft initialize the controller
                                        ;       REPEAT FOR MESSAGE BUFFER ADDRESS bits <21:19> FROM 0 TO 7
                                        ;        DO a WRITE CHARACTERISTICS with a message address bit<21:19> non zero
                                        ;        If TSSR term'nation code NOT= Function Reject  Then Print Error
                                        ;       END-REPEAT
                                        ; END
                                        ;--
034622                                          BGNSUB                          ;////////////// BEGIN SUBTEST //////////
034622                                                                                    T5.1:
034622  104402                                                                                  TRAP    C$BSUB

034624                                  5$:
                                        ;       Write to TSSR register to soft initialize the controller
034624  004737  015774                          JSR     PC,SOFINIT              ;WRITE TO TSSR TO SOFT INITIALIZE
034630  103405                                  BCS     10$                     ;BR IF SOFT INIT OKAY
034632  010001                                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
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

                                        ;       Do WRITE CHARACTERISTICS to check for Extended Features Switch
034644  004737  040030          10$:    JSR     PC,T16REST              ;RESTORE PACKET DEFAULTS
034650  005037  002222                  CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
034654  012704  040210                  MOV     #T16PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
034660  004737  010662                  JSR     PC,WRTCHR               ;DO WRITE CHARACTERISTICS COMMAND
034664                                  FORCERROR       12$                     ;@@DFORCE ERROR IF FORCER=1
034700  103407                          BCS     15$                     ;BR IF CARRY SET (GOOD RETURN)
034702  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
034704                                  NEXT.ERRNO
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
034714  005237  002222                  INC     FATFLG                  ;SET FATAL ERROR FLAG
034720                          15$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
034720  104406                                                                          TRAP    C$CLP1

                                        ;       If Extended Features Hardware Switch Clear then:
                                        ;         (* Verify Extended Features switch can be Inverted to SET *)
                                        ;         REPEAT FOR TEST PATTERNS IN TSTBLK TABLE
034722  012701  040232                  MOV     #T16BFR,R1              ;MESSAGE BUFFER ADDRESS
034726  032761  000200  000012          BIT     #X2.EXTF,XST2(R1)       ;EXTENDED FEATURES SWITCH CLEAR?
034734  001402                          BEQ     20$                     ;BR IF YES
034736  000137  035306                  JMP     200$                    ;
034742  012703  002764          20$:    MOV     #TSTBLK+10.,R3          ;START OF TEST DATA
```

```
                                        ;       Do Write Subsystem Write Miscellaneous to SET Extended Features.
                                        ;
034746  004737  040170                        JSR     PC,T16SEXT              ;SETUP PACKET FOR WRITE MISC INVERT
034752  012704  040260                        MOV     #T16PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
034756  010465  000000                        MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
034762  004737  016336                        JSR     PC,CHK$SSR              ;WAIT FOR SSR TO SET
034766                                        FORCERROR       32$                     ;@@FORCE 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$                     ;@@FORCE 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              ;@@FORCE 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$                     ;@@FORCE ERROR IF FORCER=1
```

```
1731 035202  103404                    BCS     100$                    ;BR IF YES
1732 035204                            NEXT.ERRNO
1733 035204                    #2$:    ERRHRD  ERRNO,PKTRAM,RAMERR     ;REPORT THE RAM ERROR(S)
     035204  104456                                                            TRAP    C$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$,NOTSSR             ;@@FORCE ERROR IF FORCER=1
1740 035242  020102                      CMP     R1,R2                   ;COMPARE EXPECTED TO RECEIVED
1741 035244  001404                      BEQ     120$                    ;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$:
1755                           ;         Do Write Subsystem Write Miscellaneous to CLEAR Extended Features.
1756 035306  004737  040170              JSR     PC,T16SEXT              ;SETUP PACKET FOR WRITE MISC INVERT
1757 035312  012704  040260              MOV     #T16PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
1758 035316  010465  000000              MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
1759 035322  004737  016336              JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
1760 035326                              FORCERROR       232$                    ;@@FORCE ERROR IF FORCER=1
1761 035342  103407                      BCS     240$                    ;BR IF CARRY SET (GOOD RETURN)
1762 035344  010001                      MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
1763 035346                              NEXT.ERRNO
1764 035346                    232$:   ERRDF   ERRNO,T162SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     035346  104455                                                            TRAP    C$ERDF
     035350  000773                                                            .WORD   507
     035352  036767                                                            .WORD   T162SSR
     035354  012046                                                            .WORD   PKTSSR
1765 035356  005237  002222              INC     FATFLG                  ;SET FATAL ERROR FLAG
1766 035362                    240$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     035362  104406                                                            TRAP    C$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$            ;@@@FORCE 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$:
1796 035474  012704  040210             ;       MOV     #T16PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
1797 035500  012764  000016  000006     ;       MOV     #14.,PKBCNT(R4)         ;STORE MESSAGE PACKET SIZE
1798 035506  013700  002312             ;       MOV     DATA,R0                 ;GET TEST DATA
1799         000003                     ;       .REPT   3
1800                                    ;       ASL     R0                      ;SHIFT INTO BITS 21:19
1801                                    ;       .ENDR
1802 035520  010037  040222             ;       MOV     R0,T16DATA+2            ;STORE BUFFER ADDRESS BITS 21:19
1803 035524  010465  000000             ;       MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
1804 035530  004737  016250             ;       JSR     PC,WAITF                ;WAIT FOR SSR
1805 035534                             ;       FORCERROR       342$            ;@@@FORCE 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$,NOTSSR             ;BSDFORCE ERROR IF FORCER=1
1819 035620  020102                                 CMP     R1,R2                   ;EXPD EQUAL RECV?
1820 035622  001404                                 BEQ     360$                    ;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
                                ;--
1876 035702                             BGNSUB                          ;////////////// BEGIN SUBTEST //////////
     035702                                                                     T5.2:
     035702  104402                                                                 TRAP    C$BSUB
1877                            ;       Write to TSSR register to soft initialize the controller
1878 035704                     5$:
1879 035704  004737  015774            JSR     PC,SOFINIT              ;WRITE TO TSSR TO SOFT INITIALIZE
1880 035710  103405                    BCS     10$                     ;BR IF SOFT INIT OKAY
1881 035712  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
1882 035714                            ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL DURING INIT
     035714  104455                                                                 TRAP    C$ERDF
     035716  000777                                                                 .WORD   511
     035720  003652                                                                 .WORD   SFIERR
     035722  012034                                                                 .WORD   SFIMSG
1883                            ;       Do WRITE CHARACTERISTICS to setup a Message Buffer
1884 035724  004737  040030    10$:    JSR     PC,T16REST              ;RESTORE PACKET DEFAULTS
1885 035730  005037  002222            CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
1886 035734  012704  040210            MOV     #T16PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
1887 035740  012764  000010  000006    MOV     #8.,PKBCNT(R4)          ;MESSAGE PACKET SIZE NO EXTEND
1888 035746  004737  010662            JSR     PC,WRTCHR               ;DO WRITE CHARACTERISTICS COMMAND
1889 035752                            FORCERROR       12$                     ;@@DFORCE ERROR IF FORCER=1
1890 035766  103407                    BCS     15$                     ;BR IF CARRY SET (GOOD RETURN)
1891 035770  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
1892 035772                            NEXT.ERRNO
1893 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
1894 036002  005237  002222            INC     FATFLG                  ;SET FATAL ERROR FLAG
1895 036006                    15$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     036006  104406                                                                 TRAP    C$CLP1
1696
1897                            ;       (* Verify Timers A,B after RESET TIMER with 1 microsecond delay *)
1898                            ;       Do a Write Control RESET TIMER with 1 microsecond delay
1899 036010  012700  000001            MOV     #MS.RSD,R0              ;RESET TIMER COMMAND
1900 036014  013701  036652            MOV     T16D01,R1               ;1 MICROSECOND DELAY
1901 036020  004737  040142            JSR     PC,T16WMISC             ;SETUP T16PK2 COMMAND PACKET
1902 036024  012704  040260            MOV     #T16PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
1903 036030  010465  000000            MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
1904 036034  004737  016336            JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
1905 036040                            FORCERROR       32$                     ;@@DFORCE ERROR IF FORCER 1
```

```
TSV5   HARDWARE TESTS   MACRO M1113  06 FEB 84 17:14                                  SEQ 134
TEST  5: SUBTEST 2: VERIFY TIMERS A,B

 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$:    ERRHRD  ERRNO,T16T01,TIMEXP     ;REPORT ERROR
      036140  104456                                                                TRAP    C$ERHRD
      036142  001002                                                                .WORD   514
      036144  037431                                                                .WORD   T16T01
      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                         ;       If Timer A NOT= 0  Then Print Error
 1971                         ;       If Timer B NOT= 1  Then Print Error
 1972 036402  005002                  CLR     R2                      ;INIT EXPD
 1973 036404  042702  000010          BIC     #S2.ATIM,R2             ;TIMER A EXPD=0
 1974 036410  052702  000004          BIS     #S2.BTIM,R2             ;TIMER B EXPD=1
 1975 036414  012700  040252          MOV     #T16BFSTA,R0            ;GET RECV READ STATUS
 1976 036420  016001  000002          MOV     2(R0),R1                ;GET RECV BYTE 2
 1977 036424  042701  177763          BIC     #^C<S2.ATIM!S2.BTIM>,R1 ;SAVE TIMER A:B RECV ONLY
 1978 036430                          FORCERROR       272$,NOTSSR     ;@@D
 1979 036440  020201                  CMP     R2,R1                   ;EXPD EQUAL RECV?
 1980 036442  001404                  BEQ     280$                    ;BR IF YES
 1981 036444                          NEXT.ERRNO
 1982 036444                  272$:   ERRHRD  ERRNO,T16T53,TIMEXP     ;REPORT ERROR
      036444  104456                                                          TRAP    C$ERHRD
      036446  001006                                                          .WORD   518
      036450  037630                                                          .WORD   T16T53
      036452  015552                                                          .WORD   TIMEXP
 1983 036454                  280$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
      036454  104406                                                          TRAP    C$CLP1
 1984                         ;       Do a Write Control RESET TIMER with 78 microsecond delay
 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
```

```
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
```

```
2090
2091                                    ;*
2092                                    ; SETUP T16PK2 PACKET FOR WRITE MISC.
2093                                    ;
2094                                    ; INPUT:
2095                                    ;       R0      CONTAINS WRITE MISC FUNCTION CODE (BSEL1)
2096                                    ;       R1      CONTAINS DELAY (TIMES 800 NS) FOR BSEL2
2097                                    ;
2098 040142                            T16WMISC:
2099 040142                                    SAVREG                          ;SAVE R1 R5 UNITL NEXT RETURN
2100 040146  004737  040076                    JSR     PC,T16CLRBUF            ;CLEAR MESSAGE BUFFER
2101 040152  012702  040270                    MOV     #T16DT2,R2              ;WRITE SUBSYSTEM DATA BUFFER
2102 040156  112722  000010                    MOVB    #PW.WMISC,(R2)+         ;STORE WRITE MISCELLANEOUS IN BSEL0
2103 040162  110022                            MOVB    R0,(R2)+                ;STORE WRITE MISC CODE IN BSEL1
2104 040164  110112                            MOVB    R1,(R2)                 ;STORE DELAY (RESET TIMER) IN BSEL2
2105 040166  000207                            RTS     PC                      ;RETURN
2106                                    ;*
2107                                    ; SETUP T16PK2 PACKET FOR WRITE MISC. INVERT EXTENDED FEATURES SWITCH
2108                                    ;
2109 040170                            T16SEXT:
2110 040170  012700  040270                    MOV     #T16DT2,R0              ;WRITE SUBSYSTEM DATA BUFFER
2111 040174  112720  000010                    MOVB    #PW.WMISC,(R0)+         ;STORE WRITE MISCELLANEOUS IN BSEL0
2112 040200  112710  000200                    MOVB    #MS.EXT,(R0)            ;STORE INVERT EXTENDED FEATURES IN BSEL1
2113 040204  000207                            RTS     PC                      ;RETURN
2114
2115
2116
2117
2119         040210                            .=<.+10>&177770
2121                                    ;
2122                                    ;WRITE CHARACTERISTICS COMMAND PACKET
2123                                    ;
2124 040210                            T16PACKET:                              ;COMMAND PACKET FOR TEST
2125 040210  100004                            .WORD   100004                  ;WRITE CHARACTERISTICS COMMAND, WITH ACK
2126 040212  040220                            .WORD   T16DATA                 ;ADDRESS OF CHARACTERISTICS BLOCK
2127 040214  000000                            .WORD   0
2128 040216  000012                            .WORD   10.                     ;MESSAGE PACKET SIZE
2129
2130 040220                            T16DATA:                                ;CHARACTERISTICS DATA BLOCK
2131 040220  040232                            .WORD   T16BFR                  ;ADDRESS OF MESSAGE BUFFER
2132 040222  000000                            .WORD   0
2133 040224  000024                            .WORD   20.                     ;LENGTH OF MESSAGE BUFFER
2134 040226  000000                            .WORD   0                       ;ESS,ENB,EAI,ERI
2135 040230  000000                            .WORD   0                       ;EXTENDED FEATURES WORD
2136
2137
2138                                    ;MESSAGE BUFFER
2139
2140 040232                            T16BFR:                                 ;BEGIN MESSAGE BUFFER
2141 040232  000000                            .WORD   0                       ;MESSAGE TYPE
2142 040234  000000                            .WORD   0                       ;DATA FIELD LENGTH
2143 040236  000000                            .WORD   0                       ;RBPCR
2144 040240  000000                            .WORD   0                       ;XST0
2145 040242  000000                            .WORD   0                       ;XST1
2146 040244  000000                            .WORD   0                       ;XST2
2147 040246  000000                            .WORD   0                       ;XST3
2148 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
 2170 040374                                       ENDTS1
      040374                                                           L10053:
      040374  104401                                                          TRAP    C$ETST
```

```
                                        .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
```

```
2232                                    ;-
2233 040424                             BGNSUB                          ;////////////// BEGIN SUBTEST //////////
     040424                                                                     T6.1:
     040424  104402                                                                TRAP    C$BSUB
2234
2235                                    ;       Write to TSSR register to soft initialize the controller
2236 040426                             5$:
2237 040426  004737  015774            JSR     PC,SOFINIT              ;WRITE TO TSSR TO SOFT INITIALIZE
2238 040432  103405                    BCS     10$                     ;BR IF SOFT INIT OKAY
2239 040434  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
2240 040436                            ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL DURING INIT
     040436  104455                                                                TRAP    C$ERDF
     040440  001130                                                                .WORD   600
     040442  003652                                                                .WORD   SFIERR
     040444  012034                                                                .WORD   SFIMSG
2241                                    ;       Do a WRITE CHARACTERISTICS to setup a message buffer
2242 040446  005037  002222            10$:    CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
2243 040452  012704  050220            MOV     @T17PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
2244 040456  004737  010662            JSR     PC,WRTCHR               ;DO WRITE CHARACTERISTICS COMMAND
2245 040462                            FORCERROR       42$                     ;@@FORCE ERROR IF FORCER=1
2246 040476  103407                    BCS     50$                     ;BR IF CARRY SET (GOOD RETURN)
2247 040500  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
2248 040502                            NEXT.ERRNO
2249 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
2250 040512  005237  002222            INC     FATFLG                  ;SET FATAL ERROR FLAG
2251 040516                            50$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     040516  104406                                                                TRAP    C$CLP1
2252
2253                                    ;       Do a Write Subsystem READ STATUS
2254 040520  004737  050004            JSR     PC,T17SRD               ;SETUP PACKET FOR READ STATUS
2255 040524  012704  050370            MOV     @T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
2256 040530  010465  000000            MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
2257 040534  004737  016336            JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
2258 040540                            FORCERROR       62$                     ;@@FORCE ERROR IF FORCER=1
2259 040554  103407                    BCS     70$                     ;BR IF CARRY SET (GOOD RETURN)
2260 040556  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
2261 040560                            NEXT.ERRNO
2262 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
2263 040570  005237  002222            INC     FATFLG                  ;SET FATAL ERROR FLAG
2264 040574                            70$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     040574  104406                                                                TRAP    C$CLP1
2265                                    ;       Set WORDS 0-7  of expd message buffer = to recv since not testing
2266 040576  004737  050166            JSR     PC,T17SETEXP            ;SET WORDS 0-7 EXPD=RECV
2267 040602  012701  046422            MOV     @T17EXSTA,R1            ;GET EXPECTED READ STATUS
2268 040606  012702  050262            MOV     @T17BFSTA,R2            ;GET RECV READ STATUS
2269 040612  012221                    MOV     (R2)+,(R1)+             ;SET EXPD WORD @8 = RECV TEMP
2270 040614  011211                    MOV     (R2),(R1)               ;SET EXPD WORD @9 = RECV TEMP
2271 040616  052711  000020            BIS     @S2.INRDY,(R1)          ;SET EXP INPUT READY= TRUE
2272 040622  042711  000040            BIC     @S2.OUTRDY,(R1)         ;SET EXP OUTPUT READY= FALSE
```

```
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$,NOTSSR      ;###
2282 040664  103404                        BCS     90$                     ;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 /////////
                                                                                        T6.2:
040714  104402                                                                          TRAP    C$BSUB

                                ;       Write to TSSR register to soft initializ  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$,NOTSSR      ;###
2386            041154  103404                  BCS     90$                     ;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$:                                           ;REPEAT LABEL
2394                            ;       Do a Write Subsystem WRITE NPR to set tape direction out
2395            041176  012700  000100          MOV     #NP.OUT,R0              ;SET TAPE DIRECTION OUT
2396            041202  004737  050046          JSR     PC,T17SNPR              ;SETUP T17PK2 FOR WRITE NPR
2397            041206  012704  050370          MOV     #T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
2398            041212  010465  000000          MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
2399            041216  004737  016336          JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
2400            041222                          FORCERROR       102$                    ;###FORCE 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$                    ;@@@FORCE 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$                    ;@@@FORCE 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$,NOTSSR             ;@@@
2452 041514                                BCS     140$                    ;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$                     ;@@FORCE 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  ORDS 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  ON 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$                    ;@@FORCE 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
2661 042502  004737  050146          ;       Do a Write Subsystem WRITE FIFO
2662 042506  012701  046524                  JSR     PC,T17CLEXP             ;CLEAR EXPD BUFFER
2663 042512  013702  002310                  MOV     #T17WFDATA,R1           ;EXPD WRITE FIFO DATA BUFFER
2664 042516  022737  000001  002314          MOV     COUNT,R2                ;TEST PATTERN SIZE
2665 042524  001005                          CMP     #1,TSTFLAG              ;INCREMENT PATTERN THIS TIME THRU?
2666 042526  005000                          BNE     115$                    ;BR IF NO
2667 042530  110021                          CLR     R0                      ;INCREMENT TEST PATTERN
2668 042532  005200                  110$:   MOVB    R0,(R1)+                ;STORE INCREMENT TEST BYTE
2669 042534  005302                          INC     R0                      ;SET NEXT PATTERN
2670 042536  003374                          DEC     R2                      ;DONE?
2671 042540  022737  000002  002314          BGT     110$                    ;BR IF NO
2672 042546  001006                  115$:   CMP     #2,TSTFLAG              ;DECREMENT PATTERN THIS TIME THRU?
2673 042550  012700  000377                  BNE     125$                    ;BR IF NO
2674 042554  110021                          MOV     #377,R0                 ;DECREMENT TEST PATTERN
2675 042556  005300                  120$:   MOVB    R0,(R1)+                ;STORE DECREMENT TEST BYTE
2676 042560  005302                          DEC     R0                      ;SET NEXT PATTERN
2677 042562  003374                          DEC     R2                      ;DONE?
2678 042564  022737  000003  002314          BGT     120$                    ;BR IF NO
2679 042572  001005                  125$:   CMP     #3,TSTFLAG              ;TSTBLK PATTERNS THIS TIME THRU?
2680 042574  012700  002752                  BNE     135$                    ;BR IF NO
2681 042600  112021                          MOV     #TSTBLK,R0              ;FLOAT 1'S/0'S ETC. TEST TABLE
2682 042602  005302                  130$:   MOVB    (R0)+,(R1)+             ;STORE A TSTBLK BYTE
2683 042604  003375                          DEC     R2                      ;DONE?
2684 042606                                  BGT     130$                    ;BR IF NO
2685 042606  013700  002310          135$:
2686 042612  012701  046524                  MOV     COUNT,R0                ;FIFO BYTE COUNT
2687 042616  004737  050072                  MOV     #T17WFDATA,R1           ;FIFO WRITE DATA ADDRESS
2688 042622  012704  050370                  JSR     PC,T17WFIF              ;SETUP T17PK2 FOR WRITE FIFO
2689 042626  010465  000000                  MOV     #T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
                                             MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
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```
2690 042632  004737  016336          JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
2691 042636                          FORCERROR       142$                    ;@@@FORCE ERROR IF FORCER=1
2692 042652  103407                  BCS     150$                    ;BR IF CARRY SET (GOOD RETURN)
2693 042654  010001                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
2694 042656                          NEXT.ERRNO
2695 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
2696 042666  005237  002222          INC     FATFLG                  ;SET FATAL ERROR FLAG
2697 042672                  150$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     042672  104406                                                          TRAP    C$CLP1
2698
2699                         ;       Do a Write Subsystem READ STATUS
2700 042674  004737  050004          JSR     PC,T17SRD               ;SETUP PACKET FOR READ STATUS
2701 042700  012704  050370          MOV     @T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
2702 042704  010465  000000          MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
2703 042710  004737  016336          JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
2704 042714                          FORCERROR       157$                    ;@@@FORCE ERROR IF FORCER=1
2705 042730  103407                  BCS     160$                    ;BR IF CARRY SET (GOOD RETURN)
2706 042732  010001                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
2707 042734                          NEXT.ERRNO
2708 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
2709 042744  005237  002222          INC     FATFLG                  ;SET FATAL ERROR FLAG
2710 042750                  160$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     042750  104406                                                          TRAP    C$CLP1
2711
2712
2713 042752  004737  050166          JSR     PC,T17SETEXP            ;SET WORDS 0-7 EXPD=RECV
2714 042756  012701  046422          MOV     @T17EXSTA,R1            ;GET EXPECTED READ STATUS
2715 042762  012702  050262          MOV     @T17BFSTA,R2            ;GET RECV READ STATUS
2716 042766  012221                  MOV     (R2)+,(R1)+             ;SET EXPD WORD @8 = RECV TEMP
2717 042770  011211                  MOV     (R2),(R1)               ;SET EXPD WORD @9 = RECV TEMP
2718 042772  052711  000020          BIS     @S2.INRDY,(R1)          ;SET EXP INPUT READY= 1
2719 042776  052711  000040          BIS     @S2.OUTRDY,(R1)         ;SET EXP OUTPUT READY= 1
2720 043002  042711  000200          BIC     @S2.DIM,(R1)            ;SET EXP DATA IN MISS = 0
2721 043006  042711  000100          BIC     @S2.ILW,(R1)            ;SET EXP LAST WORD (ILW)=0
2722                         ;       If Input Ready NOT=1 then Print Error
2723                         ;       If Output Ready NOT=1 or Data in Miss NOT=0 Then Print Error
2724 043012  005000                  CLR     R0                      ;HIGH RECV ADDRESS FOR CKMSG2
2725 043014  012701  050242          MOV     @T17BFR,R1              ;LOW RECV ADDRESS FOR CKMSG2
2726 043020  012702  046402          MOV     @T17EXP,R2              ;EXPD ADDRESS
2727 043024  012703  000024          MOV     @20.,R3                 ;NUMBER OF BYTES TO COMPARE
2728 043030  004737  011500          JSR     PC,CKMSG2               ;EXPD EQUAL RECV?
2729 043034                          FORCERROR       162$,NOTSSR             ;@@@
2730 043044  103404                  BCS     170$                    ;BR IF YES
2731 043046                          NEXT.ERRNO
2732 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  0022^2             ;       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
```

```
                                                                                .WORD   T176SSR
                                                                                .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   FRRNO,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                                    ;       Do a Write Subsystem WRITE FIFO 64. bytes incrementing pattern
2988 044220  012737  000100  002310            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
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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
```

```
TSV5   HARDWARE TESTS   MACRO M1113  06 FEB 84 17:14                                  SEQ 160
TEST  6: SUBTEST 5: FIFO VERIFY INPUT READY

      044760  012350                                                          .WORD   MSGSTAT
 3094 044762                        200$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
      044762  104406                                                          TRAP    C$CLP1
 3095                               ;       Do Write Subsystem READ FIFO
 3096 044764  013700  002310                MOV     COUNT,R0                ;SET READ BYTE COUNT
 3097 044770  004737  050126                JSR     PC,T17RFIF              ;SETUP T17PK2 FOR READ FIFO
 3098 044774  012704  050370                MOV     #T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
 3099 045000  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
 3100 045004  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
 3101 045010                                FORCERROR       212$                    ;@@DFORCE ERROR IF FORCER=1
 3102 045024  103407                        BCS     220$                    ;BR IF CARRY SET (GOOD RETURN)
 3103 045026  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
 3104 045030                                NEXT.ERRNO
 3105 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
 3106 045040  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
 3107 045044                        220$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
      045044  104406                                                          TRAP    C$CLP1
 3108
 3109                               ;       If Data read from FIFO NOT= to Data sent Then Print Error
 3110 045046  005000                        CLR     R0                      ;HIGH RECV ADDRESS FOR CKMSG2
 3111 045050  012702  046524                MOV     #T17WFDATA,R2           ;GET EXPECTED ADDRESS FOR CKMSG2
 3112 045054  012701  050262                MOV     #T17BFSTA,R1            ;GET RECEIVED ADDRESS FOR CKMSG2
 3113 045060  013703  002310                MOV     COUNT,R3                ;NUMBER OF BYTES TO COMPARE
 3114 045064  004737  011500                JSR     PC,CKMSG2               ;EXPD EQUAL RECV?
 3115 045070                                FORCERROR       232$,NOTSSR             ;@@D
 3116 045100  103406                        BCS     240$                    ;BR IF YES
 3117 045102                                NEXT.ERRNO
 3118 045102  013701  002310        232$:   MOV     COUNT,R1                ;GET BYTE COUNT
 3119 045106                                ERRHRD  ERRNO,T175CMP,FIFEXP    ;REPORT ERROR
      045106  104456                                                          TRAP    C$ERHRD
      045110  001177                                                          .WORD   639
      045112  047512                                                          .WORD   T175CMP
      045114  012170                                                          .WORD   FIFEXP
 3120 045116                        240$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
      045116  104406                                                          TRAP    C$CLP1
 3121
 3122                               ;       Do a Write Subsystem READ STATUS
 3123                               ;       If Input Ready  NOT=1   Then Print Error
 3124                               ;       If Output Ready NOT=0   Then Print Error
 3125                               ;       If Data In Miss NOT=1   Then Print Error
 3126 045120  004737  050004                JSR     PC,T17SRD               ;SETUP PACKET FOR READ STATUS
 3127 045124  012704  050370                MOV     #T17PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
 3128 045130  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
 3129 045134  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
 3130 045140                                FORCERROR       252$                    ;@@DFORCE ERROR IF FORCER=1
 3131 045154  103407                        BCS     260$                    ;BR IF CARRY SET (GOOD RETURN)
 3132 045156  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
 3133 045160                                NEXT.ERRNO
 3134 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$,NOTSSR     ;SBD
3152 045264  103404                            BCS     280$                    ;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$             ;@@FORCE 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$,NOTSSR      ;@@
3264 045636  103404                    BCS     100$                    ;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
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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$               ;@@FORCE 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?
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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
```

```
TSV5   HARDWARE TESTS   MACRO M1113  06 FEB 84 17:14                    SEQ 170
TEST  7: STATIC TRANSPORT BUS INTERFACE TEST

                                        ;       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
                                        ;--

                                        BGNTST
                                                                                        T7::
050510  012700  051216                  MOV     #T18ID,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$:    CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
050552  012704  051700                  MOV     #T18PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
050556  004737  010662                  JSR     PC,WRTCHR               ;DO WRITE CHARACTERISTICS COMMAND
050562                                  FORCERROR       12$                     ;@@DFORCE 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$                     ;@@DFORCE ERROR IF FORCER=1
050670  103407                          BCS     30$                     ;BR IF CARRY SET (GOOD RETURN)
```

```
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                    CLRB    (R1)+                   ;CLEAR A BYTE
3661 050776  005300                    DEC     R0                      ;DONE?
3662 051000  003375                    BGT     60$                     ;BR IF NO
3663                           ;       Do a Write Subsystem READ STATUS
3664 051002  004737  051526            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  ONTENTS 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$,NOTSSR      ;SSD
3688 051120                                    BCS     90$                     ;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/O
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                             ;
3791 051700  100004                     T18PACKET:                      ;COMMAND PACKET FOR TEST
3792 051702  051710                             .WORD   100004          ;WRITE CHARACTERISTICS COMMAND, WITH ACK
3793 051704  000000                             .WORD   T18DATA         ;ADDRESS OF CHARACTERISTICS BLOCK
3794 051706  000012                             .WORD   0
3795                                            .WORD   10.             ;MESSAGE PACKET MINIMUM SIZE
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/O 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 prov'de 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,ITADO,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$:    CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
052034  012704  062330          ;       MOV     #T19PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
052040  004737  010662          ;       JSR     PC,WRTCHR               ;DO WRITE CHARACTERISTICS COMMAND
052044                          ;       FORCERROR       12$                     ;@@FORCE 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$                     ;@@FORCE 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
```

```
TSV5   HARDWARE TESTS   MACRO M1113  06-FEB-84 17:14                                    SEQ 177
TEST  8: SUBTEST 1: LOOPBACK CONTROL SIGNAL TEST

      052172  104406                                                                    TRAP    C$CLP1
3948
3949 052174  005037  002222          ;       Do WRITE CHARACTERISTICS to select reserved unit 7
3950 052200  012704  062330                  CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
3951 052204  004737  010662                  MOV     @T19PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
3952 052210                                  JSR     PC,WRTCHR               ;DO WRITE CHARACTERISTICS COMMAND
3953 052224  103407                          FORCERROR       42$                     ;@@DFORCE ERROR IF FORCER=1
3954 052226  010001                          BCS     50$                     ;BR IF CARRY SET (GOOD RETURN)
3955 052230                                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
3956 052230                                  NEXT.ERRNO
      052230  104455                  42$:    ERRDF   ERRNO,T19SSR,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
      052232  001443                                                                  TRAP    C$ERDF
      052234  060243                                                                  .WORD   803
      052236  012046                                                                  .WORD   T19SSR
3957 052240  005237  002222                                                          .WORD   PKTSSR
3958 052244                                  INC     FATFLG                  ;SET FATAL ERROR FLAG
      052244  104406          50$:    CKLOOP                                  ;LOOP ON ERROR, IF FLAG SET
3959                                                                                  TRAP    C$CLP1
3960 052246  012700  000100    ;       Do a Write Subsystem WRITE NPR to set tape direction out and Loopback
3961 052252  052700  000040                  MOV     @NP.OUT,R0              ;SET TAPE DIRECTION OUT
3962 052256  004737  062042                  BIS     @NP.LOOP,R0             ;SET LOOPBACK ENABLE
3963 052262  012704  062500                  JSR     PC,T19SNPR              ;SETUP T19PK2 FOR WRITE NPR .
3964 052266  010465  000000                  MOV     @T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
3965 052272  004737  016336                  MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
3966 052276                                  JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
3967 052312  103407                          FORCERROR       62$                     ;@@DFORCE ERROR IF FORCER=1
3968 052314  010001                          BCS     70$                     ;BR IF CARRY SET (GOOD RETURN)
3969 052316                                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
3970 052316                                  NEXT.ERRNO
      052316  104455          62$:    ERRDF   ERRNO,T194SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
      052320  001444                                                                  TRAP    C$ERDF
      052322  060411                                                                  .WORD   804
      052324  012046                                                                  .WORD   T194SSR
3971 052326  005237  002222                                                          .WORD   PKTSSR
3972 052332                                  INC     FATFLG                  ;SET FATAL ERROR FLAG
      052332  104406          70$:    CKLOOP                                  ;LOOP ON ERROR, IF FLAG SET
3973                                                                                  TRAP    C$CLP1
3974                           ;       Do Write Subsystem Write Control to CLEAR loopback signals group 1.
3975                           ;       Do Write Subsystem Write Format to CLEAR loopback signals group 2.
3976                           ;        (the loopback signals have to be cleared here due to the flip flops
3977 052334  005000            ;          that are set on a 1 to 0 transition (IHER,IFMK,ICER))
3978 052336  042700  000200            CLR     R0                      ;WRITE 0'S
3979 052342  042700  000100            BIC     @WC.IFAD,R0             ;IFAD MUST  ALWAYS =0
3980 052346  042700  000040            BIC     @WC.IOTAD,R0            ;ITADO MUST ALWAYS =0
3981 052352  004737  062142            BIC     @WC.I1TAD,R0            ;ITAD1 MUST ALWAYS =0
3982 052356  012704  062500            JSR     PC,T19WCTL              ;SETUP PACKET FOR WRITE CONTROL
3983 052362  010465  000000            MOV     @T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
3984 052366  004737  016336            MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
3985 052372                            JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
3986 052406  103407                    FORCERROR       82$                     ;@@DFORCE ERROR IF FORCER=1
3987 052410  010001                    BCS     90$                     ;BR IF CARRY SET (GOOD RETURN)
3988 052412                            MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
3989 052412                            NEXT.ERRNO
      052412  104455          82$:    ERRDF   ERRNO,T197SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
      052414  001445                                                                  TRAP    C$ERDF
      052416  060563                                                                  .WORD   805
      052420  012046                                                                  .WORD   T197SSR
                                                                                      .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$                            ;@@FORCE 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$                    ;@@FORCE 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$                    ;@@FORCE 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)
```

```
TSV5   HARDWARE TESTS   MACRO M1113  06 FEB-84 17:14                                  SEQ 179
TEST  8: SUBTEST 1: LOOPBACK CONTROL SIGNAL TEST

 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                         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   P<TSSR
 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                    SWAP    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     #T198FSTA,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$:   MOV     R0,(R1)                 ;SETUP FINAL EXPD IN WORD @8
4146 053430  016261  000002  000002        MOV     2(R2),2(R1)             ;SET EXPD WORD @9 = RECV (NOT TESTING)
4147 053436  005000                        CLR     R0                      ;HIGH RECV ADDRESS FOR CKMSG2
4148 053440  012701  062352                MOV     @T198FR,R1              ;LOW RECV ADDRESS FOR CKMSG2
4149 053444  012702  060062                MOV     @T19EXP,R2              ;EXPD ADDRESS
4150 053450  012703  000024                MOV     @20.,R3                 ;NUMBER OF BYTES TO COMPARE
4151 053454  004737  011500                JSR     PC,CKMSG2               ;EXPD EQUAL RECV?
4152 053460                                FORCERROR       302$,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$             ;@@FORCE ERROR IF FORCFR=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                               ;       Do a WRITE FIFO with byte count equal to 1 and Tape direction OUT
4320 054352  012700  000001                MOV     #1,R0                   ;WRITE 1 BYTE
4321 054356  012701  002312                MOV     #DATA,R1                ;FIFO WRITE DATA ADDRESS
4322 054362  004737  062106                JSR     PC,T19WFIF              ;SETUP T19PK2 FOR WRITE FIFO
4323 054366  012704  062500                MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
4324 054372  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
4325 054376  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
4326 054402                                FORCERROR       107$                    ;@@DFORCE ERROR IF FORCER=1
4327 054416  103407                        BCS     110$                    ;BR IF CARRY SET (GOOD RETURN)
4328 054420  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4329 054422                                NEXT.ERRNO
4330 054422                        107$:   ERRDF   ERRNO,T195SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     054422  104455                                                                TRAP    C$ERDF
     054424  001465                                                                .WORD   821
     054426  060454                                                                .WORD   T195SSR
     054430  012046                                                                .WORD   PKTSSR
4331 054432  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
4332 054436                        110$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     054436  104406                                                                TRAP    C$CLP1
4333                               ;       Do a READ FIFO with tape direction OUT to load tape out write latch
4334 054440  012700  000001                MOV     #1,R0                   ;SET READ BYTE COUNT
4335 054444  004737  062066                JSR     PC,T19RFIF              ;SETUP T19PK2 FOR READ FIFO
4336 054450  012704  062500                MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
4337 054454  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
4338 054460  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
4339 054464                                FORCERROR       122$                    ;@@DFORCE ERROR IF FORCER=1
4340 054500  103407                        BCS     130$                    ;BR IF CARRY SET (GOOD RETURN)
4341 054502  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4342 054504                                NEXT.ERRNO
4343 054504                        122$:   ERRDF   ERRNO,T196SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     054504  104455                                                                TRAP    C$ERDF
     054506  001466                                                                .WORD   822
     054510  060520                                                                .WORD   T196SSR
     054512  012046                                                                .WORD   PKTSSR
4344 054514  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
4345 054520                        130$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     054520  104406                                                                TRAP    C$CLP1
4346                               ;       Do a WRITE NPR to set loopback and tape direction IN
4347 054522  005000                        CLR     R0                      ;CLR NP.OUT TO SET TAPE DIRECTION IN
4348 054524  052700  000040                BIS     #NP.LOOP,R0             ;SET LOOPBACK
4349 054530  004737  062042                JSR     PC,T19SNPR              ;SETUP T19PK2 FOR WRITE NPR
4350 054534  012704  062500                MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
4351 054540  010465  000000                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$
4354 054564  103407                                                  ;@@DFORCE ERROR IF FORCER=1
4355 054566  010001                  BCS     150$                    ;BR IF CARRY SET (GOOD RETURN)
4356 054570                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4357 054570                          NEXT.ERRNO
     054570  104455              142$:   ERRDF   ERRNO,T194SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
                                                                             TRAP    C$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$
4369 054654  010001                                                      ;@@DFORCE ERROR IF FORCER=1
4370 054656                              BCS     170$                    ;BR IF CARRY SET (GOOD RETURN)
4371 054656                              MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
     054656  104455                      NEXT.ERRNO
     054660  001470              162$:   ERRDF   ERRNO,T195SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
                                                                             TRAP    C$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$
4383 054736  010001                                                  ;@@DFORCE ERROR IF FORCER=1
4384 054740                          BCS     190$                    ;BR IF CARRY SET (GOOD RETURN)
4385 054740                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
     054740  104455                  NEXT.ERRNO
     054742  001471              182$:   ERRDF   ERRNO,T196SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
                                                                             TRAP    C$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$                    ;@@FORCE 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
```

```
4436
4437
4438
4439 055232                                    FORCEXIT        255$            ;@@D
4440 055242  013703  002316                    MOV     TSTPTR,R3               ;RESTORE CURRENT TSTBLK POINTER
4441 055246  020327  003062                    CMP     R3,@TBLEND              ;END OF TSTBLK?
4442 055252  103002                           BHIS    255$                    ;BR IF YES
4443 055254  000137  054246                    JMP     100$                    ;DO ANOTHER TSTBLK PATTERN
4444 055260                            255$:
4445
4446 055260                                    ENDSUB                          ;////////////// END SUBTEST //////////
     055260                                                                                    L10070:
     055260  104403                                                                                    TRAP    C$ESUB
4447
4448 055262  005737  002222                    TST     FATFLG                  ;ANY FATAL ERRORS ?
4449 055266  001402                           BEQ     260$                    ;BRANCH IF NOT
4450 055270  004737  017202                    JSR     PC,CKDROP               ;TRY TO DROP THE UNIT
4451 055274                            260$:
4452
4453
4454                                           .SBTTL  TEST  8: SUBTEST 3: LOOPBACK WRITE STROBE TEST
4455
4456                                   ;++
4457                                   ; TEST 8: SUBTEST 3:
4458                                   ;
4459                                   ; SUBTEST DESCRIPTION:
4460                                   ;
4461                                   ;       This subtest verifies the Write Strobe loopback path
4462                                   ;       can strobe data from the FIFO to the Data lines.
4463                                   ;       The signal IRESV3 drives IWSTR (write strobe) to write
4464                                   ;       data from the FIFO to the tape data out latch.
4465                                   ;
4466                                   ; TEST STEPS:
4467                                   ;
4468                                   ;
4469                                   ;  REPEAT FOR ALL TEST PATTERNS IN TSTBLK TABLE
4470                                   ;    BEGIN
4471                                   ;       Write to TS3R register to soft initialize the controller
4472                                   ;       Do WRITE CHARACTERISTICS to check for Extended Features Switch
4473                                   ;       If Extended Features Hardware Switch Clear then:
4474                                   ;         Do Write Subsystem Write Miscellaneous to Set Extended Features.
4475                                   ;       Do WRITE CHARACTERISTICS to select reserved unit 7 and setup BUFFER
4476                                   ;       Do a Write Subsystem WRITE MPR to set tape direction out and Loopback
4477                                   ;       Do a WRITE NPR to set loopback and tape direction OUT
4478                                   ;       Do a WRITE FORMAT to set IRESV3-->IWSTR = 1
4479                                   ;       Do a WRITE FIFO with byte count equal to 1 and Tape direction OUT
4480                                   ;       Do a WRITE FORMAT to set IRESV3-->IWSTR = 0 to load write data latch
4481                                   ;       Do a WRITE FORMAT to set IRESV3-->IWSTR = 1
4482                                   ;       Do a WRITE NPR to set loopback and tape direction IN
4483                                   ;       Do a WRITE FIFO with byte count equal to 1 and Tape direction IN
4484                                   ;         to strobe loopback data into FIFO.
4485                                   ;       Do a READ FIFO with tape direction IN to read data
4486                                   ;       If Data read from FIFO NOT= to Data sent Then Print Error
4487                                   ;    END
4488                                   ;
4489 055274                                    BGNSUB                          ;////////////// BEGIN SUBTEST //// .  //
     055274                                                                                    T8.3:
```

```
      055274  104402                                                                TRAP    C$BSUB
4490                                ;       Write to TSSR register to soft initialize the controller
4491 055276                         5$:
4492 055276  004737  015774                JSR     PC,SOFTINIT             ;WRITE TO TSSR TO SOFT INITIALIZE
4493 055302  103405                        BCS     10$                     ;BR IF SOFT INIT OKAY
4494 055304  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4495 055306                                ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL DURING INIT
      055306  104455                                                                TRAP    C$ERDF
      055310  001474                                                                .WORD   828
      055312  003652                                                                .WORD   SFIERR
      055314  012034                                                                .WORD   SFIMSG
4496                                ;       Do WRITE CHARACTERISTICS to check for Extended Features Switch
4497 055316  005037  002222        10$:    CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
4498 055322  012704  062330                MOV     #T19PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
4499 055326  004737  010662                JSR     PC,WRTCHR               ;DO WRITE CHARACTERISTICS COMMAND
4500 055332                                FORCERROR       12$                     ;@@DFORCE ERROR IF FORCER=1
4501 055346  103407                        BCS     15$                     ;BR IF CARRY SET (GOOD RETURN)
4502 055350  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4503 055352                                NEXT.ERRNO
4504 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
4505 055362  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
4506 055366                         15$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
      055366  104406                                                                TRAP    C$CLP1
4507                                ;       If Extended Features Hardware Switch Clear then:
4508                                ;         Do Write Subsystem Write Miscellaneous to Set Extended Features.
4509 055370  012701  062352                MOV     #T19BFR,R1              ;MESSAGE BUFFER ADDRESS
4510 055374  032761  000200  000012        BIT     #X2.EXTF,XST2(R1)       ;EXTENDED FEATURES SWITCH SET?
4511 055402  001026                        BNE     30$                     ;BR IF YES
4512 055404  004737  062202                JSR     PC,T19SEXT              ;SETUP PACKET FOR WRITE MISC INVERT
4513 055410  012704  062500                MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
4514 055414  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
4515 055420  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
4516 055424                                FORCERROR       22$                     ;@@DFORCE ERROR IF FORCER=1
4517 055440  103407                        BCS     30$                     ;BR IF CARRY SET (GOOD RETURN)
4518 055442  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4519 055444                                NEXT.ERRNO
4520 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
4521 055454  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
4522 055460                         30$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
      055460  104406                                                                TRAP    C$CLP1
4523                                ;       Do WRITE CHARACTERISTICS to select reserved unit 7
4524 055462  012704  062330                MOV     #T19PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
4525 055466  004737  010662                JSR     PC,WRTCHR               ;DO WRITE CHARACTERISTICS COMMAND
4526 055472                                FORCERROR       42$                     ;@@DFORCE ERROR IF FORCER=1
4527 055506  103407                        BCS     50$                     ;BR IF CARRY SET (GOOD RETURN)
4528 055510  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4529 055512                                NEXT.ERRNO
4530 055512                         42$:   ERRDF   ERRNO,T19SSR,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
      055512  104455                                                                TRAP    C$ERDF
```

```
TSV5  HARDWARE TESTS   MACRO M1113  06 FEB 84 17:14                                  SEQ 190
TEST  8: SUBTEST 3: LOOPBACK WRITE STROBE TEST

        055514  001477                                                                  .WORD   831
        055516  060243                                                                  .WORD   T19SSR
        055520  012046                                                                  .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$:   MOV     (R3)+,DATA              ;GET A TEST PATTERN
  4537  055540  042737  177400  002312      BIC     #^C<377>,DATA           ;DATA IS BYTE
  4538  055546  010337  002316              MOV     R3,TSTPTR               ;SETUP CURRENT TSTBLK POINTER
  4539                                  ;       Do a WRITE NPR to set loopback and tape direction OUT
  4540  055552  012700  000100              MOV     #NP.OUT,R0              ;SET TAPE DIRECTION OUT
  4541  055556  052700  000040              BIS     #NP.LOOP,R0             ;SET LOOPBACK
  4542  055562  004737  062042              JSR     PC,T19SNPR              ;SETUP T19PK2 FOR WRITE NPR
  4543  055566  012704  062500              MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
  4544  055572  010465  000000              MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
  4545  055576  004737  016336              JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
  4546  055602                              FORCERROR       102$                    ;@@FORCE 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$                    ;@@FORCE 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$                    ;@@FORCE ERROR IF FORCER 1
```

```
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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4616 056216  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4617 056220                            NEXT.ERRNO
4618 056220                    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
4619 056230  005237  002222            INC     FATFLG                  ;SET FATAL ERROR FLAG
4620 056234                    190$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     056234  104406                                                            TRAP    C$CLP1
4621                           ;       Do a WRITE FIFO with byte count equal to 1 and Tape direction IN
4622 056236  012700  000001            MOV     #1,R0                   ;WRITE 1 BYTE
4623 056242  012701  002312            MOV     #DATA,R1                ;FIFO WRITE DATA ADDRESS
4624 056246  004737  062106            JSR     PC,T19WFIF              ;SETUP T19PK2 FOR WRITE FIFO
4625 056252  012704  062500            MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
4626 056256  010465  000000            MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
4627 056262  004737  016336            JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
4628 056266                            FORCERROR       202$                    ;@@DFORCE ERROR IF FORCER=1
4629 056302  103407                    BCS     210$                    ;BR IF CARRY SET (GOOD RETURN)
4630 056304  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4631 056306                            NEXT.ERRNO
4632 056306                    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
4633 056316  005237  002222            INC     FATFLG                  ;SET FATAL ERROR FLAG
4634 056322                    210$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     056322  104406                                                            TRAP    C$CLP1
4635                           ;       Do a READ FIFO with tape direction IN to read data
4636 056324  012700  000001            MOV     #1,R0                   ;SET READ BYTE COUNT
4637 056330  004737  062066            JSR     PC,T19RFIF              ;SETUP T19PK2 FOR READ FIFO
4638 056334  012704  062500            MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
4639 056340  010465  000000            MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
4640 056344  004737  016336            JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
4641 056350                            FORCERROR       222$                    ;@@DFORCE ERROR IF FORCER=1
4642 056364  103407                    BCS     230$                    ;BR IF CARRY SET (GOOD RETURN)
4643 056366  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4644 056370                            NEXT.ERRNO
4645 056370                    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
4646 056400  005237  002222            INC     FATFLG                  ;SET FATAL ERROR FLAG
4647 056404                    230$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     056404  104406                                                            TRAP    C$CLP1
4648                           ;       If Data read from FIFO NOT= to Data sent Then Print Error
4649 056406  004737  062240            JSR     PC,T19SETEXP            ;SET WORDS 0-7 EXPD=RECV (NOT TESTING)
4650 056412  012701  060102            MOV     #T19EXSTA,R1            ;GET EXPECTED READ STATUS
4651 056416  012702  062372            MOV     #T19BFSTA,R2            ;GET RECV READ STATUS
4652 056422  013711  002312            MOV     DATA,(R1)               ;SET EXPD WORD #8 = DATA
4653 056426  016261  000002  000002    MOV     2(R2),2(R1)             ;SET EXPD WORD #9 = RECV (NOT TESTING)
4654 056434  005000                    CLR     R0                      ;HIGH RECV ADDRESS FOR CKMSG2
4655 056436  012701  062352            MOV     #T19BFR,R1              ;LOW RECV ADDRESS FOR CKMSG2
4656 056442  012702  060062            MOV     #T19EXP,R2              ;EXPD ADDRESS
4657 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
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4708                                    ;       Do a WRITE FORMAT to set IRESV4==>IRSTR = 1
4709                                    ;         (to strobe loopback data into FIFO.)
4710                                    ;       Do a READ FIFO with tape direction IN to read data
4711                                    ;       If Data read from FIFO NOT= to Data sent Then Print Error
4712                                    ;   END
4713                                    ;--
4714 056544                                     BGNSUB                          ;////////////// BEGIN SUBTEST //////////
     056544                                                                                      T8.4:
     056544  104402                                                                             TRAP    C$BSUB
4715                                    ;       Write to TSSR register to soft initialize the controller
4716 056546                            5$:
4717 056546  004737  015774                    JSR     PC,SOFINIT              ;WRITE TO TSSR TO SOFT INITIALIZE
4718 056552  103405                            BCS     10$                     ;BR IF SOFT INIT OKAY
4719 056554  010001                            MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4720 056556                                    ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL DURING INIT
     056556  104455                                                                             TRAP    C$ERDF
     056560  001510                                                                             .WORD   840
     056562  003652                                                                             .WORD   SFIERR
     056564  012034                                                                             .WORD   SFIMSG
4721                                    ;       Do WRITE CHARACTERISTICS to check for Extended Features Switch
4722 056566  005037  002222            10$:    CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
4723 056572  012704  062330                    MOV     @T19PACKET,R4           ;GET THE ADDRESS OF COMMAND PACKET
4724 056576  004737  010662                    JSR     PC,WRTCHR               ;DO WRITE CHARACTERISTICS COMMAND
4725 056602                                    FORCERROR       12$                     ;@@FORCE ERROR IF FORCER=1
4726 056616  103407                            BCS     15$                     ;BR IF CARRY SET (GOOD RETURN)
4727 056620  010001                            MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4728 056622                                    NEXT.ERRNO
4729 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
4730 056632  005237  002222                    INC     FATFLG                  ;SET FATAL ERROR FLAG
4731 056636                            15$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     056636  104406                                                                             TRAP    C$CLP1
4732                                    ;       If Extended Features Hardware Switch Clear then:
4733                                    ;         Do Write Subsystem Write Miscellaneous to Set Extended Features.
4734 056640  012701  062352                    MOV     @T19BFR,R1              ;MESSAGE BUFFER ADDRESS
4735 056644  032761  000200  000012            BIT     @X2.EXTF,XST2(R1)       ;EXTENDED FEATURES SWITCH SET?
4736 056652  001026                            BNE     30$                     ;BR IF YES
4737 056654  004737  062202                    JSR     PC,T19SEXT              ;SETUP PACKET FOR WRITE MISC INVERT
4738 056660  012704  062500                    MOV     @T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
4739 056664  010465  000000                    MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
4740 056670  004737  016336                    JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
4741 056674                                    FORCERROR       22$                     ;@@FORCE ERROR IF FORCER=1
4742 056710  103407                            BCS     30$                     ;BR IF CARRY SET (GOOD RETURN)
4743 056712  010001                            MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4744 056714                                    NEXT.ERRNO
4745 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
4746 056724  005237  002222                    INC     FATFLG                  ;SET FATAL ERROR FLAG
4747 056730                            30$:    CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     056730  104406                                                                             TRAP    C$CLP1
4748                                    ;       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                MOV     #WF.I4RES,R0            ;IRESV4==>IRSTR=1
4780 057114  004737  062162                JSR     PC,T19WFMT              ;SETUP T9PK2 FOR WRITE FORMAT
4781 057120  012704  062500                MOV     #T19PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
4782 057124  010465  000000                MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
4783 057130  004737  016336                JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
4784 057134                                FORCERROR       112$                    ;@@DFORCE ERROR IF FORCER=1
4785 057150  103407                        BCS     120$                    ;BR IF CARRY SET (GOOD RETURN)
4786 057152  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4787 057154                                NEXT.ERRNO
4788 057154                        112$:   ERRDF   ERRNO,T198SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     057154  104455                                                                TRAP    C$ERDF
     057156  001515                                                                .WORD   845
     057160  060632                                                                .WORD   T198SSR
     057162  012046                                                                .WORD   PKTSSR
4789 057164  005237  002222                INC     FATFLG                  ;SET FATAL ERROR FLAG
4790 057170                        120$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     057170  104406                                                                TRAP    C$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
                                             FORCLRROR       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
4811 057304                                  FORCERROR       152$                    ;@@DFORCE ERROR IF FORCER=1
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
4826 057404  103407                          FORCERROR       182$                    ;@@DFORCE ERROR IF FORCER=1
4827 057406  010001                          BCS     190$                    ;BR IF CARRY SET (GOOD RETURN)
4828 057410                                  MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4829 057410                                  NEXT.ERRNO
     057410  104455                  182$:   ERRDF   ERRNO,T194SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     057412  001520                                                                      TRAP    C$ERDF
     057414  060411                                                                      .WORD   848
     057416  012046                                                                      .WORD   T194SSR
4830 057420  005237  002222                                                             .WORD   PKTSSR
4831 057424                                  INC     FATFLG                  ;SET FATAL ERROR FLAG
     057424  104406                  190$:   CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
4832                                                                                    TRAP    C$CLP1
                                     ;       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   349
     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 / EXPD=RECV (NOT TESTING
4873 057656  012701  060102                MOV     #T19EXSTA,R1            ;GET EXPECTED READ STATUS
4874 057662  012702  062372                MOV     #T198FSTA,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     #T198FR,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$,NOTSSR     ;SSD
4883 057732  103404                            BCS     310$                    ;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$            ;SSD
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                            T198FCTL:                               ;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>
```

```
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
```

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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   FFER
4998 062004  012700  062510                     MOV     #T19DT2,R0              ;WRITE SUBSYSTE   DATA BUFFER
4999 062010  112720  000005                     MOVB    #PW.RDSTATUS,(R0)+      ;STORE READ STA US 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  000207                             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 BSEL0
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 BSEL0
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 BSEL0
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 BSEL0
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 BSEL0
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 06234J                    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
```

```
5210                                    ;       error occurred.
5211                                    ;       A Reset FIFO is done and the Read Data parity
5212                                    ;       error bit is again tested to insure it cleared.
5213                                    ;       Finally a Clear wrong parity function is done
5214                                    ;       and it is verified the data word can pass in loopback
5215                                    ;       mode without setting Read Data parity error.
5216                                    ;
5217                                    ; TEST STEPS:
5218                                    ;
5219                                    ;  REPEAT FOR LOOPCNT
5220                                    ;    BEGIN
5221                                    ;       Write to TSSR register to soft initialize the controller
5222                                    ;       Do WRITE CHARACTERISTICS to check for Extended Features Switch
5223                                    ;       If Extended Features Hardware Switch Clear then:
5224                                    ;         Do Write Subsystem Write Miscellaneous to Set Extended Features.
5225                                    ;       Do WRITE CHARACTERISTICS to select reserved unit 7 and setup BUFFER
5226                                    ;  REPEAT FOR ALL TEST PATTERNS IN TSTBLK TABLE
5227                                    ;    BEGIN
5228                                    ;       (* Verify Write Wrong Parity Sets Parity Error *)
5229                                    ;       Do a WRITE NPR to set loopback and tape direction OUT
5230                                    ;              and SET Write Wrong Parity.
5231                                    ;       Do a WRITE FORMAT  to set IRESV4==>IRSTR = 1 (sets read strobe high)
5232                                    ;       Do a WRITE FIFO with byte count equal to 1 and Tape direction OUT
5233                                    ;       Do a READ FIFO with tape direction OUT to load tape out write latch
5234                                    ;         (this is when wrong parity (IWP) is set)
5235                                    ;       Do a WRITE FORMAT  to set IRESV4==>IRSTR = 0 (sets read strobe low)
5236                                    ;             (Read Strobe sets PAR IN H [Parity Error])
5237                                    ;       Do a WRITE FORMAT  to set IRESV4==>IRSTR = 1 (sets read strobe high)
5238                                    ;       Do a Write Subsystem READ STATUS
5239                                    ;       If Read Data parity error NOT=1  Then Print Error
5240                                    ;       Do a Write Misc to RESET FIFO
5241                                    ;       Do a Write Subsystem READ STATUS
5242                                    ;       If Read Data parity error NOT=0  Then Print Error
5243                                    ;
5244                                    ;       (* Verify Data can be transferred without a Parity Error *)
5245                                    ;       Do a WRITE FORMAT  to set IRESV4==>IRSTR = 1 (sets read strobe high)
5246                                    ;       Do a WRITE NPR to set loopback and tape direction OUT
5247                                    ;              and CLEAR Write Wrong Parity.
5248                                    ;       Do a WRITE FIFO with byte count equal to 1 and Tape direction OUT
5249                                    ;       Do a READ FIFO with tape direction OUT to load tape out write latch
5250                                    ;       Do a WRITE FORMAT  to set IRESV4==>IRSTR = 0 (sets read strobe low)
5251                                    ;             (Read Strobe should NOT set PAR IN H [Parity Error] here)
5252                                    ;       Do a WRITE FORMAT  to set IRESV4==>IRSTR = 1 (sets read strobe high)
5253                                    ;       Do a Write Subsystem READ STATUS
5254                                    ;       If Read Data parity error NOT=0  Then Print Error
5255                                    ;
5256                                    ;    END
5257                                    ; -
5258
5259
5260 062616                                   BGNTST
     062616                                                                                T9::
5265 062616  012700  065202                    MOV     #TST20ID,R0             ;ASCII MESSAGE TO IDENTIFY TEST
5266 062622  004737  016510                    JSR     PC,TSTSETUP             ;DO INITIAL TEST SETUP
5267 062626  012737  000012  002216            MOV     #10.,LOOPCNT            ;PERFORM 10 ITERATIONS
5268 062634                              T20LOOP:
5269
```

```
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,P1                   ;SAVE CONTENTS OF TSSR
5276 062646                                    ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL DURING INIT
     062646  104455                                                                             TRAP    C$ERDF
     062650  001604                                                                            .WORD   600
     062652  003652                                                                            .WORD   SFIERR
     062654  012034                                                                            .WORD   SFIMSG
5277                                   ;       Do WRITE CHARACTERISTICS to check for Extended Features Switch
5278 062656  005037  002222              10$:  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$:   MOV     (R3)+,DATA              ;GET A TEST PATTERN
5319 063100  042737  177400  002312        BIC     #^C<377>,DATA           ;DATA IS BYTE
5320 063106  010337  002316                  MOV     R3,TSTPTR               ;SETUP CURRENT TSTBLK POINTER
5321                                 ;       Do a WRITE NPR to set loopback and tape direction OUT and
5322                                 ;                 and SET Write Wrong Parity.
5323 063112  012700  000100                  MOV     #NP.OUT,R0              ;SET TAPE DIRECTION OUT
5324 063116  052700  000040                  BIS     #NP.LOOP,R0             ;SET LOOPBACK
5325 063122  042700  000020                  BIC     #NP.WRP,R0              ;SET WRITE WRONG PARITY (INVERTED)
5326 063126  004737  066166                  JSR     PC,T20WNPR              ;SETUP T20PK2 FOR WRITE NPR
5327 063132  012704  066550                  MOV     #T20PK2,R4              ;GET WRITE SUBSYSTEM COMMAND PACKET
5328 063136  010465  000000                  MOV     R4,TSDB(R5)             ;SET THE PACKET ADDRESS TO EXECUTE
5329 063142  004737  016336                  JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
5330 063146                                  FORCERROR       102$                    ;@@FORCE 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$                    ;@@FORCE ERROR IF FORCER=1
5344 063244  103407                          BCS     120$                    ;BR IF CARRY 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
```

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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     #T208FSTA,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     #T208FR,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$:   ERRHRD  ERRNO,T20RSF,MSGSTA1    ;REPORT ERROR
     064122  104456                                                                  TRAP    C$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
```

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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$:   ERRDF   FRRNO,T204SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     064272  104455                                                                    TRAP    C$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
```

```
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 0650E2                                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                                    ;
```

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TSV5   HARDWARE TESTS   MACRO M1113  06 FEB 84 17:14                                  SEQ 215
TEST  9: READ/WRITE DATA PARITY TEST

 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
 5786 066422  000000                    T20BFR:                                 ;BEGIN MESSAGE BUFFER
 5787 066424  000000                            .WORD   0                       ;MESSAGE TYPE
 5788 066426  000000                            .WORD   0                       ;DATA FIELD LENGTH
 5789 066430  000000                            .WORD   0                       ;RBPCR
 5790 066432  000000                            .WORD   0                       ;XST0
 5791 066434  000000                            .WORD   0                       ;XST1
 5792 066436  000000                            .WORD   0                       ;XST2
 5793 066440  000000                            .WORD   0                       ;XST3
 5794 066442                                    .WORD   0                       ;XST4 (ALWAYS PRESENT FOR WRITE SUBSYSTEM
 5795 066542                            T20BFSTA: .BLKB 64.                     ;READ STATUS AND WRITE FIFO BUFFER
 5796                                   T20BEND:                                ;END OF MESSAGE BUFFER
 5797                                   ;
 5798                                   ;WRITE SUBSYSTEM READ STATUS COMMAND PACKET
 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  TES. 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.
```

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

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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$CLP1
  5981  067226                                SETPRI  #PRIO7              ;RAISE THE PRIORITY
        067226  012700  000340                                                          MOV     #PRIO7,R0
        067232  104441                                                                  TRAP    C$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     #PRIO7,(R1)         ;USE PRIORITY SEVEN
  5992  067306                                SETPRI  #PRIOO              ;LOWER INTERRUPT BR LEVEL
        067306  012700  000000                                                          MOV     #PRIOO,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,T38BSO          ;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  @T38ONL         ;'DRIVE IS NOW ON-LINE"
     070160 012746 073006                                               MOV     @T38ONL,-(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                          380$:  PRINTF  #T380FL                ;"DRIVE IS NOW OFF LINE"
     070202  012746  073042                                                        MOV    #T380FL,-(SP)
     070206  012746  000001                                                        MOV    #1,-(SP)
     070212  010600                                                                MOV    SP,R0
     070214  104417                                                                TRAP   C$PNTF
     070216  062706  000004                                                        ADD    #4,SP
6117 070222  005037  002224          390$:  CLR    INTRECV                 ;CLEAR INTERRUPT FLAG
6118 070226  000137  067650                 JMP    300$                    ;TRY AGAIN
6119 070232                          25$:   GMANIL  T38MSG,T38DAT, 1,NO     ;WAIT FOR OPERATOR TO MOUNT TAPE
     070232  104443                                                                TRAP   C$GMAN
     070234  000404                                                                BR     10000$
     070236  074014                                                                .WORD  T38DAT
     070240  000120                                                                .WORD  T$CODE
     070242  073325                                                                .WORD  T38MSG
     070244  177777                                                                .WORD  -1
     070246                                                                10000$:
6120 070246                                 BNCOMPLETE 25$                 ;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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                070600  104456                                                          TRAP    C$ERHRD
                070602  001771                                                          .WORD   1017
                070604  005056                                                          .WORD   WRTMSG
                070606  012034                                                          .WORD   SFIMSG
6204            070610                          510$:
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 TSR 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$CLP1
6217 070656                             SETPRI  #PRI07                  ;RAISE THE PRIORITY
                070656  012700  000340                                                  MOV     #PRI07,R0
                070662  104441                                                          TRAP    C$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     #PRI07,(R1)     ;USE PRIORITY SEVEN
6228 070736                                     SETPRI  #PRI00          ;LOWER INTERRUPT BR LEVEL
                070736  012700  000000                                                  MOV     #PRI00,R0
                070742  104441                                                          TRAP    C$SPRI
6229 070744     000240          560$:   NOP                             ;LOOP AWHILE
6230 070746     000776                  BR      560$                    ;STAY IN "TIGHT" LOOP
6231                                    ;+
6232                                    ;PROCESS CONSOLE INTERRUPTS
6233                                    ;-
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
625C 071054     016501  000002                  MOV     TSSR(R5),R1     ;CONTENTS OF TSSR REGISTER
```

```
TSV5   HARDWARE TESTS   MACRO M1113  06-FEB-84 17:14                                SEQ 226
TEST 10: MANUAL INTERVENTION

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$ERDF
     071204  001774                                                         .WORK   1020
     071206  003652                                                         .WORD   SFIERR
     071210  012034                                                         .WORD   SFIMSG
6278 071212                          600$: 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
```

```
6295 071270                                  610$:  CKLOOP                          ;LOOP IF SELECTED
     071270  104406                                                                          TRAP    C$CLP1
6296 071272  112737  000000  071501                MOVB    #0,T38BS1              ;CLEAR BIT #4
6297 071300  112737  000024  071500                MOVB    #24,T38BSO             ;READ EXTENDED DRIVE STATUS
6298 071306  012704  071470                        MOV     #T38PACKET,R4          ;SET UP NEW WRT. SUBSYS MEM. COMMAND
6299 071312  010465  000000                        MOV     R4,TSDB(R5)            ;SET THE PACKET ADDRESS
6300 071316  012737  000144  071462                MOV     #100.,T38DLY           ;SET UP DELAY ROUTINE
6301 071324  004737  016250                620$:   JSR     PC,WAITF               ;WAIT AWHILE FOR SSR TO SET
6302 071330  016501  000002                        MOV     TSSR(R5),R1            ;SEE IF IT REALLY DID
6303 071334  032701  000200                        BIT     #SSR,R1                ;JUST CHECK THAT BIT
6304 071340  001017                                BNE     630$                   ;BR, IF SSR IS SET
6305 071342                                        DELAY   250                    ;DELAY ABOUT .25 SEC
     071342  012727  000250                                                                  MOV     #250.,(PC)+
     071346  000000                                                                          .WORD   0
     071350  013727  002116                                                                  MOV     L$DLY,(PC)+
     071354  000000                                                                          .WORD   0
     071356  005367  177772                                                                  DEC     -6(PC)
     071362  001375                                                                          BNE     . 4
     071364  005367  177756                                                                  DEC     -22(PC)
     071370  001367                                                                          BNE     . 20
6306 071372  005337  071462                        DEC     T38DLY                 ;START DELAY COUNT DOWN
6307 071376  001352                                BNE     620$                   ;BR, IF COUNTER IS NOT AT DONE
6308 071400  004737  016336                630$:   JSR     PC,CHKTSSR             ;WAIT FOR SSR TO SET
6309 071404  103405                                BCS     650$                   ;BR IF CARRY SET (GOOD RETURN)
6310 071406  010001                                MOV     R0,R1                  ;SAVE CONTENTS OF TSSR
6314 071410                                        ERRDF   ERRNO.T38SSR,PKTSSR    ;DEVICE FATAL SSR FAILED TO SET
     071410  104455                                                                          TRAP    C$ERDF
     071412  001776                                                                          .WORD   1022
     071414  072666                                                                          .WORD   T38SSR
     071416  012046                                                                          .WORD   PKTSSR
6315 071420                                  650$:  CKLOOP                         ;LOOP ON ERROR, IF FLAG SET
     071420  104406                                                                          TRAP    C$CLP1
6316 071422  012700  071526                        MOV     #T38BFR+20,R0          ;MESSAGE BUFFER ADDRESS
6317 071426  005001                                CLR     R1                     ;NO HIGH ORDER ADDRESS BITS
6318 071430  005037  003134                        CLR     KTENABLE               ;NO KT11 STUFF EITHER
6319 071434  004737  074054                        JSR     PC,T38MBP              ;GO PRINT MESSAGE BUFFER CONTENTS
6320 071440  000137  066722                        JMP     2$                     ;GO BACK TO MENU
6321
6322
6323 071444  000137  000200                63$:    JMP     200                    ;REALLY RETURN TO THE SUPERVISOR
6324 071450                                  64$:    EXIT    TST                    ;LEAVE TEST
     071450  104432                                                                          TRAP    C$EXIT
     071452  003054                                                                          .WORD   L10075 .
6325
6326                                         ;+
6327                                         ;LOCAL TEXT MESSAGES FOR TEST
6328                                         ;
6329
6330                                         ;LOCAL STORAGE FOR THIS TEST
6331                                         ;-
6332                                         ;+
6333                                         ;LOCAL STORAGE FOR THIS TEST
6334                                         ;
6335
6336 071454  000000                          TTION2:         .WORD   0              ;WORD SET IF SUPERVISOR TTI INTER OFF
6337 071456  000000                          TVSAV2: .WORD   0              ;SAVE TTI VECTOR
6338 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 TES
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                               ;
6384                               ;WRITE TAPE PACKET
6386         072240                ;
6388 072240  140005                        .=<.+10>&177770
6389 072242  000000                T38PK4: .WORD   140005                  ;WRITE, ACK, CVC=1 COMMAND
6390 072244  000000                T38WR:  .WORD   0                       ;ADDRESS OF WRITE BUFFER
6391 072246  000400                        .WORD   0                       ;MORE ADDRESS OF WRITE BUFFER
6392                               T38SIZ: .WORD   256.                    ;SIZE OF RECORD
6393
6394
6395
6396
6397                               ;+
6398                               ;LOCAL TEXT MESSAGES FOR TEST
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:
                                                SAVREG                  ;SAVE THE REGISTERS
074054  010005                                  MOV     R0,R5           ;SAVE LOW ORDER ADDRESS
074056  005737  003134                          TST     KTENABLE        ;ADDRESS ABOVE 28K?
074062  001001                                  BNE     910$            ;BR IF YES
074064  005001                                  CLR     R1              ;SET HIGH ORDER ADDRESS TO 0
074066  010103                          910$:   MOV     R1,R3           ;SAVE HIGH ORDER ADDRESS
074070  006100                                  ROL     R0              ;SHIFT BIT15 TO C BIT
074072  006101                                  ROL     R1              ;SHIFT TO HIGH ORDER FOR PRINTOUT
074074                                          PRINTX  #T38AS0,R1,R5   ;PRINT MESSAGE BUFFER ADDRESS
074074  010546                                                                  MOV     R5,-(SP)
074076  010146                                                                  MOV     R1,(SP)
074100  012746  074356                                                          MOV     #T38AS0,-(SP)
074104  012746  000003                                                          MOV     #3,-(SP)
074110  010600                                                                  MOV     SP,R0
074112  104415                                                                  TRAP    C$PNTX
074114  062706  000010                                                          ADD     #10,SP
074120                                          PRINTX  #T38AS1         ;PRINT HEADER FOR CONTENTS
074120  012746  074423                                                          MOV     #T38AS1,-(SP)
074124  012746  000001                                                          MOV     #1,-(SP)
074130  010600                                                                  MOV     SP,R0
074132  104415                                                                  TRAP    C$PNTX
074134  062706  000004                                                          ADD     #4,SP
074140  010501                                  MOV     R5,R1           ;COPY LOW ORDER ADDRESS
074142  010300                                  MOV     R3,R0           ;COPY HIGH ORDER ADDRESS
074144  001403                                  BEQ     913$            ;BR IF NOT ABOVE 28K
074146  004737  017316                          JSR     PC,SETMAP       ;SETUP PAR ADDRESS IN R0
074152  010005                                  MOV     R0,R5           ;GET PAR FORMAT ADDRESS ABOVE 28K
074154  010537  074524                  913$:   MOV     R5,T38CNT       ;HOLD ADDRESS
074160  011504                          911$:   MOV     (R5),R4         ;GET BUFFER ENTRY
074162  022704  125252                          CMP     #125252,R4      ;CHECK FOR NO LOAD CONDITION
074166  001417                                  BEQ     912$            ;BR, IF BUFFER WASN'T LOADED
074170  010403                                  MOV     R4,R3           ;MAKE COPY
074172  042704  170377                          BIC     #170377,R4      ;ONLY BITS 11,10,9 AND 8 ARE SAVED
074176  000241                                  CLC                     ;CLEAR CARRY
074200  006004                                  ROR     R4              ;11 TO 10 BIT POSITION
074202  006004                                  ROR     R4              ;10 TO 9 BIT POSITION
074204  006004                                  ROR     R4              ;9 TO 8 BIT POSITON
074206  006004                                  ROR     R4              ;8 TO 7 BIT POSITION
074210  042703  177760                          BIC     #177760,R3      ;ONLY BITS 3,2,1 AND 0 ARE SAVED
074214  060403                                  ADD     R4,R3           ;"OR'EM TOGETHER
074216  010325                                  MOV     R3,(R5)+        ;PUT BACK IN BUFFER
074220  020527  072162                          CMP     R5,#T38EB       ;END OF BUFFER YET
074224  001355                                  BNE     911$            ;BR, IF NOT AT END YET
074226  013705  074524                  912$:   MOV     T38CNT,R5       ;PUT ADDRESS BACK
074232  012704  000001                          MOV     #1,R4           ;START BYTE NUMBER AT ONE
074236                                  915$:   PRINTX  #T38ASN,R4,(R5)+        ;PRT MEM BUFFER W/NEWLINE
074236  012546                                                                  MOV     (R5)+,-(SP)
074240  010446                                                                  MOV     R4,-(SP)
074242  012746  074500                                                          MOV     #T38ASN,-(SP)
074246  012746  000003                                                          MOV     #3,-(SP)
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                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
```

```
                                        ;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
```

```
TSV5 - HARDWARE TESTS   MACRO M1113  06 FEB 84 17:14                                SEQ 234
TEST 11: CONFIGURATION TYPEOUT

 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
```

```
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  #T390F2,UNITN    ;"DRIVE NUMBER XX IS OFF-LINE"
     075314  013746  002202                                            MOV     UNITN,-(SP)
     075320  012746  076764                                            MOV     #T390F2,(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$:   PRINTX  #T390N2,UNITN    ;"DRIVE NUMBER XX IS ON-LINE"
     075344  013746  002202                                            MOV     UNITN,-(SP)
     075350  012746  077030                                            MOV     #T390N2,(SP)
     075354  012746  000002                                            MOV     #2,(SP)
     075360  010600                                                    MOV     SP,R0
     075362  104415                                                    TRAP    C$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
```

```
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:                                 ;COMMAND PACKET FOR TEST
 6742 076450  140004                        .WORD   140004                  ;WRITE CHARA. MEM. CMND.,  ACK,CVC=1
 6743 076452  076460                        .WORD   T39DTA                  ;ADDRESS OF SELECT DATA BLOCK
 6744 076454  000000                        .WORD   0
 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     =%02
```

```
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 BSEL0 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                                ;
6833                                ;       THIS IS A STANDALONE ROUTINE PROVIDING A NUMBER OF TIGHT "SCOPE
6834                                ;       LOOPS" USEFUL FOR DEBUGGING BASIC REGISTER ACCESS PROBLEMS WITH
6835                                ;       THE M7196 MODULE.  THESE SCOPE LOOPS CAN BE USED WHEN THE NORMAL
6836                                ;       "LOOP ON ERROR" OR "LOOP ON TEST (SUBTEST)" FACILITIES DON'T
6837                                ;       SEEM TO ALLOW THE OPERATOR TO ZERO IN A PROBLEM IN THE EARLY
6838                                ;       TESTS (I.E. THE HARDWARE MAY NOT BE RESPONDING TO A REGISTER
6839                                ;       ACCESS, CAUSING A BUS ERROR TRAP, EVEN THOUGH THE DEVICE ADDRESS
6840                                ;       SELECTED BY THE PROGRAM MATCHES THE CONFIGURATION SET UP IN THE
6841                                ;       HARDWARE DIP SWITCHES).  THE FOLLOWING MENU OF SCOPE LOOPS ARE
6842                                ;       AVAILABLE:
6843                                ;
6844                                ;               CODE    SCOPE LOOP
6845                                ;
6846                                ;                 0     HELP. PRINT THIS MENU.
6847                                ;                 1     TSBA READ ACCESS
6848                                ;                 2     TSSR READ ACCESS
6849                                ;                 3     INITIALIZE (TSSR WRITE ACCESS)
6850                                ;                 4     TSDB HIGH BYTE WRITE ACCESS
```

```
6851                                    ;                5     TSDB LOW BYTE WRITE ACCESS
6852                                    ;                6     TSDB MAINTENANCE-MODE WORD WRITE ACCESS
6853                                    ;                7     TSDBX (TSSR HIGH BYTE) WRITE ACCESS
6854                                    ;                        (EXTENDED FEATURES SWITCH MUST BE ON
6855                                    ;                         TO USE SELECTION CODE 7)
6856                                    ;                8     EXIT (RETURN TO SUPERVISOR)
6857                                    ;
6858                                    ;       FOR SCOPE LOOPS THAT WRITE INTO REGISTERS, THE PROGRAM PROMPTS
6859                                    ;       THE OPERATOR FOR THE DATA TO BE WRITTEN.  TYPING <RETURN> CAUSES
6860                                    ;       AN EXIT FROM THE SCOPE LOOP BACK TO MENU LEVEL.
6861                                    ;
6862                                    ;-
6863
6864
6865 077702                                     BGNTST
     077702                                                                      T12::
6870 077702                                     RFLAGS  R0              ;GET OPERATOR FLAGS
     077702  104421                                                             TRAP    C$RFLA
6871 077704  001403                        BEQ     1$                  ;BR, IF OK TO RUN
6872 077706  012700  101275                MOV     #T40NE,R0           ;"TEST NOT EXECUTED"
6873 077712  000402                        BR      100$                ;JUST EXIT IF NOT
6874 077714  012700  101342        1$:     MOV     #TST40ID,R0         ;TEST ID MESSAGE
6875 077720  004737  016510        100$:   JSR     PC,TSTSETUP         ;DO THE COMMON SETUP
6876 077724  004737  020500                JSR     PC,CHKMAN           ;SEE IF MANUAL INTERVENTION ALLOWED
6877 077730  103402                        BCS     2$                  ;CARRY SET IF INTERVENTION ALLOWED
6878 077732  000137  100416                JMP     64$                 ;EXIT IF NO MANUAL INTERVENTION
6879 077736  004737  015774        2$:     JSR     PC,SOFINIT          ;DO A SOFT INIT
6880 077742  103405                        BCS     5$                  ;BRANCH IF OK
6881 077744  010001                        MOV     R0,R1               ;CONTENTS OF TSSR REGISTER
6885 077746                                 ERRDF   ERRNO,SFIERR,SFIMSG ;REPORT FATAL ERROR
     077746  104455                                                             TRAP    C$ERDF
     077750  002261                                                             .WORD   1201
     077752  003652                                                             .WORD   SFIERR
     077754  012034                                                             .WORD   SFIMSG
6886 077756  012700  100434        5$:     MOV     #SCMENU,R0          ;MENU OF SCOPE LOOP SELECTIONS
6887 077762  012701  000010                MOV     #8.,R1              ;MAXIMUM ALLOWED SELECTION
6888 077766  004737  020256                JSR     PC,GETSEL           ;GO GET THE OPERATORS SELECTION
6889 077772  005700                        TST     R0                  ;WAS ZERO SPECIFIED ?
6890 077774  001760                        BEQ     2$                  ;REPEAT MENU IF YES.
6891 077776  020027  000007                CMP     R0,#7               ;EXTENDED TSSR ?
6892 100002  001015                        BNE     3$                  ;BRANCH IF NOT
6893 100004  005737  002226                TST     EXTFEA                      ;CHECK FOR EXTENDED FEATURES SET
6894 100010  001012                        BNE     3$                  ;BR, IF IT IS ON
6895 100012                                 PRINTF  #EXFMSG             ;WARN OPERATOR EXTENDED FFATURES CLEAR
     100012  012746  101217                                                     MOV     #EXFMSG,-(SP)
     100016  012746  000001                                                     MOV     #1,-(SP)
     100022  010600                                                             MOV     SP,R0
     100024  104417                                                             TRAP    C$PNTF
     100026  062706  000004                                                     ADD     #4,SP
6896 100032  000137  077736                JMP     2$                  ;GO BACK TO BASIC MENU
6897 100036  010004                3$:     MOV     R0,R4               ;SAVE THE MENU SELECTION
6898 100040                                 SETPRI  #PRI07              ;RAISE THE PRIORITY
     100040  012700  000340                                                     MOV     #PRI07,R0
     100044  104441                                                             TRAP    C$SPRI
6899 100046  005037  100426                CLR     TTION               ;ASSUME INTERRUPTS ARE ENABLED
6900 100052  032737  000100  177560        BIT     #100,@#TTICSR       ;ARE TTI INTERRUPTS ON ?
6901 100060  001005                        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
```

```
6957
6958 100270  004737  020174          35$:    JSR     PC,GETPAT               ;READ THE DATA PATTERN
6959 100274  010001                          MOV     R0,R1                   ;DATA PATTERN FOR LOOP
6960 100276  012703  000000                  MOV     @TSDB,R3                ;SELECT TSDB
6961 100302  060503                          ADD     R5,R3                   ;POINT TO TSV05'S REGISTERS
6962 100304  010113                  37$:    MOV     R1,(R3)                 ;WRITE THE DATA PATTERN
6963
6964 100306  000776                          BR      37$                     ;LOOP UNTIL HALTED
6965
6966 100310  004737  020174          40$:    JSR     PC,GETPAT               ;READ THE DATA PATTERN
6967 100314  010001                          MOV     R0,R1                   ;SAVE THE DATA PATTERN
6968 100316  012703  000003                  MOV     @TSSRH,R3               ;BYTE ADDRESS OF TSSR, HIGH BYTE
6969 100322  060503                          ADD     R5,R3                   ;POINT TO TSV05'S REGISTERS
6970 100324  110113                  42$:    MOVB    R1,(R3)                 ;WRITE THE DATA TO REGISTER
6971 100326  000776                          BR      42$                     ;LOOP UNTIL HALTED
6972
6973
6974                                  ;+
6975                                  ;PROCESS CONSOLE INTERRUPTS
6976                                  ;-
6977
6978 100330  010046          60$:    MOV     R0,-(SP)                ;SAVE WORK REGISTER
6979 100332  113700  177562          MOVB    @@TTIBFR,R0             ;GET THE OPERATOR INPUT
6980 100336  042700  000200          BIC     @200,R0                 ;STRIP OFF PARITY BIT
6981 100342  122700  000015          CMPB    @15,R0                  ;IS IT A CARRIAGE RETURN ?
6982 100346  001021                  BNE     61$                     ;JUST EXIT IF NOT
6983 100350  012766  077736  000002  MOV     @2$,2(SP)               ;RETURN TO MASTER MENU
6984 100356  005066  000004          CLR     4(SP)                   ;FORCE PRIORITY ZERO
6985 100362  013737  100430  000060  MOV     TVECSAV,@@TTIVEC        ;RESTORE SUPERVISOR VECTOR
6986 100370  013737  100432  000062  MOV     TPRISAV,@@TTIVEC+2      ;RESTORE SUPERVISOR PRIORITY
6987 100376  005737  100426          TST     TTION                   ;ARE SUPERVISOR INTERRUPTS ENABLED ?
6988 100402  001403                  BEQ     61$                     ;BRANCH IF YES
6989 100404  042737  000100  177560  BIC     @100,@@TTICSR           ;TURN OFF TTI INTERRUPTS
6990 100412  012600          61$:    MOV     (SP)+,R0                ;RESTORE REGISTER
6991 100414  000002                  RTI                             ;RETURN FROM INTERUPT
6992
6993 100416                  64$:
6994 100416                  63$:    EXIT    TST                     ;EXIT THE TEST
     100416  104432                                                          TRAP    C$EXIT
     100420  000736                                                          .WORD   L10077 .
6995 100422  000137  000200          65$:    JMP     200                     ;RETURN TO SUPERVISOR
6996
6997                                  ;+
6998                                  ;LOCAL STORAGE FOR THIS TEST
6999                                  ;-
7000
7001 100426  000000          TTION:          .WORD   0               ;WORD SET IF SUPERVISOR TTI INTER OFF
7002 100430  000000          TVECSAV:        .WORD   0               ;SAVE TTI VECTOR
7003 100432  000000          TPRISAV:        .WORD   0               ;SAVE TTI PRIORITY
7004
7005
7006                                  ;+
7007                                  ;MENU FOR OPERATOR INPUT FOR SCOPE LOOPS
7008                                  ;
7009
7010                                  .EVEN
7011 100434  100466  100541  100567  SCMENU: .WORD   1$,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                                  .EVEN
   7031 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 [illegible] 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
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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         PRIA0   010230         P.WRIT= 000005
L$LOAD  002100 G       L10047  034602         NOMEM   005460         PRIBX0  007612 G       P.WRTC= 000004
L$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$PRT   002112 G       L10055  036620         NSINIT  004407         PRIT0   010356         RAMEXP  015530 G
L$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        T158FR  033412
RMCHEN= 000200          S1.I1R= 020000          TSV2    002000 G        T11     074530 G        T158F2  034100
RMMSGB= 000215          S1.I2R= 040000          TSV3    002176 G        T12     077702 G        T158S0  034100
RMMSGE= 000234          S1.PAR= 100000          TSV4    021546 G        T128FR  030302          T158S1  034101
RMPKTB= 000201          S2.ATI= 000010          TSV5    023446 G        T128KG  030757          T15DAT  033400
RMPKTE= 000210          S2.BTI= 000004          TSV6    101360 G        T128LK  030334          T15L00  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          T12L0A  030324          T16BFR  040232
SELDAT= 000004          TEMP2   003120 G        T$ERRN= 002261          T12L00  026446          T16BFS  040252
SEL2  = 000002          TERCLS= 000016          T$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          T16L00  034622
SIMSG   011766          TPRISA  100432          T$NS0 = 000000          T121L0  026560          T16PAC  040210
SKIPT   003400          TPSAV2  071460          T$NS1 = 000005          T122L0  027114          T16PK2  040260
SOFINI  015774 G        TRANST  002166 G        T$NS2 = 000002          T123L0  027334          T16REJ  037314
SPACE   010466 G        TSBA  = 000000 G        T$NS3 = 000003          T124L0  027756          T16RES  040030
SPM1    101522          TSBAH = 000001 G        T$PTNU= 000000          T124TS  030332          T16SEX  040170
SPM4    101552          TSDB  = 000000 G        T$SAVL= 177777          T138FR  024062          T16SRD  040122
SPM6    101602          TSDBH = 000001 G        T$SEGL= 177777          T13DAT  024050          T16SSR  036732
SPM7    101632          TSFCOD  007236          T$SEKO= 010000          T13L00  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$TEST= 000014          T13SSR  024267          T16WMI  040142
STATCO  012412          TSSRM = 000003 G        T$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          TSTL00  016456 G        T$$HAR= 010100          T14L00  024444          T17CLR  047760
SO.IDB= 000010          TSTPTR  002316 G        T$$HW = 010000          T14NBA  025622          T17DAT  050230
SO.IFB= 000002          TSTSET  016510 G        T$$INI= 010030          T14NIN  026063          T17DT2  050400
SO.IFP= 000001          TST12I  030470          T$$MSG= 010025          T14PAC  025160          T17EXE  046524
SO.ILD= 000020          TST13I  024102          T$$PRO= 010027          T14PK2  025600          T17EXP  046402
SO.ION= 000040          TST14I  026241          T$$RPT= 010035          T14RES  026306          T17EXS  046422
SO.IRD= 000100          TST15I  034453          T$$SEG= 010000          T14RST  026344          T17L00  040424
SO.IRW= 000004          TST16I  036662          T$$SOF= 010101          T14SSR  025773          T17MSK  046376
SO.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          T3BFLG  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          WRTCHR  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
T188FR  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
T198EN  062472          T20EXS  065102          T38PK2  072170          T6.4    043464          XSOTMK= 100000
T198FC  060016          T20LOO  062634          T38PK3  072220          T6.5    044042          XSOVCK= 000020
T198FR  062352          T20MSK  065056          T38PK4  072240          T6.6    045314          XSOWLE= 004000
T198FS  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
```

```
TSV6   PARAMETER CODING MACRO M1113  06 FEB 84 17:14                    SEQ 249
SYMBOL TABLE

X3.MBZ= 000006          X3.REV= 000040          X3.TRF= 000020          X4.MBZ= 017400          X4.TSM= 020000
X3.MDE= 177400          X3.RIB= 000001          X4.MSP= 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
.
```