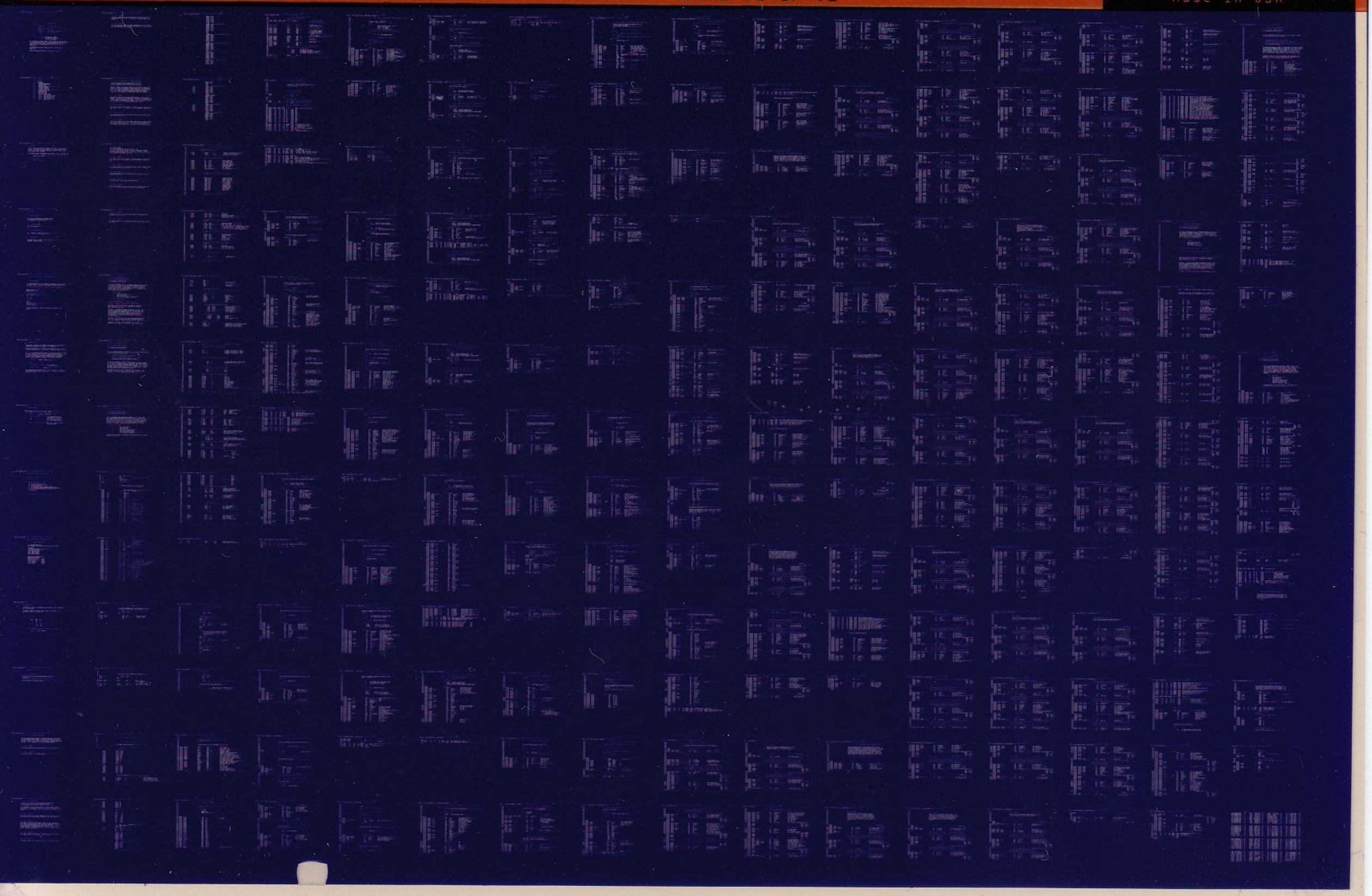
TK25

TK25 FRT END FUNC #2
CZTKFA0

AH-T778A-MC
FICHE 01 OF 02

JUL 1984
digital
Made In USA



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CZTKFAQ AH-T778A-MC
FICHE 02 OF 02

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IDENTIFICATION

PRODUCT ID:	AC-T777A-MC
PRODUCT TITLE:	CZTKFA TK25 FRT END FUNC #2
PRODUCT DATE:	MARCH, 1984
DEPARTMENT:	TAPE DIAGNOSTIC ENGINEERING
AUTHOR:	DICE SYSTEMS, INC.

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1.0 ABSTRACT

THIS IS A PDP-11/LSI RESIDENT DIAGNOSTIC WHICH CHECKS THE FUNCTIONALITY OF AN TK25 MAGTAPE SUBSYSTEM WHILE CONNECTED TO A PDP-11 SYSTEM (Q-BUS OR UNIBUS). THE PROGRAM HAS BEEN DIVIDED INTO FOUR MAJOR PIECES: CZTKE, CZTKF, CZTKG, CZTKH. SUCCESSFUL RUN EXAMPLES, AND TEST DESCRIPTIONS HAVE BEEN PROVIDED FOR EACH PROGRAM.

THE PROGRAMS PROVIDE ERROR MESSAGES WHICH IDENTIFY FAILING FUNCTIONS, AND AID IN DEVICE REPAIR. REFERENCE THE FOLLOWING DIGITAL EQUIPMENT DOCUMENTS:

1. CIQPMAO XXDP+ PROGRAMMER'S MANUAL; DOCUMENT NUMBER AC-S296A-AC; DATE: 14 JULY 1980.

1.1 REVISION HISTORY

NEW RELEASE APRIL 1984

2.0 REQUIREMENTS

2.1 HARDWARE REQUIREMENTS

PDP-11 FAMILY PROCESSOR WITH 32K WORDS OF MEMORY
TK25 MAGTAPE SUBSYSTEM (DRIVE AND CONTROLLER)
CAUTION:DIAGNOSTIC REQUIRES 32K WORDS OF MEMORY
(28K USEABLE I.E. 4K FOR I/O PAGE)

2.1.1 OPTIONAL HARDWARE -

FOUR TK25 CONTROLLERS PER PDP-11, ONE
DRIVE PER CONTROLLER

2.2 SOFTWARE REQUIREMENTS

PDP-11 DIAGNOSTIC SUPERVISOR (CIQPMAO VERSION 34 OR LATER)
PDP-11 DIAGNOSTIC LOADER/MONITOR (XXDP+)

2.3 PREREQUISITES

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

3.0 OPERATING INSTRUCTIONS - OPERATOR COMMANDS

3.1 OPERATOR COMMANDS

THE TK25 DIAGNOSTICS ARE PDP-11 DIAGNOSTIC SUPERVISOR COMPATIBLE PROGRAMS.
ALL LOADING AND RUN TIME INSTRUCTIONS CAN BE REFERENCED IN THE PDP-11
PROGRAMMER'S MANUAL "CIQPMAO XXDP" PROGRAMMER'S MANUAL NUMBER AC-S296A-AC.

BOOT THE DIAGNOSTIC XXDP+ MEDIA (OPERATOR RESPONSES ARE UNDERLINED)

```
CHMDLE0 XXDP+ DL MONITOR
BOOTED VIA UNIT 0
28K NON-UNIBUS SYSTEM

ENTER DATE <DD-MMM-YY>: 29-JAN-82
                        ---------
RESTART ADDRESS: 152010
THIS IS XXDP+ TYPE "H" OR "H/L" FOR HELP.

.R CZTKFA
 - ------
CZTKFA.BIC

DRS-E0
CZTKF-A-0
CZTKFA TK-25 FRT END FUNC #2 UNIT IS TK25
RSTRT ADR 147642
DR>START/FLAG:PNT:H0E
   ------------------
```

THE ABOVE COMMAND WILL START THE DIAGNOSTIC. THE COMMAND HAS TWO
SWITCHES ON WHICH ARE "PRINT EACH TEST NUMBER AS EXECUTED" AND "HALT ON
ERROR".

3.2 HARDWARE PARAMETERS

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) RESPONCE TO THE QUESTION, THE PROGRAM WILL USE IT'S DEFAULT HARDWARE PARAMETER VALUES. IT WILL DEFAULT TO ONE UNIT SELECTED (UNIT 0), THE DEFAULT TSBA/TSDB WILL BE 172522 AND THE INTERRUPT VECTOR WILL BE 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 ONLY IF 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)" THAT A LOGICAL RESPONSE IS TO BE MADE: "Y" FOR YES, "N' FOR NO.

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


UNIT 0

DEVICE ADDRESS (O) 172522 ? <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.

3.3 SOFTWARE PARAMETERS

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.>

ENABLE CONTROLLER RAM DUMP ON ERROR (L) N? < TYPE "Y" TO DUMP
                                             SELECTED RAM CONTENTS IN THE
                                             CONTROLLER MODULE.>
```

4.0 OPERATING INSTRUCTIONS - SAMPLE PRINTOUTS

4.1 SUCCESSUL RUN EXAMPLES

4.1.1 SUCCESSFUL RUN EXAMPLE - CZTKFA -

```
TST: 001 INITIALIZATION #2 TEST
TST: 002 OFF-LINE REJECT AND REWIND TEST
TST: 003 BASIC WRITE TEST
TST: 004 BASIC READ DATA (FORWARD AND REVERSE) TEST
TST: 005 STAND-ALONE MANUAL INTERVENTION NOT EXECUTED TEST
TST: 006 STAND-ALONE CONFIGURATION TYPEOUT NOT EXECUTED TEST
TST: 007 STAND-ALONE SCOPE LOOPS NOT EXECUTED TEST
CZTKF EOP    1
    0 TOTAL ERRS
```

NOTE: PROGRAM NOW STARTS OVER AGAIN AT TEST 1

4.2 OPERATING INSTRUCTIONS - SAMPLE ERROR MESSAGE

ERROR MESSAGE EXAMPLE

```
TST: 003 BASIC WRITE TEST
CZTKF HRD ERR 00303 ON UNIT 00 TST 003 SUB 001 PC:026500
TSSR INCORRECT AFTER WRITE COMMAND, MORE BITS SET THAN SSR

TSSR=000000
TERMINATION CLASS CODE = NORMAL TERMINATION
*****REPLACE CONTROLLER*****
PACKET ADDRESS=030510
PACKET WORD #0=140005
PACKET WORD #1=053470
PACKET WORD #2=000000
PACKET WORD #3=000024


MESSAGE BUFFER ADDRESS=030400
MESSAGE BUFFER CONTENTS:
MESSAGE BUFFER HEADER    =100020
DATA FIELD LENGTH        =000012
RESIDUAL BYTE COUNTER    =000000
XSTAT0 CONTENTS          =000300
XSTAT1 CONTENTS          =000000
XSTAT2 CONTENTS          =101000
XSTAT3 CONTENTS          =000000
```

5.0 PROGRAM RUN TIMES

THE AVERAGE RUN TIMES OF THE PROGRAMS ARE LISTED BELOW. THESE FIGURES ARE TO BE USED AS A GUIDE. THE TIMING WAS DONE ON A PDP-11/23 (LSI) PROCESSOR WITH A LA-120 CONSOLE.

THE PROGRAMS RUN IN NON-ITERATIVE MODE. EACH TEST IS RUN ONCE, WITH NO ITERATIONS. THEREFOR, THE DEFAULT MODE (NORMALLY ITERATIVE) AND THE NON-ITERATIVE MODE TIMES ARE IDENTICAL.

5.1 RUN TIMES - CZTKF

TEST NUMBER	N/I SECS.	DEF SECS.
1	2	2
2	2	2
3	41	41
4	70	70
5	N/A	N/A
6	N/A	N/A
7	N/A	N/A

THE TIMES REQUIRED TO RUN TESTS 1 THROUGH 4 IN ONE COMMAND:

Q.V. 1 MIN 55 SECONDS
DEFAULT 1 MIN 55 SECONDS

6.0 TEST DESCRIPTIONS - CZTKF

6.1 TEST 1 - INITIALIZATION #2

```
**************************************************************************
* NOTE: IF THIS TEST DETECTS AN ERROR REPLACE THE TK25'S                 *
* CONTROLLER                                                             *
**************************************************************************
```

THIS TEST VERIFIES THAT WRITING INTO THE TSSR RETURNS THE CONTROLLER TO ITS INITIALIZED STATE FROM VARIOUS CONDITONS.

6.2 TEST 2 - OFF LINE REJECT AND REWIND TEST

THIS TEST VERIFIES BASIC TAPE MOTION COMMAND DECODING AND BASIC OPERATION OF THE REWIND POSITIONING COMMAND. IT DOES NOT NECESSARILY DEMONSTRATE THAT THE TRANSPORT CAN BE REWOUND FROM AN ARBITRARY POSITION ON THE TAPE. SUBSEQUENT TESTS IMPLICITLY CHECK THE OPERATION OF THE REWIND COMMAND SINCE THEY MUST TYPICALLY REWIND THE TAPE IN IN THE NORMAL COURSE OF THEIR TEST SEQUENCES. THE TEST CONSISTS OF THE FOLLOWING THREE SUBTESTS:

6.2.1 TEST 2, SUBTEST 1: -

THIS SUBTEST VERIFIES THAT A REWIND COMMAND, WITH THE CLEAR VOLUME CHECK (CVC) BIT CLEAR IS REJECTED IF THE VOLUME CHECK (VCK) FLAG IS SET.

6.2.2 TEST 2, SUBTEST 2: -

THIS SUBTEST VERIFIES THAT A REWIND COMMAND WITH A CVC=1 CLEARS VCK AND RETURNS PROPER STATUS IN THE MESSAGE BUFFER.

6.3 TEST 3 - BASIC WRITE TEST

```
**************************************************************************
* NOTE: THIS TEST MUST HAVE A GOOD MAGTAPE IN THE DRIVE ANY              *
* TAPE ERRORS WILL BE DISPLAYED AS TAPE STATUS ALERT                     *
**************************************************************************
```

THIS TEST VERIFIES THAT THE WRITE DATA (NEXT) COMMAND OPERATES CORRECTLY, UP TO THE POINT OF CHECKING THAT THE DATA WAS ACTUALLY WRITTEN ONTO THE TAPE CORRECTLY. THE TESTING IN THIS TEST IS LIMITED TO VERIFYING THAT THE COMMAND WAS TERMINATED CORRECTLY WITH THE CORRECT REGISTER, BUFFER, AND RAM CONTENTS.

6.3.1 TEST 3, SUBTEST 1: -

THIS SUBTEST VERIFIES THAT A WRITE COMMAND (ANY VALID MODE CODE) WITH THE CLEAR VOLUME CHECK (CVC) BIT CLEAR IS REJECTED IF THE VOLUME CHECK (VCK) FLAG IS SET. ALL VALID MODE CODES ARE CHECKED (WRITE DATA, WRITE RETRY).

6.3.2 TEST 3, SUBTEST 2: -

THIS SUBTEST VERIFIES THAT WRITE DATA COMMANDS WITH CVC=1 AND THE SWAP BYTES (SWB) BIT CLEAR OPERATES PROPERLY. THE BYTE COUNT (RECORD SIZE) VARIES FROM 20 THROUGH 64K IN VARYING INCREMENTS (DEPENDING ON WHETHER OR NOT THE DIAGNOSTIC IS RUNNING ON THE LONG VERIFICATION MODE). THE TAPE IS NOT REWOUND BETWEEN SUCCESSIVE RECORDS BUT IS REWOUND AFTER THE FINAL RECORD IS WRITTEN. AN INCREMENTING COUNT PATTERN IS SUPPLIED IN THE DATA BUFFER. AFTER EACH BLOCK IS WRITTEN, THE TTSR AND THE TSBA REGISTERS AND THE MESSAGE BUFERS ARE CHECKED.

6.3.3 TEST 3, SUBTEST 3: -

THIS SUBTEST VERIFIES THAT WRITE DATA COMMANDS WITH CVC=1 AND THE SWAP BYTES (SWB) BIT SET OPERATES PROPERLY. THE TEST SEQUENCE IS IDENTICAL TO THAT USED IN SUBTEST 2. THE RESULTS SHOULD BE THE SAME.

6.3.4 TEST 3, SUBTEST 4: -

THIS SUBTEST VERIFIES THAT A WRITE COMMAND WITH AN ILLEGAL BUFFER ADDRESS IS REJECTED WITH THE PROPER ERROR STATUS AND THAT TAPE DOES NOT MOVE.

6.3.5 TEST 3, SUBTEST 5: -

THIS SUBTEST VERIFIES THAT A WRITE DATA COMMAND SPECIFYING A DATA BUFFER STARTING IN NONEXISTANT MEMORY TERMINATES WITH THE PROPER ERROR STATUS WITHOUT MOVING TAPE. THIS TEST IS SKIPPED IF NONEXISTANT MEMORY CAN NOT BE ADDRESSED.

6.3.6 TEST 3, SUBTEST 6: -

THIS SUBTEST VERIFIES THAT A WRITE DATA COMMAND SPECIFYING A DATA BUFFER STARTING IN EXISTANT MEMORY BUT RUNNING INTO NONEXISTANT MEMORY TERMINATES WITH THE PROPER ERROR STATUS. A LARGE ENOUGH RECORD SIZE IS SPECIFIED SUCH THAT TAPE IS ACTUALLY MOVED AND WRITTEN.

6.4 TEST 4 - BASIC READ DATA TEST (FORWARD AND REVERSE)

```
**********************************************************************
* NOTE: THIS TAPE MUST HAVE A GOOD MAGTAPE IN THE DRIVE              *
* ANY TAPE ERRORS WILL BE DISPLAYED AS TAPE STATUS ALERT             *
**********************************************************************
```

THIS TEST VERIFIES THAT THE READ FORWARD AND READ REVERSE COMMANDS OPERATE PROPERLY. VARIOUS COMBINATIONS OF ODD AND EVEN DATA BUFFER BOUNDARIES, RECORD SIZES AND BYTE SWAP CONTROL VARIABLES ARE USED. THE TEST FURTHER VERIFIES THE WRITE DATA COMMAND BY ACTUALLY READING AND VERIFYING WRITTEN DATA. ALSO TESTED ARE PROPER TERMINATIONS ON EXCEPTIONAL OR ERROR CONDITIONS: RECORD LENGTH LONG, RECORD LENGTH SHORT, READ REVERSE AT BOT, ILLEGAL DATA BUFFER ADDRESSES, AND NONEXISTANT DATA BUFFER ADDRESSES.

6.4.1 TEST 4, SUBTEST 1: -

THIS SUBTEST VERIFIES THAT THE READ FORWARD COMMAND WITH SWB=0 OPERATES PROPERLY. THE TAPE IS FIRST REWOUND AND THEN WRITTEN WITH A SERIES OF TEST RECORDS VARYING IN LENGTH AND DATA CONTENT. THE TAPE IS THEN REWOUND AGAIN AND THE RECORD READ SEQUENTIALLY AND RESULTS (STATUS, DATA, ETC.) VERIFIED. THE BYTE COUNT ON EACH READ FORWARD COMMAND IS SET TO THE LENGTH OF THE EXPECTED RECORD, SO NO EXCEPTIONAL CONDITIONS SHOULD OCCUR.

6.4.2 TEST 4, SUBTEST 2: -

THIS SUBTEST VERIFIES THAT THE READ DATA COMMANDS WITH CVC=1 AND THE SWAP BYTES (SWB) BIT SET OPERATES PROPERLY. THE TEST SEQUENCE IS IDENTICAL TO THAT USED IN SUBTEST 2. THE RESULTS, EXCEPT FOR RAM CONTENTS SHOULD BE THE SAME.

6.4.3 TEST 4, SUBTEST 3: -

THIS SUBTEST VERIFIES THAT A READ FORWARD COMMAND READING A RECORD LONGER THAN THE SPECIFIED BYTE COUNT CAUSES TAPE STATUS ALERT TERMINATION WITH THE RECORD LENGTH (RLL) BIT SET.

6.4.4 TEST 4, SUBTEST 4: -

THIS SUBTEST VERIFIES THAT A READ FORWARD COMMAND READING A RECORD SHORTER THAN THE SPECIFIED BYTE COUNT CAUSES TAPE STATUS ALERT TERMINATION WITH THE RECORD LENGTH SHORT (RLS) BIT SET. IT IS VERIFIED THAT THE RESIDUAL BYTE COUNT (RBPCR) IN THE MESSAGE BUFFER CONTAINS THE PROPER NONZERO VALUE (E.G. THE DIFFERENCE BETWEEN THE ACTUAL BYTE COUNT AND THE ACTUAL RECORD LENGTH).

6.4.5 TEST 4, SUBTEST 5: -

THIS SUBTEST VERIFIES
THAT A READ REVERSE COMMAND OPERATES PROPERLY. THE
TAPE IS FIRST REWOUND AND THEN WRITTEN WITH A SERIES OF TEST RECORDS
VARYING IN LENGTH AND DATA CONTENT. THE TAPE IS THEN READ IN REVERSE
SEQUENTIALLY AND THE RESULTS (STATUS, DATA, ETC.) VERIFIED. THE BYTE COUNT
ON EACH READ REVERSE COMMAND IS SET TO THE LENGTH OF THE EXPECTED RECORD,
SO NO EXCEPTIONAL CONDITIONS SHOULD OCCUR.

6.4.6 TEST 4, SUBTEST 6: -

THIS SUBTEST VERIFIES THAT THE READ DATA COMMANDS WITH CVC=1 AND THE SWAP
BYTES (SWB) BIT SET OPERATES PROPERLY. THE TEST SEQUENCE IS IDENTICAL TO
THAT USED IN SUBTEST 2. THE RESULTS EXCEPT FOR RAM CONTENTS SHOULD BE THE
SAME.

6.4.7 TEST 4, SUBTEST 7: -

THIS SUBTEST VERIFIES THAT A READ REVERSE COMMAND, READING A RECORD LONGER
THAN THE SPECIFIED BYTE COUNT, CAUSES A TAPE STATUS ALERT TERMINATION WITH
THE RECORD LENGTH LONG (RLL) BIT SET.

6.4.8 TEST 4, SUBTEST 8: -

THIS SUBTEST VERIFIES THAT A READ REVERSE COMMAND SPECIFYING A DATA BUFFER
STARTING IN NONEXISTANT MEMORY TERMINATES WITH THE PROPER ERROR STATUS
WITHOUT MOVING THE TAPE.

6.4.9 TEST 4, SUBTEST 9: -

THIS SUBTEST VERIFIES THAT ILLEGAL BUFFER ADDRESSES CAUSE A FUNCTION REJECT
TERMINATION WITH ILLEGAL ADDRESS (ILA) ERROR BIT SET.

6.4.10 TEST 4, SUBTEST 10: -

THIS SUBTEST VERIFIES THAT A DATA BUFFER ADDRESS, REFERENCING NONEXISTANT
MEMORY, CAUSES RECOVERABLE ERROR TERMINATION (TC=4), WITH THE NXM BIT SET
IN THE TSSR, AND THAT THE TAPE IS ULTIMATELY POSITIONED PROPERLY.

6.4.11 TEST 4, SUBTEST 11: -

THIS SUBTEST VERIFIES THAT A READ REVERSE COMMAND ISSUED WHILE THE TAPE IS AT BOT RESULTS IN A FUNCTION REJECT TERMINATION WITH THE NONEXECUTABLE FUNCTION (NEF) ERROR BIT SET.

6.4.12 TEST 4, SUBTEST 12: -

THIS SUBTEST VERIFIES THAT A READ REVERSE COMMAND ISSUED WHILE THE TAPE IS POSITIONED BEFORE THE FIRST RECORD ON TAPE (BUT NOT AT BOT) RESULTS IN TAPE STATUS ALERT.

6.5 TEST 5 - MANUAL INTERVENTION

THIS TEST MUST BE STARTED AS FOLLOWS:

AT THE DIAGNOSTIC SUPERVISOR PROMPT "DR>"
TYPE "START/FLAG:PNT/TEST:5/PASS:1"

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 4.
SELECTION CODES AND SUBROUTINES ARE:

CODE	ROUTINE
0	DISPLAY THIS MENU
1	REWIND AND UNLOAD COMMAND TEST
2	WRITE PROTECT TEST
3	FRONT PANEL ON-LINE/OFF-LINE SWITCH TEST
4	RETURN TO THE DIAGNOSTIC SUPERVISOR

ENTER MENU SELECTION: (D) ?

EACH MENU ITEM CORRESPONDS TO A SUBTEST, AS FOLLOWS:

SELECTION 0 - PRINTS OUT THE MENU ON THE CONSOLE TERMINAL.

SELECTION 1 - THIS ROUTINE INSTRUCTS THE OPERATOR TO PLACE THE DRIVE ON-LINE AND AT OR BEYOND BOT. THE TEST WILL THEN ISSUE THE REWIND AND UNLOAD COMMAND. IT WILL ALSO TELL THE OPERATOR IF THE DRIVE ENDED UP ON-LINE OR OFF-LINE.

SELECTION 2 - THIS ROUTINE INSTRUCTS THE OPERATOR TO MOUNT A SCRATCH TAPE REEL THAT DOES NOT HAVE A WRITE-ENABLE RING INSTALLED, THEN WAITS FOR THE OPERATOR TO RESPOND THAT THIS HAS BEEN ACCOMPLISHED. UPON THE RESPONSE, THE PROGRAM VERIFIES THAT THE TRANSPORT SHOWS A WRITE-PROTECTED STATUS, THEN ATTEMPTS TO WRITE DATA ON THE TAPE AND EXPECTS THE APPROPRIATE ERROR TERMINATION INDICATING THAT THE WRITE FUNCTION COULD NOT BE PERFORMED BECAUSE THE REEL IS WRITE-PROTECTED. IF THE APPROPRIATE TERMINATION IS NOT RECEIVED, AN ERROR IS REPORTED.

SELECTION 3 - THIS TEST CHECKS THAT THE PROGRAM CAN READ THE SENSE OF THE FRONT PANEL "ON-LINE" BUTTON/LIGHT. THE PROGRAM CHECKS THE STATE OF THE DRIVE (ON-LINE OR OFF-LINE) AND PRINTS A MESSAGE TO NOTIFY THE OPERATOR I.E. "DRIVE IS NOW OFF-LINE" OR "DRIVE IS NOW ON-LINE".

SELECTION 4 - THIS WILL RETURN THE PROGRAM TO THE DIAGNOSTIC SUPERVISOR PROMPT. NOTE: IF THE OPERATOR FAILED TO SELECT A PASS COUNT OF ONE, THE PROGRAM WILL LOOP UNTIL STOPPED WITH A CONTROL C.

6.6 TEST 6 - CONFIGURATION TYPEOUT

THIS TEST MUST BE STARTED AS FOLLOWS:

AT THE DIAGNOSTIC SUPERVISOR PROMPT "DR>"
TYPE "START/FLAG:PNT/TEST:6/PASS:1"

THIS IS A STANDALONE ROUTINE THAT PRINTS OUT ON THE CONSOLE TERMINAL THE CONFIGURATION OF THE CONTROLLER MODULE AND THE TK25 SUBSYSTEM. SPECIFICALLY, THE FOLLOWING INFORMATION IS PRINTED:

1. MICROCODE REVISION LEVEL OF THE CONTROLLER.
2. NUMBER OF TAPE TRANSPORTS CONNECTED TO THE CONTROLLER.
3. UNIT SELECT CODE AND STATE (ONLINE/OFFLINE, WRITE ENABLED/PROTECTED)OF EACH CONNECTED TRANSPORT.

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 DIALOGUE), THE ROUTINE WILL BE REENTERED SO THAT THEIR CONFIGURATIONS CAN BE PRINTED.

6.7 TEST 7 - SCOPE LOOPS

THIS TEST MUST BE STARTED AS FOLLOWS:

AT THE DIAGNOSTIC SUPERVISOR PROMPT "DR>"
TYPE "START/FLAG:PNT/TEST:7/PASS:1"
      ------------------------ --

THIS IS A STANDALONE ROUTINE PROVIDING A NUMBER OF TIGHT "SCOPE LOOPS" USEFUL FOR DEBUGGING BASIC REGISTER ACCESS PROBLEMS WITH THE CONTROLLER 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 THE CONFIGURATION SET UP IN THE HARDWARE DIP SWITCHES). THE FOLLOWING MENU OF SCOPE LOOPS IS 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	EXIT (RETURN TO SUPERVISOR)

FOR SCOPE LOOPS THAT WRITE INTO REGISTERS, THE PROGRAM PROMPTS THE OPERATOR FOR THE DATA TO BE WRITTEN. TYPING <RETURN> CAUSES AN EXIT FROM THE SCOPE LOOP BACK TO THE MENU.

```
                \
687
688                                     .SBTTL  PROGRAM HEADER
694                                     .MCALL  SVC
695 000000                              SVC                     ; INITIALIZE SUPERVISOR MACROS
696                                     .ENABLE LC
697                                     .NLIST  BEX,CND
703 000000                              .ENABL  AMA,ABS
704             002000                  . = 2000
705 002000                              BGNMOD  TUV2A
    002000                              TUV2A::
706
707                                     ;++
708                                     ; THE PROGRAM HEADER IS THE INTERFACE BETWEEN
709                                     ; THE DIAGNOSTIC PROGRAM AND THE SUPERVISOR.
710                                     ;--
711
712
713 002000                                      POINTER BGNSW,BGNSFT,BGNAU,BGNDU,BGNRPT,BGNSETUP
714 002000                                      HEADER  CZTKF,A,0,655.,0
    002000                              L$NAME::                ;DIAGNOSTIC NAME
    002000      103                             .ASCII /C/
    002001      132                             .ASCII /Z/
    002002      124                             .ASCII /T/
    002003      113                             .ASCII /K/
    002004      106                             .ASCII /F/
    002005      000                             .BYTE   0
    002006      000                             .BYTE   0
    002007      000                     L$REV::                 ;REVISION LEVEL
    002010      101                             .ASCII  /A/
    002011      060                     L$DEPO::                ;0
    002012      000001                          .ASCII  /0/
    002014      001217                  L$UNIT::                ;NUMBER OF UNITS
    002016      053066                          .WORD   T$PTHV
    002020      053226                  L$TIML::                ;LONGEST TEST TIME
    002022      002124                          .WORD   655.
    002024      002134                  L$HPCP::                ;POINTER TO H.W. QUES.
    002026      053442                          .WORD   L$HARD
    002030      000000                  L$SPCP::                ;POINTER TO S.W. QUES.
    002032      000000                          .WORD   L$SOFT
    002034      000000                  L$HPTP::                ;PTR. TO DEF. H.W. PTABLE
    002036      000000                          .WORD   L$HW
    002040      053420                  L$SPTP::                ;PTR. TO S.W. PTABLE
                                                .WORD   L$SW
                                        L$LADP::                ;DIAG. END ADDRESS
                                                .WORD   L$LAST
                                        L$STA::                 ;RESERVED FOR APT STATS
                                                .WORD   0
                                        L$CO::
                                                .WORD   0
                                        L$DTYP::                ;DIAGNOSTIC TYPE
                                                .WORD   0
                                        L$APT::                 ;APT EXPANSION
                                                .WORD   0
                                        L$DTP::                 ;PTR. TO DISPATCH TABLE
                                                .WORD   L$DISPATCH
```

```
002042
002042  000000          L$PRIO::                ;DIAGNOSTIC RUN PRIORITY
                        .WORD   0
002044                  L$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$DEVP::                ; POINTER TO DEVICE TYPE LIST
002060  003334          .WORD   L$DVTYP
002062                  L$REPP::                ;PTR. TO REPORT CODE
002062  023052          .WORD   L$RPT
002064                  L$EXP4::
002064  000000          .WORD   0
002066                  L$EXP5::
002066  000000          .WORD   0
002070                  L$AUT::                 ;PTR. TO ADD UNIT CODE
002070  022544          .WORD   L$AU
002072                  L$DUT::                 ;PTR. TO DROP UNIT CODE
002072  022642          .WORD   L$DU
002074                  L$LUN::                 ;LUN FOR EXERCISERS TO FILL
002074  000000          .WORD   0
002076                  L$DESP::                ;POINTER TO DIAG. DESCRIPTION
002076  003342          .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$ICP::                 ;PTR. TO INIT CODE
002104  021764          .WORD   L$INIT
002106                  L$CCP::                 ;PTR. TO CLEAN-UP CODE
002106  023024          .WORD   L$CLEAN
002110                  L$ACP::                 ;PTR. TO AUTO CODE
002110  022750          .WORD   L$AUTO
002112                  L$PRT::                 ;PTR. TO PROTECT TABLE
002112  021754          .WORD   L$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  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.
                        ;--
002122                          BGNHW   DFPTBL          ;DEFAULT HARD-P-TABLE
002122  000003                  .WORD   L10000-L$HW/2
002124                  L$HW::
002124                  DFPTBL::

002124  172522                  .WORD   172522          ; 2ND (OF 2) REGISTERS.
002126  000224                  .WORD   224             ; INTERRUPT VECTOR
002130  000240                  .WORD   PRI05           ; INTERRUPT PRIORITY.
002132                          ENDHW
002132                  L10000:
```

```
                                .SBTTL  SOFTWARE P-TABLE

                        ;++
                        ; THE SOFTWARE P-TABLE CONTAINS THE VALUES OF THE PROGRAM
                        ; PARAMETERS THAT CAN BE CHANGED BY THE OPERATOR.
                        ;--
002132                          BGNSW   SFPTBL
002132  000004                 .WORD   L10001-L$SW/2
002134                  L$SW::
002134                  SFPTBL::

002134  000000          TRANSTST::      .WORD   0       ;ENABLE RAM DUMP
002136  000000          NOITS::         .WORD   0       ; INHIBIT ITERATION OPTION.
                                                        ; ... 0 = ITERATE.
                                                        ; ...NZ = INHIBIT ITERATE.
002140  000031          LERRMAX::       .WORD   25.     ; LOCAL (PER TEST) ERROR LIMIT
002142  000310          GERRMAX::       .WORD   200.    ; GLOBAL (PER UNIT) ERROR LIMIT
002144                          ENDSW
002144                  L10001:
```

```
                                .SBTTL  GLOBAL EQUATES SECTION
                                .SBTTL  GLOBAL EQUATES SECTION
                              ;++
                              ; THE GLOBAL EQUATES SECTION CONTAINS PROGRAM EQUATES THAT
                              ; ARE USED IN MORE THAN ONE TEST.
                              ;--
002144                                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
                              ;
```

GLOBAL EQUATES SECTION

```
                000340          PRI07== 340
                000300          PRI06== 300
                000240          PRI05== 240
                000200          PRI04== 200
                000140          PRI03== 140
                000100          PRI02== 100
                000040          PRI01== 40
                000000          PRI00== 0
                                ;
                                ;OPERATOR FLAG BITS
                                ;
                000004          EVL==       4
                000010          LOT==      10
                000020          ADR==      20
                000040          IDU==      40
                000100          ISR==     100
                000200          UAM==     200
                000400          BOE==     400
                001000          PNT==    1000
                002000          PRI==    2000
                004000          IXE==    4000
                010000          IBE==   10000
                020000          IER==   20000
                040000          LOE==   40000
                100000          HOE==  100000
780
781 002144                              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  TK-25 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

                        ;+
                        ;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)
                        ;-
```

```
                        X1.DLT  = BIT15                          ;DATA LATE
                        X1.SPARE= BIT14                         ;NOT USED
                        X1.COR  = BIT13                         ;CORRECTABLE DATA ERROR
                        X1.MBZ  = BIT12+BIT11+BIT10+BIT9+BIT7+BIT6+BIT5+BIT4+BIT3+BIT2+BIT0 ;ALWAYS 0
                        X1.RBP  = BIT8                          ;READ BUS PARITY ERROR
                        X1.UNC  = BIT1                          ;UNCORRECTABLE DATA OR HARD ERROR

                        ;+
                        ;BIT DEFINITIONS FOR EXTENDED STATUS REGISTER 2
                        ;(XST2)
                        ;-
                        X2.OPM  = BIT15                         ;OPERATION IN PROGRESS (TAPE MOVING)
                        X2.RCE  = BIT14                         ;RAM CHECKSUM ERROR
                        X2.SPARE= BIT13+BIT12+BIT11+BIT9+BIT8   ;NOT USED BY TK-25 (ALWAYS=0)
                        X2.WCF  = BIT10                         ;WRITE CLOCK FAILURE (FIFO NOT EMPTIED BY TRANSPORT)
                        X2.EXTF = BIT7                          ;IF WRITE CHAR CMD THEN = EXTENDED FEATURES ENABLED
                        X2.BUFE = BIT6                          ;IF WRITE CHAR CMD THEN = BUFFERING ENABLED
                        X2.REV  = 000077                        ;IF WRITE CHAR CMD THEN = MICROCODE REVISION LEVEL
                        X2.UNIT = BIT2+BIT1+BIT0                ;IF GET STATUS THEN = CURRENTLY SELECTED UNIT NO.

                        ;+
                        ;BIT DEFINITIONS FOR EXTENDED STATUS REGISTER 3
                        ;(XST3)
                        ;-
                        X3.MDE  = 177400                        ;MICRO-DIAGNOSTIC ERROR CODE
                        X3.SPARE= BIT7                          ;NOT USED BY TK-25
                        X3.OPI  = BIT6                          ;OPERATION INCOMPLETE
                        X3.REV  = BIT5                          ;REVERSE
                        X3.TRF  = BIT4                          ;TRANSPORT RESPONSE FAILURE
                        X3.DCK  = BIT3                          ;DENSITY CHECK
                        X3.MBZ  =BIT2+BIT1                      ;NOT USED ALWAYS 0
                        X3.RIB  = BIT0                          ;REVERSE INTO BOT

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


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

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

                        ;+
                        ;
                        ;DEVICE REGISTER OFFSETS
                        ;
```

```
                        ;-
                        ;
177776                  TSBA==  -2
177776                  TSBAL== -2
177776                  TSDB==  -2              ;TSDB/TSBA REGISTER
177776                  TSDBL== -2              ;TSDB/TSBA REGISTER
177777                  TSBAH== -1
177777                  TSDBH== -1              ;TSDB/TSBA REGISTER HIGH BYTE
000000                  TSSR==  0               ;TSSR REGISTER
000001                  TSSRH== 1               ;TSSR REGISTER HIGH BYTE
                        ;
                        ;+
                        ; TSDB ADDRESS BIT DEFINITIONS
                        ;-
000003                  A1716   = BIT1+BIT0     ;ADDRESS BITS 17:16 ARE IN 1:0
                        ;
                        ;+
                        ; COMMAND DEFINITIONS
                        ;-
000017                  P.GETSTAT       = 17    ;GET STATUS
000013                  P.INIT          = 13    ;INITIALIZE
000012                  P.CONTROL       = 12    ;CONTROL COMMANDS
000011                  P.FORMAT        = 11    ;FORMAT
000010                  P.POSITION      = 10    ;POSITION
000006                  P.WRTSUB        = 6     ;SUBSYSTEM WRITE
000005                  P.WRITE         = 5     ;WRITE
000004                  P.WRTCHAR       = 4     ;WRITE CHARACTERISTICS
000001                  P.READ          = 1     ;READ
                        ;
                        ;+
                        ; COMMAND PACKET HEADER WORD BIT DEFINITIONS
                        ;-
100000                          P.ACK   = BIT15                 ;BUFFER AVAIL FOR CONTROLLER
040000                          P.CVC   = BIT14                 ;CLEAR VOLUME CHECK
020000                          P.OPP   = BIT13                 ;REVERSE SEQUENCE OF DATA BITS
010000                          P.SWB   = BIT12                 ;SWAP BYTES IN MEMORY
007400                          P.MODE  = BIT11!BIT10!BIT9!BIT8 ;EXTENDED COMMAND MODE FIELD
000200                          P.IE    = BIT7                  ;INTERRUPT ENABLE
000140                          P.FMT= BIT6!BIT5                ;PACKET HEADER TYPE (ALWAYS=0)
000037                          P.CMD   = 37                    ;MAJOR COMMAND FIELD
                        ;
                        ;+
                        ; CONTROL COMMAND MODE CODES
                        ;-
000000                          PC.RELEASE      = 0*256.        ;RELEASE BUFFER
000400                          PC.REWIND       = 1*256.        ;REWIND
001000                          PC.NOOP         = 2*256.        ;NO-OP
002000                          PC.IEREW        = 4*256.        ;REWIND IMMEDIATE INTERRUPT
002400                          PC.ERASE        = 5*256.        ;SECURITY ERASE
                        ;
                        ;+
                        ; CONTROLLER RAM DEFINITIONS
                        ;-
000167                  RMCHBEG = 167                           ;CHARACTERISTICS IO DATA BEGIN RAM ADDRESS
000200                  RMCHEND = 200                           ;CHARACTERISTICS IO DATA END RAM ADDRESS
000020                  RMPKTBEG= 20                            ;COMMAND PACKET BEGIN RAM ADDRESS
000027                  RMPKTEND= 27                            ;COMMAND PACKET END RAM ADDRESS
000104                  RMMSGBEG= 104                           ;MESSAGE BUFFER BEGIN RAM ADDRESS
```

```
                        RMMSGEND= 117                   ;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.NO1311       = 23            ;DISABLE MICROTEST 11 AND 13
000024                  PW.RDEXT        = 24            ;READ EXT. TAPE STATUS (NOT SUPPORTED BY ALL TRANSPO
RTS

                        ;+
                        ;BSEL1 CODES FOR WRITE TAPE CONTROL
                        ;
                        ;-
000200                  WC.IFAD         = BIT7          ;IFAD - FORMATTER ADDRESS
```

```
1014        000100          WC.IOTAD        = BIT6                  ;ITAD0  - TRANSPORT ADDRESS BIT 0
1015        000040          WC.I1TAD        = BIT5                  ;ITAD1  - TRANSPORT ADDRESS BIT 1
1016        000020          WC.I5RESV       = BIT4                  ;IRESV5 - RESERVED #5
1017        000010          WC.IREW         = BIT3                  ;IREW   - REWIND
1018        000004          WC.IRWU         = BIT2                  ;IRWU   - REWIND AND UNLOAD
1019        000002          WC.IFEN         = BIT1                  ;IFEN   - FORMATTER ENABLE
1020        000001          WC.IGO          = BIT0                  ;GO
1021
1022                        ;+
1023                        ;BSEL1 CODES FOR WRITE FORMAT
1024                        ;-
1025        000200          WF.IHISP        = BIT7                  ;IHISP  - HIGH SPEED
1026        000100          WF.IWRT         = BIT6                  ;IWRT   - WRITE
1027        000040          WF.IREV         = BIT5                  ;IREV   - REVERSE
1028        000020          WF.IWFM         = BIT4                  ;IWFM   - WRITE FILE MARK
1029        000010          WF.IEDIT        = BIT3                  ;IEDIT  - EDIT
1030        000004          WF.IERASE       = BIT2                  ;IERASE - ERASE
1031        000002          WF.I3RESV       = BIT1                  ;IRESV3 - RESERVED #3
1032        000001          WF.I4RESV       = BIT0                  ;IRESV4 - RESERVED #4
1033
1034
1035                        ;+
1036                        ;BSEL1 CODES FOR WRITE MISCELLANEOUS SUBCOMMAND
1037                        ;-
1038        000200          MS.EXT          = BIT7                  ;INVERT SENSE OF EXTENDED FEATURES SWITCH
1039        000020          MS.RSFIFO       = BIT4                  ;RESET FIFO AND INPUT PARITY ERRORR
1040        000010          MS.RSTAPE       = BIT3                  ;RESET TAPE STATUS IN 2 FLIP-FLOPS
1041        000006          MS.ATTN         = BIT2!BIT1             ;ATTENTION TRIGGER FIELD
1042        000001          MS.RSD          = BIT0                  ;RESET TIMER A,B THEN DELAY TIMES IN SEL2
1043                        ;+
1044                        ; MS.ATTN SUBCODES
1045                        ;-
1046        000000                  MSA.NOP = 0^2                   ;NO-OP (NOTHING TRIGGERED)
1047        000002                  MSA.VOL = 1^2                   ;SIMULATE ON-LINE/OFF-LINE TRANSISTION
1048        000004                  MSA.NRAM= 2^2                   ;FORCE NON-FATAL RAM ERROR (FORCES ERRCODE 54)
1049        000006                  MSA.FRAM= 3^2                   ;FORCE FATAL RAM ERROR (CAUSES SCE TO SET)
1050                        ;+
1051                        ; WRITE SUBSYSTEM WRITE NPR BSEL1 BIT DEFINITIONS
1052                        ;-
1053        000200          NP.IR           = BIT7                  ;INTERRUPT REQUEST (0-1 TRANSITION)
1054        000100          NP.OUT          = BIT6                  ;TAPE DATA DIRECTION OUT (0= IN)
1055        000040          NP.LOOP         = BIT5                  ;ENABLE TRANSPORT LOOPBACK
1056        000020          NP.WRP          = BIT4                  ;WRITE CORRECT PARITY (SET=0 TO WRITE WRONG)
1057                        ;+
1058                        ; READ STATUS MESSAGE BUFFER BIT DEFINITIONS
1059                        ;-
1060
1061        000200          S2.DIM          = BIT7                  ;WORD #9 BYTE 2 DATA IN MISS
1062        000100          S2.ILW          = BIT6                  ;               ILW H
1063        000040          S2.OUTRDY       = BIT5                  ;               OUT RDY H
1064        000020          S2.INRDY        = BIT4                  ;               IN RDY H
1065        000010          S2.ATIMR        = BIT3                  ;               TIMER A FLAG H
1066        000004          S2.BTIMR        = BIT2                  ;               TIMER B FLAG H
1067        000003          S2.UNDEF        = BIT1+BIT0             ;(UNDEFINED)
1068        100000          S1.PARIN        = BIT15                 ;WORD #8 BYTE 1 PARIN H
1069        040000          S1.I2RESV       = BIT14                 ;               IRESV2
1070        020000          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
                                S0.IRDY         = BIT6                  ;                       IRDY L
                                S0.IONL         = BIT5                  ;                       IONL L
                                S0.ILDP         = BIT4                  ;                       ILDP L
                                S0.IDBY         = BIT3                  ;                       IDBY L
                                S0.IRWD         = BIT2                  ;                       IRWD L
                                S0.IFBY         = BIT1                  ;                       IFBY L
                                S0.IFPT         = BIT0                  ;                       IFPT L
                        ;       SPECIAL KEYBOARD STUFF FOR MOVER PROGRAM

                                TKS     =177560                 ;KEYBOARD STATUS REGISTER
                                TKB     =177562                 ;KEYBOARD DATA REGISTER
                                TPS     =177564                 ;CONSOLE PRINTER STATUS REGISTER
                                TPB     =177566                 ;CONSOLE PRINTER DATA REGISTER
                                HIMEM   =007776                 ;HIGH MEMORY MASK VALUE
                        ;       CONTROLLER DEFINITIONS
                        ;
                        ;
                                CSR     =174400                 ;STATUS AND CONTROL REGISTER
                                BAR     =174402                 ;DL ADDRESS REGISTER
                                DAR     =174404                 ;PLATTER ADDRESS
                                MPR     =174406                 ;MULTIPURPOSE REGISTER
                        ;
                        ;
                        ;
                        ;
                        ;
                        ;       CONTROLLER COMMANDS
                        ;
                        ;
                                DLGETS  =4                      ;GET STATUS COMMAND
                                SEEK    =6                      ;SEEK TRACK AND HEAD SELECT
                                DLRDHD  =10                     ;READ SECTOR HEADER
                                READ    =14                     ;READ COMMAND
                                DLRDNH  =16                     ;READ SECTOR NO HEADER CHECK
                        ;
                        ;
                        ;
                        ;
                        ;
                        ;
                                READY   =1                      ;DRIVE READY BIT IN STATUS REG.
                                DLSR    =13                     ;STATUS AND RESET
                                DLERR   =177730                 ;MASK FOR COVER OPEN
                                DLUN    =6                      ;HEADS UNLOADED
                                DLCYL   =000177                 ;MASK FOR CYLINDER ADDRESS
                                DLDNER  =100200                 ;DONE SET OR ERROR SET BITS
                        ;
                        ;
                        ;
                        ;
                                TTICSR  =       17756C          ;KEYBOARD INPUT STATUS
```

J3

TK-25 REGISTER AND PACKET DEFINITIONS

```
1128    177562                  TTIBFR  =       177562          ;KEYBOARD DATA REGISTER
1129    177564                  TTOCSR  =       177564          ;CONSOLE PRINTER STATUS REGISTER
1130    177566                  TTOBFR  =       177566          ;CONSOLE PRINTER DATA REGISTER
1131
```

```
                        .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.
                                ;

002144  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.
                        ;
002146  000000          EPRTSW::        .WORD   0               ;PRINT SWITCH
002150  000000          UNITN::         .WORD   0               ;UNIT # UNDER TEST.
002152  000000          QVP::           .WORD   0               ;QUICK VERIFY FLAG.
002154  000000          CSRADDR::       .WORD   0               ;ADDRESS OF CSR FOR CURRENT DEVICE
002156  000224          IVEC::          .WORD   224             ;INTERRUPT VECTOR
002160  000200          IPRI::          .WORD   PRI04           ;INTERRUPT PRIORITY.
002162  000000          TSTCNT::        .WORD   0               ;NUMBER OF TESTS RUN IN THIS PASS
002164  000000          LOOPCNT::       .WORD   0               ;REMAINING ITERATION COUNT FOR TEST
002166  000000          DEVCNT::        .WORD   0               ;NUMBER OF DEVICE UNDER TEST
002170  000000          FATFLG::        .WORD   0               ;SET IF FATAL ERROR IS DETECTED IN TEST
002172  000000          INTRECV::       .WORD   0               ;SET IF TAPE INTERRUPT WAS RECEIVED
002174  000000          BENBSW::        .WORD   0               ;BUFFER ENABLE SWITCH SW 0=OFF;1=ON
002176  000000          EXPD::          .WORD   0               ;EXPECTED RAM DATA FOR PRAMPKT ROUTINE
002200  000000          RECV::          .WORD   0               ;RECEIVED RAM DATA FOR PRAMPKT ROUTINE
002202  000000          ERRHI::         .WORD   0               ;HIGH ADDRESS MEMORY ERROR
002204  000000          ERRLO::         .WORD   0               ;LOW ADDRESS MEMORY ERROR
002206                  RAMDATA::       .BLKW   16.             ;DATA READ FROM RAM PACKET OR MESSAGE BUF AREA
002246  000000          RAMSIZ::        .WORD   0               ;RAM DATA SIZE FOR PRAMPKT ROUTINE
002250  000000          RCVHIADD::      .WORD   0               ;RECEIVED BUFFER HIGH ADDRESS
002252  000000          RCVLOADD::      .WORD   0               ;RECEIVED BUFFER LOW ADDRESS
002254  000000          COUNT::         .WORD   0               ;TEST COUNT PATTERN
002256  000000          DATA::          .WORD   0               ;TEST DATA
002260  000000          TSTFLAG::       .WORD   0               ;TEST FLAG WORD
002262  000000          TSTPTR::        .WORD   0               ;TSTBLK POINTER
002264  000000          PRMNO::         .WORD   0               ;PRINT ROUTINE TEMP
002266                  EXPMSG::        .BLKB   100.            ;EXPECTED MESSAGE BUFFER DATA
002432                  RECMSG::        .BLKB   100.            ;RECEIVED MESSAGE BUFFER DATA
002576                  TMPBFR::        .BLKB   80.             ;TEMPORARY STORAGE FOR PRINT
002716  000000          MESBFA::        .WORD   0               ;STORES ADDRESS OF MESSAGE BUFFER FOR ERR PRT
```

```
                                .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
                        ;
                        ;-

002720                  TSTBLK::
002720  000000                .WORD   0                       ;ALL ZEROS
002722  177777                .WORD   177777                  ;ALL ONES
002724  000001                .WORD   BIT0                    ;DATA FOR WALKING ONES
002726  000002                .WORD   BIT1
002730  000004                .WORD   BIT2
002732  000010                .WORD   BIT3
002734  000020                .WORD   BIT4
002736  000040                .WORD   BIT5
002740  000100                .WORD   BIT6
002742  000200                .WORD   BIT7
002744  000400                .WORD   BIT8
002746  001000                .WORD   BIT9
002750  002000                .WORD   BIT10
002752  004000                .WORD   BIT11
002754  010000                .WORD   BIT12
002756  020000                .WORD   BIT13
002760  040000                .WORD   BIT14
002762  100000                .WORD   BIT15
002764  177776                .WORD   ^CBIT0                  ;DATA FOR WALKING ZEROS
002766  177775                .WORD   ^CBIT1
002770  177773                .WORD   ^CBIT2
002772  177767                .WORD   ^CBIT3
002774  177757                .WORD   ^CBIT4
002776  177737                .WORD   ^CBIT5
003000  177677                .WORD   ^CBIT6
003002  177577                .WORD   ^CBIT7
003004  177377                .WORD   ^CBIT8
003006  176777                .WORD   ^CBIT9
003010  175777                .WORD   ^CBIT10
003012  173777                .WORD   ^CBIT11
003014  167777                .WORD   ^CBIT12
003016  157777                .WORD   ^CBIT13
003020  137777                .WORD   ^CBIT14
003022  077777                .WORD   ^CBIT15
003024  125252                .WORD   125252                  ;ALTERNATING ONES, ZEROS
003026  052525                .WORD   052525                  ;ALTERNATING ONES, ZERO OPPOSITE FROM ABOVE
003030                  TBLEND==.
```

```
1311                                    .SBTTL  GLOBAL ENVIRONMENT STORAGE
1312                                    ;
1313                                    ;STORAGE FOR DEVICE REGISTERS
1314                                    ;
1315 003030  000000  100000  000000  DUMMY:  0,100000,0,0                  ;DUMMY DEVICE REGISTERS...
1316 003040  000000  000000  000000          0,0,0,0,0,0,0,0
1317                                                                       ;...FOR MULTI-UNIT CHECKOUT.
1318
1319
1320 003060  000000                  DUFLG::         .WORD   0            ;"DROPPED UNIT" FLAG.
1321                                                                       ;INHIBITS CODE IN "CLEAN-UP".
1322 003062  000000                  NODEV::         .WORD   0            ;FLAG TO SAY NO DEVICE.
1323
1324 003064  000000                  TEMP1::         .WORD   0            ;SOME TEMP LOCATIONS.
1325 003066  000000                  TEMP2::         .WORD   0
1326 003070  000000                  XXCOMM::        .WORD   0            ;XXDP+ COMM BLOCK POINTER.
1327 003072  000000                  FREE::          .WORD   0            ;1ST FREE MEMORY ADDRESS...
1328 003074  000000                  FRESIZ::        .WORD   0            ;...AND SIZE (IN WORDS).
1329 003076  000000                  FREEHI:         .WORD   0            ;LAST WORD IN FREE SPACE
1330 003100  000000                  KTFLG::         .WORD   0            ;KT11, MEM AVAIL FLAG -
1331                                                                       ;- .WORD        0 = <24K OR NO KT -
1332                                                                       ;- NZ = >24K AND KT.
1333 003102  000000                  KTENABLE::      .WORD   0            ;SET BY TEST ROUTINES TO FLAG >28K UNDER TEST
1334 003104  002000                  PST32W::        .WORD   2000         ;32W BLOCK ADDRESS FOR 32K START
1335 003106  000000                  SIFLAG::        .WORD   0            ;
1336 003110  000000                  BADDAT::        .WORD   0            ;ACTUAL DATA
1337 003112  000000                  GDDAT::         .WORD   0            ;EXPECTED DATA
1338 003114  000000                  LOOPFL::        .WORD   0
1339 003116                          CTAB::                               ;CONFIGURATION TABLES.
1340 003116  000000                  CTABM::         .WORD   0            ;CONFIG WORK.
1341 003120  000000                                  .WORD   0
1342 003122  000000                                  .WORD   0
1343 003124  000000                                  .WORD   0
1344 003126  177777                                  .WORD   -1                   ;END OF MEM TABLE.
1345 003130                          CTABE::
1346                                 ;ERROR STATISTICS TABLE (1 WORD PER UNIT), 64 UNITS MAX:
1347                                 ;
1348                                 ;       0       =       UNIT NOT TESTED
1349                                 ;       100000  =       UNIT ONLINE, NO ERRORS
1350                                 ;       10XXXX  =       UNIT ONLINE, ENCOUNTERED XXXX ERRORS
1351                                 ;       160000  =       UNIT DROPPED, NON-EXISTENT DEVICE REGISTER
1352                                 ;       160001  =       UNIT DROPPED, NOT IDLE AT START
1353                                 ;       14XXXX  =       UNIT DROPPED, ENCOUNTERED XXXX ERRORS
1354                                 ;
1355 003130                          ERTABL:         .BLKW   64.
1356 003330  000000                  ERTABE:         .WORD   0
1357
1358 003332  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
                                ;-

003334                                  DEVTYP  <TK-25>
003334                          L$DVTYP::
003334  124  113  055                    .ASCIZ  /TK-25/
                                        .EVEN

                                ;+
                                ;TEST DESCRIPTION
                                ;-
003342                                  DESCRIPT <CZTKFA TK-25 FRT END FUNC #2>
003342                          L$DESC::
003342  103  132  124                    .ASCIZ  /CZTKFA TK-25 FRT END FUNC #2/
                                        .EVEN
                                ;+
                                ;BIT TO ASCII CONVERSION FOR TSSR REGISTER
                                ;-

003400  003440  003443  003447  TSSRBIT::          .WORD   1$,2$,3$,4$,5$,6$,7$,8$
003420  003501  003505  003511                    .WORD   9$,10$,11$,12$,13$,14$,15$,16$
003440     123     103     000  1$:       .ASCIZ  'SC'
003443     102     111     105  2$:       .ASCIZ  'BIE'
003447     123     103     105  3$:       .ASCIZ  'SCE'
003453     122     115     122  4$:       .ASCIZ  'RMR'
003457     116     130     115  5$:       .ASCIZ  'NXM'
003463     116     102     101  6$:       .ASCIZ  'NBA'
003467     102     111     124  7$:       .ASCIZ  'BIT9'
003474     102     111     124  8$:       .ASCIZ  'BIT8'
003501     123     123     122  9$:       .ASCIZ  'SSR'
003505     117     106     114  10$:      .ASCIZ  'OFL'
003511     102     111     124  11$:      .ASCIZ  'BIT5'
003516     102     111     124  12$:      .ASCIZ  'BIT4'
003523     102     111     124  13$:      .ASCIZ  'BIT3'
003530     102     111     124  14$:      .ASCIZ  'BIT2'
003535     102     111     124  15$:      .ASCIZ  'BIT1'
003542     102     111     124  16$:      .ASCIZ  'BIT0'
                                .EVEN
003550     124     123     123  SFIERR:   .ASCIZ  'TSSR ERROR AFTER SOFT INIT'
003603     124     123     123  SFMERR:   .ASCIZ  'TSSR ERROR AFTER BUS RESET'
003636     040     040     116  NXR:      .ASCIZ  /  NON-EXISTANT DEVICE REGISTER/
003675     045     101     040  NXRX:     .ASCIZ  /%A  ADDRESS: %O6/
003716     045     101     040  TSSX:     .ASCII  /%A  TSBA,TSSR EXP'D: %O6%A,%O6%N/
003756     045     101     040              .ASCIZ  /%A  TSBA,TSSR REC'D: %O6%A,%O6/
004015     045     116     045  FUSI:     .ASCII  /%N%A/
004021     040     040     125  USI:      .ASCIZ  /  UNEXPECTED INTERRUPT/
004050     040     040     111  NSI:      .ASCIZ  /  INTERRUPT EXPECTED, NOT RECEIVED/
```

```
1411 004113  045  116  045  FNOINTR:          .ASCII  /%N%A/
1412 004117  040  040  116  NOINTR:  .ASCIZ   /  NO INTERRUPT WAS GENERATED/
1413 004154  040  040  111  IFAULT:  .ASCIZ   /  INTERRUPT FAULT/
1414 004176  045  101  040  INTX:    .ASCIZ   /%A  CPU PC: %O6%A  TSBA: %O6/
1415 004233  040  040  042  NOINIT:  .ASCIZ   /  "BUS-INIT" DIDN'T INITIALIZE CONTROLLER/
1416 004305  040  040  042  NSINIT:  .ASCIZ   /  "SOFT-INIT" DIDN'T INITIALIZE THE DPU/
1417 004355  040  040  042  BRINIT:  .ASCIZ   /  "BUS-RESET" DIDN'T INITIALIZE THE DPU/
1418
1419 004425  000            NUL:     .ASCIZ   //
1420 004426  045  116  000  NULCR:   .ASCIZ   /%N/
1421 004431  045  101  040  EXPGOT:  .ASCIZ   /%A EXP'D: %O6%A, REC'D: %O6/
1422 004465  045  116  045  EXPGT2:  .ASCIZ   /%N%A EXP'D: %O6%A, %O6%N%A REC'D: %O%A, %O6/
1423 004541  045  101  040  DUAD12:  .ASCIZ   /%A REG(W) WRITTEN TO: %O6%A REG(R) READ; EXP'D: %O6%A, REC'D: %O6/
1424 004643  122  101  115  PKTRAM::          .ASCIZ  'RAM Contents Do Not Match Packet Sent'
1425 004711  040  040  103  SCME:    .ASCIZ   /  CONFIG DOESN'T MATCH MFG. MASTER/
1426 004754  127  122  111  WRTMSG:  .ASCIZ   'WRITE CHARACTERISTICS Failed'
1427 005011  124  123  123  WRTERR:  .ASCIZ   'TSSR Incorrect After WRITE Command, More Bits Set Than SSR'
1428 005104  124  123  123  RDERR:   .ASCIZ   'TSSR Incorrect After READ Command, More Bits Set Than SSR'
1429                          .EVEN
1430
1431
1432
```

```
                                        .SBTTL  GLOBAL ERROR REPORT SECTION

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

005176                                  BGNMSG  NXRERR                  ;NON-EXISTANT DEVICE REGISTER.
005176                          NXRERR::
005176                                  PRINTX  #NXRX,NODEV             ;NODEV = NEXM ADDRESS.
005176  013746  003062                    MOV     NODEV,-(SP)
005202  012746  003675                    MOV     #NXRX,-(SP)
005206  012746  000002                    MOV     #2,-(SP)
005212  010600                            MOV     SP,R0
005214  104415                            TRAP    C$PNTX
005216  062706  000006                    ADD     #6,SP
005222  004737  005230                    JSR     PC,EXTEND               ; PRINT EXTENSION IF REQUIRED.
005226                                  ENDMSG
005226                          L10002:
005226  104423                          TRAP    C$MSG


                                ;
                                ; THIS ROUTINE APPENDS A UNIQUE EXTENSION (IF REQUIRED)
                                ; TO ANY OF THE ABOVE ERROR SIGNATURES.
                                ;
005230  005727                  EXTEND: TST     (PC)+
005232  000000                  EXTA:   0                               ; 0 = NO EXTENSION.
005234  001402                          BEQ     1$
005236  004777  177770                  JSR     PC,@EXTA                ; APPEND EXTENSION TEXT.
005242                          1$:     PRINTX  #NULCR                  ; PRINT A BLANK LINE
005242  012746  004426                    MOV     #NULCR,-(SP)
005246  012746  000001                    MOV     #1,-(SP)
005252  010600                            MOV     SP,R0
005254  104415                            TRAP    C$PNTX
005256  062706  000004                    ADD     #4,SP
005262  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
                ;
                ;-

005264          PRITSSR:
005264                  SAVREG                          ;SAVE GENERAL REGISTERS
005270  010104          MOV     R1,R4                   ;SAVE THE TSSR CONTENTS
005272                  PRINTB  #TSSRFOR,R4             ;PRINT THE CONTENTS OF TSSR
005272  010446          MOV     R4,-(SP)
005274  012746  006117  MOV     #TSSRFOR,-(SP)
005300  012746  000002  MOV     #2,-(SP)
005304  010600          MOV     SP,R0
005306  104414          TRAP    C$PNTB
005310  062706  000006  ADD     #6,SP
005314  010400          MOV     R4,R0                   ;GET TSSR BACK FOR CHKAMB
005316  004737  016714  JSR     PC,CHKAMB               ;ARE CONTENTS AMBIGUOUS ?
005322  103410          BCS     5$                      ;BRANCH IF NOT
005324                  PRINTX  #AMBTSSR                ;SHOW CONTENTS ARE AMBIGUOUS
005324  012746  006337  MOV     #AMBTSSR,-(SP)
005330  012746  000001  MOV     #1,-(SP)
005334  010600          MOV     SP,R0
005336  104415          TRAP    C$PNTX
005340  062706  000004  ADD     #4,SP
005344  010403  5$:     MOV     R4,R3                   ;CONTENTS OF TSSR
005346  042703  001476  BIC     #HIADDR!FATERR!TERCLS,R3        ;CLEAR ALL MULTIPLE BIT FIELDS
005352  001434          BEQ     20$                     ;NO BITS ARE SET
005354  012702  002576  MOV     #TMPBFR,R2              ;TEMPORARY ASCII BUFFER
005360  012701  003400  MOV     #TSSRBIT,R1             ;ASCII EQUIVALENT OF BITS
005364  005703  10$:    TST     R3                      ;REMAINING BITS TO CONVERT
005366  001413          BEQ     15$                     ;BRANCH WHEN ALL ARE DONE
005370  000241          CLC                             ;CLEAR CARRY FOR SHIFT
005372  006103          ROL     R3                      ;SHIFT NEXT BIT TO CARRY
005374  103006          BCC     13$                     ;BRANCH IF BIT NOT SET
005376  011100          MOV     (R1),R0                 ;POINTER TO BIT DEFINITION
005400  112022  11$:    MOVB    (R0)+,(R2)+             ;MOVE ASCIZ TO BUFFER
005402  001376          BNE     11$                     ;MOVE ALL BITS
005404  112762  000054  177777  MOVB    #',,-1(R2)      ;INSERT A COMMA TO TERMINATE
005412  005721  13$:    TST     (R1)+                   ;POINT TO NEXT DESCRIPTION
005414  000763          BR      10$                     ;GET THE REMAINING BITS
005416  105042  15$:    CLRB    -(R2)                   ;TERMINATE THE LINE
005420                  PRINTX  #TSSDEF,#TMPBFR         ;PRINT THE BIT DEFINITIONS
005420  012746  002576  MOV     #TMPBFR,-(SP)
005424  012746  006310  MOV     #TSSDEF,-(SP)
```

```
                005430  012746  000002                  MOV     #2,-(SP)
                005434  010600                          MOV     SP,R0
                005436  104415                          TRAP    C$PNTX
                005440  062706  000006                  ADD     #6,SP
     1504
     1505       005444  010403                  20$:    MOV     R4,R3                   ;GET THE TSSR CONTENTS
     1506       005446  042703  177761                  BIC     #^CTERCLS,R3            ;CLEAR ALL BUT TERMINATION
     1507       005452  016303  006400                  MOV     TCOCOD(R3),R3           ;GET THE TERMINATION CODE MEANING
     1508       005456                                  PRINTX  #TCOASC,R3              ;PRINT THE TERMINATION CODE
                005456  010346                          MOV     R3,-(SP)
                005460  012746  006200                  MOV     #TCOASC,-(SP)
                005464  012746  000002                  MOV     #2,-(SP)
                005470  010600                          MOV     SP,R0
                005472  104415                          TRAP    C$PNTX
                005474  062706  000006                  ADD     #6,SP
     1509       005500  010403                          MOV     R4,R3                   ;TSSR CONTENTS AGAIN
     1510       005502  042703  177717                  BIC     #^CFATERR,R3            ;CLEAR ALL BUT FATAL TERMINATION
     1511       005506  001421                          BEQ     25$                     ;DON'T PRINT IF ZERO
     1512       005510  006203                          ASR     R3
     1513       005512  006203                          ASR     R3
     1514       005514  006203                          ASR     R3                      ;ALINE TERMINATION CODE FOR INDEX
     1515       005516  016303  006740                  MOV     TSFCOD(R3),R3           ;GET THE FATAL TERMINATION CODE
     1516       005522                                  PRINTX  #TFCASC,R3              ;PRINT THE FATAL TERMINATION CODE
                005522  010346                          MOV     R3,-(SP)
                005524  012746  006241                  MOV     #TFCASC,-(SP)
                005530  012746  000002                  MOV     #2,-(SP)
                005534  010600                          MOV     SP,R0
                005536  104415                          TRAP    C$PNTX
                005540  062706  000006                  ADD     #6,SP
     1517       005544  012737  000031  002170          MOV     #25.,FATFLG             ;DROP THIS UNIT AFTER ERROR
     1518       005552  010403                  25$:    MOV     R4,R3                   ;GET TSSR CONTENTS
     1519       005554  042703  176377                  BIC     #^CHIADDR,R3            ;CLEAR ALL BUT EXTENDED ADDRESS
     1520       005560  001411                          BEQ     30$                     ;DON'T PRINT IF ZERO
     1521       005562                                  PRINTX  #TEXASC,R3              ;PRINT THE EXTENDED ADDRESS BITS
                005562  010346                          MOV     R3,-(SP)
                005564  012746  006137                  MOV     #TEXASC,-(SP)
                005570  012746  000002                  MOV     #2,-(SP)
                005574  010600                          MOV     SP,R0
                005576  104415                          TRAP    C$PNTX
                005600  062706  000006                  ADD     #6,SP
     1522       005604  022704  100210          30$:    CMP     #100210,R4              ;CHECK FOR MEDIA ERROR
     1523       005610  001003                          BNE     31$                     ;BR, IF PROBABLY NOT TAPE ERROR
     1524       005612  012737  006026  002146          MOV     #EPRT3,EPRTSW           ;"PROBABLY MEDIA RELETED ERROR - BAD TAPE"
     1525       005620  005737  002146          31$:    TST     EPRTSW                  ;CHECK FOR THE SWITCH EMPTY
     1526       005624  001003                          BNE     310$                    ;BR, IF SWITCH IS NOT EMPTY
     1527       005626  012737  005762  002146          MOV     #EPRT1,EPRTSW           ;SET SWITCH TO DEFAULT
     1528       005634  013737  002146  005644  310$:   MOV     EPRTSW,32$+2            ;PUT REAL SWITCHABLE MESSAGE IN PLACE
     1529       005642                          32$:    PRINTB  #EPRT1                  ;PRINT THE ERROR MESSAGE
                005642  012746  005762                  MOV     #EPRT1,-(SP)
                005646  012746  000001                  MOV     #1,-(SP)
                005652  010600                          MOV     SP,R0
                005654  104414                          TRAP    C$PNTB
                005656  062706  000004                  ADD     #4,SP
     1530       005662  012737  005762  002146          MOV     #EPRT1,EPRTSW           ;RESET TO NORMAL ERROR POINTER
     1531       005670  000207                          RTS     PC                      ;RETURN TO CALLER
     1532       005672     045     116     045  EPRT2:  .ASCIZ  '%N%A *****CHECK CONTROLLER, CABLES AND TRANSPORT******%S'
     1533       005762     045     116     045  EPRT1:  .ASCIZ  '%N%A *****REPLACE CONTROLLER******%S'
```

```
1534 006026      045      116      045  EPRT3:  .ASCIZ  '%N%A *****POSSIBLE MEDIA RELATED ERROR - BAD TAPE*****%S'
1535
1536 006117      045      116      045  TSSRFOR:        .ASCIZ  '%N%A TSSR = %O6'
1537 006137      045      116      045  TEXASC:         .ASCIZ  '%N%A Extended Address Bits = %O6'
1538 006200      045      116      045  TCOASC:         .ASCIZ  '%N%A Termination Class Code = %T'
1539 006241      045      116      045  TFCASC:         .ASCIZ  '%N%A Fatal Termination Class Code = %T'
1540 006310      045      116      045  TSSDEF:         .ASCIZ  '%N%A TSSR Bits Set: %T'
1541 006337      045      116      045  AMBTSSR:        .ASCIZ  '%N%A TSSR Contents Are Ambiguous'
1542                                    .EVEN
1543 006400  006420  006443  006471  TCOCOD: .WORD   1$,2$,3$,4$,5$,6$,7$,8$
1544 006420      116      157      162  1$:     .ASCIZ  'Normal Termination'
1545 006443      124      145      162  2$:     .ASCIZ  'Termination Condition'
1546 006471      124      141      160  3$:     .ASCIZ  'Tape Status Alert'
1547 006513      106      165      156  4$:     .ASCIZ  'Function Reject'
1548 006533      122      145      143  5$:     .ASCIZ  'Recoverable Error - Tape Position One Record Down'
1549 006615      122      145      143  6$:     .ASCIZ  'Recoverable Error - Tape Was Not Moved'
1550 006664      125      156      162  7$:     .ASCIZ  'Unrecoverable Error'
1551 006710      106      141      164  8$:     .ASCIZ  'Fatal Controller Error'
1552                                    .EVEN
1553
1554 006740  006750  007004  007015  TSFCOD: .WORD   1$,2$,3$,4$
1555 006750      111      156      164  1$:     .ASCIZ  'Internal Diagnostic Failure'
1556 007004      122      145      163  2$:     .ASCIZ  'Reserved'
1557 007015      102      165      163  3$:     .ASCIZ  'Bus Interface or Sanity Check Error'
1558 007061      122      145      163  4$:     .ASCIZ  'Reserved'
1559                                    .EVEN
```

```
PRIPKT  - PRINT THE ADDRESS/CONTENTS OF COMMAND PACKET

                                        .SBTTL  PRIPKT  - PRINT THE ADDRESS/CONTENTS OF COMMAND PACKET

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

007072                          PRIPKT::
007072                                  SAVREG                          ;SAVE THE REGISTERS
007076  010005                          MOV     R0,R5                   ;SAVE NO. OF WORDS IN PACKET
007100  005737  003102                  TST     KTENABLE                ;ABOVE 28K UNDER TEST?
007104  001001                          BNE     10$                     ;BR IF YES
007106  005003                          CLR     R3                      ;SET HIGH ORDER ADDRESS TO 0
007110  010301                  10$:    MOV     R3,R1                   ;COPY HIGH ORDER ADDRESS
007112  010400                          MOV     R4,R0                   ;GET LOWER ADDRESS
007114  006100                          ROL     R0                      ;SHIFT BIT 15 INTO C BIT
007116  006101                          ROL     R1                      ;AND INTO HIGH ORDER.
007120                                  PRINTB  #PKTADD,R1,R4           ;PRINT PACKET ADDRESS
007120  010446                          MOV     R4,-(SP)
007122  010146                          MOV     R1,-(SP)
007124  012746  007276                  MOV     #PKTADD,-(SP)
007130  012746  000003                  MOV     #3,-(SP)
007134  010600                          MOV     SP,R0
007136  104414                          TRAP    C$PNTB
007140  062706  000010                  ADD     #10,SP
007144  010300                  15$:    MOV     R3,R0                   ;GET HIGH ORDER ADDRESS
007146  001404                          BEQ     20$                     ;BR IF NOT ABOVE 28K.
007150  010401                          MOV     R4,R1                   ;GET LOW ORDER ADDRESS
007152  004737  020270                  JSR     PC,SETMAP               ;SETUP PAR6 MAPPING FOR 18 BIT ADDRESS
007156  010004                          MOV     R0,R4                   ;GET RETURNED PAR6 ADDRESS BIAS
007160  005001                  20$:    CLR     R1                      ;SAVE WORD NUMBER
007162  012402                  25$:    MOV     (R4)+,R2                ;GET PACKET CONTENTS
007164                                  PRINTB  #PKTFRM,R1,R2           ;PRINT THE DATA
007164  010246                          MOV     R2,-(SP)
007166  010146                          MOV     R1,-(SP)
007170  012746  007240                  MOV     #PKTFRM,-(SP)
007174  012746  000003                  MOV     #3,-(SP)
007200  010600                          MOV     SP,R0
007202  104414                          TRAP    C$PNTB
007204  062706  000010                  ADD     #10,SP
007210  005201                          INC     R1                      ;NEXT WORD NUMBER
007212  020105                          CMP     R1,R5                   ;DONE ALL PACKET WORDS?
007214  002762                          BLT     25$                     ;LOOP TILL ALL DONE
007216                                  PRINTB  #PKTNEW                 ;JUST A COUPLE NEW LINES
007216  012746  007333                  MOV     #PKTNEW,-(SP)
007222  012746  000001                  MOV     #1,-(SP)
007226  010600                          MOV     SP,R0
007230  104414                          TRAP    C$PNTB
007232  062706  000004                  ADD     #4,SP
```

J4


```
1599 007236  000207                          RTS     PC              ;RETURN
1600
1601 007240     045     116     045  PKTFRM: .ASCIZ  '%N%A Packet Word #%D1%A = %06'
1602 007276     045     116     045  PKTADD: .ASCIZ  '%N%A Packet Address = %01%05'
1603
1604 007333     045     116     045  PKTNEW: .ASCIZ  '%N%N%A  '
1605                                  .EVEN
1606
```

```
                        .SBTTL  PRIBXOR - PRINT EXPD, RECV AND XOR BYTE

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

007344          PRIBXOR::
007344                  SAVREG                          ;SAVE THE REGISTERS
007350  010203          MOV     R2,R3                   ;EXPECTED DATA
007352          XOR     R1,R3                   ;FORM THE EXCLUSIVE OR
007362  012700  177400  MOV     #^C<377>,R0             ;BYTE MASK
007366  040001          BIC     R0,R1                   ;SAVE LOW BYTE RECV
007370  040002          BIC     R0,R2                   ;SAVE LOW BYTE EXPD
007372  040003          BIC     R0,R3                   ;SAVE LOW BYTE XOR
007374                  PRINTB  #XORBFOR,R2,R1,R3 ;PRINT THE MESSAGE
007374  010346          MOV     R3,-(SP)
007376  010146          MOV     R1,-(SP)
007400  010246          MOV     R2,-(SP)
007402  012746  007426  MOV     #XORBFOR,-(SP)
007406  012746  000004  MOV     #4,-(SP)
007412  010600          MOV     SP,R0
007414  104414          TRAP    C$PNTB
007416  062706  000012  ADD     #12,SP
007422  010300          MOV     R3,R0                   ;R0 HAS XOR ON RETURN
007424  000207          RTS     PC                      ;RETURN TO CALLER

007426    045   116   045 XORBFOR:    .ASCIZ  '%N%A EXPD: %03%A RECV: %03%A XOR: %03'
                                .EVEN
```

```
                        .SBTTL  PRIXOR  - PRINT EXPD, RECV AND XOR

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

007474          PRIXOR::
007474                  SAVREG                          ;SAVE THE REGISTERS
007500  010203          MOV     R2,R3                   ;EXPECTED DATA
007502                  XOR     R1,R3                   ;FORM THE EXCLUSIVE OR
007512                  PRINTB  #XORFOR,R2,R1,R3 ;PRINT THE MESSAGE
007512  010346          MOV     R3,-(SP)
007514  010146          MOV     R1,-(SP)
007516  010246          MOV     R2,-(SP)
007520  012746  007544  MOV     #XORFOR,-(SP)
007524  012746  000004  MOV     #4,-(SP)
007530  010600          MOV     SP,R0
007532  104414          TRAP    C$PNTB
007534  062706  000012  ADD     #12,SP
007540  010300          MOV     R3,R0                   ;R0 HAS XOR ON RETURN
007542  000207          RTS     PC                      ;RETURN TO CALLER

007544    045   116   045 XORFOR: .ASCIZ  '%N%A EXPD: %O6%A RECV: %O6%A XOR: %O6'
                                .EVEN
```

```
                                .SBTTL  PRIEQU  - PRINT BIT NUMBERS AS ASCII EQUIVALENT

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

007612                  PRIEQU:
007612                          SAVREG                          ;SAVE THE REGISTERS
007616  000207                  RTS     PC                      ;RETURN TO CALLER


                                .SBTTL  PRIRAM  - PRINT RAM ADDRESS
                        ;+
                        ;
                        ;PRINT CONTROLLER RAM ADDRESS.
                        ;THIS ROUTINE IS NORMALLY CALLED ONLY FROM PRINT ROUTINES.
                        ;
                        ;INPUTS:
                        ;
                        ;       R4      RAM ADDRESS
                        ;
                        ;-
007620                  PRIRAM:
007620                          SAVREG                          ;SAVE R1-R5 UNTIL NEXT RETURN
007624                          PRINTB  @RAMFOR,R4              ;PRINT RAM ADDRESS IN ERROR
007624  010446                  MOV     R4,-(SP)
007626  012746  007650          MOV     @RAMFOR,-(SP)
007632  012746  000002          MOV     #2,-(SP)
007636  010600                  MOV     SP,R0
007640  104414                  TRAP    C$PNTB
007642  062706  000006          ADD     #6,SP
007646  000207                  RTS     PC                      ;RETURN

007650      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
```

```
                                ;
                                ;-
007712                          PRIADD:
007712                                  SAVREG                          ;SAVE R1-R5 UNTIL NEXT RETURN
007716  013700  002202                   MOV     ERRHI,R0                ;GET HIGH ADDRESSS
007722  013701  002204                   MOV     ERRLO,R1                ;GET LOW ADDRESS
007726  010102                          MOV     R1,R2                   ;COPY LOW ADDRESS
007730  006101                          ROL     R1                      ;SHIFT BIT 15 TO C BIT
007732  006100                          ROL     R0                      ;SHIFT INTO HIGH ORDER
007734                                  PRINTB  #PRIA0,R0,R2            ;PRINT MEMORY ADDRESS IN ERROR
007734  010246                          MOV     R2,-(SP)
007736  010046                          MOV     R0,-(SP)
007740  012746  007762                  MOV     #PRIA0,-(SP)
007744  012746  000003                  MOV     #3,-(SP)
007750  010600                          MOV     SP,R0
007752  104414                          TRAP    C$PNTB
007754  062706  000010                  ADD     #10,SP
007760  000207                          RTS     PC                      ;RETURN

007762    045    116    045  PRIA0:    .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
                                ;
                                ;-
010026                          PRITADD:
010026                                  SAVREG                          ;SAVE R1-R5 UNTIL NEXT RETURN
010032  013700  002202                   MOV     ERRHI,R0                ;GET HIGH ADDRESSS
010036  013701  002204                   MOV     ERRLO,R1                ;GET LOW ADDRESS
010042  010102                          MOV     R1,R2                   ;COPY LOW ADDRESS
010044  006101                          ROL     R1                      ;SHIFT BIT 15 TO C BIT
010046  006100                          ROL     R0                      ;SHIFT INTO HIGH ORDER
010050                                  PRINTB  #PRITO,R0,R2            ;PRINT MEMORY ADDRESS IN ERROR
010050  010246                          MOV     R2,-(SP)
010052  010046                          MOV     R0,-(SP)
010054  012746  010076                  MOV     #PRITO,-(SP)
010060  012746  000003                  MOV     #3,-(SP)
010064  010600                          MOV     SP,R0
010066  104414                          TRAP    C$PNTB
010070  062706  000010                  ADD     #10,SP
010074  000207                          RTS     PC                      ;RETURN

010076    045    116    045  PRITO:    .ASCIZ  '%N%A MEMORY TEST ADDRESS = %01%05'
                                        .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:
                ;
                ;
                ;-

                SPACE::
010140                          SAVREG                  ;SAVE THE GENERAL REGISTERS
010140  012737  000764  010330          MOV     #500.,SDELAY    ;SET UP DELAY
010144  012737  140010  010320          MOV     #140010,80$     ;SET UP COMMAND, SPACE FORWARD
010152  005703                          TST     R3              ;CHECK FOR DIRECTION
010160  100403                          BMI     5$              ;BR, IF REVERSE INDICATED
010162  010337  010322                  MOV     R3,90$          ;LOAD UP NUMBER OF RECORDS TO SPACE
010166  000407                          BR      10$             ;GO DO COMMAND
010170  042703  100000          5$:     BIC     #BIT15,R3       ;CLEAR DIRECTION BIT
010174  010337  010322                  MOV     R3,90$          ;LOAD UP NUMBER OF RECORDS TO SPACE
010200  052737  000400  010320          BIS     #BIT8,80$       ;SET REVERSE BIT IN COMMAND PACKET
010206  012704  010320          10$:    MOV     #80$,R4         ;SET UP R4 WITH PACKET ADDRESS
010212  010465  177776                  MOV     R4,TSDB(R5)     ;SEND OUT COMMAND
010216  004737  017120          15$:    JSR     PC,WAITF        ;WAIT FOR SSR
010222  103420                          BCS     20$             ;BR, IF SSR IS SET AND OK
010224                                  DELAY   250             ;DELAY ABOUT .25 SECONDS
010224  012727  000250                  MOV     #250.,(PC)+
010230  000000                          .WORD   0
010232  013727  002116                  MOV     L$DLY,(PC)+
010236  000000                          .WORD   0
010240  005367  177772                  DEC     -6(PC)
010244  001375                          BNE     .-4
```

```
        010250  005367  177756                  DEC     -22(PC)
        010254  001367                          BNE     .-20
1817    010256  005337  010330                  DEC     SDELAY          ;BUMP DELAY COUNTER DOWN
1818    010262  001356                          BNE     15$             ;BR, IF MORE DELAY
1819    010264  000411                          BR      60$             ;BR IF TROUBLE CARRY = CLEAR
1820    010266  016501  000000          20$:    MOV     TSSR(R5),R1     ;READ TSSR
1821    010272  012702  000200                  MOV     #SSR,R2         ;SET UP EXPECTED
1822    010276  020201                  25$:    CMP     R2,R1           ;ARE THEY OK
1823    010300  001401                          BEQ     40$             ;BR, IF EQUAL = OK
1824    010302  000402                          BR      60$             ;TROUBLE EXIT
1825    010304  000261                  40$:    SEC                     ;SET CARRY NO TROUBLE
1826    010306  000401                          BR      70$             ;EXIT
1827    010310  000241                  60$:    CLC                     ;CARRY CLEAR = ERROR
1828    010312                          70$:
1829    010312  010400                          MOV     R4,R0           ;PASS PACKET ADDRESS
1830    010314  000207                          RTS     PC              ;RETURN
```

```
1832                                    ;
1833                                    ;
1834                                    ;
1835                                    ;PACKET FOR SPACE COMMAND
1836                                    ;
1838 010316                                     .BLKB   10-<.-TUV2A&7>
1840                                    ;
1841                                    ;COMMAND WORD
1842 010320  000000                     80$:    .WORD
1843                                    ;NUMBER OF RECORDS TO BE SPACED OVER WORD
1844 010322  000000                     90$:    .WORD
1845 010324  000000                             .WORD
1846 010326  000000                             .WORD
1847 010330  000000                     SDELAY: .WORD   0               ;DELAY COUNTER
1848                                            .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:
                ;               BENBSW = BUFFER ENABLE SWITCH ON OR OFF
                ;
                ;
                ;SIDE EFFECTS:
                ;
                ;
                ;-

010332                  WRTCHR::
010332                          SAVREG                  ;SAVE THE GENERAL REGISTERS
010336  005037  002174          CLR     BENBSW          ;CLEAR BUFFER ENABLE SWITCH
010342  010465  177776  10$:    MOV     R4,TSDB(R5)     ;SEND OUT COMMAND
010346  004737  017236          JSR     PC,CHKTSSR      ;WAIT FOR SSR
010352  103401                  BCS     20$             ;BR, IF SSR IS SET AND OK
010354  000423                  BR      60$             ;BR IF TROUBLE CARRY = CLEAR
010356  016501  000000  20$:    MOV     TSSR(R5),R1     ;READ TSSR
010362  012702  000200          MOV     #SSR,R2         ;SET UP EXPECTED
010366  032701  000100          BIT     #OFL,R1         ;WAS OFF LINE SET IN TSSR
010372  001402                  BEQ     25$             ;BR, IF NO OFL SET
010374  052702  000100          BIS     #OFL,R2         ;MAKE THEM LOOK ALIKE
010400  020201          25$:    CMP     R2,R1           ;ARE THEY OK
010402  001401                  BEQ     40$             ;BR, IF EQUAL = OK
010404  000407                  BR      60$             ;TROUBLE EXIT
010406  062704  000010  40$:    ADD     #8.,R4          ;POINT TO WRT CHARA DATA PACKET
010412  011403                  MOV     (R4),R3         ;GET ADDRESS OF MESSAGE BUFFER
010414  010337  002716          MOV     R3,MESBFA       ;STORE FOR PRINT ROUTINES
010420  000261                  SEC                     ;SET CARRY NO TROUBLE
010422  000401                  BR      70$             ;EXIT
010424  000241          60$:    CLC                     ;CARRY CLEAR = ERROR
010426  016500  000000  70$:    MOV     TSSR(R5),R0     ;RETURN TSSR CONTENTS
010432  000207                  RTS     PC              ;RETURN
```

```
                                        .SBTTL  REWIND  - POSITION TAPE (REWIND) COMMAND

                                ;*
                                ;
                                ;THIS ROUTINE WILL REWIND THE SELECTED TAPE.
                                ;
                                ;       CAUTION: THE ROUTINE DOES NOT WAIT FOR BOT
                                ;                TO ARRIVE. ALSO THE CALLER MUST CHECK FOR
                                ;                SSR TO SET IN THE TSSR
                                ;
                                ;
                                ;CALLING SEQUENCE:
                                ;
                                ;       DO A SOFT INIT
                                ;       DO A WRITE CHARACTERISTICS
                                ;       JSR     PC,REWIND
                                ;
                                ;INPUT:
                                ;
                                ;       R5      FIRST DEVICE UNIBUS ADDRESS
                                ;
                                ;
                                ;OUTPUT
                                ;
                                ;       R0      THE CONTENTS OF R4 IS PASSED TO R0
                                ;
                                ;
                                ;-
                                REWIND::
010434                                  SAVREG                  ;SAVE R1-R5 UNTIL NEXT RETURN
010434  012704  010530                   MOV     #RWPACK,R4      ;GET PACKET ADDRESS
010440  010465  177776                   MOV     R4,TSDB(R5)     ;SEND PACKET ADDRESS TO EXECUTE
010444  012703  000550                   MOV     #360.,R3        ;ENOUGH TIME FOR 2400' REEL TO REWIND
010450  004737  017120           10$:    JSR     PC,WAITF        ;WAIT FOR SSR TO SET
010454  103417                           BCS     20$             ;LEAVE WHEN SSR IS SET
010460                                   DELAY   250.            ;WAIT FOR .25 SECONDS
010462  012727  000372                   MOV     #250.,(PC)+
010466  000000                           .WORD   0
010470  013727  002116                   MOV     L$DLY,(PC)+
010474  000000                           .WORD   0
010476  005367  177772                   DEC     -6(PC)
010502  001375                           BNE     .-4
010504  005367  177756                   DEC     -22(PC)
010510  001367                           BNE     .-20
010512  005303                           DEC     R3              ;BUMP COUNTER DOWN
010514  001357                           BNE     10$             ;KEEP GOING
010516  000241                           CLC                     ;CLEAR CARRY TO SET ERROR
010520  010400                   20$:    MOV     R4,R0           ;PASS THE PACKET ADDRESS
010522  000207                           RTS     PC              ;RETURN
010524                                   .BLKB   10-<.-TUV2A&7>
010530                          RWPACK:
010530  102010                           .WORD   102010          ;POSTION COMMAND (REWIND)
010532  000000                           .WORD   0               ;NOT USED
```

```
                        .SBTTL  CKRAM   - COMPARE RAM TO I/O PACKET

                ;*
                ;
                ;ROUTINE TO READ THE FIRST 8 BYTES FROM RAM
                ;MEMORY AND COMPARE THIS DATA TO A COMMAND PACKET.
                ;
                ;INPUT:
                ;
                ;       R4      ADDRESS OF THE COMMAND PACKET
                ;       R5      FIRST DEVICE UNIBUS ADDRESS
                ;
                ;OUTPUT:
                ;
                ;       CARRY   SET - RAM MATCHES PACKET
                ;               CLR - RAM DOES NOT MATCH PACKET
                ;
                ;IMPLICIT OUTPUT:
                ;
                ;       THE TABLE RAMDATA IS FILLED WITH THE
                ;       DATA HELD IN RAM.
                ;       RAMSIZ IS SET TO 8. FOR PRAMPKT ROUTINE
                ;
                ;SIDE EFFECTS:
                ;
                ;
                ;-

010534                  CKRAM::
                        SAVREG                  ;SAVE THE GENERAL REGISTERS
010540  012701  002206          MOV     @RAMDATA,R1     ;ADDRESS TO SAVE THE RAM DATA
010544  012702  000020          MOV     @RMPKTBEG,R2    ;BYTE ADDRESS OF FIRST RAM DATA
010550  005003                  CLR     R3              ;CLEAR THE ERROR FLAG
010552  004737  017236          JSR     PC,CHKTSSR      ;WAIT FOR SSR
010556  004737  017236  10$:    JSR     PC,CHKTSSR      ;WAIT FOR SSR TO SET
010562  110265  177777          MOVB    R2,TSDBH(R5)    ;SELECT NEXT RAM ADDRESS
010566  004737  017236          JSR     PC,CHKTSSR      ;WAIT FOR SSR TO SET
010572  116511  177776          MOVB    TSBAL(R5),(R1)  ;READ THE RAM DATA
010576  122124                  CMPB    (R1)+,(R4)+     ;COMPARE TO EXPECTED
010600  001401                  BEQ     20$             ;BRANCH IF OK
010602  005203                  INC     R3              ;SET ERROR FLAG
010604  005202          20$:    INC     R2              ;ADDRESS OF NEXT RAM LOCATION
010606  020227  000027          CMP     R2,@RMPKTEND    ;REACHED END YET ?
010612  003761                  BLE     10$             ;BRANCH TILL ALL READ
010614  005703                  TST     R3              ;WAS AN ERROR FOUND ?
010616  001402                  BEQ     30$             ;BRANCH IF NOT
010620  000241                  CLC                     ;CLEAR CARRY TO SHOW ERROR
010622  000401                  BR      50$             ;AND EXIT
010624  000261          30$:    SEC                     ;SHOW GOOD COMPARE
010626  012737  000010  002246  50$:    MOV     @8.,RAMSIZ      ;SETUP RAMSIZ FOR PRAMPKT ROUTINE
010634  000207                  RTS     PC              ;RETURN
```

```
                                        .SBTTL RAMER - READ AND DISPLAY SELECTED RAM
                                ;+
                                ;
                                ;ROUTINE TO READ THE SELECTED RAM LOCATIONS
                                ;
                                ;INPUT:
                                ;
                                ;       R5      FIRST DEVICE UNIBUS ADDRESS
                                ;       CONSOLE WILL ALSO BE PRINTED TO
                                ;
                                ;IMPLICIT OUTPUT:
                                ;
                                ;       THE TABLE RAMDATA IS FILLED WITH THE
                                ;       DATA HELD IN RAM.
                                ;
                                ;SIDE EFFECTS:
                                ;
                                ;
                                ;-

010636                          RAMER::
010636                                  SAVREG                          ;SAVE THE GENERAL REGISTERS
010642  013705  011022                  MOV     RAMR5H,R5               ;RESET R5 TO FIRST DEVICE REGISTER
010646  012701  002206                  MOV     #RAMDATA,R1             ;ADDRESS TO SAVE THE RAM DATA
010652  013702  011020                  MOV     RAMHLD,R2               ;BYTE ADDRESS OF THE FIRST RAM DATA
010656  013703  002246                  MOV     RAMSIZ,R3               ;SET THE SIZE OF THE READ UP
010662  004737  017236          10$:    JSR     PC,CHKTSSR              ;WAIT FOR THE SSR TO SET
010666  110265  177777                  MOVB    R2,TSDBH(R5)            ;SELECT NEXT RAM ADDRESS
010672  004737  017236                  JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
010676  116521  177776                  MOVB    TSBAL(R5),(R1)+         ;READ THE RAM DATA
010702  062702  000001          20$:    ADD     #1,R2                   ;ADDRESS OF THE NEXT RAM LOCATION
010706  077313                          SOB     R3,10$                  ;NUMBER OF LOCATIONS COUNTER
010710  013704  002246                  MOV     RAMSIZ,R4               ;GET THE RAM SIZE
010714  013702  011020                  MOV     RAMHLD,R2               ;GET THE STARTING RAM ADDRESS
010720  060204                          ADD     R2,R4                   ;CALCULATE THE END ADDRESS
010722  162704  000001                  SUB     #1,R4                   ;CORRECT VALUE OF PRINTOUT
010726                                  PRINTX  #RAMIOP,R2,R4           ;RAM ADDRESS = 10 - 17, ETC.
010726  010446                          MOV     R4,-(SP)
010730  010246                          MOV     R2,-(SP)
010732  012746  011024                  MOV     #RAMIOP,-(SP)
010736  012746  000003                  MOV     #3,-(SP)
010742  010600                          MOV     SP,R0
010744  104415                          TRAP    C$PNTX
010746  062706  000010                  ADD     #10,SP
010752  012701  002206                  MOV     #RAMDATA,R1             ;ADDRESS OF WHERE RAM DATA IS
010756  013703  002246                  MOV     RAMSIZ,R3               ;THE SIZE OF THE RAM FIELD READ
010762  005004                  30$:    CLR     R4                      ;NO EXTRA DATA LEFT OVER
010764  112104                          MOVB    (R1)+,R4                ;PICK UP BYTE OF RAM DATA
010766  042704  177400                  BIC     #177400,R4              ;GET RID OF SIGN EXTEND
010772                                  PRINTX  #RAMPD,R4               ;"010 211 111 222 377 000 123 134 ETC."
010772  010446                          MOV     R4,-(SP)
010774  012746  011075                  MOV     #RAMPD,-(SP)
011000  012746  000002                  MOV     #2,-(SP)
011004  010600                          MOV     SP,R0
011006  104415                          TRAP    C$PNTX
011010  062706  000006                  ADD     #6,SP
011014  077316                          SOB     R3,30$                  ;LOOP UNTIL ALL PRINTED
```

```
2052 011016  000207                  50$:    RTS     PC              ;RETURN
2053
2054 011020  000000                  RAMHLD: .WORD   0               ;RAM ADDR HOLDER 1ST ADDRESS
2055 011022  000000                  RAMR5H: .WORD   0               ;HOLDS R5 FOR LATER
2056 011024     045     116     045  RAMIOP: .ASCIZ  '%N%A Ram Address (Octal) = %03%A - %03%N'
2057 011075     045     101     040  RAMPD:  .ASCIZ  '%A %03%A '
2058                                 .EVEN
2059
```

```
                        .SBTTL  CKRAM2  - COMPARE RAM TO I/O CHARACTERISTICS DATA
                ;+
                ;
                ;ROUTINE TO READ THE FIRST 8 OR 10 BYTES FROM RAM
                ;MEMORY AND COMPARE THIS DATA TO A CHARACTERISTICS DATA BLOCK.
                ;
                ;INPUT:
                ;
                ;       R4      ADDRESS OF THE CHARACTERISTICS DATA
                ;       R5      FIRST DEVICE UNIBUS ADDRESS
                ;
                ;OUTPUT:
                ;
                ;       CARRY   SET - RAM MATCHES PACKET
                ;               CLR - RAM DOES NOT MATCH PACKET
                ;
                ;IMPLICIT OUTPUT:
                ;
                ;       THE TABLE RAMDATA IS FILLED WITH THE
                ;       DATA HELD IN RAM.
                ;       RAMSIZ IS SET TO 8. OR 10. FOR PRAMPKT ROUTINE
                ;
                ;SIDE EFFECTS:
                ;
                ;
                ;-

011110                  CKRAM2::
011110                          SAVREG                  ;SAVE THE GENERAL REGISTERS
011114  012701  002206          MOV     #RAMDATA,R1     ;ADDRESS TO SAVE THE RAM DATA
011120  012702  000167          MOV     #RMCHBEG,R2     ;BYTE ADDRESS OF FIRST RAM DATA
011124  005003                  CLR     R3              ;CLEAR THE ERROR FLAG
011126  004737  017236          JSR     PC,CHKTSSR      ;WAIT FOR SSR
011132  004737  017236  10$:    JSR     PC,CHKTSSR      ;WAIT FOR SSR TO SET
011136  110265  177777          MOVB    R2,TSDBH(R5)    ;SELECT NEXT RAM ADDRESS
011142  004737  017236          JSR     PC,CHKTSSR      ;WAIT FOR SSR TO SET
011146  116511  177776          MOVB    TSBAL(R5),(R1)  ;READ THE RAM DATA
011152  122124                  CMPB    (R1)+,(R4)+     ;COMPARE TO EXPECTED
011154  001401                  BEQ     20$             ;BRANCH IF OK
011156  005203                  INC     R3              ;SET ERROR FLAG
011160  005202          20$:    INC     R2              ;ADDRESS OF NEXT RAM LOCATION
011162  012737  000010  002246  MOV     #8.,RAMSIZ      ;ASSUME NORMAL NOT SET
011170  020227  000176          CMP     R2,#RMCHEND-2   ;REACHED END YET ?
011174  003756                  BLE     10$             ;BRANCH TILL ALL READ
011176  005703          27$:    TST     R3              ;WAS AN ERROR FOUND ?
011200  001402                  BEQ     30$             ;BRANCH IF NOT
011202  000241                  CLC                     ;CLEAR CARRY TO SHOW ERROR
011204  000401                  BR      50$             ;AND EXIT
011206  000261          30$:    SEC                     ;SHOW GOOD COMPARE
011210  000207          50$:    RTS     PC              ;RETURN
```

```
                        .SBTTL  CKMSG   - COMPARE WRITE CHAR. MESSAGE BUFFERS
                ;*
                ;
                ;ROUTINE TO COMPARE A WRITE CHARACTERISTICS EXPD AND RECV
                ;BUFFER. THE EXPECTED AND RECEIVED BUFFERS ARE STORED FOR
                ;ERROR PRINT ROUTINES.
                ;
                ;INPUT:
                ;
                ;       R0      RECV MESSAGE BUFFER HIGH ORDER ADDRESS
                ;       R1      RECV MESSAGE BUFFER LOW ORDER ADDRESS
                ;       R2      EXPD MESSAGE BUFFER ADDRESS
                ;OUTPUT:
                ;
                ;       CARRY   SET - MESSAGE BUFFERS MATCH
                ;               CLR -MESSAGE BUFFERS DON'T MATCH
                ;
                ;IMPLICIT OUTPUT:
                ;
                ;       EXPMSG          BUFFER IS SET TO EXPD DATA
                ;       RECMSG          BUFFER IS SET TO RECV DATA
                ;       RCVHIADD        SET TO HIGH ORDER ADDRESS OF RECV
                ;       RCVLOADD        SET TO LOW ORDER ADDRESS OF RECV
                ;
                ;-
011212          CKMSG::
011212                  SAVREG                          ;SAVE R1-R5 UNTIL NEXT RETURN
011216  010037  002250          MOV     R0,RCVHIADD     ;SAVE RECV HIGH ADDRESS
011222  010137  002252          MOV     R1,RCVLOAD      ;SAVE RECV LOW ADDRESS
011226  005737  003102          TST     KTENABLE        ;TESTING ABOVE 28K?
011232  001403                  BEQ     10$             ;BR IF NO
011234  004737  020270          JSR     PC,SETMAP       ;RETURN ADDRESS BIASED TO PAR6 IN R0
011240  010001                  MOV     R0,R1           ;GET RETURNED ADDRESS BIASED TO PAR6
011242  005004          10$:    CLR     R4              ;WORD IN BUFFER
011244  005003                  CLR     R3              ;CLEAR ERROR SEEN FLAG
011246  010205                  MOV     R2,R5           ;GET EXPD BUFFER ADDRESS
011250  011264  002266  15$:    MOV     (R2),EXPMSG(R4) ;SAVE EXPD FOR ERROR REPORT
011254  011164  002432          MOV     (R1),RECMSG(R4) ;SAVE RECV FOR ERROR REPORT
011260  022221                  CMP     (R2)+,(R1)+     ;EXPD EQUAL RECV?
011262  001401                  BEQ     25$             ;BR IF YES
011264  005203                  INC     R3              ;SET ERROR SEEN FLAG
011266  062704  000002  25$:    ADD     #2,R4           ;POINT TO NEXT WORD ADDRESS
011272  020427  000014          CMP     R4,#14          ;DONE FIRST 7 WORDS?
011276  003764                  BLE     15$             ;BR IF NO
011300  032765  000200  000012  BIT     #X2.EXTF,XST2(R5);IS EXTENDED FEATURES SET IN EXPD?
011306  001403                  BEQ     50$             ;BR IF NO
011310  020427  000016          CMP     R4,#16          ;DONE EXTENDED FEATURES WORD?
011314  003755                  BLE     15$             ;BR IF NO
011316  005703          50$:    TST     R3              ;ANY ERRORS SEEN?
011320  001402                  BEQ     55$             ;BR IF NO
011322  000241                  CLC                     ;SET FAILURE
011324  000401                  BR      60$             ;
011326  000261          55$:    SEC                     ;SET SUCCESS
011330  000207          60$:    RTS     PC              ;RETURN
2167
```

```
                                .SBTTL  CKMSG2  - COMPARE EXPD RECV MESSAGE BUFFERS
                        ;+
                        ;
                        ;ROUTINE TO COMPARE AN EXPECTED AND RECEIVED MESSAGE
                        ;BUFFER. THE EXPECTED AND RECEIVED BUFFERS ARE STORED FOR
                        ;ERROR PRINT ROUTINES.
                        ;
                        ;INPUT:
                        ;
                        ;       R0      RECV MESSAGE BUFFER HIGH ORDER ADDRESS
                        ;       R1      RECV MESSAGE BUFFER LOW ORDER ADDRESS
                        ;       R2      EXPD MESSAGE BUFFER ADDRESS
                        ;       R3      NUMBER OF BYTES TO COMPARE
                        ;
                        ;OUTPUT:
                        ;
                        ;       CARRY   SET - MESSAGE BUFFERS MATCH
                        ;               CLR - MESSAGE BUFFERS DON'T MATCH
                        ;
                        ;IMPLICIT OUTPUT:
                        ;
                        ;       EXPMSG          BUFFER IS SET TO EXPD DATA
                        ;       RECMSG          BUFFER IS SET TO RECV DATA
                        ;       RCVHIADD        SET TO HIGH ORDER ADDRESS OF RECV
                        ;       RCVLOADD        SET TO LOW ORDER ADDRESS OF RECV
                        ;
                        ;-
011332                  CKMSG2::
011332                          SAVREG                          ;SAVE R1-R5 UNTIL NEXT RETURN
011336  020327  000144          CMP     R3,#RECMSG-EXPMSG;@@D IS COUNT ABOVE MAX ALLOWED?
011342  003412                  BLE     5$                      ;@@D BR IF NO
011344  012703  000144          MOV     #RECMSG-EXPMSG,R3;@@D
011350                          PRINTF  #DEBUGMSG               ;@@D
011350  012746  011464          MOV     #DEBUGMSG,-(SP)
011354  012746  000001          MOV     #1,-(SP)
011360  010600                  MOV     SP,R0
011362  104417                  TRAP    C$PNTF
011364  062706  000004          ADD     #4,SP
011370  010037  002250  5$:     MOV     R0,RCVHIADD             ;SAVE RECV HIGH ADDRESS
011374  010137  002252          MOV     R1,RCVLOAD              ;SAVE RECV LOW ADDRESS
011400  005737  003102          TST     KTENABLE                ;TESTING ABOVE 28K?
011404  001403                  BEQ     10$                     ;BR IF NO
011406  004737  020270          JSR     PC,SETMAP               ;RETURN ADDRESS BIASED TO PAR6 IN R0
011412  010001                  MOV     R0,R1                   ;GET RETURNED ADDRESS BIASED TO PAR6
011414  005004          10$:    CLR     R4                      ;WORD IN BUFFER
011416  005005                  CLR     R5                      ;CLEAR ERROR SEEN FLAG
011420  111264  002266  15$:    MOVB    (R2),EXPMSG(R4)         ;SAVE EXPD FOR ERROR REPORT
011424  111164  002432          MOVB    (R1),RECMSG(R4)         ;SAVE RECV FOR ERROR REPORT
011430  122221                  CMPB    (R2)+,(R1)+             ;EXPD EQUAL RECV?
011432  001401                  BEQ     25$                     ;BR IF YES
011434  005205                  INC     R5                      ;SET ERROR SEEN FLAG
011436  062704  000001  25$:    ADD     #1,R4                   ;POINT TO NEXT BYTE
011442  020403                  CMP     R4,R3                   ;DONE ALL BYTES?
011444  002001                  BGE     50$                     ;BR IF YES
011446  000764                  BR      15$                     ;DO NEXT BYTE
011450  005705          50$:    TST     R5                      ;ANY ERRORS SEEN?
011452  001402                  BEQ     55$                     ;BR IF NO
```

```
2221 011454  000241                        CLC                     ;SET FAILURE
2222 011456  000401                        BR      60$             ;
2223 011460  000261                55$:     SEC                     ;SET SUCCESS
2224 011462  000207                60$:     RTS     PC              ;RETURN
2225
2226 011464     120     122     117  DEBUGMSG:      .ASCIZ  'PROGRAM INTERNAL ERROR -CKMSG2 MESSAGE BUFFER EXCEEDED-';@@D
2227 011554     045     116     045  FERCM:  .ASCII  /%N%A  %%%/
2228 011565     040     040     124  ERCM:   .ASCIZ  /  TSSR ERROR CODE REC'D = /
2229 011620     056     056     056  SIMSG:  .ASCIZ  /.... AFTER DOING SOFT INIT/
2230 011653     124     105     123  TINERR: .ASCIZ  /TEST: .../
2231                                    .EVEN
```

```
                                        ;+
                                        ;
                                        ;PRINT ROUTINE TO FATAL SOFT INIT ERRORS
                                        ;
                                        ;INPUT:
                                        ;
                                        ;       R1      CONTENTS OF TSSR AT ERROR
                                        ;
                                        ;SIDE EFFECTS:
                                        ;
                                        ;       EXECUTES DROP UNIT TO CEASE TESTING
                                        ;
                                        ;-

011666                                          BGNMSG  SFIMSG
011666                                  SFIMSG::
011666  004737  005264                          JSR     PC,PRITSSR      ;PRINT CONTENTS OF TSSR REGISTER
011672  004737  020154                          JSR     PC,CKDROP       ;DROP UNIT, IF ALLOWED
011676                                          ENDMSG
011676                                  L10003:
011676  104423                                  TRAP    C$MSG

                                        ;+
                                        ;PRINT ROUTINE TO PRINT THE CONTENTS OF
                                        ;TSSR AND A COMMAND PACKET OTHER THAN GET STATUS COMMAND PACKET.
                                        ;
                                        ;INPUTS:
                                        ;
                                        ;       R1      TSSR CONTENTS
                                        ;       R4      ADDRESS OF COMMAND PACKET
                                        ;
                                        ;-

011700                                          BGNMSG  PKTSSR
011700                                  PKTSSR::
011700  004737  005264                          JSR     PC,PRITSSR      ;PRINT THE CONTENTS OF TSSR REGISTER
011704  012700  000004                          MOV     #4,R0           ;NO. OF WORDS IN PACKET
011710  004737  007072                          JSR     PC,PRIPKT       ;PRINT THE CONTENTS OF COMMAND PACKET
011714  013700  002716                          MOV     MESBFA,R0       ;ADDRESS OF MESSAGE BUFFER
011720  005001                                  CLR     R1              ;ASSUME NO HIGH MEMORY
011722  004737  014062                          JSR     PC,PRMESS       ;PRINT THE MESSAGE BUFFER ALSO
011726                                          ENDMSG
011726                                  L10004:
011726  104423                                  TRAP    C$MSG

                                        ;+
                                        ;PRINT ROUTINE TO PRINT THE CONTENTS OF
                                        ;TSSR AND A GET STATUS COMMAND PACKET.
                                        ;
                                        ;INPUTS:
                                        ;
                                        ;       R1      TSSR CONTENTS
                                        ;       R4      ADDRESS OF COMMAND PACKET
                                        ;
                                        ;-
```

```
2284
2285 011730                                    BGNMSG  PKTGETS
     011730                                PKTGETS::
2286 011730  004737  005264                       JSR     PC,PRITSSR      ;PRINT THE CONTENTS OF TSSR REGISTER
2287 011734  012700  000002                       MOV     #2,R0           ;NO. OF WORDS IN GET STATUS PACKET
2288 011740  004737  007072                       JSR     PC,PRIPKT       ;PRINT THE CONTENTS OF COMMAND PACKET
2289 011744                                       ENDMSG
     011744                                L10005:
     011744  104423                              TRAP    C$MSG
2290
2291
2292                                           ;+
2293                                           ;PRINT TSSR ERRORS FOR INITIALIZATION TESTS
2294                                           ;
2295                                           ;INPUTS:
2296                                           ;
2297                                           ;       R1      TSSR CONTENTS
2298                                           ;       R4      ADDRESS OF COMMAND PACKET
2299                                           ;-
2300
2301 011746                                    BGNMSG  SFFMSG
     011746                                SFFMSG::
2302 011746  004737  005264                       JSR     PC,PRITSSR      ;PRINT CONTENTS OF TSSR REGISTER
2303 011752                                       ENDMSG
     011752                                L10006:
     011752  104423                              TRAP    C$MSG
2304
2305
2306                                              .SBTTL  PKTMES  - PRINT TSSR AND MESSAGE BUFFER
2307                                           ;+
2308                                           ;
2309                                           ;PRINT ROUTINE TO PRINT THE CONTENTS OF TSSR AND MESSAGE
2310                                           ;BUFFER FOR ERROR REPORTS
2311                                           ;
2312                                           ;INPUTS:
2313                                           ;
2314                                           ;       R1      CONTENTS OF TSSR
2315                                           ;       R2      LOW ORDER MESSAGE BUFFER
2316                                           ;       R3      HIGH ORDER MESSAGE BUFFER ADDRESS
2317                                           ;       NOTE: R3 IS IGNORED IF KTENABLE FLAG IS CLEAR
2318                                           ;-
2319 011754                                    BGNMSG  PKTMES
     011754                                PKTMES::
2320 011754  004737  005264                       JSR     PC,PRITSSR      ;PRINT CONTENTS OF TSSR
2321 011760  010200                              MOV     R2,R0           ;LOW ORDER ADDRESS
2322 011762  010301                              MOV     R3,R1           ;HIGH ORDER ADDRESS
2323 011764  004737  014062                       JSR     PC,PRMESS       ;PRINT THE MESSAGE BUFFER
2324 011770                                       ENDMSG
     011770                                L10007:
     011770  104423                              TRAP    C$MSG
2325
```

```
                                        .SBTTL  ADDSSR  - PRINT TEST ADDRESS AND TSSR
                                ;+
                                ;PRINT ROUTINE TO PRINT THE CONTENTS OF
                                ;TSSR AND A MEMORY TEST ADDRESS
                                ;
                                ;INPUTS:
                                ;
                                ;       R5      FIRST DEVICE UNIBUS ADDRESS
                                ;       ERRHI   HIGH ORDER MEMORY TEST ADDRESS
                                ;       ERRLO   LOW ORDER MEMORY TEST ADDRESS
                                ;-
                                        BGNMSG  ADDSSR
011772                          ADDSSR::
011772
011772  004737  010026                  JSR     PC,PRITADD      ;PRINT MEMORY TEST ADDRESS
011776  016501  000000                  MOV     TSSR(R5),R1     ;GET CURRENT TSSR
012002  004737  005264                  JSR     PC,PRITSSR      ;PRINT THE CONTENTS OF TSSR REGISTER
012006                                  ENDMSG
012006                          L10010:
012006  104423                          TRAP    C$MSG


                                        .SBTTL  MSGEXP - PRINT WRITE CHAR. EXPD-RECV MESSAGE BUFFERS
                                ;+
                                ;
                                ;PRINT ROUTINE TO PRINT WRITE CHARACTERISTIC MESSAGE BUFFER
                                ;
                                ;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  MSGEXP
012010                          MSGEXP::
012010
012010  012700  000007                  MOV     #7,R0           ;ASSUME NO EXT FEATURES
012014  004737  015422          5$:     JSR     PC,PRMSGEXP     ;PRINT EXPD/RECV MESSAGE BUFFERS
012020                                  ENDMSG
012020                          L10011:
012020  104423                          TRAP    C$MSG
```

```
                                        .SBTTL  FIFEXP  - PRINT FIFO EXP/RECV DATA
                                ;*
                                ;
                                ;PRINT ROUTINE TO PRINT FIFO EXP/RECV DATA
                                ;
                                ;       R1      - BYTE COUNT
                                ;
                                ;IMPLICIT INPUTS:
                                ;
                                ;       EXPMSG  - EXPECTED MESSAGF BUFFER (CONTAINS FIFO DATA ONLY
                                ;       RECMSG  - RECEIVED MESSAGE BUFFER (CONTAINS FIFO DATA ONLY)
                                ;-
                                        BGNMSG  FIFEXP
                                FIFEXP::
                                        PRINTX  #FIF1MSG,R1     ;PRINT BYTES TRANSFERRED
012022  010146                          MOV     R1,-(SP)
012024  012746  012074                  MOV     #FIF1MSG,-(SP)
012030  012746  000002                  MOV     #2,-(SP)
012034  010600                          MOV     SP,R0
012036  104415                          TRAP    C$PNTX
012040  062706  000006                  ADD     #6,SP
                                        PRINTX  #FIF2MSG        ;PRINT HEADER MSG
012044  012746  012143                  MOV     #FIF2MSG,-(SP)
012050  012746  000001                  MOV     #1,-(SP)
012054  010600                          MOV     SP,R0
012056  104415                          TRAP    C$PNTX
012060  062706  000004                  ADD     #4,SP
012064  010100                          MOV     R1,R0           ;GET BYTE COUNT
012066  004737  015772                  JSR     PC,PRBYTEXP     ;PRINT FIFO BYTES IN ERROR
                                        ENDMSG
                                L10012:
012072  104423                          TRAP    C$MSG
012074    045     116     045   FIF1MSG:        .ASCIZ  '<N><A NUMBER OF BYTES TRANSFERRED = <D2>'
012143    045     116     045   FIF2MSG:        .ASCIZ  '<N><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
                                ;-
012202                                  BGNMSG  MSGSTAT
012202                          MSGSTAT::
012202  012701  012244                   MOV     #STATCOD,R1     ;ASCII ADDRESS TABLE
012206  012100                  10$:     MOV     (R1)+,R0        ;DONE ALL MSG LINES?
012210  001410                           BEQ     20$             ;BR IF YES
012212                                   PRINTX  R0              ;PRINT STATUS BIT NAMES
012212  010046                           MOV     R0,-(SP)
012214  012746  000001                   MOV     #1,-(SP)
012220  010600                           MOV     SP,R0
012222  104415                           TRAP    C$PNTX
012224  062706  000004                   ADD     #4,SP
012230  000766                           BR      10$             ;DO ANOTHER MSG LINE
012232  012700  000012          20$:     MOV     #10.,R0         ;NUMBER OF WORDS IN A READ STATUS BUFFER
012236  004737  015422                   JSR     PC,PRMSGEXP     ;PRINT EXPD/RECV MESSAGE BUFFERS
012242                                   ENDMSG
012242                          L10013:
012242  104423                           TRAP    C$MSG

012244  012262  012324  012415  STATCOD:        .WORD   1$,2$,3$,4$,5$,6$,0
012262     045     116     045  1$:.ASCIZ  '<NL>A Tape Bus Signals in Word #8:'
012324     045     116     045  2$:.ASCIZ  '<NL>A         PARERR<15>  IEOT  <12>  IFMK  <9>  IRDY<6>  IRWD<2>'
012415     045     116     045  3$:.ASCIZ  '<NL>A         IRESV2<14>  IIDENT<11>  IHER  <8>  IONL<5>  IFBY<1>'
012506     045     116     045  4$:.ASCIZ  '<NL>A         IRESV1<13>  ICER  <10>  ISPEED<7>  ILDP<4>  IFPT<0>'
012577     045     116     045  5$:.ASCIZ  '<NL>A Tape Bus Signals in Word #9:'
012641     045     116     045  6$:.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
                                ;-
012716                                  BGNMSG  MSGLOOP
012716                          MSGLOOP::
012716  012701  012760                   MOV     #LOOPCOD,R1     ;ASCII ADDRESS TABLE
```

```
2436 012722  012100                  10$:    MOV     (R1)+,R0        ;DONE ALL MSG LINES?
2437 012724  001410                          BEQ     20$             ;BR IF YES
2438 012726                                  PRINTX  R0              ;PRINT STATUS BIT NAMES
     012726  010046                          MOV     R0,-(SP)
     012730  012746  000001                  MOV     #1,-(SP)
     012734  010600                          MOV     SP,R0
     012736  104415                          TRAP    C$PNTX
     012740  062706  000004                  ADD     #4,SP
2439 012744  000766                          BR      10$             ;DO ANOTHER MSG LINE
2440 012746  012700  000012          20$:    MOV     #10.,R0         ;NUMBER OF WORDS IN A READ STATUS BUFFER
2441 012752  004737  015422                  JSR     PC,PRMSGEXP     ;PRINT EXPD/RECV MESSAGE BUFFERS
2442 012756                                  ENDMSG
     012756                          L10014:
     012756  104423                          TRAP    C$MSG
2443
2444 012760  013000  013053  013152  LOOPCOD:        .WORD   1$,2$,3$,4$,5$,6$,7$,0
2445 013000    045     116     045  1$:.ASCIZ  '<NL>A Tape Bus Loopback Signals in Word #8:'
2446 013053    045     116     045  2$:.ASCIZ  '<NL>A      PARERR<15>          IRESV2<14>          IRESV1<13>'
2447 013152    045     116     045  3$:.ASCIZ  '<NL>A IMISP=>IEOT<12>    IWRT=>IIDENT<11>    IREV  =>ICER  <10>'
2448 013251    045     116     045  4$:.ASCIZ  '<NL>A IWFM =>IFMK<09>    IEDIT=>IHER <08>    IFAD  =>ISPEED<07>'
2449 013350    045     116     045  5$:.ASCIZ  '<NL>A ITADO=>IRDY<06>    ITAD1=>IONL <05>    IERASE=>ILDP  <04>'
2450 013447    045     116     045  6$:.ASCIZ  '<NL>A IREW =>IDBY<03>    IRWU =>IRWD <02>    IFEN  =>IFBY  <01>'
2451 013546    045     116     045  7$:.ASCIZ  '<NL>A IGO  =>IFPT<00>'
2452                                         .EVEN
2453
```

```
                                        .SBTTL  MSGSUB - PRINT WRITE SUBSYSTEM MESSAGE BUFFER
                                ;*
                                ;
                                ;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  MSGSUB
013574                          MSGSUB::
013574
013574  012700  000012                    MOV     #10.,R0         ;SIZE OF WRITE SUBSYSTEM BUFFER
013600  004737  015422                    JSR     PC,PRMSGEXP     ;PRINT EXPD/RECV MESSAGE BUFFERS
013604                                  ENDMSG
013604                          L10015:
013604  104423                          TRAP    C$MSG


                                        .SBTTL  MEMADD - PRINT MEMORY ADDRESS DATA ERROR
                                ;*
                                ;
                                ;PRINT ROUTINE TO PRINT MEMORY ADDRESS DATA COMPARE ERROR
                                ;
                                ;IMPLICIT INPUTS:
                                ;
                                ;       ERRHI   - MEMORY ERROR HIGH ORDER ADDRESS
                                ;       ERRLO   - MEMORY ERROR LOW ORDER ADDRESS
                                ;       EXP     - EXPECTED DATA
                                ;       RECV    - RECEIVED DATA
                                ;-
                                        BGNMSG  MEMADD
013606                          MEMADD::
013606
013606  004737  007712                    JSR     PC,PRIADD       ;PRINT MEMORY ADDRESS IN ERROR
013612  013701  002176                    MOV     EXPD,R1         ;GET EXPD DATA
013616  013702  002200                    MOV     RECV,R2         ;GET RECEIVED DATA
013622  004737  007474                    JSR     PC,PRIXOR       ;PRINT EXPD/RECV
013626                                  ENDMSG
013626                          L10016:
013626  104423                          TRAP    C$MSG
```

```
                                        .SBTTL  PRAMPKT - PRINT RAM AND PACKET DATA
                                ;+
                                ;
                                ;PRINT ROUTINE TO DISPLAY RAM/PACKET DATA
                                ;WHEN THE RAM DATA DOES NOT MATCH.
                                ;
                                ;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
                                ;-
                                PRAMPKT:
                                        SAVREG                  ;SAVE R1-R5 UNTIL NEXT RETURN
                                        MOV     #RAMDATA,R1     ;DATA FROM THE RAM
                                        CLR     R2              ;INIT BYTE NUMBER
                                5$:     CMPB    (R1)+,(R4)+     ;COMPARE EXPECTED, RECEIVED
                                        BNE     7$              ;BR IF NO MATCH
                                7$:     MOVB    -1(R1),R5       ;GET RECV RAM DATA
                                        MOVB    -1(R4),R3       ;GET EXPD PACKET DATA
                                        XOR     R5,R3           ;XOR EXPD/RECV
                                        BIC     #177400,R3      ;LOW BYTE ONLY
                                        MOVB    -1(R1),RECV     ;GET RECEIVED RAM DATA
                                        MOVB    -1(R4),EXPD     ;GET EXPECTED RAM DATA
                                        PRINTB  #RAMASC,R2,RECV,EXPD,R3
                                        MOV     R3,-(SP)
                                        MOV     EXPD,-(SP)
                                        MOV     RECV,-(SP)
                                        MOV     R2,-(SP)
                                        MOV     #RAMASC,-(SP)
                                        MOV     #5,-(SP)
                                        MOV     SP,R0
                                        TRAP    C$PNTB
                                        ADD     #14,SP
                                10$:    INC     R2              ;UPDATE BYTE COUNT
                                        TST     RAMSIZ          ;DEFAULT TO 8.?
                                        BEQ     15$             ;BR IF YES
                                        CMP     R2,RAMSIZ       ;DONE ALL BYTES?
                                        BLE     5$              ;BR IF NO
                                        BR      25$             ;
                                15$:    CMP     R2,#8.          ;DONE DEFAULT NUMBER OF BYTES?
                                20$:    BLT     5$              ;BR IF NO
                                25$:    CLR     RAMSIZ          ;SET DEFAULT RAMSIZ
                                        RTS     PC              ;RETURN
                                RAMASC: .ASCIZ  '%N%A  BYTE: %D2%A RAM: %03%A Packet: %03%A XOR:%03'
                                        .EVEN
```

```
                                        .SBTTL  PRMESS  - PRINT CONTENTS OF MESSAGE BUFFER
                                ;+
                                ;
                                ;THIS ROUTINE PRINTS THE CONTENTS OF
                                ;THE 7 WORD MESSAGE BUFFER RETURNED BY THE
                                ;TK-25.
                                ;
                                ;INPUT:
                                ;
                                ;       R0      LOW ORDER ADDRESS OF MESSAGE BUFFER
                                ;       R1      HIGH ORDER ADDRESS OF MESSAGE BUFFER
                                ;       NOTE: R1 IS IGNORED IF KTENABLE FLAG IS CLEAR
                                ;
                                ;THIS ROUTINE IS NORMALLY CALLED FROM A PRINT ROUTINE
                                ;
                                ;-

014062                          PRMESS:
014062                                  SAVREG                          ;SAVE THE REGISTERS
014066  010537  011022                  MOV     R5,RAMR5H               ;SAVE DEVICE REGISTER POINTER
014072  010005                          MOV     R0,R5                   ;SAVE LOW ORDER ADDRESS
014074  005737  003102                  TST     KTENABLE                ;ADDRESS ABOVE 28K?
014100  001001                          BNE     10$                     ;BR IF YES
014102  005001                          CLR     R1                      ;SET HIGH ORDER ADDRESS TO 0
014104  010103                  10$:    MOV     R1,R3                   ;SAVE HIGH ORDER ADDRESS
014106  006100                          ROL     R0                      ;SHIFT BIT15 TO C BIT
014110  006101                          ROL     R1                      ;SHIFT TO HIGH ORDER FOR PRINTOUT
014112                                  PRINTX  #PROASC,R1,R5           ;PRINT MESSAGE BUFFER ADDRESS
014112  010546                          MOV     R5,-(SP)
014114  010146                          MOV     R1,-(SP)
014116  012746  014714                  MOV     #PROASC,-(SP)
014122  012746  000003                  MOV     #3,-(SP)
014126  010600                          MOV     SP,R0
014130  104415                          TRAP    C$PNTX
014132  062706  000010                  ADD     #10,SP
014136  022715  177777                  CMP     #177777,(R5)            ;MESSAGE BUFFER FULL OF ONES
014142  001010                          BNE     15$                     ;BR IF BUFFER IS PROBABLY OKAY
014144                                  PRINTX  #MESBFN                 ;"MESSAGE BUFFER PROBABLY NOT VALID"
014144  012746  014634                  MOV     #MESBFN,-(SP)
014150  012746  000001                  MOV     #1,-(SP)
014154  010600                          MOV     SP,R0
014156  104415                          TRAP    C$PNTX
014160  062706  000004                  ADD     #4,SP
014164                          15$:    PRINTX  #PR1ASC                 ;PRINT HEADER FOR CONTENTS
014164  012746  014761                  MOV     #PR1ASC,-(SP)
014170  012746  000001                  MOV     #1,-(SP)
014174  010600                          MOV     SP,R0
014176  104415                          TRAP    C$PNTX
014200  062706  000004                  ADD     #4,SP
014204  005004                          CLR     R4                      ;NUMBER OF THE NEXT WORD
014206  010501                          MOV     R5,R1                   ;COPY LOW ORDER ADDRESS
014210  010300                          MOV     R3,R0                   ;COPY HIGH ORDER ADDRESS
014212  001403                          BEQ     20$                     ;BR IF NOT ABOVE 28K
014214  004737  020270                  JSR     PC,SETMAP               ;SETUP PAR ADDRESS IN R0
014220  010005                          MOV     R0,R5                   ;GET PAR FORMAT ADDRESS ABOVE 28K
014222                          20$:
014222                                  PRINTX  #MESHEA,(R5)+           ;PRINT "MESSAGE BUFFER HEADER ="
```

J6


```
                014222  012546                          MOV     (R5)+,-(SP)
                014224  012746  015017                  MOV     #MESHEA,-(SP)
                014230  012746  000002                  MOV     #2.,-(SP)
                014234  010600                          MOV     SP,R0
                014236  104415                          TRAP    C$PNTX
                014240  062706  000006                  ADD     #6,SP
     2584       014244                                  PRINTX  #DATAFL,(R5)+   ;PRINT "DATA FIELD LENGTH     ="
                014244  012546                          MOV     (R5)+,-(SP)
                014246  012746  015064                  MOV     #DATAFL,-(SP)
                014252  012746  000002                  MOV     #2.,-(SP)
                014256  010600                          MOV     SP,R0
                014260  104415                          TRAP    C$PNTX
                014262  062706  000006                  ADD     #6,SP
     2585       014266                                  PRINTX  #RBPCRA,(R5)+   ;PRINT "RESIDUAL BYTE COUNTER ="
                014266  012546                          MOV     (R5)+,-(SP)
                014270  012746  015131                  MOV     #RBPCRA,-(SP)
                014274  012746  000002                  MOV     #2.,-(SP)
                014300  010600                          MOV     SP,R0
                014302  104415                          TRAP    C$PNTX
                014304  062706  000006                  ADD     #6,SP
     2586       014310                                  PRINTX  #XSOCON,(R5)+   ;PRINT "XSTAT0 CONTENTS      ="
                014310  012546                          MOV     (R5)+,-(SP)
                014312  012746  015176                  MOV     #XSOCON,-(SP)
                014316  012746  000002                  MOV     #2.,-(SP)
                014322  010600                          MOV     SP,R0
                014324  104415                          TRAP    C$PNTX
                014326  062706  000006                  ADD     #6,SP
     2587       014332                                  PRINTX  #XS1CON,(R5)+   ;PRINT "XSTAT1 CONTENTS      ="
                014332  012546                          MOV     (R5)+,-(SP)
                014334  012746  015243                  MOV     #XS1CON,-(SP)
                014340  012746  000002                  MOV     #2.,-(SP)
                014344  010600                          MOV     SP,R0
                014346  104415                          TRAP    C$PNTX
                014350  062706  000006                  ADD     #6,SP
     2588       014354                                  PRINTX  #XS2CON,(R5)+   ;PRINT "XSTAT2 CONTENTS      ="
                014354  012546                          MOV     (R5)+,-(SP)
                014356  012746  015310                  MOV     #XS2CON,-(SP)
                014362  012746  000002                  MOV     #2.,-(SP)
                014366  010600                          MOV     SP,R0
                014370  104415                          TRAP    C$PNTX
                014372  062706  000006                  ADD     #6,SP
     2589       014376                                  PRINTX  #XS3CON,(R5)+   ;PRINT "XSTAT3 CONTENTS      ="
                014376  012546                          MOV     (R5)+,-(SP)
                014400  012746  015355                  MOV     #XS3CON,-(SP)
                014404  012746  000002                  MOV     #2.,-(SP)
                014410  010600                          MOV     SP,R0
                014412  104415                          TRAP    C$PNTX
                014414  062706  000006                  ADD     #6,SP
     2590       014420  022737  000001  002134          CMP     #1,TRANSTST     ;CHECK FOR DUMP
     2591       014426  001042                          BNE     50$             ;BR. IF NO DUMP REQUIRED
     2592       014430                                  PRINTX  #RAMFHR
                014430  012746  014536                  MOV     #RAMFHR,-(SP)
                014434  012746  000001                  MOV     #1.,-(SP)
                014440  010600                          MOV     SP,R0
                014442  104415                          TRAP    C$PNTX
                014444  062706  000004                  ADD     #4,SP
     2593       014450  012737  000010  002246          MOV     #8.,RAMSIZ      ;RAM FIELD IS 8 BYTES LONG
```

PRMESS - PRINT CONTENTS OF MESSAGE BUFFER

```
2594 014456  012737  000020  011020          MOV     #20,RAMHLD      ;FIELD STARTS AT 20 OCTAL (10 HEX)
2595 014464  004737  010636                  JSR     PC,RAMER        ;READ AND PRINT THEM
2596 014470  012737  000040  011020          MOV     #40,RAMHLD      ;FIELD STARTS AT 40 OCTAL (20 HEX)
2597 014476  004737  010636                  JSR     PC,RAMER        ;READ AND PRINT THEM
2598 014502  012737  000060  011020          MOV     #60,RAMHLD      ;FIELD STARTS AT 60 OCTAL (30 HEX)
2599 014510  004737  010636                  JSR     PC,RAMER        ;READ AND PRINT THEM
2600 014514  012737  000020  002246          MOV     #16.,RAMSIZ     ;RAM FIELD IS SIXTEEN BYTES LONG
2601 014522  012737  000100  011020          MOV     #100,RAMHLD     ;FIELD STARTS AT 100 OCTAL (40 HEX)
2602 014530  004737  010636                  JSR     PC,RAMER        ;READ AND PRINT THEM
2603 014534  000207                  50$:    RTS     PC              ;RETURN
2604 014536     045     116     045  RAMFHR: .ASCIZ  '%N%A ********** SPECIAL CONTROLLER RAM MEMORY DUMP **********'
2605 014634     045     116     045  MESBFN: .ASCIZ  '%N%A MESSAGE BUFFER CONTENTS PROBABLY NOT VALID'
2606 014714     045     116     045  PROASC: .ASCIZ  '%N%A Message Buffer Address = %01%05'
2607 014761     045     116     045  PR1ASC: .ASCIZ  '%N%A Message Buffer Contents:'
2608
2609 015017     045     116     045  MESHEA: .ASCIZ  '%N%A Message Buffer Header     = %06'
2610 015064     045     116     045  DATAFL: .ASCIZ  '%N%A Data Field Length         = %06'
2611 015131     045     116     045  RBPCRA: .ASCIZ  '%N%A Residual Byte Counter     = %06'
2612 015176     045     116     045  XSOCON: .ASCIZ  '%N%A XSTAT0 Contents           = %06'
2613 015243     045     116     045  XS1CON: .ASCIZ  '%N%A XSTAT1 Contents           = %06'
2614 015310     045     116     045  XS2CON: .ASCIZ  '%N%A XSTAT2 Contents           = %06'
2615 015355     045     116     045  XS3CON: .ASCIZ  '%N%A XSTAT3 Contents           = %06'
2616                                  .EVEN
```

```
                                        .SBTTL  PRMSGEXP - PRINT EXPD/RECV MESSAGE BUFFERS
                                ;+[B
                                ;
                                ;ROUTINE TO PRINT EXPECTED AND RECEIVED MESSAGE BUFFERS
                                ;
                                ;       R0      - NUMBER OF WORDS IN BUFFER
                                ;
                                ;IMPLICIT INPUTS:
                                ;
                                ;       EXPMSG  - EXPECTED MESSAGE BUFFER
                                ;       RECMSG  - RECEIVED MESSAGE BUFFER
                                ;       RCVHIADD- RECEIVED MESSAGE BUFFER HIGH ORDER ADDRESS
                                ;       RCVLOADD- RECEIVED MESSAGE BUFFER LOW ORDER ADDRESS
                                ;-
015422                          PRMSGEXP::
015422                                  SAVREG                          ;SAVE R1-R5 UNTIL NEXT RETURN
015426  010005                          MOV     R0,R5                   ;SAVE NUMBER OF WORDS
015430  013700  002252                  MOV     RCVLOADD,R0             ;GET RECV LOW ADDRESS
015434  010004                          MOV     R0,R4                   ;COPY LOW ADDRESS
015436  013701  002250                  MOV     RCVHIADD,R1             ;GET RECV HIGH ADDRESS
015442  006100                          ROL     R0                      ;SHIFT BIT15 TO C BIT
015444  006101                          ROL     R1                      ;SHIFT TO HIGH ORDER FOR PRINTOUT
015446                                  PRINTX  #PRMSG0,R1,R4           ;PRINT MESSAGE BUFFER ADDRESS
015446  010446                          MOV     R4,-(SP)
015450  010146                          MOV     R1,-(SP)
015452  012746  015602                  MOV     #PRMSG0,-(SP)
015456  012746  000003                  MOV     #3,-(SP)
015462  010600                          MOV     SP,R0
015464  104415                          TRAP    C$PNTX
015466  062706  000010                  ADD     #10,SP
015472                                  PRINTX  #PRMSG1                 ;PRINT HEADER FOR CONTENTS
015472  012746  015647                  MOV     #PRMSG1,-(SP)
015476  012746  000001                  MOV     #1,-(SP)
015502  010600                          MOV     SP,R0
015504  104415                          TRAP    C$PNTX
015506  062706  000004                  ADD     #4,SP
015512  005004                          CLR     R4                      ;NUMBER OF THE CURRENT WORD
015514  012701  002266                  MOV     #EXPMSG,R1              ;GET EXPD BUFFER ADDRESS
015520  012702  002432                  MOV     #RECMSG,R2              ;GET RECV BUFFER ADDRESS
015524  011100                  20$:    MOV     (R1),R0                 ;GET EXPD
015526  011203                          MOV     (R2),R3                 ;GET RECV
015530                                  XOR     R0,R3                   ;XOR EXPD/RECV
015540                                  PRINTX  #PRMSG2,R4,(R1)+,(R2)+,R3
015540  010346                          MOV     R3,-(SP)
015542  012246                          MOV     (R2)+,-(SP)
015544  012146                          MOV     (R1)+,-(SP)
015546  010446                          MOV     R4,-(SP)
015550  012746  015705                  MOV     #PRMSG2,-(SP)
015554  012746  000005                  MOV     #5,-(SP)
015560  010600                          MOV     SP,R0
015562  104415                          TRAP    C$PNTX
015564  062706  000014                  ADD     #14,SP
015570  005204                          INC     R4                      ;NUMBER OF THE NEXT
015572  020405                          CMP     R4,R5                   ;DONE ALL YET?
015574  002001                          BGE     50$                     ;BR IF YES
015576  000752                          BR      20$                     ;DO ANOTHER
015600  000207                  50$:    RTS     PC                      ;RETURN
```

```
2654
2655 015602  045  116  045  PRMSG0: .ASCIZ  '%N%A Message Buffer Address = %01%05'
2656 015647  045  116  045  PRMSG1: .ASCIZ  '%N%A Message Buffer Contents:'
2657 015705  045  116  045  PRMSG2: .ASCIZ  '%N%A   WORD #%D2%A  EXPD: %06%A  RECV: %06%A  XOR: %06'
2658                         .EVEN
2659
```

```
                                        .SBTTL  PRBYTEXP - PRINT ERROR BYTES IN EXP/REC MESSAGE BUFFER
                                ;+
                                ;
                                ;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
                                ;-
015772                          PRBYTEXP::
015772                                  SAVREG                          ;SAVE R1-R5 UNTIL NEXT RETURN
015776  010005                          MOV     R0,R5                   ;SAVE NUMBER OF BYTES
016000  005037  002264                  CLR     PRMNO                   ;INIT ERROR COUNT
016004  005004                          CLR     R4                      ;NUMBER OF THE CURRENT BYTE
016006  012701  002266                  MOV     #EXPMSG,R1              ;GET EXPD BUFFER ADDRESS
016012  012702  002432                  MOV     #RECMSG,R2              ;GET RECV BUFFER ADDRESS
016016  111100                  20$:    MOVB    (R1),R0                 ;GET EXPD BYTE
016020  042700  177400                  BIC     #^C<377>,R0             ;CLEAR UPPER BYTE
016024  110037  016340                  MOVB    R0,PRBEXP               ;SAVE FOR ERROR REPORT
016030  111203                          MOVB    (R2),R3                 ;GET RECV BYTE
016032  042703  177400                  BIC     #^C<377>,R3             ;CLEAR UPPER BYTE
016036  110337  016342                  MOVB    R3,PRBREC               ;FOR ERROR REPORT
016042                                  XOR     R0,R3                   ;XOR EXPD/RECV
016052  122122                          CMPB    (R1)+,(R2)+             ;EXPD = RECV?
016054  001431                          BEQ     30$                     ;BR IF YES
016056  005237  002264                  INC     PRMNO                   ;UPDATE ERROR COUNT
016062  023727  002264  000010          CMP     PRMNO,#8.               ;PRINTED 8?
016070  101023                          BHI     30$                     ;BR IF YES
016072                          27$:    PRINTX  #PRBMSG,R4,PRBEXP,PRBREC,R3
016072  010346                          MOV     R3,-(SP)
016074  013746  016342                  MOV     PRBREC,-(SP)
016100  013746  016340                  MOV     PRBEXP,-(SP)
016104  010446                          MOV     R4,-(SP)
016106  012746  016206                  MOV     #PRBMSG,-(SP)
016112  012746  000005                  MOV     #5,-(SP)
016116  010600                          MOV     SP,R0
016120  104415                          TRAP    C$PNTX
016122  062706  000014                  ADD     #14,SP
016126                                  FORCEXIT        50$             ;@@D
016136  000404                          BR      35$                     ;@@D
016140                          30$:
016140                                  FORCERROR  27$,NOTSSR           ;@@D
016150                          35$:                                    ;@@D
016150  005204                          INC     R4                      ;NUMBER OF THE NEXT
016152  020405                          CMP     R4,R5                   ;DONE ALL YET?
016154  002001                          BGE     50$                     ;BR IF YES
016156  000717                          BR      20$                     ;DO ANOTHER
016160                          50$:    PRINTX  #PRBTOT,PRMNO           ;PRINT TOTAL ERROR COUNT
016160  013746  002264                  MOV     PRMNO,-(SP)
016164  012746  016273                  MOV     #PRBTOT,-(SP)
016170  012746  000002                  MOV     #2,-(SP)
016174  010600                          MOV     SP,R0
016176  104415                          TRAP    C$PNTX
```

```
     016200  062706  000006                  ADD     #6,SP
2704 016204  000207                          RTS     PC              ;RETURN
2705
2706 016206     045     116     045  PRBMSG: .ASCIZ  '<N><A>   BYTE #<D2><A>  EXPD: <03><A>  RECV: <03><A>  XOR: <03>'
2707 016273     045     116     045  PRBTOT: .ASCIZ  '<N><A> NUMBER OF BYTES IN ERROR = <D2>'
2708                                  .EVEN
2709 016340  000000                  PRBEXP: .WORD   0               ;EXPD
2710 016342  000000                  PRBREC: .WORD   0               ;RECV
2711
```

```
                                        .SBTTL  EXPREC  - PRINT EXPD/RECV WORD DATA
                                ;*
                                ;
                                ;PRINT ROUTINE TO DISPLAY EXPD/RECV DATA
                                ;
                                ;INPUTS:
                                ;
                                ;       R1      RECEIVED DATA
                                ;       R2      EXPECTED DATA
                                ;
                                ;-

016344                                  BGNMSG  EXPREC
016344                          EXPREC::
016344  004737  007474                  JSR     PC,PRIXOR       ;PRINT THE DATA
016350                                  ENDMSG
016350                          L10017:
016350  104423                          TRAP    C$MSG
```

```
2731                                            .SBTTL  EXPBREC - PRINT EXPD/RECV BYTE DATA
2732                                    ;*
2733                                    ;
2734                                    ;PRINT ROUTINE TO DISPLAY BYTE EXPD/RECV DATA
2735                                    ;
2736                                    ;
2737                                    ;INPUTS:
2738                                    ;
2739                                    ;       R1      RECEIVED DATA BYTE
2740                                    ;       R2      EXPECTED DATA BYTE
2741                                    ;
2742                                    ;-
2743
2744 016352                                     BGNMSG  EXPBREC
       016352                           EXPBREC::
2745 016352  004737  007344                      JSR     PC,PRIBXOR      ;PRINT THE DATA
2746 016356                                     ENDMSG
       016356                           L10020:
       016356  104423                          TRAP    C$MSG
2747
2748
2749
2750
2751                                            .SBTTL  RAMERR  - PRINT RAM AND PACKET DATA
2752                                    ;*
2753                                    ;
2754                                    ;PRINT ROUTINE TO DISPLAY RAM/PACKET DATA
2755                                    ;
2756                                    ;INPUTS:
2757                                    ;
2758                                    ;       R4      POINTER TO COMMAND PACKET
2759                                    ;
2760                                    ;IMPLICIT INPUTS:
2761                                    ;
2762                                    ;       RAMDATA         DATA AS READ FROM THE RAM
2763                                    ;       RAMSIZ          NUMBER OF BYTES IN PACKET
2764                                    ;                       IF RAMSIZ=0 THEN DEFAULT TO 8.
2765                                    ;
2766                                    ;IMPLICIT OUTPUTS:
2767                                    ;
2768                                    ;       RAMSIZ  SET TO 0
2769                                    ;-
2770
2771 016360                                     BGNMSG  RAMERR
       016360                           RAMERR::
2772 016360  004737  013630                      JSR     PC,PRAMPKT      ;PRINT RAM/PACKET DATA
2773 016364                                     ENDMSG
       016364                           L10021:
       016364  104423                          TRAP    C$MSG
2774
2775
2776                                            .SBTTL  RAMTADD - PRINT TEST ADDRESS, RAM AND PACKET DATA
2777                                    ;*
2778                                    ;
2779                                    ;PRINT ROUTINE TO DISPLAY RAM/PACKET DATA
2780                                    ;
2781                                    ;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
016366                          RAMTADD::
016366  004737  010026                  JSR     PC,PRITADD      ;PRINT TEST ADDRESS
016372  004737  013630                  JSR     PC,PRAMPKT      ;PRINT RAM/PACKET DATA
016376                                  ENDMSG
016376                          L10022:
016376  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
016400                          RAMEXP::
016400  042701  177400                  BIC     #^C<377>,R1     ;SAVE EXPD RAM DATA BYTE
016404  042702  177400                  BIC     #^C<377>,R2     ;SAVE EXPD RAM DATA BYTE
016410  004737  007620                  JSR     PC,PRIRAM       ;PRINT THE RAM ADDRESS
016414  004737  007474                  JSR     PC,PRIXOR       ;PRINT THE DATA
016420                                  ENDMSG
016420                          L10023:
016420  104423                          TRAP    C$MSG
                                
                                        .SBTTL  TIMEXP  - PRINT TIMER A,B AND EXP/REC
                                ;+
                                ;
                                ;PRINT ROUTINE TO DISPLAY EXPD/RECV DATA
                                ;AND TIMER A,B HEADER MESSAGE
                                ;
                                ;INPUTS:
                                ;
                                ;       R1      RECEIVED DATA
                                ;       R2      EXPECTED DATA
```

```
2833                                    ;-                      ,
2834
2835 016422                                     BGNMSG  TIMEXP
     016422                             TIMEXP::
2836 016422                                     PRINTX  #TIMSGO         ;PRINT HEADER
     016422  012746  016450                     MOV     #TIMSGO,-(SP)
     016426  012746  000001                     MOV     #1,-(SP)
     016432  010600                             MOV     SP,R0
     016434  104415                             TRAP    C$PNTX
     016436  062706  000004                     ADD     #4,SP
2837 016442  004737  007474                     JSR     PC,PRIXOR       ;PRINT THE DATA
2838 016446                                     ENDMSG
     016446                             L10024:
     016446  104423                             TRAP    C$MSG
2839
2840
2841 016450     045     116     045  TIMSGO: .ASCIZ  '%N%A TIMER A STATUS IS IN BIT 3%N%A TIMER B STATUS IS IN BIT 2'
2842                                 .EVEN
```

```
                                        .SBTTL  BADSSR - PRINT TSSR ERRORS ON DATA TRANSFERS

                                ;+
                                ;
                                ;PRINT ROUTINE FOR TSSR ERRORS ON DATA TRANSFERS
                                ;
                                ;INPUTS:
                                ;
                                ;       R1      CONTENTS OF TSSR
                                ;       R2      DATA WRITTEN (8 BITS)
                                ;
                                ;-

016550                                  BGNMSG  BADSSR
016550                          BADSSR::
016550  010246                          MOV     R2,-(SP)        ;SAVE DATA TRANSFERRED
016552  042702  177400                  BIC     #177400,R2      ;GET JUST ONE BYTE
016556                                  PRINTB  #XFERASC,R2
016556  010246                          MOV     R2,-(SP)
016560  012746  016610                  MOV     #XFERASC,-(SP)
016564  012746  000002                  MOV     #2,-(SP)
016570  010600                          MOV     SP,R0
016572  104414                          TRAP    C$PNTB
016574  062706  000006                  ADD     #6,SP
016600  012602                          MOV     (SP)+,R2        ;RESTORE R2
016602  004737  005264                  JSR     PC,PRITSSR      ;DECODE TSSR CONTENTS
016606                                  ENDMSG
016606                          L10025:
016606  104423                          TRAP    C$MSG
016610     045     116     045  XFERASC:        .ASCIZ  '%N%A Data Transferred = %03'

```

```
                        .SBTTL  GLOBAL SUBROUTINES SECTION

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

                        .SBTTL  SOFINIT - SOFT INITIALIZE OF CONTROLLER

                ;+
                ;
                ;ROUTINE TO DO A SOFT INITIALIZE OF THE CONTROLLER
                ;BY WRITING INTO THE TSSR REGISTER. AFTER THE INIT,
                ;THE TSSR REGISTER IS TESTED FOR ERRORS. ANY ERRORS
                ;DETECTED SHOULD BE TREATED AS DEVICE FATAL ERRORS.
                ;
                ;INPUTS:
                ;
                ;       R5      ADDRESS OF FIRST REGISTER
                ;
                ;OUTPUTS:
                ;
                ;       R0      CONTENTS OF TSSR, IF ERROR
                ;       CARRY   SET IF INIT WAS OKAY
                ;               CLEAR IF FATAL ERROR
                ;
                ;CALLING SEQUENCE:
                ;
                ;       MOV     @ADDRESS,R5
                ;       JSR     PC,SOFINIT
                ;       BCS     CONTINUE
                ;       ERRDF                           ;REPORT FATAL ERROR
                ;
                ;-

016644                  SOFINIT::
016644                          SAVREG                  ; SAVE THE REGISTERS
016650  012765  000000  000000          MOV     #0,TSSR(R5)     ; DO THE INIT.
016656  004737  017120                  JSR     PC,WAITF        ; WAIT FOR SSR
016662  016500  000000                  MOV     TSSR(R5),R0     ;GET THE TSSR REGISTER
016666  010004                          MOV     R0,R4           ;START SETUP OF EXPECTED TSSR
016670  042704  176277                  BIC     #^C<HIADDR!OFL>,R4 ;CLEAR OUT UNUSED BITS
016674  052704  002200                  BIS     #SSR!NBA,R4     ;R4 HAS EXPECTED CONTENTS
016700  020400                          CMP     R4,R0           ;ONLY EXPECTED BITS SET ?
016702  001402                          BEQ     5$              ;BRANCH IF OKAY
016704  000241                          CLC                     ;CLEAR THE CARRY FOR ERROR
016706  000401                          BR      10$             ;GO TO EXIT
016710  000261                  5$:     SEC                     ;SET THE CARRY BIT
016712  000207                  10$:    RTS     PC              ;RETURN TO CALLER
```

```
                                .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
                        ;
                        ;-

016714                  CHKAMB:
016714                          SAVREG                          ;SAVE THE GENERAL REGISTERS
016720  010004                  MOV     R0,R4                   ;CONTENTS OF TSSR
016722  032700  100000          BIT     @SC,R0                  ;IS BIT 15 SET ?
016726  001004                  BNE     5$                      ;BRANCH IF YES
016730  032700  174077          BIT     @†C<NBA!OFL!SSR!MIADDR>,R0      ;ANY OTHER BITS SET ?
016734  001023                  BNE     40$                     ;MUST BE AN ERROR
016736  000424                  BR      45$                     ;RETURN WITH SUCCESS
016740  032700  000200  5$:     BIT     @SSR,R0                 ;IS READY BIT SET ?
016744  001011                  BNE     10$                     ;BRANCH IF READY BIT IS SET.
016746  032700  000040          BIT     @BIT5,R0                ;IS FATAL ERROR BIT SET ?
016752  001414                  BEQ     40$                     ;ERROR IF NOT
016754  042704  177761          BIC     @†CTERCLS,R4            ;CLEAR ALL BUT TERMINATION CODE
016760  020427  000016          CMP     R4,@16                  ;ALL THREE BITS MUST BE SET
016764  001007                  BNE     40$                     ;ERROR IF NOT SET
016766  000410                  BR      45$                     ;OK IF ALL ARE SET
016770  032700  000040  10$:     BIT     @BIT5,R0                ;IS FATAL ERROR BIT SET ?
016774  001405                  BEQ     45$                     ;ERROR IF BIT IS SET WITH SSR
016776  032700  000006          BIT     @BIT2!BIT1,R0           ;IS THIS A FUNCTION REJECT
017002  001002                  BNE     45$                     ;BR, IF TSSR IS OK
017004  000241  40$:     CLC                                     ;AMBIGUOUS CONTENTS
017006  000401                  BR      50$
017010  000261  45$:     SEC                                     ;SHOW SUCCESS - NO AMBIGUITY
017012  000207  50$:     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 DPU REGISTERS AND DISMISS.
                                ;

                                ; BIT DEFINITIONS FOR "INTMASK" AND "INTFLAG" BYTES:
                                ;
  000200                                IOKCKIN=BIT7            ; DON'T CHECK FOR BAD INTERRUPTS -- TEST WILL.
  000001                                IOKSTP=BIT0             ; EXPECT "STOP" INTERRUPT.
                                ;
                                ;INTERRUPT MASK -- SAYS EXPECTING INTERRUPTS
017014     000                  INTMASK:        .BYTE   0
                                ;INTERRUPT FLAG -- SAYS WE GOT ONE (IF POSITIVE)
017015     000                  INTFLAG:        .BYTE   0

                                ;SAVED INTERRUPT VECTOR:
017016  000000                  INTVEC: .WORD   0
                                ;SAVE CPU PC
017020  000000                  INTCPC: .WORD   0

                                ;SUBROUTINE TO ENABLE INTERRUPTS:
017022  010046                  ENAINT: MOV     R0,-(SP)        ;SAVE R0
017024  013700  002156                  MOV     IVEC,R0         ;GET POINTER TO VECTORS
017030  012720  017066                  MOV     #INTR,(R0)+     ;SET UP INTERRUPT VECTOR
017034  012720  000340                  MOV     #PRI07,(R0)+
017040  012600                          MOV     (SP)+,R0        ;RESTORE R0
017042  011646                          MOV     (SP),-(SP)
017044  012766  000000  000002          MOV     #0,2(SP)        ;SET CPU TO LEVEL 0
017052  000002                          RTI

                                ;SUBROUTINE TO DISABLE INTERRUPTS (RAISE PRIORITY TO LEVEL 7)
017054  011646                  DSBINT: MOV     (SP),-(SP)
017056  012766  000340  000002          MOV     #PRI07,2(SP)
017064  000002                          RTI
```

```
3001                                            .SBTTL  INTR    - INTERRUPT HANDLERS
3002
3003 017066                                     BGNSRV  INTR            ;DEFINE INTERRUPT ENTRY
     017066                             INTR::
3004 017066  012737  000001  002172             MOV     #1,INTRECV      ;SET FLAG TO SHOW INTERRUPT RECEIVED
3005 017074  105037  017015                     CLRB    INTFLAG         ;CLEAR FLAG TO SAY WE GOT INTERRUPT
3006 017100  132737  000001  017014             BITB    #IOKSTP,INTMASK ;EXPECTING STOP INTERRUPT?
3007 017106  001003                             BNE     1$              ;BR IF YES
3008 017110  152737  000001  017015             BISB    #IOKSTP,INTFLAG ;NO. SET THE ERROR FLAG.
3009
3010                                    ;SAVE REGISTERS, MSG BUFFER, ETC.
3011 017116                             1$:
3012 017116                                     ENDSRV
     017116                             L10026:
     017116  000002                             RTI
3013
3014
```

```
                                        .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
                                ;
017120                          WAITF:: BREAK                   ; DO A SUPVSR BREAK FIRST.
017120  104422                          TRAP    C$BRK
017122  012746  177776                  MOV     #177776,-(SP)   ;BIG MSEC TIMER
017126                                  DELAY   1               ;DELAY 100US
017126  012727  000001                  MOV     #1,(PC)+
017132  000000                          .WORD   0
017134  013727  002116                  MOV     L$DLY,(PC)+
017140  000000                          .WORD   0
017142  005367  177772                  DEC     -6(PC)
017146  001375                          BNE     .-4
017150  005367  177756                  DEC     -22(PC)
017154  001367                          BNE     .-20
017156  016500  000000          2$:     MOV     TSSR(R5),R0     ;READ THE TSSR REGISTER
017162  105700                          TSTB    R0              ;TEST FOR READY BIT SET

017164  100421                          BMI     3$              ; EXIT ON STOP FLAG.
017166                                  DELAY   1               ; WAIT 100 USEC
017166  012727  000001                  MOV     #1,(PC)+
017172  000000                          .WORD   0
017174  013727  002116                  MOV     L$DLY,(PC)+
017200  000000                          .WORD   0
017202  005367  177772                  DEC     -6(PC)
017206  001375                          BNE     .-4
017210  005367  177756                  DEC     -22(PC)
017214  001367                          BNE     .-20
017216                                  BREAK                   ; DO A SUPVSR BREAK FIRST.
017216  104422                          TRAP    C$BRK
017220  005316                          DEC     (SP)            ;REDUCE DELAY COUNT
017222  001355                          BNE     2$              ;RETRY UNTIL TIMER EXPIRES
017224  000241                          CLC                     ; C = 0, CONTROLLER STILL RUNNING...
017226  000401                          BR      4$              ;...OR HUNG-UP AFTER 300 MSEC.
017230  000261                  3$:     SEC                     ; C = 1, CONTROLLER IS STOPPED.
017232  005326                  4$:     DEC     (SP)+           ;RESTORE STACK WITHOUT CHANGING CARRY BIT
017234  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
                                ;
                                ;-

017236                          CHKTSSR:
017236  004737  017120                  JSR     PC,WAITF        ;WAIT FOR READY
017242  103014                          BCC     20$             ;BRANCH IF TIME OUT
017244  004737  016714                  JSR     PC,CHKAMB       ;TSSR AMBIGOUS?
017250  103006                          BCC     10$             ;BR IF YES
017252  032700  100000                  BIT     #SC,R0          ;SPECIAL CONDITION SET?
017256  001405                          BEQ     15$             ;BR IF NO
017260  032700  074000                  BIT     #<SCE!BIE!RMR!NXM>,R0   ;ANY ERROR BITS SET?
017264  001402                          BEQ     15$             ;BR IF NO
017266  000241                  10$:    CLC                     ;SET FAILURE
017270  000401                          BR      20$             ;
017272  000261                  15$:    SEC                     ;SET SUCCESS
017274  000207                  20$:    RTS     PC              ;RETURN TO CALLER
```

```
3080                                            .SBTTL  XNXM    - CHECK FOR NONEXISTENT MEMORY
3081                                    ;+
3082                                    ; ROUTINE TO TEST FOR A NEXM IN THE RANGE (R1) THRU (R2).
3083                                    ; ON RETURN, IF "C" = 1, (R1) = NEXM ADDRESS.
3084                                    ;               "C" = 0, ALL ADDRESSES OK.
3085                                    ;
3086                                    ;CALL:  MOV ADR1,R1
3087                                    ;       MOV ADR2,R2
3088                                    ;       JSR PC,NXM
3089                                    ;       RETURN                  ;TEST "C" AND PROCEED.
3090                                    ;
3091 017276  012737  017330  000004    XNXM:   MOV     #2$,@#04        ; SET BUSERR VECTOR.
3092 017304  012737  000200  000006            MOV     #PRI04,@#06
3093 017312  005003                            CLR     R3              ;FLAG.
3094 017314  005711                    1$:     TST     (R1)            ;TEST THE ADDRESS(ES).
3095                                                                    ;IF ANY TRAP, CONTINUE AT 2$.
3096 017316  020102                            CMP     R1,R2           ;OTHERWISE, CONTINUE HERE.
3097 017320  001407                            BEQ     3$              ;BR IF FINISHED (NO NEXM'S).
3098 017322  062701  000002                    ADD     #2,R1           ;SET NEXT ADDRESS...
3099 017326  000772                            BR      1$              ;...AND CONTINUE.
3100
3101 017330  005103                    2$:     COM     R3              ;GOT ONE, SET FLAG...
3102 017332  012716  017340                    MOV     #3$,(SP)
3103 017336  000002                            RTI                     ;...AND DISMISS INTERRUPT...
3104 017340                            3$:     CLRVEC  #4              ;...AND GIVE BACK THE VECTOR.
     017340  012700  000004                    MOV     #4,R0
     017344  104436                            TRAP    C$CVEC
3105 017346  005703                            TST     R3              ;DID WE CATCH ONE ??
3106 017350  001401                            BEQ     .+4             ;NO, "C" = 0, SKIP NEXT.
3107 017352  000261                            SEC                     ;YES, "C" = 1, (R1) = NEXM ADDR.
3108 017354  000207                            RTS     PC
3109
3110
3111
3112
3113                                            .SBTTL  TSTLOOP - CHECK ITERATION COUNT
3114                                    ;+
3115                                    ; SUBROUTINE TO EXECUTE TEST ITERATIONS.
3116                                    ; EXIT WITH "C" SET IF LOOPS ALLOWED AND LOOP COUNT NON-ZERO.
3117                                    ; LOOP COUNTER IS SET BY "BEGIN.TEST" MACRO.
3118                                    ;
3119                                    ; CALL: LOOPTO  ARG
3120                                    ;
3121 017356                            TSTLOOP::
3122 017356  005737  002136                    TST     NOITS           ; ITERATIONS INHIBITED?
3123 017362  001006                            BNE     1$              ; YES.
3124 017364  005737  002152                    TST     QVP             ; NO.
3125 017370  100403                            BMI     1$              ;LOOPS DISALLOWED IN QUICK PASS.
3126 017372  005337  002164                    DEC     LOOPCNT         ; BUMP LOOP COUNTER.
3127 017376  001002                            BNE     2$
3128 017400  000241                    1$:     CLC                     ;LOOP DISALLOWED, OR DONE.
3129 017402  000401                            BR      3$
3130 017404  000261                    2$:     SEC                     ;LOOP ENABLED.
3131 017406  000207                    3$:     RTS     PC
```

```
3133
3134
3135                                    .SBTTL  TSTSETUP - PRINT TEST NAME AND INIT ERROR COUNTS
3136                                ;*
3137                                ; PRINT THE NUMBER AND NAME OF EACH TEST AS WE GO ALONG.
3138                                ; INCREMENT "TESTK" TO INDICATE THE NUMBER OF TESTS
3139                                ; IN THE CURRENT RUN SEQUENCE.
3140                                ; CLEAR THE ERROR COUNTER AND SIGNATURE EXTENSION FLAGS.
3141                                ;
3142                                ;INPUT:
3143                                ;
3144                                ;       R0      POINTER TO TEST ID ASCIZ STRING
3145                                ;
3146                                ;OUTPUT:
3147                                ;
3148                                ;       R5      ADDRESS OF FIRST DEVICE REGISTER
3149                                ;
3150                                ;IMPLICIT OUTPUTS:
3151                                ;
3152                                ;       TSTCNT  UPDATED TO COUNT TESTS PERFORMED SINCE START OR RESTART
3153                                ;
3154                                ;SIDE EFFECTS:
3155                                ;
3156                                ;       INTERRUPT LEVEL IS RASIED TO LEVEL OF
3157                                ;       THE DEVICE UNDER TEST
3158                                ;
3159                                ;-
3160
3161 017410                        TSTSETUP::
3162 017410  010046                        MOV     R0,-(SP)        ;SAVE THE TEST ID MESSAGE
3163 017412  005037  003106                CLR     SIFLAG          ; CLEAR "SOFT INIT" FLAG
3164 017416  005037  017656                CLR     ERRK            ; CLEAR LOCAL ERROR COUNTER.
3165 017422  005037  005232                CLR     EXTA            ; CLEAR ERROR EXTENSION FLAG.
3166 017426  105037  017014                CLRB    INTMASK         ; CLEAR INTERRUPT MASK (CHECK ERROR)
3167 017432  013700  002150                MOV     UNITN,R0        ; GET THE UNIT NUMBER,
3168 017436  006300                        ASL     R0              ; ... AND MAKE IT A WORD OFFSET.
3169 017440  005737  003062                TST     NODEV           ; DID STARTUP FIND THE DEVICE?
3170 017444  001430                        BEQ     4$              ; BR IF YES
3171 017446  100010                        BPL     3$              ; BR IF NOT IDLE
3172 017450  052760  160000  003130        BIS     #160000,ERTABL(R0) ; FLAG ERROR IN THE ERROR TABLE
3173 017456                                ERRDF   1,NXR,NXRERR    ; NO DEVICE HERE -- PRINT IT
     017456  104455                        TRAP    C$ERDF
     017460  000001                        .WORD   1
     017462  003636                        .WORD   NXR
     017464  005176                        .WORD   NXRERR
3174 017466  000407                        BR      2$
3175 017470  052760  160001  003130  3$:   BIS     #160001,ERTABL(R0) ; FLAG ERROR IN THE ERROR TABLE
3176 017476                                ERRDF   2,NOINIT        ; DEVICE NOT IDLE
     017476  104455                        TRAP    C$ERDF
     017500  000002                        .WORD   2
     017502  004233                        .WORD   NOINIT
     017504  000000                        .WORD   0
3177 017506  012737  177777  003060  2$:   MOV     #-1,DUFLG       ; DROP THE UNIT
3178 017514                                DODU    UNITN
     017514  013700  002150                MOV     UNITN,R0
     017520  104451                        TRAP    C$DODU
3179 017522                                DOCLN                   ; ABORT THE PASS
```

```
     017522  104444                          TRAP    C$DCLN
3180 017524  000423                          BR      5$
3181
3182 017526                          4$:     RFLAGS  R0              ; GET THE OPERATOR FLAGS.
     017526  104421                          TRAP    C$RFLA
3183 017530  032700  001000                  BIT     #PNT,R0         ; PRINT THE TEST NUMBERS?
3184 017534  001412                          BEQ     1$              ; BR IF NO
3185 017536  011600                          MOV     (SP),R0         ;GET THE ID MESSAGE
3186 017540                                  PRINTF  #TNAM,R0        ;DISPLAY THE TEST ID
     017540  010046                          MOV     R0,-(SP)
     017542  012746  017604                  MOV     #TNAM,-(SP)
     017546  012746  000002                  MOV     #2,-(SP)
     017552  010600                          MOV     SP,R0
     017554  104417                          TRAP    C$PNTF
     017556  062706  000006                  ADD     #6,SP
3187 017562  005237  002162          1$:     INC     TSTCNT          ; BUMP TEST COUNTER.
3188 017566                                  SETPRI  IPRI            ;PRIORITY THAT OF DEVICE
     017566  013700  002160                  MOV     IPRI,R0
     017572  1^^441                          TRAP    C$SPRI
3189 017574  005726                  5$:     TST     (SP)+           ;FIX UP THE STACK
3190 017576  013705  002154                  MOV     CSRADDR,R5      ; ADDRESS OF TSV REGISTERS ON UNIBUS
3191 017602  000207                          RTS     PC
3192 017604     045     123     045  TNAM:   .ASCIZ  '%S%T%A Test'
3193                                          .EVEN
```

```
3195                                            .SBTTL  TSTEND  - PRINT ERRORS RECEIVED
3196                                    ;
3197                                    ; AT END OF EACH TEST, PRINT THE NUMBER OF ERRORS RECEIVED
3198                                    ; IF NORMAL ERROR REPORTING IS DISABLED (FLA:IER).
3199                                    ;
3200 017620                            TSTEND: RFLAGS  R0
      017620  104421                           TRAP    C$RFLA
3201 017622  030027  020000                    BIT     R0,#IER
3202 017626  001412                            BEQ     1$                      ; BR IF "IER" NOT SET.
3203 017630                                    PRINTF  #ESUM,ERRK              ; PRINT ERROR COUNT.
      017630  013746  017656                    MOV     ERRK,-(SP)
      017634  012746  017660                    MOV     #ESUM,-(SP)
      017640  012746  000002                    MOV     #2,-(SP)
      017644  010600                            MOV     SP,R0
      017646  104417                           TRAP    C$PNTF
      017650  062706  000006                    ADD     #6,SP
3204 017654  000207                    1$:     RTS     PC
3205
3206 017656  000000                    ERRK:   0                               ; LOCAL ERROR COUNT.
3207 017660     045     101     040    ESUM:   .ASCIZ  /%A %D%A ERRORS/
3208 017677     105     122     122    EMAXDU: .ASCIZ  /ERROR LIMIT REACHED -- DROPPING UNIT/
3209                                            .EVEN
3210
3211                                            .SBTTL  INCERK  - INCREMENT LOCAL ERROR COUNT
3212                                    ;+
3213                                    ; ROUTINES TO INCREMENT LOCAL ERROR COUNT AND CHECK FOR LIMIT:
3214                                    ;-
3215 017744  005237  017656            INCERK: INC     ERRK                    ; INCREMENT LOCAL ERROR COUNT
3216 017750  010046                            MOV     R0,-(SP)                ; SAVE R0
3217 017752  013700  002150                    MOV     UNITN,R0                ; GET UNIT NUMBER,
3218 017756  006300                            ASL     R0                      ; ... AND MAKE IT A WORD OFFSET.
3219 017760  062700  003130                    ADD     #ERTABL,R0              ; R0 GETS ADDRESS OF ERROR TABLE ENTRY.
3220 017764  005210                            INC     (R0)                    ; INCREMENT THE DEVICE ERROR COUNT
3221 017766  032710  007777                    BIT     #7777,(R0)              ; DID WE OVERFLOW THE FIELD?
3222 017772  001001                            BNE     1$                      ; BR IF NO.
3223 017774  005310                            DEC     (R0)                    ; YES -- BACK IT UP TO 7777.
3224 017776  012600                    1$:     MOV     (SP)+,R0                ; RESTORE R0
3225 020000  000207                            RTS     PC                      ; RETURN TO CALLER.
3226
3227 020002  010046                    CKEMAX: MOV     R0,-(SP)                ; SAVE R0
3228 020004  013700  002150                    MOV     UNITN,R0                ; GET UNIT NUMBER
3229 020010  006300                            ASL     R0                      ; ... AND MAKE IT A WORD OFFSET
3230 020012  016000  003130                    MOV     ERTABL(R0),R0           ; GET ERROR TABLE ENTRY
3231 020016  042700  170000                    BIC     #170000,R0              ; EXTRACT ERROR COUNT FIELD
3232 020022  020037  002142                    CMP     R0,GERRMAX              ; IS GLOBAL LIMIT EXCEEDED FOR THIS UNIT?
3233 020026  103004                            BHIS    1$                      ; BR IF YES
3234 020030  023737  017656  002140            CMP     ERRK,LERRMAX            ; IS LOCAL LIMIT EXCEEDED FOR THIS TEST?
3235 020036  103417                            BLO     2$                      ; BR IF NO
3236 020040                            1$:     RFLAGS  R0                      ; GET OPERATOR FLAGS
      020040  104421                           TRAP    C$RFLA
3237 020042  032700  000040                    BIT     #IDU,R0                 ; IS DROPPING INHIBITED?
3238 020046  001013                            BNE     2$                      ; BR IF YES.
3239 020050  012737  177777  003060            MOV     #-1,DUFLG               ; NO -- DROP THE UNIT
3240 020056                                    ERRDF   4,EMAXDU
      020056  104455                           TRAP    C$ERDF
      020060  000004                           .WORD   4
      020062  017677                           .WORD   EMAXDU
```

```
      020064  000000                          .WORD   0
 3241 020066                                  DODU    UNITN
      020066  013700  002150                  MOV     UNITN,R0
      020072  104451                          TRAP    C$DODU
 3242 020074                                  DOCLN
      020074  104444                          TRAP    C$DCLN
 3243 020076  012600                  2$:     MOV     (SP)+,R0        ; RESTORE R0
 3244 020100  000207                          RTS     PC              ; RETURN TO CALLER
 3245                                         .SBTTL  FATCHK - INC FATAL ERRORS AND CHECK FOR LIMIT
 3246                                 ;+
 3247                                 ;
 3248                                 ;       CHECK FATAL COUNTER, AFTER INC, FOR MORE THAN 25
 3249                                 ;       ERRORS AND IF OVER CALL UNIT DROP ROUTINE
 3250                                 ;
 3251                                 ;-
 3252 020102                          FATCHK:
 3253 020102                                  SAVREG                          ;BETTER SAVE THE REGISTERS
 3254 020106  013701  002150                  MOV     UNITN,R1                ;PICK UP THE UNIT NUMBER
 3255 020112  006301                          ASL     R1                      ;MAKE IT INTO A BYTE OFFSET
 3256 020114  062761  000001  003130          ADD     #1,ERTABL(R1)           ;ADD 1 TO THE PROPER UNIT'S ERROR COUNTER
 3257 020122  005237  002170                  INC     FATFLG                  ;BUMP FATAL ERROR COUNTER
 3258 020126  023727  002170  000031          CMP     FATFLG,#25.             ;CHECK AGAINST 25
 3259 020134  002406                          BLT     9$                      ;BR, IF LESS THAN 25 ERRORS
 3260 020136                                  RFLAGS  R0                      ;READ THE FLAGS INTO R0
      020136  104421                          TRAP    C$RFLA
 3261 020140  032700  040000                  BIT     #BIT14,R0               ;BR, IF LOOP ON ERROR IS SET
 3262 020144  001002                          BNE     9$                      ;OTHERWISE NEVER BE ABLE TO SCOPE ETC.
 3263 020146  004737  020154                  JSR     PC,CKDROP               ;DROP UNIT IF ALLOWED
 3264 020152  000207                  9$:     RTS     PC                      ;RETURN ETC.
 3265                                 ;
 3266                                 ;
 3267                                 ;
```

```
                                        .SBTTL  CKDROP  - CHECK IF UNIT SHOULD BE DROPPED
                                ;+
                                ; CHECK IF UNIT SHOULD BE DROPPED
                                ;-
020154  010046                 CKDROP: MOV     R0,-(SP)
020156                                  FORCERROR       1$,NOTSSR
020166                                  RFLAGS  R0
020166  104421                         TRAP    C$RFLA
020170  032700  000040                 BIT     #IDU,R0
020174  001010                         BNE     1$
020176  011600                         MOV     (SP),R0
020200  012737  177777  003060         MOV     #-1,DUFLG
020206                                  DODU    UNITN
020206  013700  002150                 MOV     UNITN,R0
020212  104451                         TRAP    C$DODU
020214                                  DOCLN                   ;ABORT THE PASS
020214  104444                         TRAP    C$DCLN
020216  012600                 1$:     MOV     (SP)+,R0
020220  000207                         RTS     PC


                                        .SBTTL  CONFIG  - DETERMINE CONFIGURATION OF SYSTEM
                                ;
                                ; SUBROUTINE - DETERMINE CONFIGURATION OF TK-25 SYSTEM.
                                ;
020222                          CONFIG:
020222  004737  016644                 JSR     PC,SOFINIT
020226  000207                         RTS     PC
```

```
3299                                            .SBTTL  KTON,KTOFF      - ENABLE/DISABLE MEMORY MANAGEMENT
3300                                    ;
3301                                    ; SUBROUTINE - ENABLE MEM MGT.
3302                                    ;
3303 020230  005737  003100            KTON:   TST     KTFLG           ; GOT KT?
3304 020234  001403                            BEQ     1$              ; NO.
3305 020236  012737  000001  177572            MOV     #1,SR0          ; YES. ENABLE KT11.
3306 020244  000207                    1$:     RTS     PC
3307
3308
3309
3310                                    ;
3311                                    ; SUBROUTINE - DISABLE MEM MGT.
3312                                    ;
3313 020246  005737  003100            KTOFF:  TST     KTFLG           ; GOT KT11?
3314 020252  001405                            BEQ     1$              ; NO.
3315 020254  000240                            NOP
3316 020256  000240                            NOP
3317 020260  012737  000000  177572            MOV     #0,SR0          ; DISABLE KT.
3318 020266  000207                    1$:     RTS     PC
3319
3320
```

```
                        .SBTTL  SETMAP  - SETUP PAR6 MAPPING

                ;+
                ;
                ;THIS ROUTINE SETS UP KERNEL PAR6 TP HANDLE
                ;AN 18 BIT ADDRESS. THE OFFSET INTO THE PAGE
                ;IS RETURNED BIASED TO PAR6.
                ;
                ;INPUTS:
                ;
                ;       R0      HIGH ORDER ADDRESS BITS
                ;       R1      LOW ORDER ADDRESS BITS
                ;
                ;OUTPUTS:
                ;
                ;       R0      OFFSET INTO BLOCK WITH PAR6 BIAS (I.E. THE ADDRESS)
                ;       CARRY   SET IF SUCCESS
                ;               CLR IF ERROR
                ;-
020270          SETMAP:
020270                  SAVREG                          ;SAVE R1-R4 UNTIL NEXT RETURN
020274  005737  003100          TST     KTFLG           ;SYSTEM HAVE ABOVE 28K?
020300  001433                  BEQ     10$             ;BR IF NO
020302  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
020334  042701  000177          BIC     #177,R1         ;ALINE FOR LOWER 4K BOUNDARY
020340  020137  003100          CMP     R1,KTFLG        ;HIGHER THAN EXISTING MEMORY?
020344  103011                  BHIS    10$             ;BR IF YES
020346  010137  172354          MOV     R1,@#KIPAR6     ;SETUP MAPPING REGISTER PAR6
020352  042702  160000          BIC     #160000,R2      ;SETUP DISPLACEMENT IN PAGE
020356  062702  140000          ADD     #140000,R2      ;ADD IN PAR6 BIAS
020362  010200                  MOV     R2,R0           ;RETURN IN R0
020364  000261                  SEC                     ;SET SUCCESS
020366  000401                  BR      15$             ;
020370  000241          10$:    CLC                     ;SET FAILURE
020372  000207          15$:    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
                                ;-
                                ;
020374                          FILLMEM:
020374                                  SAVREG                  ;SAVE R1-R5 UNTIL NEXT RETURN
020400  004737  020246                  JSR     PC,KTOFF        ;DISABLE KT.
020404  010003                          MOV     R0,R3           ;COPY TEST PATTERN
020406  013701  003072                  MOV     FREE,R1         ;GET FIRST FREE LOCATION
020412  013702  003074                  MOV     FRESIZ,R2       ;SIZE OF FREE SPACE BELOW 28K.
020416  010321                  10$:    MOV     R3,(R1)+        ;STORE A BACKGROUND WORD
020420  005302                          DEC     R2              ;DONE ALL MEMORY IN FREE SPACE?
020422  003375                          BGT     10$             ;BR IF NO
020424  005737  003100                  TST     KTFLG           ; GOT KT?
020430  001452                          BEQ     55$             ; NO. GET OUT.
020432  004737  020230                  JSR     PC,KTON         ; YES. ENABLE KT.
020436  005000                          CLR     R0              ;HIGH ORDER ADDRESS START
020440  013701  003104                  MOV     PST32W,R1       ;GET >28K START ADDRESS (IN 32W BLOCKS)
        000006                          .REPT   6
                                        CLC                     ;CLEAR C BIT
                                        ROL     R1              ;CONVERT BLOCKS TO WORDS
                                        ROL     R0              ;MAKE IT DOUBLE PRECISION
                                        .ENDR
020510  004737  020270                  JSR     PC,SETMAP       ;SETUP PAR6 MAPPING REGISTER
020514  010320                  30$:    MOV     R3,(R0)+        ;STORE TEST PATTERN IN >28K ADDRESS
020516  020027  160000                  CMP     R0,#160000      ;END OF PAR6 MAPPING AREA?
020522  103774                          BLO     30$             ;BR IF NO
020524  162700  020000                  SUB     #20000,R0       ;BACKUP INTO PAR6 MAPPING BEGIN
020530  062737  000200  172354          ADD     #200,@#KIPAR6   ;POINT TO NEXT 4K BLOCK >28K.
020536  023737  172354  003100          CMP     @#KIPAR6,KTFLG  ;END OF MEMORY?
020544  001402                          BEQ     50$             ;BR IF YES
020546  000137  020514                  JMP     30$             ;KEEP GOING ON ETC.
020552  004737  020246          50$:    JSR     PC,KTOFF        ; DISABLE KT.
020556  000207                  55$:    RTS     PC
```

```
3411                                            .SBTTL  CMPMEM  - COMPARE MEMORY TO BACKGROUND PATTERN
3412                                    ;+
3413                                    ; COMPARE MEMORY WITH A BACKGROUND PATTERN
3414                                    ;
3415                                    ; INPUTS:
3416                                    ;
3417                                    ;       R0 = BACKGROUND PATTERN
3418                                    ;       FREE    = FIRST LOCATION AVAILABLE TO DIAGNOSTIC
3419                                    ;       KTFLG   = SET TO HIGHEST MEMORY LOCATION IF > 28K.
3420                                    ;
3421                                    ; OUTPUTS:
3422                                    ;
3423                                    ;       CARRY   - SET IF NO ERROR
3424                                    ;       CARRY   - CLR IF ERROR
3425                                    ;
3426                                    ; IMPLICIT OUTPUTS:
3427                                    ;
3428                                    ;       ERRHI   - ERROR HIGH ADDRESS
3429                                    ;       ERRLO   - ERROR LOW ADDRESS
3430                                    ;       EXPD    - EXPECTED DATA
3431                                    ;       RECV    - RECEIVED DATA
3432                                    ;-
3433 020560                            CMPMEM:
3434 020560                                    SAVREG                  ;SAVE R1-R5 UNTIL NEXT RETURN
3435 020564  010003                            MOV     R0,R3           ;COPY TEST PATTERN
3436 020566  004737  020246                    JSR     PC,KTOFF        ;DISABLE KT.
3437 020572  013701  003072                    MOV     FREE,R1         ;GET FIRST FREE LOCATION
3438 020576  013702  003074                    MOV     FRESIZ,R2       ;SIZE OF FREE SPACE BELOW 28K.
3439 020602  020311                    10$:    CMP     R3,(R1)         ;FREE SPACE LOCATION EQUAL TO EXPD?
3440 020604  001411                            BEQ     15$             ;BR IF YES
3441 020606  010137  002204                    MOV     R1,ERRLO        ;SAVE ADDRESS IN ERROR
3442 020612  005037  002202                    CLR     ERRHI           ;NO HIGH ADDRESS
3443 020616  010337  002176                    MOV     R3,EXPD         ;SAVE EXPD FOR ERROR REPORT
3444 020622  011137  002200                    MOV     (R1),RECV       ;SAVE RECV FOR ERROR REPORT
3445 020626  000474                            BR      50$             ;
3446 020630  005721                    15$:    TST     (R1)+           ;POINT TO NEXT ADDRESS
3447 020632  005302                            DEC     R2              ;DONE ALL MEMORY IN FREE SPACE?
3448 020634  003362                            BGT     10$             ;BR IF NO
3449 020636  005737  003100                    TST     KTFLG           ; GOT KT?
3450 020642  001472                            BEQ     55$             ; NO. GET OUT.
3451 020644  004737  020230                    JSR     PC,KTON         ; YES. ENABLE KT.
3452 020650  005000                            CLR     R0              ;HIGH ORDER ADDRESS START
3453 020652  013701  003104                    MOV     PST32W,R1       ;GET >28K START ADDRESS (IN 32W BLOCKS)
3454         000006                            .REPT   6
3455                                            ROL     R1              ;CONVERT BLOCKS TO WORDS
3456                                            ROL     R0              ;MAKE IT DOUBLE PRECISION
3457                                            .ENDR
3458 020706  042701  000177                    BIC     #177,R1         ;ALINE 4K BOUNDARY
3459 020712  010046                            MOV     R0,-(SP)        ;SAVE HIGH ORDER
3460 020714  010146                            MOV     R1,-(SP)        ;SAVE LOW ORDER
3461 020716  004737  020270                    JSR     PC,SETMAP       ;SETUP PAR6 MAPPING REGISTER
3462 020722  010004                            MOV     R0,R4           ;COPY ADDRESS BIASED TO PAR6
3463 020724  012601                            MOV     (SP)+,R1        ;RESTORE LOW ORDER IN NON PAR6 FORMAT
3464 020726  012600                            MOV     (SP)+,R0        ;RESTORE HIGH ORDER IN NON PAR6 FORMAT
3465 020730  020314                    30$:    CMP     R3,(R4)         ;ABOVE 28K LOCATION EQUAL EXPD?
3466 020732  001411                            BEQ     32$             ;BR IF YES
3467 020734  010037  002202                    MOV     R0,ERRHI        ;SAVE HIGH ORDER IN ERROR
```

```
3468 020740  010137  002204                    MOV     R1,ERRLO        ;SAVE LOW ORDER IN ERROR
3469 020744  010337  002176                    MOV     R3,EXPD         ;SAVE EXPD FOR ERROR REPORT
3470 020750  011437  002200                    MOV     (R4),RECV       ;SAVE RECV FOR ERROR REPORT
3471 020754  000421                            BR      50$             ;
3472 020756  062701  000002            32$:    ADD     #2,R1           ;UPDATE NON PAR6 ADDRESS
3473 020762  005500                            ADC     R0              ;MAKE IT DOUBLE PRECISION ADD
3474 020764  062704  000002                    ADD     #2,R4           ;UPDATE PAR FORMAT ADDRESS
3475 020770  020427  160000                    CMP     R4,#160000      ;END OF PAR6 MAPPING AREA?
3476 020774  103755                            BLO     30$             ;BR IF NO
3477 020776  162704  020000                    SUB     #20000,R4       ;BACKUP INTO PAR6 MAPPING BEGIN
3478 021002  062737  000200  172354            ADD     #200,@#KIPAR6   ;POINT TO NEXT 4K BLOCK >28K.
3479 021010  023737  172354  003100            CMP     @#KIPAR6,KTFLG  ;END OF MEMORY?
3480 021016  101744                            BLOS    30$             ;BR IF NO
3481 021020  004737  020246            50$:    JSR     PC,KTOFF        ;TURN OFF MEMORY MAPPING
3482 021024  000241                            CLC                     ;SET FAILURE
3483 021026  000403                            BR      60$             ;
3484 021030  004737  020246            55$:    JSR     PC,KTOFF        ;TURN OFF MEMORY MAPPING
3485 021034  000261                            SEC                     ;SET SUCCESS
3486 021036  000207                    60$:    RTS     PC
3487
```

```
                                        .SBTTL  REGSAV  - SAVE R1-R5 ON STACK
                                ;+
                                ;
                                ;ROUTINE TO
                                ;SAVE R1 THROUGH R5 ON THE STACK
                                ;
                                ;CALLING SEQUENCE:
                                ;
                                ;       JSR     R5,REGSAV
                                ;
                                ;THIS IS A COOROUTINE WHICH TRANSFER CONTROL BACK TO
                                ;THE CALLING ROUTINE. AT THE END OF THE CALLING ROUTINE,
                                ;THE RTS PC RETURNS CONTROL TO THIS ROUTINE TO RESTORE
                                ;REGISTERS.
                                ;
                                ;THIS ROUTINE SHOULD ONLY BE CALLED FROM ROUTINES WHICH ARE
                                ;CALLED VIA A JSR PC INSTRUCTION
                                ;
                                ;-

021040                          REGSAV:
021040                                  BREAK                   ;LOOK FOR CNTL C
021040  104422                          TRAP    C$BRK
021042  010446                          MOV     R4,-(SP)
021044  010346                          MOV     R3,-(SP)
021046  010246                          MOV     R2,-(SP)
021050  010146                          MOV     R1,-(SP)
021052  010546                          MOV     R5,-(SP)
021054  016605  000012                  MOV     10.(SP),R5
021060  004736                          JSR     PC,@(SP)+
021062  012601                          MOV     (SP)+,R1
021064  012602                          MOV     (SP)+,R2
021066  012603                          MOV     (SP)+,R3
021070  012604                          MOV     (SP)+,R4
021072  012605                          MOV     (SP)+,R5
021074                                  BREAK                   ;LOOK FOR CNTL C
021074  104422                          TRAP    C$BRK
021076  000207                          RTS     PC
```

```
3527                                            .SBTTL  GETPAT  - GET 8 BIT PATTERN FROM OPERATOR
3528                                    ;+
3529                                    ;
3530                                    ;ROUTINE TO REQUEST AN 8 BIT DATA PATTERN FROM THE OPERATOR
3531                                    ;
3532                                    ;INPUTS:
3533                                    ;
3534                                    ;       NONE.
3535                                    ;
3536                                    ;OUTPUTS:
3537                                    ;
3538                                    ;       R0      OCTAL NUMBER FROM THE OPERATOR
3539                                    ;
3540                                    ;CALLING SEQUENCE:
3541                                    ;
3542                                    ;       JSR     PC,GETPAT
3543                                    ;
3544                                    ;-
3545
3546 021100                             GETPAT::
3547 021100                                     SAVREG                          ;SAVE THE GENERAL REGISTERS
3548 021104                             1$:     GMANID  DATASC,PATDAT,0,377,0,377,NO
     021104  104443                            TRAP    C$GMAN
     021106  000406                            BR      10000$
     021110  021134                            .WORD   PATDAT
     021112  000022                            .WORD   T$CODE
     021114  021136                            .WORD   DATASC
     021116  000377                            .WORD   377
     021120  000000                            .WORD   T$LOLIM
     021122  000377                            .WORD   T$HILIM
     021124                             10000$:
3549 021124                                     BNCOMPLETE      1$      ;RETRY IF ERROR
     021124  103367                            BCC     1$
3550 021126  013700  021134                    MOV     PATDAT,R0       ;DATA PATTERN FROM OPERATOR
3551 021132  000207                            RTS     PC              ;RETURN TO CALLER
3552
3553                                    ;+
3554                                    ;LOCAL DATA AREA
3555                                    ;-
3556
3557 021134  000000                     PATDAT: .WORD   0               ;TEMPORARY STORAGE FOR DATA
3558 021136    105     116     124      DATASC: .ASCIZ  'ENTER DATA PATTERN'
3559                                            .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
                        ;
                        ;-
021162                  GETSEL::
021162                          SAVREG                          ;SAVE GENERAL REGISTERS
021166  010002                  MOV     R0,R2                   ;SAVE THE MENU ADDRESS
021170  010203          1$:     MOV     R2,R3                   ;START OF MENU STRING
021172  005713          2$:     TST     (R3)                    ;END OF ASCII ?
021174  001412                  BEQ     3$                      ;BRANCH IF ALL LINES DISPLAYED
021176                          PRINTF  @SELASC,(R3)+           ;DISPLAY THE MENU
021176  012346                  MOV     (R3)+,-(SP)
021200  012746  021346          MOV     @SELASC,-(SP)
021204  012746  000002          MOV     #2,-(SP)
021210  010600                  MOV     SP,R0
021212  104417                  TRAP    C$PNTF
021214  062706  000006          ADD     #6,SP
021220  000764                  BR      2$
021222                  3$:     GMANID  MENASC,MENRES,D,-1,0,-1,NO
021222  104443                  TRAP    C$GMAN
021224  000406                  BR      10001$
021226  021402                  .WORD   MENRES
021230  000042                  .WORD   T$CODE
021232  021353                  .WORD   MENASC
021234  177777                  .WORD   -1
021236  000000                  .WORD   T$LOLIM
021240  177777                  .WORD   T$HILIM
021242                  10001$:
021242                          BNCOMPLETE      1$              ;RETRY IF ERROR
021242  103352                  BCC     1$
021244  013700  021402          MOV     MENRES,R0               ;GET THE OPERATOR'S REPLY
021250  020001                  CMP     R0,R1                   ;COMPARE TO MAXIMUM ALLOWED
021252  101411                  BLOS    5$                      ;BRANCH IF OK
021254                          PRINTF  @MENERR                 ;DISPLAY ERROR MESSAGE
021254  012746  021300          MOV     @MENERR,-(SP)
021260  012746  000001          MOV     #1,-(SP)
021264  010600                  MOV     SP,R0
021266  104417                  TRAP    C$PNTF
021270  062706  000004          ADD     #4,SP
021274  000735                  BR      1$                      ;RETRY
021276  000207          5$:     RTS     PC                      ;RETURN TO CALLER
021300     045  116  045  MENERR: .ASCIZ  '%N%A *** Menu Selection Too Large ***'
021346     045  116  045  SELASC: .ASCIZ  '%N%T'
021353     105  156  164  MENASC: .ASCIZ  'Enter Menu Selection: '
                                .EVEN
021402  000000          MENRES:         .WORD   0
```

```
3598                                            .SBTTL  CHKMAN  - CHECK MANUAL INTERVENTION LEGALITY
3599                                    ;*
3600                                    ;
3601                                    ;ROUTINE TO TEST FOR MANUAL INTERVENTION LEGALITY.
3602                                    ;
3603                                    ;INPUT:
3604                                    ;
3605                                    ;       NONE.
3606                                    ;
3607                                    ;OUTPUT:
3608                                    ;
3609                                    ;       CARRY   0       MANUAL INTERVENTION NOT ALLOWED
3610                                    ;               1       MANUAL INTERVENTION IS OK
3611                                    ;
3612                                    ;SIDE EFFECTS:
3613                                    ;
3614                                    ;       A MESSAGE IS DISPLAYED WARNING THAT TEST IS
3615                                    ;       NOT EXECUTED IF MANUAL INTERVENTION IS NOT
3616                                    ;       ALLOWED.
3617                                    ;
3618                                    ;-
3619
3620 021404                            CHKMAN::
3621 021404                                    SAVREG                  ;SAVE THE REGISTERS
3622 021410                                    MANUAL                  ;SEE IF MANUAL INTERVENTION OK
     021410  104450                            TRAP    C$MANI
3623 021412                                    BCOMPLETE 1$            ;BRANCH IF ALLOWED
     021412  103411                            BCS     1$
3624 021414                                    PRINTF  #NOMAN          ;PRINT THE WARNING MESSAGE
     021414  012746  021440                    MOV     #NOMAN,-(SP)
     021420  012746  000001                    MOV     #1,-(SP)
     021424  010600                            MOV     SP,R0
     021426  104417                            TRAP    C$PNTF
     021430  062706  000004                    ADD     #4,SP
3625 021434  000241                            CLC                     ;CLEAR CARRY FOR ERROR
3626 021436  000207                    1$:     RTS     PC              ;RETURN
3627
3628 021440      045     116     045   NOMAN:  .ASCIZ  '%N%A *** Manual Intervention not Allowed - Test Aborted ***'
3629                                            .even
```

```
3631                                            .SBTTL  ENVIRN  - SETUP FREE DIAGNOSTIC SPACE
3632                                    ;
3633                                    ; SUBROUTINE TO SET-UP VARIOUS ENVIRONMENTAL PARAMETERS.
3634                                    ;
3635 021534                            ENVIRN: MEMORY  R0
     021534  104431                             TRAP    C$MEM
3636 021536  010037  003072                    MOV     R0,FREE         ; GET 1ST FREE ADDRESS...
3637 021542  062737  000002  003072            ADD     #2,FREE
3638 021550  011037  003074                    MOV     (R0),FRESIZ     ;...AND WORD COUNT.
3639 021554  162737  000004  003074            SUB     #4,FRESIZ
3640 021562  013702  002012                    MOV     L$UNIT,R2       ; GET NUMBER OF UNITS
3641 021566  162737  000007  003074  10$:      SUB     #7,FRESIZ       ; TAKE AWAY 7 WORDS PER UNIT
3642 021574  005302                            DEC     R2
3643 021576  001373                            BNE     10$
3644 021600  013700  003072                    MOV     FREE,R0         ;GET FIRST FREE ADDRESS
3645 021604  063700  003074                    ADD     FRESIZ,R0       ;POINT TO LAST FREE ADDRESS
3646 021610  162700  000002                    SUB     #2,R0           ;BACKUP 1 WORD
3647 021614  010037  003076                    MOV     R0,FREEMI       ;STORE LAST FREE ADDRESS
3648 021620  000207                            RTS     PC              ;RETURN
3649
```

```
3651                                    .SBTTL  KTINIT  - SETUP KT11 MEMORY MANAGEMENT REGISTERS
3652                                ;*
3653                                ;
3654                                ;ROUTINE TO INIT KT-11
3655                                ;
3656                                ;-
3657
3658 021622                        KTINIT:
3659 021622  005037  003100                    CLR     KTFLG           ; INIT >28K MEMORY FLAG
3660 021626  005037  003102                    CLR     KTENABLE        ; INIT TEST >28K FLAG
3661 021632  023727  002120  001577            CMP     L$HIME,#1577    ; GOT ENOUGH MEMORY (>28K)?
3662 021640  101444                           BLOS    9$              ; NO.
3663 021642  013700  000004                    MOV     @#ERRVEC,R0     ; SAVE OLD ERR VEC PTR.
3664 021646  012737  021740  000004            MOV     #2$,@#ERRVEC    ; SET ERR VEC PTR.
3665 021654  005737  177572                    TST     @#SR0           ; GOT KT11?
3666 021660  000240                           NOP                     ;  (TRAP IF NO).
3667 021662  013737  002120  003100            MOV     L$HIME,KTFLG    ; YES. SET KT FLAG.
3668 021670  042737  000177  003100            BIC     #177,KTFLG      ;
3669 021676  010037  000004                    MOV     R0,@#ERRVEC     ; RESTORE OLD ERR VEC PTR.
3670 021702  005000                           CLR     R0              ; R0 = AR DATA.
3671 021704  012701  172340                    MOV     #KIPAR0,R1      ; R1 = KI REGS PTR.
3672 021710  012761  077406  177740  1$:      MOV     #77406,-40(R1)  ; SET DESCRIPTOR REG.
3673 021716  010021                           MOV     R0,(R1)+        ; SET KIPAR REG.
3674 021720  062700  000200                    ADD     #200,R0         ; BUMP AR DATA BY "4K".
3675 021724  020027  002000                    CMP     R0,#2000        ; AT "I/O"?
3676 021730  001367                           BNE     1$              ; NO.
3677 021732  012741  177600                    MOV     #177600,-(R1)   ; YES. SET KTPAR7 FOR I/O.
3678 021736  000405                           BR      9$
3679
3680 021740  012716  021746          2$:      MOV     #6$,(SP)        ; SET UP RETURN
3681 021744  000002                           RTI                     ; RTI TO NEXT LOCATION
3682
3683 021746  010037  000004          6$:      MOV     R0,@#ERRVEC     ; RESTORE OLD ERR VEC PTR.
3684
3685 021752  000207                  9$:      RTS     PC
3694
3695
3701
```

```
3703                                            .SBTTL  PROTECTION TABLE
3704 021754                                     BGNPROT
     021754                             L$PROT::
3705 021754  177777  177777  177777             .WORD   -1, -1, -1, -1  ;NO DEVICE PROTECTION REQUIRED.
3706 021764                                     ENDPROT
3707
```

```
                                        .SBTTL  INITIALIZE SECTION

                                ;++
                                ;THE INITIALIZE SECTION CONTAINS THE CODING THAT IS PERFORMED
                                ;AT THE BEGINNING OF EACH PASS.
                                ;
                                ;IF "START" OR "RESTART", SET QUICK-PASS FLAG AND BUS-INIT.
                                ;IF "CONTINUE", NOTHING IS REQUIRED.
                                ;
                                ;--
                                ;+
                                ;INSERT TEMPORARY JUMP TO ODT
                                ;-
                                        BGNINIT
021764                          L$INIT::
                                40$:
021764  012737  005762  002146          MOV     #EPRT1,EPRTSW   ;SET UP PRIMARY MESSAGE FOR REPLACEMENT
021772  005037  003106                  CLR     SIFLAG          ;CLEAR "SOFT INIT" FLAG
021776  005037  003102                  CLR     KTENABLE        ;CLEAR TEST ABOVE 28K FLAG
022002  005037  002246                  CLR     RAMSIZ          ;CLEAR RAM SIZE FOR RAMERR ROUTINE
022006                                  READEF  #EF.CONTINUE
022006  012700  000036                  MOV     #EF.CONTINUE,R0
022012  104447                          TRAP    C$REFG
022014                                  BNCOMPLETE 1$
022014  103023                          BCC     1$
022016  023737  002150  002012          CMP     UNITN,L$UNIT    ;UNIT IN RANGE?
022024  103064                          BHIS    4$              ;BR IF NO.
022026  005737  003060                  TST     DUFLG           ;DROPPED UNIT?
022032  100466                          BMI     NXTU            ;BR IF YES
022034  013701  002150                  MOV     UNITN,R1
022040  006301                          ASL     R1
022042  005761  003130                  TST     ERTABL(R1)
022046  001512                          BEQ     SETU
022050  032761  040000  003130          BIT     #BIT14,ERTABL(R1) ;DROPPED?
022056  001054                          BNE     NXTU
022060                                  EXIT    INIT            ;DO NOTHING IF "CONTINUE".
022060  104432                          TRAP    C$EXIT
022062  000412                          .WORD   L10030-.
022064                          1$:     READEF  #EF.NEW
022064  012700  000035                  MOV     #EF.NEW,R0
022070  104447                          TRAP    C$REFG
022072                                  BNCOMPLETE NXTU         ;TAKE NEXT UNIT IF NOT NEW PASS.
022072  103046                          BCC     NXTU
022074                                  READEF  #EF.START
022074  012700  000040                  MOV     #EF.START,R0
022100  104447                          TRAP    C$REFG
022102                                  BCOMPLETE 2$
022102  103404                          BCS     2$
022104                                  READEF  #EF.RESTART
022104  012700  000037                  MOV     #EF.RESTART,R0
022110  104447                          TRAP    C$REFG
022112                                  BNCOMPLETE 31$
022112  103025                          BCC     31$
022114                          2$:                             ;1ST PASS, BUS-INIT...
022114                                  BRESET                  ;BUS RESET.
022114  104433                          TRAP    C$RESET
022116  005037  002162                  CLR     TSTCNT          ;NUMBER OF TESTS RUN IN PASS
```

```
3750 022122  005037  002170                CLR     FATFLG          ;RESET FLAG TO ZERO "FATAL ERRORS"
3751 022126  005037  003332          19$:  CLR     SKIPT           ;CLEAR THE SUBTEST "SKIPPER"
3752 022132                          20$:
3753 022132  012737  177777  002152        MOV     #-1,QVP         ;...QUICK VERIFY...
3754 022140  004737  021534                JSR     PC,ENVIRN       ;SET ENVIRONMENT.
3755 022144  004737  021622                JSR     PC,KTINIT       ;INITIALIZE KT MEMORY MANAGEMENT
3756 022150  012700  003130                MOV     #ERTABL,R0
3757 022154  005020                  30$:  CLR     (R0)+           ;CLEAR THE ERROR TABLE
3758 022156  020027  003330                CMP     R0,#ERTABE
3759 022162  103774                        BLO     30$
3760 022164  000404                        BR      4$
3761 022166  005037  002152          31$:  CLR     QVP
3762 022172  000137  022242                JMP     PASRPT          ;GO REPORT THE STATUS
3763
3764 022176                          4$:
3765 022176  012737  177777  002150  NEWPAS: MOV     #-1,UNITN       ;INIT UNIT NUMBER...
3766 022204  005037  002166                CLR     DEVCNT          ;CLEAR COUNT OF DEVICES RUNNING
3767 022210                          NXTU:   BREAK
     022210  104422                        TRAP    C$BRK
3768 022212  005237  002150                INC     UNITN           ;...AND SET NEXT UNIT NUMBER.
3769 022216  023737  002150  002012        CMP     UNITN,L$UNIT
3770 022224  103423                        BLO     SETU
3771 022226  012737  177777  003060        MOV     #-1,DUFLG
3772 022234  000401                        BR      11$
3773 022236                                DOCLN                   ;ABORT, NO MORE UNITS.
     022236  104444                        TRAP    C$DCLN
3774 022240  000240                  11$:  NOP
3775 022242                          PASRPT:
3776 022242  023727  002012  000001        CMP     L$UNIT,#1       ;HOW MANY UNITS SELECTED?
3777 022250  101752                        BLOS    NEWPAS          ;BR IF ONLY 1
3778 022252  005737  002166                TST     DEVCNT          ;ARE ANY STILL RUNNING?
3779 022256  001747                        BEQ     NEWPAS          ;BR IF NO
3780 022260                                RFLAGS  R0
     022260  104421                        TRAP    C$RFLA
3781 022262  032700  000100                BIT     #ISR,R0         ;SHOULD WE PRINT STATISTICS
3782 022266  001343                        BNE     NEWPAS          ;BR IF NO
3783
3784 022270                                DORPT
     022270  104424                        TRAP    C$DRPT
3785 022272  000741                        BR      NEWPAS
3786 022274                          10$:
3787
3788 022274                          SETU:   GPHARD  UNITN,R0        ;GET UNIT N P-TABLE POINTER.
     022274  013700  002150                MOV     UNITN,R0
     022300  104442                        TRAP    C$GPHRD
3789 022302                                BNCOMPLETE NXTU         ;BR IF UNIT NOT AVAILABLE.
     022302  103342                        BCC     NXTU
3790 022304  005037  003060                CLR     DUFLG           ;CLEAR "DROPPED" FLAG.
3791 022310  005237  002166                INC     DEVCNT
3792 022314  012001                        MOV     (R0)+,R1        ;GET 1ST REGISTER ADDRESS.
3793 022316  010137  002154                MOV     R1,CSRADDR      ;ADDRESS OF REGISTERS OF UNIT UNDER TEST
3794
3795 022322  012001                        MOV     (R0)+,R1        ;GET VECTOR ADDRESS.
3796 022324  011002                        MOV     (R0),R2         ;GET INTERRUPT PRIORITY
3797 022326  010237  002160                MOV     R2,IPRI         ;SET INTERRUPT PRIORITY.
3798 022332  010137  002156                MOV     R1,IVEC         ;SET INTERRUPT VECTOR POINTER...
3799 022336  012721  017066                MOV     #INTR,(R1)+     ;...VECTOR...
```

INITIALIZE SECTION

```
3800 022342  010221                        MOV     R2,(R1)+        ;...AND PRIORITY.
3801
3802 022344                          1$:
3803                                 ;       TST     QVP             ;1ST PASS ??
3804                                 ;       BEQ     5$              ;NO, SKIP THE PASS 1 STUFF.
3805
3806                                 ;
3807                                 ;1ST PASS, CHECK THAT DEVICE ADDRESSES ARE VALID, AND
3808                                 ;THAT THE DISPLAY STATUS IS PROPERLY INITIALIZED.
3809                                 ;
3810 022344  013701  002150                MOV     UNITN,R1
3811 022350  006301                        ASL     R1
3812 022352  052761  100000  003130        BIS     #BIT15,ERTABL(R1) ;SAY DEVICE RUNNING
3813 022360  005037  005232                CLR     EXTA            ;CLEAR ERROR EXTENSION FLAG.
3814 022364  023727  002012  000001        CMP     L$UNIT,#1       ;ARE WE TESTING MULTIPLE UNITS?
3815 022372  101416                        BLOS    10$             ;BR IF NO.
3816 022374                                RFLAGS  R0              ;YES -- GET OPERATOR FLAGS.
     022374  104421                        TRAP    C$RFLA
3817 022376  032700  001000                BIT     #PNT,R0         ;SHOULD WE PRINT UNIT #?
3818 022402  001412                        BEQ     10$             ;BR IF NOT.
3819 022404                                PRINTF  #PUNIT,UNITN    ;PRINT THE UNIT #
     022404  013746  002150                MOV     UNITN,-(SP)
     022410  012746  022476                MOV     #PUNIT,-(SP)
     022414  012746  000002                MOV     #2,-(SP)
     022420  010600                        MOV     SP,R0
     022422  104417                        TRAP    C$PNTF
     022424  062706  000006                ADD     #6,SP
3820 022430                          10$:
3821 022430  005037  003062                CLR     NODEV
3822 022434  013701  002154                MOV     CSRADDR,R1      ;ADDRESS OF FIRST REGISTER
3823 022440  010102                        MOV     R1,R2           ;START OF REGISTERS
3824 022442  062702  000000                ADD     #TSSR,R2        ;ADDRESS OF TSSR REGISTER
3825 022446  004737  017276                JSR     PC,XNXM         ;TEST BOTH CONTROLLER REGISTERS...
3826 022452  103005                        BCC     2$              ;...AND BR IF ALL OK.
3827 022454  010137  003062                MOV     R1,NODEV        ;FLAG DEVICE AS NON-EXISTENT
3828 022460  012737  177777  003060        MOV     #-1,DUFLG       ;DROP THIS UNIT.
3829 022466                          2$:
3830                                 ;
3831                                 ;FINALLY, SET CPU PRIORITY AND WE'RE DONE.
3832                                 ;
3833 022466                          5$:     SETPRI  #PRI00          ;ENABLE INTERRUPTS.
     022466  012700  000000                MOV     #PRI00,R0
     022472  104441                        TRAP    C$SPRI
3834 022474                                ENDINIT
     022474                          L10030:
     022474  104411                        TRAP    C$INIT
3835
3836 022476     045     116     045  PUNIT:  .ASCIZ  /%N%N%A****** TESTING UNIT %D2%A ******/
3837                                        .EVEN
```

```
3839                                            .SBTTL  ADD AND DROP UNITS SECTIONS
3840
3841                                    ;**
3842                                    ; THE ADD-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
3843                                    ; TO BE (A) ADDED TO THE TEST LIST FOR THE FIRST TIME,
3844                                    ;    OR (B) RE-INSERTED IF IT HAD BEEN PREVIOUSLY DROPPED.
3845                                    ;--
3846 022544                                     BGNAU
     022544                             L$AU::
3847 022544  010001                             MOV     R0,R1           ; GET UNIT TO BE ADDED (R0)
3848 022546  006301                             ASL     R1              ; MAKE IT A WORD INDEX
3849 022550  052761  100000  003130             BIS     #100000,ERTABL(R1) ; SET THE "ACTIVE" BIT
3850 022556  042761  040000  003130             BIC     #40000,ERTABL(R1)  ; CLEAR THE "DROPPED" BIT
3851 022564                                     PRINTF  #1$,R0
     022564  010046                             MOV     R0,-(SP)
     022566  012746  022612                     MOV     #1$,-(SP)
     022572  012746  000002                     MOV     #2,-(SP)
     022576  010600                             MOV     SP,R0
     022600  104417                             TRAP    C$PNTF
     022602  062706  000006                     ADD     #6,SP
3852 022606                                     EXIT    AU
     022606  000167                             .WORD   J$JMP
     022610  000026                             .WORD   L10031-2-.
3853 022612     045      116      045   1$:     .ASCIZ  /%N%A  UNIT %D%A ADDED/
3854                                            .EVEN
3855
3856 022640                                     ENDAU                   ; UNUSED.
     022640                             L10031:
     022640  104452                             TRAP    C$AU
3857                                    ;**
3858                                    ; THE DROP-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
3859                                    ; TO BE REMOVED FROM THE TEST LIST.
3860                                    ;
3861                                    ; SUPVSR DOES THE "DROPPING".  THIS IS JUST TO TELL THE MAN.
3862                                    ; "DROPPED" UNITS ARE RE-SELECTED ON OPERATOR "STA" OR "ADD"
3863                                    ; COMMAND, OTHERWISE REMAIN INACTIVE.  THE "DISPLAY" COMMAND
3864                                    ; WILL PRINT ALL DROPPED UNITS, AND THE P-TABLES OF THOSE
3865                                    ; WHICH ARE STILL ACTIVE.
3866                                    ; UPON ENTRY, R0 CONTAINS THE UNIT TO BE DROPPED.
3867
3868 022642                                     BGNDU
     022642                             L$DU::
3869 022642  012737  177777  003060             MOV     #-1,DUFLG
3870 022650  010001                             MOV     R0,R1
3871 022652  006301                             ASL     R1
3872 022654  052761  140000  003130             BIS     #140000,ERTABL(R1)      ; SAY DROPPED
3873 022662  000240  000240  000240             240,240,240                     ; ?????????
3874 022670                                     PRINTF  #1$,R0
     022670  010046                             MOV     R0,-(SP)
     022672  012746  022716                     MOV     #1$,-(SP)
     022676  012746  000002                     MOV     #2,-(SP)
     022702  010600                             MOV     SP,R0
     022704  104417                             TRAP    C$PNTF
     022706  062706  000006                     ADD     #6,SP
3875 022712                                     EXIT    DU
     022712  000167                             .WORD   J$JMP
     022714  000030                             .WORD   L10032-2-.
```

```
3876 022716     045     116     045 1$:     .ASCIZ  /%N%A  UNIT %D%A DROPPED/
3877                                         .EVEN
3878 022746                                  ENDDU
     022746                             L10032:
     022746  104453                         TRAP    C$DU
3879                                       ;++
3880                                       ; AUTO-DROP CODE SECTION.
3881                                       ;--
3882 022750                                  BGNAUTO
     022750                             L$AUTO::
3883 022750  012703  000550                 MOV     #360.,R3        ;ENOUGH TIME FOR 2400' REEL TO REWIND
3884 022754  004737  017120           10$:  JSR     PC,WAITF        ;WAIT FOR SSR TO SET
3885 022760  103420                         BCS     20$             ;LEAVE WHEN SSR IS SET
3886 022762                                  DELAY   250.            ;WAIT FOR .25 SECONDS
     022762  012727  000372                 MOV     #250.,(PC)+
     022766  000000                         .WORD   0
     022770  013727  002116                 MOV     L$DLY,(PC)+
     022774  000000                         .WORD   0
     022776  005367  177772                 DEC     -6(PC)
     023002  001375                         BNE     .-4
     023004  005367  177756                 DEC     -22(PC)
     023010  001367                         BNE     .-20
3887 023012  005303                         DEC     R3              ;BUMP COUNTER DOWN
3888 023014  001357                         BNE     10$             ;KEEP GOING
3889 023016  004737  020154                 JSR     PC,CKDROP       ;TRY AND DROP UNIT
3890 023022                            20$:
3891 023022                                  ENDAUTO                 ; UNUSED.
     023022                             L10033:
     023022  104461                         TRAP    C$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.
                                ;--
023024                                  BGNCLN
023024                          L$CLEAN::
023024  005737  003060                  TST     DUFLG           ;"DROPPED" FLAG IS SET ON...
023030  100407                          BMI     1$              ;...AND GROSS CONTROLLER FAULT...
                                                                ;...DON'T TRY TO XCT CLEANUP CODE.

023032  013705  002154                  MOV     CSRADDR,R5      ; ADDRESS OF TSV REGISTERS ON UNIBUS
023036  012765  000000  000000          MOV     #0,TSSR(R5)     ;DO SOFT INIT
023044  004737  017120                  JSR     PC,WAITF
023050                          1$:
023050                          2$:     ENDCLN
023050                          L10034:
023050  104412                          TRAP    C$CLEAN

                                ;**
                                ; THE REPORT CODING SECTION CONTAINS THE
                                ; "PRINTS" CALLS THAT GENERATE STATISTICAL REPORTS.
                                ;--
023052                                  BGNRPT
023052                          L$RPT::
023052                                  PRINTS  #DEVSUM
023052  012746  023314                  MOV     #DEVSUM,-(SP)
023056  012746  000001                  MOV     #1,-(SP)
023062  010600                          MOV     SP,R0
023064  104416                          TRAP    C$PNTS
023066  062706  000004                  ADD     #4,SP
023072  010246                          MOV     R2,-(SP)
023074  010346                          MOV     R3,-(SP)
023076  010446                          MOV     R4,-(SP)
023100  012704  003130                  MOV     #ERTABL,R4      ; GET START OF ERROR TABLE.
023104  005003                          CLR     R3              ; CLEAR UNIT NUMBER
023106  011402                  1$:     MOV     (R4),R2         ; GET ERROR TABLE ENTRY & TEST IT.
023110  001467                          BEQ     4$              ; ZERO IF UNIT NOT RUN
023112  100066                          BPL     4$
023114  032702  040000                  BIT     #BIT14,R2       ; WAS UNIT DROPPED?
023120  001015                          BNE     2$              ; BR IF YES
023122  042702  170000                  BIC     #^C7777,R2      ; GET ERROR COUNT FIELD
023126                                  PRINTS  #DEVONL,R3,R2   ; PRINT
023126  010246                          MOV     R2,-(SP)
023130  010346                          MOV     R3,-(SP)
023132  012746  023351                  MOV     #DEVONL,-(SP)
023136  012746  000003                  MOV     #3,-(SP)
023142  010600                          MOV     SP,R0
023144  104416                          TRAP    C$PNTS
023146  062706  000010                  ADD     #10,SP
023152  000446                          BR      4$
023154  020227  160000          2$:     CMP     R2,#160000      ; WAS UNIT NON-EXISTENT?
023160  001012                          BNE     3$              ; BR IF NO
023162                                  PRINTS  #DEVNXR,R3
023162  010346                          MOV     R3,-(SP)
023164  012746  023421                  MOV     #DEVNXR,-(SP)
```

```
                023170  012746  000002                  MOV     #2,-(SP)
                023174  010600                          MOV     SP,R0
                023176  104416                          TRAP    C$PNTS
                023200  062706  000006                  ADD     #6,SP
        3932    023204  000431                          BR      4$
        3933    023206  020227  160001          3$:     CMP     R2,#160001      ; WAS UNIT NOT READY AT STARTUP?
        3934    023212  001012                          BNE     30$             ; BR IF NO.
        3935    023214                                  PRINTS  #DEVNRD,R3
                023214  010346                          MOV     R3,-(SP)
                023216  012746  023503                  MOV     #DEVNRD,-(SP)
                023222  012746  000002                  MOV     #2,-(SP)
                023226  010600                          MOV     SP,R0
                023230  104416                          TRAP    C$PNTS
                023232  062706  000006                  ADD     #6,SP
        3936    023236  000414                          BR      4$
        3937    023240  042702  170000          30$:    BIC     #^C7777,R2
        3938    023244                                  PRINTS  #DEVDRO,R3,R2
                023244  010246                          MOV     R2,-(SP)
                023246  010346                          MOV     R3,-(SP)
                023250  012746  023564                  MOV     #DEVDRO,-(SP)
                023254  012746  000003                  MOV     #3,-(SP)
                023260  010600                          MOV     SP,R0
                023262  104416                          TRAP    C$PNTS
                023264  062706  000010                  ADD     #10,SP
        3939    023270  062704  000002          4$:     ADD     #2,R4
        3940    023274  005203                          INC     R3
        3941    023276  020427  003330                  CMP     R4,#ERTABE
        3942    023302  103701                          BLO     1$
        3943    023304  012604                          MOV     (SP)+,R4
        3944    023306  012603                          MOV     (SP)+,R3
        3945    023310  012602                          MOV     (SP)+,R2
        3946    023312                                  ENDRPT                  ; UNUSED.
                023312                          L10035:
                023312  104425                          TRAP    C$RPT
        3947
        3948
        3949    023314      045     116     045 DEVSUM: .ASCIZ   /%N%ADEVICE STATUS SUMMARY:%N/
        3950    023351      045     101     040 DEVONL: .ASCIZ   /%A  UNIT %D3%A    ONLINE,  ERRORS = %D%N/
        3951    023421      045     101     040 DEVNXR: .ASCIZ   /%A  UNIT %D3%A    DROPPED, NON-EXISTENT REGISTER%N/
        3952    023503      045     101     040 DEVNRD: .ASCIZ   /%A  UNIT %D3%A    DROPPED, NOT READY AT STARTUP%N/
        3953    023564      045     101     040 DEVDRO: .ASCIZ   /%A  UNIT %D3%A    DROPPED, ERRORS = %D%N/
        3954                                    .EVEN
        3957
        3958
        3959
        3966
        3972
        3980
```

```
                                        .SBTTL  TEST  1: INITIALIZE #2 TEST
                                ;+
                                ;
                                ;THIS TEST VERIFIES THAT WRITING INTO THE TSSR RETURNS THE
                                ;CONTROLLER TO ITS INITIALIZED STATE FROM VARIOUS CONDITIONS
                                ;
                                ;-
023634                                  BGNTST
023634                                                                          T1::
023634  005037  002170                    CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
023640  005037  003100                    CLR     KTFLG           ;HOLD OFF KT11
023644  012737  005762  002146            MOV     #EPRT1,EPRTSW           ;SET UP PRIMARY ERROR MESSAGE

                                ;
                                ;
                                ;TEST 1
                                ;
                                ;
                                ;-

023652  004737  017054                    JSR     PC,DSBINT               ;DISABLE INTERRUPTS
023656  012700  024516                    MOV     #TST21ID,R0             ;ASCII MESSAGE TO IDENTIFY TEST
023662  004737  017410                    JSR     PC,TSTSETUP             ;DO INITIAL TEST SETUP
023666  012737  000002  002164            MOV     #2,LOOPCNT              ;PERFORM 2 ITERATIONS
023674                          T21LOOP:
023674  004737  024540                    JSR     PC,T21REST              ;SET COMMAND PACKET
023700  004737  024630                    JSR     PC,T21RT2               ;SET UP OTHER COMMAND PACKET

                                ;*************************************************************************
                                ;
                                ;ISSUE CONTROLLER "SOFT" INITIALIZE - CARRY BIT CLEAR IF ERROR
                                ;
                                ;*************************************************************************

023704  012737  176750  024276            MOV     #65000.,T21DLY          ;SET DELAY ROUTINE
023712  004737  016644          11$:      JSR     PC,SOFINIT              ;DO INITIALIZE ON CONTROLLER
023716  103426                            BCS     20$                     ;BR IF INIT WAS OK
023720                                    DELAY   250                     ;DELAY FOR A REWIND TO FINISH
023720  012727  000250                                                            MOV     #250.,(PC)+
023724  000000                                                                    .WORD   0
023726  013727  002116                                                            MOV     L$DLY,(PC)+
023732  000000                                                                    .WORD   0
023734  005367  177772                                                            DEC     -6(PC)
023740  001375                                                                    BNE     .-4
023742  005367  177756                                                            DEC     -22(PC)
023746  001367                                                                    BNE     .-20
023750  005337  024276                    DEC     T21DLY                  ;BUMP COUNTER DOWN
023754  001356                            BNE     11$                     ;BR, IF MORE TIME TO GO
023756  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
023762  010001                            MOV     R0,R1                   ;CONTENTS OF TSSR REGISTER
023764                                    ERRDF   ERRNO,SFIERR,SFIMSG     ;FATAL ERROR TSSR WAS NOT OK
023764  104455                                                                    TRAP    C$ERDF
023766  000145                                                                    .WORD   101
023770  003550                                                                    .WORD   SFIERR
023772  011666                                                                    .WORD   SFIMSG
023774                          20$:
023774  012704  024150                    MOV     #T21PACKET,R4           ;SUBROUTINE NEEDS PACKET ADDRESS
```

```
                                ;*****************************************************************
                                ;
                                ;WRITE CHARACTERISTICS COMMAND (CALL TO WRTCHR)
                                ;
                                ;*****************************************************************

024000  004737  010332                JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
024004  103407                        BCS     23$                     ;BR, IF COMMAND ISSUED OK
024006  004737  020102                JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
024012  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
024014                                ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
024014  104456                                                                TRAP    C$ERHRD
024016  000146                                                                .WORD   102
024020  004754                                                                .WORD   WRTMSG
024022  011666                                                                .WORD   SFIMSG
024024                          23$:
024024  012765  000000  000000        MOV     #0,TSSR(R5)             ;ISSUE A SOFT INITIALIZE
024032  004737  017120                JSR     PC,WAITF                ;WAIT FOR JUST THE SSR BIT TO SET
024036  016501  000000                MOV     TSSR(R5),R1             ;READ THE TSSR BACK
024042  005002                        CLR     R2                      ;SET UP EXPECTED CONTENTS IN R2
024044  032701  000100                BIT     #OFL,R1                 ;CHECK FOR OFF LINE SET (NOT ERROR)
024050  001402                        BEQ     24$                     ;BR, IF OFL IS NOT SET
024052  052702  000100                BIS     #OFL,R2                 ;IT WAS SET SO SET IN EXPECTED
024056  052702  002200          24$:  BIS     #SSR!NBA,R2             ;R2 HAS EXPECTED CONTENTS
024062  032701  000100                BIT     #OFL,R1                 ;IS OFF LINE BIT SET
024066  001012                        BNE     38$                     ;BR, IF DRIVE IS OFF LINE
024070  020102                35$:    CMP     R1,R2                   ;EXPECTED (R2) = RECEIVED (R1)
024072  001406                        BEQ     37$                     ;BR, IF THEY ARE EQUAL (OK)
024074  004737  020102                JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
024100                                ERRHRD  ERRNO,T21AM3,EXPREC     ;"ERROR TRYING TO INIT AFTER WRITE MISC.
024100  104456                                                                TRAP    C$ERHRD
024102  000147                                                                .WORD   103
024104  024375                                                                .WORD   T21AM3
024106  016344                                                                .WORD   EXPREC
024110                          37$:    CKLOOP                          ;LOOP IF SELECTED
024110  104406                                                                TRAP    C$CLP1
024112  000406                        BR      40$                     ;SKIP OVER OFF-LINE STUFF
024114                          38$:
024114                                ERRDF   ERRNO,T210FL,EXPREC     ;DRIVE IS OFF LINE
024114  104455                                                                TRAP    C$ERDF
024116  000150                                                                .WORD   104
024120  024475                                                                .WORD   T210FL
024122  016344                                                                .WORD   EXPREC
024124  004737  020154                JSR     PC,CKDROP               ;TRY AND DROP UNIT
024130  004737  017356          40$:  JSR     PC,TSTLOOP              ;DO WE NEED TO ITERATE TEST
024134  103002                        BCC     63$                     ;BR, IF NO LOOP REQUIRED
024136  000137  023674                JMP     T21LOOP                 ;EXECUTE AGAIN
024142                          63$:    EXIT    TST                     ;ALL DONE THIS TEST
024142  104432                                                                TRAP    C$EXIT
024144  000526                                                                .WORD   L10036-.
```

```
4080                                    ;*
4081                                    ;LOCAL STORAGE FOR THIS TEST
4082                                    ;-
4084 024146                                     .BLKB   10-<.-TUV2A&7>
4086 024150                             T21PACKET:                      ;COMMAND PACKET FOR TEST
4087 024150  100004                             .WORD   100004          ;WRITE CHARACTERISTICS COMMAND, WITH, ACK
4088 024152  024160                             .WORD   T21DATA         ;ADDRESS OF CHARACTERISTICS BLOCK
4089 024154  000000                             .WORD   0
4090 024156  000012                             .WORD   10.             ;STARTING VALUE OF BLOCK SIZE
4091 024160                             T21DATA:                        ;CHARACTERISTICS DATA BLOCK
4092 024160  024170                             .WORD   T21BFR          ;ADDRESS OF MESSAGE BUFFER
4093 024162  000000                             .WORD   0
4094 024164  000024                             .WORD   20.             ;LENGTH OF MESSAGE BUFFER
4095 024166  000000                             .WORD   0
4096 024170                             T21BFR: .BLKW   25.             ;MESSAGE BUFFER
4097                                    ;
4098                                    ;WRITE SUBSYSTEM MEMORY COMMAND PACKET
4099                                    ;
4101 024252                                     .BLKB   10-<.-TUV2A&7>
4103 024260                             T21PK2:
4104 024260  100206                             .WORD   100206          ;WRITE SUB SYS MEM COMMAND, IE AND ACK
4105 024262  024270                             .WORD   T21BF2          ;ADDRESS OF SELECT BLOCK DATA
4106 024264  000000                             .WORD   0
4107 024266  000006                             .WORD   6.              ;SIZE OF DATA PACKET
4108
4109                                            .EVEN
4110 024270                             T21BF2:
4111 024270     000                     T21BS0: .BYTE   0               ;BSELO AREA --- "COMMAND" BYTE
4112 024271     000                     T21BS1: .BYTE   0               ;BSEL1 AREA
4113 024272  000000                     T21S2:  .WORD   0               ;SEL 2 AREA
4114 024274  000000                     T21S3:  .WORD   0               ;DATA AREA
4115 024276  000000                     T21DLY: .WORD   0               ;DELAY COUNTER
4116
4117
4118
```

```
                                        ;*
                                        ;LOCAL TEXT MESSAGES FOR TEST
                                        ;-

024300  127  122  111  T21SSR: .ASCIZ  'WRITE MISCELLANEOUS CONTROL/READ STATUS Command Not Accepted'
024375  124  123  123  T21AM3: .ASCIZ  'TSSR Init. Failed After WRITE MISCELLANEOUS CONRTOL/READ STATUS'
024475  104  162  151  T21OFL: .ASCIZ  'Drive is OFFLINE'
024516  111  156  151  TST21ID:        .ASCIZ  'Initialization #2'
                                .EVEN
                                        ;*
                                        ;
                                        ;ROUTINE TO RESTORE COMMAND PACKET TO START-UP (DEFAULT) VALUES
                                        ;WRITE SUBSYSTEM MEMORY COMMAND
                                        ;
                                        ;-

024540                          T21REST:
024540                                  SAVREG                          ;SAVE THE REGISTERS
024544  012701  024130                  MOV     #T21PACKET,R1           ;START OF THE PACKET
024550  012721  100004                  MOV     #100004,(R1)+           ;WRITE SUBSYSTEM MEM. WITH ACK.
024554  012721  024160                  MOV     #T21DATA,(R1)+          ;ADDRESS OF CHARAISTICS DATA BLOCK
024560  005021                          CLR     (R1)+                   ;EXTENDED ADDRESS
024562  012721  000010                  MOV     #8.,(R1)+               ;SIZE OF DATA BLOCK IN BYTES
024566  012721  024170                  MOV     #T21BFR,(R1)+           ;ADDRESS OF MESSAGE BUFFER
024572  005021                          CLR     (R1)+
024574  012721  000024                  MOV     #20.,(R1)+              ;LENGTH OF MESSAGE BUFFER
024600  005021                          CLR     (R1)+
024602  005011                          CLR     (R1)
024604  012702  000020                  MOV     #20,R2                  ;NUMBER OF LOCATIONS TO BE CLEARED
024610  012762  177777  024170  64$:    MOV     #177777,T21BFR(R2)      ;ALL ONES TO MESSAGE BUFFER
024616  005742                          TST     -(R2)                   ;NEXT LOCATION
024620  020227  000000                  CMP     R2,#0                   ;CHECK R2 FOR ZERO
024624  001371                          BNE     64$                     ;BR, IF NOT AT ZERO YET
024626  000207                          RTS     PC                      ;RETURN

024630                          T21RT2:
024630                                  SAVREG                          ;SAVE THE REGISTERS
024634  012701  024260                  MOV     #T21PK2,R1              ;START OF THE PACKET
024640  012721  100206                  MOV     #100206,(R1)+           ;WRITE SUBSYSTEM MEM. WITH ACK, IE
024644  012721  024270                  MOV     #T21BF2,(R1)+           ;ADDRESS OF DATA BLOCK
024650  005021                          CLR     (R1)+                   ;EXTENDED ADDRESS
024652  012721  000006                  MOV     #6.,(R1)+               ;SIZE OF DATA BLOCK IN BYTES
024656  005021                          CLR     (R1)+
024660  012701  024270                  MOV     #T21BF2,R1              ;ADDRESS OF DATA FOR WRT SUB SYS MEM
024664  005021                          CLR     (R1)+
024666  005011                          CLR     (R1)
024670  000207                          RTS     PC                      ;RETURN
024672                                  ENDTST
024672                                                          L10036:
024672  104401                                                          TRAP    C$ETST
```

```
4171                                            .SBTTL  TEST  2: OFF-LINE AND REJECT REWIND
4172                                    ;*
4173                                    ;
4174                                    ;THIS TEST VERIFIES BASIC TAPE-MOTION COMMAND DECODING AND BASIC
4175                                    ;OPERATION OF THE REWIND POSITIONING COMMAND. IT DOES NOT
4176                                    ;NECESSARILY DEMONSTRATE THAT THE TRANSPORT CAN BE REWOUND FROM AN
4177                                    ;ARBITRARY POSITION ON THE TAPE. SUBSEQUENT TESTS IMPLICITLY
4178                                    ;CHECK THE OPERATION OF THE REWIND COMMAND SINCE THEY MUST
4179                                    ;TYPICALLY REWIND THE TAPE IN THE NORMAL COURSE OF THEIR TEST
4180                                    ;SEQUENCES. THE TEST CONSISTS OF THE FOLLOWING ONE SUBTEST
4181                                    ;
4182                                    ;
4183                                    ;-
4184 024674                                     BGNTST
     024674                                                                             T2::
4185 024674   005037   002170                   CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
4186 024700   005037   003100                   CLR     KTFLG           ;HOLD OFF KT11
4187 024704   012737   005762   002146          MOV     #EPRT1,EPRTSW           ;SET UP PRIMARY ERROR MESSAGE
4192 024712   004737   017054                   JSR     PC,DSBINT               ;DISABLE INTERRUPTS
4193 024716   012700   026032                   MOV     #TST22ID,R0             ;ASCII MESSAGE TO IDENTIFY TEST
4194 024722   004737   017410                   JSR     PC,TSTSETUP             ;DO INITIAL TEST SETUP
4195 024726   012737   000002   002164          MOV     #2,LOOPCNT              ;PERFORM 2 ITERATIONS
4196                                    ;*
4197                                    ;
```

```
4199 024734                          T22LOOP:
4200                                 ;*
4201                                 ;
4202                                 ;TEST 2, SUBTEST 1
4203                                 ;
4204                                 ;VERIFIES THAT A REWIND COMMAND WITH CVC=1 CLEARS VCK
4205                                 ;AND RETURNS PROPER STATUS IN THE MESSAGE BUFFER.
4206                                 ;
4207                                 ;
4208                                 ;-
4209 024734                                 BGNSUB                          ;>>>>>>>>>>>>> BEGIN SUBTEST >>>>>>>>>>>>>
      024734                                                                                    T2.1:
      024734  104402                                                                                TRAP    C$BSUB
4210 024736  004737  026066                JSR     PC,T22REST              ;SET COMMAND PACKET
4211 024742  004737  026160                JSR     PC,T22RT2               ;SET UP OTHER COMMAND PACKET
4212
4213                                 ;*****************************************************************
4214                                 ;
4215                                 ;ISSUE CONTROLLER "SOFT" INITIALIZE - CARRY BIT CLEAR IF ERROR
4216                                 ;
4217                                 ;*****************************************************************
4218
4219 024746  004737  016644                JSR     PC,SOFINIT              ;DO INITIALIZE ON CONTROLLER
4220 024752  103407                       BCS     20$                     ;BR IF INIT WAS OK
4221 024754  004737  020102                JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
4225 024760  010001                       MOV     R0,R1                   ;CONTENTS OF TSSR REGISTER
4226 024762                               ERRDF   ERRNO,SFIERR,SFIMSG     ;FATAL ERROR TSSR WAS NOT OK
      024762  104455                                                                            TRAP    C$ERDF
      024764  000311                                                                            .WORD   201
      024766  003550                                                                            .WORD   SFIERR
      024770  011666                                                                            .WORD   SFIMSG
4227 024772                          20$:
4228 024772  012704  025200                MOV     #T22PACKET,R4           ;SUBROUTINE NEEDS PACKET ADDRESS
4229
4230                                 ;*****************************************************************
4231                                 ;
4232                                 ;WRITE CHARACTERISTICS COMMAND (CALL TO WRTCHR)
4233                                 ;
4234                                 ;*****************************************************************
4235
4236 024776  004737  010332                JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
4237 025002  103407                       BCS     65$                     ;BR, IF COMMAND ISSUED OK
4238 025004  004737  020102                JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
4242 025010  010001                       MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4243 025012                               ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
      025012  104456                                                                            TRAP    C$ERHRD
      025014  000312                                                                            .WORD   202
      025016  004754                                                                            .WORD   WRTMSG
      025020  011666                                                                            .WORD   SFIMSG
4244 025022  012737  142010  025310  65$:  MOV     #142010,T22PK2          ;POSITION COMMAND (REWIND MODE) CVC=1
4245 025030  012704  025310                MOV     #T22PK2,R4              ;R4 = POINTER TO PACKET
4246 025034  010465  177776                MOV     R4,TSDB(R5)             ;ISSUE COMMAND
4247 025040  004737  017120                JSR     PC,WAITF                ;WAIT FOR SSR TO SET
4248 025044  016501  000000                MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
4249 025050  012702  000200                MOV     #SSR,R2                 ;SET UP EXPECTED
4250 025054  020102                       CMP     R1,R2                   ;ARE THEY EQUAL
4251 025056  001406                       BEQ     80$                     ;BR, IF OK ESP. FUNCTION REJECT
```

```
4252 025060  004737  020102                JSR     PC,FATCHK                ;INC AND CHECK FOR MORE THAN 25 ERRORS
4256 025064                                ERRHRD  ERRNO,T22RWJ,EXPREC      ;TSSR INCORRECT AFTER TAPE MOTION CMD
     025064  104456                                                                TRAP    C$ERHRD
     025066  000313                                                                .WORD   203
     025070  025704                                                                .WORD   T22RWJ
     025072  016344                                                                .WORD   EXPREC
4257 025074                          80$:   CKLOOP                           ;LOOP IF SELECTED
     025074  104406                                                                TRAP    C$CLP1
4258 025076  012703  025222                MOV     #T22BFR,R3               ;POINTER TO MESSAGE BUFFER
4259 025102  016301  000006                MOV     XSTO(R3),R1              ;PICK UP XSTO FROM MESSAGE BUFFER
4260 025106  010102                        MOV     R1,R2                    ;SET UP EXPECTED
4261 025110  042702  000020                BIC     #BIT4,R2                 ;VCK SHOULD BE CLEAR
4262 025114  020102                        CMP     R1,R2                    ;ARE THEY EQUAL
4263 025116  001406                        BEQ     90$                      ;BR, IF OK (GOOD)
4264 025120  004737  020102                JSR     PC,FATCHK                ;INC AND CHECK FOR MORE THAN 25 ERRORS
4268 025124                                ERRHRD  ERRNO,T22VCK,EXPREC      ;VCK WASN'T CLEAR (BAD)
     025124  104456                                                                TRAP    C$ERHRD
     025126  000314                                                                .WORD   204
     025130  025757                                                                .WORD   T22VCK
     025132  016344                                                                .WORD   EXPREC
4269 025134                          90$:
4270 025134                                ENDSUB                           ;>>>>>>>>>>>>> END SUBTEST >>>>>>>>>>>>>
     025134                                                                     L10040:
     025134  104403                                                                TRAP    C$ESUB
4271 025136  023727  002170  000031        CMP     FATFLG,#25.                      ;IS ERROR COUNT AT 25
4272 025144  002402                        BLT     999$                             ;BR, IF LESS THAN 25
4273 025146  004737  020154                JSR     PC,CKDROP                        ;TRY TO DROP THE UNIT
4274 025152                          999$:
4275 025152  004737  017356                JSR     PC,TSTLOOP               ;DO WE NEED TO ITERATE TEST
4276 025156  103002                        BCC     163$                     ;BR, IF NO LOOP REQUIRED
4277 025160  000137  024734                JMP     T22LOOP                  ;EXECUTE AGAIN
4278 025164                          163$:  EXIT    TST                      ;ALL DONE THIS TEST
     025164  104432                                                                TRAP    C$EXIT
     025166  001036                                                                .WORD   L10037-.
```

```
4280                                    ;*
4281                                    ;LOCAL STORAGE FOR THIS TEST
4282                                    ;-
4284 025170                                     .BLKB   10-<.-TUV2A&7>
4286 025200                             T22PACKET:
4287 025200  100204                             .WORD   100204          ;COMMAND PACKET FOR TEST
4288 025202  025210                             .WORD   T22DATA         ;WRITE CHARACTERISTICS COMMAND, WITH IE, ACK
4289 025204  000000                             .WORD   0               ;ADDRESS OF CHARACTERISTICS BLOCK
4290 025206  000012                             .WORD   10.             ;STARTING VALUE OF BLOCK SIZE
4291 025210                             T22DATA:                        ;CHARACTERISTICS DATA BLOCK
4292 025210  025222                             .WORD   T22BFR          ;ADDRESS OF MESSAGE BUFFER
4293 025212  000000                             .WORD   0
4294 025214  000024                             .WORD   20.             ;LENGTH OF MESSAGE BUFFER
4295 025216  000000                             .WORD   0
4296 025220  000007                             .WORD   7               ;SELECT DRIVE 7
4297 025222                             T22BFR: .BLKW   25.             ;MESSAGE BUFFER
4298                                    ;
4299                                    ;WRITE SUBSYSTEM MEMORY COMMAND PACKET
4300                                    ;
4302 025304                                     .BLKB   10-<.-TUV2A&7>
4304 025310                             T22PK2:
4305 025310  100206                             .WORD   100206          ;WRITE SUB SYS MEM COMMAND, IE AND ACK
4306 025312  025320                             .WORD   T22BF2          ;ADDRESS OF SELECT BLOCK DATA
4307 025314  000000                             .WORD   0
4308 025316  000006                             .WORD   6.              ;SIZE OF DATA PACKET
4309
4310                                            .EVEN
4311 025320                             T22BF2:
4312 025320     000                     T22BS0: .BYTE   0               ;BSEL0 AREA
4313 025321     000                     T22BS1: .BYTE   0               ;BSEL1 AREA
4314 025322  000000                     T22S2:  .WORD   0               ;SEL 2 AREA
4315 025324  000000                     T22S3:  .WORD   0               ;DATA AREA
4316                                    ;
4317                                    ;
4318                                            .EVEN
4319                                    ;TAPE MOTION PACKET COMMAND VALUES
4320 025326  100201                     T22RD:  .WORD   100201          ;READ TAPE FORWARD
4321 025330  100205                     T22WRT: .WORD   100205          ;WRITE TAPE FORWARD
4322 025332  100210                     T22POS: .WORD   100210          ;POSITION TAPE
4323 025334  100211                     T22FOR: .WORD   100211          ;FORMAT TAPE
4324 025336  177777                             .WORD   177777          ;END OF DATA
4325
4326
```

```
4328
4329                                    ;+
4330                                    ;LOCAL TEXT MESSAGES FOR TEST
4331                                    ;-
4332
4333 025340  127  122  111  T22SSR: .ASCIZ  'WRITE MISCELLANEOUS CONTROL/READ STATUS Command Not Accepted'
4334 025435  124  123  123  T22AM3: .ASCIZ  'TSSR Init. Failed After WRITE MISCELLANEOUS CONRTOL/READ STATUS'
4335 025535  104  162  151  T22OFL: .ASCIZ  'Drive 7 Select Failed To Set "OFL" In TSSR'
4336 025610  124  123  123  T22TM:  .ASCIZ  'TSSR Incorrect After Tape Motion Command To Off-Line Device'
4337 025704  124  123  123  T22RWJ: .ASCIZ  'TSSR Not Correct After REWIND With VCK Set'
4338 025757  103  126  103  T22VCK: .ASCIZ  'CVC Set, Didn''t Reset VCK In Message Buffer'
4339 026032  117  146  146  TST22ID:        .ASCIZ  'Off-Line And Reject Rewind'
4340                                            .EVEN
4341                                    ;+
4342                                    ;
4343                                    ;ROUTINE TO RESTORE COMMAND PACKET TO START-UP (DEFAULT) VALUES
4344                                    ;WRITE SUBSYSTEM MEMORY COMMAND
4345                                    ;
4346                                    ;-
4347
4348 026066                              T22REST:
4349 026066                                      SAVREG                          ;SAVE THE REGISTERS
4350 026072  012701  025200                       MOV     #T22PACKET,R1           ;START OF THE PACKET
4351 026076  012721  100204                       MOV     #100204,(R1)+           ;WRITE SUBSYSTEM MEM. WITH ACK, IE
4352 026102  012721  025210                       MOV     #T22DATA,(R1)+          ;ADDRESS OF CHARAISTICS DATA BLOCK
4353 026106  005021                               CLR     (R1)+                   ;EXTENDED ADDRESS
4354 026110  012721  000012                       MOV     #10.,(R1)+              ;SIZE OF DATA BLOCK IN BYTES
4355 026114  012721  025222                       MOV     #T22BFR,(R1)+           ;ADDRESS OF MESSAGE BUFFER
4356 026120  005021                               CLR     (R1)+
4357 026122  012721  000024                       MOV     #20.,(R1)+              ;LENGTH OF MESSAGE BUFFER
4358 026126  005021                               CLR     (R1)+
4359 026130  012711  000007                       MOV     #7,(R1)                 ;SELECT DRIVE SEVEN
4360 026134  012702  000020                       MOV     #20,R2                  ;NUMBER OF LOCATIONS TO BE CLEARED
4361 026140  012762  177777  025222  64$:        MOV     #177777,T22BFR(R2)      ;ALL ONES TO MESSAGE BUFFER
4362 026146  005742                               TST     -(R2)                   ;BUMP R2 DOWN
4363 026150  020227  000000                       CMP     R2,#0                   ;IS R2 AT ZERO YET
4364 026154  001371                               BNE     64$                     ;KEEP GOING UNTIL DONE
4365 026156  000207                               RTS     PC                      ;RETURN
4366
4367
4368 026160                              T22RT2:
4369 026160                                      SAVREG                          ;SAVE THE REGISTERS
4370 026164  012701  025310                       MOV     #T22PK2,R1              ;START OF THE PACKET
4371 026170  012721  100206                       MOV     #100206,(R1)+           ;WRITE SUBSYSTEM MEM. WITH ACK, IE
4372 026174  012721  025320                       MOV     #T22BF2,(R1)+           ;ADDRESS OF DATA BLOCK
4373 026200  005021                               CLR     (R1)+                   ;EXTENDED ADDRESS
4374 026202  012721  000006                       MOV     #6.,(R1)+               ;SIZE OF DATA BLOCK IN BYTES
4375 026206  005021                               CLR     (R1)+
4376 026210  012701  025320                       MOV     #T22BF2,R1              ;POINT TO DATA SEL AREA
4377 026214  005021                               CLR     (R1)+
4378 026216  005011                               CLR     (R1)
4379 026220  005011                               CLR     (R1)                    ;LAST LOC TO BE CLEARED
4380 026222  000207                               RTS     PC                      ;RETURN
4381 026224                                      ENDTST
     026224                                                          L10037:
     026224  104401                                                          TRAP    C$ETST
```

```
                                        .SBTTL  TEST  3: BASIC WRITE
                                ;*
                                ;
                                ;THIS TEST VERIFIES THAT THE WRITE DATA (NEXT) COMMAND OPERATES
                                ;PROPERLY, UP TO THE POINT OF CHECKING THAT THE DATA WAS ACTUALLY
                                ;WRITTEN ONTO THE TAPE CORRECTLY. CHECKING IN THIS TEST IS
                                ;LIMITED TO VERIFYING THAT THE COMMAND TERMINATED CORRECTLY WITH
                                ;THE CORRECT REGISTER, MESSAGE BUFFER AND RAM CONTENTS.
                                ;
                                ;THE TEST CONSISTS OF THE FOLLOWING 5 SUBTESTS
                                ;
                                ;
                                ;
                                ;-
026226                                  BGNTST
026226                                                                  T3::
026226  005037  002170                    CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
026232  005037  003100                    CLR     KTFLG           ;HOLD OFF KT11
026236  012737  005762  002146            MOV     #EPRT1,EPRTSW           ;SET UP PRIMARY ERROR MESSAGE
026244  005037  003102                    CLR     KTENABLE                ;TURN OFF KT11
026250  004737  020246                    JSR     PC,KTOFF                ;TURN OFF KT11
026254  004737  017054                    JSR     PC,DSBINT               ;DISABLE INTERRUPTS
026260  012700  031761                    MOV     #TST23ID,R0             ;ASCII MESSAGE TO IDENTIFY TEST
026264  004737  017410                    JSR     PC,TSTSETUP             ;DO INITIAL TEST SETUP
026270  012737  000001  002164            MOV     #1,LOOPCNT              ;PERFORM 1 ITERATIONS
                                ;*
                                ;
```

```
4414 026276                          T23LOOP:
4415                                 ;*
4416                                 ;
4417                                 ;TEST 3, SUBTEST 1
4418                                 ;
4419                                 ;VERIFIES THAT WRITE DATA COMMANDS WITH CVC=1 AND THE
4420                                 ;SWAP BYTES (SWB) BIT CLEAR OPERATES PROPERLY. THE
4421                                 ;BYTE COUNT (RECORD SIZE) VARIES FROM 20 THROUGH 64K
4422                                 ;IN VARYING INCREMENTS (DEPENDING UPON WHETHER OR NOT
4423                                 ;THE DIAGNOSTIC IS RUNNING IN THE LONG VERIFICATION
4424                                 ;MODE). THE TAPE IS NOT REWOUND BETWEEN SUCCESSIVE
4425                                 ;RECORDS BUT IS REWOUND AFTER THE FINAL RECORD IS
4426                                 ;WRITTEN. AN INCREMENTING COUNT PATTERN IS SUPPLIED
4427                                 ;IN THE DATA BUFFER. AFTER EACH BLOCK IS WRITTEN, THE
4428                                 ;TSSR AND TSBA REGISTERS, AND THE MESSAGE BUFFER.
4429                                 ;
4430                                 ;
4431                                 ;
4432                                 ;-
4433 026276                                 BGNSUB                  ;>>>>>>>>>>>> BEGIN SUBTEST >>>>>>>>>>>>
      026276                                                                   T3.1:
      026276  104402                                                                TRAP    C$BSUB
4434 026300  013701  003074                 MOV     FRESIZ,R1       ;GET SIZE OF AVAILIABLE MEMORY
4435 026304  000241                         CLC                     ;CLEAR THE CARRY BIT
4436 026306  006101                         ROL     R1              ;MAKE INTO BYTES
4437 026310  010137  030520                 MOV     R1,T23RSZ       ;STORE IN TEST FOR USE LATER
4438 026314  004737  031776                 JSR     PC,T23REST      ;SET COMMAND PACKET
4439 026320  004737  032132                 JSR     PC,T23RT3       ;RESTORE PACKET
4440 026324  004737  032070                 JSR     PC,T23RT2       ;SET UP OTHER COMMAND PACKET
4441
4442                                 ;*****************************************************************
4443                                 ;
4444                                 ;ISSUE CONTROLLER "SOFT" INITIALIZE - CARRY BIT CLEAR IF ERROR
4445                                 ;
4446                                 ;*****************************************************************
4447
4448 026330  004737  016644                 JSR     PC,SOFINIT      ;DO INITIALIZE ON CONTROLLER
4449 026334  103407                         BCS     20$             ;BR IF INIT WAS OK
4450 026336  004737  020102                 JSR     PC,FATCHK       ;INC AND CHECK FOR MORE THAN 25 ERRORS
4454 026342  010001                         MOV     R0,R1           ;CONTENTS OF TSSR REGISTER
4455 026344                                 ERRDF   ERRNO.SFIERR,SFIMSG     ;FATAL ERROR TSSR WAS NOT OK
      026344  104455                                                                  TRAP    C$ERDF
      026346  000455                                                                  .WORD   301
      026350  003550                                                                  .WORD   SFIERR
      026352  011666                                                                  .WORD   SFIMSG
4456 026354                          20$:
4457 026354  012704  030360                 MOV     #T23PACKET,R4   ;SUBROUTINE NEEDS PACKET ADDRESS
4458
4459                                 ;*****************************************************************
4460                                 ;
4461                                 ;WRITE CHARACTERISTICS COMMAND (CALL TO WRTCHR)
4462                                 ;
4463                                 ;*****************************************************************
4464
4465 026360  004737  010332                 JSR     PC,WRTCHR       ;ISSUE WRITE CHARACTERISTICS
4466 026364  103407                         BCS     23$             ;BR, IF COMMAND ISSUED OK
4467 026366  004737  020102                 JSR     PC,FATCHK       ;INC AND CHECK FOR MORE THAN 25 ERRORS
```

```
4471 026372  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
4472 026374                                ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
     026374  104456                                                            TRAP    C$ERHRD
     026376  000456                                                            .WORD   302
     026400  004754                                                            .WORD   WRTMSG
     026402  011666                                                            .WORD   SFIMSG
4473 026404                         23$:   CKLOOP                          ;LOOP IF SELECTED
     026404  104406                                                            TRAP    C$CLP1
4474
4475                                ;*************************************************************************
4476                                ;
4477                                ;ISSUE REWIND COMMAND TO SELECTED TAPE DRIVE
4478                                ;
4479                                ;*************************************************************************
4480
4481 026406  004737  010434                JSR     PC,REWIND               ;CALL THE TAPE REWIND
4482 026412  012703  000024                MOV     #20.,R3                 ;STARTING RECORD SIZE
4483 026416  013737  003072  030512  65$:  MOV     FREE,T23WB              ;STARTING WRITE BUFFER ADDRESS
4484
4485                                ;*************************************************************************
4486                                ;
4487                                ;WRITE DATA,CVC=1,ACK COMMAND
4488                                ;
4489                                ;*************************************************************************
4490
4491 026424  012737  140005  030510        MOV     #140005,T23PK3          ;WRITE DATA,CVC=1,ACK COMMAND
4492 026432  012704  030510                MOV     #T23PK3,R4              ;SET UP R4 WITH PACKET ADDRESS
4493 026436  010300                        MOV     R3,R0                   ;SET PATTERN IN CORRECT REGISTER
4494 026440  004737  020374                JSR     PC,FILLMEM              ;FILL MEMORY WITH RECORD SIZE
4495 026444  010337  030516                MOV     R3,T23SZ                ;SET UP RECORD SIZE IN PACKET
4496 026450  010465  177776                MOV     R4,TSDB(R5)             ;ISSUE COMMAND
4497 026454  004737  017120                JSR     PC,WAITF                ;WAIT FOR SSR TO SET
4498 026460  016501  000000                MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
4499 026464  012702  000200                MOV     #SSR,R2                 ;SET UP EXPECTED
4500 026470  020102                        CMP     R1,R2                   ;ARE THEY EQUAL
4501 026472  001406                        BEQ     80$                     ;BR, IF OK
4502 026474  004737  020102                JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
4507 026500                                ERRHRD  ERRNO,WRTERR,PKTSSR     ;TSSR INCORRECT AFTER WRITE DATA
     026500  104456                                                            TRAP    C$ERHRD
     026502  000457                                                            .WORD   303
     026504  005011                                                            .WORD   WRTERR
     026506  011700                                                            .WORD   PKTSSR
4508 026510                         80$:   CKLOOP                          ;LOOP IF SELECTED
     026510  104406                                                            TRAP    C$CLP1
4509 026512  016501  177776                MOV     TSBA(R5),R1             ;GET TSBA CONTENTS
4510 026516  012702  030510                MOV     #T23PK3,R2              ;SET UP EXPECTED
4511 026522  020102                 85$:   CMP     R1,R2                   ;ARE THEY EQUAL
4512 026524  001406                        BEQ     90$                     ;BR, IF TSBA IS CORRECT
4513 026526  004737  020102                JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
4517 026532                                ERRHRD  ERRNO,T23BA,EXPREC      ;TSBA WAS NOT CORRECT AFTER WRITE DATA
     026532  104456                                                            TRAP    C$ERHRD
     026534  000460                                                            .WORD   304
     026536  031620                                                            .WORD   T23BA
     026540  016344                                                            .WORD   EXPREC
4518 026542                         90$:   CKLOOP                          ;LOOP IF SELECTED
     026542  104406                                                            TRAP    C$CLP1
4519 026544  062703  001750         115$:  ADD     #1000.,R3               ;NEXT RECORD SIZE/DATA PATTERN
```

```
4520 026550  020337  030520                CMP     R3,T23RSZ               ;IS R3 OVER MAX RECORD SIZE
4521 026554  002005                        BGE     120$                    ;IF RECORD SIZE IS TOO BIG QUIT
4522 026556  020327  177776                CMP     R3,#65534.              ;END OF SUBTEST MAX RECORD SIZE
4523 026562  001402                        BEQ     120$                    ;BR, IF COMPLETED
4524 026564  000137  026416                JMP     65$                     ;DO MORE RECORDS
4525 026570                          120$:
4526 026570  004737  032132                JSR     PC,T23RT3               ;RESTORE PACKET
4527 026574  004737  032070                JSR     PC,T23RT2               ;CLEAN UP PACKET
4528 026600  004737  010434                JSR     PC,REWIND               ;ISSUE REWIND COMMAND WITH WAIT
4529 026604  103407                        BCS     130$                    ;BR, IF TSSR IS OK (GOOD)
4530 026606  010001                        MOV     R0,R1                   ;SAVE TSSR CONTENTS
4531 026610  004737  020102                JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
4535 026614                                ERRHRD  ERRNO,T23RWN,PKTSSR     ;TSSR IS INCORRECT AFTER REWIND
     026614  104456                                                                TRAP    C$ERHRD
     026616  000461                                                                .WORD   305
     026620  031111                                                                .WORD   T23RWN
     026622  011700                                                                .WORD   PKTSSR
4536 026624                          130$:
4537 026624                                ENDSUB                          ;>>>>>>>>>>>>> END SUBTEST >>>>>>>>>>>>>
     026624                                                                     L10042:
     026624  104403                                                                TRAP    C$ESUB
4538 026626  023727  002170  000031        CMP     FATFLG,#25.                     ;IS ERROR COUNT AT 25
4539 026634  002402                        BLT     999$                            ;BR, IF LESS THAN 25
4540 026636  004737  020154                JSR     PC,CKDROP                       ;TRY TO DROP THE UNIT
4541 026642                          999$:
```

```
                                ;*
                                ;
                                ;TEST 3, SUBTEST 2
                                ;
                                ;VERIFIES THAT WRITE DATA COMMANDS WITH CVC=1 AND THE
                                ;SWAP BYTES (SWB) BIT SET OPERATES PROPERLY. THE TEST
                                ;SEQUENCE IS IDENTICAL TO THAT USED IN SUBTEST 2.
                                ;THE RESULTS, EXCEPT FOR RAM CONTENTS, SHOULD BE THE SAME.
                                ;
                                ;
                                ;
                                ;-
                                        BGNSUB                          ;>>>>>>>>>>>> BEGIN SUBTEST >>>>>>>>>>>>
                                                                                        T3.2:
026642  104402                                                                          TRAP    C$BSUB
026644  004737  031776                  JSR     PC,T23REST              ;SET COMMAND PACKET
026650  004737  032070                  JSR     PC,T23RT2               ;SET UP OTHER COMMAND PACKET

                                ;*************************************************************************
                                ;
                                ;ISSUE CONTROLLER "SOFT" INITIALIZE - CARRY BIT CLEAR IF ERROR
                                ;
                                ;*************************************************************************

026654  004737  016644                  JSR     PC,SOFINIT              ;DO INITIALIZE ON CONTROLLER
026660  103407                          BCS     20$                     ;BR IF INIT WAS OK
026662  004737  020102                  JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
026666  010001                          MOV     R0,R1                   ;CONTENTS OF TSSR REGISTER
026670                                  ERRDF   ERRNO,SFIERR,SFIMSG     ;FATAL ERROR TSSR WAS NOT OK
026670  104455                                                                  TRAP    C$ERDF
026672  000462                                                                  .WORD   306
026674  003550                                                                  .WORD   SFIERR
026676  011666                                                                  .WORD   SFIMSG
026700                          20$:
026700  012704  030360                  MOV     #T23PACKET,R4           ;SUBROUTINE NEEDS PACKET ADDRESS

                                ;*************************************************************************
                                ;
                                ;WRITE CHARACTERISTICS COMMAND (CALL TO WRTCHR)
                                ;
                                ;*************************************************************************

026704  004737  010332                  JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
026710  103407                          BCS     23$                     ;BR, IF COMMAND ISSUED OK
026712  004737  020102                  JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
026716  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
026720                                  ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
026720  104456                                                                  TRAP    C$ERHRD
026722  000463                                                                  .WORD   307
026724  004754                                                                  .WORD   WRTMSG
026726  011666                                                                  .WORD   SFIMSG
026730                          23$:
026730  012703  000024                  MOV     #20.,R3                 ;STARTING RECORD SIZE
026734  013737  003072  030512  65$:    MOV     FREE,T23WB              ;STARTING WRITE BUFFER ADDRESS

                                ;*************************************************************************
                                ;
```

```
 4596                                   ;WRITE DATA,CVC=1,ACK,SWB COMMAND
 4597                                   ;
 4598                                   ;*************************************************************************
 4599
 4600 026742  012737  150005  030510          MOV     #150005,T23PK3          ;WRITE DATA,CVC=1,ACK,SWB COMMAND
 4601 026750  012704  030510                  MOV     #T23PK3,R4              ;SET UP R4 WITH PACKET ADDRESS
 4602 026754  010300                          MOV     R3,R0                   ;SET PATTERN IN CORRECT REGISTER
 4603 026756  004737  020374                  JSR     PC,FILLMEM              ;FILL MEMORY WITH RECORD SIZE
 4604 026762  010337  030516                  MOV     R3,T23SZ                ;SET UP RECORD SIZE IN PACKET
 4605 026766  010465  177776                  MOV     R4,TSDB(R5)             ;ISSUE COMMAND
 4606 026772  004737  017120                  JSR     PC,WAITF                ;WAIT FOR SSR TO SET
 4607 026776  016501  000000                  MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
 4608 027002  012702  000200                  MOV     #SSR,R2                 ;SET UP EXPECTED
 4609 027006  020102                          CMP     R1,R2                   ;ARE THEY EQUAL
 4610 027010  001406                          BEQ     80$                     ;BR, IF OK
 4611 027012  004737  020102                  JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
 4615 027016                                  ERRHRD  ERRNO,WRTERR,PKTSSR     ;TSSR INCORRECT AFTER WRITE DATA
      027016  104456                                                                  TRAP    C$ERHRD
      027020  000464                                                                 .WORD   308
      027022  005011                                                                 .WORD   WRTERR
      027024  011700                                                                 .WORD   PKTSSR
 4616 027026                          80$:    CKLOOP                          ;LOOP IF SELECTED
      027026  104406                                                                  TRAP    C$CLP1
 4617 027030  016501  177776                  MOV     TSBA(R5),R1             ;GET TSBA CONTENTS
 4618 027034  012702  030510                  MOV     #T23PK3,R2              ;SET UP EXPECTED
 4619 027040  020102                  85$:    CMP     R1,R2                   ;ARE THEY EQUAL
 4620 027042  001406                          BEQ     90$                     ;BR, IF TSBA IS CORRECT
 4621 027044  004737  020102                  JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
 4625 027050                                  ERRHRD  ERRNO,T23BA,EXPREC      ;TSBA WAS NOT CORRECT AFTER WRITE DATA
      027050  104456                                                                  TRAP    C$ERHRD
      027052  000465                                                                 .WORD   309
      027054  031620                                                                 .WORD   T23BA
      027056  016344                                                                 .WORD   EXPREC
 4626 027060                          90$:    CKLOOP                          ;LOOP IF SELECTED
      027060  104406                                                                  TRAP    C$CLP1
 4627 027062  020327  007376                  CMP     R3,#7376                ;ONLY CHECK RAM UNTIL ITS FULL
 4628 027066  002057                          BGE     115$                    ;IT WRAPS AROUND ETC.
 4629 027070  004737  032070                  JSR     PC,T23RT2               ;MAKE SURE PACKET AND DATA ARE CLEAN
 4630 027074  012737  000400  030524          MOV     #256.,T23S2             ;STARTING RAM ADDRESS
 4631 027102  112737  000000  030522          MOVB    #0,T23BSO               ;STOP INTERNAL TUV05 DIAGNOSTICS
 4632 027110  112737  000000  030523          MOVB    #0,T23BS1               ;SIZE OF RAM READ
 4633 027116  012704  030470                  MOV     #T23PK2,R4              ;SET R4 WITH PACKET ADDRESS
 4634 027122  010465  177776                  MOV     R4,TSDB(R5)             ;ISSUE WRITE SUB SYS MEM COMMAND
 4635 027126  004737  017236                  JSR     PC,CHKTSSR              ;CHECK TSSR AND WAIT FOR SSR TO SET
 4636 027132  103407                          BCS     92$                     ;BR, IF NO ERRORS IN TSSR
 4637 027134  010001                          MOV     R0,R1                   ;SAVE TSSR
 4638 027136  004737  020102                  JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
 4642 027142                                  ERRHRD  ERRNO,T23WSS,PKTSSR     ;TSSR BAD AFTER WRITE SUB SYS MEM
      027142  104456                                                                  TRAP    C$ERHRD
      027144  000466                                                                 .WORD   310
      027146  031672                                                                 .WORD   T23WSS
      027150  011700                                                                 .WORD   PKTSSR
 4643 027152                          92$:    CKLOOP                          ;LOOP IF SELECTED
      027152  104406                                                                  TRAP    C$CLP1
 4644 027154  004737  032070                  JSR     PC,T23RT2               ;MAKE SURE PACKET AND DATA ARE CLEAN
 4645 027160  012737  000400  030524          MOV     #256.,T23S2             ;STARTING RAM ADDRESS
 4646 027166  112737  000001  030522          MOVB    #1,T23BSO               ;READ RAM COMMAND FOR WRITE SUB SYS M.
```

```
4647 027174  112737  000002  030523          MOVB    #2,T23BS1           ;SIZE OF RAM READ
4648 027202  012704  030470                  MOV     #T23PK2,R4          ;SET R4 WITH PACKET ADDRESS
4649 027206  010465  177776          95$:    MOV     R4,TSDB(R5)         ;ISSUE WRITE SUB SYS MEM CMD (READ RAM)
4650 027212  004737  017236                  JSR     PC,CHKTSSR          ;CHECK TSSR AND WAIT FOR SSR TO SET
4651 027216  103403                          BCS     115$                ;BR, IF NO ERRORS IN TSSR
4652 027220  010001                          MOV     R0,R1               ;SAVE TSSR
4653 027222  004737  020102                  JSR     PC,FATCHK           ;INC AND CHECK FOR MORE THAN 25 ERRORS
4657 027226  062703  001750          115$:   ADD     #1000.,R3           ;NEXT RECORD SIZE/DATA PATTERN
4658 027232  020337  030520                  CMP     R3,T23RSZ           ;IS R3 OVER MAX RECORD SIZE
4659 027236  002005                          BGE     120$                ;IF RECORD SIZE IS TOO BIG QUIT
4660 027240  020327  177776                  CMP     R3,#65534.          ;END OF SUBTEST MAX RECORD SIZE
4661 027244  001402                          BEQ     120$                ;BR, IF COMPLETED
4662 027246  000137  026734                  JMP     65$                 ;DO MORE RECORDS
4663 027252                          120$:
4664 027252  004737  032070                  JSR     PC,T23RT2           ;CLEAN UP PACKET
4665 027256  004737  010434                  JSR     PC,REWIND           ;ISSUE REWIND COMMAND WITH WAIT
4666 027262  103407                          BCS     130$                ;BR, IF TSSR IS OK (GOOD)
4667 027264  010001                          MOV     R0,R1               ;SAVE TSSR CONTENTS
4668 027266  004737  020102                  JSR     PC,FATCHK           ;INC AND CHECK FOR MORE THAN 25 ERRORS
4672 027272                                  ERRHRD  ERRNO,T23RWN,PKTSSR ;TSSR IS INCORRECT AFTER REWIND
     027272  104456                                                              TRAP    C$ERHRD
     027274  000470                                                              .WORD   312
     027276  031111                                                              .WORD   T23RWN
     027300  011700                                                              .WORD   PKTSSR
4673 027302                          130$:
4674 027302                                  ENDSUB                      ;>>>>>>>>>>>>> END SUBTEST >>>>>>>>>>>>>
     027302                                                                       L10043:
     027302  104403                                                              TRAP    C$ESUB
4675 027304  023727  002170  000031          CMP     FATFLG,#25.                 ;IS ERROR COUNT AT 25
4676 027312  002402                          BLT     999$                        ;BR, IF LESS THAN 25
4677 027314  004737  020154                  JSR     PC,CKDROP                   ;TRY TO DROP THE UNIT
4678 027320                          999$:
```

```
                                ;*
                                ;
                                ;TEST 3, SUBTEST 3
                                ;
                                ;VERIFIES THAT A WRITE COMMAND WITH AN ILLEGAL MODE
                                ;FIELD OR AN ILLEGAL BUFFER ADDRESS IS REJECTED WITH
                                ;THE PROPER ERROR STATUS AND THAT TAPE DOES NOT MOVE
                                ;
                                ;
                                ;-

                                        BGNSUB                          ;>>>>>>>>>>>>> BEGIN SUBTEST >>>>>>>>>>>>>
                                                                                        T3.3:
                                                                                                TRAP    C$BSUB
                                        JSR     PC,T23REST              ;SET COMMAND PACKET
                                        JSR     PC,T23RT3               ;RESTORE PACKET
                                        JSR     PC,T23RT2               ;SET UP OTHER COMMAND PACKET

                                ;*******************************************************************
                                ;
                                ;ISSUE CONTROLLER "SOFT" INITIALIZE - CARRY BIT CLEAR IF ERROR
                                ;
                                ;*******************************************************************

                                        JSR     PC,SOFINIT              ;DO INITIALIZE ON CONTROLLER
                                        BCS     20$                     ;BR IF INIT WAS OK
                                        JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
                                        MOV     R0,R1                   ;CONTENTS OF TSSR REGISTER
                                        ERRDF   ERRNO,SFIERR,SFIMSG     ;FATAL ERROR TSSR WAS NOT OK
                                                                                        TRAP    C$ERDF
                                                                                        .WORD   313
                                                                                        .WORD   SFIERR
                                                                                        .WORD   SFIMSG
                                20$:
                                        MOV     #T23PACKET,R4           ;SUBROUTINE NEEDS PACKET ADDRESS

                                ;*******************************************************************
                                ;
                                ;WRITE CHARACTERISTICS COMMAND (CALL TO WRTCHR)
                                ;
                                ;*******************************************************************

                                        JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
                                        BCS     23$                     ;BR, IF COMMAND ISSUED OK
                                        JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
                                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
                                        ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
                                                                                        TRAP    C$ERHRD
                                                                                        .WORD   314
                                                                                        .WORD   WRTMSG
                                                                                        .WORD   SFIMSG

                                ;*******************************************************************
                                ;
                                ;WRITE DATA, ACK, ILLEGAL BITS
                                ;
                                ;*******************************************************************
```

```
 4733
 4734 027412  012737  104405  030510  23$:    MOV     #104405,T23PK3          ;WRITE DATA, ACK, ILLEGAL BITS
 4735 027420  013737  003072  030512          MOV     FREE,T23WB              ;SET UP WRITE BUFFER ADDRESS
 4736 027426  062737  000001  030512          ADD     #1,T23WB                ;MAKE ADDRESS ODD (ILLEGAL)
 4737 027434  012737  000400  030516          MOV     #256.,T23SZ             ;SET UP BUFFER SIZE
 4738 027442  012704  030510                  MOV     #T23PK3,R4              ;R4 = POINTER TO PACKET
 4739 027446  010465  177776                  MOV     R4,TSDB(R5)             ;ISSUE COMMAND
 4740 027452  004737  017120                  JSR     PC,WAITF                ;WAIT FOR SSR TO SET
 4741 027456  016501  000000                  MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
 4742 027462  012702  100206                  MOV     #SSR!SC!BIT1!BIT2,R2    ;SET UP EXPECTED
 4743 027466  020102                          CMP     R1,R2                   ;ARE THEY EQUAL
 4744 027470  001406                          BEQ     80$                     ;BR, IF OK ESP. FUNCTION REJECT
 4745 027472  004737  020102                  JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
 4749 027476                                  ERRHRD  ERRNO,T23TM,PKTSSR      ;TSSR INCORRECT AFTER WRITE COMMAND
      027476  104456                                                                  TRAP    C$ERHRD
      027500  000473                                                                  .WORD   315
      027502  030736                                                                  .WORD   T23TM
      027504  011700                                                                  .WORD   PKTSSR
 4750 027506                          80$:    CKLOOP                          ;LOOP IF SELECTED
      027506  104406                                                                  TRAP    C$CLP1
 4751 027510                                  ENDSUB                          ;>>>>>>>>>>>>> END SUBTEST >>>>>>>>>>>>>
      027510                                                                       L10044:
      027510  104403                                                                  TRAP    C$ESUB
 4752 027512  023727  002170  000031          CMP     FATFLG,#25.                     ;IS ERROR COUNT AT 25
 4753 027520  002402                          BLT     999$                            ;BR, IF LESS THAN 25
 4754 027522  004737  020154                  JSR     PC,CKDROP                       ;TRY TO DROP THE UNIT
 4755 027526                          999$:
```

```
                                        ;*
                                        ;
                                        ;TEST 3, SUBTEST 4
                                        ;
                                        ;VERIFIES THAT A WRITE DATA COMMAND SPECIFYING A DATA
                                        ;BUFFER STARTING IN NONEXISTANT MEMORY TERMINATES WITH
                                        ;THE PROPER ERROR STATUS WITHOUT MOVING TAPE
                                        ;
                                        ;
                                        ;-

                                                BGNSUB                          ;>>>>>>>>>>>>> BEGIN SUBTEST >>>>>>>>>>>>>
                                                                                                T3.4:
027526  104402                                                                                          TRAP    C$BSUB
027530  005737  003100                        TST     KTFLG                   ;CHECK FOR KT-11
                                        ;       BEQ     10$                     ;BR, IF NO KT-11
                                        ;
                                        ;       DIALOG PATCH FOR NXM
                                        ;
                                                NOP                             ;REMOVE WHEN NXM IS FIXED
027534  000240
027536  000137  027776                        JMP     90$                     ;SKIP THIS TEST IF KT-11
027542  004737  031776                10$:    JSR     PC,T23REST              ;SET COMMAND PACKET
027546  004737  032132                        JSR     PC,T23RT3               ;RESTORE PACKET
027552  004737  032070                        JSR     PC,T23RT2               ;SET UP OTHER COMMAND PACKET

                                        ;*******************************************************************
                                        ;
                                        ;ISSUE CONTROLLER "SOFT" INITIALIZE - CARRY BIT CLEAR IF ERROR
                                        ;
                                        ;*******************************************************************

027556  004737  016644                        JSR     PC,SOFINIT              ;DO INITIALIZE ON CONTROLLER
027562  103407                                BCS     20$                     ;BR IF INIT WAS OK
027564  004737  020102                        JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
027570  010001                                MOV     R0,R1                   ;CONTENTS OF TSSR REGISTER
027572                                          ERRDF   ERRNO,SFIERR,SFIMSG     ;FATAL ERROR TSSR WAS NOT OK
027572  104455                                                                                          TRAP    C$ERDF
027574  000474                                                                                          .WORD   316
027576  003550                                                                                          .WORD   SFIERR
027600  011666                                                                                          .WORD   SFIMSG
027602                                  20$:
027602  012704  030360                        MOV     #T23PACKET,R4           ;SUBROUTINE NEEDS PACKET ADDRESS

                                        ;*******************************************************************
                                        ;
                                        ;WRITE CHARACTERISTICS COMMAND (CALL TO WRTCHR)
                                        ;
                                        ;*******************************************************************

027606  004737  010332                        JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
027612  103407                                BCS     23$                     ;BR, IF COMMAND ISSUED OK
027614  004737  020102                        JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
027620  010001                                MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
027622                                          ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
027622  104456                                                                                          TRAP    C$ERHRD
027624  000475                                                                                          .WORD   317
```

```
      027626  004754                                                        .WORD   WRTMSG
      027630  011666                                                        .WORD   SFIMSG
 4812
 4813                          ;*************************************************************************
 4814                          ;
 4815                          ;WRITE DATA, ACK, CVC=1
 4816                          ;
 4817                          ;*************************************************************************
 4818
 4819 027632  005037  040726          23$:    CLR     T24DLY                  ;SET EXTENDED ADDRESS BITS TO 0
 4820 027636  012737  140005  030510  25$:    MOV     #140005,T23PK3          ;WRITE DATA, ACK, CVC=1
 4821 027644  012701  160000                  MOV     #160000,R1              ;START POSSIBLE NXM ADDRESS
 4822 027650  012702  177776                  MOV     #177776,R2              ;END POSSIBLE NXM ADDRESS
 4823 027654  004737  017276                  JSR     PC,XNXM                 ;CALL NXM FINDER ROUTINE
 4824 027660  103402                          BCS     76$                     ;BR IF NXM ADDRESS FOUND
 4825 027662  000137  027776                  JMP     90$                     ;JMP OVER CAN'T FIND NXM
 4826 027666  010137  030512          76$:    MOV     R1,T23WB                ;SET UP WRITE BUFFER ADDRESS
 4827 027672  013737  040726  030514          MOV     T24DLY,T23WB+2          ;HIGH ORDER ADDRESS BITS
 4828 027700  012737  000100  030516          MOV     #64.,T23SZ              ;SET UP BUFFER SIZE
 4829 027706  012704  030510                  MOV     #T23PK3,R4              ;R4 = POINTER TO PACKET
 4830 027712  010465  177776                  MOV     R4,TSDB(R5)             ;ISSUE COMMAND
 4831 027716  004737  017120                  JSR     PC,WAITF                ;WAIT FOR SSR TO SET
 4832 027722  016501  000000                  MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
 4833 027726  012702  104210                  MOV     #SC!NXM!SSR!BIT3,R2     ;SET UP EXPECTED
 4834 027732  020102                          CMP     R1,R2                   ;ARE THEY EQUAL
 4835 027734  001417                          BEQ     80$                     ;BR, IF OK ESP. FUNCTION REJECT
 4836 027736  062737  000001  040726          ADD     #1,T24DLY               ;LOOK AT NEXT EXTENDED BITS WORTH OF MEM
 4837 027744  022737  000100  040726          CMP     #100,T24DLY             ;TOO MUCH MEMORY YET
 4838 027752  001402                          BEQ     168$                    ;BR, IF OVER 18 BIT ADDRESS
 4839 027754  000137  027636                  JMP     25$                     ;TRY AGAIN (NEXT BUNCH OF MEMORY)
 4840 027760  004737  020102          168$:   JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
 4844 027764                          ERRHRD  ERRNO,T23TM,PKTSSR              ;TSSR INCORRECT AFTER WRITE COMMAND
      027764  104456                                                          TRAP    C$ERHRD
      027766  000476                                                          .WORD   318
      027770  030736                                                          .WORD   T23TM
      027772  011700                                                          .WORD   PKTSSR
 4845 027774                          80$:    CKLOOP                          ;LOOP IF SELECTED
      027774  104406                                                          TRAP    C$CLP1
 4846 027776                          90$:
 4847 027776                          ENDSUB                                  ;>>>>>>>>>>>>> END SUBTEST >>>>>>>>>>>>>
      027776                                                                          L10045:
      027776  104403                                                          TRAP    C$ESUB
 4848 030000  023727  002170  000031          CMP     FATFLG,#25.                     ;IS ERROR COUNT AT 25
 4849 030006  002402                          BLT     999$                            ;BR, IF LESS THAN 25
 4850 030010  004737  020154                  JSR     PC,CKDROP                       ;TRY TO DROP THE UNIT
 4851 030014                          999$:
```

```
                                        ;*
                                        ;
                                        ;TEST 3, SUBTEST 5
                                        ;
                                        ;VERIFIES THAT A WRITE DATA COMMAND SPECIFYING A DATA
                                        ;BUFFER STARTING IN EXISTANT MEMORY BUT RUNNING INTO
                                        ;NONEXISTENT MEMORY TERMINATES WITH THE PROPER ERROR
                                        ;STATUS. A LARGE ENOUGH RECORD SIZE IS SPECIFIED SUCH
                                        ;THAT TAPE IS ACTUALLY MOVED AND WRITTEN.
                                        ;
                                        ;
                                        ;
                                        ;-

                                                BGNSUB                          ;>>>>>>>>>>>>> BEGIN SUBTEST >>>>>>>>>>>>>
                                                                                                T3.5:
030014  104402                                                                                    TRAP    C$BSUB
030016  005737  003100                9$:     TST     KTFLG                   ;CHECK FOR KT11
                                        ;       BEQ     10$                     ;BR. IF NO KT11
                                        ;
                                        ;       DIALOG PATCH FOR NXM
                                        ;
                                                NOP                             ;REMOVE WHEN NXM IS FIXED
030022  000240
030024  000137  030320                        JMP     85$                     ;SKIP THIS TEST
030030  004737  032132                10$:    JSR     PC,T23RT3               ;RESTORE PACKET
030034  004737  031776                        JSR     PC,T23REST              ;SET COMMAND PACKET
030040  004737  032070                        JSR     PC,T23RT2               ;SET UP OTHER COMMAND PACKET

                                        ;*****************************************************************
                                        ;
                                        ;ISSUE CONTROLLER "SOFT" INITIALIZE - CARRY BIT CLEAR IF ERROR
                                        ;
                                        ;*****************************************************************

030044  004737  016644                        JSR     PC,SOFINIT              ;DO INITIALIZE ON CONTROLLER
030050  103407                                BCS     20$                     ;BR IF INIT WAS OK
030052  004737  020102                        JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
030056  010001                                MOV     R0,R1                   ;CONTENTS OF TSSR REGISTER
030060                                        ERRDF   ERRNO,SFIERR,SFIMSG     ;FATAL ERROR TSSR WAS NOT OK
030060  104455                                                                                    TRAP    C$ERDF
030062  000477                                                                                    .WORD   319
030064  003550                                                                                    .WORD   SFIERR
030066  011666                                                                                    .WORD   SFIMSG
030070                                  20$:
030070  012704  030360                        MOV     #T23PACKET,R4           ;SUBROUTINE NEEDS PACKET ADDRESS

                                        ;*****************************************************************
                                        ;
                                        ;WRITE CHARACTERISTICS COMMAND (CALL TO WRTCHR)
                                        ;
                                        ;*****************************************************************

030074  004737  010332                        JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
030100  103407                                BCS     23$                     ;BR. IF COMMAND ISSUED OK
030102  004737  020102                        JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
030106  010001                                MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
```

```
4910 030110                                ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
     030110  104456                                                                TRAP    C$ERHRD
     030112  000500                                                                .WORD   320
     030114  004754                                                                .WORD   WRTMSG
     030116  011666                                                                .WORD   SFIMSG
4911
4912                                ;*************************************************************************
4913                                ;
4914                                ;WRITE DATA, ACK,CVC=1
4915                                ;
4916                                ;*************************************************************************
4917
4918 030120  012737  000000  030514  23$:    MOV     #0,T23WB+2              ;HIGH ORDER ADDRESS BITS ETC.
4919 030126  012737  140005  030510  24$:    MOV     #140005,T23PK3          ;WRITE DATA, ACK,CVC=1
4920 030134  013701  003076                  MOV     FREEHI,R1               ;HIGHEST ADDRESS
4921 030140  162701  000100                  SUB     #100,R1                 ;SET ADDRESS A LITTLE LOWER
4922 030144  010137  030512                  MOV     R1,T23WB                ;LOAD INTO THE PACKET
4923 030150  012737  175000  030516          MOV     #64000.,T23SZ           ;SET UP BUFFER SIZE (64K BYTES)
4924 030156  012704  030510                  MOV     #T23PK3,R4              ;R4 = POINTER TO PACKET
4925 030162  010465  177776                  MOV     R4,TSDB(R5)             ;ISSUE COMMAND
4926 030166  004737  017120                  JSR     PC,WAITF                ;WAIT FOR SSR TO SET
4927 030172  016501  000000                  MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
4928 030176  012702  104210                  MOV     #SC!NXM!SSR!BIT3,R2     ;SET UP EXPECTED
4929 030202  020102                          CMP     R1,R2                   ;ARE THEY EQUAL
4930 030204  001415                          BEQ     80$                     ;BR, IF OK ESP. FUNCTION REJECT
4931 030206  062737  000001  030514          ADD     #1,T23WB+2              ;START CUTTING THE HIGH ADDRESS BITS DOWN
4932 030214  022737  000100  030514          CMP     #100,T23WB+2
4933 030222  001341                          BNE     24$                     ;IF NOT AT ZERO, KEEP TRYING
4934 030224  004737  020102                  JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
4938 030230                                ERRHRD  ERRNO,T23TMA,PKTSSR     ;TSSR INCORRECT AFTER WRITE COMMAND
     030230  104456                                                                TRAP    C$ERHRD
     030232  000501                                                                .WORD   321
     030234  031025                                                                .WORD   T23TMA
     030236  011700                                                                .WORD   PKTSSR
4939 030240                          80$:    CKLOOP                          ;LOOP IF SELECTED
     030240  104406                                                                TRAP    C$CLP1
4940 030242  004737  032070                  JSR     PC,T23RT2               ;CLEAN UP PACKET
4941 030246  004737  032132                  JSR     PC,T23RT3               ;RESTORE PACKET
4942
4943                                ;*************************************************************************
4944                                ;
4945                                ;       ISSUE A CALL TO REWIND ROUTINE WHICH WILL WAIT QUITE SOME TIME FOR SSR
4946                                ;
4947                                ;*************************************************************************
4948 030252  004737  010434                  JSR     PC,REWIND               ;CALL THE TAPE REWIND
4949
4950
4951
4952 030256  012737  102010  030470          MOV     #102010,T23PK2          ;REWIND (POSITION) COMMAND
4953 030264  012704  030470                  MOV     #T23PK2,R4              ;LOAD R4 WITH PACKET ADDRESS
4954 030270  010465  177776                  MOV     R4,TSDB(R5)             ;ISSUE REWIND COMMAND
4955 030274  004737  017236                  JSR     PC,CHKTSSR              ;WAIT FOR SSR TO SET
4956 030300  103407                          BCS     85$                     ;BR, IF TSSR IS OK (GOOD)
4957 030302  010001                          MOV     R0,R1                   ;SAVE TSSR CONTENTS
4958 030304  004737  020102                  JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
4962 030310                                ERRHRD  ERRNO,T23RWN,PKTSSR     ;TSSR IS INCORRECT AFTER REWIND
     030310  104456                                                                TRAP    C$ERHRD
```

```
      030312  000502                                                                .WORD   322
      030314  031111                                                                .WORD   T23RWN
      030316  011700                                                                .WORD   PKTSSR
 4963 030320                          85$:
 4964 030320                          SKIP:
 4965 030320                          130$:
 4966 030320                                  ENDSUB                  ;>>>>>>>>>>>>> END SUBTEST >>>>>>>>>>>>>
      030320                                                                  L10046:
      030320  104403                                                                  TRAP    C$ESUB
 4967 030322  023727  002170  000031          CMP     FATFLG,#25.             ;IS ERROR COUNT AT 25
 4968 030330  002402                          BLT     999$                    ;BR, IF LESS THAN 25
 4969 030332  004737  020154                  JSR     PC,CKDROP               ;TRY TO DROP THE UNIT
 4970 030336                          999$:
 4971 030336  004737  017356                  JSR     PC,TSTLOOP              ;DO WE NEED TO ITERATE TEST
 4972 030342  103002                          BCC     163$                    ;BR, IF NO LOOP REQUIRED
 4973 030344  000137  026276                  JMP     T23LOOP                 ;EXECUTE AGAIN
 4974 030350                          163$:
 4975 030350                                  EXIT    TST                     ;ALL DONE THIS TEST
      030350  104432                                                                  TRAP    C$EXIT
      030352  001604                                                                  .WORD   L10041-.
```

```
                                ;+
                                ;LOCAL STORAGE FOR THIS TEST
                                ;-
                                        .BLKB   10-<.-TUV2A&7>
030354                          T23PACKET:
030360                                  .WORD   100004          ;COMMAND PACKET FOR TEST
030360  100004                          .WORD   100004          ;WRITE CHARACTERISTICS COMMAND, WITH ACK
030362  030370                          .WORD   T23DATA         ;ADDRESS OF CHARACTERISTICS BLOCK
030364  000000                          .WORD   0
030366  000010                          .WORD   8.              ;STARTING VALUE OF BLOCK SIZE
030370                          T23DATA:                        ;CHARACTERISTICS DATA BLOCK
030370  030400                          .WORD   T23BFR          ;ADDRESS OF MESSAGE BUFFER
030372  000000                          .WORD   0
030374  000012                          .WORD   10.             ;LENGTH OF MESSAGE BUFFER
030376  000000                          .WORD   0
030400                          T23BFR: .BLKW   25.             ;MESSAGE BUFFER
                                ;
                                ;WRITE SUBSYSTEM MEMORY COMMAND PACKET
                                ;
                                        .BLKB   10-<.-TUV2A&7>
030462                          T23PK2:
030470                                  .WORD   100006          ;WRITE SUB SYS MEM COMMAND, AND ACK
030470  100006                          .WORD   T23BF2          ;ADDRESS OF SELECT BLOCK DATA
030472  030522                          .WORD   0
030474  000000                          .WORD   6.              ;SIZE OF DATA PACKET
030476  000006
                                        .BLKB   10-<.-TUV2A&7>
030500                          T23PK3:
030510                                  .WORD   100005          ;WRITE COMMAND,  AND ACK
030510  100005                  T23WB:  .WORD   0               ;ADDRESS OF WRITE BUFFER
030512  000000                          .WORD   0
030514  000000                  T23SZ:  .WORD   0               ;SIZE OF BUFFER (EXTENT)
030516  000000                          .EVEN
                                ;
030520  000000                  T23RSZ: .WORD   0               ;LARGEST TAPE RECORD IN BYTES
                                ;
                                ;
030522                          T23BF2:
030522     010                  T23BS0: .BYTE   10              ;BSEL0 AREA
030523     200                  T23BS1: .BYTE   200             ;BSEL1 AREA
030524  000000                  T23S2:  .WORD   0               ;SEL 2 AREA
030526  000000                  T23S3:  .WORD   0               ;DATA AREA
                                ;
                                ;
                                        .EVEN
                                ;TAPE MOTION PACKET COMMAND VALUES

030530  100005                  T23WD:  .WORD   100005          ;WRITE DATA (NEXT)
030532  100405                  T23WDR: .WORD   100405          ;WRITE DATA RETRY
030534  102005                  T23CON: .WORD   102005          ;WRITE CONTINOUS
030536  177777                          .WORD   177777          ;END OF DATA
```

```
5036
5037                                    ;+
5038                                    ;LOCAL TEXT MESSAGES FOR TEST
5039                                    ;-
5040
5041 030540    127     122     111     T23SSR: .ASCIZ  'WRITE Command Not Accepted'
5042 030573    105     117     124     T23ET:  .ASCIZ  'EOT Not Found In 12000 4k Writes, (Use Shorter Tape)'
5043 030660    127     122     111     T23EOT: .ASCIZ  'WRITE DATA OVER EOT GAVE NO TAPE STATUS ALERT'
5044 030736    124     123     123     T23TM:  .ASCIZ  'TSSR Not Correct After WRITE Command Reject Due To NXM'
5045 031025    124     123     123     T23TMA: .ASCIZ  'TSSR Not Correct After WRITE To Non-Existent Memory'
5046 031111    122     145     167     T23RWN: .ASCIZ  'Rewind (POSITION) Command Not Accepted'
5047 031160    122     101     115     T23RNC: .ASCIZ  'RAM Error, Correct Data Pattern Not In Ram'
5048 031233    124     123     123     T23AM3: .ASCIZ  'TSSR Init. Failed After WRITE Command'
5049 031301    104     162     151     T23OFL: .ASCIZ  'Drive 7 Select Failed To Set "OFL" In TSSR'
5050 031354    124     123     123     T23WDD: .ASCIZ  'TSSR Not Correct After WRITE DATA Command, SWB Bit Set'
5051 031443    124     123     123     T23WDC: .ASCIZ  'TSSR Not Correct After WRITE DATA Command, Check For Tape Offline'
5052 031545    103     126     103     T23VCK: .ASCIZ  'CVC Set, Didn''t Reset VCK In Message Buffer'
5053 031620    124     123     102     T23BA:  .ASCIZ  'TSBA Not Correct After WRITE DATA Command'
5054 031672    127     122     111     T23WSS: .ASCIZ  'WRITE SUBSYSTEM MEMORY Command Not Accepted (RAM Read)'
5055 031761    102     141     163     TST23ID:        .ASCIZ  'Basic Write'
5056                                            .EVEN
5057                                    ;+
5058                                    ;
5059                                    ;ROUTINE TO RESTORE COMMAND PACKET TO START-UP (DEFAULT) VALUES
5060                                    ;WRITE SUBSYSTEM MEMORY COMMAND
5061                                    ;
5062                                    ;-
5063
5064 031776                      T23REST:
5065 031776                              SAVREG                          ;SAVE THE REGISTERS
5066 032002  012701  030360              MOV     #T23PACKET,R1           ;START OF THE PACKET
5067 032006  012721  100004              MOV     #100004,(R1)+           ;WRITE SUBSYSTEM MEM. WITH ACK
5068 032012  012721  030370              MOV     #T23DATA,(R1)+          ;ADDRESS OF CHARAISTICS DATA BLOCK
5069 032016  005021                      CLR     (R1)+                   ;EXTENDED ADDRESS
5070 032020  012721  000012              MOV     #10.,(R1)+              ;SIZE OF DATA BLOCK IN BYTES
5071 032024  012721  030400              MOV     #T23BFR,(R1)+           ;ADDRESS OF MESSAGE BUFFER
5072 032030  005021                      CLR     (R1)+
5073 032032  012721  000024              MOV     #20.,(R1)+              ;LENGTH OF MESSAGE BUFFER
5074 032036  005021                      CLR     (R1)+
5075 032040  012711  000000              MOV     #0,(R1)                 ;SELECT DRIVE ZERO
5076 032044  012702  000030              MOV     #24.,R2                 ;NUMBER OF LOCATIONS TO BE CLEARED
5077 032050  012762  177777  030400  64$:  MOV     #177777,T23BFR(R2)      ;ALL ONES TO MESSAGE BUFFER
5078 032056  005742                      TST     -(R2)                   ;BUMP DOWN TO NEXT LOCATION
5079 032060  020227  000000              CMP     R2,#0                   ;R2 AT ZERO YET
5080 032064  001371                      BNE     64$                     ;KEEP GOING UNTIL DONE
5081 032066  000207                      RTS     PC                      ;RETURN
5082
5083
5084 032070                      T23RT2:
5085 032070                              SAVREG                          ;SAVE THE REGISTERS
5086 032074  012701  030470              MOV     #T23PK2,R1              ;START OF THE PACKET
5087 032100  012721  100006              MOV     #100006,(R1)+           ;WRITE SUBSYSTEM MEM. WITH ACK
5088 032104  012721  030522              MOV     #T23BF2,(R1)+           ;ADDRESS OF DATA BLOCK
5089 032110  005021                      CLR     (R1)+                   ;EXTENDED ADDRESS
5090 032112  012721  000006              MOV     #6.,(R1)+               ;SIZE OF DATA BLOCK IN BYTES
5091 032116  012701  030522              MOV     #T23BF2,R1              ;POINT TO DATA SEL AREA
5092 032122  005021                      CLR     (R1)+
```

```
5093 032124  005021                        CLR     (R1)+
5094 032126  005011                        CLR     (R1)
5095 032130  000207                        RTS     PC                  ;RETURN
5096 032132                          T23RT3:
5097 032132                                SAVREG                      ;SAVE THE REGISTERS
5098 032136  012701  030510                MOV     #T23PK3,R1          ;START OF THE PACKET
5099 032142  012721  100005                MOV     #100005,(R1)+       ;WRITE  TAPE. WITH ACK
5100 032146  005021                        CLR     (R1)+               ;ADDRESS OF DATA BLOCK
5101 032150  005021                        CLR     (R1)+               ;EXTENDED ADDRESS
5102 032152  005011                        CLR     (R1)                ;SIZE OF DATA BLOCK
5103 032154  000207                        RTS     PC                          ;RETURN
5104 032156                                ENDTST
     032156                                                    L10041:
     032156  104401                                                    TRAP    C$ETST
```

```
                                        .SBTTL  TEST  4: BASIC READ DATA (FORWARD AND REVERSE)
                                ;+
                                ;
                                ;THIS TEST VERIFIES THAT THE READ FORWARD AND READ REVERSE
                                ;COMMANDS OPERATE PROPERLY. VARIOUS COMBINATIONS OF ODD AND EVEN
                                ;DATA BUFFER BOUNDARIES, RECORD SIZES (UP TO 64K BYTES IF MEMORY
                                ;SPACE IS AVAILIABLE), AND BYTE-SWAP CONTROL ARE USED. THIS TEST
                                ;OF COURSE, FURTHER VERIFIES THE WRITE DATA COMMAND BY ACTUALLY
                                ;READING AND VERIFYING WRITTEN DATA. ALSO TESTED ARE PROPER
                                ;TERMINATIONS ON EXCEPTIONAL OR ERROR CONDITIONS: RECORD LENGTH
                                ;LONG, RECORD LENGTH SHORT, READ REVERSE AT BOT, ILLEGAL DATA
                                ;BUFFER ADDRESSES, ILLEGAL CODES IN THE MODE FIELD OF THE BASIC
                                ;READ COMMAND, AND DATA BUFFERS IN NON-EXISTANT MEMORY. THE TEST
                                ;
                                ;
                                ;THE TEST CONSISTS OF THE FOLLOWING 12 SUBTESTS
                                ;
                                ;
                                ;
                                ;-
032160                                  BGNTST
032160                                                                  T4::
032160  005037  002170                    CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
032164  005037  003100                    CLR     KTFLG           ;HOLD OFF KT11
032170  012737  005762  002146            MOV     #EPRT1,EPRTSW           ;SET UP PRIMARY ERROR MESSAGE
032176  005037  003102                    CLR     KTENABLE                ;TURN OFF KT11
032202  004737  020246                    JSR     PC,KTOFF                ;TURN KT11 OFF
032206  012700  043172                    MOV     #TST24ID,R0             ;ASCII MESSAGE TO IDENTIFY TEST
032212  004737  017410                    JSR     PC,TSTSETUP             ;DO INITIAL TEST SETUP
032216  012737  000001  002164            MOV     #1,LOOPCNT              ;PERFORM 1 ITERATIONS
                                ;+
032224                          T24LOOP:
                                ;
```

```
 5144                                   ;+
 5145                                   ;
 5146                                   ;TEST 4, SUBTEST 1
 5147                                   ;
 5148                                   ;VERIFIES THAT READ FORWARD COMMANDS WITH SWB=0
 5149                                   ;OPERATES PROPERLY. THE TAPE IS FIRST REWOUND AND THEN
 5150                                   ;WRITTEN WITH A SERIES OF TEST RECORDS VARING IN
 5151                                   ;LENGTH AND DATA CONTENT. THE TAPE IS THEN REWOUND
 5152                                   ;AGAIN AND THE RECORD READ SEQUENTIALLY AND RESULTS
 5153                                   ;(STATUS, DATA, ETC.) VERIFIED. THE BYTE COUNT ON
 5154                                   ;EACH READ FORWARD COMMAND IS SET TO THE LENGTH OF THE
 5155                                   ;EXPECTED RECORD, SO NO EXCEPTIONAL CONDITIONS SHOULD
 5156                                   ;OCCUR.
 5157                                   ;
 5158                                   ;
 5159                                   ;
 5160                                   ;-
 5161 032224                                   BGNSUB                          ;>>>>>>>>>>>>> BEGIN SUBTEST >>>>>>>>>>>>>
      032224                                                                                    T4.1:
      032224   104402                                                                                 TRAP    C$BSUB
 5162 032226   004737   043374                 JSR     PC,T24RT3               ;SET UP OTHER COMMAND PACKET
 5163 032232   004737   043240                 JSR     PC,T24REST              ;SET COMMAND PACKET
 5164 032236   004737   043332                 JSR     PC,T24RT2               ;SET UP OTHER COMMAND PACKET
 5165 032242                                   RFLAGS  R0                      ;READ SUPERVISOR FLAGS
      032242   104421                                                                              TRAP    C$RFLA
 5166 032244   032700   000100                 BIT     #BIT6,R0                ;CHECK FOR THE ILS BIT SET
 5167 032250   001002                          BNE     9$                      ;IF SET SKIP THE PATCH
 5168 032252   000137   032776                 JMP     192$                    ;PATCH IT OUT
 5169 032256                                   9$:
 5170                                   ;*****************************************************************************
 5171                                   ;
 5172                                   ;ISSUE CONTROLLER "SOFT" INITIALIZE - CARRY BIT CLEAR IF ERROR
 5173                                   ;
 5174                                   ;*****************************************************************************
 5175
 5176 032256   004737   016644                 JSR     PC,SOFINIT              ;DO INITIALIZE ON CONTROLLER
 5177 032262   103407                          BCS     20$                     ;BR IF INIT WAS OK
 5178 032264   004737   020102                 JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
 5182 032270   010001                          MOV     R0,R1                   ;CONTENTS OF TSSR REGISTER
 5183 032272                                   ERRDF   ERRNO,SFIERR,SFIMSG     ;FATAL ERROR TSSR WAS NOT OK
      032272   104455                                                                              TRAP    C$ERDF
      032274   000621                                                                              .WORD   401
      032276   003550                                                                              .WORD   SFIERR
      032300   011666                                                                              .WORD   SFIMSG
 5184 032302                                   20$:
 5185 032302   012704   040550                 MOV     #T24PACKET,R4           ;SUBROUTINE NEEDS PACKET ADDRESS
 5186
 5187                                   ;*****************************************************************************
 5188                                   ;
 5189                                   ;WRITE CHARACTERISTICS COMMAND (CALL TO WRTCHR)
 5190                                   ;
 5191                                   ;*****************************************************************************
 5192
 5193 032306   004737   010332                 JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
 5194 032312   103407                          BCS     24$                     ;BR, IF COMMAND ISSUED OK
 5195 032314   004737   020102                 JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
 5199 032320   010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
```

```
5200 032322                          ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
     032322  104456                                                          TRAP    C$ERHRD
     032324  000622                                                          .WORD   402
     032326  004754                                                          .WORD   WRTMSG
     032330  011666                                                          .WORD   SFIMSG
5201 032332                     24$:    CKLOOP                          ;LOOP IF SELECTED
     032332  104406                                                          TRAP    C$CLP1
5202
5203                            ;*****************************************************************
5204                            ;
5205                            ;ISSUE REWIND COMMAND TO SELECTED TAPE DRIVE
5206                            ;
5207                            ;*****************************************************************
5208
5209 032334  004737  010434             JSR     PC,REWIND               ;CALL TAPE REWIND COMMAND
5210 032340  103407                     BCS     30$                     ;BR, IF NO PROBLEM
5211 032342  010001                     MOV     R0,R1                   ;SAVE TSSR
5212 032344  004737  020102             JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
5216 032350                             ERRHRD  ERRNO,T24RWN,PKTSSR     ;REWIND NOT ACCEPTED
     032350  104456                                                          TRAP    C$ERHRD
     032352  000623                                                          .WORD   403
     032354  042036                                                          .WORD   T24RWN
     032356  011700                                                          .WORD   PKTSSR
5217 032360                     30$:    CKLOOP                          ;LOOP IF SELECTED
     032360  104406                                                          TRAP    C$CLP1
5218
5219                            ;*****************************************************************
5220                            ;
5221                            ;READ MESSAGE BUFFER EXTENDED STATUS REGISTER ZERO (XST0)
5222                            ;
5223                            ;*****************************************************************
5224
5225 032362  013701  040576             MOV     T24BFR+6,R1             ;PICK UP XST0
5226 032366  010102                     MOV     R1,R2                   ;SET UP EXPECTED
5227 032370  052702  000002             BIS     #BIT1,R2                ;SET BOT BIT IN EXPECTED
5228 032374  020102                     CMP     R1,R2                   ;DOES EXP = REC'D
5229 032376  001406                     BEQ     40$                     ;BR, IF EQUAL (OK)
5230 032400  004737  020102             JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
5234 032404                             ERRHRD  ERRNO,T24BOT,EXPREC     ;TAPE NOT AT BOT AFTER REWIND
     032404  104456                                                          TRAP    C$ERHRD
     032406  000624                                                          .WORD   404
     032410  041553                                                          .WORD   T24BOT
     032412  016344                                                          .WORD   EXPREC
5235 032414                     40$:    CKLOOP                          ;LOOP IF SELECTED
     032414  104406                                                          TRAP    C$CLP1
5236 032416  012703  000400             MOV     #256.,R3                ;RECORD SIZE
5237 032422  013737  003072  040702     MOV     FREE,T24RB              ;STARTING WRITE BUFFER ADDRESS
5238
5239                            ;*****************************************************************
5240                            ;
5241                            ;WRITE DATA,CVC=1,ACK COMMAND
5242                            ;
5243                            ;*****************************************************************
5244
5245 032430  012737  140005  040700     MOV     #140005,T24PK3          ;WRITE DATA,CVC=1,ACK COMMAND
5246 032436  012704  040700             MOV     #T24PK3,R4              ;SET UP R4 WITH PACKET ADDRESS
5247 032442                     65$:
```

```
5248 032442  010300                        MOV     R3,R0                   ;SET PATTERN IN CORRECT REGISTER
5249 032444  004737  020374                JSR     PC,FILLMEM              ;FILL MEMORY WITH RECORD SIZE
5250 032450  010337  040706                MOV     R3,T24SZ                ;SET UP RECORD SIZE IN PACKET
5251 032454  010465  177776                MOV     R4,TSDB(R5)             ;ISSUE COMMAND
5252 032460  004737  017120                JSR     PC,WAITF                ;WAIT FOR SSR TO SET
5253 032464  016501  000000                MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
5254 032470  012702  000200                MOV     #SSR,R2                 ;SET UP EXPECTED
5255 032474  020102                        CMP     R1,R2                   ;ARE THEY EQUAL
5256 032476  001406                        BEQ     75$                     ;BR, IF OK
5257 032500  004737  020102                JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
5261                                                                        ;SOFT ERROR, REALLY CHECKING THE
5262                                                                        ;READ COMMAND
5263 032504                                ERRSOFT ERRNO,WRTERR,PKTSSR     ;TSSR INCORRECT AFTER WRITE DATA
     032504  104457                                                                    TRAP    C$ERSOFT
     032506  000625                                                                    .WORD   405
     032510  005011                                                                    .WORD   WRTERR
     032512  011700                                                                    .WORD   PKTSSR
5264 032514                        75$:    CKLOOP                          ;LOOP IF SELECTED
     032514  104406                                                                    TRAP    C$CLP1
5265 032516  005723                        TST     (R3)+           ;BUMP RECORD SIZE
5266 032520  022703  000414                CMP     #268.,R3                ;END OF RECORD YET
5267 032524  001346                        BNE     65$                     ;BR, IF MORE RECORDS TO WRITE
5268 032526                        80$:    CKLOOP                          ;LOOP IF SELECTED
     032526  104406                                                                    TRAP    C$CLP1
5269 032530                        120$:
5270
5271                               ;*****************************************************************
5272                               ;
5273                               ;ISSUE REWIND COMMAND TO SELECTED TAPE DRIVE
5274                               ;
5275                               ;*****************************************************************
5276
5277 032530  012703  000012                MOV     #10.,R3                 ;SPECIAL MULTIPLE REWIND
5278 032534  004737  010434        125$:   JSR     PC,REWIND               ;ISSUE REWIND COMMAND
5279 032540  103407                        BCS     130$                    ;BR, IF NO PROBLEM
5280 032542  010001                        MOV     R0,R1                   ;SAVE TSSR
5281 032544  004737  020102                JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
5285 032550                                ERRHRD  ERRNO,T24RWN,PKTSSR     ;REWIND NOT ACCEPTED
     032550  104456                                                                    TRAP    C$ERHRD
     032552  000626                                                                    .WORD   406
     032554  042036                                                                    .WORD   T24RWN
     032556  011700                                                                    .WORD   PKTSSR
5286 032560                        130$:   CKLOOP                          ;LOOP IF SELECTED
     032560  104406                                                                    TRAP    C$CLP1
5287
5288                               ;*****************************************************************
5289                               ;
5290                               ;READ MESSAGE BUFFER EXTENDED STATUS REGISTER ZERO (XST0)
5291                               ;
5292                               ;*****************************************************************
5293
5294 032562  013701  040576                MOV     T24BFR+6,R1             ;PICK UP XST0
5295 032566  010102                        MOV     R1,R2                   ;SET UP EXPECTED
5296 032570  052702  000002                BIS     #BIT1,R2                ;SET BOT BIT IN EXPECTED
5297 032574  020102                        CMP     R1,R2                   ;DOES EXP = REC'D
5298 032576  001407                        BEQ     140$                    ;BR, IF EQUAL (OK)
5299 032600  077323                        SOB     R3,125$                 ;DO ANOTHER REWIND BEFORE REPORTING ERROR
```

```
5300 032602  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
5304 032606                                     ERRHRD  ERRNO,T24BOT,EXPREC     ;TAPE NOT AT BOT AFTER REWIND
     032606  104456                                                                TRAP    C$ERHRD
     032610  000627                                                                .WORD   407
     032612  041553                                                                .WORD   T24BOT
     032614  016344                                                                .WORD   EXPREC
5305 032616                          140$:      CKLOOP                          ;LOOP IF SELECTED
     032616  104406                                                                TRAP    C$CLP1
5306 032620  012703  000400                    MOV     #256.,R3                ;RECORD SIZE
5307 032624  013737  003072  040702            MOV     FREE,T24RB              ;STARTING READ BUFFER ADDRESS
5308
5309                                 ;*************************************************************************
5310                                 ;
5311                                 ;READ DATA,CVC=1,ACK COMMAND
5312                                 ;
5313                                 ;*************************************************************************
5314
5315 032632  012737  140001  040700            MOV     #140001,T24PK3          ;READ DATA,CVC=1,ACK COMMAND
5316 032640  012704  040700          165$:     MOV     #T24PK3,R4              ;SET UP R4 WITH PACKET ADDRESS
5317 032644  010337  040706                    MOV     R3,T24SZ                ;SET UP RECORD SIZE IN PACKET
5318 032650  010465  177776                    MOV     R4,TSDB(R5)             ;ISSUE COMMAND
5319 032654  004737  017120                    JSR     PC,WAITF                ;WAIT FOR SSR TO SET
5320 032660  016501  000000                    MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
5321 032664  012702  000200                    MOV     #SSR,R2                 ;SET UP EXPECTED
5322 032670  020102                            CMP     R1,R2                   ;ARE THEY EQUAL
5323 032672  001406                            BEQ     170$                    ;BR, IF OK
5324 032674  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
5328 032700                                     ERRHRD  ERRNO,RDERR,PKTSSR      ;TSSR INCORRECT AFTER READ DATA
     032700  104456                                                                TRAP    C$ERHRD
     032702  000630                                                                .WORD   408
     032704  005104                                                                .WORD   RDERR
     032706  011700                                                                .WORD   PKTSSR
5329 032710                          170$:      CKLOOP                          ;LOOP IF SELECTED
     032710  104406                                                                TRAP    C$CLP1
5330 032712  013702  003072                    MOV     FREE,R2                 ;GET BUFFER ADDRESS
5331 032716  010304                            MOV     R3,R4                   ;CURRENT RECORD SIZE
5332 032720  162704  000400                    SUB     #256.,R4                ;FIRST LOCATION IN BUFFER
5333 032724  060204                  173$:     ADD     R2,R4                   ;GET LOCATION IN BUFFER (ADDRESS)
5334 032726  021403                            CMP     (R4),R3                 ;CHECK DATA READ (R3=DATA ALSO)
5335 032730  001410                            BEQ     180$                    ;BR, IF ALL IS WELL
5336 032732  011401                            MOV     (R4),R1                 ;RECD DATA
5337 032734  010302                            MOV     R3,R2                   ;EXPECTED DATA
5338 032736  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
5342 032742                                     ERRHRD  ERRNO,T24DTA,EXPREC     ;DATA READ NOT = WRITTEN
     032742  104456                                                                TRAP    C$ERHRD
     032744  000631                                                                .WORD   409
     032746  041620                                                                .WORD   T24DTA
     032750  016344                                                                .WORD   EXPREC
5343 032752                          180$:      CKLOOP                          ;LOOP IF SELECTED
     032752  104406                                                                TRAP    C$CLP1
5344 032754  005724                            TST     (R4)+           ;BUMP TO NEXT LOCATION
5345 032756  160204                            SUB     R2,R4           ;GET BACK TO CORRECT SIZE
5346 032760  020403                            CMP     R4,R3                   ;END OF RECORD YET
5347 032762  001360                            BNE     173$                    ;BR, IF NOT AT END OF RECORD
5348 032764  005723                            TST     (R3)+                   ;BUMP RECORD SIZE
5349 032766  022703  000412                    CMP     #266.,R3                ;END OF RECORD YET
5350 032772  001322                            BNE     165$                    ;BR, IF MORE RECORDS TO WRITE
```

```
5351 032774                          190$:   CKLOOP                          ;LOOP IF SELECTED
     032774  104406                                                                  TRAP    C$CLP1
5352 032776                          192$:
5353 032776                                  ENDSUB                          ;>>>>>>>>>>>>> END SUBTEST >>>>>>>>>>>>>
     032776                                                                          L10050:
     032776  104403                                                                  TRAP    C$ESUB
5354 033000  023727  002170  000031         CMP     FATFLG,#25.                     ;IS ERROR COUNT AT 25
5355 033006  002402                         BLT     999$                            ;BR, IF LESS THAN 25
5356 033010  004737  020154                 JSR     PC,CKDROP                       ;TRY TO DROP THE UNIT
5357 033014                          999$:
```

```
                                        ;*
                                        ;
                                        ;TEST 4, SUBTEST 2
                                        ;
                                        ;VERIFIES THAT READ DATA COMMANDS WITH CVC=1 AND THE
                                        ;SWAP BYTES (SWB) BIT SET OPERATES PROPERLY. THE TEST
                                        ;SEQUENCE IS IDENTICAL TO THAT USED IN SUBTEST 2.
                                        ;THE RESULTS, EXCEPT FOR RAM CONTENTS, SHOULD BE THE SAME.
                                        ;
                                        ;
                                        ;
                                        ;-
033014                                          BGNSUB                          ;>>>>>>>>>>>>> BEGIN SUBTEST >>>>>>>>>>>>>
033014                                                                                          T4.2:
033014  104402                                                                                  TRAP    C$BSUB
033016  004737  043374                        JSR     PC,T24RT3               ;SET UP OTHER COMMAND PACKET
033022  004737  043240                        JSR     PC,T24REST              ;SET COMMAND PACKET
033026  004737  043332                        JSR     PC,T24RT2               ;SET UP OTHER COMMAND PACKET

                                        ;*************************************************************************
                                        ;
                                        ;ISSUE CONTROLLER "SOFT" INITIALIZE - CARRY BIT CLEAR IF ERROR
                                        ;
                                        ;*************************************************************************

033032  004737  016644                        JSR     PC,SOFINIT              ;DO INITIALIZE ON CONTROLLER
033036  103407                                BCS     20$                     ;BR IF INIT WAS OK
033040  004737  020102                        JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
033044  010001                                MOV     R0,R1                   ;CONTENTS OF TSSR REGISTER
033046                                          ERRDF   ERRNO,SFIERR,SFIMSG     ;FATAL ERROR TSSR WAS NOT OK
033046  104455                                                                                  TRAP    C$ERDF
033050  000632                                                                                  .WORD   410
033052  003550                                                                                  .WORD   SFIERR
033054  011666                                                                                  .WORD   SFIMSG
033056                                  20$:
033056  012704  040550                        MOV     #T24PACKET,R4           ;SUBROUTINE NEEDS PACKET ADDRESS

                                        ;*************************************************************************
                                        ;
                                        ;WRITE CHARACTERISTICS COMMAND (CALL TO WRTCHR)
                                        ;
                                        ;*************************************************************************

033062  004737  010332                        JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
033066  103407                                BCS     24$                     ;BR, IF COMMAND ISSUED OK
033070  004737  020102                        JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
033074  010001                                MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
033076                                          ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
033076  104456                                                                                  TRAP    C$ERHRD
033100  000633                                                                                  .WORD   411
033102  004754                                                                                  .WORD   WRTMSG
033104  011666                                                                                  .WORD   SFIMSG
033106                                  24$:    CKLOOP                          ;LOOP IF SELECTED
033106  104406                                                                                  TRAP    C$CLP1

                                        ;*************************************************************************
                                        ;
```

```
5411                                    ;ISSUE REWIND COMMAND TO SELECTED TAPE DRIVE
5412                                    ;
5413                                    ;*************************************************************************
5414
5415 033110  004737  010434                    JSR     PC,REWIND               ;CALL TAPE REWIND COMMAND
5416 033114  103407                            BCS     30$                     ;BR, IF NO PROBLEM
5417 033116  010001                            MOV     R0,R1                   ;SAVE TSSR
5418 033120  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
5422 033124                                    ERRHRD  ERRNO,T24RWN,PKTSSR     ;REWIND NOT ACCEPTED
      033124  104456                                                                    TRAP    C$ERHRD
      033126  000634                                                                    .WORD   412
      033130  042036                                                                    .WORD   T24RWN
      033132  011700                                                                    .WORD   PKTSSR
5423 033134                             30$:    CKLOOP                          ;LOOP IF SELECTED
      033134  104406                                                                    TRAP    C$CLP1
5424
5425                                    ;*************************************************************************
5426                                    ;
5427                                    ;READ MESSAGE BUFFER EXTENDED STATUS REGISTER ZERO (XSTO)
5428                                    ;
5429                                    ;*************************************************************************
5430
5431 033136  013701  040576                    MOV     T24BFR+6,R1             ;PICK UP XSTO
5432 033142  010102                            MOV     R1,R2                   ;SET UP EXPECTED
5433 033144  052702  000002                    BIS     #BIT1,R2                ;SET BOT BIT IN EXPECTED
5434 033150  020102                            CMP     R1,R2                   ;DOES EXP = REC'D
5435 033152  001406                            BEQ     40$                     ;BR, IF EQUAL (OK)
5436 033154  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
5440 033160                                    ERRHRD  ERRNO,T24BOT,EXPREC     ;TAPE NOT AT BOT AFTER REWIND
      033160  104456                                                                    TRAP    C$ERHRD
      033162  000635                                                                    .WORD   413
      033164  041553                                                                    .WORD   T24BOT
      033166  016344                                                                    .WORD   EXPREC
5441 033170                             40$:    CKLOOP                          ;LOOP IF SELECTED
      033170  104406                                                                    TRAP    C$CLP1
5442 033172  012703  000400                    MOV     #256.,R3                ;RECORD SIZE
5443 033176  013737  003072  040702            MOV     FREE,T24RB              ;STARTING WRITE BUFFER ADDRESS
5444
5445                                    ;*************************************************************************
5446                                    ;
5447                                    ;WRITE DATA,ACK,SWB,CVC=1 COMMAND
5448                                    ;
5449                                    ;*************************************************************************
5450
5451 033204  012737  150005  040700            MOV     #150005,T24PK3          ;WRITE DATA,ACK,SWB,CVC=1 COMMAND
5452 033212  012704  040700                    MOV     #T24PK3,R4              ;SET UP R4 WITH PACKET ADDRESS
5453 033216                             65$:
5454 033216  010300                            MOV     R3,R0                   ;SET PATTERN IN CORRECT REGISTER
5455 033220  004737  020374                    JSR     PC,FILLMEM              ;FILL MEMORY WITH RECORD SIZE
5456 033224  010337  040706                    MOV     R3,T24SZ                ;SET UP RECORD SIZE IN PACKET
5457 033230  010465  177776                    MOV     R4,TSDB(R5)             ;ISSUE COMMAND
5458 033234  004737  017120                    JSR     PC,WAITF                ;WAIT FOR SSR TO SET
5459 033240  016501  000000                    MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
5460 033244  012702  000200                    MOV     #SSR,R2                 ;SET UP EXPECTED
5461 033250  020102                            CMP     R1,R2                   ;ARE THEY EQUAL
5462 033252  001406                            BEQ     75$                     ;BR, IF OK
5463 033254  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
```

```
5467                                                                    ;SOFT ERROR, REALLY CHECKING THE
5468                                                                    ;READ COMMAND
5469 033260                                ERRSOFT ERRNO,WRTERR,PKTSSR  ;TSSR INCORRECT AFTER WRITE DATA
     033260  104457                                                                TRAP    C$ERSOFT
     033262  000636                                                                .WORD   414
     033264  005011                                                                .WORD   WRTERR
     033266  011700                                                                .WORD   PKTSSR
5470 033270                        75$:    CKLOOP                       ;LOOP IF SELECTED
     033270  104406                                                                TRAP    C$CLP1
5471 033272  005723                        TST     (R3)+                ;BUMP RECORD SIZE
5472 033274  022703  000414               CMP     #268.,R3             ;END OF RECORD YET
5473 033300  001346                        BNE     65$                  ;BR, IF MORE RECORDS TO WRITE
5474 033302                        80$:    CKLOOP                       ;LOOP IF SELECTED
     033302  104406                                                                TRAP    C$CLP1
5475 033304                        120$:
5476
5477                               ;*************************************************************************
5478                               ;
5479                               ;ISSUE REWIND COMMAND TO SELECTED TAPE DRIVE
5480                               ;
5481                               ;*************************************************************************
5482
5483 033304  004737  010434               JSR     PC,REWIND            ;CALL TAPE REWIND COMMAND
5484 033310  103407                        BCS     130$                 ;BR, IF NO PROBLEM
5485 033312  010001                        MOV     R0,R1                ;SAVE TSSR
5486 033314  004737  020102               JSR     PC,FATCHK            ;INC AND CHECK FOR MORE THAN 25 ERRORS
5490 033320                                ERRHRD  ERRNO,T24RWN,EXPREC  ;REWIND NOT ACCEPTED
     033320  104456                                                                TRAP    C$ERHRD
     033322  000637                                                                .WORD   415
     033324  042036                                                                .WORD   T24RWN
     033326  016344                                                                .WORD   EXPREC
5491 033330                        130$:   CKLOOP                       ;LOOP IF SELECTED
     033330  104406                                                                TRAP    C$CLP1
5492
5493                               ;*************************************************************************
5494                               ;
5495                               ;READ MESSAGE BUFFER EXTENDED STATUS REGISTER ZERO (XSTO)
5496                               ;
5497                               ;*************************************************************************
5498
5499 033332  013701  040576               MOV     T24BFR+6,R1          ;PICK UP XSTO
5500 033336  010102                        MOV     R1,R2                ;SET UP EXPECTED
5501 033340  052702  000002               BIS     #BIT1,R2             ;SET BOT BIT IN EXPECTED
5502 033344  020102                        CMP     R1,R2                ;DOES EXP = REC'D
5503 033346  001406                        BEQ     140$                 ;BR, IF EQUAL (OK)
5504 033350  004737  020102               JSR     PC,FATCHK            ;INC AND CHECK FOR MORE THAN 25 ERRORS
5508 033354                                ERRHRD  ERRNO,T24BOT,EXPREC  ;TAPE NOT AT BOT AFTER REWIND
     033354  104456                                                                TRAP    C$ERHRD
     033356  000640                                                                .WORD   416
     033360  041553                                                                .WORD   T24BOT
     033362  016344                                                                .WORD   EXPREC
5509 033364                        140$:   CKLOOP                       ;LOOP IF SELECTED
     033364  104406                                                                TRAP    C$CLP1
5510 033366  012703  000400               MOV     #256.,R3             ;RECORD SIZE
5511 033372  013737  003072  040702       MOV     FREE,T24RB           ;STARTING READ BUFFER ADDRESS
5512
5513                               ;*************************************************************************
```

```
5514                                    ;
5515                                    ;READ DATA,IE,ACK,SWB COMMAND
5516                                    ;
5517                                    ;*************************************************************************
5518
5519 033400  012737  110001  040700            MOV     #110001,T24PK3          ;READ DATA,IE,ACK,SWB COMMAND
5520 033406  012704  040700          165$:     MOV     #T24PK3,R4              ;SET UP R4 WITH PACKET ADDRESS
5521 033412  010337  040706                    MOV     R3,T24SZ                ;SET UP RECORD SIZE IN PACKET
5522 033416  010465  177776                    MOV     R4,TSDB(R5)             ;ISSUE COMMAND
5523 033422  004737  017120                    JSR     PC,WAITF                ;WAIT FOR SSR TO SET
5524 033426  016501  000000                    MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
5525 033432  012702  000200                    MOV     #SSR,R2                 ;SET UP EXPECTED
5526 033436  020102                            CMP     R1,R2                   ;ARE THEY EQUAL
5527 033440  001406                            BEQ     170$                    ;BR, IF OK
5528 033442  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
5532 033446                                    ERRHRD  ERRNO,RDERR,PKTSSR      ;TSSR INCORRECT AFTER READ DATA
     033446  104456                                                                    TRAP    C$ERHRD
     033450  000641                                                                    .WORD   417
     033452  005104                                                                    .WORD   RDERR
     033454  011700                                                                    .WORD   PKTSSR
5533 033456                          170$:     CKLOOP                          ;LOOP IF SELECTED
     033456  104406                                                                    TRAP    C$CLP1
5534 033460  013702  003072                    MOV     FREE,R2                 ;GET BUFFER ADDRESS
5535 033464  010304                            MOV     R3,R4                   ;CURRENT RECORD SIZE
5536 033466  162704  000400                    SUB     #256.,R4                ;FIRST LOCATION IN BUFFER
5537 033472  060204                  173$:     ADD     R2,R4                   ;GET LOCATION IN BUFFER (ADDRESS)
5538 033474  021403                            CMP     (R4),R3                 ;CHECK DATA READ (R3=DATA ALSO)
5539 033476  001410                            BEQ     180$                    ;BR, IF ALL IS WELL
5540 033500  011401                            MOV     (R4),R1                 ;RECD DATA
5541 033502  010302                            MOV     R3,R2                   ;EXPECTED DATA
5542 033504  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
5546 033510                                    ERRHRD  ERRNO,T24DTA,EXPREC     ;DATA READ NOT = WRITTEN
     033510  104456                                                                    TRAP    C$ERHRD
     033512  000642                                                                    .WORD   418
     033514  041620                                                                    .WORD   T24DTA
     033516  016344                                                                    .WORD   EXPREC
5547 033520                          180$:     CKLOOP                          ;LOOP IF SELECTED
     033520  104406                                                                    TRAP    C$CLP1
5548 033522  005724                            TST     (R4)+                   ;BUMP TO NEXT LOCATION
5549 033524  160204                            SUB     R2,R4                   ;SET SIZE TO CORRECT VALUE
5550 033526  020403                            CMP     R4,R3                   ;END OF RECORD YET
5551 033530  001360                            BNE     173$                    ;BR, IF NOT AT END OF RECORD
5552 033532  005723                            TST     (R3)+                   ;BUMP RECORD SIZE
5553 033534  022703  000412                    CMP     #266.,R3                ;END OF RECORD YET
5554 033540  001322                            BNE     165$                    ;BR, IF MORE RECORDS TO WRITE
5555 033542                          190$:     CKLOOP                          ;LOOP IF SELECTED
     033542  104406                                                                    TRAP    C$CLP1
5556 033544                                    ENDSUB                          ;>>>>>>>>>>>>> END SUBTEST >>>>>>>>>>>>>
     033544                                                                         L10051:
     033544  104403                                                                    TRAP    C$ESUB
5557 033546  023727  002170  000031                    CMP     FATFLG,#25.             ;IS ERROR COUNT AT 25
5558 033554  002402                                    BLT     999$                    ;BR, IF LESS THAN 25
5559 033556  004737  020154                            JSR     PC,CKDROP               ;TRY TO DROP THE UNIT
5560 033562                          999$:
```

```
                                ;*
                                ;
                                ;TEST 4, SUBTEST 3
                                ;
                                ;VERIFIES THAT A READ FORWARD COMMAND READING A RECORD
                                ;LONGER THAN THE SPECIFIED BYTE COUNT CAUSES TAPE
                                ;STATUS ALERT TERMINATION WITH THE RECORD LENGTH LONG
                                ;(RLL) BIT SET.
                                ;
                                ;
                                ;-

                                        BGNSUB                          ;>>>>>>>>>>>>> BEGIN SUBTEST >>>>>>>>>>>>>
                                                                                        T4.3:
                                                                                        TRAP    C$BSUB
                                        JSR     PC,T24RT3               ;SET UP OTHER COMMAND PACKET
                                        JSR     PC,T24REST              ;SET COMMAND PACKET
                                        JSR     PC,T24RT2               ;SET UP OTHER COMMAND PACKET

                                ;*************************************************************************
                                ;
                                ;ISSUE CONTROLLER "SOFT" INITIALIZE - CARRY BIT CLEAR IF ERROR
                                ;
                                ;*************************************************************************

                                        JSR     PC,SOFINIT              ;DO INITIALIZE ON CONTROLLER
                                        BCS     20$                     ;BR IF INIT WAS OK
                                        JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
                                        MOV     R0,R1                   ;CONTENTS OF TSSR REGISTER
                                        ERRDF   ERRNO,SFIERR,SFIMSG     ;FATAL ERROR TSSR WAS NOT OK
                                                                                        TRAP    C$ERDF
                                                                                        .WORD   419
                                                                                        .WORD   SFIERR
                                                                                        .WORD   SFIMSG
                                20$:
                                        MOV     #T24PACKET,R4           ;SUBROUTINE NEEDS PACKET ADDRESS

                                ;*************************************************************************
                                ;
                                ;WRITE CHARACTERISTICS COMMAND (CALL TO WRTCHR)
                                ;
                                ;*************************************************************************

                                        JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
                                        BCS     24$                     ;BR, IF COMMAND ISSUED OK
                                        JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
                                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
                                        ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
                                                                                        TRAP    C$ERHRD
                                                                                        .WORD   420
                                                                                        .WORD   WRTMSG
                                                                                        .WORD   SFIMSG
                                24$:    CKLOOP                          ;LOOP IF SELECTED
                                                                                        TRAP    C$CLP1

                                ;*************************************************************************
                                ;
```

```
5614                                    ;ISSUE REWIND COMMAND TO SELECTED TAPE DRIVE
5615                                    ;
5616                                    ;*************************************************************************
5617
5618 033656  004737  010434                    JSR     PC,REWIND               ;CALL TAPE REWIND COMMAND
5619 033662  103407                            BCS     30$                     ;BR, IF NO PROBLEM
5620 033664  010001                            MOV     R0,R1                   ;SAVE TSSR
5621 033666  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
5625 033672                                    ERRHRD  ERRNO,T24RWN,PKTSSR     ;REWIND NOT ACCEPTED
      033672  104456                                                                    TRAP    C$ERHRD
      033674  000645                                                                    .WORD   421
      033676  042036                                                                    .WORD   T24RWN
      033700  011700                                                                    .WORD   PKTSSR
5626 033702                             30$:    CKLOOP                          ;LOOP IF SELECTED
      033702  104406                                                                    TRAP    C$CLP1
5627
5628                                    ;*************************************************************************
5629                                    ;
5630                                    ;READ MESSAGE BUFFER EXTENDED STATUS REGISTER ZERO (XST0)
5631                                    ;
5632                                    ;*************************************************************************
5633
5634 033704  013701  040576                    MOV     T24BFR+6,R1             ;PICK UP XST0
5635 033710  010102                            MOV     R1,R2                   ;SET UP EXPECTED
5636 033712  052702  000002                    BIS     #BIT1,R2                ;SET BOT BIT IN EXPECTED
5637 033716  020102                            CMP     R1,R2                   ;DOES EXP = REC'D
5638 033720  001406                            BEQ     40$                     ;BR, IF EQUAL (OK)
5639 033722  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
5643 033726                                    ERRHRD  ERRNO,T24BOT,EXPREC     ;TAPE NOT AT BOT AFTER REWIND
      033726  104456                                                                    TRAP    C$ERHRD
      033730  000646                                                                    .WORD   422
      033732  041553                                                                    .WORD   T24BOT
      033734  016344                                                                    .WORD   EXPREC
5644 033736                             40$:    CKLOOP                          ;LOOP IF SELECTED
      033736  104406                                                                    TRAP    C$CLP1
5645 033740  012703  001000                    MOV     #512.,R3                ;RECORD SIZE
5646 033744  013737  003072  040702            MOV     FREE,T24RB              ;STARTING WRITE BUFFER ADDRESS
5647
5648                                    ;*************************************************************************
5649                                    ;
5650                                    ;WRITE DATA,ACK,CVC=1 COMMAND
5651                                    ;
5652                                    ;*************************************************************************
5653
5654 033752  012737  140005  040700            MOV     #140005,T24PK3          ;WRITE DATA,ACK,CVC=1 COMMAND
5655 033760  012704  040700                    MOV     #T24PK3,R4              ;SET UP R4 WITH PACKET ADDRESS
5656 033764                             65$:
5657 033764  010337  040706                    MOV     R3,T24SZ                ;SET UP RECORD SIZE IN PACKET
5658 033770  010465  177776                    MOV     R4,TSDB(R5)             ;ISSUE COMMAND
5659 033774  004737  017120                    JSR     PC,WAITF                ;WAIT FOR SSR TO SET
5660 034000  016501  000000                    MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
5661 034004  012702  000200                    MOV     #SSR,R2                 ;SET UP EXPECTED
5662 034010  020102                            CMP     R1,R2                   ;ARE THEY EQUAL
5663 034012  001406                            BEQ     75$                     ;BR, IF OK
5664 034014  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
5668                                                                            ;SOFT ERROR, REALLY CHECKING THE
5669                                                                            ;READ DATA COMMAND
```

```
5670 034020                          ERRSOFT ERRNO,WRTERR,PKTSSR     ;TSSR INCORRECT AFTER WRITE DATA
     034020  104457                                                          TRAP    C$ERSOFT
     034022  000647                                                          .WORD   423
     034024  005011                                                          .WORD   WRTERR
     034026  011700                                                          .WORD   PKTSSR
5671 034030                     75$:    CKLOOP                          ;LOOP IF SELECTED
     034030  104406                                                          TRAP    C$CLP1
5672 034032                     120$:
5673
5674                            ;*****************************************************************
5675                            ;
5676                            ;ISSUE REWIND COMMAND TO SELECTED TAPE DRIVE
5677                            ;
5678                            ;*****************************************************************
5679
5680 034032  004737  010434             JSR     PC,REWIND               ;CALL TAPE REWIND COMMAND
5681 034036  103407                     BCS     130$                    ;BR, IF NO PROBLEM
5682 034040  010001                     MOV     R0,R1                   ;SAVE TSSR
5683 034042  004737  020102             JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
5687 034046                             ERRHRD  ERRNO,T24RWN,PKTSSR     ;REWIND NOT ACCEPTED
     034046  104456                                                          TRAP    C$ERHRD
     034050  000650                                                          .WORD   424
     034052  042036                                                          .WORD   T24RWN
     034054  011700                                                          .WORD   PKTSSR
5688 034056                     130$:   CKLOOP                          ;LOOP IF SELECTED
     034056  104406                                                          TRAP    C$CLP1
5689
5690                            ;*****************************************************************
5691                            ;
5692                            ;READ MESSAGE BUFFER EXTENDED STATUS REGISTER ZERO (XSTO)
5693                            ;
5694                            ;*****************************************************************
5695
5696 034060  013701  040576             MOV     T24BFR+6,R1             ;PICK UP XSTO
5697 034064  010102                     MOV     R1,R2                   ;SET UP EXPECTED
5698 034066  052702  000002             BIS     #BIT1,R2                ;SET BOT BIT IN EXPECTED
5699 034072  020102                     CMP     R1,R2                   ;DOES EXP = REC'D
5700 034074  001406                     BEQ     140$                    ;BR, IF EQUAL (OK)
5701 034076  004737  020102             JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
5705 034102                             ERRHRD  ERRNO,T24BOT,EXPREC     ;TAPE NOT AT BOT AFTER REWIND
     034102  104456                                                          TRAP    C$ERHRD
     034104  000651                                                          .WORD   425
     034106  041553                                                          .WORD   T24BOT
     034110  016344                                                          .WORD   EXPREC
5706 034112                     140$:   CKLOOP                          ;LOOP IF SELECTED
     034112  104406                                                          TRAP    C$CLP1
5707 034114  012703  000400             MOV     #256.,R3                ;RECORD SIZE
5708 034120  013737  003072  040702     MOV     FREE,T24RB              ;STARTING READ BUFFER ADDRESS
5709
5710                            ;*****************************************************************
5711                            ;
5712                            ;READ DATA,ACK,CVC=1 COMMAND
5713                            ;
5714                            ;*****************************************************************
5715
5716 034126  012737  140001  040700     MOV     #140001,T24PK3          ;READ DATA,ACK,CVC=1 COMMAND
5717 034134  012704  040700     165$:   MOV     #T24PK3,R4              ;SET UP R4 WITH PACKET ADDRESS
```

```
5718 034140  010337  040706                MOV     R3,T24SZ                ;SET UP RECORD SIZE IN PACKET
5719 034144  010465  177776                MOV     R4,TSDB(R5)             ;ISSUE COMMAND
5720 034150  004737  017120                JSR     PC,WAITF                ;WAIT FOR SSR TO SET
5721 034154  016501  000000                MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
5722 034160  012702  100204                MOV     #SSR!SC!BIT2,R2         ;SET UP EXPECTED
5723 034164  020102                        CMP     R1,R2                   ;ARE THEY EQUAL
5724 034166  001406                        BEQ     170$                    ;BR, IF OK
5725 034170  004737  020102                JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
5729 034174                                ERRHRD  ERRNO,T24TRL,PKTSSR     ;TSSR INCORRECT AFTER READ DATA
     034174  104456                                                                TRAP    C$ERHRD
     034176  000652                                                                .WORD   426
     034200  043104                                                                .WORD   T24TRL
     034202  011700                                                                .WORD   PKTSSR
5730 034204                        170$:   CKLOOP                          ;LOOP IF SELECTED
     034204  104406                                                                TRAP    C$CLP1
5731
5732                               ;*************************************************************************
5733                               ;
5734                               ;READ MESSAGE BUFFER EXTENDED STATUS REGISTER ZERO (XST0)
5735                               ;
5736                               ;*************************************************************************
5737
5738 034206  013701  040576                MOV     T24BFR+6,R1             ;GET MESSAGE BUFFER
5739 034212  010102                        MOV     R1,R2                   ;SET UP EXPECTED
5740 034214  052702  010000                BIS     #BIT12,R2               ;SET THE RLL BIT IN EXPECTED
5741 034220  020102                        CMP     R1,R2                   ;ARE THEY EQUAL
5742 034222  001406                        BEQ     180$                    ;BR, IF EQUAL (ALL IS WELL)
5743 034224  004737  020102                JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
5747 034230                                ERRHRD  ERRNO,T24LON,EXPREC     ;THE RLL BIT WAS NOT SET IN XST0
     034230  104456                                                                TRAP    C$ERHRD
     034232  000653                                                                .WORD   427
     034234  042652                                                                .WORD   T24LON
     034236  016344                                                                .WORD   EXPREC
5748 034240                        180$:
5749 034240                                ENDSUB                          ;>>>>>>>>>>>>> END SUBTEST >>>>>>>>>>>>>
     034240                                                                         L10052:
     034240  104403                                                                TRAP    C$ESUB
5750 034242  023727  002170  000031                CMP     FATFLG,#25.             ;IS ERROR COUNT AT 25
5751 034250  002402                                BLT     999$                    ;BR, IF LESS THAN 25
5752 034252  004737  020154                        JSR     PC,CKDROP               ;TRY TO DROP THE UNIT
5753 034256                        999$:
```

```
5755                                    ;*
5756                                    ;
5757                                    ;TEST 4, SUBTEST 4
5758                                    ;
5759                                    ;VERIFIES THAT A READ FORWARD COMMAND READING A RECORD
5760                                    ;SHORTER THAN THE SPECIFIED BYTE COUNT CAUSES TAPE
5761                                    ;STATUS ALERT TERMINATION WITH THE RECORD LENGTH SHORT
5762                                    ;(RLS) BITS SET. IT IS VERIFIED THAT THE RESIDUAL BYTE
5763                                    ;COUNT (RBPCR) IN THE MESSAGE BUFFER CONTAINS THE
5764                                    ;PROPER NONZERO VALUE (E.G. THE DIFFERENCE BETWEEN
5765                                    ;THE ORIGINAL BYTE COUNT AND THE ACTUAL RECORD
5766                                    ;LENGTH).
5767                                    ;
5768                                    ;
5769                                    ;-
5770
5771
5772 034256                                     BGNSUB                          ;>>>>>>>>>>>>> BEGIN SUBTEST >>>>>>>>>>>>>
      034256                                                                                    T4.4:
      034256  104402                                                                              TRAP    C$BSUB
5773 034260  004737  043374                     JSR     PC,T24RT3               ;SET UP OTHER COMMAND PACKET
5774 034264  004737  043240                     JSR     PC,T24REST              ;SET COMMAND PACKET
5775 034270  004737  043332                     JSR     PC,T24RT2               ;SET UP OTHER COMMAND PACKET
5776
5777                                    ;*************************************************************************
5778                                    ;
5779                                    ;ISSUE CONTROLLER "SOFT" INITIALIZE - CARRY BIT CLEAR IF ERROR
5780                                    ;
5781                                    ;*************************************************************************
5782
5783 034274  004737  016644                     JSR     PC,SOFINIT              ;DO INITIALIZE ON CONTROLLER
5784 034300  103407                             BCS     20$                     ;BR IF INIT WAS OK
5785 034302  004737  020102                     JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
5789 034306  010001                             MOV     R0,R1                   ;CONTENTS OF TSSR REGISTER
5790 034310                                     ERRDF   ERRNO,SFIERR,SFIMSG     ;FATAL ERROR TSSR WAS NOT OK
      034310  104455                                                                           TRAP    C$ERDF
      034312  000654                                                                           .WORD   428
      034314  003550                                                                           .WORD   SFIERR
      034316  011666                                                                           .WORD   SFIMSG
5791 034320                             20$:
5792 034320  012704  040550                     MOV     #T24PACKET,R4           ;SUBROUTINE NEEDS PACKET ADDRESS
5793
5794                                    ;*************************************************************************
5795                                    ;
5796                                    ;WRITE CHARACTERISTICS COMMAND (CALL TO WRTCHR)
5797                                    ;
5798                                    ;*************************************************************************
5799
5800 034324  004737  010332                     JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
5801 034330  103407                             BCS     24$                     ;BR, IF COMMAND ISSUED OK
5802 034332  004737  020102                     JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
5806 034336  010001                             MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
5807 034340                                     ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
      034340  104456                                                                           TRAP    C$ERHRD
      034342  000655                                                                           .WORD   429
      034344  004754                                                                           .WORD   WRTMSG
      034346  011666                                                                           .WORD   SFIMSG
```

```
5808 034350                          24$:    CKLOOP                          ;LOOP IF SELECTED
     034350  104406                                                                  TRAP    C$CLP1
5809
5810                                 ;*****************************************************************
5811                                 ;
5812                                 ;ISSUE REWIND COMMAND TO SELECTED TAPE DRIVE
5813                                 ;
5814                                 ;*****************************************************************
5815
5816 034352  004737  010434                  JSR     PC,REWIND               ;CALL TAPE REWIND COMMAND
5817 034356  103407                          BCS     30$                     ;BR, IF NO PROBLEM
5818 034360  010001                          MOV     R0,R1                   ;SAVE TSSR
5819 034362  004737  020102                  JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
5823 034366                                  ERRHRD  ERRNO,T24RWN,PKTSSR     ;REWIND NOT ACCEPTED
     034366  104456                                                                  TRAP    C$ERHRD
     034370  000656                                                                  .WORD   430
     034372  042036                                                                  .WORD   T24RWN
     034374  011700                                                                  .WORD   PKTSSR
5824 034376                          30$:    CKLOOP                          ;LOOP IF SELECTED
     034376  104406                                                                  TRAP    C$CLP1
5825 034400  012703  000400                  MOV     #256.,R3                ;RECORD SIZE
5826 034404  013737  003072  040702          MOV     FREE,T24RB              ;STARTING WRITE BUFFER ADDRESS
5827
5828                                 ;*****************************************************************
5829                                 ;
5830                                 ;WRITE DATA,ACK,CVC=1 COMMAND
5831                                 ;
5832                                 ;*****************************************************************
5833
5834 034412  012737  140005  040700          MOV     #140005,T24PK3          ;WRITE DATA,ACK,CVC=1 COMMAND
5835 034420  012704  040700                  MOV     #T24PK3,R4              ;SET UP R4 WITH PACKET ADDRESS
5836 034424                          65$:
5837 034424  010337  040706                  MOV     R3,T24SZ                ;SET UP RECORD SIZE IN PACKET
5838 034430  010465  177776                  MOV     R4,TSDB(R5)             ;ISSUE COMMAND
5839 034434  004737  017120                  JSR     PC,WAITF                ;WAIT FOR SSR TO SET
5840 034440  016501  000000                  MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
5841 034444  012702  000200                  MOV     #SSR,R2                 ;SET UP EXPECTED
5842 034450  020102                          CMP     R1,R2                   ;ARE THEY EQUAL
5843 034452  001406                          BEQ     75$                     ;BR, IF OK
5844 034454  004737  020102                  JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
5848                                                                         ;SOFT ERROR, REALLY CHECKING THE
5849                                                                         ;READ DATA COMMAND
5850 034460                                  ERRSOFT ERRNO,WRTERR,PKTSSR     ;TSSR INCORRECT AFTER WRITE DATA
     034460  104457                                                                  TRAP    C$ERSOFT
     034462  000657                                                                  .WORD   431
     034464  005011                                                                  .WORD   WRTERR
     034466  011700                                                                  .WORD   PKTSSR
5851 034470                          75$:    CKLOOP                          ;LOOP IF SELECTED
     034470  104406                                                                  TRAP    C$CLP1
5852 034472                          120$:
5853
5854                                 ;*****************************************************************
5855                                 ;
5856                                 ;ISSUE REWIND COMMAND TO SELECTED TAPE DRIVE
5857                                 ;
5858                                 ;*****************************************************************
5859
```

```
5860 034472  004737  010434                    JSR     PC,REWIND               ;CALL TAPE REWIND COMMAND
5861 034476  103407                            BCS     130$                    ;BR, IF NO PROBLEM
5862 034500  010001                            MOV     R0,R1                   ;SAVE TSSR
5863 034502  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
5867 034506                                    ERRHRD  ERRNO,T24RWN,PKTSSR     ;REWIND NOT ACCEPTED
     034506  104456                                                            TRAP    C$ERHRD
     034510  000660                                                            .WORD   432
     034512  042036                                                            .WORD   T24RWN
     034514  011700                                                            .WORD   PKTSSR
5868 034516                            130$:   CKLOOP                          ;LOOP IF SELECTED
     034516  104406                                                            TRAP    C$CLP1
5869 034520  012703  001000                    MOV     #512.,R3                ;RECORD SIZE
5870 034524  013737  003072  040702            MOV     FREE,T24RB              ;STARTING READ BUFFER ADDRESS
5871
5872                                   ;*****************************************************************
5873                                   ;
5874                                   ;READ DATA,ACK,CVC=1 COMMAND
5875                                   ;
5876                                   ;*****************************************************************
5877
5878 034532  012737  140001  040700            MOV     #140001,T24PK3          ;READ DATA,ACK,CVC=1 COMMAND
5879 034540  012704  040700            165$:   MOV     #T24PK3,R4              ;SET UP R4 WITH PACKET ADDRESS
5880 034544  010337  040706                    MOV     R3,T24SZ                ;SET UP RECORD SIZE IN PACKET
5881 034550  010465  177776                    MOV     R4,TSDB(R5)             ;ISSUE COMMAND
5882 034554  004737  017120                    JSR     PC,WAITF                ;WAIT FOR SSR TO SET
5883 034560  016501  000000                    MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
5884 034564  012702  100204                    MOV     #SSR!SC!BIT2,R2         ;SET UP EXPECTED
5885 034570  020102                            CMP     R1,R2                   ;ARE THEY EQUAL
5886 034572  001406                            BEQ     170$                    ;BR, IF OK
5887 034574  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
5891 034600                                    ERRHRD  ERRNO,T24TRL,EXPREC     ;TSSR INCORRECT AFTER READ DATA
     034600  104456                                                            TRAP    C$ERHRD
     034602  000661                                                            .WORD   433
     034604  043104                                                            .WORD   T24TRL
     034606  016344                                                            .WORD   EXPREC
5892 034610                            170$:   CKLOOP                          ;LOOP IF SELECTED
     034610  104406                                                            TRAP    C$CLP1
5893
5894                                   ;*****************************************************************
5895                                   ;
5896                                   ;READ MESSAGE BUFFER EXTENDED STATUS REGISTER ZERO (XSTO)
5897                                   ;
5898                                   ;*****************************************************************
5899
5900 034612  013701  040576                    MOV     T24BFR+6,R1             ;GET MESSAGE BUFFER
5901 034616  010102                            MOV     R1,R2                   ;SET UP EXPECTED
5902 034620  052702  040000                    BIS     #BIT14,R2               ;SET THE RLS BIT IN EXPECTED
5903 034624  020102                            CMP     R1,R2                   ;ARE THEY EQUAL
5904 034626  001406                            BEQ     180$                    ;BR, IF EQUAL (ALL IS WELL)
5905 034630  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
5909 034634                                    ERRHRD  ERRNO,T24LOP,EXPREC     ;THE RLL BIT WAS NOT SET IN XSTO
     034634  104456                                                            TRAP    C$ERHRD
     034636  000662                                                            .WORD   434
     034640  042734                                                            .WORD   T24LOP
     034642  016344                                                            .WORD   EXPREC
5910 034644                            180$:
5911 034644  013701  040574                    MOV     T24BFR+4,R1             ;PICK UP RESIDUAL BYTE COUNTER
```

```
5912 034650  012702  000400                    MOV     #256.,R2            ;THIS SHOULD BE THE DIFFERENCE
5913 034654  020102                            CMP     R1,R2               ;IS THE DIFFERENCE CORRECT
5914 034656  001406                            BEQ     190$                ;BR, IF CORRECT
5915 034660  004737  020102                    JSR     PC,FATCHK           ;INC AND CHECK FOR MORE THAN 25 ERRORS
5919 034664                                    ERRHRD  ERRNO,T24PBP,EXPREC ;RBPCR NOT CORRECT
     034664  104456                                                            TRAP    C$ERHRD
     034666  000663                                                            .WORD   435
     034670  043016                                                            .WORD   T24PBP
     034672  016344                                                            .WORD   EXPREC
5920 034674                            190$:   CKLOOP                      ;LOOP IF SELECTED
     034674  104406                                                            TRAP    C$CLP1
5921 034676                                    ENDSUB                      ;>>>>>>>>>>>>> END SUBTEST >>>>>>>>>>>>>
     034676                                                                 L10053:
     034676  104403                                                            TRAP    C$ESUB
5922 034700  023727  002170  000031            CMP     FATFLG,#25.                 ;IS ERROR COUNT AT 25
5923 034706  002402                            BLT     999$                        ;BR, IF LESS THAN 25
5924 034710  004737  020154                    JSR     PC,CKDROP                   ;TRY TO DROP THE UNIT
5925 034714                            999$:
```

```
5927                                    ;*
5928                                    ;
5929                                    ;TEST 4, SUBTEST 5
5930                                    ;
5931                                    ;VERIFIES THAT READ REVERSE COMMANDS WITH SWB=0
5932                                    ;OPERATES PROPERLY. THE TAPE IS FIRST REWOUND AND THEN
5933                                    ;WRITTEN WITH A SERIES OF TEST RECORDS VARING IN
5934                                    ;LENGTH AND DATA CONTENT. THE TAPE IS THEN READ IN REVERSE
5935                                    ;SEQUENTIALLY AND THE RESULTS
5936                                    ;(STATUS, DATA, ETC.) VERIFIED. THE BYTE COUNT ON
5937                                    ;EACH READ REVERSE COMMAND IS SET TO THE LENGTH OF THE
5938                                    ;EXPECTED RECORD, SO NO EXCEPTIONAL CONDITIONS SHOULD
5939                                    ;OCCUR.
5940                                    ;
5941                                    ;
5942                                    ;
5943                                    ;-
5944 034714                                    BGNSUB                          ;>>>>>>>>>>>>> BEGIN SUBTEST >>>>>>>>>>>>>
      034714                                                                                  T4.5:
      034714  104402                                                                            TRAP    C$BSUB
5945 034716  004737  043374                    JSR     PC,T24RT3               ;SET UP OTHER COMMAND PACKET
5946 034722  004737  043240                    JSR     PC,T24REST              ;SET COMMAND PACKET
5947 034726  004737  043332                    JSR     PC,T24RT2               ;SET UP OTHER COMMAND PACKET
5948
5949                                    ;*************************************************************************
5950                                    ;
5951                                    ;ISSUE CONTROLLER "SOFT" INITIALIZE - CARRY BIT CLEAR IF ERROR
5952                                    ;
5953                                    ;*************************************************************************
5954
5955 034732  004737  016644                    JSR     PC,SOFINIT              ;DO INITIALIZE ON CONTROLLER
5956 034736  103407                            BCS     20$                     ;BR IF INIT WAS OK
5957 034740  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
5961 034744  010001                            MOV     R0,R1                   ;CONTENTS OF TSSR REGISTER
5962 034746                                    ERRDF   ERRNO,SFIERR,SFIMSG     ;FATAL ERROR TSSR WAS NOT OK
      034746  104455                                                                          TRAP    C$ERDF
      034750  000664                                                                          .WORD   436
      034752  003550                                                                          .WORD   SFIERR
      034754  011666                                                                          .WORD   SFIMSG
5963 034756                            20$:
5964 034756  012704  040550                    MOV     #T24PACKET,R4           ;SUBROUTINE NEEDS PACKET ADDRESS
5965
5966                                    ;*************************************************************************
5967                                    ;
5968                                    ;WRITE CHARACTERISTICS COMMAND (CALL TO WRTCHR)
5969                                    ;
5970                                    ;*************************************************************************
5971
5972 034762  004737  010332                    JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
5973 034766  103407                            BCS     24$                     ;BR, IF COMMAND ISSUED OK
5974 034770  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
5978 034774  010001                            MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
5979 034776                                    ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
      034776  104456                                                                          TRAP    C$ERHRD
      035000  000665                                                                          .WORD   437
      035002  004754                                                                          .WORD   WRTMSG
      035004  011666                                                                          .WORD   SFIMSG
```

```
5980 035006                          24$:   CKLOOP                          ;LOOP IF SELECTED
     035006  104406                                                                TRAP    C$CLP1
5981
5982                                 ;*************************************************************************
5983                                 ;
5984                                 ;ISSUE REWIND COMMAND TO SELECTED TAPE DRIVE
5985                                 ;
5986                                 ;*************************************************************************
5987
5988 035010  004737  010434                JSR     PC,REWIND               ;CALL TAPE REWIND COMMAND
5989 035014  103407                        BCS     30$                     ;BR, IF NO PROBLEM
5990 035016  010001                        MOV     R0,R1                   ;SAVE TSSR
5991 035020  004737  020102                JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
5995 035024                                ERRHRD  ERRNO,T24RWN,PKTSSR     ;REWIND NOT ACCEPTED
     035024  104456                                                                TRAP    C$ERHRD
     035026  000666                                                                .WORD   438
     035030  042036                                                                .WORD   T24RWN
     035032  011700                                                                .WORD   PKTSSR
5996 035034                          30$:   CKLOOP                          ;LOOP IF SELECTED
     035034  104406                                                                TRAP    C$CLP1
5997 035036  012703  000400                MOV     #256.,R3                ;RECORD SIZE
5998 035042  013737  003072  040702        MOV     FREE,T24RB              ;STARTING WRITE BUFFER ADDRESS
5999
6000                                 ;*************************************************************************
6001                                 ;
6002                                 ;WRITE DATA,ACK,CVC=1 COMMAND
6003                                 ;
6004                                 ;*************************************************************************
6005
6006 035050  012737  140005  040700        MOV     #140005,T24PK3          ;WRITE DATA,ACK,CVC=1 COMMAND
6007 035056  012704  040700                MOV     #T24PK3,R4              ;SET UP R4 WITH PACKET ADDRESS
6008 035062                          65$:
6009 035062  010300                        MOV     R3,R0                   ;SET PATTERN IN CORRECT REGISTER
6010 035064  004737  020374                JSR     PC,FILLMEM              ;FILL MEMORY WITH RECORD SIZE
6011 035070  010337  040706                MOV     R3,T24SZ                ;SET UP RECORD SIZE IN PACKET
6012 035074  010465  177776                MOV     R4,TSDB(R5)             ;ISSUE COMMAND
6013 035100  004737  017120                JSR     PC,WAITF                ;WAIT FOR SSR TO SET
6014 035104  016501  000000                MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
6015 035110  012702  000200                MOV     #SSR,R2                 ;SET UP EXPECTED
6016 035114  020102                        CMP     R1,R2                   ;ARE THEY EQUAL
6017 035116  001406                        BEQ     75$                     ;BR, IF OK
6018 035120  004737  020102                JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6022                                                                       ;SOFT ERROR, REALLY CHECKING THE
6023                                                                       ;READ DATA COMMAND
6024 035124                                ERRSOFT ERRNO,WRTERR,PKTSSR     ;TSSR INCORRECT AFTER WRITE DATA
     035124  104457                                                                TRAP    C$ERSOFT
     035126  000667                                                                .WORD   439
     035130  005011                                                                .WORD   WRTERR
     035132  011700                                                                .WORD   PKTSSR
6025 035134                          75$:   CKLOOP                          ;LOOP IF SELECTED
     035134  104406                                                                TRAP    C$CLP1
6026 035136  005723                        TST     (R3)+                   ;BUMP RECORD SIZE
6027 035140  022703  000414                CMP     #268.,R3                ;END OF RECORD YET
6028 035144  001346                        BNE     65$                     ;BR, IF MORE RECORDS TO WRITE
6029 035146                          80$:   CKLOOP                          ;LOOP IF SELECTED
     035146  104406                                                                TRAP    C$CLP1
6030 035150  005743                        TST     -(R3)                   ;SET BACK TO 512.
```

```
6031 035152  013737  003072  040702          MOV     FREE,T24RB              ;STARTING READ BUFFER ADDRESS
6032
6033                                 ;*************************************************************************
6034                                 ;
6035                                 ;READ REVERSE DATA,ACK COMMAND
6036                                 ;
6037                                 ;*************************************************************************
6038
6039 035160  012737  100401  040700          MOV     #100401,T24PK3          ;READ REVERSE DATA,ACK COMMAND
6040 035166  012704  040700      165$:       MOV     #T24PK3,R4              ;SET UP R4 WITH PACKET ADDRESS
6041 035172  010337  040706                  MOV     R3,T24SZ                ;SET UP RECORD SIZE IN PACKET
6042 035176  010465  177776                  MOV     R4,TSDB(R5)             ;ISSUE COMMAND
6043 035202  004737  017120                  JSR     PC,WAITF                ;WAIT FOR SSR TO SET
6044 035206  016501  000000                  MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
6045 035212  012702  000200                  MOV     #SSR,R2                 ;SET UP EXPECTED
6046 035216  020102                          CMP     R1,R2                   ;ARE THEY EQUAL
6047 035220  001406                          BEQ     170$                    ;BR, IF OK
6048 035222  004737  020102                  JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6052 035226                                  ERRHRD  ERRNO,T24WDC,PKTSSR     ;TSSR INCORRECT AFTER READ DATA
     035226  104456                                                                  TRAP    C$ERHRD
     035230  000670                                                                  .WORD   440
     035232  042366                                                                  .WORD   T24WDC
     035234  011700                                                                  .WORD   PKTSSR
6053 035236                      170$:       CKLOOP                          ;LOOP IF SELECTED
     035236  104406                                                                  TRAP    C$CLP1
6054 035240  013702  003072                  MOV     FREE,R2                 ;GET BUFFER ADDRESS
6055 035244  010304                          MOV     R3,R4                   ;CURRENT RECORD SIZE
6056 035246  162704  000400                  SUB     #256.,R4                ;FIRST LOCATION IN BUFFER
6057 035252  060204              173$:       ADD     R2,R4                   ;SET POINTER TO FRAME (WORD)
6058 035254  021403                          CMP     (R4),R3                 ;CHECK DATA READ (R3=DATA ALSO)
6059 035256  001410                          BEQ     180$                    ;BR, IF ALL IS WELL
6060 035260  011401                          MOV     (R4),R1                 ;RECD DATA
6061 035262  010302                          MOV     R3,R2                   ;EXPECTED DATA
6062 035264  004737  020102                  JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6066 035270                                  ERRHRD  ERRNO,T24DTA,EXPREC     ;DATA READ NOT = WRITTEN
     035270  104456                                                                  TRAP    C$ERHRD
     035272  000671                                                                  .WORD   441
     035274  041620                                                                  .WORD   T24DTA
     035276  016344                                                                  .WORD   EXPREC
6067 035300                      180$:       CKLOOP                          ;LOOP IF SELECTED
     035300  104406                                                                  TRAP    C$CLP1
6068 035302  005724                          TST     (R4)+                   ;BUMP TO NEXT LOCATION
6069 035304  160204                          SUB     R2,R4                   ;GET RID OF BASE ADDRESS
6070 035306  020403                          CMP     R4,R3                   ;END OF RECORD YET
6071 035310  001360                          BNE     173$                    ;BR, IF NOT AT END OF RECORD
6072 035312  005743                          TST     -(R3)                   ;BUMP RECORD SIZE
6073 035314  022703  000400                  CMP     #256.,R3                ;END OF RECORD YET
6074 035320  001322                          BNE     165$                    ;BR, IF MORE RECORDS TO WRITE
6075 035322                      190$:       CKLOOP                          ;LOOP IF SELECTED
     035322  104406                                                                  TRAP    C$CLP1
6076 035324                                  ENDSUB                          ;>>>>>>>>>>>> END SUBTEST >>>>>>>>>>>>
     035324                                                                       L10054:
     035324  104403                                                                  TRAP    C$ESUB
6077 035326  023727  002170  000031          CMP     FATFLG,#25.                     ;IS ERROR COUNT AT 25
6078 035334  002402                          BLT     999$                            ;BR, IF LESS THAN 25
6079 035336  004737  020154                  JSR     PC,CKDROP                       ;TRY TO DROP THE UNIT
6080 035342                      999$:
```

```
                                ;*
                                ;
                                ;TEST 4, SUBTEST 6
                                ;
                                ;VERIFIES THAT READ DATA COMMANDS WITH CVC=1 AND THE
                                ;SWAP BYTES (SWB) BIT SET OPERATES PROPERLY. THE TEST
                                ;SEQUENCE IS IDENTICAL TO THAT USED IN SUBTEST 2.
                                ;THE RESULTS, EXCEPT FOR RAM CONTENTS, SHOULD BE THE SAME.
                                ;
                                ;
                                ;
                                ;-
035342                                  BGNSUB                          ;>>>>>>>>>>>>> BEGIN SUBTEST >>>>>>>>>>>>>
035342                                                                                  T4.6:
035342  104402                                                                          TRAP    C$BSUB
035344  004737  043374                JSR     PC,T24RT3               ;SET UP OTHER COMMAND PACKET
035350  004737  043240                JSR     PC,T24REST              ;SET COMMAND PACKET
035354  004737  043332                JSR     PC,T24RT2               ;SET UP OTHER COMMAND PACKET

                                ;*************************************************************************
                                ;
                                ;ISSUE CONTROLLER "SOFT" INITIALIZE - CARRY BIT CLEAR IF ERROR
                                ;
                                ;*************************************************************************

035360  004737  016644                JSR     PC,SOFINIT              ;DO INITIALIZE ON CONTROLLER
035364  103407                        BCS     20$                     ;BR IF INIT WAS OK
035366  004737  020102                JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
035372  010001                        MOV     R0,R1                   ;CONTENTS OF TSSR REGISTER
035374                                  ERRDF   ERRNO,SFIERR,SFIMSG     ;FATAL ERROR TSSR WAS NOT OK
035374  104455                                                                          TRAP    C$ERDF
035376  000672                                                                          .WORD   442
035400  003550                                                                          .WORD   SFIERR
035402  011666                                                                          .WORD   SFIMSG
035404                          20$:
035404  012704  040550                MOV     #T24PACKET,R4           ;SUBROUTINE NEEDS PACKET ADDRESS

                                ;*************************************************************************
                                ;
                                ;WRITE CHARACTERISTICS COMMAND (CALL TO WRTCHR)
                                ;
                                ;*************************************************************************

035410  004737  010332                JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
035414  103407                        BCS     24$                     ;BR, IF COMMAND ISSUED OK
035416  004737  020102                JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
035422  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
035424                                  ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
035424  104456                                                                          TRAP    C$ERHRD
035426  000673                                                                          .WORD   443
035430  004754                                                                          .WORD   WRTMSG
035432  011666                                                                          .WORD   SFIMSG
035434                          24$:    CKLOOP                          ;LOOP IF SELECTED
035434  104406                                                                          TRAP    C$CLP1

                                ;*************************************************************************
                                ;
```

```
                                ;ISSUE REWIND COMMAND TO SELECTED TAPE DRIVE
                                ;
                                ;*************************************************************************
                                
035436  004737  010434                JSR     PC,REWIND               ;CALL TAPE REWIND COMMAND
035442  103407                        BCS     30$                     ;BR, IF NO PROBLEM
035444  010001                        MOV     R0,R1                   ;SAVE TSSR
035446  004737  020102                JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
035452                                ERRHRD  ERRNO,T24RWN,PKTSSR     ;REWIND NOT ACCEPTED
035452  104456                                                                TRAP    C$ERHRD
035454  000674                                                                .WORD   444
035456  042036                                                                .WORD   T24RWN
035460  011700                                                                .WORD   PKTSSR
035462                          30$:    CKLOOP                          ;LOOP IF SELECTED
035462  104406                                                                TRAP    C$CLP1
035464  012703  000400                MOV     #256.,R3                ;RECORD SIZE
035470  013737  003072  040702        MOV     FREE,T24RB              ;STARTING WRITE BUFFER ADDRESS
                                
                                ;*************************************************************************
                                ;
                                ;WRITE DATA,ACK,CVC=1,SWB COMMAND
                                ;
                                ;*************************************************************************
                                
035476  012737  150005  040700        MOV     #150005,T24PK3          ;WRITE DATA,ACK,CVC=1,SWB COMMAND
035504  012704  040700                MOV     #T24PK3,R4              ;SET UP R4 WITH PACKET ADDRESS
035510                          65$:
035510  010300                        MOV     R3,R0                   ;SET PATTERN IN CORRECT REGISTER
035512  004737  020374                JSR     PC,FILLMEM              ;FILL MEMORY WITH RECORD SIZE
035516  010337  040706                MOV     R3,T24SZ                ;SET UP RECORD SIZE IN PACKET
035522  010465  177776                MOV     R4,TSDB(R5)             ;ISSUE COMMAND
035526  004737  017120                JSR     PC,WAITF                ;WAIT FOR SSR TO SET
035532  016501  000000                MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
035536  012702  000200                MOV     #SSR,R2                 ;SET UP EXPECTED
035542  020102                        CMP     R1,R2                   ;ARE THEY EQUAL
035544  001406                        BEQ     75$                     ;BR, IF OK
035546  004737  020102                JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
                                                                        ;SOFT ERROR, REALLY CHECKING THE
                                                                        ;READ DATA COMMAND
035552                                ERRSOFT ERRNO,WRTERR,PKTSSR     ;TSSR INCORRECT AFTER WRITE DATA
035552  104457                                                                TRAP    C$ERSOFT
035554  000675                                                                .WORD   445
035556  005011                                                                .WORD   WRTERR
035560  011700                                                                .WORD   PKTSSR
035562                          75$:    CKLOOP                          ;LOOP IF SELECTED
035562  104406                                                                TRAP    C$CLP1
035564  005723                        TST     (R3)+                   ;BUMP RECORD SIZE
035566  022703  000414                CMP     #268.,R3                ;END OF RECORD YET
035572  001346                        BNE     65$                     ;BR, IF MORE RECORDS TO WRITE
035574                          80$:    CKLOOP                          ;LOOP IF SELECTED
035574  104406                                                                TRAP    C$CLP1
035576  005743                        TST     -(R3)                   ;SET RECORD SIZE BACK TO 512.
035600  013737  003072  040702        MOV     FREE,T24RB              ;STARTING READ BUFFER ADDRESS
                                
                                ;*************************************************************************
                                ;
                                ;READ REVERSE DATA,ACK,SWB COMMAND
```

```
6186                                    ;
6187                                    ;*************************************************************************
6188
6189 035606  012737  110401  040700            MOV     #110401,T24PK3          ;READ REVERSE DATA,ACK,SWB COMMAND
6190 035614  012704  040700          165$:     MOV     #T24PK3,R4              ;SET UP R4 WITH PACKET ADDRESS
6191 035620  010337  040706                    MOV     R3,T24SZ                ;SET UP RECORD SIZE IN PACKET
6192 035624  010465  177776                    MOV     R4,TSDB(R5)             ;ISSUE COMMAND
6193 035630  004737  017120                    JSR     PC,WAITF                ;WAIT FOR SSR TO SET
6194 035634  016501  000000                    MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
6195 035640  012702  000200                    MOV     #SSR,R2                 ;SET UP EXPECTED
6196 035644  020102                            CMP     R1,R2                   ;ARE THEY EQUAL
6197 035646  001406                            BEQ     170$                    ;BR, IF OK
6198 035650  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6202 035654                                    ERRHRD  ERRNO,T24WDC,EXPREC     ;TSSR INCORRECT AFTER READ DATA
     035654  104456                                                                    TRAP    C$ERHRD
     035656  000676                                                                    .WORD   446
     035660  042366                                                                    .WORD   T24WDC
     035662  016344                                                                    .WORD   EXPREC
6203 035664                            170$:   CKLOOP                          ;LOOP IF SELECTED
     035664  104406                                                                    TRAP    C$CLP1
6204 035666  013702  003072                    MOV     FREE,R2                 ;GET BUFFER ADDRESS
6205 035672  010304                            MOV     R3,R4                   ;CURRENT RECORD SIZE
6206 035674  162704  000400                    SUB     #256.,R4                ;FIRST LOCATION IN BUFFER
6207 035700  060204                  173$:     ADD     R2,R4                   ;SET POINTER TO FRAME (WORD)
6208 035702  021403                            CMP     (R4),R3                 ;CHECK DATA READ (R3=DATA ALSO)
6209 035704  001410                            BEQ     180$                    ;BR, IF ALL IS WELL
6210 035706  011401                            MOV     (R4),R1                 ;RECD DATA
6211 035710  010302                            MOV     R3,R2                   ;EXPECTED DATA
6212 035712  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6216 035716                                    ERRHRD  ERRNO,T24DTA,EXPREC     ;DATA READ NOT = WRITTEN
     035716  104456                                                                    TRAP    C$ERHRD
     035720  000677                                                                    .WORD   447
     035722  041620                                                                    .WORD   T24DTA
     035724  016344                                                                    .WORD   EXPREC
6217 035726                            180$:   CKLOOP                          ;LOOP IF SELECTED
     035726  104406                                                                    TRAP    C$CLP1
6218 035730  005724                            TST     (R4)+                   ;BUMP TO NEXT LOCATION
6219 035732  160204                            SUB     R2,R4                   ;GET RID OF BASE ADDRESS
6220 035734  020403                            CMP     R4,R3                   ;END OF RECORD YET
6221 035736  001360                            BNE     173$                    ;BR, IF NOT AT END OF RECORD
6222 035740  005743                            TST     -(R3)                   ;BUMP RECORD SIZE
6223 035742  022703  000400                    CMP     #256.,R3                ;END OF RECORD YET
6224 035746  001322                            BNE     165$                    ;BR, IF MORE RECORDS TO WRITE
6225 035750                            190$:   CKLOOP                          ;LOOP IF SELECTED
     035750  104406                                                                    TRAP    C$CLP1
6226 035752                                    ENDSUB                          ;>>>>>>>>>>>> END SUBTEST >>>>>>>>>>>>
     035752                                                                         L10055:
     035752  104403                                                                    TRAP    C$ESUB
6227 035754  023727  002170  000031                CMP     FATFLG,#25.                     ;IS ERROR COUNT AT 25
6228 035762  002402                                BLT     999$                            ;BR, IF LESS THAN 25
6229 035764  004737  020154                        JSR     PC,CKDROP                       ;TRY TO DROP THE UNIT
6230 035770                            999$:
```

```
6232                                    ;*
6233                                    ;
6234                                    ;TEST 4, SUBTEST 7
6235                                    ;
6236                                    ;VERIFIES THAT A READ REVERSE COMMAND READING A RECORD
6237                                    ;LONGER THAN THE SPECIFIED BYTE COUNT CAUSES TAPE
6238                                    ;STATUS ALERT TERMINATION WITH THE RECORD LENGTH LONG
6239                                    ;(RLL) BIT SET.
6240                                    ;
6241                                    ;
6242                                    ;-
6243
6244 035770                                 BGNSUB                          ;>>>>>>>>>>>>> BEGIN SUBTEST >>>>>>>>>>>>>
      035770                                                                                T4.7:
      035770  104402                                                                  TRAP    C$BSUB
6245 035772  004737  043374                 JSR     PC,T24RT3               ;SET UP OTHER COMMAND PACKET
6246 035776  004737  043240                 JSR     PC,T24REST              ;SET COMMAND PACKET
6247 036002  004737  043332                 JSR     PC,T24RT2               ;SET UP OTHER COMMAND PACKET
6248
6249                                    ;*************************************************************************
6250                                    ;
6251                                    ;ISSUE CONTROLLER "SOFT" INITIALIZE - CARRY BIT CLEAR IF ERROR
6252                                    ;
6253                                    ;*************************************************************************
6254
6255 036006  004737  016644                 JSR     PC,SOFINIT              ;DO INITIALIZE ON CONTROLLER
6256 036012  103407                        BCS     20$                     ;BR IF INIT WAS OK
6257 036014  004737  020102                 JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6261 036020  010001                        MOV     R0,R1                   ;CONTENTS OF TSSR REGISTER
6262 036022                                ERRDF   ERRNO,SFIERR,SFIMSG     ;FATAL ERROR TSSR WAS NOT OK
      036022  104455                                                                  TRAP    C$ERDF
      036024  000700                                                                  .WORD   448
      036026  003550                                                                  .WORD   SFIERR
      036030  011666                                                                  .WORD   SFIMSG
6263 036032                            20$:
6264 036032  012704  040550                 MOV     #T24PACKET,R4           ;SUBROUTINE NEEDS PACKET ADDRESS
6265
6266                                    ;*************************************************************************
6267                                    ;
6268                                    ;WRITE CHARACTERISTICS COMMAND (CALL TO WRTCHR)
6269                                    ;
6270                                    ;*************************************************************************
6271
6272 036036  004737  010332                 JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
6273 036042  103407                        BCS     24$                     ;BR, IF COMMAND ISSUED OK
6274 036044  004737  020102                 JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6278 036050  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
6279 036052                                ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
      036052  104456                                                                  TRAP    C$ERHRD
      036054  000701                                                                  .WORD   449
      036056  004754                                                                  .WORD   WRTMSG
      036060  011666                                                                  .WORD   SFIMSG
6280 036062                            24$:    CKLOOP                          ;LOOP IF SELECTED
      036062  104406                                                                  TRAP    C$CLP1
6281
6282                                    ;*************************************************************************
6283                                    ;
```

```
6284                                    ;ISSUE REWIND COMMAND TO SELECTED TAPE DRIVE
6285                                    ;
6286                                    ;*************************************************************************
6287
6288 036064  004737  010434                    JSR     PC,REWIND               ;CALL TAPE REWIND COMMAND
6289 036070  004737  017236                    JSR     PC,CHKTSSR              ;SEE HOW TSSR IS
6290 036074  103407                            BCS     30$                     ;BR, IF NO PROBLEM
6291 036076  010001                            MOV     R0,R1                   ;SAVE TSSR
6292 036100  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6296 036104                                    ERRHRD  ERRNO,T24RWN,PKTSSR     ;REWIND NOT ACCEPTED
     036104  104456                                                                    TRAP    C$ERHRD
     036106  000702                                                                    .WORD   450
     036110  042036                                                                    .WORD   T24RWN
     036112  011700                                                                    .WORD   PKTSSR
6297 036114                            30$:    CKLOOP                          ;LOOP IF SELECTED
     036114  104406                                                                    TRAP    C$CLP1
6298 036116  012703  001000                    MOV     #512.,R3                ;RECORD SIZE
6299 036122  013737  003072  040702            MOV     FREE,T24RB              ;STARTING WRITE BUFFER ADDRESS
6300
6301                                    ;*************************************************************************
6302                                    ;
6303                                    ;WRITE DATA,ACK,CVC=1 COMMAND
6304                                    ;
6305                                    ;*************************************************************************
6306
6307 036130  012737  140005  040700            MOV     #140005,T24PK3          ;WRITE DATA,ACK,CVC=1 COMMAND
6308 036136  012704  040700                    MOV     #T24PK3,R4              ;SET UP R4 WITH PACKET ADDRESS
6309 036142                            65$:
6310 036142  010337  040706                    MOV     R3,T24SZ                ;SET UP RECORD SIZE IN PACKET
6311 036146  010465  177776                    MOV     R4,TSDB(R5)             ;ISSUE COMMAND
6312 036152  004737  017120                    JSR     PC,WAITF                ;WAIT FOR SSR TO SET
6313 036156  016501  000000                    MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
6314 036162  012702  000200                    MOV     #SSR,R2                 ;SET UP EXPECTED
6315 036166  020102                            CMP     R1,R2                   ;ARE THEY EQUAL
6316 036170  001406                            BEQ     75$                     ;BR, IF OK
6317 036172  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6321                                                                            ;SOFT ERROR, REALLY CHECKING THE
6322                                                                            ;READ DATA COMMAND
6323 036176                                    ERRSOFT ERRNO,WRTERR,PKTSSR     ;TSSR INCORRECT AFTER WRITE DATA
     036176  104457                                                                    TRAP    C$ERSOFT
     036200  000703                                                                    .WORD   451
     036202  005011                                                                    .WORD   WRTERR
     036204  011700                                                                    .WORD   PKTSSR
6324 036206                            75$:    CKLOOP                          ;LOOP IF SELECTED
     036206  104406                                                                    TRAP    C$CLP1
6325 036210  012703  000400                    MOV     #256.,R3                ;SIZE OF RECORD
6326 036214  013737  003072  040702            MOV     FREE,T24RB              ;STARTING READ BUFFER ADDRESS
6327
6328                                    ;*************************************************************************
6329                                    ;
6330                                    ;READ DATA,ACK COMMAND
6331                                    ;
6332                                    ;*************************************************************************
6333
6334 036222  012737  100401  040700            MOV     #100401,T24PK3          ;READ DATA,ACK COMMAND
6335 036230  012704  040700            165$:   MOV     #T24PK3,R4              ;SET UP R4 WITH PACKET ADDRESS
6336 036234  010337  040706                    MOV     R3,T24SZ                ;SET UP RECORD SIZE IN PACKET
```

```
6337 036240  010465  177776                MOV     R4,TSDB(R5)             ;ISSUE COMMAND
6338 036244  004737  017120                JSR     PC,WAITF                ;WAIT FOR SSR TO SET
6339 036250  016501  000000                MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
6340 036254  012702  100204                MOV     #SSR!SC!BIT2,R2         ;SET UP EXPECTED
6341 036260  020102                        CMP     R1,R2                   ;ARE THEY EQUAL
6342 036262  001406                        BEQ     170$                    ;BR, IF OK
6343 036264  004737  020102                JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6347 036270                                ERRHRD  ERRNO,T24TRL,EXPREC     ;TSSR INCORRECT AFTER READ DATA
     036270  104456                                                                TRAP    C$ERHRD
     036272  000704                                                                .WORD   452
     036274  043104                                                                .WORD   T24TRL
     036276  016344                                                                .WORD   EXPREC
6348 036300                        170$:   CKLOOP                          ;LOOP IF SELECTED
     036300  104406                                                                TRAP    C$CLP1
6349
6350                               ;*************************************************************************
6351                               ;
6352                               ;READ MESSAGE BUFFER EXTENDED STATUS REGISTER ZERO (XSTO)
6353                               ;
6354                               ;*************************************************************************
6355
6356 036302  013701  040576                MOV     T24BFR+6,R1             ;GET MESSAGE BUFFER (XSTO)
6357 036306  010102                        MOV     R1,R2                   ;SET UP EXPECTED
6358 036310  052702  010000                BIS     #BIT12,R2               ;SET THE RLL BIT IN EXPECTED
6359 036314  020102                        CMP     R1,R2                   ;ARE THEY EQUAL
6360 036316  001406                        BEQ     180$                    ;BR, IF EQUAL (ALL IS WELL)
6361 036320  004737  020102                JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6365 036324                                ERRHRD  ERRNO,T24LON,EXPREC     ;THE RLL BIT WAS NOT SET IN XSTO
     036324  104456                                                                TRAP    C$ERHRD
     036326  000705                                                                .WORD   453
     036330  042652                                                                .WORD   T24LON
     036332  016344                                                                .WORD   EXPREC
6366 036334                        180$:
6367 036334                                ENDSUB                          ;>>>>>>>>>>>> END SUBTEST >>>>>>>>>>>>
     036334                                                                     L10056:
     036334  104403                                                                TRAP    C$ESUB
6368 036336  023727  002170  000031                CMP     FATFLG,#25.             ;IS ERROR COUNT AT 25
6369 036344  002402                                BLT     999$                    ;BR, IF LESS THAN 25
6370 036346  004737  020154                        JSR     PC,CKDROP               ;TRY TO DROP THE UNIT
6371 036352                        999$:
6372                               ;+
```

```
6374                                    ;
6375                                    ;TEST 4, SUBTEST 8
6376                                    ;
6377                                    ;VERIFIES THAT A READ REVERSE COMMAND SPECIFYING A DATA
6378                                    ;BUFFER STARTING IN NONEXISTANT MEMORY TERMINATES WITH
6379                                    ;THE PROPER ERROR STATUS WITHOUT MOVING TAPE
6380                                    ;
6381                                    ;
6382                                    ;
6383                                    ;-
6384
6385 036352                                    BGNSUB                          ;>>>>>>>>>>>>> BEGIN SUBTEST >>>>>>>>>>>>>
      036352                                                                                    T4.8:
      036352  104402                                                                                TRAP    C$BSUB
6386 036354  012737  000000  040726          MOV     #0,T24DLY               ;ADDRESS BITS FOR LATER
6387 036362  005737  003100              9$: TST     KTFLG                   ;CHECK FOR KT11
6388                                        ;   BEQ     10$                     ;BR, IF NO KT11
6389                                        ;
6390                                        ;   DIALOG NXM PATCH
6391                                        ;
6392 036366  000240                         NOP                             ;REMOVE WHEN NXM IS FIXED
6393 036370  000137  037010                 JMP     180$                    ;JUMP IF KT11
6394 036374  004737  043374             10$: JSR     PC,T24RT3               ;SET UP OTHER COMMAND PACKET
6395 036400  004737  043240                 JSR     PC,T24REST              ;SET COMMAND PACKET
6396 036404  004737  043332                 JSR     PC,T24RT2               ;SET UP OTHER COMMAND PACKET
6397
6398                                    ;*************************************************************************
6399                                    ;
6400                                    ;ISSUE CONTROLLER "SOFT" INITIALIZE - CARRY BIT CLEAR IF ERROR
6401                                    ;
6402                                    ;*************************************************************************
6403
6404 036410  004737  016644                 JSR     PC,SOFINIT              ;DO INITIALIZE ON CONTROLLER
6405 036414  103407                         BCS     20$                     ;BR IF INIT WAS OK
6406 036416  004737  020102                 JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6410 036422  010001                         MOV     R0,R1                   ;CONTENTS OF TSSR REGISTER
6411 036424                                 ERRDF   ERRNO,SFIERR,SFIMSG     ;FATAL ERROR TSSR WAS NOT OK
      036424  104455                                                                            TRAP    C$ERDF
      036426  000706                                                                            .WORD   454
      036430  003550                                                                            .WORD   SFIERR
      036432  011666                                                                            .WORD   SFIMSG
6412 036434                             20$:
6413 036434  012704  040550                 MOV     #T24PACKET,R4           ;SUBROUTINE NEEDS PACKET ADDRESS
6414
6415                                    ;*************************************************************************
6416                                    ;
6417                                    ;WRITE CHARACTERISTICS COMMAND (CALL TO WRTCHR)
6418                                    ;
6419                                    ;*************************************************************************
6420
6421 036440  004737  010332                 JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
6422 036444  103407                         BCS     24$                     ;BR, IF COMMAND ISSUED OK
6423 036446  004737  020102                 JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6427 036452  010001                         MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
6428 036454                                 ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
      036454  104456                                                                            TRAP    C$ERHRD
      036456  000707                                                                            .WORD   455
```

```
      036460  004754                                                          .WORD   WRTMSG
      036462  011666                                                          .WORD   SFIMSG
 6429 036464                        24$:    CKLOOP                          ;LOOP IF SELECTED
      036464  104406                                                          TRAP    C$CLP1
 6430
 6431                               ;*****************************************************************
 6432                               ;
 6433                               ;ISSUE REWIND COMMAND TO SELECTED TAPE DRIVE
 6434                               ;
 6435                               ;*****************************************************************
 6436
 6437 036466  004737  010434                JSR     PC,REWIND               ;CALL TAPE REWIND COMMAND
 6438 036472  004737  017236                JSR     PC,CHKTSSR              ;SEE HOW TSSR IS
 6439 036476  103407                        BCS     30$                     ;BR, IF NO PROBLEM
 6440 036500  010001                        MOV     R0,R1                   ;SAVE TSSR
 6441 036502  004737  020102                JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
 6445 036506                                ERRHRD  ERRNO,T24RWN,PKTSSR     ;REWIND NOT ACCEPTED
      036506  104456                                                          TRAP    C$ERHRD
      036510  000710                                                          .WORD   456
      036512  042036                                                          .WORD   T24RWN
      036514  011700                                                          .WORD   PKTSSR
 6446 036516                        30$:    CKLOOP                          ;LOOP IF SELECTED
      036516  104406                                                          TRAP    C$CLP1
 6447 036520  012703  000400                MOV     #256.,R3                ;RECORD SIZE
 6448 036524  013737  003072  040702        MOV     FREE,T24RB              ;STARTING WRITE BUFFER ADDRESS
 6449
 6450                               ;*****************************************************************
 6451                               ;
 6452                               ;WRITE DATA,ACK,CVC-1 COMMAND
 6453                               ;
 6454                               ;*****************************************************************
 6455
 6456 036532  012737  140005  040700        MOV     #140005,T24PK3          ;WRITE DATA,ACK,CVC-1 COMMAND
 6457 036540  012704  040700                MOV     #T24PK3,R4              ;SET UP R4 WITH PACKET ADDRESS
 6458 036544                        65$:
 6459 036544  010337  040706                MOV     R3,T24SZ                ;SET UP RECORD SIZE IN PACKET
 6460 036550  010465  177776                MOV     R4,TSDB(R5)             ;ISSUE COMMAND
 6461 036554  004737  017120                JSR     PC,WAITF                ;WAIT FOR SSR TO SET
 6462 036560  016501  000000                MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
 6463 036564  012702  000200                MOV     #SSR,R2                 ;SET UP EXPECTED
 6464 036570  020102                        CMP     R1,R2                   ;ARE THEY EQUAL
 6465 036572  001406                        BEQ     75$                     ;BR, IF OK
 6466 036574  004737  020102                JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
 6470 036600                                ERRSOFT ERRNO,WRTERR,PKTSSR     ;TSSR INCORRECT AFTER WRITE DATA
      036600  104457                                                          TRAP    C$ERSOFT
      036602  000711                                                          .WORD   457
      036604  005011                                                          .WORD   WRTERR
      036606  011700                                                          .WORD   PKTSSR
 6471 036610                        75$:    CKLOOP                          ;LOOP IF SELECTED
      036610  104406                                                          TRAP    C$CLP1
 6472 036612  012703  000400                MOV     #256.,R3                ;RECORD SIZE
 6473 036616  012701  160000                MOV     #160000,R1              ;START POSSIBLE NXM ADDRESS
 6474 036622  012702  177776                MOV     #177776,R2              ;END POSSIBLE NXM ADDRESS
 6475 036626  004737  017276                JSR     PC,XNXM                 ;CALL NXM FINDER ROUTINE
 6476 036632  103402                        BCS     76$                     ;BR IF NXM ADDRESS FOUND
 6477 036634  000137  037010                JMP     180$                    ;JMP OVER CAN'T FIND NXM
 6478 036640  010137  040702        76$:    MOV     R1,T24RB                ;STARTING READ REVERSE BUFFER ADDRESS
```

```
6479
6480                                    ;*****************************************************************************
6481                                    ;
6482                                    ;READ REVERSE DATA,ACK COMMAND
6483                                    ;
6484                                    ;*****************************************************************************
6485
6486 036644  013737  040726  040704          MOV     T24DLY,T24RB+2          ;GET BITS 16 AND 17
6487 036652  012737  100401  040700          MOV     #100401,T24PK3          ;READ REVERSE DATA,ACK COMMAND
6488 036660  012704  040700          165$:   MOV     #T24PK3,R4              ;SET UP R4 WITH PACKET ADDRESS
6489 036664  012737  000400  040706          MOV     #256.,T24SZ             ;SET UP RECORD SIZE IN PACKET
6490 036672  010465  177776                  MOV     R4,TSDB(R5)             ;ISSUE COMMAND
6491 036676  004737  017120                  JSR     PC,WAITF                ;WAIT FOR SSR TO SET
6492 036702  016501  000000                  MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
6493 036706  012702  104210                  MOV     #SSR!NXM!SC!BIT3,R2     ;SET UP EXPECTED
6494 036712  020102                          CMP     R1,R2                   ;ARE THEY EQUAL
6495 036714  001417                          BEQ     170$                    ;BR, IF OK
6496 036716  062737  000001  040726          ADD     #1,T24DLY               ;NEXT BUNCH OF MEMORY
6497 036724  022737  000100  040726          CMP     #100,T24DLY             ;TOO MUCH MEMORY
6498 036732  001402                          BEQ     168$                    ;BR IF OVER
6499 036734  000137  036374                  JMP     10$                     ;TRY AGAIN
6500 036740  004737  020102          168$:   JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6504 036744                                  ERRHRD  ERRNO,T24NXM,PKTSSR     ;TSSR INCORRECT AFTER READ DATA
     036744  104456                                                                  TRAP    C$ERHRD
     036746  000712                                                                  .WORD   458
     036750  041141                                                                  .WORD   T24NXM
     036752  011700                                                                  .WORD   PKTSSR
6505 036754                          170$:   CKLOOP                          ;LOOP IF SELECTED
     036754  104406                                                                  TRAP    C$CLP1
6506
6507                                    ;*****************************************************************************
6508                                    ;
6509                                    ;READ MESSAGE BUFFER EXTENDED STATUS REGISTER ZERO (XSTO)
6510                                    ;
6511                                    ;*****************************************************************************
6512
6513 036756  013701  040576                  MOV     T24BFR+6,R1             ;GET MESSAGE BUFFER
6514 036762  010102                          MOV     R1,R2                   ;SET UP EXPECTED
6515 036764  052702  040000                  BIS     #BIT14,R2               ;SET THE RLS BIT IN EXPECTED
6516 036770  020102                          CMP     R1,R2                   ;ARE THEY EQUAL
6517 036772  001406                          BEQ     180$                    ;BR, IF EQUAL (ALL IS WELL)
6518 036774  004737  020102                  JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6522 037000                                  ERRHRD  ERRNO,T24LOP,EXPREC     ;THE RLL BIT WAS NOT SET IN XSTO
     037000  104456                                                                  TRAP    C$ERHRD
     037002  000713                                                                  .WORD   459
     037004  042734                                                                  .WORD   T24LOP
     037006  016344                                                                  .WORD   EXPREC
6523 037010                          180$:
6524 037010                                  ENDSUB                          ;>>>>>>>>>>>>> END SUBTEST >>>>>>>>>>>>>
     037010                                                                       L10057:
     037010  104403                                                                  TRAP    C$ESUB
6525 037012  023727  002170  000031                  CMP     FATFLG,#25.                     ;IS ERROR COUNT AT 25
6526 037020  002402                                  BLT     999$                            ;BR, IF LESS THAN 25
6527 037022  004737  020154                          JSR     PC,CKDROP                       ;TRY TO DROP THE UNIT
6528 037026                          999$:
```

```
6530                                    ;*
6531                                    ;
6532                                    ;TEST 4, SUBTEST 9
6533                                    ;
6534                                    ;VERIFIES THAT ILLEGAL BUFFER ADDRESSES CAUSE A
6535                                    ;FUNCTION REJECT TERMINATION WITH ILLEGAL ADDRESS
6536                                    ;(ILA) ERROR BIT SET.
6537                                    ;
6538                                    ;
6539                                    ;
6540                                    ;-
6541
6542 037026                                    BGNSUB                          ;>>>>>>>>>>>>> BEGIN SUBTEST >>>>>>>>>>>>>
      037026                                                                                    T4.9:
      037026  104402                                                                              TRAP    C$BSUB
6543 037030  004737  043374                    JSR     PC,T24RT3               ;SET COMMAND PACKET UP CLEAR
6544 037034  004737  043240                    JSR     PC,T24REST              ;SET COMMAND PACKET
6545 037040  004737  043332                    JSR     PC,T24RT2               ;SET UP OTHER COMMAND PACKET
6546
6547                                    ;*************************************************************************
6548                                    ;
6549                                    ;ISSUE CONTROLLER "SOFT" INITIALIZE - CARRY BIT CLEAR IF ERROR
6550                                    ;
6551                                    ;*************************************************************************
6552
6553 037044  004737  016644                    JSR     PC,SOFINIT              ;DO INITIALIZE ON CONTROLLER
6554 037050  103407                            BCS     20$                     ;BR IF INIT WAS OK
6555 037052  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6559 037056  010001                            MOV     R0,R1                   ;CONTENTS OF TSSR REGISTER
6560 037060                                    ERRDF   ERRNO,SFIERR,SFIMSG     ;FATAL ERROR TSSR WAS NOT OK
      037060  104455                                                                           TRAP    C$ERDF
      037062  000714                                                                           .WORD   460
      037064  003550                                                                           .WORD   SFIERR
      037066  011666                                                                           .WORD   SFIMSG
6561 037070                                20$:
6562 037070  012704  040550                        MOV     #T24PACKET,R4           ;SUBROUTINE NEEDS PACKET ADDRESS
6563
6564                                    ;*************************************************************************
6565                                    ;
6566                                    ;WRITE CHARACTERISTICS COMMAND (CALL TO WRTCHR)
6567                                    ;
6568                                    ;*************************************************************************
6569
6570 037074  004737  010332                    JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
6571 037100  103407                            BCS     24$                     ;BR, IF COMMAND ISSUED OK
6572 037102  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6576 037106  010001                            MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
6577 037110                                    ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
      037110  104456                                                                           TRAP    C$ERHRD
      037112  000715                                                                           .WORD   461
      037114  004754                                                                           .WORD   WRTMSG
      037116  011666                                                                           .WORD   SFIMSG
6578 037120                                24$:    CKLOOP                          ;LOOP IF SELECTED
      037120  104406                                                                           TRAP    C$CLP1
6579 037122  013737  003072  040702                MOV     FREE,T24RB              ;ILLEGAL STARTING READ BUFFER ADDRESS
6580 037130  012737  177700  040704                MOV     #177700,T24RB+2         ;CREATE ILLEGAL ADDRESS
6581
```

```
6582                                    ;*****************************************************************
6583                                    ;
6584                                    ;LEGAL MODE,ACK,CVC=1,READ COMMAND
6585                                    ;
6586                                    ;*****************************************************************
6587
6588 037136  012737  140001  040700          MOV     #140001,T24PK3          ;LEGAL MODE,ACK,CVC=1,READ COMMAND
6589 037144  012704  040700                  MOV     #T24PK3,R4              ;SET UP R4 WITH PACKET ADDRESS
6590 037150  012737  000400  040706          MOV     #256.,T24SZ             ;SET UP RECORD SIZE IN PACKET
6591 037156  010465  177776                  MOV     R4,TSDB(R5)             ;ISSUE COMMAND
6592 037162  004737  017120                  JSR     PC,WAITF                ;WAIT FOR SSR!BIT1!BIT2 TO SET
6593 037166  016501  000000                  MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
6594 037172  012702  100206                  MOV     #SSR!SC!BIT1!BIT2,R2    ;SET UP EXPECTED
6595 037176  020102                          CMP     R1,R2                   ;ARE THEY EQUAL
6596 037200  001406                          BEQ     75$                     ;BR, IF OK
6597 037202  004737  020102                  JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6601 037206                                  ERRHRD  ERRNO,T24WDG,PKTSSR     ;TSSR INCORRECT AFTER READ DATA
      037206  104456                                                                  TRAP    C$ERHRD
      037210  000716                                                                  .WORD   462
      037212  041052                                                                  .WORD   T24WDG
      037214  011700                                                                  .WORD   PKTSSR
6602 037216                          75$:    CKLOOP                          ;LOOP IF SELECTED
      037216  104406                                                                  TRAP    C$CLP1
6603
6604                                    ;*****************************************************************
6605                                    ;
6606                                    ;READ MESSAGE BUFFER EXTENDED STATUS REGISTER ZERO (XSTO)
6607                                    ;
6608                                    ;*****************************************************************
6609
6610 037220  013701  040576                  MOV     T24BFR+6,R1             ;GET MESSAGE BUFFER
6611 037224  010102                          MOV     R1,R2                   ;SET UP EXPECTED
6612 037226  052702  000400                  BIS     #BIT8,R2                ;SET THE ILA BIT IN EXPECTED
6613 037232  020102                          CMP     R1,R2                   ;ARE THEY EQUAL
6614 037234  001406                          BEQ     180$                    ;BR, IF EQUAL (ALL IS WELL)
6615 037236  004737  020102                  JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6619 037242                                  ERRHRD  ERRNO,T24ILA,EXPREC     ;THE ILA BIT WAS NOT SET IN XSTO
      037242  104456                                                                  TRAP    C$ERHRD
      037244  000717                                                                  .WORD   463
      037246  041302                                                                  .WORD   T24ILA
      037250  016344                                                                  .WORD   EXPREC
6620 037252                          180$:
6621 037252                                  ENDSUB                          ;>>>>>>>>>>>>> END SUBTEST >>>>>>>>>>>>>
      037252                                                                          L10060:
      037252  104403                                                                  TRAP    C$ESUB
6622 037254  023727  002170  000031                  CMP     FATFLG,#25.             ;IS ERROR COUNT AT 25
6623 037262  002402                                  BLT     999$                    ;BR, IF LESS THAN 25
6624 037264  004737  020154                          JSR     PC,CKDROP               ;TRY TO DROP THE UNIT
6625 037270                          999$:
```

```
6627                                    ;*
6628                                    ;
6629                                    ;TEST 4, SUBTEST 10
6630                                    ;
6631                                    ;VERIFIES THAT A DATA BUFFER ADDRESS REFERENCING
6632                                    ;NONEXISTANT MEMORY CAUSES RECOVERABLE ERROR
6633                                    ;TERMINATION (TC=4), WITH THE NXM BIT SET IN THE TSSR, AND
6634                                    ;THAT THE TAPE IS ULTIMATELY POSITIONED PROPERLY.
6635                                    ;
6636                                    ;
6637                                    ;
6638                                    ;-
6639
6640 037270                                BGNSUB                          ;>>>>>>>>>>>>> BEGIN SUBTEST >>>>>>>>>>>>>
      037270                                                                        T4.10:
      037270  104402                                                                      TRAP    C$BSUB
6641 037272  012737  000000  040726        MOV     #0,T24DLY               ;SET BITS 16 AND 17
6642 037300  005737  003100        9$:     TST     KTFLG                   ;CHECK FOR KT11
6643                                    ;   BEQ     10$                     ;BR, IF NO KT11
6644                                    ;
6645                                    ;   DIALOG NXM PATCH
6646                                    ;
6647 037304  000240                        NOP                             ;REMOVE WHEN NXM IS FIXED
6648 037306  000137  037544                JMP     80$                     ;JUMP IF KT11 (SKIP TEST)
6649 037312  004737  043374        10$:    JSR     PC,T24RT3               ;SET COMMAND PACKET UP CLEAR
6650 037316  004737  043240              JSR     PC,T24REST              ;SET COMMAND PACKET
6651 037322  004737  043332              JSR     PC,T24RT2               ;SET UP OTHER COMMAND PACKET
6652
6653                                    ;*******************************************************************
6654                                    ;
6655                                    ;ISSUE CONTROLLER "SOFT" INITIALIZE - CARRY BIT CLEAR IF ERROR
6656                                    ;
6657                                    ;*******************************************************************
6658
6659 037326  004737  016644                JSR     PC,SOFINIT              ;DO INITIALIZE ON CONTROLLER
6660 037332  103407                        BCS     20$                     ;BR IF INIT WAS OK
6661 037334  004737  020102                JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6665 037340  010001                        MOV     R0,R1                   ;CONTENTS OF TSSR REGISTER
6666 037342                                ERRDF   ERRNO,SFIERR,SFIMSG     ;FATAL ERROR TSSR WAS NOT OK
      037342  104455                                                                TRAP    C$ERDF
      037344  000720                                                                .WORD   464
      037346  003550                                                                .WORD   SFIERR
      037350  011666                                                                .WORD   SFIMSG
6667 037352                             20$:
6668 037352  012704  040550                MOV     #T24PACKET,R4           ;SUBROUTINE NEEDS PACKET ADDRESS
6669
6670                                    ;*******************************************************************
6671                                    ;
6672                                    ;WRITE CHARACTERISTICS COMMAND (CALL TO WRTCHR)
6673                                    ;
6674                                    ;*******************************************************************
6675
6676 037356  004737  010332                JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
6677 037362  103407                        BCS     24$                     ;BR, IF COMMAND ISSUED OK
6678 037364  004737  020102                JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6682 037370  010001                        MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
6683 037372                                ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
```

```
        037372  104456                                                          TRAP    C$ERHRD
        037374  000721                                                          .WORD   465
        037376  004754                                                          .WORD   WRTMSG
        037400  011666                                                          .WORD   SFIMSG
6684    037402                          24$:    CKLOOP                          ;LOOP IF SELECTED
        037402  104406                                                          TRAP    C$CLP1
6685    037404  012701  160000                  MOV     #160000,R1              ;START POSSIBLE NXM ADDRESS
6686    037410  012702  177776                  MOV     #177776,R2              ;END POSSIBLE NXM ADDRESS
6687    037414  004737  017276                  JSR     PC,XNXM                 ;CALL NXM FINDER ROUTINE
6688    037420  103402                          BCS     76$                     ;BR IF WE FOUND NXM
6689    037422  000137  037544                  JMP     180$                    ;JUMP OVER, CAN'T FIND NXM
6690    037426  010137  040702          76$:    MOV     R1,T24RB                ;STARTING READ BUFFER ADDRESS
6691                                    ;*******************************************************************
6692                                    ;
6693                                    ;READ, ACK, CVC=1, COMMAND
6694                                    ;
6695                                    ;*******************************************************************
6696
6697    037432  013737  040726  040704          MOV     T24DLY,T24RB+2          ;MEMORY BITS 16 AND 17
6698    037440  012737  140001  040700          MOV     #140001,T24PK3          ;READ, ACK, CVC=1, COMMAND
6699    037446  012704  040700                  MOV     #T24PK3,R4              ;SET UP R4 WITH PACKET ADDRESS
6700    037452  012737  000400  040706          MOV     #256.,T24SZ             ;SET UP RECORD SIZE IN PACKET
6701    037460  010465  177776                  MOV     R4,TSDB(R5)             ;ISSUE COMMAND
6702    037464  004737  017120                  JSR     PC,WAITF                ;WAIT FOR SSR!BIT1!BIT2 TO SET
6703    037470  016501  000000                  MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
6704    037474  012702  104210                  MOV     #SSR!SC!NXM!BIT3,R2     ;SET UP EXPECTED
6705    037500  020102                          CMP     R1,R2                   ;ARE THEY EQUAL
6706    037502  001417                          BEQ     75$                     ;BR, IF OK
6707    037504  062737  000001  040726          ADD     #1,T24DLY               ;NEXT BUNCH OF MEMORY
6708    037512  022737  000100  040726          CMP     #100,T24DLY             ;TOO MUCH MEMORY
6709    037520  001402                          BEQ     50$                     ;END OF LINE
6710    037522  000137  037312                  JMP     10$                     ;TRY AGAIN
6711    037526  004737  020102          50$:    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6715    037532                                  ERRHRD  ERRNO,T24NXM,PKTSSR     ;TSSR INCORRECT AFTER READ DATA
        037532  104456                                                                  TRAP    C$ERHRD
        037534  000722                                                                  .WORD   466
        037536  041141                                                                  .WORD   T24NXM
        037540  011700                                                                  .WORD   PKTSSR
6716    037542                          75$:    CKLOOP                          ;LOOP IF SELECTED
        037542  104406                                                                  TRAP    C$CLP1
6717    037544                          80$:
6718    037544                          180$:   ENDSUB                          ;>>>>>>>>>>>>> END SUBTEST >>>>>>>>>>>>>
        037544                                                                          L10061:
        037544  104403                                                                  TRAP    C$ESUB
6719    037546  023727  002170  000031          CMP     FATFLG,#25.                     ;IS ERROR COUNT AT 25
6720    037554  002402                          BLT     999$                            ;BR, IF LESS THAN 25
6721    037556  004737  020154                  JSR     PC,CKDROP                       ;TRY TO DROP THE UNIT
6722    037562                          999$:
```

```
                                        ;*
                                        ;
                                        ;TEST 4, SUBTEST 11
                                        ;
                                        ;VERIFIES THAT A READ REVERSE COMMAND ISSUED WHILE THE
                                        ;TAPE IS AT BOT RESULTS IN FUNCTION REJECT TERMINATION
                                        ;WITH THE NONEXECUTABLE FUNCTION (NEF) ERROR BIT SET
                                        ;
                                        ;
                                        ;-

                                            BGNSUB                      ;>>>>>>>>>>>>> BEGIN SUBTEST >>>>>>>>>>>>>
                                                                                        T4.11:
037562  104402                                                                          TRAP    C$BSUB
037564  004737  043374                    JSR     PC,T24RT3               ;SET COMMAND PACKET UP CLEAR
037570  004737  043240                    JSR     PC,T24REST              ;SET COMMAND PACKET
037574  004737  043332                    JSR     PC,T24RT2               ;SET UP OTHER COMMAND PACKET

                                        ;*************************************************************************
                                        ;
                                        ;ISSUE CONTROLLER "SOFT" INITIALIZE - CARRY BIT CLEAR IF ERROR
                                        ;
                                        ;*************************************************************************

037600  004737  016644                    JSR     PC,SOFINIT              ;DO INITIALIZE ON CONTROLLER
037604  103407                            BCS     20$                     ;BR IF INIT WAS OK
037606  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
037612  010001                            MOV     R0,R1                   ;CONTENTS OF TSSR REGISTER
037614                                    ERRDF   ERRNO,SFIERR,SFIMSG     ;FATAL ERROR TSSR WAS NOT OK
037614  104455                                                                          TRAP    C$ERDF
037616  000723                                                                          .WORD   467
037620  003550                                                                          .WORD   SFIERR
037622  011666                                                                          .WORD   SFIMSG
037624                                  20$:
037624  012704  040550                        MOV     #T24PACKET,R4           ;SUBROUTINE NEEDS PACKET ADDRESS

                                        ;*************************************************************************
                                        ;
                                        ;WRITE CHARACTERISTICS COMMAND (CALL TO WRTCHR)
                                        ;
                                        ;*************************************************************************

037630  004737  010332                    JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
037634  103407                            BCS     24$                     ;BR, IF COMMAND ISSUED OK
037636  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
037642  010001                            MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
037644                                    ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
037644  104456                                                                          TRAP    C$ERHRD
037646  000724                                                                          .WORD   468
037650  004754                                                                          .WORD   WRTMSG
037652  011666                                                                          .WORD   SFIMSG
037654                                  24$:    CKLOOP                  ;LOOP IF SELECTED
037654  104406                                                                          TRAP    C$CLP1

                                        ;*************************************************************************
                                        ;
```

```
6776                                    ;ISSUE REWIND COMMAND TO SELECTED TAPE DRIVE
6777                                    ;
6778                                    ;*************************************************************************
6779
6780 037656  004737  010434                    JSR     PC,REWIND               ;CALL TAPE REWIND COMMAND
6781 037662  004737  017236                    JSR     PC,CHKTSSR              ;SEE HOW TSSR IS
6782 037666  103407                            BCS     30$                     ;BR, IF NO PROBLEM
6783 037670  010001                            MOV     R0,R1                   ;SAVE TSSR
6784 037672  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6788 037676                                    ERRHRD  ERRNO,T24RWN,PKTSSR     ;REWIND NOT ACCEPTED
     037676  104456                                                                    TRAP    C$ERHRD
     037700  000725                                                                    .WORD   469
     037702  042036                                                                    .WORD   T24RWN
     037704  011700                                                                    .WORD   PKTSSR
6789 037706                            30$:    CKLOOP                          ;LOOP IF SELECTED
     037706  104406                                                                    TRAP    C$CLP1
6790 037710  012703  000400                    MOV     #256.,R3                ;RECORD SIZE
6791 037714  013737  003072  040702            MOV     FREE,T24RB              ;STARTING WRITE BUFFER ADDRESS
6792
6793                                    ;*************************************************************************
6794                                    ;
6795                                    ;READ REVERSE DATA,ACK COMMAND
6796                                    ;
6797                                    ;*************************************************************************
6798
6799 037722  012737  100401  040700            MOV     #100401,T24PK3          ;READ REVERSE DATA,ACK COMMAND
6800 037730  012704  040700                    MOV     #T24PK3,R4              ;SET UP R4 WITH PACKET ADDRESS
6801 037734                            65$:
6802 037734  010337  040706                    MOV     R3,T24SZ                ;SET UP RECORD SIZE IN PACKET
6803 037740  010465  177776                    MOV     R4,TSDB(R5)             ;ISSUE COMMAND
6804 037744  004737  017120                    JSR     PC,WAITF                ;WAIT FOR SSR TO SET
6805 037750  016501  000000                    MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
6806 037754  012702  100206                    MOV     #SSR!SC!BIT1!BIT2,R2    ;SET UP EXPECTED
6807 037760  020102                            CMP     R1,R2                   ;ARE THEY EQUAL
6808 037762  001406                            BEQ     75$                     ;BR, IF OK
6809 037764  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6813 037770                                    ERRHRD  ERRNO,T24WDE,PKTSSR     ;TSSR INCORRECT AFTER READ DATA
     037770  104456                                                                    TRAP    C$ERHRD
     037772  000726                                                                    .WORD   470
     037774  041501                                                                    .WORD   T24WDE
     037776  011700                                                                    .WORD   PKTSSR
6814 040000                            75$:    CKLOOP                          ;LOOP IF SELECTED
     040000  104406                                                                    TRAP    C$CLP1
6815
6816                                    ;*************************************************************************
6817                                    ;
6818                                    ;READ MESSAGE BUFFER EXTENDED STATUS REGISTER ZERO (XSTO)
6819                                    ;
6820                                    ;*************************************************************************
6821
6822 040002  013701  040576                    MOV     T24BFR+6,R1             ;GET MESSAGE BUFFER
6823 040006  010102                            MOV     R1,R2                   ;SET UP EXPECTED
6824 040010  052702  002000                    BIS     #BIT10,R2               ;SET THE NEF BIT IN EXPECTED
6825 040014  020102                            CMP     R1,R2                   ;ARE THEY EQUAL
6826 040016  001406                            BEQ     180$                    ;BR, IF EQUAL (ALL IS WELL)
6827 040020  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6831 040024                                    ERRHRD  ERRNO,T24NEF,EXPREC     ;THE RLL BIT WAS NOT SET IN XSTO
```

```
        040024  104456                                                          TRAP    C$ERHRD
        040026  000727                                                          .WORD   471
        040030  040730                                                          .WORD   T24NEF
        040032  016344                                                          .WORD   EXPREC
  6832  040034                                180$:
  6833  040034                                      ENDSUB                ;>>>>>>>>>>>>> END SUBTEST >>>>>>>>>>>>>
        040034                                                                  L10062:
        040034  104403                                                          TRAP    C$ESUB
  6834  040036  023727  002170  000031              CMP     FATFLG,#25.       ;IS ERROR COUNT AT 25
  6835  040044  002402                              BLT     999$              ;BR, IF LESS THAN 25
  6836  040046  004737  020154                      JSR     PC,CKDROP         ;TRY TO DROP THE UNIT
  6837  040052                                999$:
```

```
 6839                                   ;+
 6840                                   ;
 6841                                   ;TEST 4, SUBTEST 12
 6842                                   ;
 6843                                   ;VERIFIES THAT A READ REVERSE COMMAND ISSUED WHILE THE
 6844                                   ;TAPE IS POSITIONED BEFORE THE FIRST RECORD ON TAPE
 6845                                   ;(BUT NOT AT BOT) RESULTS IN TAPE STATUS ALERT.
 6846                                   ;
 6847                                   ;
 6848                                   ;
 6849                                   ;-
 6850
 6851 040052                                   BGNSUB                          ;>>>>>>>>>>>>> BEGIN SUBTEST >>>>>>>>>>>>>
      040052                                                                                    T4.12:
      040052  104402                                                                             TRAP    C$BSUB
 6852 040054  004737  043374                   JSR     PC,T24RT3               ;SET COMMAND PACKET UP CLEAR
 6853 040060  004737  043240                   JSR     PC,T24REST              ;SET COMMAND PACKET
 6854 040064  004737  043332                   JSR     PC,T24RT2               ;SET UP OTHER COMMAND PACKET
 6855
 6856                                   ;*************************************************************************
 6857                                   ;
 6858                                   ;ISSUE CONTROLLER "SOFT" INITIALIZE - CARRY BIT CLEAR IF ERROR
 6859                                   ;
 6860                                   ;*************************************************************************
 6861
 6862 040070  004737  016644                   JSR     PC,SOFINIT              ;DO INITIALIZE ON CONTROLLER
 6863 040074  103407                           BCS     20$                     ;BR IF INIT WAS OK
 6864 040076  004737  020102                   JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
 6868 040102  010001                           MOV     R0,R1                   ;CONTENTS OF TSSR REGISTER
 6869 040104                                   ERRDF   ERRNO,SFIERR,SFIMSG     ;FATAL ERROR TSSR WAS NOT OK
      040104  104455                                                                            TRAP    C$ERDF
      040106  000730                                                                           .WORD   472
      040110  003550                                                                           .WORD   SFIERR
      040112  011666                                                                           .WORD   SFIMSG
 6870 040114                            20$:
 6871 040114  012704  040550                   MOV     #T24PACKET,R4           ;SUBROUTINE NEEDS PACKET ADDRESS
 6872
 6873                                   ;*************************************************************************
 6874                                   ;
 6875                                   ;WRITE CHARACTERISTICS COMMAND (CALL TO WRTCHR)
 6876                                   ;
 6877                                   ;*************************************************************************
 6878
 6879 040120  004737  010332                   JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
 6880 040124  103407                           BCS     24$                     ;BR, IF COMMAND ISSUED OK
 6881 040126  004737  020102                   JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
 6885 040132  010001                           MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
 6886 040134                                   ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
      040134  104456                                                                            TRAP    C$ERHRD
      040136  000731                                                                           .WORD   473
      040140  004754                                                                           .WORD   WRTMSG
      040142  011666                                                                           .WORD   SFIMSG
 6887 040144                            24$:    CKLOOP                          ;LOOP IF SELECTED
      040144  104406                                                                            TRAP    C$CLP1
 6888
 6889                                   ;*************************************************************************
 6890                                   ;
```

```
6891                                    ;ISSUE REWIND COMMAND TO SELECTED TAPE DRIVE
6892                                    ;
6893                                    ;*************************************************************************
6894
6895 040146  004737  010434                    JSR     PC,REWIND               ;CALL TAPE REWIND COMMAND
6896 040152  004737  017236                    JSR     PC,CHKTSSR              ;SEE HOW TSSR IS
6897 040156  103407                            BCS     30$                     ;BR, IF NO PROBLEM
6898 040160  010001                            MOV     R0,R1                   ;SAVE TSSR
6899 040162  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6903 040166                                    ERRHRD  ERRNO,T24RWN,PKTSSR     ;REWIND NOT ACCEPTED
     040166  104456                                                                    TRAP    C$ERHRD
     040170  000732                                                                    .WORD   474
     040172  042036                                                                    .WORD   T24RWN
     040174  011700                                                                    .WORD   PKTSSR
6904 040176                            30$:    CKLOOP                          ;LOOP IF SELECTED
     040176  104406                                                                    TRAP    C$CLP1
6905 040200  012703  000400                    MOV     #256.,R3                ;RECORD SIZE
6906 040204  013737  003072  040702            MOV     FREE,T24RB              ;STARTING WRITE BUFFER ADDRESS
6907
6908                                    ;*************************************************************************
6909                                    ;
6910                                    ;WRITE DATA,ACK,CVC=1 COMMAND
6911                                    ;
6912                                    ;*************************************************************************
6913
6914 040212  012737  140005  040700            MOV     #140005,T24PK3          ;WRITE DATA,ACK,CVC=1 COMMAND
6915 040220  012704  040700                    MOV     #T24PK3,R4              ;SET UP R4 WITH PACKET ADDRESS
6916 040224                            65$:
6917 040224  010337  040706                    MOV     R3,T24SZ                ;SET UP RECORD SIZE IN PACKET
6918 040230  010465  177776                    MOV     R4,TSDB(R5)             ;ISSUE COMMAND
6919 040234  004737  017120                    JSR     PC,WAITF                ;WAIT FOR SSR TO SET
6920 040240  016501  000000                    MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
6921 040244  012702  000200                    MOV     #SSR,R2                 ;SET UP EXPECTED
6922 040250  020102                            CMP     R1,R2                   ;ARE THEY EQUAL
6923 040252  001406                            BEQ     75$                     ;BR, IF OK
6924 040254  004737  020102                    JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6928                                                                           ;SOFT ERROR, REALLY CHECKING THE
6929                                                                           ;READ REVERSE DATA COMMAND
6930 040260                                    ERRSOFT ERRNO,WRTERR,PKTSSR     ;TSSR INCORRECT AFTER READ DATA
     040260  104457                                                                    TRAP    C$ERSOFT
     040262  000733                                                                    .WORD   475
     040264  005011                                                                    .WORD   WRTERR
     040266  011700                                                                    .WORD   PKTSSR
6931 040270                            75$:    CKLOOP                          ;LOOP IF SELECTED
     040270  104406                                                                    TRAP    C$CLP1
6932 040272  012703  000400                    MOV     #256.,R3                ;RECORD SIZE
6933 040276  013737  003072  040702            MOV     FREE,T24RB              ;STARTING READ BUFFER ADDRESS
6934
6935                                    ;*************************************************************************
6936                                    ;
6937                                    ;READ REVERSE DATA,ACK COMMAND
6938                                    ;
6939                                    ;*************************************************************************
6940
6941 040304  012737  100401  040700            MOV     #100401,T24PK3          ;READ REVERSE DATA,ACK COMMAND
6942 040312  012704  040700            165$:   MOV     #T24PK3,R4              ;SET UP R4 WITH PACKET ADDRESS
6943 040316  010337  040706                    MOV     R3,T24SZ                ;SET UP RECORD SIZE IN PACKET
```

```
6944 040322  010465  177776                MOV     R4,TSDB(R5)             ;ISSUE COMMAND
6945 040326  004737  017120                JSR     PC,WAITF                ;WAIT FOR SSR TO SET
6946 040332  016501  000000                MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
6947 040336  012702  0C0200                MOV     #SSR,R2                 ;SET UP EXPECTED
6948 040342  020102                        CMP     R1,R2                   ;ARE THEY EQUAL
6949 040344  001406                        BEQ     170$                    ;BR, IF OK
6950 040346  004737  020102                JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6954 040352                                ERRHRD  ERRNO,T24TRL,PKTSSR     ;TSSR INCORRECT AFTER READ DATA
     040352  104456                                                                TRAP    C$ERHRD
     040354  000734                                                                .WORD   476
     040356  043104                                                                .WORD   T24TRL
     040360  011700                                                                .WORD   PKTSSR
6955 040362                        170$:   CKLOOP                          ;LOOP IF SELECTED
     040362  104406                                                                TRAP    C$CLP1
6956 040364  012703  000400                MOV     #256.,R3                ;RECORD SIZE
6957 040370  013737  003072  040702        MOV     FREE,T24RB              ;STARTING READ BUFFER ADDRESS
6958
6959                               ;*************************************************************************
6960                               ;
6961                               ;READ REVERSE DATA,ACK COMMAND
6962                               ;
6963                               ;*************************************************************************
6964
6965 040376  012737  100401  040700        MOV     #100401,T24PK3          ;READ REVERSE DATA,ACK COMMAND
6966 040404  012704  040700        195$:   MOV     #T24PK3,R4              ;SET UP R4 WITH PACKET ADDRESS
6967 040410  010337  040706                MOV     R3,T24SZ                ;SET UP RECORD SIZE IN PACKET
6968 040414  010465  177776                MOV     R4,TSDB(R5)             ;ISSUE COMMAND
6969 040420  004737  017120                JSR     PC,WAITF                ;WAIT FOR SSR TO SET
6970 040424  016501  000000                MOV     TSSR(R5),R1             ;GET TSSR CONTENTS
6971 040430  012702  100204                MOV     #SSR!SC!BIT2,R2                 ;SET UP EXPECTED
6972 040434  020102                        CMP     R1,R2                   ;ARE THEY EQUAL
6973 040436  001406                        BEQ     200$                    ;BR, IF OK
6974 040440  004737  020102                JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6978 040444                                ERRHRD  ERRNO,T24TRL,PKTSSR     ;TSSR INCORRECT AFTER READ DATA
     040444  104456                                                                TRAP    C$ERHRD
     040446  000735                                                                .WORD   477
     040450  043104                                                                .WORD   T24TRL
     040452  011700                                                                .WORD   PKTSSR
6979 040454                        200$:   CKLOOP                          ;LOOP IF SELECTED
     040454  104406                                                                TRAP    C$CLP1
6980 040456  013701  040604                MOV     T24BFR+14,R1            ;GET MESSAGE BUFFER (XST3)
6981 040462  010102                        MOV     R1,R2                   ;SET UP EXPECTED
6982 040464  052702  000001                BIS     #BIT0,R2                ;SET THE RIB BIT IN EXPECTED
6983 040470  020102                        CMP     R1,R2                   ;ARE THEY EQUAL
6984 040472  001406                        BEQ     210$                    ;BR, IF EQUAL (ALL IS WELL)
6985 040474  004737  020102                JSR     PC,FATCHK               ;INC AND CHECK FOR MORE THAN 25 ERRORS
6989 040500                                ERRHRD  ERRNO,T24LOR,EXPREC     ;THE RIB BIT WAS NOT SET IN XSTO
     040500  104456                                                                TRAP    C$ERHRD
     040502  000736                                                                .WORD   478
     040504  041002                                                                .WORD   T24LOR
     040506  016344                                                                .WORD   EXPREC
6990 040510                        210$:
6991 040510                                ENDSUB                          ;>>>>>>>>>>>>> END SUBTEST >>>>>>>>>>>>>
     040510                                                                          L10063:
     040510  104403                                                                TRAP    C$ESUB
6992 040512  023727  002170  000031                CMP     FATFLG,#25.             ;IS ERROR COUNT AT 25
6993 040520  002402                                BLT     999$                    ;BR, IF LESS THAN 25
```

```
 6995 040522  004737  020154                 JSR     PC,CKDROP                ;TRY TO DROP THE UNIT
 6996 040526                          999$:
 6997                                 ;
 6998                                 ;
 6999                                 ;
 7000 040526  004737  017356                 JSR     PC,TSTLOOP               ;DO WE NEED TO ITERATE TEST
 7001 040532  103002                         BCC     163$                     ;BR, IF NO LOOP REQUIRED
 7002 040534  000137  032224                 JMP     T24LOOP                  ;EXECUTE AGAIN
 7003 040540                          163$:
 7004 040540                                 EXIT    TST                      ;ALL DONE THIS TEST
      040540  104432                                                             TRAP    C$EXIT
      040542  002662                                                             .WORD   L10047-.
```

```
7006                                    ;*
7007                                    ;LOCAL STORAGE FOR THIS TEST
7008                                    ;-
7010 040544                                     .BLKB   10-<.-TUV2A&7>
7012 040550                             T24PACKET:                      ;COMMAND PACKET FOR TEST
7013 040550  100204                             .WORD   100204          ;WRITE CHARACTERISTICS COMMAND, WITH IE, ACK
7014 040552  040560                             .WORD   T24DATA         ;ADDRESS OF CHARACTERISTICS BLOCK
7015 040554  000000                             .WORD   0
7016 040556  000012                             .WORD   10.             ;STARTING VALUE OF BLOCK SIZE
7017 040560                             T24DATA:                        ;CHARACTERISTICS DATA BLOCK
7018 040560  040570                             .WORD   T24BFR          ;ADDRESS OF MESSAGE BUFFER
7019 040562  000000                             .WORD   0
7020 040564  000024                             .WORD   20.             ;LENGTH OF MESSAGE BUFFER
7021 040566  000000                             .WORD   0
7022 040570                             T24BFR: .BLKW   25.             ;MESSAGE BUFFER
7023                                    ;
7024                                    ;WRITE SUBSYSTEM MEMORY COMMAND PACKET
7025                                    ;
7027 040652                                     .BLKB   10-<.-TUV2A&7>
7029 040660                             T24PK2:
7030 040660  100206                             .WORD   100206          ;WRITE SUB SYS MEM COMMAND, IE AND ACK
7031 040662  040710                             .WORD   T24BF2          ;ADDRESS OF SELECT BLOCK DATA
7032 040664  000000                             .WORD   0
7033 040666  000006                             .WORD   6.              ;SIZE OF DATA PACKET
7034
7036 040670                                     .BLKB   10-<.-TUV2A&7>
7038 040700                             T24PK3:
7039 040700  100205                             .WORD   100205          ;READ COMMAND, IE AND ACK
7040 040702                             T24RB:
7041 040702  003072                     T24WB:  .WORD   FREE            ;ADDRESS OF WRITE BUFFER
7042 040704  000000                             .WORD   0
7043 040706  000000                     T24SZ:  .WORD   0               ;SIZE OF BUFFER (EXTENT)
7044                                            .EVEN
7045                                    ;
7046                                    ;
7047                                    ;
7048 040710                             T24BF2:
7049 040710     010                     T24BS0: .BYTE   10              ;BSEL0 AREA
7050 040711     200                     T24BS1: .BYTE   200             ;BSEL1 AREA
7051 040712  000000                     T24S2:  .WORD   0               ;SEL 2 AREA
7052 040714  000000                     T24S3:  .WORD   0               ;DATA AREA
7053                                    ;
7054                                    ;
7055                                            .EVEN
7056                                    ;TAPE MOTION PACKET COMMAND VALUES
7057
7058 040716  100005                     T24RN:  .WORD   100005          ;READ DATA (NEXT)
7059 040720  100405                     T24WDR: .WORD   100405          ;READ DATA RETRY
7060 040722  102005                     T24CON: .WORD   102005          ;WRITE CONTINOUS
7061 040724  177777                             .WORD   177777          ;END OF DATA
7062 040726  000000                     T24DLY: .WORD   0               ;DELAY STORAGE AREA
7063
7064
```

```
7066
7067                                    ;*
7068                                    ;LOCAL TEXT MESSAGES FOR TEST
7069                                    ;-
7070
7071 040730  116  105  106  T24NEF: .ASCIZ  'NEF Not Set After NON-EXECUTABLE FUNCTION'
7072 041002  122  111  102  T24LOR: .ASCIZ  'RIB Not Set After READ REVERSE Into BOT'
7073 041052  124  123  123  T24WDG: .ASCIZ  'TSSR Not Correct After Illegal Buffer Address Bits Set'
7074 041141  124  123  123  T24NXM: .ASCIZ  'TSSR Not Correct After NXM Memory Address In Packet'
7075 041225  124  123  123  T24WDF: .ASCIZ  'TSSR Not Correct After Illegal Mode Bits Set'
7076 041302  111  154  154  T24ILA: .ASCIZ  'Illegal Address Bits, Failed To Set ILA Bit In XSTO'
7077 041366  111  154  154  T24LOG: .ASCIZ  'Illegal Mode Bits, Failed To Set ILC Bit In XSTO'
7078 041447  122  105  101  T24SSR: .ASCIZ  'READ COMMAND Not Accepted'
7079 041501  124  123  123  T24WDE: .ASCIZ  'TSSR Not Correct After WRITE DATA Command'
7080 041553  124  141  160  T24BOT: .ASCIZ  'Tape Not At BOT After REWIND Command'
7081 041620  104  141  164  T24DTA: .ASCIZ  'Data Written To Tape Not Equal To Data Read From Tape'
7082 041706  122  105  101  T24EOT: .ASCIZ  'READ DATA OVER EOT GAVE NO TAPE STATUS ALERT'
7083 041763  124  123  123  T24TM:  .ASCIZ  'TSSR Not Correct After READ COMMAND Reject'
7084 042036  122  145  167  T24RWN: .ASCIZ  'Rewind (POSITION) Command Not Accepted'
7085 042105  122  101  115  T24RNC: .ASCIZ  'RAM Error, Correct Data Pattern Not In Ram'
7086 042160  124  123  123  T24AM3: .ASCIZ  'TSSR Init. Failed After READ COMMAND'
7087 042225  104  162  151  T240FL: .ASCIZ  'Drive 7 Select Failed To Set "OFL" In TSSR'
7088 042300  124  123  123  T24WDD: .ASCIZ  'TSSR Not Correct After READ DATA Command, SWB Bit Set'
7089 042366  124  123  123  T24WDC: .ASCIZ  'TSSR Not Correct After READ DATA Command'
7090 042437  103  126  103  T24VCK: .ASCIZ  'CVC Set, Didn''t Reset VCK In Message Buffer'
7091 042512  124  123  102  T24BA:  .ASCIZ  'TSBA Not Correct After READ DATA Command'
7092 042563  127  122  111  T24WSS: .ASCIZ  'WRITE SUBSYSTEM MEMORY Command Not Accepted (RAM Read)'
7093 042652  122  145  141  T24LON: .ASCIZ  'Reading Long Record Failed To Set RLL Bit In XSTO'
7094 042734  122  145  141  T24LOP: .ASCIZ  'Reading Long Record Failed To Set RLS Bit In XSTO'
7095 043016  122  145  163  T24PBP: .ASCIZ  'Residual Byte Count Incorrect After Short Record Read'
7096 043104  122  145  141  T24TRL: .ASCIZ  'Reading Long Record  Failed To Give Tape Status Alert'
7097 043172  102  141  163  TST24ID:        .ASCIZ  'Basic Read Data (Forward and Reverse)'
7098                                            .EVEN
7099                                    ;*
7100                                    ;
7101                                    ;ROUTINE TO RESTORE COMMAND PACKET TO START-UP (DEFAULT) VALUES
7102                                    ;WRITE SUBSYSTEM MEMORY COMMAND
7103                                    ;
7104                                    ;-
7105
7106 043240                             T24REST:
7107 043240                                     SAVREG                          ;SAVE THE REGISTERS
7108 043244  012701  040550                    MOV     @T24PACKET,R1           ;START OF THE PACKET
7109 043250  012721  100004                    MOV     @100004,(R1)+           ;WRITE SUBSYSTEM MEM. WITH ACK.
7110 043254  012721  040560                    MOV     @T24DATA,(R1)+          ;ADDRESS OF CHARAISTICS DATA BLOCK
7111 043260  005021                            CLR     (R1)+                   ;EXTENDED ADDRESS
7112 043262  012721  000012                    MOV     @10.,(R1)+              ;SIZE OF DATA BLOCK IN BYTES
7113 043266  012721  040570                    MOV     @T24BFR,(R1)+           ;ADDRESS OF MESSAGE BUFFER
7114 043272  005021                            CLR     (R1)+
7115 043274  012721  000024                    MOV     @20.,(R1)+              ;LENGTH OF MESSAGE BUFFER
7116 043300  005021                            CLR     (R1)+
7117 043302  012711  000000                    MOV     @0,(R1)                 ;SELECT DRIVE ZERO
7118 043306  012702  000030                    MOV     @24.,R2                 ;NUMBER OF LOCATIONS TO BE CLEARED
7119 043312  012762  177777  040570  64$:     MOV     @177777,T24BFR(R2)      ;ALL ONES TO MESSAGE BUFFER
7120 043320  005742                            TST     -(R2)                   ;NEXT LOCATION
7121 043322  022702  000000                    CMP     @0,R2                   ;CKECK FOR END OF LOOP
7122 043326  001371                            BNE     64$                     ;KEEP GOING UNTIL DONE
```

```
7123 043330  000207                    RTS     PC                      ;RETURN
7124
7125
7126 043332                        T24RT2:
7127 043332                            SAVREG                          ;SAVE THE REGISTERS
7128 043336  012701  040660            MOV     #T24PK2,R1              ;START OF THE PACKET
7129 043342  012721  100206            MOV     #100206,(R1)+           ;WRITE SUBSYSTEM MEM. WITH ACK, IE
7130 043346  012721  040710            MOV     #T24BF2,(R1)+           ;ADDRESS OF DATA BLOCK
7131 043352  005021                    CLR     (R1)+                   ;EXTENDED ADDRESS
7132 043354  012721  000006            MOV     #6.,(R1)+               ;SIZE OF DATA BLOCK IN BYTES
7133 043360  005021                    CLR     (Ri)+
7134 043362  012701  040710            MOV     #T24BF2,R1              ;POINT TO DATA SEL AREA
7135 043366  005021                    CLR     (R1)+
7136 043370  005011                    CLR     (R1)
7137 043372  000207                    RTS     PC                      ;RETURN
7138 043374                        T24RT3:
7139 043374                            SAVREG                          ;SAVE THE REGISTERS
7140 043400  012701  040700            MOV     #T24PK3,R1              ;START OF THE PACKET
7141 043404  012721  000000            MOV     #0,(R1)+                ;CLEAR AREA OUT
7142 043410  012721  000000            MOV     #0,(R1)+                ;ADDRESS OF DATA BLOCK
7143 043414  005021                    CLR     (R1)+                   ;EXTENDED ADDRESS
7144 043416  012711  000000            MOV     #0,(R1)                 ;SIZE OF DATA BLOCK IN BYTES
7145 043422  000207                    RTS     PC                      ;RETURN
7146 043424                            ENDTST
     043424                                                    L10047:
     043424  104401                                                TRAP    C$ETST
```

```
                        .SBTTL  TEST 5: MANUAL INTERVENTION

;THIS TEST MUST BE STARTED AS FOLLOWS:
;
;AT THE DIAGNOSTIC SUPERVISOR PROMPT "DR>"
;TYPE "START/FLAG:PNT/TEST:5/PASS:1"
;       ---------------------------
;
;
;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 4.
;SELECTION CODES AND SUBROUTINES ARE:
;
;
;       CODE    ROUTINE
;
;         0     HELP. PRINTS THIS MENU.
;         1     REWIND AND UNLOAD COMMAND TEST
;         2     WRITE-PROTECT TEST
;         3     FRONT PANEL ON-LINE SWITCH TEST
;         4     EXIT (RETURN TO SUPERVISOR)
;
;
;EACH MENU ITEM CORRESPONDS TO A SUBTEST, AS FOLLOWS:
;
;
;
;SELECTION 0 - PRINTS OUT THE MENU ON THE CONSOLE TERMINAL.
;
;
;
;
;
;SELECTION 1 - THIS ROUTINE INSTRUCTS THE OPERATOR TO PLACE THE DRIVE ON-LINE
;AND AT OR BEYOND BOT. THE TEST WILL THEN ISSUE THE REWIND AND
;UNLOAD COMMAND. IT WILL ALSO TELL THE OPERATOR IF THE DRIVE
;ENDED UP ON-LINE OR OFF-LINE.
;
;
;SELECTION 2 - THIS ROUTINE INSTRUCTS THE OPERATOR TO MOUNT A SCRATCH
;TAPE REEL THAT DOES NOT HAVE A WRITE-ENABLE RING INSTALLED, THEN
;WAITS FOR THE OPERATOR TO RESPOND THAT THIS HAS BEEN ACCOMPLISHED.
;UPON THE RESPONSE, THE PROGRAM VERIFIES THAT THE TRANSPORT SHOWS
;A WRITE-PROTECTED STATUS, THEN ATTEMPTS TO WRITE DATA ON THE
;TAPE AND EXPECTS THE APPROPRIATE ERROR TERMINATION INDICATING THAT
;THE WRITE FUNCTION COULD NOT BE PERFORMED BECAUSE THE REEL IS
;WRITE-PROTECTED.  IF THE APPROPRIATE TERMINATION IS NOT RECEIVED,
;AN ERROR IS REPORTED.
;
;SELECTION 3 - THIS TEST CHECKS THAT THE PROGRAM CAN READ THE SENSE
;OF THE FRONT PANEL "ON-LINE" BUTTON/LIGHT. THE PROGRAM CHECKS THE
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```
                                        ;STATE OF THE DRIVE (ON-LINE OR OFF-LINE) AND PRINTS A MESSAGE TO
                                        ;NOTIFY THE OPERATOR I.E. "DRIVE IS NOW OFF-LINE" OR "DRIVE IS NOW ON-LINE".
                                        ;
                                        ;
                                        ;SELECTION 4 - THIS WILL RETURN THE PROGRAM TO THE DIAGNOSTIC
                                        ;SUPERVISOR PROMPT. NOTE: IF THE OPERATOR FAILED TO SELECT A PASS
                                        ;COUNT OF ONE, THE PROGRAM WILL LOOP UNTIL STOPPED WITH A CONTROL C.
                                        ;
                                        ;
                                        ;
                                        ;
043426                                          BGNTST
043426                                                                          T5::
043426  005037  002170                          CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
043432  005037  003100                          CLR     KTFLG                   ;HOLD OFF KT11
043436  005737  002162                          TST     TSTCNT                  ;IS THIS THE FIRST TEST
043442  001403                                  BEQ     21$                     ;BR, IF FIRST TEST
043444  012700  045400                          MOV     #T38NE,R0               ;"TEST NOT EXECUTED"
043450  000402                                  BR      3$                      ;JUMP IF NOT FIRST TEST
043452                                  21$:
043452  012700  046466                          MOV     #T38ID,R0               ;TEST ID MESSAGE
043456  004737  017410                  3$:     JSR     PC,TSTSETUP             ;DO THE COMMON SETUP
043462  004737  021404                          JSR     PC,CHKMAN               ;IS MANUAL INTERVENTION ALLOWED?
043466  103402                                  BCS     19$                     ;BR, IF MANUAL INTER ALLOWED
043470  000137  044600                          JMP     64$                     ;JUMP IF NOT ALLOWED
043474  022737  000001  002162          19$:    CMP     #1,TSTCNT               ;CHECK MIGHT HAVE TO LEAVE
043502  001402                                  BEQ     22$                     ;BR, IF YOU DON'T HAVE TO
043504  000137  044600                          JMP     64$                     ;WASN'T FIRST TEST IN SEQUENCE
043510                                  22$:
043510  005037  002170                  2$:     CLR     FATFLG                  ;CLEAR THE FATAL ERROR FLAG
043514  012737  176750  044612                  MOV     #65000.,T38DLY          ;SET UP DELAY COUNTER
043522  004737  016644                  5$:     JSR     PC,SOFINIT              ;DO A SOFT INIT
043526  103427                                  BCS     23$                     ;BRANCH IF OK
043530  010001                                  MOV     R0,R1                   ;CONTENTS OF TSSR REGISTER
043532  032701  000200                          BIT     #SSR,R1                 ;CHECK FOR TSSR SET
043536  001023                                  BNE     23$                     ;KEEP GOING IF NOT SET
043540                                          DELAY   250                     ;CALL DELAY ROUTINE
043540  012727  000250                                                                  MOV     #250,(PC)+
043544  000000                                                                          .WORD   0
043546  013727  002116                                                                  MOV     L$DLY,(PC)+
043552  000000                                                                          .WORD   0
043554  005367  177772                                                                  DEC     -6(PC)
043560  001375                                                                          BNE     .-4
043562  005367  177756                                                                  DEC     -22(PC)
043566  001367                                                                          BNE     .-20
043570  005337  044612                          DEC     T38DLY                  ;BUMP COUNTER DOWN
043574  001352                                  BNE     5$                      ;BR, IF MORE TIME LEFT
043576                                          ERRDF   ERRNO,SFIERR,SFIMSG     ;REPORT FATAL ERROR
043576  104455                                                                  TRAP    C$ERDF
043600  000765                                                                  .WORD   501
043602  003550                                                                  .WORD   SFIERR
043604  011666                                                                  .WORD   SFIMSG
043606  012700  046512                  23$:    MOV     #MIMENU,R0              ;MENU OF MANUAL INTERVENTIONS
043612  012701  000004                          MOV     #4,R1                   ;MAXIMUM ALLOWED SELECTION
043616  004737  021162                          JSR     PC,GETSEL               ;GO GET THE OPERATORS SELECTION
043622  010004                                  MOV     R0,R4                   ;GET NUMBER FROM ROUTINE
043624  006304                                  ASL     R4                      ;CONVERT TO WORD OFFSET
```

```
 7256 043626  000174  043632                 JMP     @6$(R4)                 ;JUMP TO PROPER LOOP
 7257 043632  043510                 6$:     .WORD   2$                      ;RETYPE THE MENU
 7258 043634  043644                         .WORD   20$                     ; 1 REWIND AND UNLOAD COMMAND TEST
 7259 043636  044176                         .WORD   25$                     ; 2 WRITE PROTECT
 7260 043640  044456                         .WORD   500$                    ; 3 FRONT PANEL ON-LINE SWITCH TEST
 7261 043642  044600                         .WORD   63$                     ; 4 LEAVE THE TEST
 7262
 7263
 7264 043644                         20$:    PRINTF  #T38MS4                 ;TELL'EM WHAT TO DO
      043644  012746  046026                                                             MOV     #T38MS4,-(SP)
      043650  012746  000001                                                             MOV     #1,-(SP)
      043654  010600                                                                     MOV     SP,R0
      043656  104417                                                                     TRAP    C$PNTF
      043660  062706  000004                                                             ADD     #4,SP
 7265 043664  004737  016644         222$:   JSR     PC,SOFINIT              ;DO SOFT INIT OF CONTROLLER
 7266 043670  103405                         BCS     300$                    ;BR IF SOFT INIT = OK
 7270 043672  010001                         MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
 7271 043674                                 ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL ERROR DURING INIT
      043674  104455                                                                     TRAP    C$ERDF
      043676  000766                                                                     .WORD   502
      043700  003550                                                                     .WORD   SFIERR
      043702  011666                                                                     .WORD   SFIMSG
 7272 043704                         300$:
 7273 043704  012704  045320                 MOV     #T38PK2,R4              ;SUBROUTINE NEEDS PACKET ADDRESS
 7274 043710  004737  010332                 JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
 7275 043714  103405                         BCS     310$                    ;BR, IF COMMAND ISSUED OK
 7279 043716  010001                         MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
 7280 043720                                 ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
      043720  104456                                                                     TRAP    C$ERHRD
      043722  000767                                                                     .WORD   503
      043724  004754                                                                     .WORD   WRTMSG
      043726  011666                                                                     .WORD   SFIMSG
 7281 043730                         310$:
 7282 043730  012737  000031  044612         MOV     #25.,T38DLY             ;SET UP FOR A LONG WAIT
 7283 043736  036527  000000  000100 311$:   BIT     TSSR(R5),#OFL           ;IS DRIVE OFF-LINE
 7284 043744  001431                         BEQ     315$                    ;BR, IF DRIVE IS ON-LINE
 7285 043746                                 DELAY   250                     ;DELAY ABOUT .25 SEC
      043746  012727  000250                                                             MOV     #250.,(PC)+
      043752  000000                                                                     .WORD   0
      043754  013727  002116                                                             MOV     L$DLY,(PC)+
      043760  000000                                                                     .WORD   0
      043762  005367  177772                                                             DEC     -6(PC)
      043766  001375                                                                     BNE     .-4
      043770  005367  177756                                                             DEC     -22(PC)
      043774  001367                                                                     BNE     .-20
 7286 043776  005337  044612                 DEC     T38DLY                  ;BUMP LONG DELAY COUNTER DOWN
 7287 044002  001355                         BNE     311$                    ;BR, IF MORE LONG DELAY TO GO
 7288 044004                                 PRINTF  #T38OFL                 ;"DRIVE IS NOW OFF-LINE"
      044004  012746  045772                                                             MOV     #T38OFL,-(SP)
      044010  012746  000001                                                             MOV     #1,-(SP)
      044014  010600                                                                     MOV     SP,R0
      044016  104417                                                                     TRAP    C$PNTF
      044020  062706  000004                                                             ADD     #4,SP
 7289 044024  000137  043664                 JMP     222$                    ;STAY HERE FOREVER, WITH MESSAGE
 7290 044030                         315$:   PRINTF  #T38MS5                 ;"DRIVE SHOULD NOW REWIND AND GO OFL"
      044030  012746  046105                                                             MOV     #T38MS5,-(SP)
      044034  012746  000001                                                             MOV     #1,-(SP)
```

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                                                                                MOV     SP,R0
                                                                                TRAP    C$PNTF
                                                                                ADD     #4,SP
7291 044050 012704 045350               MOV     #T38PK3,R4      ;SET UP NEW PACKET FOR REWIND/RELEASE
7292 044054 010465 177776               MOV     R4,TSDB(R5)     ;REWIND RELEASE,ACK,CVC=1 CMD
7293 044060 004737 017120               JSR     PC,WAITF        ;WAIT FOR SSR TO SET
7294 044064 016501 000000               MOV     TSSR(R5),R1     ;GET TSSR STATUS
7295 044070 012702 000300       320$:   MOV     #SSR!OFL,R2     ;SET UP EXPECTED
7296 044074 020201                      CMP     R2,R1           ;IS EVERYTHING OK
7297 044076 001404                      BEQ     350$            ;BR, IF ALL IS WELL
7301 044100                             ERRHRD  ERRNO,T38SST,PKTSSR     ;DEVICE FATAL SSR FAILED TO SET
     044100 104456                                                              TRAP    C$ERHRD
     044102 000770                                                              .WORD   504
     044104 046240                                                              .WORD   T38SST
     044106 011700                                                              .WORD   PKTSSR
7302 044110                     350$:   CKLOOP                  ;LOOP ON ERROR, IF FLAG SET
     044110 104406                                                              TRAP    C$CLP1
7303 044112 016501 000000               MOV     TSSR(R5),R1     ;READ TSSR STATUS
7304 044116 032701 000100               BIT     #OFL,R1         ;CHECK THE OFF-LINE BIT
7305 044122 001011                      BNE     380$            ;BR, IF DRIVE IS OFF-LINE
7306 044124                             PRINTF  #T380NL         ;"DRIVE IS NOW ON-LINE"
     044124 012746 045676                                                       MOV     #T380NL,-(SP)
     044130 012746 000001                                                       MOV     #1,-(SP)
     044134 010600                                                              MOV     SP,R0
     044136 104417                                                              TRAP    C$PNTF
     044140 062706 000004                                                       ADD     #4,SP
7307 044144 000410                      BR      390$            ;ALMOST DONE
7308 044146                     380$:   PRINTF  #T380FL         ;"DRIVE IS NOW OFF-LINE"
     044146 012746 045772                                                       MOV     #T380FL,-(SP)
     044152 012746 000001                                                       MOV     #1,-(SP)
     044156 010600                                                              MOV     SP,R0
     044160 104417                                                              TRAP    C$PNTF
     044162 062706 000004                                                       ADD     #4,SP
7309 044166 005037 002172       390$:   CLR     INTRECV         ;CLEAR INTERRUPT FLAG
7310 044172 000137 043510               JMP     2$              ;TRY AGAIN
7311 044176                     25$:    GMANIL  T38MSG,T38DAT,-1,NO     ;WAIT FOR OPERATOR TO MOUNT TAPE
     044176 104443                                                              TRAP    C$GMAN
     044200 000404                                                              BR      10000$
     044202 047042                                                              .WORD   T38DAT
     044204 000120                                                              .WORD   T$CODE
     044206 046370                                                              .WORD   T38MSG
     044210 177777                                                              .WORD   -1
     044212                                                             10000$:
7312 044212                             BNCOMPLETE 25$          ;RETRY IF ERROR
     044212 103371                                                              BCC     25$
7313 044214 005737 047042               TST     T38DAT          ;DID OPERATOR SAY 'YES' ?
7314 044220 001002                      BNE     27$             ;BRANCH IF YES
7315 044222 000137 043510               JMP     2$              ;RETURN TO MAIN MENU
7316 044226                     27$:
7317 044226 004737 016644               JSR     PC,SOFINIT      ;DO SOFT INIT OF CONTROLLER
7318 044232 103405                      BCS     400$            ;BR IF SOFT INIT = OK
7322 044234 010001                      MOV     R0,R1           ;SAVE CONTENTS OF TSSR
7323 044236                             ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL ERROR DURING INIT
     044236 104455                                                              TRAP    C$ERDF
     044240 000771                                                              .WORD   505
     044242 003550                                                              .WORD   SFIERR
     044244 011666                                                              .WORD   SFIMSG
```

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7324 044246                          400$:  CKLOOP                          ;LOOP IF SELECTED
     044246  104406                                                                 TRAP    C$CLP1
7325 044250  012704  045320                 MOV     #T38PK2,R4             ;SUBROUTINE NEEDS PACKET ADDRESS
7326 044254  004737  010332                 JSR     PC,WRTCHR              ;ISSUE WRITE CHARACTERISTICS
7327 044260  103405                         BCS     410$                   ;BR, IF COMMAND ISSUED OK
7331 044262  010001                         MOV     R0,R1                  ;SAVE CONTENTS OF TSSR
7332 044264                                 ERRHRD  ERRNO,WRTMSG,SFIMSG    ;WRITE CHARACTERISTISC FAILED
     044264  104456                                                                 TRAP    C$ERHRD
     044266  000772                                                                 .WORD   506
     044270  004754                                                                 .WORD   WRTMSG
     044272  011666                                                                 .WORD   SFIMSG
7333 044274                          410$:  CKLOOP                          ;LOOP IF SELECTED
     044274  104406                                                                 TRAP    C$CLP1
7334 044276  013701  044644                 MOV     T38BFR+6,R1            ;PICK UP XSTO CONTENTS
7335 044302  010102                         MOV     R1,R2                  ;SET UP EXPECTED
7336 044304  052702  000004                 BIS     #BIT2,R2               ;SET UP THE WRITE LOCKED BIT
7337 044310  020102                         CMP     R1,R2                  ;ARE THEY CORRECT
7338 044312  001406                         BEQ     430$                   ;BR, IF ALL IS WELL (OK)
7342 044314                                 ERRHRD  ERRNO,T38WRL,EXPREC    ;"WRITE LOCKED BIT IS NOT SET ETC."
     044314  104456                                                                 TRAP    C$ERHRD
     044316  000773                                                                 .WORD   507
     044320  045541                                                                 .WORD   T38WRL
     044322  016344                                                                 .WORD   EXPREC
7343 044324  000137  043510                 JMP     2$                     ;BECAUSE OF ERROR GO BACK TO MENU
7344 044330                          430$:  CKLOOP                          ;LOOP IF SELECTED
     044330  104406                                                                 TRAP    C$CLP1
7345 044332                                 PRINTF  #T38WOK                ;PRINT "DRIVE IS WRITE PROTECTED"
     044332  012746  046430                                                         MOV     #T38WOK,-(SP)
     044336  012746  000001                                                         MOV     #1,-(SP)
     044342  010600                                                                 MOV     SP,R0
     044344  104417                                                                 TRAP    C$PNTF
     044346  062706  000004                                                         ADD     #4,SP
7346 044352  017737  136514  045372  435$:  MOV     @FREE,T38WR            ;SET UP WRITE BUFFER ADDRESS
7347 044360  012704  045370                 MOV     #T38PK4,R4             ;GET PACKET ADDRESS
7348 044364  010465  177776                 MOV     R4,TSDB(R5)            ;SET THE PACKET ADDRESS
7349 044370  004737  017120                 JSR     PC,WAITF               ;WAIT FOR SSR TO SET
7350 044374  016501  000000                 MOV     TSSR(R5),R1            ;GET TSSR
7351 044400  012702  100206                 MOV     #SC!SSR!BIT1!BIT2,R2   ;SET UP EXPECTED
7352 044404  020102                         CMP     R1,R2                  ;ARE THEY EQUAL (CORRECT)
7353 044406  001404                         BEQ     440$                   ;BR, IF CORRECT STATUS
7357 044410                                 ERRHRD  ERRNO,T38WRT,PKTSSR    ;"TSSR INCORRECT AFTER WRITE COMMAND
     044410  104456                                                                 TRAP    C$ERHRD
     044412  000774                                                                 .WORD   508
     044414  045455                                                                 .WORD   T38WRT
     044416  011700                                                                 .WORD   PKTSSR
7358 044420                          440$:  CKLOOP                          ;LOOP ON ERROR, IF FLAG SET
     044420  104406                                                                 TRAP    C$CLP1
7359 044422  013701  044644                 MOV     T38BFR+6,R1            ;READ XSTO CONTENTS
7360 044426  010102                         MOV     R1,R2                  ;SET UPR EXPECTED
7361 044430  052702  004000                 BIS     #BIT11,R2              ;SET THE WRITE LOCK ERROR BIT (XSTO)
7362 044434  020102                         CMP     R1,R2                  ;WAS THE BIT SET
7363 044436  001404                         BEQ     450$                   ;BR, IF IT WAS (GOOD)
7367 044440                                 ERRHRD  ERRNO,T38WLE,EXPREC    ;"WRITE LOCK ERROR BIT NOT SET"
     044440  104456                                                                 TRAP    C$ERHRD
     044442  000775                                                                 .WORD   509
     044444  045602                                                                 .WORD   T38WLE
     044446  016344                                                                 .WORD   EXPREC
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7368 044450
     044450  104406
7369 044452  000137  043510          450$:   CKLOOP                          ;LOOP IF SELECTED
                                                                                    TRAP    C$CLP1
                                             JMP     2$                      ;GO BACK TO MENU
7370
7371 044456                          500$:   PRINTF  #T38MS6                 ;TELL'EM WHAT TO DO
     044456  012746  046162                                                          MOV     #T38MS6,-(SP)
     044462  012746  000001                                                        MOV     #1,-(SP)
     044466  010600                                                                MOV     SP,R0
     044470  104417                                                                TRAP    C$PNTF
     044472  062706  000004                                                        ADD     #4,SP
7372 044476  004737  016644          510$:   JSR     PC,SOFINIT              ;DO SOFT INIT OF CONTROLLER
7373 044502  103405                          BCS     520$                    ;BR IF SOFT INIT = OK
7377 044504  010001                          MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
7378 044506                                  ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL ERROR DURING INIT
     044506  104455                                                                TRAP    C$ERDF
     044510  000776                                                                .WORD   510
     044512  003550                                                                .WORD   SFIERR
     044514  011666                                                                .WORD   SFIMSG
7379 044516                          520$:
7380 044516  016503  000000                  MOV     TSSR(R5),R3             ;IS DRIVE OFF-LINE
7381 044522  030327  000100                  BIT     R3,#OFL                 ;LOOK AT THE OFF-LINE BIT
7382 044526  001412                          BEQ     550$                    ;BR, IF DRIVE IS ON-LINE
7383 044530                                  PRINTF  #T380FL                 ;"DRIVE IS NOW OFF-LINE"
     044530  012746  045772                                                          MOV     #T380FL,-(SP)
     044534  012746  000001                                                        MOV     #1,-(SP)
     044540  010600                                                                MOV     SP,R0
     044542  104417                                                                TRAP    C$PNTF
     044544  062706  000004                                                        ADD     #4,SP
7384 044550  000137  043510                  JMP     2$                      ;RETURN TO MENU
7385
7386
7387 044554                          550$:   PRINTF  #T380NM                 ;"DRIVE IS NOW ON-LINE"
     044554  012746  045740                                                          MOV     #T380NM,-(SP)
     044560  012746  000001                                                        MOV     #1,-(SP)
     044564  010600                                                                MOV     SP,R0
     044566  104417                                                                TRAP    C$PNTF
     044570  062706  000004                                                        ADD     #4,SP
7388 044574  000137  043510                  JMP     2$                      ;RETURN TO MENU
7389
7390 044600                          63$:
7391 044600                          64$:    EXIT    TST                     ;LEAVE TEST
     044600  104432                                                                TRAP    C$EXIT
     044602  002752                                                                .WORD   L10064-.
7392
7393                                 ;+
7394                                 ;LOCAL TEXT MESSAGES FOR TEST
7395                                 ;-
7396
7397                                 ;LOCAL STORAGE FOR THIS TEST
7398                                 ;-
7399                                 ;+
7400                                 ;LOCAL STORAGE FOR THIS TEST
7401                                 ;-
7402
7403 044604  000000          TTION2:         .WORD   0               ;WORD SET IF SUPERVISOR TTI INTER OFF
7404 044606  000000          TVSAV2: .WORD   0               ;SAVE TTI VECTOR
7405 044610  000000          TPSAV2: .WORD   0               ;SAVE TTI PRIORITY
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7406
7407 044612  000000                T38DLY: .WORD   0                       ;DELAY COUNTER FOR TEST
7409 044614                              .BLKB   10-<.-TUV2A&7>
7411 044620                      T38PACKET:                              ;COMMAND PACKET FOR TEST
7412 044620  140006                      .WORD   140006                  ;WRITE SUBSYSTEM MEM. CMD,  ACK,CVC=1
7413 044622  044630                      .WORD   T38TAD                  ;ADDRESS OF CHARACTERISTICS BLOCK
7414 044624  000000                      .WORD   0
7415 044626  000012                      .WORD   10.                     ;STARTING VALUE OF BLOCK SIZE
7416 044630                      T38TAD:                         ;CHARACTERISTICS DATA BLOCK
7417 044630     000              T38BS0: .BYTE   0                       ;BSEL0 BYTE
7418 044631     000              T38BS1: .BYTE   0                       ;BSEL1 BYTE
7419 044632  000000              T38BS2: .WORD   0                       ;BSEL1 WORD
7420 044634  000000                      .WORD   0                       ;DATA
7421 044636                      T38BFR: .BLKW   150.                    ;MESSAGE BUFFER
7422 045312  000000              T38EB:  .WORD                           ;END OF BUFFER ADDRESS
7423
7424
7426 045314                              .BLKB   10-<.-TUV2A&7>
7428 045320                      T38PK2:                                 ;COMMAND PACKET FOR TEST
7429 045320  140004                      .WORD   140004                  ;WRITE CHARA. MEM. CMND.,  ACK,CVC=1
7430 045322  045330                      .WORD   T38DTA                  ;ADDRESS OF SELECT DATA BLOCK
7431 045324  000000                      .WORD   0
7432 045326  000012                      .WORD   10.                     ;STARTING VALUE OF BLOCK SIZE
7433
7434
7435 045330                      T38DTA:                                 ;SELECT DATA BLOCK
7436 045330  044636                      .WORD   T38BFR                  ;ADDRESS OF MESSAGE BUFFER
7437 045332  000000                      .WORD   0
7438 045334  000400                      .WORD   256.                    ;LENGTH OF MESSAGE BUFFER
7439 045336  000000              T38EAI: .WORD   0                       ;EAI BIT WORD
7441 045340                              .BLKB   10-<.-TUV2A&7>
7443 045350  140412              T38PK3: .WORD   140412                  ;REWIND AND UNLOAD COMMAND
7444 045352  000000                      .WORD   0                       ;NOT USED
7445 045354  000000                      .WORD   0                       ;NOT USED
7446 045356  000000                      .WORD   0                       ;NOT USED
7447 045360  000000                      .WORD   0                       ;NOT USED
7448                             ;
7449                             ;WRITE TAPE PACKET
7450                             ;
7452 045362                              .BLKB   10-<.-TUV2A&7>
7454 045370  140005              T38PK4: .WORD   140005                  ;WRITE, ACK, CVC=1 COMMAND
7455 045372  000000              T38WR:  .WORD   0                       ;ADDRESS OF WRITE BUFFER
7456 045374  000000                      .WORD   0                       ;MORE ADDRESS OF WRITE BUFFER
7457 045376  000400              T38SIZ: .WORD   256.                    ;SIZE OF RECORD
7458
7459
7460
7461
7462                             ;+
7463                             ;LOCAL TEXT MESSAGES FOR TEST
7464                             ;-
7465
7466
7467
7468
7469
7470 045400     123     164     141  T38NE:  .ASCIZ  'Stand-alone Manual Intervention Not Executed'
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7471 045455  124  123  123  T38WRT: .ASCIZ  'TSSR Not Correct After WRITE, With WRITE PROTECT On'
7472 045541  127  122  111  T38WRL: .ASCIZ  'WRITE LOCKED Bit Not Set In XSTO'
7473 045602  127  122  111  T38WLE: .ASCIZ  'WRITE LOCK ERROR Bit Not Set In XSTO, After Attempted WRITE'
7474 045676  045  116  045  T38ONL: .ASCIZ  '%N%A ERROR Drive Is Still ON-LINE'
7475 045740  045  116  045  T38ONM: .ASCIZ  '%N%A Drive Is Now ON-LINE'
7476 045772  045  116  045  T38OFL: .ASCIZ  '%N%A Drive Is Now  OFF-LINE'
7477 046026  045  116  045  T38MS4: .ASCIZ  '%N%A Set Drive To On-line and At Or Beyond BOT'
7478 046105  045  116  045  T38MS5: .ASCIZ  '%N%A Drive Should Now Rewind and Go Off-line'
7479
7480 046162  045  116  045  T38MS6: .ASCIZ  '%N%A Front Panel On-line/Off-line Switch Test'
7481 046240  103  157  156  T38SST: .ASCIZ  'Contents Of TSSR Incorrect After REWIND And RELEASE'
7482 046324  045  116  045  T38MS2: .ASCIZ  '%N%AType RETURN To Return To Menu%N'
7483 046370  111  163  040  T38MSG: .ASCIZ  'Is Write-Protected Tape Mounted'
7484 046430  045  116  045  T38WOK: .ASCIZ  '%N%A Drive Is Write Protected'
7485 046466  115  141  156  T38ID:  .ASCIZ  'Manual Intervention'
7486                         .EVEN
7487 046512 046532 046604 046632 MIMENU: .WORD  1$,2$,5$,6$,7$
7488 046524 046776 047041 000000         .WORD  9$,10$,0
7489
7490 046532  012  123  105  1$:     .ASCIZ  <12>'SELECT OPERATION FROM FOLLOWING OPTIONS:'
7491 046604  012  011  060  2$:     .ASCIZ  <12>'    0       Display This Menu'
7492 046632  011  061  011  5$:     .ASCIZ  '        1       Rewind and Unload Command Test'
7493 046674  011  062  011  6$:     .ASCIZ  '        2       Write Protect Test'
7494 046722  011  063  011  7$:     .ASCIZ  '        3       Front Panel On-line/Off-line Switch Test'
7495 046776  011  064  011  9$:     .ASCIZ  '        4       Return to Diagnostic Supervisor'
7496 047041  000            10$:    .ASCIZ  ''
7497                         .EVEN
7498
7499                     ;+
7500                     ;LOCAL STORAGE FOR THIS TEST
7501                     ;-
7502
7503 047042 000000   T38DAT: .WORD   0                ;LOGICAL RESPONSE TO QUESTION
7504 047044          T38REST:
7505 047044                  SAVREG                   ;SAVE THE REGISTERS
7506 047050 012701 044620    MOV     #T38PACKET,R1    ;START OF THE PACKET
7507 047054 012721 140206    MOV     #140206,(R1)+    ;WRITE SUBSYSTEM MEM. WITH ACK,CVC=1
7508 047060 012721 044630    MOV     #T38TAD,(R1)+    ;ADDRESS OF DATA BLOCK
7509 047064 005021           CLR     (R1)+            ;EXTENDED ADDRESS
7510 047066 012721 000006    MOV     #6.,(R1)+        ;SIZE OF DATA BLOCK IN BYTES
7511 047072 005021           CLR     (R1)+            ;CLEAR BSEL0 AND BSEL1
7512 047074 005021           CLR     (R1)+            ;CLEAR SEL2
7513 047076 005011           CLR     (R1)             ;CLEAR DATA AREA
7514 047100 000207           RTS     PC               ;RETURN
7515
7516
7517                     ;+
7518                     ;
7519                     ;THIS ROUTINE PRINTS THE CONTENTS OF
7520                     ;THE 256 BYTE MESSAGE BUFFER RETURNED BY THE
7521                     ;TUV-05.
7522                     ;
7523                     ;INPUT:
7524                     ;
7525                     ;       R0      LOW ORDER ADDRESS OF MESSAGE BUFFER
7526                     ;       R1      HIGH ORDER ADDRESS OF MESSAGE BUFFER
7527                     ;       NOTE: R1 IS IGNORED IF KTENABLE FLAG IS CLEAR
```

```
7528                                    ;
7529                                    ;
7530                                    ;-
7531
7532 047102                             T38MBP:
7533 047102                                     SAVREG                  ;SAVE THE REGISTERS
7534 047106  010005                             MOV     R0,R5           ;SAVE LOW ORDER ADDRESS
7535 047110  005737  003102                     TST     KTENABLE        ;ADDRESS ABOVE 28K?
7536 047114  001001                             BNE     910$            ;BR IF YES
7537 047116  005001                             CLR     R1              ;SET HIGH ORDER ADDRESS TO 0
7538 047120  010103                     910$:   MOV     R1,R3           ;SAVE HIGH ORDER ADDRESS
7539 047122  006100                             ROL     R0              ;SHIFT BIT15 TO C BIT
7540 047124  006101                             ROL     R1              ;SHIFT TO HIGH ORDER FOR PRINTOUT
7541 047126                                     PRINTX  #T38AS0,R1,R5   ;PRINT MESSAGE BUFFER ADDRESS
     047126  010546                                                             MOV     R5,-(SP)
     047130  010146                                                             MOV     R1,-(SP)
     047132  012746  047404                                                     MOV     #T38AS0,-(SP)
     047136  012746  000003                                                     MOV     #3,-(SP)
     047142  010600                                                             MOV     SP,R0
     047144  104415                                                             TRAP    C$PNTX
     047146  062706  000010                                                     ADD     #10,SP
7542 047152                                     PRINTX  #T38AS1         ;PRINT HEADER FOR CONTENTS
     047152  012746  047451                                                     MOV     #T38AS1,-(SP)
     047156  012746  000001                                                     MOV     #1,-(SP)
     047162  010600                                                             MOV     SP,R0
     047164  104415                                                             TRAP    C$PNTX
     047166  062706  000004                                                     ADD     #4,SP
7543 047172  010501                             MOV     R5,R1           ;COPY LOW ORDER ADDRESS
7544 047174  010300                             MOV     R3,R0           ;COPY HIGH ORDER ADDRESS
7545 047176  001403                             BEQ     913$            ;BR IF NOT ABOVE 28K
7546 047200  004737  020270                     JSR     PC,SETMAP       ;SETUP PAR ADDRESS IN R0
7547 047204  010005                             MOV     R0,R5           ;GET PAR FORMAT ADDRESS ABOVE 28K
7548 047206  010537  047552             913$:   MOV     R5,T38CNT       ;HOLD ADDRESS
7549 047212  011504                     911$:   MOV     (R5),R4         ;GET BUFFER ENTRY
7550 047214  022704  125252                     CMP     #125252,R4      ;CHECK FOR NO LOAD CONDITION
7551 047220  001417                             BEQ     912$            ;BR, IF BUFFER WASN'T LOADED
7552 047222  010403                             MOV     R4,R3           ;MAKE COPY
7553 047224  042704  170377                     BIC     #170377,R4      ;ONLY BITS 11,10,9 AND 8 ARE SAVED
7554 047230  000241                             CLC                     ;CLEAR CARRY
7555 047232  006004                             ROR     R4              ;11 TO 10 BIT POSITION
7556 047234  006004                             ROR     R4              ;10 TO 9 BIT POSITION
7557 047236  006004                             ROR     R4              ;9 TO 8 BIT POSITON
7558 047240  006004                             ROR     R4              ;8 TO 7 BIT POSITION
7559 047242  042703  177760                     BIC     #177760,R3      ;ONLY BITS 3,2,1 AND 0 ARE SAVED
7560 047246  060403                             ADD     R4,R3           ;"OR'EM TOGETHER
7561 047250  010325                             MOV     R3,(R5)+        ;PUT BACK IN BUFFER
7562 047252  020527  045312                     CMP     R5,#T38EB       ;END OF BUFFER YET
7563 047256  001355                             BNE     911$            ;BR, IF NOT AT END YET
7564 047260  013705  047552             912$:   MOV     T38CNT,R5       ;PUT ADDRESS BACK
7565 047264  012704  000001                     MOV     #1,R4           ;START BYTE NUMBER AT ONE
7566 047270                             915$:   PRINTX  #T38ASN,R4,(R5)+        ;PRT MEM BUFFER W/NEWLINE
     047270  012546                                                             MOV     (R5)+,-(SP)
     047272  010446                                                             MOV     R4,-(SP)
     047274  012746  047526                                                     MOV     #T38ASN,-(SP)
     047300  012746  000003                                                     MOV     #3,-(SP)
     047304  010600                                                             MOV     SP,R0
     047306  104415                                                             TRAP    C$PNTX
```

```
      047310  062706  000010                                                          ADD     #10,SP
 7567 047314  005037  047552                CLR     T38CNT                  ;CLEAR COUNTER
 7568 047320  000412                        BR      921$                    ;SKIP OTHER PRINT
 7569 047322                        920$:   PRINTX  #T38ASC,R4,(R5)+        ;PRINT THE CONTENTS OF MEMORY BUFFER
      047322  012546                                                                  MOV     (R5)+,-(SP)
      047324  010446                                                                  MOV     R4,-(SP)
      047326  012746  047507                                                          MOV     #T38ASC,-(SP)
      047332  012746  000003                                                          MOV     #3,-(SP)
      047336  010600                                                                  MOV     SP,R0
      047340  104415                                                                  TRAP    C$PNTX
      047342  062706  000010                                                          ADD     #10,SP
 7570 047346  005237  047552                921$:   INC     T38CNT                  ;BUMP COUNTER
 7571 047352  005204                        INC     R4              ;NUMBER OF THE NEXT
 7572 047354  020427  000200                CMP     R4,#128.                ;DONE ALL YET ?
 7573 047360  003010                        BGT     50$             ;BRANCH IF ALL DONE
 7574 047362  023727  047552  000004        CMP     T38CNT,#4               ;DONE FOUR YET
 7575 047370  001401                        BEQ     925$                    ;BR, IF THREE DONE
 7576 047372  000753                        BR      920$            ;KEEP GOING
 7577 047374  005037  047552                925$:   CLR     T38CNT                  ;CLEAR COUNTER
 7578 047400  000733                        BR      915$                    ;PRINT WITH NEW LINE
 7579 047402  000207                        50$:    RTS     PC              ;RETURN
 7580
 7581 047404     045     116     045        T38AS0: .ASCIZ  '%N%A Message Buffer Address = %01%05'
 7582 047451     045     116     045        T38AS1: .ASCIZ  '%N%A Message Buffer Contents:'
 7583 047507     045     101     040        T38ASC: .ASCIZ  '%A  %D4%A: %03'
 7584 047526     045     116     045        T38ASN: .ASCIZ  '%N%A Byte%D4%A: %03'
 7585                                        .EVEN
 7586 047552  000000                        T38CNT: .WORD                   ;COUNTER FOR PRINT
 7587 047554                                ENDTST
      047554                                                          L10064:
      047554  104401                                                          TRAP    C$ETST
```

```
                        .SBTTL  TEST 6: CONFIGURATION TYPEOUT

                ;THIS TEST MUST BE STARTED AS FOLLOWS:
                ;
                ;AT THE DIAGNOSTIC SUPERVISOR PROMPT "DR>"
                ;TYPE "START/FLAG:PNT/TEST:6/PASS:1"
                ;       ----------------------------
                ;
                ;
                ;THIS IS A STANDALONE ROUTINE THAT PRINTS OUT ON THE CONSOLE TERMINAL
                ;THE CONFIGURATION OF THE CONTROLLER MODULE AND TK25 SUBSYSTEM. SPECIFICALLY,
                ;THE FOLLOWING INFORMATION IS PRESENTED:
                ;
                ;
                ;
                ; 1.0 MICROCODE REVSION LEVEL OF THE CONTROLLER,
                ;
                ; 2.0 NUMBER OF TAPE TRANSPORTS CONNECTED TO THE CONTROLLER,
                ;
                ; 3.0 UNIT SELECT CODE AND STATE (ONLINE/OFFLINE, WRITE ENABLED/PROTECTED)
                ;     OF EACH CONNECTED TRANSPORT.
                ;
                ;
                ;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.
                ;
047556                  BGNTST
047556                                                                  T6::
047556  005037  002170          CLR     FATFLG                 ;CLEAR FATAL ERROR FLAG
047562  005037  003100          CLR     KTFLG          ;HOLD OF KT11
047566  005737  002162          TST     TSTCNT                 ;IS THIS FIRST TEST IN SEQUENCE ?
047572  001403                  BEQ     10$                    ;BR, IF FIRST TEST
047574  012700  051003          MOV     #T39NE,R0              ;"TEST NOT EXECUTED"
047600  000402                  BR      11$                    ;JUMP OUT OF TEST IF NOT
047602  012700  051450  10$:    MOV     #TST39ID,R0            ;TEST ID MESSAGE
047606  004737  017410  11$:    JSR     PC,TSTSETUP            ;DO THE COMMON SETUP
047612  004737  021404          JSR     PC,CHKMAN              ;IS MANUAL INTERVENTION ALLOWED?
047616  103402                  BCS     15$                    ;BR, IF MANUAL INTERVENTION ALLOWED
047620  000137  050220          JMP     64$                    ;JUMP TO OUT IF NOT
047624  022737  000001  002162  15$:    CMP     #1,TSTCNT              ;IS THIS THE FIRST TEST IN SEQ
047632  001402                  BEQ     20$                    ;BR, IF FIRST TEST
047634  000137  050220          JMP     64$                    ;JMP IF IT WASN'T
047640                  20$:
047640  004737  016644          JSR     PC,SOFINIT             ;DO SOFT INIT OF CONTROLLER
047644  103405                  BCS     25$                    ;BR IF SOFT INIT = OK
```

```
7652 047646  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
7653 047650                             ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL ERROR DURING INIT
     047650  104455                                                             TRAP    C$ERDF
     047652  001131                                                             .WORD   601
     047654  003550                                                             .WORD   SFIERR
     047656  011666                                                             .WORD   SFIMSG
7654 047660                     25$:    CKLOOP                                  ;LOOP IF SELECTED
     047660  104406                                                             TRAP    C$CLP1
7655 047662  012704  050730            MOV     @T39PK2,R4              ;SUBROUTINE NEEDS PACKET ADDRESS
7656 047666  004737  010332            JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
7657 047672  103405                    BCS     50$                     ;BR, IF COMMAND ISSUED OK
7661 047674  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
7662 047676                             ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
     047676  104456                                                             TRAP    C$ERHRD
     047700  001132                                                             .WORD   602
     047702  004754                                                             .WORD   WRTMSG
     047704  011666                                                             .WORD   SFIMSG
7663 047706                     50$:    CKLOOP                          ;LOOP IF SELECTED
     047706  104406                                                             TRAP    C$CLP1
7664 047710  013701  050252    130$:   MOV     T39BFR+4,R1             ;PICK UP THE RES. BYTE CNTR AREA
7665 047714  042701  177700            BIC     #177700,R1              ;ONLY LEAVE MICROCODE REV LEVEL
7666 047720  010137  051406            MOV     R1,T39RL                ;LOAD UP REV LEVEL
7667 047724                             PRINTX  @T39MCL,T39RL           ;"MICROCODE REVISION LEVEL -000XXX"
     047724  013746  051406                                                     MOV     T39RL,-(SP)
     047730  012746  051323                                                     MOV     @T39MCL,-(SP)
     047734  012746  000002                                                     MOV     #2,-(SP)
     047740  010600                                                             MOV     SP,R0
     047742  104415                                                             TRAP    C$PNTX
     047744  062706  000006                                                     ADD     #6,SP
7668 047750  004737  016644            JSR     PC,SOFINIT              ;DO SOFT INIT OF CONTROLLER
7669 047754  103405                    BCS     140$                    ;BR IF SOFT INIT = OK
7673 047756  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
7674 047760                             ERRDF   ERRNO,SFIERR,SFIMSG     ;DEVICE FATAL ERROR DURING INIT
     047760  104455                                                             TRAP    C$ERDF
     047762  001133                                                             .WORD   603
     047764  003550                                                             .WORD   SFIERR
     047766  011666                                                             .WORD   SFIMSG
7675 047770                     140$:   CKLOOP                                  ;LOOP IF SELECTED
     047770  104406                                                             TRAP    C$CLP1
7676 047772  012704  050730            MOV     @T39PK2,R4              ;SUBROUTINE NEEDS PACKET ADDRESS
7677 047776  004737  010332            JSR     PC,WRTCHR               ;ISSUE WRITE CHARACTERISTICS
7678 050002  103405                    BCS     150$                    ;BR, IF COMMAND ISSUED OK
7682 050004  010001                    MOV     R0,R1                   ;SAVE CONTENTS OF TSSR
7683 050006                             ERRHRD  ERRNO,WRTMSG,SFIMSG     ;WRITE CHARACTERISTISC FAILED
     050006  104456                                                             TRAP    C$ERHRD
     050010  001134                                                             .WORD   604
     050012  004754                                                             .WORD   WRTMSG
     050014  011666                                                             .WORD   SFIMSG
7684 050016                     150$:   CKLOOP                          ;LOOP IF SELECTED
     050016  104406                                                             TRAP    C$CLP1
7685 050020  005037  002150            CLR     UNITN                   ;SET TO DRIVE 0
7686
7687 050024  016501  000000    190$:   MOV     TSSR(R5),R1             ;GET TSSR STATUS
7688 050030  032701  000100            BIT     #OFL,R1                 ;CHECK FOR OFF-LINE
7689 050034  001414                    BEQ     200$                    ;BR, IF DRIVE IS ON-LINE
7690 050036                             PRINTX  @T390F2,UNITN           ;"DRIVE NUMBER XX IS OFF-LINE"
     050036  013746  002150                                                     MOV     UNITN,-(SP)
```

```
        050042  012746  051062                                          MOV     #T390F2,-(SP)
        050046  012746  000002                                          MOV     #2,-(SP)
        050052  010600                                                  MOV     SP,R0
        050054  104415                                                  TRAP    C$PNTX
        050056  062706  000006                                          ADD     #6,SP
7691    050062  000137  050200          JMP     63$                    ;DO NOT TRY TO GET ANYMORE INFO.
7692    050066                  200$:   PRINTX  #T390N2,UNITN          ;"DRIVE NUMBER XX IS ON-LINE"
        050066  013746  002150                                          MOV     UNITN,-(SP)
        050072  012746  051126                                          MOV     #T390N2,-(SP)
        050076  012746  000002                                          MOV     #2,-(SP)
        050102  010600                                                  MOV     SP,R0
        050104  104415                                                  TRAP    C$PNTX
        050106  062706  000006                                          ADD     #6,SP
7693    050112  013701  050254          MOV     T39BFR+6,R1            ;READ EXTENDED STATUS (XST0)
7694    050116  032701  000004          BIT     #BIT2,R1               ;IS DRIVE WTITE PROTECTED
7695    050122  001013                  BNE     210$                   ;BR, IF WRITE PROTECTED
7696    050124                          PRINTX  #T39WPN,UNITN          ;"DRIVE NUMBER IS NOT WRT PRO"
        050124  013746  002150                                          MOV     UNITN,-(SP)
        050130  012746  051244                                          MOV     #T39WPN,-(SP)
        050134  012746  000002                                          MOV     #2,-(SP)
        050140  010600                                                  MOV     SP,R0
        050142  104415                                                  TRAP    C$PNTX
        050144  062706  000006                                          ADD     #6,SP
7697    050150  000413                  BR      63$                    ;SKIP OVER
7698    050152                  210$:   PRINTX  #T39WRT,UNITN          ;"DRIVE NUMBER XX IS WRT PRO"
        050152  013746  002150                                          MOV     UNITN,-(SP)
        050156  012746  051171                                          MOV     #T39WRT,-(SP)
        050162  012746  000002                                          MOV     #2,-(SP)
        050166  010600                                                  MOV     SP,R0
        050170  104415                                                  TRAP    C$PNTX
        050172  062706  000006                                          ADD     #6,SP
7699    050176  000400                  BR      63$                    ;BR, IF NO MORE DRIVES
7700    050200                  63$:    PRINTX  #T39NFL                ;NEW LINE
        050200  012746  051000                                          MOV     #T39NFL,-(SP)
        050204  012746  000001                                          MOV     #1,-(SP)
        050210  010600                                                  MOV     SP,R0
        050212  104415                                                  TRAP    C$PNTX
        050214  062706  000004                                          ADD     #4,SP
7701    050220                  64$:    EXIT    TST                    ;EXIT THIS SECTION
        050220  104432                                                  TRAP    C$EXIT
        050222  001254                                                  .WORD   L10065-.
7702                                    ;+
7703                                    ;LOCAL TEXT MESSAGES FOR TEST
7704                                    ;-
7705
7706                                    ;LOCAL STORAGE FOR THIS TEST
7707                                    ;-
7708
7709    050224  000000          T39DLY: .WORD   0                      ;DELAY COUNTER FOR TEST
7711    050226                          .BLKB   10-<.-TUV2A&7>
7713    050230                  T39PACKET:                             ;COMMAND PACKET FOR TEST
7714    050230  140006                  .WORD   140006                 ;WRITE SUBSYSTEM MEM. CMD.  ACK,CVC=1
7715    050232  050240                  .WORD   T39TAD                 ;ADDRESS OF CHARACTERISTICS BLOCK
7716    050234  000000                  .WORD   0
7717    050236  000012                  .WORD   10.                    ;STARTING VALUE OF BLOCK SIZE
7718    050240                  T39TAD:                        ;CHARACTERISTICS DATA BLOCK
7719    050240      000         T39BSO: .BYTE   0                      ;BSELO BYTE
```

```
7720 050241     000                T39BS1: .BYTE   0                       ;BSEL1 BYTE
7721 050242  000000                T39BS2: .WORD   0                       ;BSEL1 WORD
7722 050244  000000                        .WORD   0                       ;DATA
7723 050246                        T39BFR: .BLKW   150.                    ;MESSAGE BUFFER
7724
7725
7727 050722                                .BLKB   10-<.-TUV2AE7>
7729 050730                        T39PK2:                                 ;COMMAND PACKET FOR TEST
7730 050730  140004                        .WORD   140004                  ;WRITE CHARA. MEM. CMND.,  ACK,CVC=1
7731 050732  050740                        .WORD   T39DTA                  ;ADDRESS OF SELECT DATA BLOCK
7732 050734  000000                        .WORD   0
7733 050736  000012                        .WORD   10.                     ;STARTING VALUE OF BLOCK SIZE
7734
7735
7736 050740                        T39DTA:                                 ;SELECT DATA BLOCK
7737 050740  050246                        .WORD   T39BFR                  ;ADDRESS OF MESSAGE BUFFER
7738 050742  000000                        .WORD   0
7739 050744  000400                        .WORD   256.                    ;LENGTH OF MESSAGE BUFFER
7740 050746  000000                T39EAI: .WORD   0                       ;EAI BIT WORD
7742 050750                                .BLKB   10-<.-TUV2AE7>
7744 050760  140012                T39PK3: .WORD   140012                  ;MESSAGE BUFFER RELEASE COMMAND
7745 050762  000000                        .WORD   0                       ;NOT USED
7746                               ;
7747                               ;WRITE TAPE PACKET
7748                               ;
7750 050764                                .BLKB   10-<.-TUV2AE7>
7752 050770  140005                T39PK4: .WORD   140005                  ;WRITE, ACK, CVC=1 COMMAND
7753 050772  000000                T39WR:  .WORD   0                       ;ADDRESS OF WRITE BUFFER
7754 050774  000000                        .WORD   0                       ;MORE ADDRESS OF WRITE BUFFER
7755 050776  000400                T39SIZ: .WORD   256.                    ;SIZE OF RECORD
7756
7757
7758
7759
7760                               ;+
7761                               ;LOCAL TEXT MESSAGES FOR TEST
7762                               ;-
7763
7764
7765
7766
7767 051000      045      116      000  T39NFL: .ASCIZ  '%N'
7768 051003      123      164      141  T39NE:  .ASCIZ  'Stand-alone Configuration Typeout Not Executed'
7769 051062      045      116      045  T39OF2: .ASCIZ  '%N%A Drive Number %D2%A Is Off-Line'
7770 051126      045      116      045  T39ON2: .ASCIZ  '%N%A Drive Number %D2%A Is On-Line'
7771 051171      045      116      045  T39WRT: .ASCIZ  '%N%A Drive Number %D2%A Is Write Protected'
7772 051244      045      116      045  T39WPN: .ASCIZ  '%N%A Drive Number %D2%A Is NOT Write Protected'
7773 051323      045      116      045  T39MCL: .ASCIZ  '%N%A Controller Microcode Revision Level     =%02'
7774                                              .EVEN
7775 051406  000000                    T39RL:  .WORD   0
7776                                              .EVEN
7777                                              .EVEN
7778
7779                               ;+
7780                               ;LOCAL STORAGE FOR THIS TEST
7781                               ;-
7782
```

```
7783 051410  000000                T39DAT: .WORD   0               ;LOGICAL RESPONSE TO QUESTION
7784 051412                        T39REST:
7785 051412                                SAVREG                  ;SAVE THE REGISTERS
7786 051416  012701  050230                MOV     #T39PACKET,R1   ;START OF THE PACKET
7787 051422  012721  140006                MOV     #140006,(R1)+   ;WRITE SUBSYSTEM MEM. WITH ACK,CVC=1
7788 051426  012721  050240                MOV     #T39TAD,(R1)+   ;ADDRESS OF DATA BLOCK
7789 051432  005021                        CLR     (R1)+           ;EXTENDED ADDRESS
7790 051434  012721  000006                MOV     #6.,(R1)+       ;SIZE OF DATA BLOCK IN BYTES
7791 051440  005021                        CLR     (R1)+           ;CLEAR BSEL0 AND BSEL1
7792 051442  005021                        CLR     (R1)+           ;CLEAR SEL2 .
7793 051444  005011                        CLR     (R1)            ;CLEAR DATA AREA
7794 051446  000207                        RTS     PC              ;RETURN
7795
7796                               ;+
7797                               ;LOCAL TEXT MESSAGES FOR TEST
7798                               ;-
7799
7800 051450     103     157     156  TST39ID:        .ASCIZ  'Configuration Typeout'
7801                                        .EVEN
7802 051476                                ENDTST
     051476                                                          L10065:
     051476  104401                                                        TRAP    C$ETST
7803
```

```
                                .SBTTL  TEST 7: SCOPE LOOPS

                        ;*
                        ;THIS TEST MUST BE STARTED AS FOLLOWS:
                        ;
                        ;AT THE DIAGNOSTIC SUPERVISOR PROMPT "DR>"
                        ;TYPE "START/FLAG:PNT/TEST:7/PASS:1"
                        ;       ----------------------------
                        ;
                        ;
                        ;
                        ;       THIS IS A STANDALONE ROUTINE PROVIDING A NUMBER OF TIGHT "SCOPE
                        ;       LOOPS" USEFUL FOR DEBUGGING BASIC REGISTER ACCESS PROBLEMS WITH
                        ;       THE CONTROLLER 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. DISPLAY 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     TSSR BYTE WRITE (SELF-TEST)
                        ;                 7     RETURN TO DIAGNOSTIC SUPERVISOR
                        ;
                        ;       FOR SCOPE LOOPS THAT WRITE INTO REGISTERS, THE PROGRAM PROMPTS
                        ;       THE OPERATOR FOR THE DATA TO BE WRITTEN.  TYPING <RETURN> CAUSES
                        ;       AN EXIT FROM THE SCOPE LOOP BACK TO MENU LEVEL.
                        ;
                        ;-

                        BGNTST
                                                                        T7::
                        CLR     FATFLG                  ;CLEAR FATAL ERROR FLAG
                        CLR     KTFLG           ;HOLD OF KT11
                        TST     TSTCNT                  ;IS THIS FIRST TEST IN RUN ?
                        BEQ     1$                      ;CONTINUE TEST IF FIRST IN RUN
                        MOV     #T40NE,R0               ;"TEST NOT EXECUTED"
                        BR      100$                    ;JUST EXIT IF NOT
                1$:     MOV     #TST40ID,R0             ;TEST ID MESSAGE
                100$:   JSR     PC,TSTSETUP             ;DO THE COMMON SETUP
                        JSR     PC,CHKMAN               ;SEE IF MANUAL INTERVENTION ALLOWED
                        BCS     102$                    ;CARRY SET IF INTERVENTION ALLOWED
                        JMP     64$                     ;EXIT IF NO MANUAL INTERVENTION
                102$:   CMP     #1,TSTCNT               ;WAS THIS THE FIRST TEST IN SEQ
                        BEQ     2$                      ;BR, IF IT WAS
                        JMP     64$                     ;JMP TO END OF TEST
```

```
                                2$:     JSR     PC,SOFINIT              ;DO A SOFT INIT
                                        BCS     5$                      ;BRANCH IF OK
                                        MOV     R0,R1                   ;CONTENTS OF TSSR REGISTER
                                        ERRDF   ERRNO,SFIERR,SFIMSG     ;REPORT FATAL ERROR
051572  104455                                                                    TRAP    C$ERDF
051574  001275                                                                    .WORD   701
051576  003550                                                                    .WORD   SFIERR
051600  011666                                                                    .WORD   SFIMSG
                                5$:     MOV     #SCMENU,R0              ;MENU OF SCOPE LOOP SELECTIONS
                                        MOV     #8.,R1                  ;MAXIMUM ALLOWED SELECTION
                                        JSR     PC,GETSEL               ;GO GET THE OPERATORS SELECTION
                                        TST     R0                      ;WAS ZERO SPECIFIED ?
                                        BEQ     2$                      ;REPEAT MENU IF YES.
                                3$:     MOV     R0,R4                   ;SAVE THE MENU SELECTION
                                        SETPRI  #PRI07                  ;RAISE THE PRIORITY
051624  012700  000340                                                            MOV     #PRI07,R0
051630  104441                                                                    TRAP    C$SPRI
                                        CLR     TTION                   ;ASSUME INTERRUPTS ARE ENABLED
                        177560          BIT     #100,@#TTICSR           ;ARE TTI INTERRUPTS ON ?
                                        BNE     4$                      ;BRANCH IF YES
                                        INC     TTION                   ;FLAG SET IF INTERRUPTS OFF
                        177560          BIS     #100,@#TTICSR           ;ENABLE INTERRUPTS
                                4$:     MOV     #TTIVEC,R1              ;START OF TTI VECTORS
                                        MOV     (R1),TVECSAV            ;SAVE THE CURRENT TTI VECTOR
                                        MOV     #60$,(R1)+              ;SET NEW INTERRUPT ROUTINE
                                        MOV     (R1),TPRISAV            ;SAVE THE VECTOR PRIORITY
                                        MOV     #PRI07,(R1)             ;USE PRIORITY SEVEN
                                        SETPRI  #PRI00                  ;LOWER INTERRUPT BR LEVEL
000000                                                                          MOV     #PRI00,R0
104441                                                                          TRAP    C$SPRI
                                        ASL     R4                      ;CONVERT TO WORD OFFSET
                        051720          JMP     @6$(R4)                 ;JUMP TO PROPER LOOP
                                6$:     .WORD   2$                      ;RETYPE THE MENU
                                        .WORD   10$                     ;TSBA READ ACCESS
                                        .WORD   15$                     ;TSSR READ ACCESS
                                        .WORD   20$                     ;TSSR WRITE ACCESS
                                        .WORD   25$                     ;TSDB HIGH BYTE WRITE ACCESS
                                        .WORD   30$                     ;TSDB LOW BYTE WRITE ACCESS
                                        .WORD   35$                     ;TSSR BYTE WRITE (SELF-TEST)
                                        .WORD   65$                     ;LEAVE THE TEST


                                10$:
                        177776  12$:     MOV     TSBA(R5),R0             ;READ TSBA REGISTER
                                        BR      12$                     ;LOOP UNTIL HALTED

                                15$:
                        000000  18$:     MOV     TSSR(R5),R0             ;READ TSSR REGISTER
                                        BR      18$                     ;LOOP UNTIL STOPPED


                        021100  20$:     JSR     PC,GETPAT               ;READ THE DATA PATTERN
                                        MOV     R0,R1                   ;DATA PATTERN FOR LOOP
                        000000  22$:     MOV     R1,TSSR(R5)             ;WRITE DATA TO TSSR
                                        BR      22$                     ;LOOP
```

```
7917 051770                          25$:
7918 051770  004737  021100                 JSR     PC,GETPAT          ;READ THE DATA PATTERN
7919 051774  010001                         MOV     R0,R1              ;DATA PATTERN FOR LOOP
7920 051776  110165  177777          27$:   MOVB    R1,TSDBH(R5)       ;WRITE THE DATA TO TSDB, HIGH BYTE
7921 052002  000775                         BR      27$                ;LOOP UNTIL STOPPED
7922
7923
7924 052004                          30$:
7925 052004  004737  021100                 JSR     PC,GETPAT          ;READ THE DATA PATTERN
7926 052010  010001                         MOV     R0,R1              ;DATA PATTERN FOR LOOP
7927 052012  110165  177776          32$:   MOVB    R1,TSDB(R5)        ;WRITE DATA TO TSSR, LOW BYTE
7928 052016  000775                         BR      32$                ;LOOP UNTIL HALTED BY OPERATOR
7929
7930 052020  004737  021100          35$:   JSR     PC,GETPAT          ;PICK UP THE PATTERN FROM OPR
7931 052024  010001                         MOV     R0,R1              ;STORE IN R1
7932 052026  110165  000000          37$:   MOVB    R1,TSSR(R5)        ;WRITE BYTE TO TSSR, THIS STARTS MDIAG
7933 052032                                 DELAY   250                ;WAIT 2500US
     052032  012727  000250                                                 MOV     #250,(PC)+
     052036  000000                                                        .WORD   0
     052040  013727  002116                                                 MOV     L$DLY,(PC)+
     052044  000000                                                        .WORD   0
     052046  005367  177772                                                 DEC     -6(PC)
     052052  001375                                                         BNE     .-4
     052054  005367  177756                                                 DEC     -22(PC)
     052060  001367                                                         BNE     .-20
7934 052062  036527  000000  000200             BIT     TSSR(R5),#SSR      ;CHECK FOR READY SET, IF A TRAP OCCURS
7935                                                                        ;THE TSSR WAS "NOT BACK TO THE BUS"
7936                                                                        ;IN TIME.
7937 052070  001356                         BNE     37$                ;BR, IF SSR WAS SET (GOOD) KEEP LOOPING
7941 052072                                 ERRDF   ERRNO,T40NSR,SFIMSG ;PRINT DEVICE FATAL ERROR MESSAGE
     052072  104455                                                         TRAP    C$ERDF
     052074  001276                                                        .WORD   702
     052076  052772                                                        .WORD   T40NSR
     052100  011666                                                        .WORD   SFIMSG
7942 052102  000137  000200                 JMP     200                ;GO TO SUPERVISOR ETC.
7943
7944
7945                                 ;+
7946                                 ;PROCESS CONSOLE INTERRUPTS
7947                                 ;-
7948
7949 052106  010046                  60$:   MOV     R0,-(SP)           ;SAVE WORK REGISTER
7950 052110  113700  177562                 MOVB    @#TTIBFR,R0        ;GET THE OPERATOR INPUT
7951 052114  042700  000200                 BIC     #200,R0            ;STRIP OFF PARITY BIT
7952 052120  122700  000015                 CMPB    #15,R0             ;IS IT A CARRIAGE RETURN ?
7953 052124  001021                         BNE     61$                ;JUST EXIT IF NOT
7954 052126  012766  051562  000002         MOV     #2$,2(SP)          ;RETURN TO MASTER MENU
7955 052134  005066  000004                 CLR     4(SP)              ;FORCE PRIORITY ZERO
7956 052140  013737  052202  000060         MOV     TVECSAV,@#TTIVEC   ;RESTORE SUPERVISOR VECTOR
7957 052146  013737  052204  000062         MOV     TPRISAV,@#TTIVEC+2 ;RESTORE SUPERVISOR PRIORITY
7958 052154  005737  052200                 TST     TTION              ;ARE SUPERVISOR INTERRUPTS ENABLED ?
7959 052160  001403                         BEQ     61$                ;BRANCH IF YES
7960 052162  042737  000100  177560         BIC     #100,@#TTICSR      ;TURN OFF TTI INTERRUPTS
7961 052170  012600                  61$:   MOV     (SP)+,R0           ;RESTORE REGISTER
7962 052172  000002                         RTI                        ;RETURN FROM INTERUPT
7963
7964 052174                          64$:
```

```
                                63$:
                                65$:    EXIT    TST                     ;EXIT THE TEST
052174  104432                                                          TRAP    C$EXIT
052176  000664                                                          .WORD   L10066-.

                                ;+
                                ;LOCAL STORAGE FOR THIS TEST
                                ;-

052200  000000                  TTION:          .WORD   0               ;WORD SET IF SUPERVISOR TTI INTER OFF
052202  000000                  TVECSAV:        .WORD   0               ;SAVE TTI VECTOR
052204  000000                  TPRISAV:        .WORD   0               ;SAVE TTI PRIORITY


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

                                        .EVEN
052206  052236  052311  052337  SCMENU: .WORD   1$,2$,3$,4$,5$,6$
052222  052510  052546  052605          .WORD   7$,8$,10$,11$,12$,0

052236     012     123     105  1$:     .ASCIZ  <12>'SELECT SCOPE LOOP FROM FOLLOWING OPTIONS:'
052311     012     011     060  2$:     .ASCIZ  <12>'   0       Display This Menu'
052337     011     061     011  3$:     .ASCIZ  '       1       TSBA Read Access'
052363     011     062     011  4$:     .ASCIZ  '       2       TSSR Read Access'
052407     011     063     011  5$:     .ASCIZ  '       3       Initialize (TSSR Write Access)'
052451     011     064     011  6$:     .ASCIZ  '       4       TSDB High Byte Write Access'
052510     011     065     011  7$:     .ASCIZ  '       5       TSDB Low Byte Write Access'
052546     011     066     011  8$:     .ASCIZ  '       6       TSSR Write Byte (Self Test)'
052605     011     067     011  10$:    .ASCIZ  '       7       Return to Diagnostic Supervisor'
052650     000                  11$:    .ASCIZ  ''
052651     124     171     160  12$:    .ASCIZ  'Type RETURN To Stop Scope Loops'
052711     123     164     141  T40NE:  .ASCIZ  'Stand-alone Scope Loops Not Executed'
052756     123     143     157  TST40ID:        .ASCIZ  'Scope Loops'
052772     123     123     122  T40NSR: .ASCIZ  'SSR Failed To Set After TSSR Write Byte And 10ms Delay'
                                        .EVEN
053062                          ENDTST
053062                                                          L10066:
053062  104401                                                          TRAP    C$ETST


                                        .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
```

```
      053064  000015                        .WORD L10067-L$HARD/2
      053066                          L$HARD::
 8032
 8033 053066                                GPRMA   HPM1,0,0,160000,177776,YES      ;GET TSBA/TSDB REGISTER ADDRESS.
      053066  000031                        .WORD   T$CODE
      053070  053120                        .WORD   HPM1
      053072  160000                        .WORD   T$LOLIM
      053074  177776                        .WORD   T$HILIM
 8034 053076                                GPRMA   HPM2,2,0,0,776,YES             ;GET VECTOR ADDRESS.
      053076  001031                        .WORD   T$CODE
      053100  053147                        .WORD   HPM2
      053102  000000                        .WORD   T$LOLIM
      053104  000776                        .WORD   T$HILIM
 8035 053106                                GPRMD   HPM3,4,0,340,0,7,YES           ;GET INTERRUPT PRIORITY.
      053106  002032                        .WORD   T$CODE
      053110  053173                        .WORD   HPM3
      053112  000340                        .WORD   340
      053114  000000                        .WORD   T$LOLIM
      053116  000007                        .WORD   T$HILIM
 8036 053120                                ENDHRD
                                            .EVEN
      053120                          L10067:
 8037 053120      104     105     126  HPM1:  .ASCIZ  'DEVICE ADDRESS (TSSR) '
 8038 053147      111     116     124  HPM2:  .ASCIZ  'INTERRUPT VECTOR    '
 8039 053173      111     116     124  HPM3:  .ASCIZ  'INTERRUPT PRIORITY      '
 8040                                       .EVEN
 8041
```

```
                                        .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.
                                ;--
053224                                  BGNSFT
053224  000006                          .WORD L10070-L$SOFT/2
053226                          L$SOFT::
053226                                  GPRML   SPM1,0,-1,YES                   ;GET RAM DUMP FLAG
053226  000130                          .WORD   T$CODE
053230  053242                          .WORD   SPM1
053232  177777                          .WORD   -1
053234                                  GPRML   SPM4,2,-1,YES                   ; GET ITERATION CONTROL.
053234  001130                          .WORD   T$CODE
053236  053306                          .WORD   SPM4
053240  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
053242                                  ENDSFT
                                        .EVEN
053242                          L10070:

053242  105  116  101  SPM1:    .ASCIZ  'ENABLE CONTROLLER RAM DUMP ON ERROR'
053306  111  116  110  SPM4:    .ASCIZ  'INHIBIT ITERATIONS     '
053336  120  105  122  SPM6:    .ASCIZ  'PER TEST ERROR LIMIT   '
053366  120  105  122  SPM7:    .ASCIZ  'PER UNIT ERROR LIMIT   '
                                .EVEN
                                .SBTTL  PATCH AREA
                                ;+
                                ;DISPATCH TABLE
                                ;
                                ; *** MOVE TO FRONT OF PROGRAM FOR RELEASE ***
                                ;-

053416                                  DISPATCH        TESTNO
053416  000007                          .WORD   7
053420                          L$DISPATCH::
053420  023634                          .WORD   T1
053422  024674                          .WORD   T2
053424  026226                          .WORD   T3
053426  032160                          .WORD   T4
053430  043426                          .WORD   T5
053432  047556                          .WORD   T6
053434  051500                          .WORD   T7

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

```
8081
8082 053436                          PATCH::
8083                                         .EVEN
8084                                 ;       .IF     NZ,.&377
8085                                 ;       .=.!377+1
8086                                 ;       .ENDC
8087 053436                                  LASTAD          ;SET LAST USED ADDRESS.
                                             .EVEN
      053436  053454                         .WORD T$FREE
      053440  000005                         .WORD T$SIZE
      053442                         L$LAST::
8088                                         .SBTTL  HARD CODED P-TABLE
8089                                 ;++
8090                                 ;       DIAGNOSTIC IS PRE-PARAMETERIZED PER THIS TABLE
8091                                 ;--
8092 053442                                  BGNSETUP        1
8093 053442                                  BGNPTAB
      053442  000000                         .WORD   0
      053444  000003                         .WORD   L10073-./2-1
      053446                         L10071:
8094 053446  172522                         .WORD           172522
8095 053450  000224                         .WORD           224
8096 053452  000240                         .WORD           PRI05
8097 053454                                  ENDPTAB
      053454                         L10073:
8098 053454                                  ENDSETUP
8099
8100         000001                          .END
```

SYMBOL TABLE

```
ADDSSR  011772 G    C$AU  = 000052    DEBUGM  011464      FATFLG  002170 G    HIMEM = 007776
ADR   = 000020 G    C$AUTO= 000061    DEVCNT  002166 G    FERCM   011554      HOE   = 100000 G
AMBTSS  006337       C$BRK = 000022    DEVDRO  023564      FIFEXP  012022 G    HPM1    053120
ASSEMB= 000010       C$BSEG= 000004    DEVNRD  023503      FIF1MS  012074      HPM2    053147
A1716 = 000003       C$BSUB= 000002    DEVNXR  023421      FIF2MS  012143      HPM3    053173
BADDAT  003110 G     C$CEFG= 000045    DEVONL  023351      FILLME  020374      IBE   = 010000 G
BADSSR  016550 G     C$CLCK= 000062    DEVSUM  023314      FNOINT  004113      IDU   = 000040 G
BAR   = 174402       C$CLEA= 000012    DFPTBL  002124 G    FORCER  002144 G    IER   = 020000 G
BENBSW  002174 G     C$CLOS= 000035    DIAGMC= 000000      FREE    003072 G    IFAULT  004154
BIE   = 040000       C$CLP1= 000006    DLCYL = 000177      FREEMI  003076      INCERK  017744
BIT0  = 000001 G     C$CVEC= 000036    DLDNER= 100200      FRESIZ  003074 G    INTCPC  017020
BIT00 = 000001 G     C$DCLN= 000044    DLERR = 177730      FUSI    004015      INTFLA  017015
BIT01 = 000002 G     C$DODU= 000051    DLGETS= 000004      F$AU  = 000015      INTMAS  017014
BIT02 = 000004 G     C$DRPT= 000024    DLRDHD= 000010      F$AUTO= 000020      INTR    017066 G
BIT03 = 000010 G     C$DU  = 000053    DLRDNH= 000016      F$BGN = 000040      INTREC  002172 G
BIT04 = 000020 G     C$EDIT= 000003    DLSR  = 000013      F$CLEA= 000007      INTVEC  017016
BIT05 = 000040 G     C$ERDF= 000055    DLUN  = 000006      F$DU  = 000016      INTX    004176
BIT06 = 000100 G     C$ERHR= 000056    DSBINT  017054      F$END = 000041      IOKCKI= 000200
BIT07 = 000200 G     C$ERRO= 000060    DUAD12  004541      F$HARD= 000004      IOKSTP= 000001
BIT08 = 000400 G     C$ERSF= 000054    DUFLG   003060 G    F$HW  = 000013      IPRI    002160 G
BIT09 = 001000 G     C$ERSO= 000057    DUMMY   003030      F$INIT= 000006      ISR   = 000100 G
BIT1  = 000002 G     C$ESCA= 000010    EF.CON= 000036 G    F$JMP = 000050      IVEC    002156 G
BIT10 = 002000 G     C$ESEG= 000005    EF.NEW= 000035 G    F$MOD = 000000      IXE   = 004000 G
BIT11 = 004000 G     C$ESUB= 000003    EF.PWR= 000034 G    F$MSG = 000011      I$AU  = 000041
BIT12 = 010000 G     C$ETST= 000001    EF.RES= 000037 G    F$PROT= 000021      I$AUTO= 000041
BIT13 = 020000 G     C$EXIT= 000032    EF.STA= 000040 G    F$PWR = 000017      I$CLN = 000041
BIT14 = 040000 G     C$GETB= 000026    EMAXDU  017677      F$RPT = 000012      I$DU  = 000041
BIT15 = 100000 G     C$GETW= 000027    EN    = 000000      F$SEG = 000003      I$HRD = 000041
BIT2  = 000004 G     C$GMAN= 000043    ENAINT  017022      F$SOFT= 000005      I$INIT= 000041
BIT3  = 000010 G     C$GPHR= 000042    ENVIRN  021534      F$SRV = 000010      I$MOD = 000040
BIT4  = 000020 G     C$GPLO= 000030    EPRTSW  002146 G    F$SUB = 000002      I$MSG = 000041
BIT5  = 000040 G     C$GPRI= 000040    EPRT1   005762      F$SW  = 000014      I$PROT= 000040
BIT6  = 000100 G     C$INIT= 000011    EPRT2   005672      F$TEST= 000001      I$PTAB= 000041
BIT7  = 000200 G     C$INLP= 000020    EPRT3   006026      GDDAT   003112 G    I$PWR = 000041
BIT8  = 000400 G     C$MANI= 000050    ERCM    011565      GERRMA  002142 G    I$RPT = 000041
BIT9  = 001000 G     C$MEM = 000031    ERRHI   002202 G    GETPAT  021100 G    I$SEG = 000041
BOE   = 000400 G     C$MSG = 000023    ERRK    017656      GETSEL  021162 G    I$SETU= 000041
BRINIT  004355       C$OPEN= 000034    ERRLO   002204 G    G$CNTO= 000200      I$SFT = 000041
BSEL0 = 000000       C$PNTB= 000014    ERRNO = 001276      G$DELM= 000372      I$SRV = 000041
BSEL1 = 000001       C$PNTF= 000017    ERRVEC= 000004 G    G$DISP= 000003      I$SUB = 000041
CHKAMB  016714       C$PNTS= 000016    ERTABE  003330      G$EXCP= 000400      I$TST = 000041
CHKMAN  021404 G     C$PNTX= 000015    ERTABL  003130      G$HILI= 000002      J$JMP = 000167
CHKTSS  017236       C$QIO = 000377    ESUM    017660      G$LOLI= 000001      KIPAR0= 172340
CKDROP  020154       C$RDBU= 000007    EVL   = 000004 G    G$NO  = 000000      KIPAR1= 172342
CKEMAX  020002       C$REFG= 000047    EXBCNT= 000010      G$OFFS= 000400      KIPAR2= 172344
CKMSG   011212 G     C$RESE= 000033    EXPBRE  016352 G    G$OFSI= 000376      KIPAR3= 172346
CKMSG2  011332 G     C$REVI= 000003    EXPD    002176 G    G$PRMA= 000001      KIPAR4= 172350
CKRAM   010534 G     C$RFLA= 000021    EXPGOT  004431      G$PRMD= 000002      KIPAR5= 172352
CKRAM2  011110 G     C$RPT = 000025    EXPGT2  004465      G$PRML= 000000      KIPAR6= 172354
CMPMEM  020560       C$SEFG= 000046    EXPMSG  002266 G    G$RADA= 000140      KIPAR7= 172356
CONFIG  020222       C$SPRI= 000041    EXPREC  016344 G    G$RADB= 000000      KIPDR0= 172300
COUNT   002254 G     C$SVEC= 000037    EXTA    005232      G$RADD= 000040      KIPDR1= 172302
CSR   = 174400       C$TPRI= 000013    EXTEND  005230      G$RADL= 000120      KIPDR2= 172304
CSRADD  002154 G     DAR   = 174404    E$END = 002100      G$RADO= 000020      KIPDR3= 172306
CTAB    003116 G     DATA    002256 G  E$LOAD= 000035      G$XFER= 000004      KIPDR4= 172310
CTABE   003130 G     DATAFL  015064    FATCHK  020102      G$YES = 000010      KIPDR5= 172312
CTABM   003116 G     DATASC  021136    FATERR= 000060      HIADDR= 001400      KIPDR6= 172314
```

SYMBOL TABLE

```
KIPDR7= 172316
KTENAB  003102 G
KTFLG   003100 G
KTINIT  021622
KTOFF   020246
KTON    020230
LERRMA  002140 G
LISTAL= 000001
LOE   = 040000 C
LOOPCN  002164 G
LOOPCO  012760
LOOPFL  003114 G
LOT   = 000010 G
L$ACP   002110 G
L$APT   002036 G
L$AU    022544 G
L$AUT   002070 G
L$AUTO  022750 G
L$CCP   002106 G
L$CLEA  023024 G
L$CO    002032 G
L$DEPO  002011 G
L$DESC  003342 G
L$DESP  002076 G
L$DEVP  002060 G
L$DISP  053420 G
L$DLY   002116 G
L$DTP   002040 G
L$DTYP  002034 G
L$DU    022642 G
L$DUT   002072 G
L$DVTY  003334 G
L$EF    002052 G
L$ENVI  002044 G
L$ETP   002102 G
L$EXP1  002046 G
L$EXP4  002064 G
L$EXP5  002066 G
L$HARD  053066 G
L$HIME  002120 G
L$HPCP  002016 G
L$HPTP  002022 G
L$HW    002124 G
L$ICP   002104 G
L$INIT  021764 G
L$LADP  002026 G
L$LAST  053442 G
L$LOAD  002100 G
L$LUN   002074 G
L$MREV  002050 G
L$NAME  002000 G
L$PRIO  002042 G
L$PROT  021754 G
L$PRT   002112 G
L$REPP  002062 G
L$REV   002010 G
L$RPT   023052 G
L$SOFT  053226 G
L$SPC   002056 G
L$SPCP  002020 G
L$SPTP  002024 G
L$STA   002030 G
L$SW    002134 G
L$TEST  002114 G
L$TIML  002014 G
L$UNIT  002012 G
L10000  002132
L10001  002144
L10002  005226
L10003  011676
L10004  011726
L10005  011744
L10006  011752
L10007  011770
L10010  012006
L10011  012020
L10012  012072
L10013  012242
L10014  012756
L10015  013604
L10016  013626
L10017  016350
L10020  016356
L10021  016364
L10022  016376
L10023  016420
L10024  016446
L10025  016606
L10026  017116
L10030  022474
L10031  022640
L10032  022746
L10033  023022
L10034  023050
L10035  023312
L10036  024672
L10037  026224
L10040  025134
L10041  032156
L10042  026624
L10043  027302
L10044  027510
L10045  027776
L10046  030320
L10047  043424
L10050  032776
L10051  033544
L10052  034240
L10053  034676
L10054  035324
L10055  035752
L10056  036334
L10057  037010
L10060  037252
L10061  037544
L10062  040034
L10063  040510
L10064  047554
L10065  051476
L10066  053062
L10067  053120
L10070  053242
L10071  053446
L10073  053454
MEMADD  013606 G
MENASC  021353
MENERR  021300
MENRES  021402
MESBFA  002716 G
MESBFN  014634
MESHEA  015017
MIMENU  046512
MMVEC = 000250
MPR   = 174406
MSA.FR= 000006
MSA.NO= 000000
MSA.NR= 000004
MSA.VO= 000002
MSGEXP  012010 G
MSGLOO  012716 G
MSGSTA  012202 G
MSGSUB  013574 G
MS.ATT= 000006
MS.EXT= 000200
MS.RSD= 000001
MS.RSF= 000020
MS.RST= 000010
NBA   = 002000
NEWPAS  022176
NODEV   003062 G
NOINIT  004233
NOINTR  004117
NOITS   002136 G
NOMAN   021440
NP.IR = 000200
NP.LOO= 000040
NP.OUT= 000100
NP.WRP= 000020
NSI     004050
NSINIT  004305
NUL     004425
NULCR   004426
NXM   = 004000
NXR     003636
NXRERR  005176 G
NXRX    003675
NXTU    022210
OFL   = 000100
ONEFIL= 000000
O$APTS= 000000
O$AU  = 000001
O$BGNR= 000001
O$BGNS= 000001
O$DU  = 000001
O$ERRT= 000000
O$GNSW= 000001
O$POIN= 000001
O$SETU= 000001
PASRPT  022242
PATCH   053436 G
PATDAT  021134
PC.ERA= 002400
PC.IER= 002000
PC.NOO= 001000
PC.REL= 000000
PC.REW= 000400
PKBCNT= 000006
PKHI  = 000004
PKLOW = 000002
PKTADD  007276
PKTFRM  007240
PKTGET  011730 G
PKTMES  011754 G
PKTNEW  007333
PKTRAM  004643 G
PKTSSR  011700 G
PNT   = 001000 G
PRAMPK  013630
PRBEXP  016340
PRBMSG  016206
PRBREC  016342
PRBTOT  016273
PRBYTE  015772 G
PRI   = 002000 G
PRIADD  007712
PRIAO   007762
PRIBXO  007344 G
PRIEQU  007612
PRIPKT  007072 G
PRIRAM  007620
PRITAD  010026
PRITSS  005264
PRITO   010076
PRIXOR  007474 G
PRIO0 = 000000 G
PRIO1 = 000040 G
PRIO2 = 000100 G
PRIO3 = 000140 G
PRIO4 = 000200 G
PRIO5 = 000240 G
PRIO6 = 000300 G
PRIO7 = 000340 G
PRMESS  014062
PRMNO   002264 G
PRMSGE  015422 G
PRMSGO  015602
PRMSG1  015647
PRMSG2  015705
PROASC  014714
PR1ASC  014761
PST32W  003104 G
PUNIT   022476
PW.D11= 000021
PW.D13= 000022
PW.D22= 000020
PW.NOP= 000000
PW.NO1= 000023
PW.RDE= 000024
PW.RDR= 000001
PW.RDS= 000005
PW.RFI= 000003
PW.WCT= 000006
PW.WFI= 000004
PW.WFM= 000007
PW.WMI= 000010
PW.WNP= 000011
PW.WTR= 000002
P.ACK = 100000
P.CMD = 000037
P.CONT= 000012
P.CVC = 040000
P.FMT = 000140
P.FORM= 000011
P.GETS= 000017
P.IE  = 000200
P.INIT= 000013
P.MODE= 007400
P.OPP = 020000
P.POSI= 000010
P.READ= 000001
P.SWB = 010000
P.WRIT= 000005
P.WRTC= 000004
P.WRTS= 000006
QVP     002152 G
RAMASC  013776
RAMDAT  002206 G
RAMER   010636 G
RAMERR  016360 G
RAMEXP  016400 G
RAMFHR  014536
RAMFOR  007650
RAMHLD  011020
RAMIOP  011024
RAMPD   011075
RAMRSH  011022
RAMSIZ  002246 G
RAMTAD  016366 G
RBPCRA  015131
RCVHIA  002250 G
RCVLOA  002252 G
RDERR   005104
READ  = 000014
READY = 000001
RECMSG  002432 G
```

SYMBOL TABLE

```
RECV    002200 G    S1.ICE= 002000      TST21I  024516      T$$PTA= 010072      T23ET   030573
REGSAV  021040      S1.IEO= 010000      TST22I  026032      T$$RPT= 010035      T23LOO  026276
REWIND  010434 G    S1.IFM= 001000      TST23I  031761      T$$SOF= 010070      T23OFL  031301
RMCHBE= 000167      S1.IHE= 000400      TST24I  043172      T$$SRV= 010026      T23PAC  030360
RMCHEN= 000200      S1.IID= 004000      TST39I  051450      T$$SUB= 010063      T23PK2  030470
RMMSGB= 000104      S1.I1R= 020000      TST40I  052756      T$$SW = 010001      T23PK3  030510
RMMSGE= 000117      S1.I2R= 040000      TTIBFR= 177562 G    T$$TES= 010066      T23RES  031776
RMPKTB= 000020      S1.PAR= 100000      TTICSR= 177560 G    T1      023634 G    T23RNC  031160
RMPKTE= 000027      S2.ATI= 000010      TTION   052200      T2      024674 G    T23RSZ  030520
RMR   = 010000      S2.BTI= 000004      TTION2  044604      T2.1    024734      T23RT2  032070
RWPACK  010530      S2.DIM= 000200      TTIVEC= 000060 G    T21AM3  024375      T23RT3  032132
SC    = 100000      S2.ILW= 000100      TTOBFR= 177566      T21BFR  024170      T23RWN  031111
SCE   = 020000      S2.INR= 000020      TTOCSR= 177564      T21BF2  024270      T23SSR  030540
SCME    004711      S2.OUT= 000040      TUV2A   002000 G    T21BS0  024270      T23SZ   030516
SCMENU  052206      S2.UND= 000003      TVECSA  052202      T21BS1  024271      T23S2   030524
SDELAY  010330      TBLEND= 003030 G    TVSAV2  044606      T21DAT  024160      T23S3   030526
SEEK  = 000006      TCOASC  006200      T$ARGC= 000001      T21DLY  024276      T23TM   030736
SELASC  021346      TCOCOD  006400      T$CODE= 001130      T21LOO  023674      T23TMA  031025
SELDAT= 000004      TEMP1   003064 G    T$ERRN= 001276      T21OFL  024475      T23VCK  031545
SEL2  = 000002      TEMP2   003066 G    T$EXCP= 000000      T21PAC  024150      T23WB   030512
SETMAP  020270      TERCLS= 000016      T$FLAG= 000040      T21PK2  024260      T23WD   030530
SETU    022274      TESTNO= 000007      T$FREE= 053454      T21RES  024540      T23WDC  031443
SFFMSG  011746 G    TEXASC  006137      T$GMAN= 000000      T21RT2  024630      T23WDD  031354
SFHERR  003603      TFCASC  006241      T$HILI= 000007      T21SSR  024300      T23WDR  030532
SFIERR  003550      TIMEXP  016422 G    T$LAST= 000001      T21S2   024272      T23WSS  031672
SFIMSG  011666 G    TIMSGO  016450      T$LOLI= 000000      T21S3   024274      T24AM3  042160
SFPTBL  002134 G    TINERR  011653      T$LSYM= 010000      T22AM3  025435      T24BA   042512
SIFLAG  003106 G    TKB   = 177562      T$LTNO= 000007      T22BFR  025222      T24BFR  040570
SIMSG   011620      TKS   = 177560      T$NEST= 000000      T22BF2  025320      T24BF2  040710
SKIP    030320      TMPBFR  002576 G    T$NSO = 000000      T22BS0  025320      T24BOT  041553
SKIPT   003332      TNAM    017604      T$NS1 = 000005      T22BS1  025321      T24BS0  040710
SOFINI  016644 G    TPB   = 177566      T$NS2 = 000002      T22DAT  025210      T24BS1  040711
SPACE   010140 G    TPRISA  052204      T$PCNT= 000000      T22FOR  025334      T24CON  040722
SPM1    053242      TPS   = 177564      T$PTAB= 010072      T22LOO  024734      T24DAT  040560
SPM4    053306      TPSAV2  044610      T$PTHV= 000001      T22OFL  025535      T24DLY  040726
SPM6    053336      TRANST  002134 G    T$PTNU= 000001      T22PAC  025200      T24DTA  041620
SPM7    053366      TSBA  = 177776 G    T$SAVL= 177777      T22PK2  025310      T24EOT  041706
SR0   = 177572      TSBAH = 177777 G    T$SEGL= 177777      T22POS  025332      T24ILA  041302
SR1   = 177574      TSBAL = 177776 G    T$SIZE= 000005      T22RD   025326      T24LON  042652
SR2   = 177576      TSDB  = 177776 G    T$SUBN= 000000      T22RES  026066      T24LOO  032224
SR3   = 172516      TSDBH = 177777 G    T$TAGL= 177777      T22RT2  026160      T24LOP  042734
SSR   = 000200      TSDBL = 177776 G    T$TAGN= 010074      T22RWJ  025704      T24LOQ  041366
STATCO  012244      TSFCOD  006740      T$TEMP= 000010      T22SSR  025340      T24LOR  041002
SVCGBL= 000000      TSREJ = 000006      T$TEST= 000007      T22S2   025322      T24NEF  040730
SVCINS= 000000      TSSDEF  006310      T$TSTM= 177777      T22S3   025324      T24NXM  041141
SVCSUB= 000001      TSSR  = 000000 G    T$TSTS= 000001      T22TM   025610      T24OFL  042225
SVCTAG= 000000      TSSRBI  003400 G    T$$AU = 010031      T22VCK  025757      T24PAC  040550
SVCTST= 000001      TSSRFO  006117      T$$AUT= 010033      T22WRT  025330      T24PBP  043016
S$LSYM= 010000      TSSRH = 000001 G    T$$CLE= 010034      T23AM3  031233      T24PK2  040660
SO.IDB= 000010      TSSX    003716      T$$DAT= 010073      T23BA   031620      T24PK3  040700
SO.IFB= 000002      TSTBLK  002720 G    T$$DU = 010032      T23BFR  030400      T24RB   040702
SO.IFP= 000001      TSTCNT  002162 G    T$$HAR= 010067      T23BF2  030522      T24RES  043240
SO.ILD= 000020      TSTEND  017620      T$$HW = 010000      T23BS0  030522      T24RN   040716
SO.ION= 000040      TSTFLA  002260 G    T$$INI= 010030      T23BS1  030523      T24RNC  042105
SO.IRD= 000100      TSTLOO  017356 G    T$$MSG= 010025      T23CON  030534      T24RT2  043332
SO.IRW= 000004      TSTPTR  002262 G    T$$PC = 000001      T23DAT  030370      T24RT3  043374
SO.ISP= 000200      TSTSET  017410 G    T$$PRO= 010027      T23EOT  030660      T24RWN  042036
```

SYMBOL TABLE

```
T24SSR  041447          T38MS2  046324          T39PK4  050770          WC.I1T= 000040          XSOWLE= 004000
T24SZ   040706          T38MS4  046026          T39RES  051412          WC.I5R= 000020          XSOWLK= 000004
T24S2   040712          T38MS5  046105          T39RL   051406          WF.IED= 000010          XS1CON  015243
T24S3   040714          T38MS6  046162          T39SIZ  050776          WF.IER= 000004          XS2CON  015310
T24TM   041763          T38NE   045400          T39TAD  050240          WF.IMI= 000200          XS3CON  015355
T24TRL  043104          T38OFL  045772          T39WPN  051244          WF.IRE= 000040          XXCOMM  003070 G
T24VCK  042437          T38ONL  045676          T39WR   050772          WF.IWF= 000020          X$ALWA= 000000
T24WB   040702          T38ONM  045740          T39WRT  051171          WF.IWR= 000100          X$FALS= 000040
T24WDC  042366          T38PAC  044620          T4      032160 G        WF.I3R= 000002          X$OFFS= 000400
T24WDD  042300          T38PK2  045320          T4.1    032224          WF.I4R= 000001          X$TRUE= 000020
T24WDE  041501          T38PK3  045350          T4.10   037270          WRTCHR  010332 G        X1.COR= 020000
T24WDF  041225          T38PK4  045370          T4.11   037562          WRTERR  005011          X1.DLT= 100000
T24WDG  041052          T38RES  047044          T4.12   040052          WRTMSG  004754          X1.MBZ= 017375
T24WDR  040720          T38SIZ  045376          T4.2    033014          XFERAS  016610          X1.RBP= 000400
T24WSS  042563          T38SST  046240          T4.3    033562          XNXM    017276          X1.SPA= 040000
T3      026226 G        T38TAD  044630          T4.4    034256          XORBFO  007426          X1.UNC= 000002
T3.1    026276          T38WLE  045602          T4.5    034714          XORFOR  007544          X2.BUF= 000100
T3.2    026642          T38WOK  046430          T4.6    035342          XST0  = 000006 G        X2.EXT= 000200
T3.3    027320          T38WR   045372          T4.7    035770          XST1  = 000010 G        X2.OPM= 100000
T3.4    027526          T38WRL  045541          T4.8    036352          XST2  = 000012 G        X2.RCE= 040000
T3.5    030014          T38WRT  045455          T4.9    037026          XST3  = 000014 G        X2.REV= 000077
T38ASC  047507          T39BFR  050246          T40NE   052711          XST4  = 000016 G        X2.SPA= 035400
T38ASN  047526          T39BS0  050240          T40NSR  052772          XSOBOT= 000002          X2.UNI= 000007
T38AS0  047404          T39BS1  050241          T5      043426 G        XSOCON  015176          X2.WCF= 002000
T38AS1  047451          T39BS2  050242          T6      047556 G        XSOEOT= 000001          X3.DCK= 000010
T38BFR  044636          T39DAT  051410          T7      051500 G        XSOIE = 000040          X3.MBZ= 000006
T38BS0  044630          T39DLY  050224          UAM   = 000200 G        XSOILA= 000400          X3.MDE= 177400
T38BS1  044631          T39DTA  050740          UNITN   002150 G        XSOILC= 001000          X3.OPI= 000100
T38BS2  044632          T39EAI  050746          UNREC = 000006          XSOLET= 020000          X3.REV= 000040
T38CNT  047552          T39MCL  051323          USI     004021          XSOMOT= 000200          X3.RIB= 000001
T38DAT  047042          T39NE   051003          WAITF   017120 G        XSONEF= 002000          X3.SPA= 000200
T38DLY  044612          T39NFL  051000          WC.IFA= 000200          XSOONL= 000100          X3.TRF= 000020
T38DTA  045330          T39OF2  051062          WC.IFE= 000002          XSOPED= 000010          X4.HSP= 100000
T38EAI  045336          T39ON2  051126          WC.IGO= 000001          XSORLL= 010000          X4.MBZ= 017400
T38EB   045312          T39PAC  050230          WC.IRE= 000010          XSORLS= 040000          X4.RCE= 040000
T38ID   046466          T39PK2  050730          WC.IRW= 000004          XSOTMK= 100000          X4.TSM= 020000
T38MBP  047102          T39PK3  050760          WC.IOT= 000100          XSOVCK= 000020          X4.WRC= 000377
T38MSG  046370

. ABS.  053454      000
        000000      001
ERRORS DETECTED:  0

VIRTUAL MEMORY USED:  29424 WORDS  ( 115 PAGES)
DYNAMIC MEMORY:  20060 WORDS  ( 77 PAGES)
ELAPSED TIME:  00:30:09
CZTKFA.BIC,CZTKFA/-SP=SVC/ML,CZTKFA

.
```