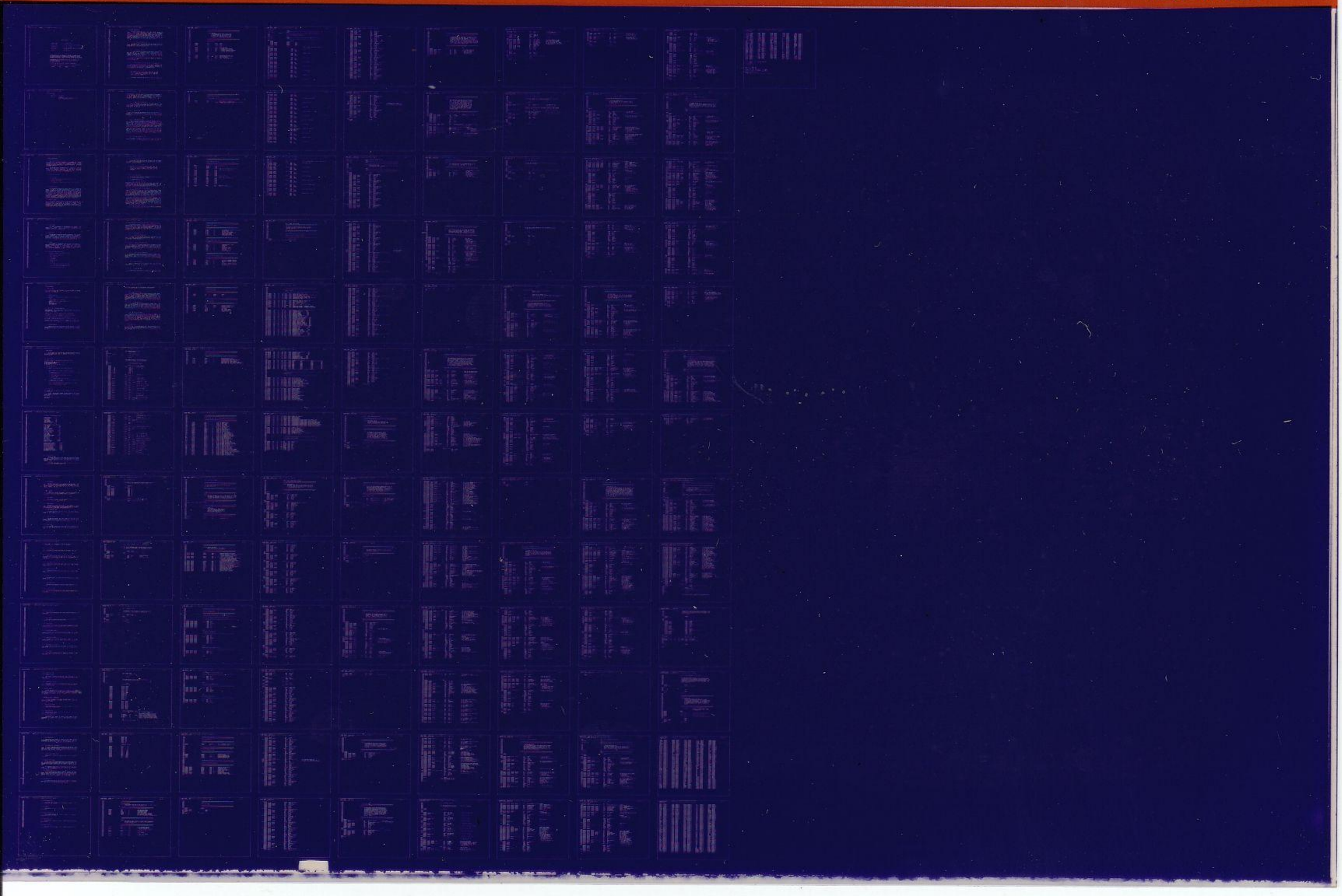
TK50

TK50 FRONT END FUNC
CZTKAB0

AH-T772B-MC
1 OF 1 OCT 1985

digital
MADE IN USA



```
                        .REM @
```

IDENTIFICATION

PRODUCT CODE:	AC - T771B MC
PRODUCT NAME:	CZTKAB0 TK50 FRONT END FUNCTIONAL
PRODUCT DATE:	26 - JUL - 1985
MAINTAINER:	TAPE AND OPTICAL DIAGNOSTIC ENGINEERING
AUTHOR:	RAYMOND CHANG

```
                        REVISION HISTORY

                APRIL 1985      NEW RELEASE

                JUNE 1985       REVISION B
                                ADDED CODE SO THAT PROGRAM CAN RUN ON
                                PDP - 11 UNIBUS FAMILY CPUS.
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1 GENERAL INFORMATION

1.1 Product Description

The TK50 Functional Diagnostic is intended to provide confidence in the basic functionality of the TK50 subsystem. As such, this should be the first host level diagnostic run on the TK50 subsystem to verify installation, or for troubleshooting. Throughout the program, emphasis is placed on isolating faults to the Field Replaceable Unit (FRU).

The program runs in standalone mode in conjunction with the PDP-11 family Diagnostic Supervisor. In addition to host level testing, the program will implicitly invoke the TK50's controller resident Level 1 self-test microdiagnostics as well as explicitly invoking the controller's Level 2 microdiagnostics.

1.2 Product Users And Uses

1. DMT testing
2. As appropriate at various manufacturing facilities
3. Field service personnel
4. DEC customers who choose to provide their own maintainance

1.3 Performance Goals

This program will test up to four TK50's in a sequential manner. To run a full pass of the program, a scratch tape must be mounted in the transport and an operator must be present to perform manual intervention. However, appropriate subsets of the program can be run if there is no scratch tape, or the operator inhibits manual intervention tests. Furthermore, the first pass of the program will run in "quick verify" mode; i.e., a single iteration of each test will be performed. If multiple passes are specifieo by the operator, the second and all subsequent passes will run with each test executed with multiple iterations. First pass execution time will be approximately 20 minutes while second pass execution time will be approximately 24 minutes. These pass times are based on a single unit under test.

1.4 Pass/Fail Criteria

This program employs a bottom-up approach to testing the TK50; that is, Test 1 will attempt to verify the simplest level of host-to-controller communication as outlined in UQSSP. Each subsequent test builds upon the functionality already verified in previous tests. Hence, most errors encountered by the program will be considered as fatal device errors and the failing unit will be dropped from the rest of the test sequence.

1.5 Failsoft Goals

Unit specific problems will be handled by the program. CPU faults (i.e., illegal traps or interrupts) will be handled by the Diagnostic Supervisor. System faults will be handled by the Diagnostic Supervisor, fault dependent.

1.6 Restrictions

Although basic read/write testing is performed, this program is not interested in measuring the subsystem's data reliability. While recoverable data errors will be reported by the program, no attempt will be made to determine the subsystem's compliance with error rates. Unrecoverable data errors will be considered as fatal device errors, although the media could be the causative factor.

1.7 Non-Goals

This program is intended to verify the gross functionality of host-to-controller communications, the integrity of the controller hardware, controller-to-drive communication and the basic functionality of the drive. It is not intended as a verification of TMSCP protocol as implemented in the controller firmware, and no testing of TMSCP commands is provided.

1.8 Runtime Environment Requirements

Runtime environment requirements include:

1. XXDP+ Diagnostic Supervisor
2. PDP-11 family CPU
3. 28 KW memory
4. Console Terminal
5. Load Device
6. 1 to 4 TK50 tape drives with controllers
7. 1 to 4 TK50 scratch cartridges (optional)
8. LCP-5 UFD software (optional)

2 USER INTERFACE

2.1 User Dialogue

The following user dialogue will be provided at program start-time to allow the user to establish certain operational parameters of the program.

2.1.1 Hardware Questions -

This set of questions must be answered when the program is first started.

```
CHANGE HARDWARE (L)?  no default

NUMBER OF UNITS (D)?  enter number from 1 4
UNIT x
BASE ADDRESS (O) 774500?
VECTOR (O) 224?
UNIT NUMBER (O)?
```

2.1.2 Definition Of Hardware Questions -

CHANGE HARDWARE This question merely wants to know if you want to reconfigure the units under test. It must be answered "yes" on the first pass of the program.

NUMBER OF UNITS - Enter the number of TK50's to be tested.

BASE ADDRESS - Enter the IO address of the unit to be tested.

VECTOR - Enter the vector location to be used for the unit.

UNIT NUMBER - Enter the MSCP-specified unit number for the unit.

This entire set of questions will be repeated up to four times, depending on the user's response to the "number of units" question.

2.1.3 Software Questions -

Most of the optional functionality of the program is either handled automatically by the program or through established procedures provided by the Diagnostic Supervisor hence there are no software questions.

3 ERROR REPORTS

Error reports will have two basic formats as described below. It is anticipated that, due to program partitioning, it will be possible to unambiguously define a single FRU as the cause of any error condition.

3.1 Error Format 1

This basic format will be used by all host level testing.

```
CZTKA DVC FTL ERR  eee  ON UNIT ll  TST tt  SUB  ss  PC: xxxxxx
SA REG CONTENTS INCORRECT
IN INIT SEQUENCE STEP #: n
SA EXPECTED: yyyyyy  SA RECEIVED: zzzzzz

*****FAILING FRU: CNTL
```

In this example, the fields have the following meanings:

- eee = discrete error number as defined by program

- ll = logical unit number assigned to unit-in-error during hardware questions

- tt = test number during which error occurred

- ss = subtest number

- xxxxxx = program location of error call

- n = step number of the UQSSP initialization sequence which detected the error condition

- yyyyyy = expected contents of SA register for this step

- zzzzzz = actual SA register contents

3.2 Error Format 2

This format will be used for errors detected by the Level 2 microdiagnostics.

The DUP "Receive Data" command is used to monitor the status of the Level 2 diagnostic and to collect results. It is valid to issue a "Receive Data" command at any time after the Level 2s have been started.

```
CZTKA DEV FTL ERR  eee  ON UNIT  11  TST 09  SUB  ss  PC: xxxxxx
DRIVE ERROR
```

```
                        **** LEVEL 2 MICRODIAGNOSTIC DUMP *****

                        Program Status      ******
                        Drive Status           ***
                        Test Number            ***
                        Track Number           ***
                        TMSCP Command          ***
                        TMSCP Response Flag    ***
                        TMSCP Unit Flags    ******

                        Error Log (Tape Transfer Error)
                        Error Format                ***
                        Error Flags                 ***
                        Event Code                ******
                        Error Retry Level           ***
                        Number of Reties            ***
                        Position (Low Order)      ******
                        Position (High Order      ******
                        Controller Status           ***
                        Drive Error Code            ***
                        Drive Flags                 ***
                        Track number                ***
                        Physical Block Number     ******
                        Logical Block Number        ***
                        Tape Count 0                ***
                        Tape Count 1                ***
                        Tape Count 2                ***
                        Drive State               ******
                        Read/Write State          ******
                        Operation Flags           ******

                        Blocks Written Channel 1       ******
                        Blocks Written Channel 2       ******
                        Blocks Read Channel 1          ******
                        Blocks Read Channel 2          ******
                        Soft Write Channel 1           ******
                        Soft Write Channel 2           ******
                        Ecc Corrected Channel 1        ******
                        Ecc Corrected Channel 2        ******
                        Read Repositions Channel 1     ******
                        Read Repositions Channel 2     ******
```

3.2.1 Program Status -

The program status word is only valid when read with a message number of 1. Upon an error, it will contain the status field of the TMSCP command which produced the error. Note that there are several diagnostic error codes which will be returned with a "ST_DIA" diagnostic status.

If the test completed without a fatal or hard error, this word will be zero (Normal Successful Completion).

3.2.2 Drive Status -

The drive status word is only updated during the level 3 idle loop. Therefore, this word is only valid with a message number of 2. This word will contain the status returned for the TMSCP "Get Unit Status" command. The unit flags for the "Get Unit Status' command will be in the Unit Flag Field.

3.2.3 Test Number

This byte will contain the number of the test during which an error occurred (only valid when message number is 1 and program status is non-zero). This is only used for the Level 2 diagnostic.

3.2.4 Track Number -

This byte will contain the track number of track most recently written/read. Valid only for message number 1.

3.2.5 TMSCP Command -

This byte will contain the opcode of the command in error (only valid when message number is 1 and program status is non-zero). TMSCP opcodes used include WRITE, READ, REPOSITION, ONLINE, AVAILABLE, GET UNIT STATUS, and SET CONTROLLER CHARACTERISTICS.

3.2.6 TMSCP Response Flags -

This byte will contain the flag field of the TMSCP response packet of the command in error. It will only be valid when the command in error field is valid.

3.2.7 TMSCP Unit Flags -

This word will contain the unit flags for the "Get Unit Status" command issued during the Level 2 Idle Loop. From this word, the host program will be able to tell if the drive is write protected. Unit Flags are only valid when Drive Status is valid.

3.2.8 Error Format -

This byte will contain the format code for any hard error for which an error log was received. If no error log was received, this byte will contain 255 decimal (OFF Hex, 377 Octal, 11111111 Binary).

In this case, all information which follows may be ingnored (i.e. it's undefined). This is also only valid for message 1.

3.2.9 Error Flags

This byte will contain the flags from the error log. It is only valid when the error log format code is not equal to 255(10).

3.2.10 Event Code -

This word will contain the event code of the error log. For more detail on this and other fields of the error log, please refer to "TK50 Magnetic Tape Sub-system Functions", 11 January 1985, Ric Perron.

3.2.11 Error Retry Level -

This byte will contain the level field for a Tape Transfer error. Only valid when Error Log Format Code is equal to Tape Transfer error.

3.2.12 Number Of Retries -

This byte will contain the retry field for a Tape Transfer error. Only valid when Error Log Format Code is equal to Tape Transfer error.

3.2.13 Position -

This double word will contain the tape position for a Tape Transfer error. Only valid when Error Log Format Code is equal to Tape Transfer error.

3.2.14 Controller Status -

This byte will contain the controller status code and is only valid when Error Log Format Code is equal to Tape Transfer error.

3.2.15 Drive Error Code -

This byte will contain the drive error code as reported for a Drive error. Only valid when Error Log Format Code is equal to Tape Transfer error.

3.2.16 Drive Error Code

This byte will contain the drive error code as reported for a Drive error. Only valid when Error Log Format Code is equal to Tape Transfer error.

3.2.17 Drive Flags

This byte will contain the drive flags. Only valid when Error Log Format Code is equal to Tape Transfer error.

3.2.18 Track Number -

This byte will contain the track number as reported for a Tape Transfer error. Only valid when Error Log Format Code is equal to Tape Transfer error.

3.2.19 Physical Block Number -

This word will contain the physical block number for a Tape Transfer error. Only valid when Error Log Format Code is equal to Tape Transfer error.

3.2.20 Logical Block Number -

This byte will contain the logical block number for a Tape Transfer error. Only valid when Error Log Format Code is equal to Tape Transfer error.

3.2.21 Tape Counts 0, 1, And 2 -

These bytes will contain the tape counts as reported for a Drive error. Only valid when Error Log Format Code is equal to Tape Transfer error.

3.2.22 Drive State -

This word will contain the drive state as reported in the error log. Only valid when Error Log Format Code 's equal to Tape Transfer error.

3.2.23 Read/Write State

3.2.24 Operation Flags -

This word will contain the Operation Flags as reported in the error log. Only valid when Error Log Format Code is equal to Tape Transfer error.

3.2.25 Controller Error Code -

This word will contain the controller error code as reported for a Controller error. Only valid when Error Log Format Code is equal to Controller error.

3.3 Get DUST Status

The DUP "Get DUST Status" command can be issued to verify that the Level 2 diagnostics are still running. If the progress count received for two consecutive "Get DUST Status" commands is identical, then progress has stopped. The Level 2 diagnostic should be aborted and restarted.

4 STOPPING THE LEVEL 2 DIAGNOSTIC

The Level 2 diagnostic will never terminate itself. If it is desired to stop the test in progress, the host must issue the DUP "Abort Program" command.

4.0.1 Blocks Written/Read -

These double words will contain the current number of block written/read on a per channel basis.

4.0.2 Soft Write Errors -

These words will contain a count of the number of soft write errors on a per channel basis.

4.0.3 ECC Corrected Error -

These words will contain a count of the number of CRC miscompares on a data block during a read operation which were corrected by an ECC group. This count is maintained on a per channel basis.

4.0.4 Read W/Reposition -

These words will contain a count of the number of CRC miscompares on data blocks during a read operations which could only be corrected by repositioning. That is, the ECC group could not correct the read error for the data block without repositioning.

4.0.5 Data Compare Error Information -

This buffer area will contain the following information: byte number in error, expected byte, and actual byte read. The first 10 bytes will be the byte value expected. The next 10 bytes will be the byte value read (actual). The final 10 words will contain the byte offset into the block in error (0 to 511).

4.0.6 Number Of Data Compare Bytes -

This word will contain the number of bytes which miscompared in the block.

4.1 Diagnostic Error Codes

In most cases, the Program Status Word will contain the error code returned by the controller firmware for the failing command. In the case where an error is detected by the diagnostic and not by the firmware, the Program Status Word will contain a diagnostic status code.

The diagnostic status code is indicated by the "1F" hex status (ST.DIA : internal diagnostic status code - see MSCP specification). The subcodes will be as follows:

4.2 Data Compare Error

This indicates that the compare operation between the data pattern which was written and read failed. The data compare buffer area will contain up to 10 bytes of the failing record, including byte location within the block, expected and actual data read. In addition, a total count of the bytes in error is available.

4.3 Controller Error

This code will be set in response to the diagnostic internally receiving an error log indicating a controller error. The controller error code field will contain the error code received.

4.4 Bad Parameters Error

This error code indicates that the parameters passed to the Level 2 diagnostic were invalid.

4.5 Bad Pattern

This subcode indicates an internal diagnostic error and should never be seen.

4.6 Response Address Error

This subcode indicates an internal firmware or diagnostic problem and should never be seen.

4.7 Host Address Error

This subcode indicates an internal firmware problem and should never be seen.

4.8 Unknown Error Log

This subcode indicates an internal firmware problem and should never be seen.

5 FUNCTIONAL DESCRIPTION

The following test descriptions all have certain points in common. All errors specified below will cause the unit to be dropped from the test, unless specifically noted to the contrary. Furthermore, if the operator has chosen loop-on-error (LOE flag set) scope loops will return to the beginning of the test containing the failure. Exceptions to this will also be noted explicitly below. To understand the normal four step initialization sequence, refer to the UQSSP; the descriptions of tests that use this sequence will only highlight unique features utilized by that specific test.

5.1 Test 1 - Existence Verfication Test

This test verifies the existence of the IP and SA registers by simply addressing them. Failure here could be caused by incorrect address setting in the controller DIP switch, faulty controller logic or operator error in specifying base address.

5.2 Test 2 - SA Register Wrap Test

This test commences the UQ-port initialization sequence, but sets the "WR" bit in its Step 1 response to the controller. Upon seeing this bit set, the controller should immediately enter the Diagnostic Wrap Mode. The program will now write and read a floating 1 pattern to and from the SA register. The process will then be repeated with a floating 0 pattern.

A failure to echo the written data will result in a callout to the controller. If loop on error is set, the program will loop on the failing write and read.

5.3 Test 3 - Initialization Test And Power Up Microdiagnostics

This test commences the UQ-port initialization sequence with interrupts disabled. It will verify that all step transitions occur within the alloted time, and that all host supplied information is correctly echoed by the controller. The program further verifies that no interrupts occur as a result of the step transitions.

NOTE

The diagnostic will verify that interrupts do not occur at the vector assigned to the Unit Under Test (UUT). Inappropriate interrupts to an unassigned vector will be trapped by the Diagnostic Supervisor and will abort the program.

It should be noted that, in accordance with the UQSSP, the controller's power-up microdiagnostics will be executed during Step 1

of the sequence. Controller specific failure codes will be posted in the SA register by the self tests; these could be correlated to a failing test number as an aid in troubleshooting. All failures in this test, however, will indicate the controller as the failing FRU. The specific codes will be 10 consecutive numbers in the range of 600-699 (decimal); exact values have not been designated.

5.4 Test 4 - Vector And Interrupt Test

Test 3 is repeated, this time with interrupts enabled. The checks of test 3 will also be performed, but now the program will also verify that an interrupt occurs at each step transition. No interrupt should occur at the end of step 4. Failures in this test will be attributed to the controller.

5.5 Test 5 - BR Level Test

This test insures that the TK50 cannot interrupt when the CPU priority is set to 7. The test goes through only the first step of the init sequence, since the controller will "hang" waiting for the interrupt acknowledge. Failures in this test will be attributed to the controller.

5.6 Test 6 - Purge And Poll Test

The initialization sequence will again be started by the host, but in step 3, the host will set the "PP" (Purge and Poll) bit. The first part of this test will simulate the UQSSP handshake for a bus adapter purge. The host will then request the controller to commence "poll" testing. The controller will now begin DMA activity in both directions to the host-identified communication area. The controller must end this test by leaving the communication area cleared and by transitioning to step 4. The host will verify that the entire

communication area is cleared. (Note: At the start of this test the host will have filled the communication area with a non-zero data pattern.) Ring depth in this test will be set to the minimal value(i.e., one), reducing potential impact on host memory in event of failure.Failures encountered will again be attributed to the controller.

5.7 Test 7 - Maximum Ring Buffer Test

This test is similar to test 5, but it will utilize the maximum allowable ring depth as specified in UQSSP. This value is equal to 128 command and 128 response slots of 32 bits per slot.

5.8 Test 8 Extended Address Test

The format of this test is similar to test 6, but the program will establish the communication area in the highest available memory locations. This will allow testing of the upper six bits of address logic on the controller board.

NOTE

The ability of this test to comprehensively test the upper six bits of address is dependent upon memory size of the run time system. This test will be completely bypassed if the system has only 28K words of memory.

5.9 Test 9 - Get DUST Status

The Get DUST Status test will request and test the DUST status of each unit under test for two specific cases:

1. No command modifiers set

2. Illegal command modifiers set

DUST status will be received from the unit under test after the program issues the Get DUST Status command available in DUP. The response packet received from the unit will be tested against a known good mask. If the expected and received bits do not match, excluding variable bits which will be discounted, an error will be reported.

5.10 Test 10 - Execute Level 2 Microdiagnostics

This test will invoke, via the DUP Execute Local Program command, the controller resident Level 2 microdiagnostics. These tests are aimed at establishing full communication between the controller and drive, as well as performing functional testing of the drive. Refer to the Level 2 Microdiagnostic Functional Specification for a detailed description of these tests. Test progress will be monitored from the host with the Get DUST Status command. Most errors encountered in this test will be attributed to the drive.

While the Level 2 Microdiagnostics are executing, TMSCP commands will be rejected by the controller. The microdiagnostics, in conjunction with those portions of operational microcode utilized by them, will have responsibility for detecting and dealing with drive errors, including command timeouts and other communication failures of the drive. The host program will be responsible for monitoring overall execution of the microdiagnostics, via DUP commands, and detecting "hung" controller conditions, as well as any spurious interrupts generated by the subsystem.

It is not possible for the Level 2 microdiagnostics themselves to guarantee that a scratch medium is mounted. They are reliant upon

host level software to protect user data from accid♦ tal destruction.

The following sequence of tests will be performed twice, thus ensuring that both channels of the head receive equal testing. To reduce execution time, the entire sequence is performed first at the physical BOT end of tape, utilizing head channel 1. The tape will then be positioned to physical EOT end of tape and the entire sequence repeated, utilizing channel 2. Finally the tape is rewound and left at physical BOT.

5.11 Micro Test Descriptions

5.11.1 Test 1 - Simple Write/Read Test -

This test will write several blocks of 1F and 2F data to the tape. The tape will be rewound and the blocks read back. The test will perform a compare operation of the data read back. This test verifies basic write/read capability.

5.11.2 Test 2 - Streaming Write/Read Test -

This test will write approximately 20 feet of tape on a single track with blocks of various data patterns. The tape will be kept streaming throughout the write. The tape will then be rewound and all records are read, again while streaming. Data compare is performed on all blocks. This test is intended to verify that the drive can write and read in a normal operational.

5.11.3 Test 3 - Thrashing Write/Read Test -

This test will again write 40 feet of tape on a single track; in this test delays will be inserted between the write blocks to force tape thrashing. After rewinding, the blocks will be read with forced delays bewteen reads. This test is intended to verify that tape tracking and tensioning are not affected by frequent direction changes.

5.11.4 Test 4 - Peak Shift Test -

Test 2 is repeated, this time using the worst case MFM peak shift patterns. This test is intended to verify that the write precomensation logic is functioning properly.

5.11.5 Test 5 - Signal Sag Test -

Ten blocks will be written with random data. The tape w'll be rewound, then moved back and forth 10 times. The tape will then be

positioned at logical BOT for the recorded track and read back. This test is intended to detect self erasure of recorded data.

5.11.6 Test 6 - Overwrite Test

One hundred blocks of data will be written on a single track, using an "MW" data pattern. (A binary representation of the MW pattern is 1110111, although the actual number of ones appearing in a group is subject to further worst case testing by the Drive Engineering group.) The tape will then be rewound and rewritten. (The data pattern used for rewrite consists of 50 blocks of worst-case MFM followed by 50 blocks of random data.) The purpose of the test is to guarantee that the drive is capable of overwriting previously recorded data.

5.11.7 Test 7 - Track Access Test -

Fifty blocks of data will be written on a single track. The tape will then be rewound, the head stepped to the next track and the same number of blocks will be written. This process will be repeated until all the tracks for that head have been written. The test will then reread the blocks from all data. This test is intended to verify tape tracking and the ability to successfully record and retrieve data on adjacent tracks.

5.11.8 Test 8 - Positioning Test -

The primary purpose of this test is simply to perform the correct positioning of the tape for what is to follow; that is, the first time through the test sequence, this test will cause the tape to be positioned at the physical EOT end of tape, thus allowing the entire test cycle to be repeated for testing the drive's operation with channel 2 of the head. Upon second entry to this test, it will cause the tape to be positioned back at physical BOT. The test will include a coarse watch-dog timer to guard against a "hung" drive condition.

5.12 Retry Algorithms

The Level 2 microdiagnostics will make extensive use of portions of the controller's operational microcode, including retry algorithms intended to recover from data errors. Please refer to the TK50 Microcode Functional Specification for detailed descriptions of the retry algorithms.

@

```
                                .TITLE PROGRAM HEADER AND TABLES
                                .SBTTL  PROGRAM HEADER

                                        .ENABL  ABS,AMA
002000          002000                  .       =       2000
                                        .NLIST  BEX

002000                                  BGNMOD

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

002000                                  POINTER BGNDU,ERRTBL,BGNRPT


002000                                  HEADER  CZTKA,B,0,120.,0,PRI00
002000                          L$NAME::                ;DIAGNOSTIC NAME
002000      103                         .ASCII /C/
002001      132                         .ASCII /Z/
002002      124                         .ASCII /T/
002003      113                         .ASCII /K/
002004      101                         .ASCII /A/
002005      000                         .BYTE   0
002006      000                         .BYTE   0
002007      000                         .BYTE   0
002010                          L$REV::                 ;REVISION LEVEL
002010      102                         .ASCII  /B/
002011                          L$DEPO::                ;0
002011      060                         .ASCII  /0/
002012                          L$UNIT::                ;NUMBER OF UNITS
002012  000000                          .WORD   0
002014                          L$TIML::                ;LONGEST TEST TIME
002014  000170                          .WORD   120.
002016                          L$HPCP::                ;POINTER TO H.W. QUES.
002016  047664                          .WORD   L$HARD
002020                          L$SPCP::                ;POINTER TO S.W. QUES.
002020  000000                          .WORD   0
002022                          L$HPTP::                ;PTR. TO DEF. H.W. PTABLE
002022  002202                          .WORD   L$HW
002024                          L$SPTP::                ;PTR. TO S.W. PTABLE
002024  000000                          .WORD   0
002026                          L$LADP::                ;DIAG. END ADDRESS
002026  062130                          .WORD   L$LAST
002030                          L$STA::                 ;RESERVED FOR APT STATS
002030  000000                          .WORD   0
002032                          L$CO::
002032  000000                          .WORD   0
002034                          L$DTYP::                ;DIAGNOSTIC TYPE
002034  000000                          .WORD   0
002036                          L$APT::                 ;APT EXPANSION
002036  000000                          .WORD   0
002040                          L$DTP::                 ;PTR. TO DISPATCH TABLE
002040  002124                          .WORD   L$DISPATCH
002042                          L$PRIO::                ;DIAGNOSTIC RUN PRIORITY
002042  000000                          .WORD   PRI00
```

PROGRAM HEADER

```
002044                          L$ENVI::                ;FLAGS DESCRIBE HOW IT WAS SETUP
002044  000000                            .WORD   0
002046                          L$EXP1::                ;EXPANSION WORD
002046  000000                            .WORD   0
002050                          L$MREV::                ;SVC REV AND EDIT #
002050     004                            .BYTE   C$REVISION
002051     000                            .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  023412                            .WORD   L$DVTYP
002062                          L$REPP::                ;PTR. TO REPORT CODE
002062  035002                            .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  000000                            .WORD   0
002072                          L$DUT::                 ;PTR. TO DROP UNIT CODE
002072  041130                            .WORD   L$DU
002074                          L$LUN::                 ;LUN FOR EXERCISERS TO FILL
002074  000000                            .WORD   0
002076                          L$DESP::                ;POINTER TO DIAG. DESCRIPTION
002076  002150                            .WORD   L$DESC
002100                          L$LOAD::                ;GENERATE SPECIAL AUTOLOAD EMT
002100  104035                          EMT     E$LOAD
002102                          L$ETP::                 ;POINTER TO ERRTBL
002102  023052                            .WORD   L$ERRTBL
002104                          L$ICP::                 ;PTR. TO INIT CODE
002104  040620                            .WORD   L$INIT
002106                          L$CCP::                 ;PTR. TO CLEAN-UP CODE
002106  041100                            .WORD   L$CLEAN
002110                          L$ACP::                 ;PTR. TO AUTO CODE
002110  000000G                           .WORD   L$AUTO
002112                          L$PRT::                 ;PTR. TO PROTECT TABLE
002112  023044                            .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
992
```

```
  999                                   .SBTTL  DISPATCH TABLE
 1000
 1001                                   ;++
 1002                                   ; THE DISPATCH TABLE CONTAINS THE STARTING ADDRESS OF EACH TEST.
 1003                                   ; IT IS USED BY THE SUPERVISOR TO DISPATCH TO EACH TEST.
 1004                                   ;--
 1005
 1006 002122                                   DISPATCH 10.
      002122  000012                           .WORD   10
      002124                           L$DISPATCH::
      002124  041152                           .WORD   T1
      002126  041650                           .WORD   T2
      002130  042432                           .WORD   T3
      002132  043120                           .WORD   T4
      002134  043714                           .WORD   T5
      002136  044362                           .WORD   T6
      002140  045202                           .WORD   T7
      002142  046022                           .WORD   T8
      002144  046746                           .WORD   T9
      002146  047156                           .WORD   T10
 1007
 1014
 1015 002150                                   DESCRIPT        <CZTKAB0 TK50 FUNCTIONAL>
      002150                           L$DESC::
      002150     103     132     124           .ASCIZ  /CZTKAB0 TK50 FUNCTIONAL/
                                               .EVEN
 1016
```

```
                                .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 HARDWARE P-TABLES.
                                ;--

002200                                  BGNHW   DFPTBL
002200  000003                          .WORD   L10000 L$HW/2
002202                          L$HW::
002202                          DFPTBL::

002202  174500                          .WORD   174500          ;TKIP BASE ADDRESS
002204  000260                          .WORD   260             ;VECTOR
002206  000000                          .WORD   0               ;T/MSCP UNIT NUMBER
002210                                  ENDHW
002210                          L10000:
```

```
1039                                    .SBTTL  SOFTWARE P TABLE
1040
1041                                    ;++
1042                                    ; THE SOFTWARE P TABLE CONTAINS THE VALUES OF THE PROGRAM
1043                                    ; PARAMETERS THAT CAN BE CHANGED BY THE OPERATOR.
1044                                    ;--
1045
1046 002210                                     BGNSW   SFPTBL
     002210  000000                             .WORD   L10001 L$SW/2
     002212                             L$SW::
     002212                             SFPTBL::
1047
1054
1055 002212                                     ENDSW
     002212                             L10001:
1056
1057 002212                                     ENDMOD
```

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


002212                                  BGNMOD

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

002212                                  EQUALS
                                ;
                                ; 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
                                ;
                                ;                                ;  BIT POSITION IN SECOND STATUS WORD
000040                          EF.START==      32.              ; (100000) START COMMAND WAS ISSUED
000037                          EF.RESTART==    31.              ; (040000) RESTART COMMAND WAS ISSUED
000036                          EF.CONTINUE==   30.              ; (020000) CONTINUE COMMAND WAS ISSUED
000035                          EF.NEW==        29.              ; (010000) A NEW PASS HAS BEEN STARTED
000034                          EF.PWR==        28.              ; (004000) A POWER-FAIL/POWER-UP OCCURRED
                                ;
                                ;
                                ; PRIORITY LEVEL DEFINITIONS
                                ;
```

```
000340                  PRIO7== 340
000300                  PRIO6== 300
000240                  PRIO5== 240
000200                  PRIO4== 200
000140                  PRIO3== 140
000100                  PRIO2== 100
000040                  PRIO1== 40
000000                  PRIOC== 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
```

GLOBAL EQUATES SECTION

```
1114                            ;;*****************************************************************
1115                            ;;*****************************************************************
1116                            ;
1117                            ;LUN_BLOCK OFFSETS
1118                            ;       THESE LITERALS ARE USED AS WORD OFFSETS INTO THE LUNBLK, WHICH
1119                            ;       IS POINTED TO THROUGHOUT THE PROGRAM BY R4.
1120                            ;
1121                            ;;*****************************************************************
1122                            ;;*****************************************************************
1123
1124     000000                 TKIP    ==      0               ;TKIP REGISTER ADDRESS
1125     000002                 TKSA    ==      2               ;TKSA REGISTER ADDRESS
1126     000004                 TKVEC   ==      4               ;TK INTERRUPT VECTOR
1127     000006                 MSCPUN  ==      6               ;T/MSCP UNIT NUMBER
1128     000010                 TKIPSV  ==     10               ;SAVE LOCATION FOR IP CONTENTS
1129     000012                 TKSASV  ==     12               ;SAVE LOCATION FOR SA CONTENTS
1130     000014                 LUNFLG  ==     14               ;BIT-SPECIFIC MEANINGS AS DEFINED BELOW
1131
1132
1133                            ;;*****************************************************************
1134                            ;;*****************************************************************
1135                            ;
1136                            ;LUNFLG
1137                            ;       THIS WORD IN LUNBLK IS USED TO CONVEY VARIOUS INFORMATION
1138                            ;       IN A BIT-SPECIFIC MANNER.  BITS USED BY THE PROGRAM ARE
1139                            ;       DEFINED AS FOLLOWS.
1140                            ;
1141                            ;;*****************************************************************
1142                            ;;*****************************************************************
1143
1144     000001                 DRPFLG  ==      BIT0            ;=0 UUT AVAILABLE FOR TEST
1145                                                            ;=1 UUT HAS BEEN DROPPED
1146     000002                 INTFLG  ==      BIT1            ;=1 EXPECTED INTERRUPT OCCURRED
1147
1148     000004                 BRFLAG  ==      BIT2            ;=1 INTERRUPT PRIORITY TEST
1149
1150     000010                 DUPFLG  ==      BIT3            ;=1 DUP COMMAND
1151
1152     000020                 ABTFLG  ==      BIT4            ;=1 ABORT LOCAL PROGRAM
1153
1154     000040                 CNTRLC  ==      BIT5            ;=1 RETURN TO DRS
1155
```

```
                        ;;*****************************************************************
                        ;;*****************************************************************
                        ;
                        ;UQ PORT EQUATES
                        ;       THIS SECTION DEFINES THOSE LITERALS USED
                        ;       BY THE DIAGNOSTIC IN THE UQ-PORT PROTOCOL.
                        ;       IN GENERAL THEY HAVE BEEN FORMED BY USING
                        ;       THE TWO LETTER MNEMONIC DEFINED IN UQSSP,
                        ;       PRECEDED BY "B." INDICATING THEY ARE BITS.
                        ;
                        ;;*****************************************************************
                        ;;*****************************************************************

                        ;READ-ONLY BITS

004000                  B.S1    ==      BIT11   ;STEP 1
010000                  B.S2    ==      BIT12   ;STEP 2
020000                  B.S3    ==      BIT13   ;STEP 3
040000                  B.S4    ==      BIT14   ;STEP 4

100000                  B.ER    ==      BIT15   ;ERROR INDICATION
002000                  B.NV    ==      BIT10   ;=0 VECTOR IS HOST SETTABLE
001000                  B.QB    ==      BIT9    ;=1 SUPPORTS 22 BIT HOST BUS
000400                  B.DI    ==      BIT8    ;=1 SUPPORTS ENHANCED DIAGNOSTICS
000200                  B.OD    ==      BIT7    ;=1 SUPPORTS ODD BUFFER ADDRESSES
000100                  B.MP    ==      BIT6    ;=1 SUPPORTS ADDRESS MAPPING

                        ;WRITE-ONLY BITS

100000                  B.PP    ==      BIT15   ;PERFORM PURGE AND POLL TESTS
040000                  B.WR    ==      BIT14   ;ENTER DIAGNOSTIC WRAP MODE
000002                  B.LF    ==      BIT1    ;LAST FAIL REQUEST
000001                  B.PI    ==      BIT0    ;ENABLE ADAPTER PURGE INTERRUPTS
000001                  B.GO    ==      BIT0    ;GO BIT - START RUNNING

                        ;READ/WRITE BITS

000200                  B.IE    ==      BIT7    ;STEP X-TION INTERRUPT ENABLE
```

```
                                ;;*****************************************************************
                                ;;*****************************************************************
                                ;
                                ;GENERAL PURPOSE EQUATES
                                ;
                                ;;*****************************************************************
                                ;;*****************************************************************

000004                          VEC4    ==      4       ;VECTOR FOUR - NXM TIMEOUTS, ETC.
177560                          RCSR    ==      177560  ;TERMINAL RECEIVE CONTROL/STATUS REGISTER ADDRESS
177562                          RBUF    ==      177562  ;TERMINAL RECEIVE BUFFER ADDRESS
```

```
1210                    ;;*****************************************************************
1211                    ;;*****************************************************************
1212                    ;
1213                    ;MEMORY MANAGEMENT EQUATES
1214                    ;
1215                    ;;*****************************************************************
1216                    ;;*****************************************************************
1217
1218    177572          MMUSR0  ==      177572  ;STATUS REG 0
1219    177574          MMUSR1  ==      177574
1220    177576          MMUSR2  ==      177576
1221    172516          MMUSR3  ==      172516  ;SHOULD ONLY BE PRESENT ON 22 BIT CPU'S
1222
1223    172340          KPAR0   ==      172340  ;KERNEL MODE PAGE ADDRESS REG 0
1224    172342          KPAR1   ==      172342
1225    172344          KPAR2   ==      172344
1226    172346          KPAR3   ==      172346
1227    172350          KPAR4   ==      172350
1228    172352          KPAR5   ==      172352
1229    172354          KPAR6   ==      172354
1230    172356          KPAR7   ==      172356  ;ALWAYS FOR I/O PAGE
1231
1232    172300          KPDR0   ==      172300  ;KERNEL MODE PAGE DESCRIPTOR REG 0
1233    172302          KPDR1   ==      172302
1234    172304          KPDR2   ==      172304
1235    172306          KPDR3   ==      172306
1236    172310          KPDR4   ==      172310
1237    172312          KPDR5   ==      172312
1238    172314          KPDR6   ==      172314
1239    172316          KPDR7   ==      172316
1240
1241    000001          MMON    ==      BIT0    ;ENABLE MMU - MMUSR0
1242    000020          MM22ON  ==      BIT4    ;ENABLE 22 BIT MMU - MMUSR3
1243
```

```
1245                            ;;*****************************************************************
1246                            ;;*****************************************************************
1247                            ;
1248                            ;COMMAND PACKET OPCODES
1249                            ;
1250                            ;;*****************************************************************
1251                            ;;*****************************************************************
1252
1253    000004                  OP.SCC  ==      04              ;SET CONTROLLER CHARACTERISTICS OPCODE
1254    000011                  OP.ONL  ==      11              ;ONLINE OPCODE
1255    000001                  OP.GDS  ==      01              ;GET DUST STATUS OPCODE
1256    000003                  OP.ELP  ==      03              ;EXECUTE LOCAL PROGRAM OPCODE
1257    000005                  OP.REC  ==      05              ;RECEIVE DATA OPCODE
1258    000006                  OP.ABT  ==      06              ;ABORT PROGRAM OPCODE
1259    000200                  OP.END  ==      200             ;END MESSAGE FLAG OPCODE
1260
1261
1262                            ;;*****************************************************************
1263                            ;;*****************************************************************
1264                            ;
1265                            ;GENERIC COMMAND PACKET OFFSETS
1266                            ;
1267                            ;;*****************************************************************
1268                            ;;*****************************************************************
1269
1270    000000                  P.CRF   ==       0              ;COMMAND REFERENCE NUMBER
1271    000004                  P.UNIT  ==       4              ;UNIT NUMBER
1272    000010                  P.OPCD  ==      10              ;OPCODE
1273    000011                  P.FLGS  ==      11              ;END MESSAGE FLAGS
1274    000012                  P.MOD   ==      12              ;MODIFIERS / STATUS
1275    000012                  P.STS   ==      12              ;MODIFIERS / STATUS
1276    000014                  P.BCNT  ==      14              ;BYTE COUNT
1277    000020                  P.BUFF  ==      20              ;BUFFER DESCRIPTOR
1278
1279
1280                            ;;*****************************************************************
1281                            ;;*****************************************************************
1282                            ;
1283                            ;GET DUST STATUS END PACKET OFFSETS
1284                            ;
1285                            ;;*****************************************************************
1286                            ;;*****************************************************************
1287
1288    000014                  P.EXT1  ==      14              ;1ST BYTE OF PROGRAM EXTENSION
1289    000015                  P.EXT2  ==      15              ;2ND BYTE OF PROGRAM EXTENSION
1290    000016                  P.EXT3  ==      16              ;3RD BYTE OF PROGRAM EXTENSION
1291    000017                  DUSTFL  ==      17              ;FLAGS
1292    000020                  P.IND1  ==      20              ;1ST WORD OF PROGRESS INDICATOR
1293    000022                  P.IND2  ==      22              ;2ND WORD OF PROGRESS INDICATOR
1294    000024                  TIMOUT  ==      24              ;TIMEOUT VALUE
1295
```

```
1297                    ;;*****************************************************************
1298                    ;;*****************************************************************
1299                    ;
1300                    ;TKSA BIT DEFINITIONS
1301                    ;
1302                    ;;*****************************************************************
1303                    ;;*****************************************************************
1304
1305    100000          ERR     ==      100000          ;ERROR
1306    004000          S1      ==      004000          ;STEP 1
1307    000001          GO      ==      000001          ;GO
1308
1309
1310                    ;;*****************************************************************
1311                    ;;*****************************************************************
1312                    ;
1313                    ;U/Q PORT LITERALS
1314                    ;
1315                    ;;*****************************************************************
1316                    ;;*****************************************************************
1317
1318    100000          OWN     ==      100000          ;DESCRIPTOR OWNERSHIP BIT
1319    040000          FLAG    ==      040000          ;DESCRIPTOR INTERUPT FLAG BIT
1320    000200          IMM     ==      000200          ;IMMEDIATE COMMAND FLAG
1321    000010          TF.BLK  ==      10              ;TAPE FORMAT
1322    000000          HSTIMO  ==      0               ;HOST TIMEOUT VALUE
1323    000000          MSCPVR  ==      0               ;MSCP VERSION NUMBER
1324    000004          RNGSTP  ==       4.             ;DESCRIPTOR RING STEP
1325    000104          RSPSTP  ==      68.             ;RESPONCE BUFFER STEP
1326
1327
```

```
1329                            ;;*****************************************************************
1330                            ;;*****************************************************************
1331                            ;
1332                            ;TMSCP DRIVER BUFFER OFFSETS
1333                            ;
1334                            ;;*****************************************************************
1335                            ;;*****************************************************************
1336
1337        000002              HIADDR  ==      2.          ;DESCRIPTOR ADDRESS OFFSET
1338        177777              CONID   ==     -1.          ;COMMAND/RESPONSE CONNECTION TYPE I.D.
1339        177776              CRD     ==      2.          ;COMMAND/RESPONSE CREDIT LIMIT OFFSET
1340        177774              MSGLEN  ==     -4.          ;COMMAND/RESPONSE MESSAGE LENGTH
1341        000005              TXFER   ==      5.          ;ERROR FORMAT FOR "TAPE TRANSFER" ERROR LOG
1342        000011              DRVER   ==      9.          ;ERROR FORMAT FOR "DRIVE ERROR" ERROR LOG
1343        000000              CNTER   ==      0.          ;ERROR FORMAT FOR "CONTROLLER ERROR" ERROR LOG
1344
```

```
1346                    ;;*****************************************************************
1347                    ;;*****************************************************************
1348                    ;
1349                    ;OFFSET VALUES INTO LEVEL 2 MICRODIAGNOSTIC RECEIVE DATA BUFFER
1350                    ;
1351                    ;;*****************************************************************
1352                    ;;*****************************************************************
1353
1354     000002         L2STA  ==       2       ;OFFSET OF PROGRAM STATUS
1355     000004         L2DRV  ==       4       ;OFFSET OF DRIVE STATUS
1356     000006         L2TST  ==       6       ;OFFSET OF TEST NUMBER
1357     000007         L2TRK  ==       7       ;OFFSET OF TRACK NUMBER
1358     000010         L2CMD  ==       10      ;OFFSET OF COMMAND IN ERROR
1359     000011         L2RSP  ==       11      ;OFFSET OF RESPONSE FLAG
1360     000012         L2UNT  ==       12      ;OFFSET OF UNIT FLAGS
1361     000014         L2BWR1 ==       14      ;OFFSET OF BLOCKS WRITTEN CH. 1
1362     000020         L2BWR2 ==       20      ;OFFSET OF BLOCKS WRITTEN CH. 2
1363     000024         L2BRD1 ==       24      ;OFFSET OF BLOCKS READ CH. 1
1364     000030         L2BRD2 ==       30      ;OFFSET OF BLOCKS READ CH. 2
1365     000034         L2SWR1 ==       34      ;OFFSET OF SOFT WRITE ERRORS CH. 1
1366     000036         L2SWR2 ==       36      ;OFFSET OF SOFT WRITE ERRORS CH. 2
1367     000040         L2ECC1 ==       40      ;OFFSET OF ECC CORRECTED ERRORS CH. 1
1368     000042         L2ECC2 ==       42      ;OFFSET OF ECC CORRECTED ERRORS CH. 2
1369     000044         L2CRC1 ==       44      ;OFFSET OF CRC ERRORS ON ECC BLOCK CH. 1
1370     000046         L2CRC2 ==       46      ;OFFSET OF CRC ERRORS ON ECC BLOCK CH. 2
1371     000050         L2REP1 ==       50      ;OFFSET OF READ REPOSITIONS CH. 1
1372     000052         L2REP2 ==       52      ;OFFSET OF READ REPOSITIONS CH. 2
1373     000134         L2ELFM ==       134     ;OFFSET OF ERROR LOG ERROR FORMAT
1374     000135         L2ELFL ==       135     ;OFFSET OF ERROR LOG FLAGS
1375     000136         L2ELEV ==       136     ;OFFSET OF ERROR LOG EVENT CODE
1376     000144         L2ELRL ==       144     ;OFFSET OF ERROR LOG RETRY LEVEL
1377     000145         L2ELRT ==       145     ;OFFSET OF ERROR LOG NUMBER OF RETRIES
1378     000146         L2ELP1 ==       146     ;OFFSET OF ERROR LOG POSITION (low order)
1379     000150         L2ELP2 ==       150     ;OFFSET OF ERROR LOG POSITION (high order)
1380     000154         L2ELST ==       154     ;OFFSET OF CONTROLLER STATUS
1381     000155         L2ELDE ==       155     ;OFFSET OF ERROR LOG DRIVE ERROR CODE
1382     000156         L2ELDF ==       156     ;OFFSET OF ERROR LOG DRIVE FLAGS
1383     000157         L2ELTN ==       157     ;OFFSET OF ERROR LOG TRACK NUMBER
1384     000160         L2ELPB ==       160     ;OFFSET OF ERROR LOG PHYSICAL BLOCK NUMBER
1385     000162         L2ELLB ==       162     ;OFFSET OF ERROR LOG LOGICAL BLOCK NUMBER
1386     000163         L2ELT0 ==       163     ;OFFSET OF ERROR LOG LSB OF TAPE LENGTH COUNT
1387     000164         L2ELT1 ==       164     ;OFFSET OF ERROR LOG BYTE 1 OF TAPE LENGTH COUNT
1388     000165         L2ELT2 ==       165     ;OFFSET OF ERROR LOG MSB OF TAPE LENGTH COUNT
1389     000166         L2ELDS ==       166     ;OFFSET OF ERROR LOG DRIVE STATE
1390     000170         L2ELRW ==       170     ;OFFSET OF ERROR LOG READ/WRITE STATE
1391     000172         L2ELOF ==       172     ;OFFSET OF ERROR LOG OPERATION FLAGS
1392     000140         L2ELEC ==       140     ;OFFSET OF ERROR LOG CONTROLLER ERROR CODE
```

```
                                .SBTTL  GLOBAL DATA SECTION


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



                                ;;******************************************************************
                                ;;******************************************************************
                                ;
                                ;LUNBLK
                                ;       THIS BLOCK OF MEMORY IS USED TO STORE VARIABLE INFORMATION
                                ;       PERTAINING TO THE CURRENT LOGICAL UNIT UNDER TEST.  LUNBLK
                                ;       IS POINTED TO THROUGHOUT THE PROGRAM BY R4 AND INDIVIDUAL
                                ;       LOCATIONS ARE ACCESSED VIA LITERALS DEFINED ABOVE.
                                ;
                                ;;******************************************************************
                                ;;******************************************************************

002212  000000  000000  000000  LUNBLK::        .WORD   0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0


                                ;;******************************************************************
                                ;;******************************************************************
                                ;
                                ;UQ-PORT NECESSITIES
                                ;       THESE TABLES ARE SET UP BY VARIOUS
                                ;       TESTS WITH VALUES TO BE WRITTEN TO
                                ;       THE PORT, AND COMPARISON VALUES TO
                                ;       CHECK THE PORT AFTER EACH STEP TRAN-
                                ;       SITION OCCURS, RESPECTIVELY.
                                ;
                                ;;******************************************************************
                                ;;******************************************************************

002250                          STPTBL::        .BLKW   4       ;VALUES WRITTEN TO THE PORT

002260                          CMPTBL::        .BLKW   4       ;COMPARISON VALUES
```

```
1441                                    ;;**********************************************************************
1442                                    ;;**********************************************************************
1443                                    ;
1444                                    ;PROGRAM CONTROL VARIABLES
1445                                    ;       THESE GLOBAL VARIABLES ARE GENERALLY USED TO CONTROL THE
1446                                    ;       OVERALL EXECUTION OF THE DIAGNOSTIC.
1447                                    ;
1448                                    ;;**********************************************************************
1449                                    ;;**********************************************************************
1450
1451 002270  000000                    PASCNT::        .WORD   0       ;CUMULATIVE PROGRAM PASS COUNTER
1452 002272  000000                    ITRCNT::        .WORD   0       ;LOADED BY EACH TEST TO SPECIFY # OF ITERATIONS
1453 002274  000000                    KTFLAG::        .WORD   0       ;=0 MEMORY MANAGEMENT NOT AVAILABLE
1454                                                                    ;=1 MEMORY MANAGEMENT IS AVAILABLE
1455 002276  000000                    TRP4FG::        .WORD   0       ;=1 TRAP TO VECTOR OCCURRED
1456 002300  000000                    PAROFF::        .WORD   0       ;USED IN TEST 7 TO STEP THROUGH UPPER MEMORY
1457 002302  000000                    CMMERR::        .WORD   0       ;=0 NO ERROR IN COMMUNICATION AREA
1458                                                                    ;=1 ERROR WITHIN COMMUNICATION AREA
1459                                                                    ;=-1 ERROR BEYOND BOUNDS OF COMM AREA
1460 002304  000000                    CMTBLG::        .WORD   0       ;# OF CONTIGUOUS WORDS IN ERROR IN COMM AREA
1461 002306  000000                    CMARLG::        .WORD   0       ;LENGTH OF COMM AREA FOR TEST N
1462 002310  000000                    FRUIS::         .WORD   0       ;POINTER TO FAULTY FRU ASCII FOR PRINTOUT
1463 002312  000000                    LOGUNT::        .WORD   0       ;LOGICAL UNIT # OF CURRENT UUT
1464 002314  000000                    SAEXP::         .WORD   0       ;LOADED WITH EXPECTED SA FOR ERROR CHECKING
1465 002316  000000                    INISTP::        .WORD   0       ;CURRENT STEP OF INIT SEQUENCE
1466 002320  000000                    STEPST::        .WORD   0       ;SUCCESS/FAIL STATUS FROM STEP SUBROUTINES
1467 002322  000000                    WRDATA::        .WORD   0       ;LOADED WITH DATA FRO WRAP MODE TEST
1468 002324  000000                    INNER::         .WORD   0       ;COUNTER FOR PDELAY ROUTINE
1469 002326  000000                    OUTER::         .WORD   0       ;OTHER COUNTER FOR PDELAY
1470 002330  000000                    TOUT::          .WORD   0       ;TIMEOUT INDICATOR FOR PDELAY
1471 002332  000000                    TEMP::          .WORD   0       ;TEMPORARY STORAGE LOCATION
1472 002334  000000                    FLAGS::         .WORD   0       ;WORK LOCATION FOR SUPERVISOR FLAGS
```

```
                                ;;*****************************************************************
                                ;;*****************************************************************
                                ;
                                ;TMSCP/DUP COMMAND PACKETS
                                ;
                                ;;*****************************************************************
                                ;;*****************************************************************

                                ;;*****************************************************************
                                ;
                                ;TMSCP SET CONTROLLER CHARACTERISTICS COMMAND PACKET
                                ;
                                ;;*****************************************************************

002336  000040  000000                  .WORD   32.,0
002342  000000  000000          SCTRLC: .WORD   0,0
002346  000000  000000                  .WORD   0,0
002352  000004  000000                  .WORD   OP.SCC,0
002356  000000  000000                  .WORD   0,0
002362  000000  000000                  .WORD   0,0
002366  000000  000000                  .WORD   0,0
002372  000000  000000                  .WORD   0,0
002376  000000  000000                  .WORD   0,0


                                ;STARS
                                ;
                                ;TMSCP ONLINE COMMAND PACKET
                                ;
                                ;;*****************************************************************

002402  000044  000000                  .WORD   36.,0
002406  000000  000000          ONLINE: .WORD   0,0
002412  000000  000000                  .WORD   0,0
002416  000011  000000                  .WORD   OP.ONL,0
002422  000000  000000                  .WORD   0,0
002426  000000  000000                  .WORD   0,0
002432  000000  000000                  .WORD   0,0
002436  000000  000000                  .WORD   0,0
002442  000000  000000                  .WORD   0,0
002446  000000  000000                  .WORD   0,0


                                ;STARS
                                ;
                                ;DUP GET DUST STATUS COMMAND PACKET
                                ;
                                ;;*****************************************************************

002452  000020  000000                  .WORD   16.,0
002456  000000  000000          GDUST:  .WORD   0,0
002462  000000  000000                  .WORD   0,0
002466  000001  000000                  .WORD   OP.GDS,0


                                ;STARS
                                ;
```

```
                                        ;DUP EXECUTE LOCAL PROGRAM COMMAND PACKET
                                        ;
                                        ;;*****************************************************************
                                                .WORD   18.,0
002476  000000  000000                  XLOCPR: .WORD   0,0
002502  000000  000000                          .WORD   0,0
002506  000003  000000                          .WORD   OP.ELP,0
002512    104     111     101                   .ASCII  /DIAGL2/

                                        ;STARS
                                        ;
                                        ;DUP RECEIVE DATA COMMAND PACKET
                                        ;
                                        ;;*****************************************************************

002520  000024  000000                          .WORD   20.,0
002524  000000  000000                  RCVDAT: .WORD   0,0
002530  000000  000000                          .WORD   0,0
002534  000005  000000                          .WORD   OP.REC,0
002540  000226  000000                          .WORD   150.,0
002544  060000  000000                          .WORD   RDBUF,0


                                        ;STARS
                                        ;
                                        ;DUP ABORT COMMAND PACKET
                                        ;
                                        ;;*****************************************************************

002550  000014  000000                          .WORD   12.,0
002554  000000  000000                  ABORT:  .WORD   0,0
002560  000000  000000                          .WORD   0,0
002564  000006  000000                          .WORD   OP.ABT,0
```

```
                        ;;*****************************************************************
                        ;;*****************************************************************
                        ;
                        ;CLASS DRIVER BUFFERS
                        ;
                        ;;*****************************************************************
                        ;;*****************************************************************

002570                  RESPBF::        .BLKW   2.      ;TOP 4 LOCATIONS OF RESPONSE BUFFER
002574                  RSPBUF::        .BLKW   66.     ;DRIVER RESPONSE BUFFER


                        ;;*****************************************************************
                        ;;*****************************************************************
                        ;
                        ;U/Q PORT DESCRIPTOR RINGS
                        ;
                        ;;*****************************************************************
                        ;;*****************************************************************

003000                  DSCRNG::        .BLKW   2.      ;DESCRIPTOR RING
003004                  RSPEND::                        ;END OF RESPONSE BUFFER
003004                  RSPRNG::        .BLKW   4.      ;RESPONSE DESCRIPTOR RING
003014                  CMDRNG::        .BLKW   4.      ;COMMAND DESCRIPTOR RING
003024                  DSCEND::                        ;END OF DESCRIPTOR RING


                        ;;*****************************************************************
                        ;;*****************************************************************
                        ;
                        ;CLASS AND PORT DRIVER VARIABLES
                        ;
                        ;;*****************************************************************
                        ;;*****************************************************************

003024  000000          CNTHI::         .WORD   0       ;VALUE OF THE HIGH TIMEOUT
003026  000000          CNTFLG::        .WORD   0       ;CONTROLLER FLAGS
003030  000000          PCKSIZ::        .WORD   0       ;PACKET SIZE IN BYTES
003032  000000          CMDREF::        .WORD   0       ;COMMAND REFERENCE NUMBER
003034  000000          CMDCNT::        .WORD   0       ;COMMAND COUNT
003036                  WRBUF::         .BLKW   4096.   ;WRITE BUFFER
023036  000000          CMDSAV::        .WORD   0       ;COMMAND DESCRIPTOR SAVE
023040  000000          RSPSAV::        .WORD   0       ;RESPONSE DESCRIPTOR SAVE
023042  000000          CURCMD::        .WORD   0       ;POINTER TO CURRENT COMMAND ASCII
```

```
                        ;;*****************************************************************************
                        ;;*****************************************************************************
                        ;
                        ;PROTECTION TABLE
                        ;
                        ;;*****************************************************************************
                        ;;*****************************************************************************

023044                  BGNPROT
023044                  L$PROT::
023044  000000                  .WORD   0
023046  177777                  .WORD   -1
023050  177777                  .WORD   -1

023052                  ENDPROT
```

```
1633 023052                          STARS
                                     ;;*****************************************************************
1634 023052                          STARS
                                     ;;*****************************************************************
1635                                 ;
1636                                 ;LEVEL 2 MICRODIAGNOSTIC ERROR TABLE
1637                                 ;
1638 023052                          STARS
                                     ;;*****************************************************************
1639 023052                          STARS
                                     ;;*****************************************************************
1640
1641 023052                                  ERRTBL
     023052                          L$ERRTBL::
     023052  000000                  ERRTYP::        .WORD   0
     023054  000000                  ERRNBR::        .WORD   0
     023056  000000                  ERRMSG::        .WORD   0
     023060  000000                  ERRBLK::        .WORD   0
1642
1643 023062                          L2ETBL::                        ;START OF TMSCP COMMAND ERROR MESSAGES
1644
1645 023062  000001                          .WORD   1.              ;INVALID COMMAND
1646 023064  000145                          .WORD   101.
1647 023066  030763                          .WORD   L2ER1
1648 023070  033544                          .WORD   L2DUMP
1649
1650 023072  000001                          .WORD   1.              ;COMMAND ABORTED
1651 023074  000146                          .WORD   102.
1652 023076  031003                          .WORD   L2ER2
1653 023100  033544                          .WORD   L2DUMP
1654
1655 023102  000001                          .WORD   1.              ;UNIT-OFFLINE
1656 023104  000147                          .WORD   103.
1657 023106  031023                          .WORD   L2ER3
1658 023110  033544                          .WORD   L2DUMP
1659
1660 023112  000001                          .WORD   1.              ;UNIT-AVAILABLE
1661 023114  000150                          .WORD   104.
1662 023116  031040                          .WORD   L2ER4
1663 023120  033544                          .WORD   L2DUMP
1664
1665 023122  000001                          .WORD   1.              ;INVALID STATUS
1666 023124  000151                          .WORD   105.
1667 023126  031057                          .WORD   L2ER5
1668 023130  033544                          .WORD   L2DUMP
1669
1670 023132  000001                          .WORD   1.              ;WRITE PROTECTED
1671 023134  000152                          .WORD   106.
1672 023136  031107                          .WORD   L2ER6
1673 023140  033544                          .WORD   L2DUMP
1674
1675 023142  000001                          .WORD   1.              ;COMPARE ERROR
1676 023144  000153                          .WORD   107.
1677 023146  031127                          .WORD   L2ER7
1678 023150  033544                          .WORD   L2DUMP
1679
1680 023152  000001                          .WORD   1.              ;DATA ERROR
```

GLOBAL DATA SECTION

```
1681 023154  000154                    .WORD   108.
1682 023156  031145                    .WORD   L2ER8
1683 023160  033544                    .WORD   L2DUMP
1684
1685 023162  000001                    .WORD   1.              ;HOST BUFFER ACCESS ERROR
1686 023164  000155                    .WORD   109.
1687 023166  031160                    .WORD   L2ER9
1688 023170  033544                    .WORD   L2DUMP
1689
1690 023172  000001                    .WORD   1.              ;CONTROLLER ERROR
1691 023174  000156                    .WORD   110.
1692 023176  031211                    .WORD   L2ER10
1693 023200  033544                    .WORD   L2DUMP
1694
1695 023202  000001                    .WORD   1.              ;DRIVE ERROR
1696 023204  000157                    .WORD   111.
1697 023206  031232                    .WORD   L2ER11
1698 023210  033544                    .WORD   L2DUMP
1699
1700 023212  000001                    .WORD   1.              ;FORMATTER ERROR
1701 023214  000160                    .WORD   112.
1702 023216  031246                    .WORD   L2ER12
1703 023220  033544                    .WORD   L2DUMP
1704
1705 023222  000001                    .WORD   1.              ;BOT ENCOUNTERED
1706 023224  000161                    .WORD   113.
1707 023226  031266                    .WORD   L2ER13
1708 023230  033544                    .WORD   L2DUMP
1709
1710 023232  000001                    .WORD   1.              ;TAPE MARK ENCOUNTERED
1711 023234  000162                    .WORD   114.
1712 023236  031306                    .WORD   L2ER14
1713 023240  033544                    .WORD   L2DUMP
1714
1715 023242  000001                    .WORD   1.              ;INVALID STATUS
1716 023244  000163                    .WORD   115.
1717 023246  031334                    .WORD   L2ER15
1718 023250  033544                    .WORD   L2DUMP
1719
1720 023252  000001                    .WORD   1.              ;RECORD DATA TRUNCATED
1721 023254  000164                    .WORD   116.
1722 023256  031364                    .WORD   L2ER16
1723 023260  033544                    .WORD   L2DUMP
1724
1725 023262  000001                    .WORD   1.              ;POSITION LOST
1726 023264  000165                    .WORD   117.
1727 023266  031412                    .WORD   L2ER17
1728 023270  033544                    .WORD   L2DUMP
1729
1730 023272  000001                    .WORD   1.              ;SERIOUS EXCEPTION
1731 023274  000166                    .WORD   118.
1732 023276  031430                    .WORD   L2ER18
1733 023300  033544                    .WORD   L2DUMP
1734
1735 023302  000001                    .WORD   1.              ;LEOT DETECTED
1736 023304  000167                    .WORD   119.
1737 023306  031451                    .WORD   L2ER19
```

```
1738 023310  033544                        .WORD   L2DUMP
1739
1740 023312                        L2MSG:                          ;START OF MICRODIAGNOSTIC DETECTED ERROR MESSAGES
1741
1742 023312  000001                DCERR:  .WORD   1.              ;DATA COMPARE ERROR
1743 023314  000170                        .WORD   120.
1744 023316  031467                        .WORD   L2ER20
1745 023320  033544                        .WORD   L2DUMP
1746
1747 023322  000001                CNTERR: .WORD   1.              ;CONTROLLER ERROR
1748 023324  000171                        .WORD   121.
1749 023326  031551                        .WORD   L2ER21
1750 023330  033544                        .WORD   L2DUMP
1751
1752 023332  000001                INVSTA: .WORD   1.              ;INVALID STATUS
1753 023334  000172                        .WORD   122.
1754 023336  031631                        .WORD   L2ER22
1755 023340  033544                        .WORD   L2DUMP
1756
1757 023342  000001                BPNERR: .WORD   1.              ;BAD PATTERN NUMBER
1758 023344  000173                        .WORD   123
1759 023346  031720                        .WORD   L2ER23
1760 023350  033544                        .WORD   L2DUMP
1761
1762 023352  000001                RSPADD: .WORD   1.              ;RESPONSE ADDRESS ERROR
1763 023354  000174                        .WORD   124.
1764 023356  032010                        .WORD   L2ER24
1765 023360  033544                        .WORD   L2DUMP
1766
1767 023362  000001                HBFADD: .WORD   1.              ;HOST BUFFER ADDRESS ERROR
1768 023364  000175                        .WORD   125.
1769 023366  032076                        .WORD   L2ER25
1770 023370  033544                        .WORD   L2DUMP
1771
1772 023372  000001                UNERLG: .WORD   1.              ;UNKNOWN ERROR LOG RECEIVED
1773 023374  000176                        .WORD   126.
1774 023376  032167                        .WORD   L2ER26
1775 023400  033544                        .WORD   L2DUMP
1776
1777 023402  000001                RSPTO:  .WORD   1.              ;RESPONSE TIMEOUT ERROR
1778 023404  000177                        .WORD   127.
1779 023406  032261                        .WORD   L2ER27
1780 023410  033544                        .WORD   L2DUMP
```

```
 1782                                   .SBTTL  GLOBAL TEXT SECTION
 1786                                   ;;*****************************************************************
 1787                                   ;;*****************************************************************
 1788                                   ;
 1789                                   ; THE GLOBAL TEXT SECTION CONTAINS FORMAT STATEMENTS,
 1790                                   ; MESSAGES, AND ASCII INFORMATION THAT ARE USED IN
 1791                                   ; MORE THAN ONE TEST.
 1792                                   ;
 1793                                   ;;*****************************************************************
 1794                                   ;;*****************************************************************
 1795
 1796
 1797                                   ;;*****************************************************************
 1798                                   ;
 1799                                   ; NAMES OF DEVICES SUPPORTED BY PROGRAM
 1800                                   ;
 1801                                   ;;*****************************************************************
 1805
 1806 023412                                   DEVTYP  <TK50>
      023412                           L$DVTYP::
      023412     124     113     065           .ASCIZ  %TK50%
                                               .EVEN
 1807
```

```
1812
1813                                    ;;*****************************************************************
1814                                    ;
1815                                    ;FORMAT STATEMENTS
1816                                    ;
1817                                    ;;*****************************************************************
1818
1819 023420    045     101     111  LINE1:: .ASCIZ  ?%AINIT SEQUENCE STEP #: %D1?
1820 023454    045     116     045  LINE2:: .ASCIZ  ?%N%ASA REG: %O6%A EXPCTD: %O6%A  ACTUAL SA: %O6?
1821 023534    045     116     045  LINE3:: .ASCIZ  ?%N%AIP REG ADDRESS: %O6?
1822 023564    045     116     045  LINE4:: .ASCIZ  ?%N%A****FAILING FRU: %T%A*****%N%N?
1823 023626    045     101     122  LINE5:: .ASCIZ  ?%ARELOCATION CONSTANT: %O6%A  VIRT. ADD: %O6?
1824 023703    045     116     045  LINE6:: .ASCIZ  ?%N%AEXPECTED: %O6%A  RECEIVED: %O6?
1825 023746    045     101     120  LINE7:: .ASCIZ  ?%APHYSICAL ADD: %O6?
1826
1827 023772    045     116     045  WR1::   .ASCIZ  ?%N%ASA REG: %O6%A SA CONTENTS: %O6?
1828 024035    045     116     045  WR2::   .ASCIZ  ?%N%AFAILING COMMAND :  %T%N?
1829 024071    045     116     045  WR3::   .ASCIZ  ?%N%A   RESPONSE PACKET%N?
1830 024122    045     116     045  WR4::   .ASCIZ  ?%N%A   %O6%A     %O6?
1831 024147    045     116     045  WR5::   .ASCIZ  ?%N%ACMD EXP: %O6%A  CMD REC:  %O6?
1832 024211    045     116     000  WR6::   .ASCIZ  ?%N?
1833 024214    045     116     045  WR7::   .ASCIZ  ?%N%AFAILING COMMAND : %T%N%AUNIT UNKNOWN?
1834 024265    045     116     045  WR8::   .ASCIZ  ?%N%AFAILING COMMAND : %T%N%ANO MEDIA MOUNTED?
1835 024342    045     116     045  WR9::   .ASCIZ  ?%N%AFAILING COMMAND : %T%N%AUNIT INOPERATIVE?
1836
1837
1838 024417    045     116     062  L21::   .ASCIZ  ?%N2%A**** LEVEL 2 MICRODIAGNOSTIC DUMP ****?
1839 024473    045     116     062  L22::   .ASCIZ  ?%N2%APROGRAM STATUS:      %O6?
1840 024531    045     116     045  L23::   .ASCIZ  ?%N%ADRIVE STATUS:          %O3?
1841 024571    045     116     045  L24::   .ASCIZ  ?%N%ATEST NUMBER:          %D3?
1842 024631    045     116     045  L25::   .ASCIZ  ?%N%ATRACK NUMBER:         %D3?
1843 024671    045     116     045  L26::   .ASCIZ  ?%N%ATMSCP COMMAND:        %O3?
1844 024731    045     116     045  L27::   .ASCIZ  ?%N%ATMSCP RESPONSE FLAG:  %O3?
1845 024771    045     116     045  L28::   .ASCIZ  ?%N%ATMSCP UNIT FLAG:     %O6?
1846 025026    045     116     062  L29::   .ASCIZ  ?%N2%ABLOCKS WRITTEN CHANNEL 1:   %D6?
1847 025073    045     116     045  L210::  .ASCIZ  ?%N%ABLOCKS WRITTEN CHANNEL 2:   %D6?
1848 025137    045     116     045  L211::  .ASCIZ  ?%N%ABLOCKS READ CHANNEL 1:      %D6?
1849 025203    045     116     045  L212::  .ASCIZ  ?%N%ABLOCKS READ CHANNEL 2:      %D6?
1850 025247    045     116     045  L213::  .ASCIZ  ?%N%ASOFT WRITE CHANNEL 1:       %D6?
1851 025313    045     116     045  L214::  .ASCIZ  ?%N%ASOFT WRITE CHANNEL 2:       %D6?
1852 025357    045     116     045  L215::  .ASCIZ  ?%N%AECC CORRECTED CHANNEL 1:    %D6?
1853 025423    045     116     045  L216::  .ASCIZ  ?%N%AECC CORRECTED CHANNEL 2:    %D6?
1854 025467    045     116     045  L219::  .ASCIZ  ?%N%AREAD REPOSITIONS CHANNEL 1: %D6?
1855 025533    045     116     045  L220::  .ASCIZ  ?%N%AREAD REPOSITIONS CHANNEL 2: %D6%N?
1856 025601    045     116     062  L221::  .ASCIZ  ?%N2%AERROR LOG (TAPE TRANSFER ERROR)?
1857 025646    045     116     045  L222::  .ASCIZ  ?%N%AERROR FORMAT:             %O3?
1858 025710    045     116     045  L223::  .ASCIZ  ?%N%AERROR FLAGS:              %O3?
1859 025752    045     116     045  L224::  .ASCIZ  ?%N%AEVENT CODE:           %O6?
1860 026011    045     116     045  L225::  .ASCIZ  ?%N%AERROR RETRY LEVEL:       %O3?
1861 026053    045     116     045  L226::  .ASCIZ  ?%N%ANUMBER OF RETRIES:       %D3?
1862 026115    045     116     045  L227::  .ASCIZ  ?%N%APOSITION (LOW ORDER):  %O6?
1863 026154    045     116     045  L228::  .ASCIZ  ?%N%APOSITION (HIGH ORDER): %O6?
1864 026213    045     116     045  L229::  .ASCIZ  ?%N%ACONTROLLER STATUS:       %O3?
1865 026255    045     116     045  L230::  .ASCIZ  ?%N%ADRIVE ERROR CODE:        %O3?
1866 026317    045     116     045  L231::  .ASCIZ  ?%N%ADRIVE FLAGS:            %O3?
1867 026361    045     116     045  L232::  .ASCIZ  ?%N%ATRACK NUMBER:           %D3?
1868 026423    045     116     045  L233::  .ASCIZ  ?%N%APHYSICAL BLOCK NUMBER: %D6?
```

```
1869 026462  045  116  045  L234::  .ASCIZ  ?%N%ALOGICAL BLOCK NUMBER:     %D3?
1870 026524  045  116  045  L235::  .ASCIZ  ?%N%ATAPE COUNT 0 :            %03?
1871 026566  045  116  045  L236::  .ASCIZ  ?%N%ATAPE COUNT 1 :            %03?
1872 026630  045  116  045  L237::  .ASCIZ  ?%N%ATAPE COUNT 2 :            %03?
1873 026672  045  116  045  L238::  .ASCIZ  ?%N%ADRIVE STATE:           %06?
1874 026731  045  116  045  L239::  .ASCIZ  ?%N%AREAD/WRITE STATE:      %06?
1875 026770  045  116  045  L240::  .ASCIZ  ?%N%AOPERATION FLAGS:       %06?
1876 027027  045  116  062  L241::  .ASCIZ  ?%N2%AERROR LOG (CONTROLLER ERROR)?
1877 027071  045  116  045  L242::  .ASCIZ  ?%N%ACONTROLLER ERROR CODE: %06?
1878
1879 027130  045  116  062  L244::  .ASCIZ  ?%N2%ABYTE READ: %03%A BYTE WRITTEN: %03%A BYTE ADDRESS: %06?
1880 027224  045  116  045  L245::  .ASCIZ  ?%N%A          %03%A              %03%A              %06?
1881 027320  045  116  045  L246::  .ASCIZ  ?%N%A          %03%A              %03%A              %06?
1882 027414  045  116  045  L247::  .ASCIZ  ?%N%A          %03%A              %03%A              %06?
1883 027510  045  116  045  L248::  .ASCIZ  ?%N%A          %03%A              %03%A              %06?
1884 027604  045  116  045  L249::  .ASCIZ  ?%N%A          %03%A              %03%A              %06?
1885 027700  045  116  045  L250::  .ASCIZ  ?%N%A          %03%A              %03%A              %06?
1886 027774  045  116  045  L251::  .ASCIZ  ?%N%A          %03%A              %03%A              %06?
1887 030070  045  116  045  L252::  .ASCIZ  ?%N%A          %03%A              %03%A              %06?
1888 030164  045  116  045  L253::  .ASCIZ  ?%N%A          %03%A              %03%A              %06?
1889 030260  045  116  062  L254::  .ASCIZ  ?%N2%ATOTAL NUMBER OF MISCOMPARED BYTES: %06?
1890                        .EVEN
1891
1892                        ;;*****************************************************************
1893                        ;
1894                        ;ERROR MESSAGES
1895                        ;
1896                        ;;*****************************************************************
1897
1898
1899 030334  116  130  115  EMSG5:: .ASCIZ  ?NXM ON READ TKIP?
1900 030355  124  113  111  EMSG6:: .ASCIZ  ?TKIP NOT 0 ON FIRST READ?
1901 030406  116  130  115  EMSG7:: .ASCIZ  ?NXM ON READ TKSA?
1902 030427  123  101  040  EMSG8:: .ASCIZ  ?SA REG IN ERROR ON FIRST READ?
1903 030465  123  101  040  EMSG9:: .ASCIZ  ?SA CONTENTS IN ERROR?
1904 030512  123  101  040  EMSG10::.ASCIZ  ?SA WRONG IN DATA WRAP?
1905 030540  105  130  120  EMSG11::.ASCIZ  ?EXPECTED INTERRUPT DID NOT OCCUR?
1906 030601  111  116  124  EMSG12::.ASCIZ  ?INTRRPT OCCURRED WITH CPU PRIORITY = 7?
1907 030650  123  101  040  EMSG13::.ASCIZ  ?SA NOT 0 IN PURGE/POLL?
1908 030677  120  125  122  EMSG14::.ASCIZ  ?PURGE/POLL TEST FAILED?
1909 030726  105  130  124  EMSG15::.ASCIZ  ?EXTENDED ADDRESS TEST FAILED?
1910
1911 030763  111  116  126  L2ER1:: .ASCIZ  ?INVALID COMMAND?
1912 031003  103  117  115  L2ER2:: .ASCIZ  ?COMMAND ABORTED?
1913 031023  125  116  111  L2ER3:: .ASCIZ  ?UNIT-OFFLINE?
1914 031040  125  116  111  L2ER4:: .ASCIZ  ?UNIT-AVAILABLE?
1915 031057  111  116  126  L2ER5:: .ASCIZ  ?INVALID STATUS RECEIVED?
1916 031107  127  122  111  L2ER6:: .ASCIZ  ?WRITE PROTECTED?
1917 031127  103  117  115  L2ER7:: .ASCIZ  ?COMPARE ERROR?
1918 031145  104  101  124  L2ER8:: .ASCIZ  ?DATA ERROR?
1919 031160  110  117  123  L2ER9:: .ASCIZ  ?HOST BUFFER ACCESS ERROR?
1920 031211  103  117  116  L2ER10::.ASCIZ  ?CONTROLLER ERROR?
1921 031232  104  122  111  L2ER11::.ASCIZ  ?DRIVE ERROR?
1922 031246  106  117  122  L2ER12::.ASCIZ  ?FORMATTER ERROR?
1923 031266  102  117  124  L2ER13::.ASCIZ  ?BOT ENCOUNTERED?
1924 031306  124  101  120  L2ER14::.ASCIZ  ?TAPE MARK ENCOUNTERED?
1925 031334  111  116  126  L2ER15::.ASCIZ  ?INVALID STATUS RECEIVED?
```

```
1926 031364     122     105     103  L2ER16::.ASCIZ  ?RECORD DATA TRUNCATED?
1927 031412     120     117     123  L2ER17::.ASCIZ  ?POSITION LOST?
1928 031430     123     105     122  L2ER18::.ASCIZ  ?SERIOUS EXEPTION?
1929 031451     114     105     117  L2ER19::.ASCIZ  ?LEOT DETECTED?
1930 031467     115     111     103  L2ER20::.ASCIZ  ?MICRODIAGNOSTIC PROGRAM ERROR: DATA COMPARE ERROR?
1931 031551     115     111     103  L2ER21::.ASCIZ  ?MICRODIAGNOSTIC PROGRAM ERROR: CONTROLLER ERROR?
1932 031631     115     111     103  L2ER22::.ASCIZ  ?MICRODIAGNOSTIC PROGRAM ERROR: INVALID STATUS RECEIVED?
1933 031720     115     111     103  L2ER23::.ASCIZ  ?MICRODIAGNOSTIC PROGRAM ERROR: BAD PATTERN NUMBER ERROR?
1934 032010     115     111     103  L2ER24::.ASCIZ  ?MICRODIAGNOSTIC PROGRAM ERROR: RESPONSE ADDRESS ERROR?
1935 032076     115     111     103  L2ER25::.ASCIZ  ?MICRODIAGNOSTIC PROGRAM ERROR: HOST BUFFER ADDRESS ERROR?
1936 032167     115     111     103  L2ER26::.ASCIZ  ?MICRODIAGNOSTIC PROGRAM ERROR: UNKNOWN ERROR LOG RECEIVED?
1937 032261     115     111     103  L2ER27::.ASCIZ  ?MICRODIAGNOSTIC PROGRAM ERROR: RESPONSE TIMEOUT ERROR?
1938
1939 032347     124     111     115  WRER1:: .ASCIZ  ?TIME OUT DURING PORT INIT?
1940 032401     120     117     122  WRER2:: .ASCIZ  ?PORT INIT FAILED?
1941 032422     124     115     123  WRER3:: .ASCIZ  ?TMSCP COMMAND FAILURE?
1942 032450     120     117     122  WRER4:: .ASCIZ  ?PORT DETECTED ERROR?
1943 032474     122     105     123  WRER5:: .ASCIZ  ?RESPONSE OUT OF SEQUENCE?
1944 032525     103     117     115  WRER6:: .ASCIZ  ?COMMAND TIME OUT?
1945 032546     125     116     105  WRER7:: .ASCIZ  ?UNEXPECTED STATUS FOR ONLINE RECEIVED?
1946 032614     104     125     120  WRER8:: .ASCIZ  ?DUP COMMAND FAILURE?
1947                                          .EVEN
1948
1949                                 ;;*****************************************************************
1950                                 ;
1951                                 ;MISCELLANEOUS ERROR MESSAGES
1952                                 ;
1953                                 ;;*****************************************************************
1954
1955 032640     103     116     124  CTRL::   .ASCIZ  ?CNTRLR/CABLE?
1956 032655     104     122     111  DRVE::   .ASCIZ  ?DRIVE?
1957 032663     123     103     103  SCCCMD::.ASCIZ  ?SCC ?
1958 032670     117     116     114  ONLCMD::.ASCIZ  ?ONL ?
1959 032675     122     105     127  REWCMD::.ASCIZ  ?REW ?
1960 032702     127     122     040  WRCMD:: .ASCIZ  ?WR  ?
1961 032707     122     104     040  RDCMD:: .ASCIZ  ?RD  ?
1962 032714     107     104     123  GDSCMD::.ASCIZ  ?GDS ?
1963 032721     105     114     120  ELPCMD::.ASCIZ  ?ELP ?
1964 032726     122     103     126  RCVCMD::.ASCIZ  ?RCV ?
1965 032733     101     102     124  ABTCMD::.ASCIZ  ?ABT ?
1966                                          .EVEN
1967
```

```
                                .SBTTL  GLOBAL ERROR REPORT SECTION
                                ;;*****************************************************************
                                ;;*****************************************************************
                                ;
                                ;GLOBAL ERROR REPORTS
                                ;       THE GLOBAL ERROR REPORT SECTION CONTAINS THE PRINTB
                                ;       AND PRINTX CALLS THAT ARE USED IN MORE THAN ONE TEST.
                                ;       IT ALSO INCLUDES THE ASCII MESSAGES THAT ARE USED BY
                                ;       THE PRINTB AND PRINTX CALLS.
                                ;
                                ;;*****************************************************************
                                ;;*****************************************************************

032740                                  BGNMSG

032740                          PRIINI::
032740                                  PRINTX  #LINE1,INISTP
032740  013746  002316                  MOV     INISTP,-(SP)
032744  012746  023420                  MOV     #LINE1,-(SP)
032750  012746  000002                  MOV     #2,-(SP)
032754  010600                          MOV     SP,R0
032756  104415                          TRAP    C$PNTX
032760  062706  000006                  ADD     #6,SP

032764                          PRISA::
032764                                  PRINTX  #LINE2,TKSA(R4),SAEXP,TKSASV(R4)
032764  016446  000012                  MOV     TKSASV(R4),-(SP)
032770  013746  002314                  MOV     SAEXP,-(SP)
032774  016446  000002                  MOV     TKSA(R4),-(SP)
033000  012746  023454                  MOV     #LINE2,-(SP)
033004  012746  000004                  MOV     #4,-(SP)
033010  010600                          MOV     SP,R0
033012  104415                          TRAP    C$PNTX
033014  062706  000012                  ADD     #12,SP
033020  000452                          BR      PRIERR

033022                          PRIPAD::
033022                                  PRINTX  #LINE7,R2
033022  010246                          MOV     R2,-(SP)
033024  012746  023746                  MOV     #LINE7,-(SP)
033030  012746  000002                  MOV     #2,-(SP)
033034  010600                          MOV     SP,R0
033036  104415                          TRAP    C$PNTX
033040  062706  000006                  ADD     #6,SP
033044  000413                          BR      PRIDAT

033046                          PRIVAD::
033046                                  PRINTX  #LINE5,KPAR3,R2
033046  010246                          MOV     R2,-(SP)
033050  013746  172346                  MOV     KPAR3,-(SP)
033054  012746  023626                  MOV     #LINE5,-(SP)
033060  012746  000003                  MOV     #3,-(SP)
033064  010600                          MOV     SP,R0
033066  104415                          TRAP    C$PNTX
033070  062706  000010                  ADD     #10,SP

033074                          PRIDAT::
```

```
 2005 033074                                    PRINTX  #LINE6,R1,(R2)
      033074  011246                           MOV     (R2), (SP)
      033076  010146                           MOV     R1,-(SP)
      033100  012746  023703                    MOV     #LINE6,-(SP)
      033104  012746  000003                    MOV     #3,-(SP)
      033110  010600                            MOV     SP,R0
      033112  104415                            TRAP    C$PNTX
      033114  062706  000010                    ADD     #10,SP
 2006 033120  000412                            BR      PRIERR
 2007
 2008 033122                            PRIIP::
 2009 033122                                    PRINTX  #LINE3,TKIP(R4)
      033122  016446  000000                    MOV     TKIP(R4),-(SP)
      033126  012746  023534                    MOV     #LINE3,-(SP)
      033132  012746  000002                    MOV     #2,-(SP)
      033136  010600                            MOV     SP,R0
      033140  104415                            TRAP    C$PNTX
      033142  062706  000006                    ADD     #6,SP
 2010
 2011 033146                            PRIERR::
 2012 033146                                    PRINTB  #LINE4,FRUIS
      033146  013746  002310                    MOV     FRUIS,-(SP)
      033152  012746  023564                    MOV     #LINE4,-(SP)
      033156  012746  000002                    MOV     #2,-(SP)
      033162  010600                            MOV     SP,R0
      033164  104414                            TRAP    C$PNTB
      033166  062706  000006                    ADD     #6,SP
 2013 033172  000137  033536                    JMP     PRIEX
 2014
 2015 033176                            WRINTO::
 2016 033176                                    PRINTX  #LINE1,INISTP
      033176  013746  002316                    MOV     INISTP,-(SP)
      033202  012746  023420                    MOV     #LINE1,-(SP)
      033206  012746  000002                    MOV     #2,-(SP)
      033212  010600                            MOV     SP,R0
      033214  104415                            TRAP    C$PNTX
      033216  062706  000006                    ADD     #6,SP
 2017
 2018 033222                            WRPRTE::
 2019 033222                                    PRINTX  #WR1,TKSA(R4),TKSASV(R4)
      033222  016446  000012                    MOV     TKSASV(R4),-(SP)
      033226  016446  000002                    MOV     TKSA(R4),-(SP)
      033232  012746  023772                    MOV     #WR1,-(SP)
      033236  012746  000003                    MOV     #3,-(SP)
      033242  010600                            MOV     SP,R0
      033244  104415                            TRAP    C$PNTX
      033246  062706  000010                    ADD     #10,SP
 2020 033252  000137  033512                    JMP     WREX
 2021
 2022 033256                            WRCMDE::
 2023 033256                                    PRINTX  R2,CURCMD
      033256  013746  023042                    MOV     CURCMD, (SP)
      033262  010246                            MOV     R2,-(SP)
      033264  012746  000002                    MOV     #2,-(SP)
      033270  010600                            MOV     SP,R0
      033272  104415                            TRAP    C$PNTX
      033274  062706  000006                    ADD     #6,SP
```

```
 2024 033300                                    PRINTX  #WR3
      033300  012746  024071                    MOV     #WR3,-(SP)
      033304  012746  000001                    MOV     #1,-(SP)
      033310  010600                            MOV     SP,R0
      033312  104415                            TRAP    C$PNTX
      033314  062706  000004                    ADD     #4,SP
 2025 033320  010301                            MOV     R3,R1
 2026 033322                            W1:     PRINTX  #WR4,2(R1),(R1)
      033322  011146                            MOV     (R1),-(SP)
      033324  016146  000002                    MOV     2(R1),-(SP)
      033330  012746  024122                    MOV     #WR4,(SP)
      033334  012746  000003                    MOV     #3,-(SP)
      033340  010600                            MOV     SP,R0
      033342  104415                            TRAP    C$PNTX
      033344  062706  000010                    ADD     #10,SP
 2027 033350  062701  000004                    ADD     #4,R1
 2028 033354  162763  000004  177774           SUB     #4,MSGLEN(R3)
 2029 033362  001357                            BNE     W1
 2030 033364                                    PRINTX  #WR6
      033364  012746  024211                    MOV     #WR6,-(SP)
      033370  012746  000001                    MOV     #1,-(SP)
      033374  010600                            MOV     SP,R0
      033376  104415                            TRAP    C$PNTX
      033400  062706  000004                    ADD     #4,SP
 2031 033404  000137  033512                    JMP     WREX
 2032
 2033 033410                            WRSEQE::
 2034 033410                                    PRINTX  #WR2,CURCMD
      033410  013746  023042                    MOV     CURCMD,-(SP)
      033414  012746  024035                    MOV     #WR2,-(SP)
      033420  012746  000002                    MOV     #2,-(SP)
      033424  010600                            MOV     SP,R0
      033426  104415                            TRAP    C$PNTX
      033430  062706  000006                    ADD     #6,SP
 2035 033434                                    PRINTX  #WR5,P.CRF(R3),P.CRF(R5)
      033434  016546  000000                    MOV     P.CRF(R5),-(SP)
      033440  016346  000000                    MOV     P.CRF(R3),-(SP)
      033444  012746  024147                    MOV     #WR5,-(SP)
      033450  012746  000003                    MOV     #3,-(SP)
      033454  010600                            MOV     SP,R0
      033456  104415                            TRAP    C$PNTX
      033460  062706  000010                    ADD     #10,SP
 2036 033464  000412                            BR      WREX
 2037
 2038 033466                            WRTOE::
 2039 033466                                    PRINTX  #WR2,CURCMD
      033466  013746  023042                    MOV     CURCMD,-(SP)
      033472  012746  024035                    MOV     #WR2,(SP)
      033476  012746  000002                    MOV     #2,-(SP)
      033502  010600                            MOV     SP,R0
      033504  104415                            TRAP    C$PNTX
      033506  062706  000006                    ADD     #6,SP
 2040
 2041 033512                            WREX::
 2042 033512                                    PRINTB  #LINE4,FRUIS
      033512  013746  002310                    MOV     FRUIS,-(SP)
      033516  012746  023564                    MOV     #LINE4,(SP)
```

```
        033522  012746  000002                  MOV     #2,-(SP)
        033526  010600                          MOV     SP,R0
        033530  104414                          TRAP    C$PNTB
        033532  062706  000006                  ADD     #6,SP
  2043
  2044 033536                           PRIEX:  EXIT    MSG
        033536  000167                          .WORD   J$JMP
        033540  000000                          .WORD   L10003 2 .
  2045
  2046 033542                                   ENDMSG
        033542                          L10003:
        033542  104423                          TRAP    C$MSG
  2047
  2048 033544                                   BGNMSG  L2DUMP
        033544                          L2DUMP::
  2049
  2050 033544                                   PRINTB  #LINE4,FRUIS
        033544  013746  002310                  MOV     FRUIS, (SP)
        033550  012746  023564                  MOV     #LINE4,-(SP)
        033554  012746  000002                  MOV     #2,-(SP)
        033560  010600                          MOV     SP,R0
        033562  104414                          TRAP    C$PNTB
        033564  062706  000006                  ADD     #6,SP
  2051 033570                                   PRINTB  #L21
        033570  012746  024417                  MOV     #L21,-(SP)
        033574  012746  000001                  MOV     #1,-(SP)
        033600  010600                          MOV     SP,R0
        033602  104414                          TRAP    C$PNTB
        033604  062706  000004                  ADD     #4,SP
  2052 033610                                   PRINTB  #L22,L2STA(R1)
        033610  016146  000002                  MOV     L2STA(R1),-(SP)
        033614  012746  024473                  MOV     #L22,-(SP)
        033620  012746  000002                  MOV     #2,-(SP)
        033624  010600                          MOV     SP,R0
        033626  104414                          TRAP    C$PNTB
        033630  062706  000006                  ADD     #6,SP
  2053 033634                                   PRINTB  #L23,L2DRV(R1)
        033634  016146  000004                  MOV     L2DRV(R1),-(SP)
        033640  012746  024531                  MOV     #L23,-(SP)
        033644  012746  000002                  MOV     #2,-(SP)
        033650  010600                          MOV     SP,R0
        033652  104414                          TRAP    C$PNTB
        033654  062706  000006                  ADD     #6,SP
  2054 033660                                   PRINTB  #L24,<B,L2TST(R1)>
        033660  005046                          CLR     -(SP)
        033662  156116  000006                  BISB    L2TST(R1),(SP)
        033666  012746  024571                  MOV     #L24,-(SP)
        033672  012746  000002                  MOV     #2,-(SP)
        033676  010600                          MOV     SP,R0
        033700  104414                          TRAP    C$PNTB
        033702  062706  000006                  ADD     #6,SP
  2055 033706                                   PRINTB  #L25,<B,L2TRK(R1)>
        033706  005046                          CLR     -(SP)
        033710  156116  000007                  BISB    L2TRK(R1),(SP)
        033714  012746  024631                  MOV     #L25,-(SP)
        033720  012746  000002                  MOV     #2,-(SP)
        033724  010600                          MOV     SP,R0
```

```
        033726  104414                          TRAP    C$PNTB
        033730  062706  000006                  ADD     #6,SP
   2056 033734                                  PRINTB  #L26,<B,L2CMD(R1)>
        033734  005046                          CLR     -(SP)
        033736  156116  000010                  BISB    L2CMD(R1),(SP)
        033742  012746  024671                  MOV     #L26,-(SP)
        033746  012746  000002                  MOV     #2,-(SP)
        033752  010600                          MOV     SP,R0
        033754  104414                          TRAP    C$PNTB
        033756  062706  000006                  ADD     #6,SP
   2057 033762                                  PRINTB  #L27,<B,L2RSP(R1)>
        033762  005046                          CLR     -(SP)
        033764  156116  000011                  BISB    L2RSP(R1),(SP)
        033770  012746  024731                  MOV     #L27,-(SP)
        033774  012746  000002                  MOV     #2,-(SP)
        034000  010600                          MOV     SP,R0
        034002  104414                          TRAP    C$PNTB
        034004  062706  000006                  ADD     #6,SP
   2058 034010                                  PRINTB  #L28,L2UNT(R1)
        034010  016146  000012                  MOV     L2UNT(R1),-(SP)
        034014  012746  024771                  MOV     #L28,-(SP)
        034020  012746  000002                  MOV     #2,-(SP)
        034024  010600                          MOV     SP,R0
        034026  104414                          TRAP    C$PNTB
        034030  062706  000006                  ADD     #6,SP
   2059 034034  126127  000134  000005         CMPB    L2ELFM(R1),#TXFER       ;"TAPE TRANSFER" ERROR LOG ?
   2060 034042  001402                          BEQ     1$                      ;YES, DUMP "TAPE TRANSFER" ERROR LOG
   2061 034044  000137  034720                  JMP     10$                     ;NO, CHECK "CONTROLLER ERROR" ERROR LOG
   2062 034050                          1$:     PRINTB  #L221
        034050  012746  025601                  MOV     #L221,-(SP)
        034054  012746  000001                  MOV     #1,-(SP)
        034060  010600                          MOV     SP,R0
        034062  104414                          TRAP    C$PNTB
        034064  062706  000004                  ADD     #4,SP
   2063 034070                                  PRINTB  #L222,<B,L2ELFM(R1)>
        034070  005046                          CLR     -(SP)
        034072  156116  000134                  BISB    L2ELFM(R1),(SP)
        034076  012746  025646                  MOV     #L222,-(SP)
        034102  012746  000002                  MOV     #2,-(SP)
        034106  010600                          MOV     SP,R0
        034110  104414                          TRAP    C$PNTB
        034112  062706  000006                  ADD     #6,SP
   2064 034116                                  PRINTB  #L223,<B,L2ELFL(R1)>
        034116  005046                          CLR     -(SP)
        034120  156116  000135                  BISB    L2ELFL(R1),(SP)
        034124  012746  025710                  MOV     #L223,-(SP)
        034130  012746  000002                  MOV     #2,-(SP)
        034134  010600                          MOV     SP,R0
        034136  104414                          TRAP    C$PNTB
        034140  062706  000006                  ADD     #6,SP
   2065 034144                                  PRINTB  #L224,L2ELEV(R1)
        034144  016146  000136                  MOV     L2ELEV(R1),-(SP)
        034150  012746  025752                  MOV     #L224,-(SP)
        034154  012746  000002                  MOV     #2,-(SP)
        034160  010600                          MOV     SP,R0
        034162  104414                          TRAP    C$PNTB
        034164  062706  000006                  ADD     #6,SP
```

```
 2066 034170                                    PRINTB  #L225,<B,L2ELRL(R1)>
      034170  005046                           CLR     -(SP)
      034172  156116  000144                   BISB    L2ELRL(R1),(SP)
      034176  012746  026011                   MOV     #L225,-(SP)
      034202  012746  000002                   MOV     #2,-(SP)
      034206  010600                           MOV     SP,R0
      034210  104414                           TRAP    C$PNTB
      034212  062706  000006                   ADD     #6,SP
 2067 034216                                    PRINTB  #L226,<B,L2ELRT(R1)>
      034216  005046                           CLR     -(SP)
      034220  156116  000145                   BISB    L2ELRT(R1),(SP)
      034224  012746  026053                   MOV     #L226,-(SP)
      034230  012746  000002                   MOV     #2,-(SP)
      034234  010600                           MOV     SP,R0
      034236  104414                           TRAP    C$PNTB
      034240  062706  000006                   ADD     #6,SP
 2068 034244                                    PRINTB  #L227,L2ELP1(R1)
      034244  016146  000146                   MOV     L2ELP1(R1),-(SP)
      034250  012746  026115                   MOV     #L227,-(SP)
      034254  012746  000002                   MOV     #2,-(SP)
      034260  010600                           MOV     SP,R0
      034262  104414                           TRAP    C$PNTB
      034264  062706  000006                   ADD     #6,SP
 2069 034270                                    PRINTB  #L228,L2ELP2(R1)
      034270  016146  000150                   MOV     L2ELP2(R1),-(SP)
      034274  012746  026154                   MOV     #L228,-(SP)
      034300  012746  000002                   MOV     #2,-(SP)
      034304  010600                           MOV     SP,R0
      034306  104414                           TRAP    C$PNTB
      034310  062706  000006                   ADD     #6,SP
 2070 034314                                    PRINTB  #L229,<B,L2ELST(R1)>
      034314  005046                           CLR     -(SP)
      034316  156116  000154                   BISB    L2ELST(R1),(SP)
      034322  012746  026213                   MOV     #L229,-(SP)
      034326  012746  000002                   MOV     #2,-(SP)
      034332  010600                           MOV     SP,R0
      034334  104414                           TRAP    C$PNTB
      034336  062706  000006                   ADD     #6,SP
 2071 034342                                    PRINTB  #L230,<B,L2ELDE(R1)>
      034342  005046                           CLR     -(SP)
      034344  156116  000155                   BISB    L2ELDE(R1),(SP)
      034350  012746  026255                   MOV     #L230,-(SP)
      034354  012746  000002                   MOV     #2,-(SP)
      034360  010600                           MOV     SP,R0
      034362  104414                           TRAP    C$PNTB
      034364  062706  000006                   ADD     #6,SP
 2072 034370                                    PRINTB  #L231,<B,L2ELDF(R1)>
      034370  005046                           CLR     -(SP)
      034372  156116  000156                   BISB    L2ELDF(R1),(SP)
      034376  012746  026317                   MOV     #L231,-(SP)
      034402  012746  000002                   MOV     #2,-(SP)
      034406  010600                           MOV     SP,R0
      034410  104414                           TRAP    C$PNTB
      034412  062706  000006                   ADD     #6,SP
 2073 034416                                    PRINTB  #L232,<B,L2ELTN(R1)>
      034416  005046                           CLR     -(SP)
      034420  156116  000157                   BISB    L2ELTN(R1),(SP)
```

```
        034424  012746  026361                  MOV     #L232,-(SP)
        034430  012746  000002                  MOV     #2,-(SP)
        034434  010600                          MOV     SP,R0
        034436  104414                          TRAP    C$PNTB
        034440  062706  000006                  ADD     #6,SP
  2074  034444                                  PRINTB  #L233,L2ELPB(R1)
        034444  016146  000160                  MOV     L2ELPB(R1), (SP)
        034450  012746  026423                  MOV     #L233,-(SP)
        034454  012746  000002                  MOV     #2, (SP)
        034460  010600                          MOV     SP,R0
        034462  104414                          TRAP    C$PNTB
        034464  062706  000006                  ADD     #6,SP
  2075  034470                                  PRINTB  #L234,<B,L2ELLB(R1)>
        034470  005046                          CLR     -(SP)
        034472  156116  000162                  BISB    L2ELLB(R1),(SP)
        034476  012746  026462                  MOV     #L234,-(SP)
        034502  012746  000002                  MOV     #2,-(SP)
        034506  010600                          MOV     SP,R0
        034510  104414                          TRAP    C$PNTB
        034512  062706  000006                  ADD     #6,SP
  2076  034516                                  PRINTB  #L235,<B,L2ELTO(R1)>
        034516  005046                          CLR     -(SP)
        034520  156116  000163                  BISB    L2ELTO(R1),(SP)
        034524  012746  026524                  MOV     #L235,-(SP)
        034530  012746  000002                  MOV     #2,-(SP)
        034534  010600                          MOV     SP,R0
        034536  104414                          TRAP    C$PNTB
        034540  062706  000006                  ADD     #6,SP
  2077  034544                                  PRINTB  #L236,<B,L2ELT1(R1)>
        034544  005046                          CLR     -(SP)
        034546  156116  000164                  BISB    L2ELT1(R1),(SP)
        034552  012746  026566                  MOV     #L236,-(SP)
        034556  012746  000002                  MOV     #2,-(SP)
        034562  010600                          MOV     SP,R0
        034564  104414                          TRAP    C$PNTB
        034566  062706  000006                  ADD     #6,SP
  2078  034572                                  PRINTB  #L237,<B,L2ELT2(R1)>
        034572  005046                          CLR     -(SP)
        034574  156116  000165                  BISB    L2ELT2(R1),(SP)
        034600  012746  026630                  MOV     #L237,-(SP)
        034604  012746  000002                  MOV     #2,-(SP)
        034610  010600                          MOV     SP,R0
        034612  104414                          TRAP    C$PNTB
        034614  062706  000006                  ADD     #6,SP
  2079  034620                                  PRINTB  #L238,L2ELDS(R1)
        034620  016146  000166                  MOV     L2ELDS(R1),-(SP)
        034624  012746  026672                  MOV     #L238,-(SP)
        034630  012746  000002                  MOV     #2,-(SP)
        034634  010600                          MOV     SP,R0
        034636  104414                          TRAP    C$PNTB
        034640  062706  000006                  ADD     #6,SP
  2080  034644                                  PRINTB  #L239,L2ELRW(R1)
        034644  016146  000170                  MOV     L2ELRW(R1),-(SP)
        034650  012746  026731                  MOV     #L239,-(SP)
        034654  012746  000002                  MOV     #2,-(SP)
        034660  010600                          MOV     SP,R0
        034662  104414                          TRAP    C$PNTB
```

```
      034664  062706  000006                  ADD     #6,SP
 2081 034670                                  PRINTB  #L240,L2ELOF(R1)
      034670  016146  000172                  MOV     L2ELOF(R1),-(SP)
      034674  012746  026770                  MOV     #L240,-(SP)
      034700  012746  000002                  MOV     #2,-(SP)
      034704  010600                          MOV     SP,R0
      034706  104414                          TRAP    C$PNTB
      034710  062706  000006                  ADD     #6,SP
 2082 034714  000137  034774                  JMP     25$
 2083 034720  126127  000134  000000  10$:    CMPB    L2ELFM(R1),#CNTER       ;"CONTROLLER ERROR" ERROR LOG ?
 2084 034726  001022                          BNE     25$                     ;NO, NO ERROR LOG TO PRINT, EXIT
 2085 034730                                  PRINTB  #L241                   ;DUMP "CONTROLLER ERROR" ERROR LOG
      034730  012746  027027                  MOV     #L241,-(SP)
      034734  012746  000001                  MOV     #1,-(SP)
      034740  010600                          MOV     SP,R0
      034742  104414                          TRAP    C$PNTB
      034744  062706  000004                  ADD     #4,SP
 2086 034750                                  PRINTB  #L242,L2ELEC(R1)
      034750  016146  000140                  MOV     L2ELEC(R1),-(SP)
      034754  012746  027071                  MOV     #L242,-(SP)
      034760  012746  000002                  MOV     #2,-(SP)
      034764  010600                          MOV     SP,R0
      034766  104414                          TRAP    C$PNTB
      034770  062706  000006                  ADD     #6,SP
 2087 034774                          25$:    EXIT    MSG
      034774  000167                          .WORD   J$JMP
      034776  000000                          .WORD   L10004 2-.
 2088
 2089 035000                                  ENDMSG
      035000                          L10004:
      035000  104423                          TRAP    C$MSG
```

```
2091                                    .SBTTL  STATISTICAL REPORT SECTION
2092 035002                             STARS
                                        ;;**********************************************************************
2093 035002                             STARS
                                        ;;**********************************************************************
2094                                    ;
2095                                    ;STATISTICAL REPORT SECTION
2096                                    ;       THESE ARE THE "PRINTS" STATEMENTS USED TO DUMP THE LEVEL 2
2097                                    ;       MICRODIAGNOSTIC TEST RESULTS
2098                                    ;
2099 035002                             STARS
                                        ;;**********************************************************************
2100 035002                             STARS
                                        ;;**********************************************************************
2101
2102 035002                                     BGNRPT
     035002                             L$RPT::
2103 035002                                     PRINTS  #L29,L2BWR1(R1)
     035002  016146  000014                     MOV     L2BWR1(R1),-(SP)
     035006  012746  025026                     MOV     #L29,-(SP)
     035012  012746  000002                     MOV     #2,-(SP)
     035016  010600                             MOV     SP,R0
     035020  104416                             TRAP    C$PNTS
     035022  062706  000006                     ADD     #6,SP
2104 035026                                     PRINTS  #L210,L2BWR2(R1)
     035026  016146  000020                     MOV     L2BWR2(R1),-(SP)
     035032  012746  025073                     MOV     #L210,-(SP)
     035036  012746  000002                     MOV     #2,-(SP)
     035042  010600                             MOV     SP,R0
     035044  104416                             TRAP    C$PNTS
     035046  062706  000006                     ADD     #6,SP
2105 035052                                     PRINTS  #L211,L2BRD1(R1)
     035052  016146  000024                     MOV     L2BRD1(R1),-(SP)
     035056  012746  025137                     MOV     #L211,-(SP)
     035062  012746  000002                     MOV     #2,-(SP)
     035066  010600                             MOV     SP,R0
     035070  104416                             TRAP    C$PNTS
     035072  062706  000006                     ADD     #6,SP
2106 035076                                     PRINTS  #L212,L2BRD2(R1)
     035076  016146  000030                     MOV     L2BRD2(R1),-(SP)
     035102  012746  025203                     MOV     #L212,-(SP)
     035106  012746  000002                     MOV     #2,-(SP)
     035112  010600                             MOV     SP,R0
     035114  104416                             TRAP    C$PNTS
     035116  062706  000006                     ADD     #6,SP
2107 035122                                     PRINTS  #L213,L2SWR1(R1)
     035122  016146  000034                     MOV     L2SWR1(R1),-(SP)
     035126  012746  025247                     MOV     #L213,-(SP)
     035132  012746  000002                     MOV     #2,-(SP)
     035136  010600                             MOV     SP,R0
     035140  104416                             TRAP    C$PNTS
     035142  062706  000006                     ADD     #6,SP
2108 035146                                     PRINTS  #L214,L2SWR2(R1)
     035146  016146  000036                     MOV     L2SWR2(R1),-(SP)
     035152  012746  025313                     MOV     #L214,-(SP)
     035156  012746  000002                     MOV     #2,-(SP)
     035162  010600                             MOV     SP,R0
```

```
        035164  104416                          TRAP    C$PNTS
        035166  062706  000006                  ADD     #6,SP
 2109   035172                                  PRINTS  #L215,L2ECC1(R1)
        035172  016146  000040                  MOV     L2ECC1(R1), (SP)
        035176  012746  025357                  MOV     #L215,-(SP)
        035202  012746  000002                  MOV     #2,-(SP)
        035206  010600                          MOV     SP,R0
        035210  104416                          TRAP    C$PNTS
        035212  062706  000006                  ADD     #6,SP
 2110   035216                                  PRINTS  #L216,L2ECC2(R1)
        035216  016146  000042                  MOV     L2ECC2(R1),-(SP)
        035222  012746  025423                  MOV     #L216,-(SP)
        035226  012746  000002                  MOV     #2,-(SP)
        035232  010600                          MOV     SP,R0
        035234  104416                          TRAP    C$PNTS
        035236  062706  000006                  ADD     #6,SP
 2111   035242                                  PRINTS  #L219,L2REP1(R1)
        035242  016146  000050                  MOV     L2REP1(R1),-(SP)
        035246  012746  025467                  MOV     #L219,-(SP)
        035252  012746  000002                  MOV     #2,-(SP)
        035256  010600                          MOV     SP,R0
        035260  104416                          TRAP    C$PNTS
        035262  062706  000006                  ADD     #6,SP
 2112   035266                                  PRINTS  #L220,L2REP2(R1)
        035266  016146  000052                  MOV     L2REP2(R1),-(SP)
        035272  012746  025533                  MOV     #L220,-(SP)
        035276  012746  000002                  MOV     #2,-(SP)
        035302  010600                          MOV     SP,R0
        035304  104416                          TRAP    C$PNTS
        035306  062706  000006                  ADD     #6,SP
 2113   035312  026127  000124  000000         CMP     124(R1),#0                      ;ANY DATA COMPARES ?
 2114   035320  001002                          BNE     1$                              ;YES, LIST THEM
 2115   035322  000137  036052                  JMP     10$                             ;NO, FINISHED
 2116   035326                          1$:     PRINTS  #L244,<B,66(R1)>,<B,54(R1)>,100(R1)
        035326  016146  000100                  MOV     100(R1),-(SP)
        035332  005046                          CLR     -(SP)
        035334  156116  000054                  BISB    54(R1),(SP)
        035340  005046                          CLR     -(SP)
        035342  156116  000066                  BISB    66(R1),(SP)
        035346  012746  027130                  MOV     #L244,-(SP)
        035352  012746  000004                  MOV     #4,-(SP)
        035356  010600                          MOV     SP,R0
        035360  104416                          TRAP    C$PNTS
        035362  062706  000012                  ADD     #12,SP
 2117   035366                                  PRINTS  #L245,<B,67(R1)>,<B,55(R1)>,102(R1)
        035366  016146  000102                  MOV     102(R1),-(SP)
        035372  005046                          CLR     -(SP)
        035374  156116  000055                  BISB    55(R1),(SP)
        035400  005046                          CLR     -(SP)
        035402  156116  000067                  BISB    67(R1),(SP)
        035406  012746  027224                  MOV     #L245,-(SP)
        035412  012746  000004                  MOV     #4,-(SP)
        035416  010600                          MOV     SP,R0
        035420  104416                          TRAP    C$PNTS
        035422  062706  000012                  ADD     #12,SP
 2118   035426                                  PRINTS  #L246,<B,70(R1)>,<B,56(R1)>,104(R1)
        035426  016146  000104                  MOV     104(R1),-(SP)
```

```
        035432  005046                  CLR     (SP)
        035434  156116  000056          BISB    56(R1),(SP)
        035440  005046                  CLR     -(SP)
        035442  156116  000070          BISB    70(R1),(SP)
        035446  012746  027320          MOV     #L246,-(SP)
        035452  012746  000004          MOV     #4,-(SP)
        035456  010600                  MOV     SP,R0
        035460  104416                  TRAP    C$PNTS
        035462  062706  000012          ADD     #12,SP
  2119  035466                          PRINTS  #L247,<B,71(R1)>,<B,57(R1)>,106(R1)
        035466  016146  000106          MOV     106(R1),-(SP)
        035472  005046                  CLR     -(SP)
        035474  156116  000057          BISB    57(R1),(SP)
        035500  005046                  CLR     -(SP)
        035502  156116  000071          BISB    71(R1),(SP)
        035506  012746  027414          MOV     #L247,-(SP)
        035512  012746  000004          MOV     #4,-(SP)
        035516  010600                  MOV     SP,R0
        035520  104416                  TRAP    C$PNTS
        035522  062706  000012          ADD     #12,SP
  2120  035526                          PRINTS  #L248,<B,72(R1)>,<B,60(R1)>,110(R1)
        035526  016146  000110          MOV     110(R1),-(SP)
        035532  005046                  CLR     -(SP)
        035534  156116  000060          BISB    60(R1),(SP)
        035540  005046                  CLR     -(SP)
        035542  156116  000072          BISB    72(R1),(SP)
        035546  012746  027510          MOV     #L248,-(SP)
        035552  012746  000004          MOV     #4,-(SP)
        035556  010600                  MOV     SP,R0
        035560  104416                  TRAP    C$PNTS
        035562  062706  000012          ADD     #12,SP
  2121  035566                          PRINTS  #L249,<B,73(R1)>,<B,61(R1)>,112(R1)
        035566  016146  000112          MOV     112(R1),-(SP)
        035572  005046                  CLR     -(SP)
        035574  156116  000061          BISB    61(R1),(SP)
        035600  005046                  CLR     -(SP)
        035602  156116  000073          BISB    73(R1),(SP)
        035606  012746  027604          MOV     #L249,-(SP)
        035612  012746  000004          MOV     #4,-(SP)
        035616  010600                  MOV     SP,R0
        035620  104416                  TRAP    C$PNTS
        035622  062706  000012          ADD     #12,SP
  2122  035626                          PRINTS  #L250,<B,74(R1)>,<B,62(R1)>,114(R1)
        035626  016146  000114          MOV     114(R1),-(SP)
        035632  005046                  CLR     -(SP)
        035634  156116  000062          BISB    62(R1),(SP)
        035640  005046                  CLR     -(SP)
        035642  156116  000074          BISB    74(R1),(SP)
        035646  012746  027700          MOV     #L250,-(SP)
        035652  012746  000004          MOV     #4,-(SP)
        035656  010600                  MOV     SP,R0
        035660  104416                  TRAP    C$PNTS
        035662  062706  000012          ADD     #12,SP
  2123  035666                          PRINTS  #L251,<B,75(R1)>,<B,63(R1)>,116(R1)
        035666  016146  000116          MOV     116(R1),-(SP)
        035672  005046                  CLR     -(SP)
        035674  156116  000063          BISB    63(R1),(SP)
```

```
                035700  005046                  CLR     -(SP)
                035702  156116  000075          BISB    75(R1),(SP)
                035706  012746  027774          MOV     #L251,-(SP)
                035712  012746  000004          MOV     #4,-(SP)
                035716  010600                  MOV     SP,R0
                035720  104416                  TRAP    C$PNTS
                035722  062706  000012          ADD     #12,SP
          2124  035726                          PRINTS  #L252,<B,76(R1)>,<B,64(R1)>,120(R1)
                035726  016146  000120          MOV     120(R1),-(SP)
                035732  005046                  CLR     -(SP)
                035734  156116  000064          BISB    64(R1),(SP)
                035740  005046                  CLR     -(SP)
                035742  156116  000076          BISB    76(R1),(SP)
                035746  012746  030070          MOV     #L252,-(SP)
                035752  012746  000004          MOV     #4,-(SP)
                035756  010600                  MOV     SP,R0
                035760  104416                  TRAP    C$PNTS
                035762  062706  000012          ADD     #12,SP
          2125  035766                          PRINTS  #L253,<B,77(R1)>,<B,65(R1)>,122(R1)
                035766  016146  000122          MOV     122(R1),-(SP)
                035772  005046                  CLR     -(SP)
                035774  156116  000065          BISB    65(R1),(SP)
                036000  005046                  CLR     -(SP)
                036002  156116  000077          BISB    77(R1),(SP)
                036006  012746  030164          MOV     #L253,-(SP)
                036012  012746  000004          MOV     #4,-(SP)
                036016  010600                  MOV     SP,R0
                036020  104416                  TRAP    C$PNTS
                036022  062706  000012          ADD     #12,SP
          2126  036026                          PRINTS  #L254,124(R1)
                036026  016146  000124          MOV     124(R1),-(SP)
                036032  012746  030260          MOV     #L254,-(SP)
                036036  012746  000002          MOV     #2,-(SP)
                036042  010600                  MOV     SP,R0
                036044  104416                  TRAP    C$PNTS
                036046  062706  000006          ADD     #6,SP
          2127  036052                  10$:    ENDRPT
                036052                  L10005:
                036052  104425                  TRAP    C$RPT
```

```
                        .SBTTL  GLOBAL SUBROUTINES SECTION

                        ;;******************************************************************
                        ;;******************************************************************
                        ;
                        ;GLOBAL SUBROUTINES SECTION
                        ;       THIS SECTION CONTAINS ALL SUBROUTINES AND
                        ;       INTERRUPT SERVICE ROUTINES THAT ARE AC-
                        ;       CESSED FROM ANYWHERE IN THE PROGRAM.
                        ;
                        ;;******************************************************************
                        ;;******************************************************************


                        ;;******************************************************************
                        ;;******************************************************************
                        ;
                        ;TRAP4
                        ;       THE ADDRESS OF THIS ROUTINE IS LOADED
                        ;       INTO VECTOR 4 WHENEVER THE PROGRAM IS
                        ;       ATTEMPTING TO ACCESS A PIECE OF HARDWARE
                        ;       FOR THE FIRST TIME.  IT IS INTENDED TO
                        ;       CATCH NON-EXISTENT MEMORY TIMEOUTS IN
                        ;       THE EVENT THE HARDWARE IS NOT REALLY PRE-
                        ;       SENT OR IS MALFUNCTIONING.  IT SIMPLY
                        ;       SETS A FLAG, INDICATING THE TRAP OCCURRED.
                        ;
                        ;;******************************************************************
                        ;;******************************************************************

036054                          BGNSRV  TRAP4
036054                  TRAP4::

036054  005237  002276                  INC     TRP4FG          ;SET THE FLAG - TRAP OCCURRED

036060                          ENDSRV
036060                  L10006:
036060  000002                  RTI
```

```
 2175
 2176
 2177                                   ;;*****************************************************************
 2178                                   ;;*****************************************************************
 2179                                   ;
 2180                                   ;INTRCV
 2181                                   ;       THIS IS THE TK50 INTERRUPT HANDLER USED BY THE PPO-
 2182                                   ;       GRAM WHEN INTERRUPTS HAVE BEEN ENABLED.  IF THE
 2183                                   ;       BRFALG IS CLEAR, THE ROUTINE SETS A FLAG INDICATING
 2184                                   ;       THE EXPECTED INTERRUPT OCCURRED.  IF BRFLAG IS SET,
 2185                                   ;       IT INDICATES THAT PROCESOR PRIORITY WAS SET TO A
 2186                                   ;       LEVEL THAT SHOULD HAVE INHIBITED THE INTERRUPT, SO
 2187                                   ;       THE ROUTINE SETS AN ERROR INDICATOR.
 2188                                   ;
 2189                                   ;;*****************************************************************
 2190                                   ;;*****************************************************************
 2191
 2195 036062                                   BGNSRV  INTRCV
      036062                           INTRCV::
 2196
 2197                                   ;       BIT     #BRFLAG,LUNFLG(R4)      ;IF NOT PRIORITY LEVEL TESTING
 2198                                   ;       BEQ     5$                      ;  THEN SKIP AROUND
 2199                                   ;       MOV     #DRPFLG,LUNFLG(R4)      ;  ELSE SET FAILED BIT
 2200                                   ;       BR      EXTINT                  ;RETURN
 2201
 2202 036062  052764  000002  000014  5$:     BIS     #INTFLG,LUNFLG(R4)      ;SET THE FLAG
 2203
 2204 036070                           EXTINT:
 2205 036070                                   ENDSRV
      036070                           L10007:
      036070  000002                           RTI
 2206
```

```
 2211
 2212                                   ;;*****************************************************************
 2213                                   ;;*****************************************************************
 2214                                   ;
 2215                                   ;ILLINT
 2216                                   ;       THIS HANDLER ROUTINE'S ADDRESS IS LOADED INTO THE
 2217                                   ;       CURRENT UUT'S VECTOR FOR ALL TESTS THAT DO NOT EN-
 2218                                   .       ABLE DEVICE INTERRUPTS.
 2219                                   ;
 2220                                   ;;*****************************************************************
 2221                                   ;;*****************************************************************
 2225
 2226 036072                                   BGNSRV  ILLINT
      036072                           ILLINT::
 2227
 2228 036072  052764  000001  000014            BIS     #DRPFLG,LUNFLG(R4)
 2229
 2230
 2231 036100                                   ENDSRV
      036100                           L10010:
      036100  000002                          RTI
```

```
 2236
 2237                           ;;*****************************************************************
 2238                           ;;*****************************************************************
 2239                           ;
 2240                           ;KTTEST
 2241                           ;       THIS SUBROUTINE IS USED BY THE INIT CODE TO
 2242                           ;       DETERMINE IF THE MEMORY MANAGEMENT UNIT IS
 2243                           ;       PRESENT.  IF SO, IT RETURNS A FLAG IN THE
 2244                           ;       SET STATE.  OTHERWISE THE FALG IS CLEAR IN
 2245                           ;       WHICH CASE TEST SEVEN IS BYPASSED.
 2246                           ;
 2247                           ;;*****************************************************************
 2248                           ;;*****************************************************************
 2252
 2253 036102                   KTTEST::
 2254 036102                           SETVEC  #VEC4,#TRAP4,#PRI07     ;SET UP FOR POSSIBLE NXM
      036102  012746  000340           MOV     #PRI07,-(SP)
      036106  012746  036054           MOV     #TRAP4,-(SP)
      036112  012746  000004           MOV     #VEC4,-(SP)
      036116  012746  000003           MOV     #3,-(SP)
      036122  104437                   TRAP    C$SVEC
      036124  062706  000010           ADD     #10,SP
 2255 036130  005737  177572           TST     MMUSR0          ;ARE YOU THERE, MMU?
 2256 036134                           DELAY   1               ;GIVE NXM TIMEOUT A CHANCE
      036134  012727  000001           MOV     #1,(PC)+
      036140  000000                   .WORD   0
      036142  013727  002116           MOV     L$DLY,(PC)+
      036146  000000                   .WORD   0
      036150  005367  177772           DEC     -6(PC)
      036154  001375                   BNE     .-4
      036156  005367  177756           DEC     -22(PC)
      036162  001367                   BNE     . 20
 2257
 2258 036164  005737  002276           TST     TRP4FG          ;IF NXM OCCURRED
 2259 036170  001026                   BNE     NOKT            ;  THEN NO MMU IS PRESENT
 2260 036172  005237  002274           INC     KTFLAG          ;  ELSE SAY WE FOUND 18 BIT SO FAR
 2261
 2262 036176  005737  172516           TST     MMUSR3          ;NOW LOOK FOR 22 BIT MAPPING
 2263 036202                           DELAY   1               ;GIVE NXM A CHANCE
      036202  012727  000001           MOV     #1,(PC)+
      036206  000000                   .WORD   0
      036210  013727  002116           MOV     L$DLY,(PC)+
      036214  000000                   .WORD   0
      036216  005367  177772           DEC     -6(PC)
      036222  001375                   BNE     .-4
      036224  005367  177756           DEC     -22(PC)
      036230  001367                   BNE     .-20
 2264
 2265 036232  005737  002276           TST     TRP4FG          ;IF NXM OCCURRED
 2266 036236  001005                   BNE     KTEXT           ;  THEN 18 BIT IS ALL WE'VE GOT
 2267 036240  005237  002274           INC     KTFLAG          ;  ELSE SAY WE'VE GOT 22 BIT
 2268 036244  000402                   BR      KTEXT           ;   AND BRANCH AROUND NEXT
 2269
 2270 036246  005037  002274   NOKT:   CLR     KTFLAG          ;NO MMU - CLEAR FLAG
 2271
 2272 036252                   KTEXT:  CLRVEC  #VEC4           ;RESTORE VECTOR
      036252  012700  000004           MOV     #VEC4,R0
```

```
        036256  104436                          TRAP    C$CVEC
 2273   036260  005037  002276                  CLR     TRP4FG          ;MORE HOUSEKEEPING
 2274   036264  000207                          RTS     PC
 2275
 2276
```

```
 2281
 2282
 2283                            ;;*****************************************************************
 2284                            ;;*****************************************************************
 2285                            ;
 2286                            ;RSTVEC
 2287                            ;       THIS ROUTINE IS CALLED FROM VARIOUS PLACES
 2288                            ;       IN THE PROGRAM TO SET THE UUT'S INTERRUPT
 2289                            ;       VECTOR WITH THE ADDRESS OF A HANDLER ROUTINE
 2290                            ;       WHICH WILL CATCH ILLEGAL DEVICE INTERRUPTS,
 2291                            ;       SPECIFICALLY "ILLINT".  INTERRUPT PRIORITY
 2292                            ;       IS SET TO 0.
 2293                            ;
 2294                            ;;*****************************************************************
 2295                            ;;*****************************************************************
 2296
 2300 036266                    RSTVEC::
 2301 036266                            SETVEC  TKVEC(R4),#ILLINT,#PRI00
      036266  012746  000000            MOV     #PRI00,-(SP)
      036272  012746  036072            MOV     #ILLINT,-(SP)
      036276  016446  000004            MOV     TKVEC(R4),-(SP)
      036302  012746  000003            MOV     #3,-(SP)
      036306  104437                    TRAP    C$SVEC
      036310  062706  000010            ADD     #10,SP
 2302
 2303 036314  000207                    RTS     PC
 2304
```

```
 2309
 2310
 2311                                    ;;*****************************************************************
 2312                                    ;;*****************************************************************
 2313                                    ;
 2314                                    ;VECTOR
 2315                                    ;       THIS ROUTINE IS CALLED FROM VARIOUS PLACES
 2316                                    ;       IN THE PROGRAM TO SET THE UUT'S VECTOR WITH
 2317                                    ;       THE ADDRESS OF A HANDLER ROUTINE WHEN DEVICE
 2318                                    ;       INTERRUPTS HAVE BEEN ENABLED.  THE ROUTINE HAS
 2319                                    ;       TWO MODES OF OPERATION: WHEN BRFLAG IS CLEAR,
 2320                                    ;       PROCESSOR PRIORITY IS SET TO ZERO, ALLOWING
 2321                                    ;       DEVICE INTERRUPTS.  IF BRFLAG IS SET, PRIORITY
 2322                                    ;       IS SET TO 7.  IF AN INTERRUPT OCCURS IN THIS
 2323                                    ;       CASE, AN ERROR IS RETURNED BY THE HANDLER
 2324                                    ;       ROUTINE, "INTRCV".
 2325                                    ;
 2326                                    ;;*****************************************************************
 2327                                    ;;*****************************************************************
 2328
 2332 036316                            VECTOR::
 2333 036316  032764  000004  000014            BIT     #BRFLAG,LUNFLG(R4)      ;IF FLAG IS SET
 2334 036324  001014                            BNE     5$                      ;  THEN SKIP TO SECOND HALF
 2335 036326                                    SETVEC  TKVEC(R4),#INTRCV,#PRIOO        ;ELSE LOW PRIORITY
      036326  012746  000000                    MOV     #PRIOO,-(SP)
      036332  012746  036062                    MOV     #INTRCV,-(SP)
      036336  016446  000004                    MOV     TKVEC(R4),-(SP)
      036342  012746  000003                    MOV     #3,-(SP)
      036346  104437                            TRAP    C$SVEC
      036350  062706  000010                    ADD     #10,SP
 2336 036354  000413                            BR      EXTVEC                  ;RETURN
 2337
 2338 036356                            5$:     SETVEC  TKVEC(R4),#INTRCV,#PRIO7        ;HIGH PRIORITY
      036356  012746  000340                    MOV     #PRIO7,-(SP)
      036362  012746  036062                    MOV     #INTRCV,-(SP)
      036366  016446  000004                    MOV     TKVEC(R4),-(SP)
      036372  012746  000003                    MOV     #3,-(SP)
      036376  104437                            TRAP    C$SVEC
      036400  062706  000010                    ADD     #10,SP
 2339
 2340 036404  000207                    EXTVEC: RTS     PC
 2341
 2342
```

```
 2347
 2348
 2349                                ;;**********************************************************************
 2350                                ;;**********************************************************************
 2351                                ;
 2352                                ;PDELAY
 2353                                ;       THIS ROUTINE IS USED THROUGHOUT THE PROGRAM TO PROVIDE
 2354                                ;       A VARIABLE AMOUNT OF DELAY TIME.  THE DELAY WILL BE
 2355                                ;       INSTRUCTION EXECUTION TIME DEPENDENT.  TWO VALUES MUST
 2356                                ;       BE LOADED BY MAINLINE CODE PRIOR TO CALLING PDELAY:
 2357                                ;       "INNER" AND "OUTER".  IF SUFFICIENT CALLS TO PDELAY ARE
 2358                                ;       MADE SUCH THAT THE OUTER COUNT IS EXHAUSTED, THE ROUTINE
 2359                                ;       RETURNS "TOUT" EQUAL TO 1, INDICATING TIMEOUT HAS OCCURRED.
 2360                                ;       "INNER" SHOULD BE RE-LOADED BY MAINLINE CODE, PRIOR TO
 2361                                ;       CALL TO PDELAY WITHIN A TIMING LOOP.
 2362                                ;
 2363                                ;;**********************************************************************
 2364                                ;;**********************************************************************
 2368
 2369
 2370 036406                        PDELAY::
 2371 036406  005037  002330                CLR     TOUT            ;CLEAR TIMEOUT INDICATOR
 2372 036412  005337  002324                DEC     INNER           ;IF COUNT NOT EXHAUSTED
 2373 036416  001373                        BNE     PDELAY          ;  THEN KEEP LOOPING
 2374 036420  005337  002326                DEC     OUTER           ;IF MAJOR COUNT NOT 0
 2375 036424  001002                        BNE     PDLYEX          ;  THEN LEAVE WITH STATUS = OK
 2376 036426  005237  002330                INC     TOUT            ;  ELSE SET TIMEOUT
 2377 036432  000207                PDLYEX: RTS     PC
 2378
 2379
```

```
2384
2385                                    ;;*****************************************************************
2386                                    ;;*****************************************************************
2387                                    ;
2388                                    ;STEP1
2389                                    ;       THIS SUBROUTINE IS RESPONSIBLE FOR PERFORMING
2390                                    ;       STEP 1 OF THE UQ PORT INIT SEQUENCE.  SPECIFI-
2391                                    ;       CALLY, IT WILL INITIALIZE THE UUT BY WRITING
2392                                    ;       TO ITS IP REGISTER.  AFTER A BRIEF DELAY, IT
2393                                    ;       WILL READ THE SA REGISTER TO INSURE THAT THE
2394                                    ;       STEP 1 BIT IS SET AND THE ERROR BIT IS CLEAR.
2395                                    ;       IT WILL THEN WRITE THE FIRST LOCATION OF THE
2396                                    ;       STEP TABLE (SET UP BY MAINLINE CODE) TO THE
2397                                    ;       UUT'S SA REG.  IF ALL STEPS COMPLETE SUCCESS
2398                                    ;       FULLY THE ROUTINE RETURNS "STEPST" CLEARED;
2399                                    ;       OTHERWISE "STEPST" IS RETURNED INDICATING A
2400                                    ;       FAILURE OCCURRED.
2401                                    ;
2402                                    ;;*****************************************************************
2403                                    ;;*****************************************************************
2404
2405 036434                            STEP1::
2406 036434  005037  002320                       CLR     STEPST          ;CLEAR THE STATUS INDICATOR
2407 036440  012774  000000  000000               MOV     #0,@TKIP(R4)    ;INIT THE UUT
2408 036446  012727  000001                       MOV     #1,(PC)+
     036452  000000                               .WORD   0
     036454  013727  002116                       MOV     L$DLY,(PC)+
     036460  000000                               .WORD   0
     036462  005367  177772                       DEC     -6(PC)
     036466  001375                               BNE     .-4
     036470  005367  177756                       DEC     -22(PC)
     036474  001367                               BNE     .-20
2409
2410 036476  017464  000002  000012               MOV     @TKSA(R4),TKSASV(R4)    ;GET THE SA REG CONTENTS
2411 036504  022764  005700  000012               CMP     #B.S1!B.QB!B.DI!B.OD!B.MP,TKSASV(R4)
2412
2413 036512  001413                               BEQ     1$              ;IF QBUS, BRANCH
2414 036514  022764  004700  000012               CMP     #4700,TKSASV(R4)        ;IF NOT UNIBUS
2415 036522  001013                               BNE     STP1ER                  ;  THEN TAKE ERROR EXIT
2416 036524  022737  007776  002120               CMP     #7776,L$HIME            ;  ELSE IF LESS THAN OR EQUAL TO 128K MEMORY
2417 036532  002003                               BGE     1$                      ;         THEN BRANCH
2418 036534  012737  007776  002120               MOV     #7776,L$HIME            ;         ELSE SET UP L$HIME
2419
2420 036542  013774  002250  000002  1$:          MOV     STPTBL,@TKSA(R4);       WRITE HOST'S STEP 1 RESPONSE
2421 036550  000402                               BR      STP1EX          ;       AND LEAVE SHOWING SUCCESS
2422
2423 036552  005237  002320            STP1ER:    INC     STEPST          ;SET ERROR INDICATOR
2424
2425 036556  000207                      STP1EX:    RTS     PC
2426
```

```
 2431                                   ;;*****************************************************************
 2432                                   ;;*****************************************************************
 2433                                   ;
 2434                                   ;BAKPAT
 2435                                   ;       THIS SUBROUTINE WILL FILL THE COMMUNICATION WITH AN
 2436                                   ;       ALL 1'S DATA PATTERN.  THE LENGTH OF THE AREA IN USE
 2437                                   ;       BY THE CURRENT TEST IS CONTAINED IN "CMARLG".
 2438                                   ;
 2439                                   ;;*****************************************************************
 2440                                   ;;*****************************************************************
 2444
 2445 036560                           3AKPAT::
 2446 036560  012702  060000                      MOV     #COMMBF,R2              ;STARTING ADDRESS OF COMM AREA
 2447                                                                             ;-20 WORDS
 2448 036564  012703  000024                      MOV     #20.,R3                 ;BUFFER LENGTH IN FRONT OF AREA
 2449 036570  006303                              ASL     R3                      ;MULTIPLIED BY 2
 2450 036572  063703  002306                      ADD     CMARLG,R3               ;ADD COMM AREA LENGTH USED
 2451 036576  012722  177777           1$:       MOV     #-1,(R2)+               ;WRITE THE DATA
 2452 036602  005303                              DEC     R3                      ;IF NOT DONE YET
 2453 036604  001374                              BNE     1$                      ;  THEN DO IT AGAIN
 2454
 2455 036606  000207                              RTS     PC
 2456
```

```
 2461
 2462
 2463                           ;;*************************************************************
 2464                           ;;*************************************************************
 2465                           ;
 2466                           ;CHKCOM
 2467                           ;       THIS ROUTINE IS CALLED BY TESTS DOING THE PURGE/POLL
 2468                           ;       CHECK.  IT IS USED TO VERIFY THAT THE PORT LEFT THE
 2469                           ;       COMMUNICATIONS AREA CLEARED.  ADDITIONALLY, IT CHECKS
 2470                           ;       THE 20 WORDS PRECEDING AND SUCCEEDING THE COMM AREA
 2471                           ;       TO MAKE SURE THE PORT DIDN'T GO OUTSIDE THE COMM AREA.
 2472                           ;
 2473                           ;;*************************************************************
 2474                           ;;*************************************************************
 2478
 2479 036610                   CHKCOM::
 2480 036610  012701  177777            MOV     #-1,R1                  ;TEST DATA
 2481 036614  012702  060000            MOV     #COMMBF,R2              ;STARTING ADDRESS
 2482 036620  012703  000022            MOV     #18.,R3                 ;FIRST COUNT
 2483 036624  020122            1$:     CMP     R1,(R2)+                ;IF NOT ALL 1'S
 2484 036626  001022                    BNE     15$                     ;  THEN GO REPORT ERROR
 2485 036630  005303                    DEC     R3                      ;IF NOT ALL DONE
 2486 036632  001374                    BNE     1$                      ;  THEN GO CHECK ANOTHER
 2487
 2488 036634  005001                    CLR     R1                      ;TEST DATA FOR PRINTOUT
 2489 036636  013703  002306            MOV     CMARLG,R3               ;SET UP COUNTER FOR COMM AREA
 2490 036642  005722            5$:     TST     (R2)+                   ;IF NOT 0
 2491 036644  001013                    BNE     15$                     ;  THEN GO REPORT ERROR
 2492 036646  005303                    DEC     R3                      ;IF NOT ALL DONE
 2493 036650  001374                    BNE     5$                      ;  THEN GO CHECK ANOTHER
 2494
 2495 036652  012701  177777            MOV     #-1,R1                  ;TEST DATA FOR PRINTOUT
 2496 036656  012703  000024            MOV     #20.,R3                 ;SET UP COUNTER FOR POST COMM AREA
 2497 036662  020122            10$:    CMP     R1,(R2)+                ;IF NOT ALL 1'S
 2498 036664  001003                    BNE     15$                     ;  THEN GO REPORT ERROR
 2499 036666  005303                    DEC     R3                      ;IF NOT ALL DONE
 2500 036670  001374                    BNE     10$                     ;  THEN GO CHECK ANOTHER
 2501 036672  000422                    BR      CKCMEX                  ;  ELSE RETURN
 2502
 2503 036674  162702  000002    15$:    SUB     #2,R2                   ;ADJUST ADDRESS FOR PRINTOUT
 2504 036700  022737  000010  002114    CMP     #8.,L$TEST              ;IF IN TEST 8
 2505 036706  001405                    BEQ     20$                     ;  THEN DO ALTERNATE PRINTOUT
 2506 036710                            ERRDF   1,EMSG14,PRIPAD         ;"PURGE/POLL TEST FAILED"
      036710  104455                    TRAP    C$ERDF
      036712  000001                    .WORD   1
      036714  030677                    .WORD   EMSG14
      036716  033022                    .WORD   PRIPAD
 2507 036720  000404                    BR      25$                     ;COMMON EXIT
 2508
 2509 036722                    20$:    ERRDF   2,EMSG15,PRIVAD         ;"EXTENDED ADDRESS TEST FAILED"
      036722  104455                    TRAP    C$ERDF
      036724  000002                    .WORD   2
      036726  030726                    .WORD   EMSG15
      036730  033046                    .WORD   PRIVAD
 2510
 2511 036732                    25$:    DODU    LOGUNT
      036732  013700  002312            MOV     LOGUNT,R0
```

GLOBAL SUBROUTINES SECTION

```
        036736  104451                          TRAP    C$DODU
2512
2513 036740  000207                  CKCMEX: RTS     PC
2514
```

```
 2519
 2520
 2521                                   ;;*****************************************************************
 2522                                   ;;*****************************************************************
 2523                                   ;
 2524                                   ;INTMMU
 2525                                   ;       THIS SUBROUTINE IS CALLED FROM TEST 8 TO INITIALIZE
 2526                                   ;       MEMORY MANAGEMENT REGISTERS.  ALL PAR'S EXCEPT ONE
 2527                                   ;       ARE SET UP TO MAP VIRTUAL ADDRESSES INTO THE LOWEST
 2528                                   ;       32K OF PHYSICAL MEMORY.  KPAR7 IS SET UP TO MAP TO
 2529                                   ;       THE I/O PAGE.  THE PAR REGISTER THAT CORRESPONDS TO
 2530                                   ;       THE VIRTUAL ADDRESS OF THE COMMUNICATION AREA IS SET
 2531                                   ;       UP TO POINT TO THE SECOND 32K OF PHYSICAL MEMORY.
 2532                                   ;       ALL PDR'S ARE INITIALIZED TO THE SAME VALUE; NAMELY,
 2533                                   ;       UPWARD EXPANDABLE, READ/WRITE ACCESS ENABLED, AND THE
 2534                                   ;       FULL 8KBYTE PAGE IS ACCESSIBLE.
 2535                                   ;
 2536                                   ;;*****************************************************************
 2537                                   ;;*****************************************************************
 2541
 2542 036742                           INTMMU::
 2543 036742  012703  172300                    MOV     #KPDR0,R3               ;START OF PDR ADDRESS RANGE
 2544 036746  012702  172340                    MOV     #KPAR0,R2               ;START OF PAR ADDRESS RANGE
 2545 036752  005001                            CLR     R1                      ;STARTING RELOCATION VALUE
 2546
 2547 036754  010122                    1$:     MOV     R1,(R2)+                ;LOAD RELOCATION VALUE
 2548 036756  012723  077406                    MOV     #77406,(R3)+            ;LOAD PDR
 2549 036762  062701  000200                    ADD     #200,R1                 ;ADJUST RELOCATION VALUE
 2550 036766  022701  002000                    CMP     #2000,R1                ;IF NOT AT THE END
 2551 036772  001370                            BNE     1$                      ;  THEN DO ANOTHER ONE
 2552
 2553 036774  010137  172346                    MOV     R1,KPAR3                ;  ELSE SET THIS REG TO NEXT 32K
 2554 037000  012737  007600  172356            MOV     #7600,KPAR7             ;18 BIT I/O PAGE
 2555 037006  032737  000002  002274            BIT     #BIT1,KTFLAG            ;IF 22-BIT BUS NOT AVAILABLE
 2556 037014  001406                            BEQ     2$                      ;  THEN GO TURN MMU ON
 2557 037016  012737  177600  172356            MOV     #177600,KPAR7           ;  ELSE SET 22 BIT I/O PAGE
 2558 037024  012737  000020  172516            MOV     #MM22ON,MMUSR3          ;  AND ENABLE 22 BIT MAPPING
 2559
 2560 037032  012737  000001  177572    2$:     MOV     #MMON,MMUSR0            ;TURN ON THE WHOLE THING
 2561 037040  000207                            RTS     PC
 2562
 2563
 2564 037042                           PRTINT::
 2565 037042  010174  000000                    MOV     R1,@TKIP(R4)            ;INITIALIZE THE DRIVE
 2566 037046  012703  037264                    MOV     #INTTBL,R3              ;PUT THE TABLE ADDRESS INTO R3
 2567 037052  012701  004000                    MOV     #S1,R1                  ;SET UP TO BEGIN AT STEP 1
 2568 037056  005037  002316                    CLR     INISTP                  ;CLEAR THE STEP TRACKER
 2569 037062  012737  000030  003024    LOOP:   MOV     #24.,CNTHI              ;SET UP THE TIME OUT COUNTER
 2570 037070  005002                            CLR     R2                      ;CLEAR R2
 2571 037072  005202                    ILOOP:  INC     R2                      ;INCREMENT HI TIME OUT VALUE ?
 2572 037074  001016                            BNE     2$                      ;IF NOT, BRANCH
 2573 037076  005337  003024                    DEC     CNTHI                   ;ELSE, DECREMENT LO TIMEOUT
 2574 037102  001013                            BNE     2$                      ;BRANCH IF NO TIME OUT
 2575 037104  017464  000002  000012            MOV     @TKSA(R4),TKSASV(R4)    ;SAVE THE SA FOR THE ERROR PRINTOUT
 2576 037112                                    ERRDF   51.,WRER1,WRINTO        ;PRINT PORT INIT FAILURE
      037112  104455                            TRAP    C$ERDF
      037114  000063                            .WORD   51
```

```
        037116  032347                          .WORD   WRER1
        037120  033176                          .WORD   WRINTO
 2577   037122                                  DODU    LOGUNT                  ;DROP THE UNIT
        037122  013700  002312                  MOV     LOGUNT,R0
        037126  104451                          TRAP    C$DODU
 2578   037130  000454                          BR      100$                    ;EXIT ROUTINE
 2579   037132  037401  000002          2$:     BIT     @TKSA(R4),R1            ;TEST FOR STEP BIT FROM DRIVE
 2580   037136  001755                          BEQ     ILOOP                   ;LOOP UNTIL SOMETHING SETS
 2581   037140  032774  100000  000002          BIT     #ERR,@TKSA(R4)          ;CHECK FOR ERROR
 2582   037146  001413                          BEQ     3$                      ;NO ERROR, KEEP GOING
 2533   037150  017464  000002  000012          MOV     @TKSA(R4),TKSASV(R4)    ;SAVE THE SA CONTENTS
 2584   037156                                  ERRDF   52.,WRER2,WRPRTE        ;PRINT ERROR
        037156  104455                          TRAP    C$ERDF
        037160  000064                          .WORD   52
        037162  032401                          .WORD   WRER2
        037164  033222                          .WORD   WRPRTE
 2585   037166                                  DODU    LOGUNT                  ;DROP THE UNIT
        037166  013700  002312                  MOV     LOGUNT,R0
        037172  104451                          TRAP    C$DODU
 2586   037174  000432                          BR      100$                    ;EXIT ROUTINE
 2587   037176  005237  002316          3$:     INC     INISTP                  ;INCREMENT THE STEP TRACKER
 2588   037202  012374  000002                  MOV     (R3)+,@TKSA(R4)         ;WRITE WORD FROM TABLE TO CONTROLLER
 2589   037206  006301                          ASL     R1                      ;SHIFT TO NEXT STEP
 2590   037210  100324                          BPL     LOOP                    ;IF NOT AT LAST STEP LOOP
 2591   037212  012702  003004                  MOV     #RSPRNG,R2              ;PUT THE RESPONSE DESCRIPTOR ADD IN R2
 2592   037216  012703  002574                  MOV     #RSPBUF,R3              ;PUT THE RESPONSE BUFFER ADDRESS IN R3
 2593   037222  010322                  5$:     MOV     R3,(R2)+                ;PUT THE BUFF ADD IN THE DESCRIPTOR
 2594   037224  012722  100000                  MOV     #OWN,(R2)+              ;SET THE DESCRIPTOR TO THE CONTROLLER
 2595   037230  062703  000104                  ADD     #RSPSTP,R3              ;STEP TO THE NEXT BUFFER SLOT
 2596   037234  022703  003004                  CMP     #RSPEND,R3              ;ARE WE AT THE END OF THE BUFFER ?
 2597   037240  001370                          BNE     5$                      ;NO, KEEP GOING
 2598   037242  012737  003004  023040          MOV     #RSPRNG,RSPSAV          ;SET UP TO USE FIRST RESPONSE BUFFER
 2599   037250  012737  003014  023036          MOV     #CMDRNG,CMDSAV          ;SET UP TO USE FIRST COMMAND BUFFER
 2600   037256  005037  003032                  CLR     CMDREF                  ;SET THE COMMAND REFERENCE # TO 0
 2601   037262  000207                  100$:   RTS     PC                      ;RETURN
 2602
 2603                                          ;INIT DATA TABLE
 2604   037264  104400                  INTTBL:         .WORD   104400
 2605   037266  003004                                  .WORD   RSPRNG
 2606   037270  000000                                  .WORD   0
 2607   037272  000001                                  .WORD   GO
```

```
2609 037274                                CLSDRV::
2610 037274  005237  003032          5$:   INC     CMDREF                  ;ADD 1 TO THE COMMAND REFERENCE NUMBER
2611 037300  004737  037632                JSR     PC,PRTDRV               ;GO SEND THE COMMAND
2612 037304  032764  000001  000014        BIT     #DRPFLG,LUNFLG(R4)      ;IS THE DRIVE AVAILABLE
2613 037312  001146                        BNE     100$                    ;GET OUT IF NOT AVAILABLE
2614 037314  004737  037774                JSR     PC,CDRECV               ;GO CHECK FOR ANY NEW RESPONSES
2615 037320  032764  000001  000014        BIT     #DRPFLG,LUNFLG(R4)      ;IS THE DRIVE AVAILABLE
2616 037326  001140                        BNE     100$                    ;GET OUT IF NOT AVAILABLE
2617 037330  012702  024035                MOV     #WR2,R2                 ;R2 GETS ERROR MESSAGE ADDRESS
2618 037334  005763  000012                TST     P.STS(R3)               ;WAS STATUS "NORMAL"?
2619 037340  001463                        BEQ     15$                     ;YES - BRANCH
2620 037342  032764  000010  000014  7$:   BIT     #DUPFLG,LUNFLG(R4)      ;IS IT A DUP COMMAND ?
2521 037350  001047                        BNE     12$                     ;YES, PRINT DUP ERROR
2622 037352  022705  002406                CMP     #ONLINE,R5              ;IS IT AN ONLINE COMMAND
2623 037356  001024                        BNE     10$                     ;NO, GO PRINT ERROR
2624 037360  122763  000003  000012        CMPB    #3,P.STS(R3)            ;WAS IT A UNIT UNKNOWN ERROR ?
2625 037366  001003                        BNE     8$                      ;NO, CONTINUE
2626 037370  012702  024214                MOV     #WR7,R2                 ;R2 GETS ERROR MESSAGE ADDRESS
2627 037374  000415                        BR      10$                     ;PRINT ERROR MESSAGE
2628 037376  122763  000043  000012  8$:   CMPB    #43,P.STS(R3)           ;WAS IT A NO MEDIA MOUNTED ERROR ?
2629 037404  001003                        BNE     9$                      ;NO, CONTINUE
2630 037406  012702  024265                MOV     #WR8,R2                 ;R2 GETS ERROR MESSAGE ADDRESS
2631 037412  000406                        BR      10$                     ;PRINT ERROR MESSAGE
2632 037414  122763  000103  000012  9$:   CMPB    #103,P.STS(R3)          ;WAS IT A UNIT INOPERATIVE ERROR ?
2633 037422  001012                        BNE     11$                     ;NO, MUST BE INVALID STATUS
2634 037424  012702  024265                MOV     #WR8,R2                 ;R2 GETS ERROR MESSAGE ADDRESS
2635 037430                          10$:   ERRDF   57.,WRER3,WRCMDE        ;GET READY TO PRINT FAILURE
     037430  104455                        TRAP    C$ERDF
     037432  000071                        .WORD   57
     037434  032422                        .WORD   WRER3
     037436  033256                        .WORD   WRCMDE
2636 037440                                DODU    LOGUNT                  ;DROP THE UNIT
     037440  013700  002312                MOV     LOGUNT,R0
     037444  104451                        TRAP    C$DODU
2637 037446  000470                        BR      100$                    ;GET OUT ON ERROR
2638 037450                          11$:   ERRDF   58.,WRER7,WRCMDE        ;GET READY TO PRINT FAILURE
     037450  104455                        TRAP    C$ERDF
     037452  000072                        .WORD   58
     037454  032546                        .WORD   WRER7
     037456  033256                        .WORD   WRCMDE
2639 037460                                DODU    LOGUNT                  ;DROP THE UNIT
     037460  013700  002312                MOV     LOGUNT,R0
     037464  104451                        TRAP    C$DODU
2640 037466  000460                        BR      100$                    ;GET OUT ON ERROR
2641 037470                          12$:   ERRDF   59.,WRER8,WRCMDE        ;GET READY TO PRINT FAILURE
     037470  104455                        TRAP    C$ERDF
     037472  000073                        .WORD   59
     037474  032614                        .WORD   WRER8
     037476  033256                        .WORD   WRCMDE
2642 037500                                DODU    LOGUNT                  ;DROP THE UNIT
     037500  013700  002312                MOV     LOGUNT,R0
     037504  104451                        TRAP    C$DODU
2643 037506  000450                        BR      100$                    ;GET OUT ON ERROR
2644 037510  022705  002456          15$:   CMP     #GDUST,R5               ;WAS IT A GET DUST STATUS COMMAND ?
2645 037514  001035                        BNE     20$                     ;NO, CONTINUE
2646 037516  126327  000014  000113        CMPB    P.EXT1(R3),#113         ;1ST BYTE OF PROGRAM EXTENSION = "K" ?
2647 037524  001341                        BNE     10$                     ;NO, ERROR
```

```
2648 037526  126327  000015  000065          CMPB    P.EXT2(R3),#65          ;2ND BYTE OF PROGRAM EXTENSION = '5  ?
2649 037534  001335                          BNE     10$                     ;NO, ERROR
2650 037536  126327  000016  000060          CMPB    P.EXT3(R3),#60          ;3RD BYTE OF PROGRAM EXTENSION = '0' ?
2651 037544  001331                          BNE     10$                     ;NO, ERROR
2652 037546  126327  000017  000007          CMPB    DUSTFL(R3),#7           ;FLAGS = 7 ?
2653 037554  001325                          BNE     10$                     ;NO, ERROR
2654 037556  026327  000020  000000          CMP     P.IND1(R3),#0           ;1ST WORD OF PROGRESS INDICATOR = 0 ?
2655 037564  001321                          BNE     10$                     ;NO, ERROR
2656 037566  026327  000022  000000          CMP     P.IND2(R3),#0           ;2ND WORD OF PROGRESS INDICATOR = 0 ?
2657 037574  001315                          BNE     10$                     ;NO, ERROR
2658 037576  026327  000024  000012          CMP     TIMOUT(R3),#12          ;TIMEOUT VALUE = 12 ?
2659 037604  001311                          BNE     10$                     ;NO, ERROR
2660 037606  000405                          BR      30$                     ;NO ERRORS, RETURN
2661 037610  022705  002524          20$:    CMP     #RCVDAT,R5              ;WAS IT A RECEIVE DATA COMMAND?
2662 037614  001002                          BNE     30$                     ;NO, CONTINUE
2663 037616  004737  040224                  JSR     PC,L2DATA               ;YES, GO READ DIAGL2 PROGRAM STATUS
2664 037622  005337  002272          30$:    DEC     ITRCNT                  ;SUBTRACT 1 FROM TIMES TO DO
2665 037626  001222                          BNE     5$                      ;GO SEND IT AGAIN
2666 037630  000207          100$:   RTS     PC                      ;RETURN
2667
2668 037632                  PRTDRV::
2669 037632  013701  023036                  MOV     CMDSAV,R1               ;SET UP COMMAND RING POINTER
2670 037636  013765  003032  000000          MOV     CMDREF,P.CRF(R5)        ;PUT COMMAND REFERENCE # INTO PACKET
2671 037644  112765  000002  177776          MOVB    #2,CRD(R5)              ;PUT THE CREDIT LIMIT INTO THE PACKET
2672 037652  032764  000010  000014          BIT     #DUPFLG,LUNFLG(R4)      ;IS IT A DUP COMMAND?
2673 037660  001404                          BEQ     1$                      ;NO, CONNECTION TYPE = 1
2674 037662  112765  000002  177777          MOVB    #2,CONID(R5)            ;YES,CONNECTION TYPE = 2
2675 037670  000403                          BR      2$                      ;CONTINUE
2676 037672  112765  000001  177777  1$:     MOVB    #1,CONID(R5)            ;PUT THE CONNECTION TYPE INTO THE PACKET
2677 037700  010511                  2$:     MOV     R5,(R1)                 ;PUT THE PACKET ADDRESS INTO THE DESCRIPTOR
2678 037702  012761  100000  000002          MOV     #OWN,HIADDR(R1)         ;SET THE OWNERSHIP BIT OF THE DESCRIPTOR
2679 037710  005774  000000                  TST     @TKIP(R4)               ;READ THE IP REGISTER
2680 037714  005774  000002                  TST     @TKSA(R4)               ;READ THE SA REGISTER
2681 037720  100013                          BPL     10$                     ;BRANCH IF NO ERRORS
2682 037722  017464  000002  000012          MOV     @TKSA(R4),TKSASV(R4)    ;SAVE THE SA FOR THE ERROR PRINTOUT
2683 037730                                  ERRDF   53.,WRER4,WRPRTE        ;PRINT PORT DETECTED ERROR
     037730  104455                          TRAP    C$ERDF
     037732  000065                          .WORD   53
     037734  032450                          .WORD   WRER4
     037736  033222                          .WORD   WRPRTE
2684 037740                                  DODU    LOGUNT                  ;DROP THE UNIT
     037740  013700  002312                  MOV     LOGUNT,R0
     037744  104451                          TRAP    C$DODU
2685 037746  000411                          BR      100$                    ;GET OUT
2686 037750  062701  000004          10$:    ADD     #RNGSTP,R1              ;ADJUST RESPONCE POINTER FOR NEXT TIME
2687 037754  022701  003024                  CMP     #DSCEND,R1              ;ARE WE AT THE END ?
2688 037760  001002                          BNE     15$                     ;NO, GET OUT
2689 037762  012701  003014                  MOV     #CMDRNG,R1              ;SET R1 TO TOP BUFFER
2690 037766  010137  023036          15$:    MOV     R1,CMDSAV               ;SAVE THE COMMAND RING LOCATION
2691 037772  000207          100$:   RTS     PC                      ;RETURN
```

```
 2693 037774                                CDRECV::
 2694 037774  004737  040102          1$:   JSR     PC,PDRECV               ;CALL PORT DRIVER RECEIVE
 2695 040000  032764  000001  000014        BIT     #DRPFLG,LUNFLG(R4)      ;IS THE DRIVE AVAILABLE
 2696 040006  001034                        BNE     100$                    ;GET OUT IF NOT AVAILABLE
 2697 040010  011103                        MOV     (R1),R3                 ;SET UP RESPONCE BUFFER POINTER
 2698 040012  026365  000000  000000        CMP     P.CRF(R3),P.CRF(R5)     ;IS THIS THE COMMAND THAT IS EXPECTED ?
 2699 040020  001015                        BNE     10$                     ;GET OUT IF WRONG RESPONCE
 2700 040022  012761  100000  000002        MOV     #OWN,HIADDR(R1)         ;GIVE THE CONTROLLER THE RING BACK
 2701 040030  062701  000004                ADD     #RNGSTP,R1              ;ADJUST RESPONCE POINTER FOR NEXT TIME
 2702 040034  020701  003014                CMP     #CMDRNG,R1              ;ARE WE AT THE END ?
 2703 040040  001002                        BNE     15$                     ;NO, GET OUT
 2704 040042  012701  003004                MOV     #RSPRNG,R1              ;SET R1 TO TOP BUFFER
 2705 040046  010137  023040          15$:  MOV     R1,RSPSAV               ;SAVE THE POINTER FOR NEXT TIME
 2706 040052  000412                        BR      100$
 2707 040054  012737  032640  002310  10$:  MOV     #CTRL,FRUIS             ;PRINT CONTROLLER ERROR
 2708 040062                                ERRDF   56.,WRER5,WRSEQE        ;PRINT COMMAND OUT OF SEQUENCE ERROR
      040062  104455                        TRAP    C$ERDF
      040064  000070                        .WORD   56
      040066  032474                        .WORD   WRER5
      040070  033410                        .WORD   WRSEQE
 2709 040072                                DODU    LOGUNT                  ;DROP THE UNIT
      040072  013700  002312                MOV     LOGUNT,R0
      040076  104451                        TRAP    C$DODU
 2710 040100  000207                100$:   RTS     PC                      ;RETURN
 2711
 2712
 2713
 2714 040102                                PDRECV::
 2715 040102  013701  023040                MOV     RSPSAV,R1               ;PUT THE RESPONSE RING SAVE IN R1
 2716 040106  012737  000225  003024  1$:   MOV     #225,CNTHI              ;SET UP THE TIME OUT COUNTER
 2717 040114  005002                        CLR     R2                      ;CLEAR R2
 2718 040116  005202                5$:     INC     R2                      ;INCREMENT HI TIME OUT VALUE ?
 2719 040120  001013                        BNE     10$                     ;IF NOT, BRANCH
 2720 040122  005337  003024                DEC     CNTHI                   ;ELSE, INCREMENT HI TIMEOUT
 2721 040126  001010                        BNE     10$                     ;KEEP GOING ,NO TIME OUT YET
 2722 040130                                ERRDF   54.,WRER6,WRTOE         ;PRINT COMMAND TIMEOUT MESSAGE
      040130  104455                        TRAP    C$ERDF
      040132  000066                        .WORD   54
      040134  032525                        .WORD   WRER6
      040136  033466                        .WORD   WRTOE
 2723 040140                                DODU    LOGUNT                  ;GO DROP THE UNIT
      040140  013700  002312                MOV     LOGUNT,R0
      040144  104451                        TRAP    C$DODU
 2724 040146  000425                        BR      100$                    ;GET OUT ON ERROR
 2725 040150  017464  000002  000012  10$:  MOV     @TKSA(R4),TKSASV(R4)    ;GET SA CONTENTS
 2726 040156  005764  000012                TST     TKSASV(R4)              ;CHECK FOR SA ERROR
 2727 040162  100013                        BPL     20$                     ;BRANCH IF NO ERROR
 2728 040164  012737  032640  002310        MOV     #CTRL,FRUIS             ;LOAD FAILING FRU
 2729 040172                                ERRDF   55.,EMSG9,WRPRTE        ;PRINT SA CONTENTS IN ERROR MESSAGE
      040172  104455                        TRAP    C$ERDF
      040174  000067                        .WORD   55
      040176  030465                        .WORD   EMSG9
      040200  033222                        .WORD   WRPRTE
 2730 040202                                DODU    LOGUNT                  ;GO DROP THE UNIT
      040202  013700  002312                MOV     LOGUNT,R0
      040206  104451                        TRAP    C$DODU
 2731 040210  000404                        BR      100$                    ;GET OUT ON ERROR
```

```
2732 040212  032761  100000  000002  20$:    BIT     #OWN,HIADDR(R1)         ;IS THE SLOT SET TO US ?
2733 040220  001336                          BNE     5$                      ;KEEP GOING TILL TIMEOUT OR SUCCESS
2734 040222  000207                  100$:   RTS     PC                      ;RETURN
2735
2736
2737
2738
2739 040224                          L2DATA::
2740 040224  010146                          MOV     R1, (SP)                ;SAVE REGISTERS
2741 040226  010246                          MOV     R2,-(SP)
2742 040230  010346                          MOV     R3,-(SP)
2743 040232  012701  060000                  MOV     #RDBUF,R1               ;GET START ADDRESS OF RECEIVE DATA
2744 040236  121127  000001                  CMPB    (R1),#1                 ;ANY NEW INFORMATION ?
2745 040242  001162                          BNE     EXIT                    ;NO, RETURN
2746 040244  026127  000002  000000          CMP     L2STA(R1),#0            ;YES, LOCAL PROGRAM FINISHED ?
2747 040252  001552                          BEQ     GOABO                   ;YES, SET ABORT FLAG
2748 040254  016103  000002                  MOV     L2STA(R1),R3            ;GET LEVEL 2 PROGRAM STATUS
2749 040260  042703  177740                  BIC     #177740,R3              ;MASK OFF UPPER 11 BITS OF STATUS
2750 040264  022703  000037                  CMP     #37,R3                  ;L2 MESSAGE IF 1ST 5 BITS SET
2751 040270  001113                          BNE     MSCPER                  ;TMSCP COMMAND ERROR OTHERWISE
2752 040272  016103  000002                  MOV     L2STA(R1),R3            ;GET LEVEL 2 PROGRAM STATUS
2753 040276  012737  032640  002310          MOV     #CTRL,FRUIS             ;NO, SET FAILING FRU TO CONTROLLER
2754 040304  042703  000037                  BIC     #000037,R3              ;MASK OFF UNUSED BITS OF STATUS
2755 040310  006203                          ASR     R3
2756 040312  006203                          ASR     R3
2757 040314  006203                          ASR     R3
2758 040316  006203                          ASR     R3
2759 040320  006203                          ASR     R3
2760
2761 040322  022703  000001                  CMP     #1.,R3                  ;IS IT A DATA COMPARE ERROR ?
2762 040326  001006                          BNE     5$                      ;NO TRY AGAIN
2763 040330  012702  023312                  MOV     #DCERR,R2               ;SET UP TO PRINT ERROR
2764 040334  012737  032655  002310          MOV     #DRVE,FRUIS             ;SET FRU CALLOUT TO DRIVE
2765 040342  000454                          BR      40$                     ;GO PRINT IT
2766
2767 040344  022703  000002          5$:     CMP     #2.,R3                  ;IS IT A CONTROLLER ERROR ?
2768 040350  001003                          BNE     10$                     ;NO TRY AGAIN
2769 040352  012702  023322                  MOV     #CNTERR,R2              ;SET UP TO PRINT ERROR
2770 040356  000446                          BR      40$                     ;GO PRINT IT
2771
2772 040360  022703  000012          10$:    CMP     #10.,R3                 ;IS IT AN INVAILID STATUS ERROR ?
2773 040364  001003                          BNE     15$                     ;NO TRY AGAIN
2774 040366  012702  023332                  MOV     #INVSTA,R2              ;SET UP TO PRINT ERROR
2775 040372  000440                          BR      40$                     ;GO PRINT IT
2776
2777 040374  022703  000024          15$:    CMP     #20.,R3                 ;IS IT A BAD PATTERN NUMBER ERROR ?
2778 040400  001003                          BNE     20$                     ;NO TRY AGAIN
2779 040402  012702  023342                  MOV     #BPNERR,R2              ;SET UP TO PRINT ERROR
2780 040406  000432                          BR      40$                     ;GO PRINT IT
2781
2782 040410  022703  000025          20$:    CMP     #21.,R3                 ;IS IT A RESPONSE ADDRESS ERROR ?
2783 040414  001003                          BNE     25$                     ;NO TRY AGAIN
2784 040416  012702  023352                  MOV     #RSPADD,R2              ;SET UP TO PRINT ERROR
2785 040422  000424                          BR      40$                     ;GO PRINT IT
2786
2787 040424  022703  000026          25$:    CMP     #22.,R3                 ;IS IT A HOST BUFFER ADDRESS ERROR ?
2788 040430  001003                          BNE     30$                     ;NO TRY AGAIN
```

```
 2789 040432  012702  023362            MOV     #HBFADD,R2          ;SET UP TO PRINT ERROR
 2790 040436  000416                    BR      40$                 ;GO PRINT IT
 2791
 2792 040440  022703  000027    30$:    CMP     #23.,R3             ;IS IT A UNKNOWN ERROR LOG RECIEVED ?
 2793 040444  001005                    BNE     35$                 ;NO TRY AGAIN
 2794 040446  012702  023372            MOV     #UNERLG,R2          ;SET UP TO PRINT ERROR
 2795 040452  000410                    BR      40$                 ;GO PRINT IT
 2796
 2797 040454  022703  000030    35$:    CMP     #24.,R3             ;IS IT A RESPONSE TIME OUT ERROR ?
 2798 040460  001003                    BNE     36$                 ;NO TRY AGAIN
 2799 040462  012702  023402            MOV     #RSPTO,R2           ;SET UP TO PRINT ERROR
 2800 040466  000402                    BR      40$                 ;GO PRINT IT
 2801
 2802 040470  012702  023332    36$:    MOV     #INVSTA,R2          ;SET UP TO PRINT ERROR
 2803
 2804 040474  012237  023052    40$:    MOV     (R2)+,ERRTYP        ;LOAD ERROR TYPE
 2805 040500  012237  023054            MOV     (R2)+,ERRNBR        ;LOAD ERROR NUMBER
 2806 040504  012237  023056            MOV     (R2)+,ERRMSG        ;LOAD ERROR MESSAGE ADDRESS
 2807 040510  012237  023060            MOV     (R2)+,ERRBLK        ;LOAD ERROR SUBROUTINE ADDRESS
 2808 040514                            ERROR                       ;CALL "ERROR" MACRO
      040514  104460                    TRAP    C$ERROR
 2809 040516  000430                    BR      GOABO               ;ABORT MICRODIAGNOSTIC
 2810 040520  022703  000012    MSCPER: CMP     #12,R3              ;IS IT A CONTROLLER ERROR ?
 2811 040524  001406                    BEQ     10$                 ;YES, SET FAILING FRU TO CONTROLLER
 2812 040526  022703  000014            CMP     #14,R3              ;IS IT A FORMATTER ERROR ?
 2813 040532  001403                    BEQ     10$                 ;YES, LEAVE FAILING FRU AS CONTRLLOER
 2814 040534  012737  032655  002310  5$:     MOV     #DRVE,FRUIS     ;NO, SET FAILING FRU TO DRIVE
 2815 040542  005303            10$:    DEC     R3
 2816 040544  070327  000010            MUL     #10,R3              ;R3 IS OFFSET INTO TMSCP ERROR TABLE
 2817 040550  012702  023062            MOV     #L2ETBL,R2          ;GET TMSCP ERROR TABLE START ADDRESS
 2818 040554  060302                    ADD     R3,R2               ;R2 POINTS TO ENTRY IN TMSCP ERROR TABLE.
 2819 040556  012237  023052            MOV     (R2)+,ERRTYP        ;LOAD ERROR TYPE
 2820 040562  012237  023054            MOV     (R2)+,ERRNBR        ;LOAD ERROR NUMBER
 2821 040566  012237  023056            MOV     (R2)+,ERRMSG        ;LOAD ERROR MESSAGE ADDRESS
 2822 040572  012237  023060            MOV     (R2)+,ERRBLK        ;LOAD ERROR SUBROUTINE ADDRESS
 2823 040576                            ERROR                       ;CALL "ERROR" MACRO
      040576  104460                    TRAP    C$ERROR
 2824 040600  052764  000020  000014  GOABO:  BIS     #ABTFLG,LUNFLG(R4)  ;SET ABORT FLAG
 2825 040606                            DORPT                       ;DUMP NORMAL COMPLETION STATISTICS
      040606  104424                    TRAP    C$DRPT
 2826 040610  012603            EXIT:   MOV     (SP)+,R3            ;RESTORE REGISTERS
 2827 040612  012602                    MOV     (SP)+,R2
 2828 040614  012601                    MOV     (SP)+,R1
 2829 040616  000207                    RTS     PC
 2830
 2831 040620                            ENDMOD
 2842                           .TITLE MISCELLANEOUS SECTIONS
 2843                           .SBTTL  REPORT CODING SECTION
 2871
 2872 040620                            BGNMOD
 2873
```

```
                                .SBTTL  INITIALIZE SECTION

                                ;++
                                ; THE INITIALIZE SECTION CONTAINS THE CODING THAT IS PERFORMED
                                ; AT THE BEGINNING OF EACH PASS.
                                ;--

040620                                  BGNINIT
040620                          L$INIT::

                                        READEF  #EF.START               ;IF THIS IS A FRESH START
040620  012700  000040                  MOV     #EF.START,R0
040624  104447                          TRAP    C$REFG
040626                                  BCOMPLETE       START           ;  THEN GO TO START
040626  103421                          BCS     START

                                        READEF  #EF.RESTART             ;IF THIS IS A RESTART
040630  012700  000037                  MOV     #EF.RESTART,R0
040634  104447                          TRAP    C$REFG
040636                                  BCOMPLETE       START           ;  THEN GO TO START
040636  103415                          BCS     START

                                        READEF  #EF.PWR                 ;IF POWER-FAIL OCCURRED
040640  012700  000034                  MOV     #EF.PWR,R0
040644  104447                          TRAP    C$REFG
040646                                  BCOMPLETE       START           ;  THEN START FROM THE BEGINNING
040646  103411                          BCS     START

                                        READEF  #EF.NEW                 ;IF THIS IS A NEW PASS
040650  012700  000035                  MOV     #EF.NEW,R0
040654  104447                          TRAP    C$REFG
040656                                  BCOMPLETE       NUPASS          ;  THEN SKIP START UP CODE
040656  103422                          BCS     NUPASS

                                        READEF  #EF.CONTINUE            ;IF THIS IS A CONTINUE
040660  012700  000036                  MOV     #EF.CONTINUE,R0
040664  104447                          TRAP    C$REFG
040666                                  BCOMPLETE       END             ;  THEN SKIP ALL INIT CODE
040666  103465                          BCS     END

040670  000423                          BR      NEXT                    ;JUST HERE FOR NEXT UUT

040672                          START:
040672  012737  000000  002270          MOV     #0,PASCNT               ;INITIALIZE PASS COUNT
040700  005037  002274                  CLR     KTFLAG                  ;IN CASE WE'RE STARTED > THAN ONCE
040704  012704  002212                  MOV     #LUNBLK,R4              ;R4 WILL ALWAYS POINT TO LUNBLK
040710  022737  001400  002120          CMP     #1400,L$HIME            ;IF <= 28KWORDS OF MEMORY PRESENT
040716  103002                          BHIS    NUPASS                  ;  THEN SKIP NEXT
040720  004737  036102                  JSR     PC,KTTEST               ;  ELSE SEE IF MMU IS PRESENT

040724                          NUPASS: BRESET                          ;CLEAR THE WORLD
040724  104433                          TRAP    C$RESET
040726  005237  002270                  INC     PASCNT                  ;UPDATE THE PASS COUNT
040732  012737  177777  002312          MOV     # 1,LOGUNT              ;INITIALIZE LOGICAL UNIT COUNT

040740  005237  002312          NEXT:   INC     LOGUNT                  ;POINT TO NEXT UUT
```

```
 2915 040744  023737  002312  002012          CMP     LOGUNT,L$UNIT           ;IF WE'VE PASSED MAXIMUM UUT'S
 2916 040752  001433                          BEQ     END                     ;  THEN LEAVE INIT
 2917
 2918 040754                                  GPHARD  LOGUNT,R0               ;GET P-TABLE FOR THIS UNIT
      040754  013700  002312                  MOV     LOGUNT,R0
      040760  104442                          TRAP    C$GPHRD
 2919 040762                                  BNCOMPLETE      NEXT            ;TRY AGAIN
      040762  103366                          BCC     NEXT
 2920
 2921 040764  011064  000000                  MOV     (R0),TKIP(R4)           ;PUT IP REG ADDRESS IN LUNBLK
 2922 040770  012064  000002                  MOV     (R0)+,TKSA(R4)          ; AND ANOTHER COPY IN LUNBLK
 2923 040774  062764  000002  000002          ADD     #2,TKSA(R4)             ;MAKE IT THE SA REG ADDRESS
 2924 041002  012064  000004                  MOV     (R0)+,TKVEC(R4)         ;GET THE VECTOR INTO THE LUNBLK
 2925 041006  011064  000006                  MOV     (R0),MSCPUN(R4)         ;PUT THE T/MSCP UNIT # IN LUNBLK
 2926 041012  004737  036266                  JSR     PC,RSTVEC               ;SET UUT VECTOR FOR ILLEGAL INTRPTS.
 2927 041016                                  PRINTF  #IMSG,LOGUNT            ;"TESTING UNIT N"
      041016  013746  002312                  MOV     LOGUNT,-(SP)
      041022  012746  041046                  MOV     #IMSG,-(SP)
      041026  012746  000002                  MOV     #2,-(SP)
      041032  010600                          MOV     SP,R0
      041034  104417                          TRAP    C$PNTF
      041036  062706  000006                  ADD     #6,SP
 2928
 2929 041042                          END:
 2930 041042                                  EXIT    INIT
      041042  104432                          TRAP    C$EXIT
      041044  000032                          .WORD   L10011-.
 2931
 2943 041046     045     116     045  IMSG:  .ASCIZ  ?%N%ATESTING UNIT %D1%N?
 2944                                          .EVEN
 2945
 2946 041076                                  ENDINIT
      041076                          L10011:
      041076  104411                          TRAP    C$INIT
```

```
                                .SBTTL  CLEANUP CODING SECTION

                                ;++
                                ; THE CLEANUP CODING SECTION CONTAINS THE CODING THAT IS PERFORMED
                                ; AFTER THE HARDWARE TESTS HAVE BEEN PERFORMED.
                                ; -

                                        BGNCLN
                                L$CLEAN::
                                ;
041100  032764  000000G 002212          BIT     @T9FLAG,LUNBLK(R4)      ;IF NOT HERE FROM TEST 9
041106  001400                          BEQ     ENDCLE                  ;  THEN SKIP THE REST
                                ;
                                ;EVENTUALLY MORE CODE WILL BE PLACED HERE TO GUARANTEE THAT AN ABORT
                                ;COMMAND IS ISSUED TO THE UUT TO STOP EXECUTION OF THE LOCAL PROGRAM.
                                ;
041110  005064  000014          ENDCLE: CLR     LUNFLG(R4)              ;CLEAR OUT THE LUN FLAGS
                                ;
                                ;NOTE: THIS LINE OF CODE MAY HAVE TO BE REMOVED TO HANDLE ^C FOLLOWED
                                ;BY A PROCEED COMMAND CORRECTLY.
041114                                  CLRVEC  TKVEC(R4)               ;PUT "TRAP CATCHER" INTO VECTOR
041114  016400  000004                    MOV     TKVEC(R4),R0
041120  104436                          TRAP    C$CVEC
                                ;
041122                                  EXIT    CLN
041122  104432                          TRAP    C$EXIT
041124  000002                          .WORD   L10012-.
                                ;
                                ;
                                        .EVEN
                                ;
041126                                  ENDCLN
041126                          L10012:
041126  104412                          TRAP    C$CLEAN
```

```
 2993                                   .SBTTL  DROP UNIT SECTION
 2994
 2995                                   ;++
 2996                                   ; THE DROP-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
 2997                                   ; TO NO LONGER BE TESTED.
 2998                                   ;--
 2999
 3000 041130                                    BGNDU
      041130                            L$DU::
 3001
 3007
 3008 041130  012764  000001  000014            MOV     #DRPFLG,LUNFLG(R4)      ;LETS PROGRAM KNOW IT'S DEAD
 3009
 3010 041136                                    EXIT    DU
      041136  000167                            .WORD   J$JMP
      041140  000000                            .WORD   L10013-2-.
 3011
 3023
 3024                                           .EVEN
 3025
 3026 041142                                    ENDDU
      041142                            L10013:
      041142  104453                            TRAP    C$DU
```

```
                                .SBTTL  ADD UNIT SECTION

                                ;++
                                ; THE ADD-UNIT SECTION CONTAINS ANY CODE THE PROGRAMMER WISHES
                                ;  TO BE EXECUTED IN CONJUNCTION WITH THE ADDING OF A UNIT BACK
                                ;  TO THE TEST CYCLE.
                                ; -

041144                                  BGNAU
041144                          L$AU::

041144                                  EXIT    AU
041144  000167                          .WORD   J$JMP
041146  000000                          .WORD   L10014-2 .

                                        .EVEN

041150                                  ENDAU
041150                          L10014:
041150  104452                          TRAP    C$AU

041152                                  ENDMOD
```

```
3066
3067                                    .TITLE HARDWARE TEST
3071            000000                  HELP=0          ; CONTROL LISTING OF HELP INFORMATION
3072                                                    ; HELP-0   NO LIST
3073                                                    ; HELP=1   LIST
3074
3075                                    ;ONEFILE=       ; CONTROL USE OF SOURCE FILES
3076                                                    ; ONEFILE IS NOT DEFINED   ASSEMBLE EACH SOURCE FILE SEPARATELY
3077                                                    ; ONEFILE=ANYTHING   ASSEMBLE ALL SOURCE FILES TOGETHER
3081
3082                                    .SBTTL  TEST 1: EXISTENCE VERIFICATION TEST
3095
3097
3098                                    ;;*****************************************************************
3099                                    ;;*****************************************************************
3100                                    ;
3101                                    ;TEST 1    EXISTENCE VERIFICATION TEST
3102                                    ;       THIS TEST VERIFIES THE EXISTENCE OF THE UUT BY
3103                                    ;       ATTEMPTING TO READ FIRST THE IP AND THEN THE SA
3104                                    ;       REGISTERS OF THE TK50.  VECTOR 4 IS SET UP WITH
3105                                    ;       A TRAP HANDLING ROUTINE IN CASE OF A NON-EXISTENT
3106                                    ;       MEMORY TIMEOUT.
3107                                    ;
3108                                    ;;*****************************************************************
3109                                    ;;*****************************************************************
3110
3114 041152                                     BGNTST
     041152                             T1::
3115 041152  000240                             NOP
3116 041154  012737  000001  002272             MOV     #1,ITRCNT               ;SET UP FOR ONE TEST ITERATION
3117 041162  005737  002270                     TST     PASCNT                  ;IF PASS 0
3118 041166  001404                             BEQ     T1.1                    ;  THEN START TEST
3119 041170  012737  000010  002272             MOV     #10,ITRCNT              ;  ELSE DO MULTIPLE ITERATIONS
3120 041176  000240                             NOP
3121 041200                                     BGNSUB
     041200                             T1.1:
     041200  104402                             TRAP    C$BSUB
3122 041202  005037  002276             1$:     CLR     TRP4FG                  ;CLEAR NXM TRAP FLAG
3123
3124 041206                                     SETVEC  #VEC4,#TRAP4,#PRI07     ;SET UP VECTOR 4 FOR NXM TRAP
     041206  012746  000340                     MOV     #PRI07, (SP)
     041212  012746  036054                     MOV     #TRAP4,-(SP)
     041216  012746  000004                     MOV     #VEC4,-(SP)
     041222  012746  000003                     MOV     #3,-(SP)
     041226  104437                             TRAP    C$SVEC
     041230  062706  000010                     ADD     #10,SP
3125 041234  000240                             NOP
3126 041236  005074  000000                     CLR     @TKIP(R4)               ;WRITE THE IP REGISTER
3127 041242  000240                             NOP
3128 041244                                     DELAY   1                       ;MAKE SURE TIMEOUT CAN OCCUR
     041244  012727  000001                     MOV     #1,(PC)+
     041250  000000                             .WORD   0
     041252  013727  002116                     MOV     L$DLY,(PC)+
     041256  000000                             .WORD   0
     041260  005367  177772                     DEC     -6(PC)
     041264  001375                             BNE     .-4
     041266  005367  177756                     DEC     -22(PC)
```

```
                041272  001367                          BNE     .-20
3129
3130            041274  005737  002276                  TST     TRP4FG                  ;IF NO TRAP OCCURRED
3131            041300  001416                          BEQ     5$                      ;  THEN CONTINUE TEST
3132            041302  000240                          NOP
3133            041304  012737  032640  002310          MOV     #CTRL,FRUIS             ;IDENTIFY FAILING FRU FOR PRINTOUT
3134            041312                                  ERRDF   5,EMSG5,PRIERR          ;"NXM ON READ TKIP"
                041312  104455                          TRAP    C$ERDF
                041314  000005                          .WORD   5
                041316  030334                          .WORD   EMSG5
                041320  033146                          .WORD   PRIERR
3135            041322                                  CKLOOP                          ;LOOP ON ERROR?
                041322  104406                          TRAP    C$CLP1
3136            041324                                  DODU    LOGUNT                  ;DROP UNIT
                041324  013700  002312                  MOV     LOGUNT,R0
                041330  104451                          TRAP    C$DODU
3137            041332                                  ESCAPE  SUB                     ;CAN'T CONTINUE
                041332  104410                          TRAP    C$ESCAPE
                041334  000002                          .WORD   L10016 .
3138
3139            041336                          5$:     ENDSUB
                041336                          L10016:
                041336  104403                          TRAP    C$ESUB
3140            041340  000240                          NOP
3141            041342                                  CLRVEC  #VEC4                   ;RESTORE VECTOR 4
                041342  012700  000004                  MOV     #VEC4,R0
                041346  104436                          TRAP    C$CVEC
3142            041350  032764  000001  000014          BIT     #DRPFLG,LUNFLG(R4)      ;IF UNIT WAS NOT DROPPED
3143            041356  001402                          BEQ     T1.2                    ;  THEN CONTINUE TESTING
3144            041360                                  ESCAPE  TST                     ;  ELSE LEAVE TEST
                041360  104410                          TRAP    C$ESCAPE
                041362  000264                          .WORD   L10015-.
3145
3146            041364                                  BGNSUB
                041364                          T1.2:
                041364  104402                          TRAP    C$BSUB
3147            041366  005037  002276          10$:    CLR     TRP4FG                  ;CLEAR NXM ERROR FLAG
3148
3149            041372                                  SETVEC  #VEC4,#TRAP4,#PRI07     ;SET VECTOR 4 FOR NXM TRAPS
                041372  012746  000340                  MOV     #PRI07,-(SP)
                041376  012746  036054                  MOV     #TRAP4, (SP)
                041402  012746  000004                  MOV     #VEC4,-(SP)
                041406  012746  000003                  MOV     #3,-(SP)
                041412  104437                          TRAP    C$SVEC
                041414  062706  000010                  ADD     #10,SP
3150            041420  000240                          NOP
3151            041422  005774  000002                  TST     @TKSA(R4)               ;READ THE SA REGISTER
3152            041426  000240                          NOP
3153            041430                                  DELAY   25.                     ;WAIT TO ALLOW NXM TRAP
                041430  012727  000031                  MOV     #25.,(PC)+
                041434  000000                          .WORD   0
                041436  013727  002116                  MOV     L$DLY,(PC)+
                041442  000000                          .WORD   0
                041444  005367  177772                  DEC     -6(PC)
                041450  001375                          BNE     .-4
                041452  005367  177756                  DEC     -22(PC)
                041456  001367                          BNE     . 20
```

```
3154
3155 041460  005737  002276                    TST     TRP4FG                  ;IF NXM DID NOT OCCUR
3156 041464  001416                            BEQ     15$                     ;  THEN CONTINUE TEST
3157 041466  000240                            NOP
3158 041470  012737  032640  002310            MOV     #CTRL,FRUIS             ;IDENTIFY FAILING FRU FOR PRINTOUT
3159 041476                                    ERRDF   7,EMSG7,PRIERR          ;"NXM ON FIRST READ OF SA"
     041476  104455                            TRAP    C$ERDF
     041500  000007                            .WORD   7
     041502  030406                            .WORD   EMSG7
     041504  033146                            .WORD   PRIERR
3160 041506                                    CKLOOP                          ;LOOP ON ERROR?
     041506  104406                            TRAP    C$CLP1
3161 041510                                    DODU    LOGUNT                  ;DROP UNIT IF NOT
     041510  013700  002312                    MOV     LOGUNT,R0
     041514  104451                            TRAP    C$DODU
3162 041516                                    ESCAPE  SUB                     ;LEAVE TEST
     041516  104410                            TRAP    C$ESCAPE
     041520  000062                            .WORD   L10017 .
3163
3164 041522  017464  000002  000012  15$:     MOV     @TKSA(R4),TKSASV(R4)    ;GET A COPY OF SA IN MEMORY
3165 041530  032764  004000  000012            BIT     #B.S1,TKSASV(R4)        ;IF STEP 1 BIT IS SET
3166 041536  001021                            BNE     16$                     ;  THEN TEST 1 IS COMPLETE
3167 041540  000240                            NOP
3168 041542  012737  004000  002314            MOV     #B.S1,SAEXP             ;LOAD "EXPECTED FOR PRINTOUT
3169 041550  012737  032640  002310            MOV     #CTRL,FRUIS             ;IDENTIFY FAILING FRU FOR PRINTOUT
3170 041556                                    ERRDF   8.,EMSG8,PRISA          ;"SA REG IN ERROR ON FIRST READ"
     041556  104455                            TRAP    C$ERDF
     041560  000010                            .WORD   8
     041562  030427                            .WORD   EMSG8
     041564  032764                            .WORD   PRISA
3171 041566                                    CKLOOP                          ;LOOP ON ERROR?
     041566  104406                            TRAP    C$CLP1
3172 041570                                    DODU    LOGUNT                  ;DROP UNIT IF NOT
     041570  013700  002312                    MOV     LOGUNT,R0
     041574  104451                            TRAP    C$DODU
3173 041576                                    ESCAPE  SUB                     ;LEAVE TEST
     041576  104410                            TRAP    C$ESCAPE
     041600  000002                            .WORD   L10017-.
3174 041602                            16$:    ENDSUB
     041602                            L10017:
     041602  104403                            TRAP    C$ESUB
3175
3176 041604  005037  002314            20$:    CLR     SAEXP                   ;CLEAR ERROR INDICATOR
3177 041610                                    CLRVEC  #VEC4                   ;RESTORE VECTOR 4
     041610  012700  000004                    MOV     #VEC4,R0
     041614  104436                            TRAP    C$CVEC
3178 041616  032764  000001  000014            BIT     #DRPFLG,LUNFLG(R4)      ;IF UNIT DROPPED
3179 041624  001006                            BNE     25$                     ;  THEN LEAVE NOW
3180 041626  005337  002272                    DEC     ITRCNT                  ;IF ITERATIONS EQUAL 0
3181 041632  000240                            NOP
3182 041634  001402                            BEQ     25$                     ;  THEN LEAVE TEST
3183 041636  000137  041200                    JMP     T1.1                    ;  ELSE GO BACK FOR MORE
3184
3185 041642                            25$:    EXIT    TST
     041642  104432                            TRAP    C$EXIT
     041644  000002                            .WORD   L10015-.
3186
```

SEQ 86

```
3187
3188                                        .EVEN
3189
3190 041646                                 ENDTST
     041646                          L10015:
     041646  104401                        TRAP    C$ETST
```

```
                                .SBTTL TEST 2: SA REGISTER WRAP TEST

                                ;;*****************************************************************
                                ;;*****************************************************************
                                ;
                                ;TEST 2 - SA REGISTER WRAP TEST
                                ;       THIS TEST WILL INITIALIZE THE UUT BY WRITING TO ITS
                                ;       IP REGISTER.  IT WILL FORCE THE UUT INTO DIAGNOSTIC
                                ;       WRAP MODE, AND WRITE FIRST A FLOATING 0 DATA PATTERN,
                                ;       FOLLOWED BY A FLOATING 1 DATA PATTERN TO THE SA REG.
                                ;       EACH WRITE WILL BE FOLLOWED BY A READ AND COMPARE
                                ;       OPERATION.
                                ;
                                ;;*****************************************************************
                                ;;*****************************************************************
041650                                  BGNTST
041650                          T2::

041650  032764  000001  000014          BIT     #DRPFLG,LUNFLG(R4)      ;IF UUT NOT DROPPED
041656  001423                          BEQ     GO2                     ;  THEN DO TEST
041660                                  RFLAGS  FLAGS                   ;ELSE GO GET SUPRVISOR FLAGS
041660  104421                          TRAP    C$RFLA
041662  010037  002334                  MOV     R0,FLAGS
041666  032737  001000  002334          BIT     #PNT,FLAGS              ;SEE IF WE'RE PRINTING TEST NUMBERS
041674  001412                          BEQ     1$                      ;NO, DON'T PRINT BYPASSED
041676                                  PRINTF  #BYPASS,L$TEST          ;  ELSE PRINT THE TEST
041676  013746  002114                  MOV     L$TEST,-(SP)
041702  012746  047626                  MOV     #BYPASS,-(SP)
041706  012746  000002                  MOV     #2,-(SP)
041712  010600                          MOV     SP,R0
041714  104417                          TRAP    C$PNTF
041716  062706  000006                  ADD     #6,SP
041722                          1$:     EXIT    TST                     ;BYPASSED MESSAGE AND GET OUT
041722  104432                          TRAP    C$EXIT
041724  000504                          .WORD   L10020-.

041726  012737  000001  002316  GO2:    MOV     #1,INISTP               ;STEP 1 FOR ERROR PRINTOUT
041734  012737  000001  002272          MOV     #1,ITRCNT               ;SET UP FOR ONE TEST ITERATION
041742  022737  000001  002270          CMP     #1,PASCNT               ;IF FIRST PASS
041750  001403                          BEQ     2$                      ;  THEN START TEST
041752  012737  000002  002272          MOV     #2,ITRCNT               ;  ELSE DO 2 ITERATIONS

041760  012737  140000  002314  2$:     MOV     #BIT15!B.WR,SAEXP       ;SET UP STEP 1 FOR DIAG. WRAP MODE
041766  013737  002314  002250          MOV     SAEXP,STPTBL            ;PUT IT IN STEP 1 OF TABLE
041774  004737  036434                  JSR     PC,STEP1                ;GO DO IT

042000  005737  002320                  TST     STEPST                  ;IF STATUS OKAY
042004  001415                          BEQ     5$                      ;  THEN CONTINUE TEST

042006  012737  032640  002310          MOV     #CTRL,FRUIS             ;FAILING FRU FOR PRINTOUT
042014                                  ERRDF   9.,EMSG9,PRIINI         ;"SA CONTENTS IN ERROR"
042014  104455                          TRAP    C$ERDF
042016  000011                          .WORD   9
042020  030465                          .WORD   EMSG9
042022  032740                          .WORD   PRIINI
042024                                  CKLOOP                          ;LOOP ON ERROR?
042024  104406                          TRAP    C$CLP1
```

```
3240 042026                                    DODU    LOGUNT                  ;SET UNIT
     042026  013700  002312                    MOV     LOGUNT,R0
     042032  104451                            TRAP    C$DODU
3241 042034                                    ESCAPE  TST                     ;LEAVE TST
     042034  104410                            TRAP    C$ESCAPE
     042036  000372                            .WORD   L10020-.
3242
3243 042040  012737  000100  002326  5$:      MOV     #100,OUTER              ;SET UP FOR DELAY ROUTINE
3244 042046  012737  037200  002324  6$:      MOV     #16000.,INNER           ;SET UP INNER
3245 042054  017464  000002  000012            MOV     @TKSA(R4),TKSASV(R4)    ;GET SA CONTENTS
3246 042062  023764  002314  000012            CMP     SAEXP,TKSASV(R4)        ;IF SA IS WHAT WE EXPECT
3247 042070  001422                            BEQ     10$                     ;  THEN MOVE ALONG
3248 042072  004737  036406                    JSR     PC,PDELAY               ;  ELSE GIVE UUT SOME TIME
3249 042076  005737  002330                    TST     TOUT                    ;IF NO TIMEOUT YET
3250 042102  001761                            BEQ     6$                      ;  THEN GO TAKE ANOTHER LOOK
3251
3252 042104  012737  032640  002310            MOV     #CTRL,FRUIS             ;FAILING FRU FOR PRINTOUT
3253 042112                                    ERRDF   10.,EMSG9,PRIINI        ;"SA CONTENTS IN ERROR"
     042112  104455                            TRAP    C$ERDF
     042114  000012                            .WORD   10
     042116  030465                            .WORD   EMSG9
     042120  032740                            .WORD   PRIINI
3254 042122                                    CKLOOP
     042122  104406                            TRAP    C$CLP1
3255 042124                                    DODU    LOGUNT
     042124  013700  002312                    MOV     LOGUNT,R0
     042130  104451                            TRAP    C$DODU
3256 042132                                    ESCAPE  TST
     042132  104410                            TRAP    C$ESCAPE
     042134  000274                            .WORD   L10020 .
3257
3258 042136  012737  177776  002322  10$:     MOV     #177776,WRDATA          ;INITIALIZE WRAP DATA
3259 042144  013774  002322  000002  11$:     MOV     WRDATA,@TKSA(R4)        ;SEND DATA TO UUT
3260 042152  013737  002322  002314            MOV     WRDATA,SAEXP            ;SAVE A COPY FOR COMPARE
3261 042160  012737  000100  002326            MOV     #100,OUTER              ;SET UP FOR DELAY ROUTINE
3262
3263 042166  013737  037200  002324  15$:     MOV     16000.,INNER            ;INNER TOO
3264 042174  017464  000002  000012            MOV     @TKSA(R4),TKSASV(R4)    ;READ SA
3265 042202  023764  002314  000012            CMP     SAEXP,TKSASV(R4)        ;IF DATA MATCHES
3266 042210  001422                            BEQ     20$                     ;  THEN CHANGE DATA
3267 042212  004737  036406                    JSR     PC,PDELAY               ;  ELSE GIVE UUT SOME TIME
3268 042216  005737  002330                    TST     TOUT                    ;IF NO TIMEOUT YET
3269 042222  001761                            BEQ     15$                     ;  THEN GO TAKE ANOTHER LOOK
3270
3271 042224  012737  032640  002310            MOV     #CTRL,FRUIS             ;FAILING FRU FOR PRINTOUT
3272 042232                                    ERRDF   11.,EMSG10,PRIINI       ;"SA WRONG IN DATA WRAP"
     042232  104455                            TRAP    C$ERDF
     042234  000013                            .WORD   11
     042236  030512                            .WORD   EMSG10
     042240  032740                            .WORD   PRIINI
3273 042242                                    CKLOOP
     042242  104406                            TRAP    C$CLP1
3274 042244                                    DODU    LOGUNT
     042244  013700  002312                    MOV     LOGUNT,R0
     042250  104451                            TRAP    C$DODU
3275 042252                                    ESCAPE  TST                     ;GET OUT IF NOT LOOPING
     042252  104410                            TRAP    C$ESCAPE
```

```
      042254  000154                          .WORD   L10020 .
 3276
 3277 042256  006137  002322          20$:    ROL     WRDATA                  ;SHIFT TEST PATTERN
 3278 042262  103730                          BCS     11$                     ;WE RE NOT DONE YET
 3279
 3280 042264  012737  000001  002322          MOV     #1,WRDATA               ;SET UP FOR FLOATING 1 PATTERN
 3281 042272  013774  002322  000002  24$:    MOV     WRDATA,@TKSA(R4)        ;SEND DATA TO UUT
 3282 042300  013737  002322  002314          MOV     WRDATA,SAEXP            ;KEEP A COPY FOR COMPARE
 3283 042306  012737  000100  002326          MOV     #100,OUTER              ;SET UP FOR DELAY ROUTINE
 3284
 3285 042314  012737  016000  002324  25$:    MOV     #16000,INNER            ;DELAY ROUTINE TOO
 3286 042322  017464  000002  000012          MOV     @TKSA(R4),TKSASV(R4)    ;READ THE SA
 3287 042330  023764  002314  000012          CMP     SAEXP,TKSASV(R4)        ;IF IT MATCHES
 3288 042336  001422                          BEQ     30$                     ;  THEN SEE IF WE'RE DONE
 3289 042340  004737  C36406                  JSR     PC,PDELAY               ;  ELSE GIVE UUT SOME MORE TIME
 3290 042344  005737  002330                  TST     TOUT                    ;IF NO TIMEOUT YET
 3291 042350  001761                          BEQ     25$                     ;  THEN TAKE ANOTHER LOOK
 3292
 3293 042352  012737  032640  002310          MOV     #CTRL,FRUIS             ;FAILING FRU FOR PRINTOUT
 3294 042360                                  ERRDF   12.,EMSG10,PRIINI       ;"SA WRONG IN DATA WRAP"
      042360  104455                          TRAP    C$ERDF
      042362  000014                          .WORD   12
      042364  030512                          .WORD   EMSG10
      042366  032740                          .WORD   PRIINI
 3295 042370                                  CKLOOP
      042370  104406                          TRAP    C$CLP1
 3296 042372                                  DODU    LOGUNT
      042372  013700  002312                  MOV     LOGUNT,R0
      042376  104451                          TRAP    C$DODU
 3297 042400                                  ESCAPE  TST                     ;LEAVE TEST IF NOT LOOPING
      042400  104410                          TRAP    C$ESCAPE
      042402  000026                          .WORD   L10020-.
 3298
 3299 042404  006137  002322          30$:    ROL     WRDATA                  ;SHIFT DATA PATTERN
 3300 042410  103330                          BCC     24$                     ;WE'RE NOT DONE YET
 3301 042412  005337  002272                  DEC     ITRCNT                  ;IF ITERATIONS  = 0
 3302 042416  001402                          BEQ     T2EXT                   ;  THEN LEAVE TEST
 3303 042420  000137  041760                  JMP     2$                      ;  ELSE DO ANOTHER ONE
 3304
 3305 042424                          T2EXT:  EXIT    TST                     ;GET OUTTA HERE
      042424  104432                          TRAP    C$EXIT
      042426  000002                          .WORD   L10020-.
 3306
 3307 042430                                  ENDTST
      042430                          L10020:
      042430  104401                          TRAP    C$ETST
```

```
 3310                                   .SBTTL TEST 3: INITIALIZATION TEST
 3314
 3315
 3316                                   ;;*****************************************************************
 3317                                   ;;*****************************************************************
 3318                                   ;
 3319                                   ;TEST 3 - INITIALIZATION TEST
 3320                                   ;       THIS TEST COMMENCES THE UQ-PORT INITIALIZATION SEQUENCE
 3321                                   ;       WITH INTERRUPTS DISABLED.  IT VERIFIES THAT ALL STEP
 3322                                   ;       TRANSITIONS OCCUR WITHIN THE ALLOTED TIME, AND THAT ALL
 3323                                   ;       HOST SUPPLIED INFORMATION IS ECHOED BY THE UUT.  THE
 3324                                   ;       PROGRAM FURTHER VERIFIES THAT NO INTERRUPTS OCCUR AS A
 3325                                   ;       RESULT OF THE STEP TRANSITIONS.
 3326                                   ;
 3327                                   ;;*****************************************************************
 3328                                   ;;*****************************************************************
 3332
 3333 042432                                   BGNTST
      042432                           T3::
 3334
 3335 042432  032764  000001  000014          BIT     #DRPFLG,LUNFLG(R4)      ;IF UUT NOT DROPPED
 3336 042440  001423                          BEQ     GO3                     ;  THEN DO TEST
 3337 042442                                  RFLAGS  FLAGS                   ;ELSE GO GET SUPRVISOR FLAGS
      042442  104421                          TRAP    C$RFLA
      042444  010037  002334                  MOV     R0,FLAGS
 3338 042450  032737  001000  002334          BIT     #PNT,FLAGS              ;SEE IF WE'RE PRINTING TEST NUMBERS
 3339 042456  001412                          BEQ     1$                      ;NO, DON'T PRINT BYPASSED
 3340 042460                                  PRINTF  #BYPASS,L$TEST          ;  ELS  PRINT THE TEST
      042460  013746  002114                  MOV     L$TEST,-(SP)
      042464  012746  047626                  MOV     #BYPASS,-(SP)
      042470  012746  000002                  MOV     #2,-(SP)
      042474  010600                          MOV     SP,R0
      042476  104417                          TRAP    C$PNTF
      042500  062706  000006                  ADD     #6,SP
 3341 042504                           1$:    EXIT    TST                     ;BYPASSED MESSAGE AND GET OUT
      042504  104432                          TRAP    C$EXIT
      042506  000410                          .WORD   L10021-.
 3342
 3343 042510  012737  032640  002310  GO3:    MOV     #CTRL,FRUIS             ;FAILING FRU IN CASE OF ERROR
 3344 042516  012737  000001  002272          MOV     #1,ITRCNT               ;SET UP FOR ONE TEST ITERATION
 3345 042524  022737  000001  002270          CMP     #1,PASCNT               ;IF FIRST PASS
 3346 042532  001403                          BEQ     2$                      ;  THEN START TEST
 3347 042534  012737  000012  002272          MOV     #10.,ITRCNT             ;  ELSE DO 10 ITERATIONS
 3348
 3349 042542  012705  000000          2$:     MOV     #0,R5                   ;SET UP R5 AS INDEX TO STEP TABLES
 3350 042546  012737  000001  002316          MOV     #1,INISTP               ;STEP 1 FOR ERROR PRINTOUT
 3351 042554  016437  000004  002250          MOV     TKVEC(R4),STPTBL        ;PUT VECTOR IN STEP 1
 3352 042562  006237  002250                  ASR     STPTBL                  ;DIVIDE BY TWO
 3353 042566  006237  002250                  ASR     STPTBL                  ;DIVIDE BY FOUR
 3354 042572  013737  002250  002264          MOV     STPTBL,CMPTBL+4         ;PUT VECTOR IN STEP 3 COMPARE
 3355 042600  052737  104400  002250          BIS     #104400,STPTBL          ;REST OF STEP ONE
 3356 042606                                  READBUS                         ;IF QBUS
      042606  104407                          TRAP    C$RDBU
 3357 042610                                  BCOMPLETE       3$              ;   THEN BR FOR QBUS SET UP
      042610  103404                          BCS     3$
 3358 042612  012737  004700  002260          MOV     #4700,CMPTBL            ;   ELSE SET UP FOR UNIBUS
 3359 042620  000403                          BR      4$
```

TEST 3: INITIALIZATION TEST

```
3360 042622  012737  005700  002260  3$:     MOV     #B.S1!B.Q8!B.DI!B.OD!B.MP,CMPTBL
3361                                                 ;STEP 1 COMPARE VALUE
3362 042630  012737  060050  002252  4$:     MOV     #COMMAR,STPTBL+2        ;STEP 2 - COMM AREA ADDRESS
3363 042636  012737  010211  002262          MOV     #010211,CMPTBL+2        ;STEP 2 COMPARE
3364 042644  012737  000000  002254          MOV     #0,STPTBL+4             ;STEP 3 - HIGH ADDRESS
3365 042652  112737  000040  002265          MOVB    #40,CMPTBL+5            ;REST OF STEP 3 COMPARE
3366 042660  012737  000000  002256          MOV     #0,STPTBL+6             ;STEP 4
3367 042666  012737  040000  002266          MOV     #040000,CMPTBL+6        ;STEP 4 COMPARE
3368
3369 042674  004737  036434                  JSR     PC,STEP1                ;GO DO IT
3370 042700  005737  002320                  TST     STEPST                  ;IF STATUS OKAY
3371 042704  001412                          BEQ     5$                      ;  THEN CONTINUE TEST
3372
3373 042706                                   ERRDF   9.,EMSG9,PRIINI         ;"SA CONTENTS IN ERROR"
     042706  104455                          TRAP    C$ERDF
     042710  000011                          .WORD   9
     042712  030465                          .WORD   EMSG9
     042714  032740                          .WORD   PRIINI
3374 042716                                   CKLOOP                          ;LOOP ON ERROR?
     042716  104406                          TRAP    C$CLP1
3375 042720                                   DODU    LOGUNT                  ;DROP UUT
     042720  013700  002312                  MOV     LOGUNT,R0
     042724  104451                          TRAP    C$DODU
3376 042726                                   ESCAPE  TST                     ;LEAVE TST
     042726  104410                          TRAP    C$ESCAPE
     042730  000166                          .WORD   L10021-.
3377
3378 042732  005237  002316          5$:     INC     INISTP                  ;ADJUST STEP COUNTER
3379 042736  062705  000002                  ADD     #2,R5                   ;ADJUST TABLE INDEX
3380 042742  012737  000100  002326  6$:     MOV     #100,OUTER              ;SET UP FOR DELAY ROUTINE
3381 042750  016537  002260  002314          MOV     CMPTBL(R5),SAEXP        ;SET UP FOR COMPARE
3382 042756  012737  037200  002324  7$:     MOV     #16000.,INNER           ;SET UP INNER
3383 042764  017464  000002  000012          MOV     @TKSA(R4),TKSASV(R4)    ;GET SA CONTENTS
3384 042772  022705  000006                  CMP     #6,R5                   ;ARE WE IN STEP 4?
3385 042776  001005                          BNE     8$                      ;BRANCH IF NOT
3386 043000  033764  002314  000012          BIT     SAEXP,TKSASV(R4)        ;JUST LOOK FOR STEP 4 BIT
3387 043006  001024                          BNE     10$                     ;IT'S SET SO LET'S GO
3388 043010  000404                          BR      9$                      ;STAY IN LOOP OTHERWISE
3389 043012  023764  002314  000012  8$:     CMP     SAEXP,TKSASV(R4)        ;IF SA IS WHAT WE EXPECT
3390 043020  001417                          BEQ     10$                     ;  THEN MOVE ALONG
3391 043022  004737  036406          9$:     JSR     PC,PDELAY               ;  ELSE GIVE UUT SOME TIME
3392 043026  005737  002330                  TST     TOUT                    ;IF NO TIMEOUT YET
3393 043032  001751                          BEQ     7$                      ;  THEN GO TAKE ANOTHER LOOK
3394
3395 043034                                   ERRDF   13.,EMSG9,PRIINI        ;"SA CONTENTS IN ERROR"
     043034  104455                          TRAP    C$ERDF
     043036  000015                          .WORD   13
     043040  030465                          .WORD   EMSG9
     043042  032740                          .WORD   PRIINI
3396 043044                                   CKLOOP
     043044  104406                          TRAP    C$CLP1
3397 043046                                   DODU    LOGUNT
     043046  013700  002312                  MOV     LOGUNT,R0
     043052  104451                          TRAP    C$DODU
3398 043054                                   ESCAPE  TST
     043054  104410                          TRAP    C$ESCAPE
     043056  000040                          .WORD   L10021-.
```

```
 3399
 3400 043060  016574  002250  000002  10$:    MOV     STPTBL(R5),@TKSA(R4)    ;WRITE NEXT STEP TO UUT
 3401 043066  022705  000006                  CMP     #6,R5                   ;IF NOT IN STEP 4
 3402 043072  001317                          BNE     5$                      ;GO BACK TO MAIN LOOP
 3403
 3404 043074  032764  000001  000014          BIT     #DRPFLG,LUNFLG(R4)      ;HAS UUT BEEN DROPPED
 3405 043102  001003                          BNE     T3EXT                   ;LEAVE NOW IF SO
 3406 043104  005337  002272                  DEC     ITRCNT                  ;IF MORE ITERATIONS LEFT
 3407 043110  001214                          BNE     2$                      ;  THEN GO DO IT AGAIN
 3408
 3409 043112                          T3EXT:  EXIT    TST
      043112  104432                          TRAP    C$EXIT
      043114  000002                          .WORD   L10021 .
 3410
 3411 043116                                  ENDTST
      043116                          L10021:
      043116  104401                          TRAP    C$ETST
```

```
                                .SBTTL  TEST 4: VECTOR AND INTERRUPT TEST

                                ;;******************************************************************
                                ;;******************************************************************
                                ;
                                ;TEST 4 - VECTOR AND INTERRUPT TEST
                                ;       TEST 3 IS REPEATED, BUT WITH INTERRUPTS ENABLED.
                                ;       THE PROGRAM VERIFIES THAT AN INTERRUPT OCCURS AT
                                ;       THE END OF STEPS 1 - 3.
                                ;
                                ;;******************************************************************
                                ;;******************************************************************

043120                                  BGNTST
043120                          T4::
043120 032764 000001 000014             BIT     @DRPFLG,LUNFLG(R4)      ;IF UUT NOT DROPPED
043126 001423                           BEQ     G04                     ;  THEN DO TEST
043130                                  RFLAGS  FLAGS                   ;ELSE GO GET SUPRVISOR FLAGS
043130 104421                           TRAP    C$RFLA
043132 010037 002334                    MOV     R0,FLAGS
043136 032737 001000 002334             BIT     @PNT,FLAGS              ;SEE IF WE'RE PRINTING TEST NUMBERS
043144 001412                           BEQ     1$                      ;NO, DON'T PRINT BYPASSED
043146                                  PRINTF  @BYPASS,L$TEST          ;  ELSE PRINT THE TEST
043146 013746 002114                    MOV     L$TEST,-(SP)
043152 012746 047626                    MOV     @BYPASS,-(SP)
043156 012746 000002                    MOV     @2,-(SP)
043162 010600                           MOV     SP,R0
043164 104417                           TRAP    C$PNTF
043166 062706 000006                    ADD     @6,SP
043172                          1$:     EXIT    TST                     ;BYPASSED MESSAGE AND GET OUT
043172 104432                           TRAP    C$EXIT
043174 000516                           .WORD   L10022-.

043176 042764 000004 000014     G04:    BIC     @BRFLAG,LUNFLG(R4)      ;DO TEST WITH PRIORITY SET TO 0
043204 042764 000002 000014             BIC     @INTFLG,LUNFLG(R4)      ;CLEAR THE INTERUPT FLAG
043212 012737 032640 002310             MOV     @CTRL,FRUIS             ;FAILING FRU IN CASE OF ERROR
043220 012737 000001 002272             MOV     @1,ITRCNT               ;SET UP FOR ONE TEST ITERATION
043226 022737 000001 002270             CMP     @1,PASCNT               ;IF FIRST PASS
043234 001403                           BEQ     2$                      ;  THEN START TEST
043236 012737 000012 002272             MOV     @10.,ITRCNT             ;  ELSE DO 10 ITERATIONS

043244 004737 036316            2$:     JSR     PC,VECTOR               ;SET UP VECTOR WITH INTERRUPT HANDLER
043250 012705 000000                    MOV     @0,R5                   ;SET UP R5 AS INDEX TO STEP TABLES
043254 012737 000001 002316             MOV     @1,INISTP               ;STEP 1 FOR ERROR PRINTOUT
043262 016437 000004 002250             MOV     TKVEC(R4),STPTBL        ;PUT VECTOR IN STEP 1
043270 006237 002250                    ASR     STPTBL                  ;DIVIDE BY TWO
043274 006237 002250                    ASR     STPTBL                  ;DIVIDE BY FOUR
043300 013737 002250 002264             MOV     STPTBL,CMPTBL+4         ;PUT VECTOR IN STEP 3 COMPARE
043306 052737 104600 002250             BIS     #104600,STPTBL          ;REST OF STEP ONE
043314                                  READBUS                         ;IF QBUS
043314 104407                           TRAP    C$RDBU
043316                                  BCOMPLETE       3$              ;   THEN BR FOR QBUS SET UP
043316 103404                           BCS     3$
043320 012737 004700 002260             MOV     @4700,CMPTBL            ;   ELSE SET UP FOR UNIBUS
043326 000403                           BR      4$
```

```
 3464 043330  012737  005700  002260  3$:     MOV     #B.S1!B.Q8!B.DI!B.OD!B.MP,CMPTBL
 3465                                                                ;STEP 1 COMPARE VALUE
 3466 043336  012737  060050  002252  4$:     MOV     #COMMAR,STPTBL+2        ;STEP 2 - COMM AREA ADDRESS
 3467 043344  012737  010211  002262          MOV     #010211,CMPTBL+2        ;STEP 2 COMPARE
 3468 043352  012737  000000  002254          MOV     #0,STPTBL+4             ;STEP 3   HIGH ADDRESS
 3469 043360  052737  000200  002264          BIS     #B.IE,CMPTBL+4          ;SET THE INTERRUPT ENABLE BIT
 3470 043366  112737  000040  002265          MOVB    #40,CMPTBL+5            ;REST OF STEP 3 COMPARE
 3471 043374  012737  000000  002256          MOV     #0,STPTBL+6             ;STEP 4
 3472 043402  012737  040000  002266          MOV     #040000,CMPTBL+6        ;STEP 4 COMPARE
 3473
 3474 043410  004737  036434                  JSR     PC,STEP1                ;GO DO IT
 3475 043414  005737  002320                  TST     STEPST                  ;IF STATUS OKAY
 3476 043420  001412                          BEQ     5$                      ;  THEN CONTINUE TEST
 3477
 3478 043422                                  ERRDF   14.,EMSG9,PRIINI        ;"SA CONTENTS IN ERROR"
      043422  104455                          TRAP    C$ERDF
      043424  000016                          .WORD   14
      043426  030465                          .WORD   EMSG9
      043430  032740                          .WORD   PRIINI
 3479 043432                                  CKLOOP                          ;LOOP ON ERROR?
      043432  104406                          TRAP    C$CLF1
 3480 043434                                  DODU    LOGUNT                  ;DROP UUT
      043434  013700  002312                  MOV     LOGUNT,R0
      043440  104451                          TRAP    C$DODU
 3481 043442                                  ESCAPE  TST                     ;LEAVE TST
      043442  104410                          TRAP    C$ESCAPE
      043444  000246                          .WORD   L10022-.
 3482
 3483 043446  012737  000100  002326  5$:     MOV     #100,OUTER              ;SET UP FOR DELAY ROUTINE
 3484 043454  016537  002260  002314          MOV     CMPTBL(R5),SAEXP        ;SET UP FOR COMPARE
 3485 043462  012737  037200  002324  7$:     MOV     #16000.,INNER           ;SET UP INNER
 3486 043470  032764  000002  000014          BIT     #INTFLG,LUNFLG(R4)      ;IF INTERRUPT OCCURRED
 3487 043476  001017                          BNE     10$                     ;  THEN SEE IF SA IS CORRECT
 3488 043500  004737  036406          9$:     JSR     PC,PDELAY               ;  ELSE GIVE UUT SOME TIME
 3489 043504  005737  002330                  TST     TOUT                    ;IF NO TIMEOUT YET
 3490 043510  001764                          BEQ     7$                      ;  THEN GO TAKE ANOTHER LOOK
 3491
 3492 043512                                  ERRDF   15.,EMSG11,PRIERR       ;"EXPECTED INTERRUPT DID NOT OCCUR'
      043512  104455                          TRAP    C$ERDF
      043514  000017                          .WORD   15
      043516  030540                          .WORD   EMSG11
      043520  033146                          .WORD   PRIERR
 3493 043522                                  CKLOOP
      043522  104406                          TRAP    C$CLF1
 3494 043524                                  DODU    LOGUNT
      043524  013700  002312                  MOV     LOGUNT,R0
      043530  104451                          TRAP    C$DODU
 3495 043532                                  ESCAPE  TST
      043532  104410                          TRAP    C$ESCAPE
      043534  000156                          .WORD   L10022-.
 3496
 3497 043536  042764  000002  000014  10$:    BIC     #INTFLG,LUNFLG(R4)      ;CLEAR THE INTERRUPT FLAG
 3498 043544  005237  002316                  INC     INISTP                  ;ADJUST THE STEP COUNTER
 3499 043550  062705  000002                  ADD     #2,R5                   ;ADJUST TABLE INDEX
 3500 043554  016537  002260  002314          MOV     CMPTBL(R5),SAEXP        ;GET THE COMPARISON VALUE
 3501 043562  017464  000002  000012          MOV     @TKSA(R4),TKSASV(R4)    ;GET SA CONTENTS
 3502 043570  022705  000006                  CMP     #6,R5                   ;ARE WE IN STEP 4?
```

```
 3503 043574  001005                        BNE     15$                     ;BRANCH IF NOT
 3504 043576  033764  002314  000012        BIT     SAEXP,TKSASV(R4)        ;JUST LOOK FOR STEP 4 BIT
 3505 043604  001017                        BNE     20$                     ;IT'S SET SO LET'S GO
 3506 043606  000404                        BR      16$                     ;ERROR
 3507 043610  023764  002314  000012  15$:  CMP     SAEXP,TKSASV(R4)        ;IF SA IS WHAT WE EXPECT
 3508 043616  001412                        BEQ     20$                     ;  THEN MOVE ALONG
 3509
 3510 043620                          16$:  ERRDF   16.,EMSG9,PRIINI                ;"SA CONTENTS IN ERROR'
      043620  104455                        TRAP    C$ERDF
      043622  000020                        .WORD   16
      043624  030465                        .WORD   EMSG9
      043626  032740                        .WORD   PRIINI
 3511 043630                                CKLOOP
      043630  104406                        TRAP    C$CLP1
 3512 043632                                DODU    LOGUNT
      043632  013700  002312                MOV     LOGUNT,R0
      043636  104451                        TRAP    C$DODU
 3513 043640                                ESCAPE  TST
      043640  104410                        TRAP    C$ESCAPE
      043642  000050                        .WORD   L10022-.
 3514
 3515 043644  016574  002250  000002  20$:  MOV     STPTBL(R5),@TKSA(R4)    ;WRITE NEXT STEP TO UUT
 3516 043652  022705  000006                CMP     #6,R5                   ;IF NOT IN STEP 4
 3517 043656  001273                        BNE     5$                      ;GO BACK TO MAIN LOOP
 3518
 3519 043660  032764  000001  000014        BIT     #DRPFLG,LUNFLG(R4)      ;HAS UUT BEEN DROPPED
 3520 043666  001005                        BNE     T4EXT                   ;LEAVE NOW IF SO
 3521 043670  005337  002272                DEC     ITRCNT                  ;IF NO MORE ITERATIONS LEFT
 3522 043674  001402                        BEQ     T4EXT                   ;  THEN EXIT
 3523 043676  000137  043244                JMP     2$                      ;  ELSE DO IT AGAIN
 3524
 3525 043702  004737  036266          T4EXT: JSR     PC,RSTVEC               ;CATCH ILLEGAL INTERRUPTS
 3526 043706                                EXIT    TST
      043706  104432                        TRAP    C$EXIT
      043710  000002                        .WORD   L10022 .
 3527
 3528 043712                                ENDTST
      043712                          L10022:
      043712  104401                        TRAP    C$ETST
```

```
                                .SBTTL TEST 5: BR LEVEL TEST

                                ;;*****************************************************************
                                ;;*****************************************************************
                                ;
                                ;TEST 5 - BR LEVEL TEST
                                ;       THIS TEST INSURES THAT THE TK50 CAN NOT INTERRUPT
                                ;       WHEN THE CPU PRIORITY IS SET TO 7.  THE TEST GOES
                                ;       ONLY THROUGH THE FIRST STEP OF THE INIT SEQUENCE
                                ;       SINCE THE CONTROLLER WILL "HANG" WAITING FOR THE
                                ;       INTERRUPT ACKNOWLEDGE.
                                ;
                                ;;*****************************************************************
                                ;;*****************************************************************

                                        BGNTST
                                T5::

                                        BIT     #DRPFLG,LUNFLG(R4)      ;IF UUT NOT DROPPED
                                        BEQ     GO5                     ;  THEN DO TEST
                                        RFLAGS  FLAGS                   ;ELSE GO GET SUPRVISOR FLAGS
                                        TRAP    C$RFLA
                                        MOV     R0,FLAGS
                                        BIT     #PNT,FLAGS              ;SEE IF WE'RE PRINTING TEST NUMBERS
                                        BEQ     1$                      ;NO, DON'T PRINT BYPASSED
                                        PRINTF  #BYPASS,L$TEST          ;  ELSE PRINT THE TEST
                                        MOV     L$TEST, (SP)
                                        MOV     #BYPASS,-(SP)
                                        MOV     #2,-(SP)
                                        MOV     SP,R0
                                        TRAP    C$PNTF
                                        ADD     #6,SP
                                1$:     EXIT    TST                     ;BYPASSED MESSAGE AND GET OUT
                                        TRAP    C$EXIT
                                        .WORD   L10023-.

                                GO5:    BIS     #BRFLAG,LUNFLG(R4)      ;DO TEST WITH HIGH PRIORITY
                                        MOV     #CTRL,FRUIS             ;FAILING FRU IN CASE OF ERROR
                                        MOV     #1,ITRCNT               ;SET UP FOR ONE TEST ITERATION
                                        CMP     #1,PASCNT               ;IF FIRST PASS
                                        BEQ     2$                      ;  THEN START TEST
                                        MOV     #2,ITRCNT               ;  ELSE DO 10 ITERATIONS

                                2$:     SETPRI  #PRI07                  ;CPU PRIORITY = 7
                                        MOV     #PRI07,R0
                                        TRAP    C$SPRI
                                        JSR     PC,VECTOR               ;SET UP VECTOR WITH INTERRUPT HANDLER
                                        MOV     #0,R5                   ;SET UP R5 AS INDEX TO STEP TABLES
                                        MOV     #1,INISTP               ;STEP 1 FOR ERROR PRINTOUT
                                        MOV     TKVEC(R4),STPTBL        ;PUT VECTOR IN STEP 1
                                        ASR     STPTBL                  ;DIVIDE BY TWO
                                        ASR     STPTBL                  ;DIVIDE BY FOUR
                                        BIS     #104600,STPTBL          ;REST OF STEP ONE
                                        MOV     TKVEC(R4),CMPTBL        ;STEP 1 COMPARE VALUE

                                        JSR     PC,STEP1                ;GO DO IT
                                        TST     STEPST                  ;IF STATUS OKAY
```

```
3581 044120  001412                          BEQ     5$                      ;  THEN CONTINUE TEST
3582
3583 044122                                  ERRDF   14.,EMSG9,PRIINI        ;"SA CONTENTS IN ERROR"
     044122  104455                          TRAP    C$ERDF
     044124  000016                          .WORD   14
     044126  030465                          .WORD   EMSG9
     044130  032740                          .WORD   PRIINI
3584 044132                                  CKLOOP                          ;LOOP ON ERROR?
     044132  104406                          TRAP    C$CLP1
3585 044134                                  DODU    LOGUNT                  ;DROP UUT
     044134  013700  002312                  MOV     LOGUNT,R0
     044140  104451                          TRAP    C$DODU
3586 044142                                  ESCAPE  TST                     ;LEAVE TST
     044142  104410                          TRAP    C$ESCAPE
     044144  000214                          .WORD   L10023-.
3587
3588 044146  012737  000100  002326  5$:    MOV     #100,OUTER              ;SET UP FOR DELAY ROUTINE
3589 044154  016537  002260  002314          MOV     CMPTBL(R5),SAEXP        ;SET UP FOR COMPARE
3590 044162  012737  037200  002324  7$:    MOV     #16000.,INNER           ;SET UP INNER
3591 044170  004737  036406          9$:    JSR     PC,PDELAY               ;  ELSE GIVE UUT SOME TIME
3592 044174  005737  002330                  TST     TOUT                    ;IF NO TIMEOUT YET
3593 044200  001770                          BEQ     7$                      ;  THEN GO TAKE ANOTHER LOOK
3594
3595 044202  017464  000002  000012          MOV     @TKSA(R4),TKSASV(R4)    ;GET SA CONTENTS
3596 044210  023764  002314  000012          CMP     SAEXP,TKSASV(R4)        ;IF CONTENTS OKAY
3597 044216  001412                          BEQ     10$                     ;  THEN CHECK FOR INTERRUPT
3598
3599 044220                                  ERRDF   17.,EMSG9,PRIINI        ;'SA CONTENTS IN ERROR"
     044220  104455                          TRAP    C$ERDF
     044222  000021                          .WORD   17
     044224  030465                          .WORD   EMSG9
     044226  032740                          .WORD   PRIINI
3600 044230                                  CKLOOP
     044230  104406                          TRAP    C$CLP1
3601 044232                                  DODU    LOGUNT
     044232  013700  002312                  MOV     LOGUNT,R0
     044236  104451                          TRAP    C$DODU
3602 044240                                  ESCAPE  TST
     044240  104410                          TRAP    C$ESCAPE
     044242  000116                          .WORD   L10023-.
3603
3604 044244  032764  000002  000014  10$:    BIT     #INTFLG,LUNFLG(R4)      ;IF NO INTERRUPT OCCURRED
3605 044252  001415                          BEQ     20$                     ;  THEN CARRY ON WITH TEST
3606 044254  042764  000002  000014          BIC     #INTFLG,LUNFLG(R4)      ;CLEAR FLAG IN CASE WE'RE LOOPING
3607 044262                                  ERRDF   18.,EMSG12,PRIINI       ;"INTRRPT WITH CPU PRIORITY =7"
     044262  104455                          TRAP    C$ERDF
     044264  000022                          .WORD   18
     044266  030601                          .WORD   EMSG12
     044270  032740                          .WORD   PRIINI
3608 044272                                  CKLOOP
     044272  104406                          TRAP    C$CLP1
3609 044274                                  DODU    LOGUNT
     044274  013700  002312                  MOV     LOGUNT,R0
     044300  104451                          TRAP    C$DODU
3610 044302                                  ESCAPE  TST
     044302  104410                          TRAP    C$ESCAPE
     044304  000054                          .WORD   L10023-.
```

```
3611
3612 044306                          20$:    SETPRI  #PRI00                  ;CPU PRIORITY = 0
     044306  012700  000000                  MOV     #PRI00,R0
     044312  104441                          TRAP    C$SPRI
3613 044314  000240                          NOP
3614 044316  000240                          NOP                             ;DELAY FOR PENDING INTERRUPT
3615 044320  042764  000002  000014          BIC     #INTFLG,LUNFLG(R4)      ;CLEAR THE FLAG NOW
3616
3617 044326  032764  000001  000014          BIT     #DRPFLG,LUNFLG(R4)      ;HAS UUT BEEN DROPPED
3618 044334  001005                          BNE     T5EXT                   ;LEAVE NOW IF SO
3619 044336  005337  002272                  DEC     ITRCNT                  ;IF NO MORE ITERATIONS LEFT
3620 044342  001402                          BEQ     T5EXT                   ;  THEN EXIT
3621 044344  000137  044032                  JMP     2$                      ;  ELSE DO IT AGAIN
3622
3623 044350  004737  036266          T5EXT:  JSR     PC,RSTVEC               ;CATCH ILLEGAL INTERRUPTS
3624 044354                          EXIT    TST
     044354  104432                          TRAP    C$EXIT
     044356  000002                          .WORD   L10023-.
3625
3626 044360                          ENDTST
     044360                      L10023:
     044360  104401                          TPAU    C$ETST
```

```
 3629                                   .SBTTL TEST 6: PURGE AND POLL TEST
 3633
 3634                                   ;;*****************************************************************
 3635                                   ;;*****************************************************************
 3636                                   ;
 3637                                   ;TEST 6 - PURGE AND POLL TEST
 3638                                   ;       THIS TEST WILL AGAIN RUN THROUGH THE INIT SEQUENCE, THIS
 3639                                   ;       TIME SETTING THE "PURGE AND POLL" BIT IN STEP 3.  THIS
 3640                                   ;       SHOULD CAUSE THE PORT TO DMA VARIOUS DATA PATTERNS TO
 3641                                   ;       AND FROM THE COMMUNICATIONS AREA AND FINALLY LEAVE IT
 3642                                   ;       CLEARED BEFORE TRANSITIONING TO STEP 4.  THE PROGRAM WILL
 3643                                   ;       HAVE FILLED THIS AREA WITH A BACKGROUND PATTERN OF ALL
 3644                                   ;       1'S DATA PRIOR TO STARTING THE INIT.  WHNE STEP 4 IS
 3645                                   ;       REACHED, THE PROGRAM WILL VERIFY THAT THE COMM AREA IS
 3646                                   ;       ALL 0'S, AND THAT THE 20 WORDS PRECEDING AND SUCCEEDING
 3647                                   ;       THE COMM AREA ARE UNTOUCHED.  RING DEPTH USED IN THIS
 3648                                   ;       TEST IS THE MINIMUM.
 3649                                   ;
 3650                                   ;;*****************************************************************
 3651                                   ;;*****************************************************************
 3655
 3656 044362                                   BGNTST
      044362                           T6::
 3657
 3658 044362  032764  000001  000014          BIT     #DRPFLG,LUNFLG(R4)      ;IF UUT NOT DROPPED
 3659 044370  001423                          BEQ     GO6                     ;  THEN DO TEST
 3660 044372                                  RFLAGS  FLAGS                   ;ELSE GO GET SUPRVISOR FLAGS
      044372  104421                         TRAP    C$RFLA
      044374  010037  002334                 MOV     R0,FLAGS
 3661 044400  032737  001000  002334          BIT     #PNT,FLAGS              ;SEE IF WE'RE PRINTING TEST NUMBERS
 3662 044406  001412                          BEQ     1$                      ;NO, DON'T PRINT BYPASSED
 3663 044410                                  PRINTF  #BYPASS,L$TEST          ;  ELSE PRINT THE TEST
      044410  013746  002114                 MOV     L$TEST,-(SP)
      044414  012746  047626                 MOV     #BYPASS,-(SP)
      044420  012746  000002                 MOV     #2,-(SP)
      044424  010600                         MOV     SP,R0
      044426  104417                         TRAP    C$PNTF
      044430  062706  000006                 ADD     #6,SP
 3664 044434                           1$:    EXIT    TST                     ;BYPASSED MESSAGE AND GET OUT
      044434  104432                         TRAP    C$EXIT
      044436  000542                         .WORD   L10024-.
 3665
 3666 044440  012737  032640  002310  GO6:    MOV     #CTRL,FRUIS             ;FAILING FRU IN CASE OF ERROR
 3667 044446  012737  000001  002272          MOV     #1,ITRCNT               ;SET UP FOR ONE TEST ITERATION
 3668 044454  022737  000001  002270          CMP     #1,PASCNT               ;IF FIRST PASS
 3669 044462  001403                          BEQ     2$                      ;  THEN START TEST
 3670 044464  012737  000012  002272          MOV     #10.,ITRCNT             ;  ELSE DO 10 ITERATIONS
 3671
 3672 044472  012705  000000          2$:     MOV     #0,R5                   ;SET UP R5 AS INDEX TO STEP TABLES
 3673 044476  012737  000001  002316          MOV     #1,INISTP               ;STEP 1 FOR ERROR PRINTOUT
 3674 044504  016437  000004  002250          MOV     TKVEC(R4),STPTBL        ;PUT VECTOR IN STEP 1
 3675 044512  006237  002250                  ASR     STPTBL                  ;DIVIDE BY TWO
 3676 044516  006237  002250                  ASR     STPTBL                  ;DIVIDE BY FOUR
 3677 044522  013737  002250  002264          MOV     STPTBL,CMPTBL+4         ;PUT VECTOR IN STEP 3 COMPARE
 3678 044530  052737  104400  002250          BIS     #104400,STPTBL          ;REST OF STEP ONE
 3679 044536                                  READBUS                         ;IF QBUS
      044536  104407                         TRAP    C$RDBU
```

```
044540                                 BCOMPLETE      3$            ;   THEN BR FOR QBUS SET UP
044540  103404                         BCS     3$
044542  012737  004700  002260         MOV     #4700,CMPTBL         ;   ELSE SET UP FOR UNIBUS
044550  000403                         BR      4$
044552  012737  005700  002260  3$:    MOV     #B.S1!B.QB!B.DI!B.OD!B.MP,CMPTBL
                                                                    ;STEP 1 COMPARE VALUE
044560  012737  060050  002252  4$:    MOV     #COMMAR,STPTBL+2     ;STEP 2 - COMM AREA ADDRESS
044566  012737  010211  002262         MOV     #010211,CMPTBL+2     ;STEP 2 COMPARE
044574  012737  100000  002254         MOV     #B.PP,STPTBL+4       ;STEP 3 - HIGH ADDRESS AND PRGE/POLL
044602  112737  000040  002265         MOVB    #40,CMPTBL+5         ;REST OF STEP 3 COMPARE
044610  012737  000000  002256         MOV     #0,STPTBL+6          ;STEP 4
044616  012737  040000  002266         MOV     #040000,CMPTBL+6     ;STEP 4 COMPARE

044624  012737  000012  002306         MOV     #10.,CMARLG          ;LENGTH OF COMM AREA FOR THIS TEST
044632  004737  036560                 JSR     PC,BAKPAT            ;FILL COMM AREA WITH ALL 1'S DATA

044636  004737  036434                 JSR     PC,STEP1             ;GO DO IT
044642  005737  002320                 TST     STEPST               ;IF STATUS OKAY
044646  001412                         BEQ     5$                   ;  THEN CONTINUE TEST

044650                                 ERRDF   19.,EMSG9,PRIINI     ;"SA CONTENTS IN ERROR"
044650  104455                         TRAP    C$ERDF
044652  000023                         .WORD   19
044654  030465                         .WORD   EMSG9
044656  032740                         .WORD   PRIINI
044660                                 CKLOOP                       ;LOOP ON ERROR?
044660  104406                         TRAP    C$CLP1
044662                                 DODU    LOGUNT               ;DROP UUT
044662  013700  002312                 MOV     LOGUNT,R0
044666  104451                         TRAP    C$DODU
044670                                 ESCAPE  TST                  ;LEAVE TST
044670  104410                         TRAP    C$ESCAPE
044672  000306                         .WORD   L10024-.

044674  005237  002316          5$:    INC     INISTP               ;ADJUST STEP COUNTER
044700  062705  000002                 ADD     #2,R5                ;ADJUST TABLE INDEX
044704  012737  000100  002326  6$:    MOV     #100,OUTER           ;SET UP FOR DELAY ROUTINE
044712  016537  002260  002314         MOV     CMPTBL(R5),SAEXP     ;SET UP FOR COMPARE
044720  012737  037200  002324  7$:    MOV     #16000.,INNER        ;SET UP INNER
044726  017464  000002  000012         MOV     @TKSA(R4),TKSASV(R4) ;GET SA CONTENTS
044734  022705  000006                 CMP     #6,R5                ;ARE WE IN STEP 4?
044740  001005                         BNE     8$                   ;BRANCH IF NOT
044742  033764  002314  000012         BIT     SAEXP,TKSASV(R4)     ;JUST LOOK FOR STEP 4 BIT
044750  001024                         BNE     10$                  ;IT'S SET SO LET'S GO
044752  000404                         BR      9$                   ;STAY IN LOOP OTHERWISE
044754  023764  002314  000012  8$:    CMP     SAEXP,TKSASV(R4)     ;IF SA IS WHAT WE EXPECT
044762  001417                         BEQ     10$                  ;  THEN MOVE ALONG
044764  004737  036406          9$:    JSR     PC,PDELAY            ;  ELSE GIVE UUT SOME TIME
044770  005737  002330                 TST     TOUT                 ;IF NO TIMEOUT YET
044774  001751                         BEQ     7$                   ;  THEN GO TAKE ANOTHER LOOK

044776                                 ERRDF   20.,EMSG9,PRIINI     ;"SA CONTENTS IN ERROR"
044776  104455                         TRAP    C$ERDF
045000  000024                         .WORD   20
045002  030465                         .WORD   EMSG9
045004  032740                         .WORD   PRIINI
045006                                 CKLOOP
```

```
        045006  104406                          TRAP    C$CLP1
 3723   045010                                  DODU    LOGUNT
        045010  013700  002312                  MOV     LOGUNT,R0
        045014  104451                          TRAP    C$DODU
 3724   045016                                  ESCAPE  TST
        045016  104410                          TRAP    C$ESCAPE
        045020  000160                          .WORD   L10024 .
 3725
 3726   045022  016574  002250  000002  10$:    MOV     STPTBL(R5),@TKSA(R4)    ;WRITE NEXT STEP TO UUT
 3727   045030  022705  000004                  CMP     #4,R5                   ;IF STEP 3
 3728   045034  001404                          BEQ     15$                     ;  THEN DO PURGE/POLL STUFF
 3729   045036  022705  000006                  CMP     #6,R5                   ;IF NOT IN STEP 4
 3730   045042  001314                          BNE     5$                      ;  THEN GO BACK TO MAIN LOOP
 3731   045044  000440                          BR      20$                     ;  ELSE GO CHECK RESULTS
 3732
 3733   045046                          15$:    DELAY   1                       ;GIVE PORT SOME TIME
        045046  012727  000001                  MOV     #1,(PC)+
        045052  000000                          .WORD   0
        045054  013727  002116                  MOV     L$DLY,(PC)+
        045060  000000                          .WORD   0
        045062  005367  177772                  DEC     -6(PC)
        045066  001375                          BNE     .-4
        045070  005367  177756                  DEC     -22(PC)
        045074  001367                          BNE     .-20
 3734   045076  017464  000002  000012          MOV     @TKSA(R4),TKSASV(R4)    ;GET SA CONTENTS
 3735   045104  001412                          BEQ     16$                     ;BRANCH IF OKAY
 3736
 3737   045106                                  ERRDF   21.,EMSG13,PRIINI       ;SA NOT 0 IN PURGE/POLL
        045106  104455                          TRAP    C$ERDF
        045110  000025                          .WORD   21
        045112  030650                          .WORD   EMSG13
        045114  032740                          .WORD   PRIINI
 3738   045116                                  CKLOOP
        045116  104406                          TRAP    C$CLP1
 3739   045120                                  DODU    LOGUNT
        045120  013700  002312                  MOV     LOGUNT,R0
        045124  104451                          TRAP    C$DODU
 3740   045126                                  ESCAPE  TST
        045126  104410                          TRAP    C$ESCAPE
        045130  000050                          .WORD   L10024-.
 3741
 3742   045132  012774  000000  000002  16$:    MOV     #0,@TKSA(R4)            ;WRITE 0'S TO SA
 3743   045140  005774  000000                  TST     @TKIP(R4)               ;AND READ IP
 3744   045144  000653                          BR      5$                      ;GO WAIT FOR NEXT TRANSITION
 3745
 3746   045146  004737  036610          20$:    JSR     PC,CHKCOM               ;GO CHECK COMM AREA
 3747   045152  032764  000001  000014          BIT     #DRPFLG,LUNFLG(R4)      ;HAS UUT BEEN DROPPED
 3748   045160  001005                          BNE     T6EXT                   ;LEAVE NOW IF SO
 3749   045162  005337  002272                  DEC     ITRCNT                  ;IF NO MORE ITERATIONS LEFT
 3750   045166  001402                          BEQ     T6EXT                   ;  THEN LEAVE TEST
 3751   045170  000137  044472                  JMP     2$                      ;  ELSE DO IT AGAIN
 3752
 3753   045174                          T6EXT:  EXIT    TST
        045174  104432                          TRAP    C$EXIT
        045176  000002                          .WORD   L10024-.
 3754
 3755   045200                                  ENDTST
```

```
045200                          L10024:
045200  104401                          TRAP    C$ETST
```

```
                                .SBTTL TEST 7: MAXIMUM RING BUFFER TEST

                                STARS
                                ;;*****************************************************************
                                STARS
                                ;;*****************************************************************
                                ;
                                ;TEST 7 - MAXIMUM RING BUFFER TEST
                                ;       THIS TEST IS SIMILAR TO TEST 5, BUT IT WILL UTILIZE
                                ;       THE MAXIMUM ALLOWABLE RING DEPTH AS SPECIFIED IN
                                ;       UQSSP.  THIS VALUE IS EQUAL TO 128 COMMAND AND 128
                                ;       RESPONSE SLOTS OF 32 BITS PER SLOT.
                                ;
                                STARS
                                ;;*****************************************************************
                                STARS
                                ;;*****************************************************************

                                        BGNTST
                                T7::
045202  032764  000001  000014          BIT     #DRPFLG,LUNFLG(R4)      ;IF UUT NOT DROPPED
045210  001423                          BEQ     GO7                     ;  THEN DO TEST
045212                                  RFLAGS  FLAGS                   ;ELSE GO GET SUPRVISOR FLAGS
045212  104421                          TRAP    C$?FLA
045214  010037  002334                  MOV     R0,FLAGS
045220  032737  001000  002334          BIT     #PNT,FLAGS              ;SEE IF WE'RE PRINTING TEST NUMBERS
045226  001412                          BEQ     1$                      ;NO, DON'T PRINT BYPASSED
045230                                  PRINTF  #BYPASS,L$TEST          ;  ELSE PRINT THE TEST
045230  013746  002114                  MOV     L$TEST,-(SP)
045234  012746  047626                  MOV     #BYPASS,-(SP)
045240  012746  000002                  MOV     #2,-(SP)
045244  010600                          MOV     SP,R0
045246  104417                          TRAP    C$PNTF
045250  062706  000006                  ADD     #6,SP
045254                          1$:     EXIT    TST                     ;BYPASSED MESSAGE AND GET OUT
045254  104432                          TRAP    C$EXIT
045256  000542                          .WORD   L10025-.

045260  012737  032640  002310  GO7:    MOV     #CTRL,FRUIS             ;FAILING FRU IN CASE OF ERROR
045266  012737  000001  002272          MOV     #1,ITRCNT               ;SET UP FOR ONE TEST ITERATION
045274  022737  000001  002270          CMP     #1,PASCNT               ;IF FIRST PASS
045302  001403                          BEQ     2$                      ;  THEN START TEST
045304  012737  000012  002272          MOV     #10.,ITRCNT             ;  ELSE DO 10 ITERATIONS

045312  012705  000000          2$:     MOV     #0,R5                   ;SET UP R5 AS INDEX TO STEP TABLES
045316  012737  000001  002316          MOV     #1,INISTP               ;STEP 1 FOR ERROR PRINTOUT
045324  016437  000004  002250          MOV     TKVEC(R4),STPTBL        ;PUT VECTOR IN STEP 1
045332  006237  002250                  ASR     STPTBL                  ;DIVIDE BY TWO
045336  006237  002250                  ASR     STPTBL                  ;DIVIDE BY FOUR
045342  013737  002250  002264          MOV     STPTBL,CMPTBL+4         ;PUT VECTOR IN STEP 3 COMPARE
045350  052737  137400  002250          BIS     #137400,STPTBL          ;REST OF STEP ONE
045356                                  READBUS                         ;IF QBUS
045356  104407                          TRAP    C$RDBU
045360                                  BCOMPLETE       3$              ;   THEN BR FOR QBUS SET UP
045360  103404                          BCS     3$
045362  012737  004700  002260          MOV     #4700,CMPTBL            ;   ELSE SET UP FOR UNIBUS
```

```
3798 045370  000403                          BR      4$
3799 045372  012737  005700  002260  3 :     MOV     #B.S1!B.QB!B.DI!B.OD!B.MP,CMPTBL
3800                                                                 ;STEP 1 COMPARE VALUE
3801 045400  012737  060050  002252  4$:     MOV     #COMMAR,STPTBL+2        ;STEP 2   COMM AREA ADDRESS
3802 045406  012737  010277  002262          MOV     #010277,CMPTBL+2        ;STEP 2 COMPARE
3803 045414  012737  100000  002254          MOV     #B.PP,STPTBL+4          ;STEP 3 - HIGH ADDRESS AND PRGE/POLL
3804 045422  112737  000040  002265          MOVB    #40,CMPTBL+5            ;REST OF STEP 3 COMPARE
3805 045430  012737  000000  002256          MOV     #0,STPTBL+6             ;STEP 4
3806 045436  012737  040000  002266          MOV     #040000,CMPTBL+6        ;STEP 4 COMPARE
3807
3808 045444  012737  001002  002306          MOV     #514.,CMARLG            ;LENGTH OF COMM AREA FOR THIS TEST
3809 045452  004737  036560                  JSR     PC,BAKPAT               ;FILL COMM AREA WITH ALL 1'S DATA
3810
3811 045456  004737  036434                  JSR     PC,STEP1                ;GO DO IT
3812 045462  005737  002320                  TST     STEPST                  ;IF STATUS OKAY
3813 045466  001412                          BEQ     5$                      ;  THEN CONTINUE TEST
3814
3815 045470                                  ERRDF   22.,EMSG9,PRIINI        ;"SA CONTENTS IN ERROR"
     045470  104455                          TRAP    C$ERDF
     045472  000026                          .WORD   22
     045474  030465                          .WORD   EMSG9
     045476  032740                          .WORD   PRIINI
3816 045500                                  CKLOOP                          ;LOOP ON ERROR?
     045500  104406                          TRAP    C$CLP1
3817 045502                                  DODU    LOGUNT                  ;DROP UUT
     045502  013700  002312                  MOV     LOGUNT,R0
     045506  104451                          TRAP    C$DODU
3818 045510                                  ESCAPE  TST                     ;LEAVE TST
     045510  104410                          TRAP    C$ESCAPE
     045512  000306                          .WORD   L10025-.
3819
3820 045514  005237  002316          5$:     INC     INISTP                  ;ADJUST STEP COUNTER
3821 045520  062705  000002                  ADD     #2,R5                   ;ADJUST TABLE INDEX
3822 045524  012737  000100  002326  6$:     MOV     #100,OUTER              ;SET UP FOR DELAY ROUTINE
3823 045532  016537  002260  002314          MOV     CMPTBL(R5),SAEXP        ;SET UP FOR COMPARE
3824 045540  012737  037200  002324  7$:     MOV     #16000.,INNER           ;SET UP INNER
3825 045546  017464  000002  000012          MOV     @TKSA(R4),TKSASV(R4)    ;GET SA CONTENTS
3826 045554  022705  000006                  CMP     #6,R5                   ;ARE WE IN STEP 4?
3827 045560  001005                          BNE     8$                      ;BRANCH IF NOT
3828 045562  033764  002314  000012          BIT     SAEXP,TKSASV(R4)        ;JUST LOOK FOR STEP 4 BIT
3829 045570  001024                          BNE     10$                     ;IT'S SET SO LET'S GO
3830 045572  000404                          BR      9$                      ;STAY IN LOOP OTHERWISE
3831 045574  023764  002314  000012  8$:     CMP     SAEXP,TKSASV(R4)        ;IF SA IS WHAT WE EXPECT
3832 045602  001417                          BEQ     10$                     ;  THEN MOVE ALONG
3833 045604  004737  036406          9$:     JSR     PC,PDELAY               ;  ELSE GIVE UUT SOME TIME
3834 045610  005737  002330                  TST     TOUT                    ;IF NO TIMEOUT YET
3835 045614  001751                          BEQ     7$                      ;  THEN GO TAKE ANOTHER LOOK
3836
3837 045616                                  ERRDF   23.,EMSG9,PRIINI        ;"SA CONTENTS IN ERROR"
     045616  104455                          TRAP    C$ERDF
     045620  000027                          .WORD   23
     045622  030465                          .WORD   EMSG9
     045624  032740                          .WORD   PRIINI
3838 045626                                  CKLOOP
     045626  104406                          TRAP    C$CLP1
3839 045630                                  DODU    LOGUNT
     045630  01370C  002312                  MOV     LOGUNT,R0
```

```
      045634  104451                          TRAP    C$DODU
 3840 045636                                  ESCAPE  TST
      045636  104410                          TRAP    C$ESCAPE
      045640  000160                          .WORD   L10025-.
 3841
 3842 045642  016574  002250  000002  10$:    MOV     STPTBL(R5),@TKSA(R4)    ;WRITE NEXT STEP TO UUT
 3843 045650  022705  000004                  CMP     #4,R5                   ;IF STEP 3
 3844 045654  001404                          BEQ     15$                     ;  THEN DO PURGE/POLL STUFF
 3845 045656  022705  000006                  CMP     #6,R5                   ;IF NOT IN STEP 4
 3846 045662  001314                          BNE     5$                      ;  THEN GO BACK TO MAIN LOOP
 3847 045664  000440                          BR      20$                     ;  ELSE GO CHECK RESULTS
 3848
 3849 045666                          15$:    DELAY   1                       ;GIVE PORT SOME TIME
      045666  012727  000001                  MOV     #1,(PC)+
      045672  000000                          .WORD   0
      045674  013727  002116                  MOV     L$DLY,(PC)+
      045700  000000                          .WORD   0
      045702  005367  177772                  DEC     -6(PC)
      045706  001375                          BNE     .-4
      045710  005367  177756                  DEC     -22(PC)
      045714  001367                          BNE     .-20
 3850 045716  017464  000002  000012          MOV     @TKSA(R4),TKSASV(R4)    ;GET SA CONTENTS
 3851 045724  001412                          BEQ     16$                     ;BRANCH IF OKAY
 3852
 3853 045726                                  ERRDF   24.,EMSG13,PRIINI       ;SA NOT 0 IN PURGF/POLL
      045726  104455                          TRAP    C$ERDF
      045730  000030                          .WORD   24
      045732  030650                          .WORD   EMSG13
      045734  032740                          .WORD   PRIINI
 3854 045736                                  CKLOOP
      045736  104406                          TRAP    C$CLP1
 3855 045740                                  DODU    LOGUNT
      045740  013700  002312                  MOV     LOGUNT,R0
      045744  104451                          TRAP    C$DODU
 3856 045746                                  ESCAPE  TST
      045746  104410                          TRAP    C$ESCAPE
      045750  000050                          .WORD   L10025-.
 3857
 3858 045752  012774  000000  000002  16$:    MOV     #0,@TKSA(R4)            ;WRITE 0'S TO SA
 3859 045760  005774  000000                  TST     @TKIP(R4)               ;AND READ IP
 3860 045764  000653                          BR      5$                      ;GO WAIT FOR NEXT TRANSITION
 3861
 3862 045766  004737  036610          20$:    JSR     PC,CHKCOM               ;GO CHECK COMM AREA
 3863 045772  032764  000001  000014          BIT     #DRPFLG,LUNFLG(R4)      ;HAS UUT BEEN DROPPED
 3864 046000  001005                          BNE     T7EXT                   ;LEAVE NOW IF SO
 3865 046002  005337  002272                  DEC     ITRCNT                  ;IF NO MORE ITERATIONS LEFT
 3866 046006  001402                          BEQ     T7EXT                   ;  THEN LEAVE TEST
 3867 046010  000137  045312                  JMP     2$                      ;  ELSE DO IT AGAIN
 3868
 3869 046014                          T7EXT:  EXIT    TST
      046014  104432                          TRAP    C$EXIT
      046016  000002                          .WORD   L10025-.
 3870
 3871 046020                                  ENDTST
      046020                          L10025:
      046020  104401                          TRAP    C$ETST
```

```
                                        .SBTTL  TEST 8: EXTENDED ADDRESS TEST

                                        STARS
                                        ;;*****************************************************************
                                        STARS
                                        ;;*****************************************************************
                                        ;
                                        ;TEST 8 - EXTENDED ADDRESS TEST
                                        ;       THE FORMAT OF THIS TEST IS SIMILAR TO TEST 6, BUT THE
                                        ;       PROGRAM WILL ESTABLISH THE COMMUNICATION AREA IN THE
                                        ;       HIGHEST AVAILABLE MEMORY LOCATIONS.  THIS WILL ALLOW
                                        ;       TESTING OF THE UPPER SIX BITS OF ADDRESS LOGIC ON THE
                                        ;       CONTROLLER BOARD.
                                        ;
                                        STARS
                                        ;;*****************************************************************
                                        STARS
                                        ;;*****************************************************************

                                                BGNTST
                                        T8::
046022  032764  000001  000014          BIT     #DRPFLG,LUNFLG(R4)      ;IF UUT NOT DROPPED
046030  001423                          BEQ     GO8                     ;  THEN DO TEST
046032                                  RFLAGS  FLAGS                   ;ELSE GO GET SUPRVISOR FLAGS
046032  104421                          TRAP    C$RFLA
046034  010037  002334                  MOV     R0,FLAGS
046040  032737  001000  002334          BIT     #PNT,FLAGS              ;SEE IF WE'RE PRINTING TEST NUMBERS
046046  001412                          BEQ     1$                      ;NO, DON'T PRINT BYPASSED
046050                                  PRINTF  #BYPASS,L$TEST          ;  ELSE PRINT THE TEST
046050  013746  002114                  MOV     L$TEST, (SP)
046054  012746  047626                  MOV     #BYPASS,-(SP)
046060  012746  000002                  MOV     #2,-(SP)
046064  010600                          MOV     SP,R0
046066  104417                          TRAP    C$PNTF
046070  062706  000006                  ADD     #6,SP
046074                          1$:     EXIT    TST                     ;BYPASSED MESSAGE AND GET OUT
046074  104432                          TRAP    C$EXIT
046076  000646                          .WORD   L10026-.

046100  005737  002274          GO8:    TST     KTFLAG                  ;IF MEMORY MANAGEMENT AVAILABLE
046104  001002                          BNE     1$                      ;  THEN DO TEST
046106                                  EXIT    TST                     ;  ELSE GET OUT
046106  104432                          TRAP    C$EXIT
046110  000634                          .WORD   L10026-.
046112  012737  032640  002310  1$:     MOV     #CTRL,FRUIS             ;FAILING FRU IN CASE OF ERROR
046120  012737  000001  002272          MOV     #1,ITRCNT               ;SET UP FOR ONE TEST ITERATION
046126  022737  000001  002270          CMP     #1,PASCNT               ;IF FIRST PASS
046134  001403                          BEQ     2$                      ;  THEN START TEST
046136  012737  000012  002272          MOV     #10.,ITRCNT             ;  ELSE DO 10 ITERATIONS

046144  004737  036742          2$:     JSR     PC,INTMMU               ;INITIALIZE MMU REGISTERS
046150  012705  000000          3$:     MOV     #0,R5                   ;SET UP R5 AS INDEX TO STEP TABLES
046154  012737  000001  002316          MOV     #1,INISTP               ;STEP 1 FOR ERROR PRINTOUT
046162  016437  000004  002250          MOV     TKVEC(R4),STPTBL        ;PUT VECTOR IN STEP 1
046170  006237  002250                  ASR     STPTBL                  ;DIVIDE BY TWO
046174  006237  002250                  ASR     STPTBL                  ;DIVIDE BY FOUR
```

TEST 8: EXTENDED ADDRESS TEST

```
3914 046200  013737  002250  002264        MOV     STPTBL,CMPTBL+4         ;PUT VECTOR IN STEP 3 COMPARE
3915 046206  052737  111000  002250        BIS     #111000,STPTBL          ;REST OF STEP ONE
3916 046214                                READBUS                         ;IF QBUS
     046214  104407                        TRAP    C$RDBU
3917 046216                                BCOMPLETE       11$             ;   THEN BR FOR QBUS SET UP
     046216  103404                        BCS     11$
3918 046220  012737  004700  002260        MOV     #4700,CMPTBL            ;   ELSE SET UP FOR UNIBUS
3919 046226  000403                        BR      12$
3920 046230  012737  005700  002260  11$:  MOV     #B.S1!B.QB!B.DI!B.OD!B.MP,CMPTBL
3921                                                                       ;STEP 1 COMPARE VALUE
3922 046236  012737  060050  002252  12$:  MOV     #COMMAR,STPTBL+2        ;STEP 2 - COMM AREA ADDRESS
3923 046244  042737  160000  002252        BIC     #BIT15!BIT14!BIT13,STPTBL+2
3924                                                                       ;CLEAR THE ACTIVE PAGE FIELD
3925 046252  012737  010222  002262        MOV     #010222,CMPTBL+2        ;STEP 2 COMPARE
3926 046260  013737  172346  002332        MOV     KPAR3,TEMP              ;GET RELOCATION VALUE
3927 046266  113737  002333  002254        MOVB    TEMP+1,STPTBL+4         ;JUST THE HGH BYTE
3928 046274  006237  002254                ASR     STPTBL+4                ;MAKE IT THE EXTENDED
3929 046300  006237  002254                ASR     STPTBL+4                ;  ADDRESS OF THE COMM AREA
3930 046304  052737  100000  002254        BIS     #B.PP,STPTBL+4          ;NOW SET PURGE/POLL BIT
3931 046312  112737  000040  002265        MOVB    #40,CMPTBL+5            ;REST OF STEP 3 COMPARE
3932 046320  012737  000000  002256        MOV     #0,STPTBL+6             ;STEP 4
3933 046326  012737  040000  002266        MOV     #040000,CMPTBL+6        ;STEP 4 COMPARE
3934
3935 046334  012737  000022  002306        MOV     #18.,CMARLG             ;LENGTH OF COMM AREA FOR THIS TEST
3936 046342  004737  036560                JSR     PC,BAKPAT               ;FILL COMM AREA WITH ALL 1'S DATA
3937
3938 046346  004737  036434                JSR     PC,STEP1                ;GO DO IT
3939 046352  005737  002320                TST     STEPST                  ;IF STATUS OKAY
3940 046356  001412                        BEQ     5$                      ;  THEN CONTINUE TEST
3941
3942 046360                                ERRDF   25.,EMSG9,PRIINI        ;"SA CONTENTS IN ERROR'
     046360  104455                        TRAP    C$ERDF
     046362  000031                        .WORD   25
     046364  030465                        .WORD   EMSG9
     046366  032740                        .WORD   PRIINI
3943 046370                                CKLOOP                          ;LOOP ON ERROR?
     046370  104406                        TRAP    C$CLP1
3944 046372                                DODU    LOGUNT                  ;DROP UUT
     046372  013700  002312                MOV     LOGUNT,R0
     046376  104451                        TRAP    C$DODU
3945 046400                                ESCAPE  TST                     ;LEAVE TST
     046400  104410                        TRAP    C$ESCAPE
     046402  000342                        .WORD   L10026 .
3946
3947 046404  005237  002316        5$:     INC     INISTP                  ;ADJUST STEP COUNTER
3948 046410  062705  000002                ADD     #2,R5                   ;ADJUST TABLE INDEX
3949 046414  012737  000100  002326  6$:   MOV     #100,OUTER              ;SET UP FOR DELAY ROUTINE
3950 046422  016537  002260  002314        MOV     CMPTBL(R5),SAEXP        ;SET UP FOR COMPARE
3951 046430  012737  037200  002324  7$:   MOV     #16000.,INNER           ;SET UP INNER
3952 046436  017464  000002  000012        MOV     @TKSA(R4),TKSASV(R4)    ;GET SA CONTENTS
3953 046444  022705  000006                CMP     #6,R5                   ;ARE WE IN STEP 4?
3954 046450  001005                        BNE     8$                      ;BRANCH IF NOT
3955 046452  033764  002314  000012        BIT     SAEXP,TKSASV(R4)        ;JUST LOOK FOR STEP 4 BIT
3956 046460  001024                        BNE     10$                     ;IT'S SET SO LET'S GO
3957 046462  000404                        BR      9$                      ;STAY IN LOOP OTHERWISE
3958 046464  023764  002314  000012  8$:   CMP     SAEXP,TKSASV(R4)        ;IF SA IS WHAT WE EXPECT
3959 046472  001417                        BEQ     10$                     ;  THEN MOVE ALONG
```

```
 3960 046474  004737  036406          9$:     JSR     PC,PDELAY               ;  ELSE GIVE UUT SOME TIME
 3961 046500  005737  002330                  TST     TOUT                    ;IF NO TIMEOUT YET
 3962 046504  001751                          BEQ     7$                      ;  THEN GO TAKE ANOTHER LOOK
 3963
 3964 046506                                  ERRDF   26.,EMSG9,PRIINI        ;"SA CONTENTS IN ERROR'
      046506  104455                          TRAP    C$ERDF
      046510  000032                          .WORD   26
      046512  030465                          .WORD   EMSG9
      046514  032740                          .WORD   PRIINI
 3965 046516                                  CKLOOP
      046516  104406                          TRAP    C$CLP1
 3966 046520                                  DODU    LOGUNT
      046520  013700  002312                  MOV     LOGUNT,R0
      046524  104451                          TRAP    C$DODU
 3967 046526                                  ESCAPE  TST
      046526  104410                          TRAP    C$ESCAPE
      046530  000214                          .WORD   L10026-.
 3968
 3969 046532  016574  002250  000002  10$:    MOV     STPTBL(R5),@TKSA(R4)    ;WRITE NEXT STEP TO UUT
 3970 046540  022705  000004                  CMP     #4,R5                   ;IF STEP 3
 3971 046544  001404                          BEQ     15$                     ;  THEN DO PURGE/POLL STUFF
 3972 046546  022705  000006                  CMP     #6,R5                   ;IF NOT IN STEP 4
 3973 046552  001314                          BNE     5$                      ;  THEN GO BACK TO MAIN LOOP
 3974 046554  000440                          BR      20$                     ;  ELSE GO CHECK RESULTS
 3975
 3976 046556                          15$:    DELAY   1                       ;GIVE PORT SOME TIME
      046556  012727  000001                  MOV     #1,(PC)+
      046562  000000                          .WORD   0
      046564  013727  002116                  MOV     L$DLY,(PC)+
      046570  000000                          .WORD   0
      046572  005367  17777c                  DEC     -6(PC)
      046576  001375                          BNE     .-4
      046600  005367  177756                  DEC     -22(PC)
      046604  001367                          BNE     .-20
 3977 046606  017464  000002  000012          MOV     @TKSA(R4),TKSASV(R4)    ;GET SA CONTENTS
 3978 046614  001412                          BEQ     16$                     ;BRANCH IF OKAY
 3979
 3980 046616                                  ERRDF   27.,EMSG13,PRIINI       ;SA NOT 0 ON PURGE/POLL
      046616  104455                          TRAP    C$ERDF
      046620  000033                          .WORD   27
      046622  030650                          .WORD   EMSG13
      046624  032740                          .WORD   PRIINI
 3981 046626                                  CKLOOP
      046626  104406                          TRAP    C$CLP1
 3982 046630                                  DODU    LOGUNT
      046630  013700  002312                  MOV     LOGUNT,R0
      046634  104451                          TRAP    C$DODU
 3983 046636                                  ESCAPE  TST
      046636  10441C                          TRAP    C$ESCAPE
      046640  000104                          .WORD   L10026-.
 3984
 3985 046642  012774  000000  000002  16$:    MOV     #0,@TKSA(R4)            ;WRITE 0'S TO SA
 3986 046650  005774  000000                  TST     @TKIP(R4)               ;AND READ IP
 3987 046654  000553                          BR      5$                      ;GO WAIT FOR NEXT TRANSITION
 3988
 3989 046656  004737  036610          20$:    JSR     PC,CHKCOM               ;GO CHECK COMM AREA
 3990 046662  032764  000001  000014          BIT     #DRPFLG,LUNFLG(R4)      ;HAS UUT BEEN DROPPED
```

```
 3991 046670  001021                          BNE     T8EXT                   ;LEAVE NOW IF SO
 3992
 3993 046672  062737  002000  172346          ADD     #2000,KPAR3             ;POINT TO NEXT 32KWORDS
 3994 046700  103406                          BCS     25$                     ;DON'T ALLOW OVERFLOW IF 4 MBYTES
 3995 046702  023737  002120  172346          CMP     I$HIME,KPAR3            ;IF THERE'S NO MORE MEMORY AVAILABLE
 3996 046710  103402                          BLO     25$                     ;  THEN CHECK FOR MORE ITERATIONS
 3997 046712  000137  046150                  JMP     3$                      ;  ELSE DO IT AGAIN
 3998
 3999 046716  005037  177572          25$:    CLR     MMUSR0                  ;SHUT DOWN MEMORY MANAGEMENT
 4000 046722  005337  002272                  DEC     ITRCNT                  ;IF NO MORE ITERATIONS LEFT
 4001 046726  001402                          BEQ     T8EXT                   ;  THEN LEAVE TEST
 4002 046730  000137  046144                  JMP     2$                      ;  ELSE DO IT AGAIN
 4003
 4004 046734  005037  177572          T8EXT:  CLR     MMUSR0                  ;MAKE SURE IT'S OFF
 4005 046740                                  EXIT    TST
      046740  104432                          TRAP    C$EXIT
      046742  000002                          .WORD   L10026 .
 4006
 4007 046744                                  ENDTST
      046744                          L10026:
      046744  104401                          TRAP    C$ETST
```

```
                                .SBTTL  TEST 9:GET DUST STATUS

                                STARS
                                ;;*****************************************************************
                                STARS
                                ;;*****************************************************************
                                ;
                                ;TEST 9 - GET DUST STATUS
                                ;       THE GET DUST STATUS TEST WILL REQUEST AND TEST THE DUST
                                ;       STATUS OF EACH UNIT UNDER TEST FOR TWO SPECIFIC CASES·
                                ;       1) NO COMMAND MODIFIERS SET AND 2) ILLEGAL COMMAND
                                ;       MODIFIERS SET.  DUST STATUS WILL BE RECEIVED FROM THE
                                ;       UNIT UNDER TEST AFTER THE PROGRAM ISSUES THE GET DUST
                                ;       STATUS COMMAND AVAILABLE IN DUP.  THE RESPONSE PACKET
                                ;       RECEIVED FROM THE UNIT WILL BE TESTED AGAINST A KNOWN
                                ;       GOOD MASK.
                                ;
                                STARS
                                ;;*****************************************************************
                                STARS
                                ;;*****************************************************************

                                        BGNTST
046746                          T9::

046746  032764  000001  000014          BIT     #DRPFLG,LUNFLG(R4)      ;IS THE DRIVE AVAILABLE
046754  001423                          BEQ     GO9                     ;GO DO TEST IF AVAILABLE
046756                                  RFLAGS  FLAGS                   ;ELSE GO GET SUPRVISOR FLAGS
046756  104421                          TRAP    C$RFLA
046760  010037  002334                  MOV     R0,FLAGS
046764  032737  001000  002334          BIT     #PNT,FLAGS              ;SEE IF WE'RE PRINTING TEST NUMBERS
047072  001412                          BEQ     1$                      ;NO, DON'T PRINT BYPASSED
047074                                  PRINTF  #BYPASS,L$TEST          ;  ELSE PRINT THE TEST
046774  013746  002114                  MOV     L$TEST, (SP)
047000  012746  047626                  MOV     #BYPASS,-(SP)
047004  012746  000002                  MOV     #2,-(SP)
047010  010600                          MOV     SP,R0
047012  104417                          TRAP    C$PNTF
047014  062706  000006                  ADD     #6,SP
047020                          1$:     EXIT    TST                     ;BYPASSED MESSAGE AND GET OUT
047020  104432                          TRAP    C$EXIT
047022  000132                          .WORD   L10027-.

047024  042761  000010  000014  GO9:    BIC     #DUPFLG,LUNFLG(R4)      ;CLEAR DUP FLAG
047032  012737  032640  002310          MOV     #CTRL,FRUIS             ;SET UP FRU POINTER
047040  004737  037042                  JSR     PC,PRTINT               ;GO DO A PORT INITIALIZE
047044  032764  000001  000014          BIT     #DRPFLG,LUNFLG(R4)      ;IS THE DRIVE AVAILABLE
047052  001036                          BNE     T9EXT                   ;GET OUT IF NOT AVAILABLE
047054  012705  002342                  MOV     #SCTRLC,R5              ;SET UP TO DO THE SCC COMMAND
047060  012737  000001  002272          MOV     #1,ITRCNT               ;DO IT ONCE
047066  012737  032663  023042          MOV     #SCCCMD,CURCMD          ;SET UP COMMAND ASCII
047074  004737  037274                  JSR     PC,CLSDRV               ;GO ISSUE THE COMMAND
047100  032764  000001  000014          BIT     #DRPFLG,LUNFLG(R4)      ;IS THE DRIVE AVAILABLE
047106  001020                          BNE     T9EXT                   ;GET OUT IF NOT AVAILABLE
047110  052764  000010  000014          BIS     #DUPFLG,LUNFLG(R4)      ;SET DUP FLAG FOR FOLLOWING COMMAND
047116  012705  002456                  MOV     #GDUST,R5               ;SET UP TO DO GET DUST STATUS COMMAND
047122  012737  000001  002272          MOV     #1,ITRCNT
```

```
 4052 047130  012737  032714  023042          MOV     #GDSCMD,CURCMD          ;SET UP COMMAND ASCII
 4053 047136  004737  037274                  JSR     PC,CLSDRV               ;GO ISSUE THE COMMAND
 4054 047142  042764  000010  000014          BIC     #DUPFLG,LUNFLG(R4)      ;CLEAR DUP FLAG
 4055 047150                          T9EXT:  EXIT    TST
      047150  104432                          TRAP    C$EXIT
      047152  000002                          .WORD   L10027-.
 4056 047154                                  ENDTST
      047154                          L10027:
      047154  104401                          TRAP    C$ETST
```

```
4058                                    SBTTL  TEST 10:EXECUTE LOCAL PROGRAM (Level II microdiagnostics)
4059
4060 047156                             STARS
                                        ;;*****************************************************************
4061 047156                             STARS
                                        ;;*****************************************************************
4062                                    ;
4063                                    ;TEST 10   EXECUTE LOCAL PROGRAM
4064                                    ;       THIS TEST WILL INVOKE, VIA THE DUP EXECUTE LOCAL
4065                                    ;       PROGRAM COMMAND, THE CONTROLLER RESIDENT LEVEL 2
4066                                    ;       MICRODIAGNOSTICS.
4067                                    ;
4068 047156                             STARS
                                        ;;*****************************************************************
4069 047156                             STARS
                                        ;;*****************************************************************
4070
4071 047156                                     BGNTST
      047156                            T10::
4072
4073 047156  032764  000001  000014            BIT     #DRPFLG,LUNFLG(R4)      ;IS THE DRIVE AVAILABLE
4074 047164  001423                            BEQ     G010                    ;GO DO TEST IF AVAILABLE
4075 047166                                    RFLAGS  FLAGS                   ;ELSE GO GET SUPRVISOR FLAGS
      047166  104421                           TRAP    C$RFLA
      047170  010037  002334                   MOV     R0,FLAGS
4076 047174  032737  001000  002334            BIT     #PNT,FLAGS              ;SEE IF WE'RE PRINTING TEST NUMBERS
4077 047202  001412                            BEQ     1$                      ;NO, DON'T PRINT BYPASSED
4078 047204                                    PRINTF  #BYPASS,L$TEST          ;  ELSE PRINT THE TEST
      047204  013746  002114                   MOV     L$TEST,-(SP)
      047210  012746  047626                   MOV     #BYPASS,-(SP)
      047214  012746  000002                   MOV     #2,-(SP)
      047220  010600                           MOV     SP,R0
      047222  104417                           TRAP    C$PNTF
      047224  062706  000006                   ADD     #6,SP
4079 047230                             1$:    EXIT    TST                     ;BYPASSED MESSAGE AND GET OUT
      047230  104432                           TRAP    C$EXIT
      047232  000372                           .WORD   L10030 .
4080
4081 047234  042764  000010  000014  G010:     BIC     #DUPFLG,LUNFLG(R4)      ;CLEAR DUP FLAG
4082 047242  042764  000020  000014            BIC     #ABTFLG,LUNFLG(R4)      ;CLEAR ABORT FLAG
4083 047250  042764  000040  000014            BIC     #CNTRLC,LUNFLG(R4)      ;CLEAR CONTROL C FLAG
4084 047256  012737  032640  002310            MOV     #CTRL,FRUIS             ;SET UP FRU POINTER
4085 047264  004737  037042                    JSR     PC,PRTINT               ;GO DO A PORT INITIALIZE
4086 047270  032764  000001  000014            BIT     #DRPFLG,LUNFLG(R4)      ;IS THE DRIVE AVAILABLE
4087 047276  001150                            BNE     TSTXEX                  ;GET OUT IF NOT AVAILABLE
4088 047300  012705  002342                    MOV     #SCTRLC,R5              ;SET UP TO DO THE SCC COMMAND
4089 047304  012737  000001  002272            MOV     #1,ITRCNT               ;DO IT ONCE
4090 047312  012737  032663  023042            MOV     #SCCCMD,CURCMD          ;SET UP COMMAND ASCII
4091 047320  004737  037274                    JSR     PC,CLSDRV               ;GO ISSUE THE COMMAND
4092 047324  032764  000001  000014            BIT     #DRPFLG,LUNFLG(R4)      ;IS THE DRIVE AVAILABLE
4093 047332  001132                            BNE     TSTXEX                  ;GET OUT IF NOT AVAILABLE
4094 047334  012705  002406                    MOV     #ONLINE,R5              ;SET UP TO DO THE ONLINE COMMAND
4095 047340  012737  000001  002272            MOV     #1,ITRCNT               ;DO IT ONCE
4096 047346  012737  032670  023042            MOV     #ONLCMD,CURCMD          ;SET UP COMMAND ASCII
4097 047354  016465  000006  000004            MOV     MSCPUN(R4),P.UNIT(R5)   ;PUT THE UNIT NUMBER IN THE PACKET
4098 047362  004737  037274                    JSR     PC,CLSDRV               ;GO ISSUE THE COMMAND
4099 047366  032764  000001  000014            BIT     #DRPFLG,LUNFLG(R4)      ;IS THE DRIVE AVAILABLE
```

```
4100 047374  001111                          BNE     TSTXEX                  ;GET OUT IF NOT AVAILABLE
4101 047376  052764  000010  000014          BIS     #DUPFLG,LUNFLG(R4)      ;ALL FOLLOWING COMMANDS ARE DUP
4102 047404  012705  002476                  MOV     #XLOCPR,R5              ;SET UP TO DO ELP COMMAND
4103 047410  012737  000001  002272          MOV     #1,ITRCNT               ;DO IT ONCE
4104 047416  012737  032721  023042          MOV     #ELPCMD,CURCMD          ;SET UP COMMAND ASCII
4105 047424  004737  037274                  JSR     PC,CLSDRV               ;GO ISSUE THE COMMAND
4106 047430  032764  000001  000014          BIT     #DRPFLG,LUNFLG(R4)      ;IS THE DRIVE AVAILABLE
4107 047436  001070                          BNE     TSTXEX                  ;GET OUT IF NOT AVAILABLE
4108 047440  032737  000200  177560  1$:     BIT     #BIT7,RCSR              ;CHECK FOR INPUT FROM KEYBOARD
4109 047446  001413                          BEQ     2$                      ;IF NONE, CONTINUE
4110 047450  013705  177562                  MOV     RBUF,R5                 ;GET DATA INPUT FROM KEYBOARD
4111 047454  042705  000200                  BIC     #BIT7,R5                ;STRIP PARITY
4112 047460  022705  000003                  CMP     #3,R5                   ;CHECK FOR "CONTROL C" INPUT
4113 047464  001004                          BNE     2$                      ;IF NOT, CONTINUE
4114 047466  052764  000040  000014          BIS     #CNTRLC,LUNFLG(R4)      ;SET "CONTROL C" FLAG
4115 047474  000432                          BR      20$                     ;GO ABORT MICRODIAGNOSTICS
4116 047476  012705  002524          2$:     MOV     #RCVDAT,R5              ;SET UP TO DO RECEIVE DATA COMMAND
4117 047502  012737  000001  002272          MOV     #1,ITRCNT               ;DO IT ONCE
4118 047510  012737  032726  023042          MOV     #RCVCMD,CURCMD          ;SET UP COMMAND ASCII
4119 047516  004737  037274                  JSR     PC,CLSDRV               ;GO ISSUE THE COMMAND
4120 047522  032764  000001  000014          BIT     #DRPFLG,LUNFLG(R4)      ;IS THE DRIVE AVAILABLE
4121 047530  001033                          BNE     TSTXEX                  ;GET OUT IF NOT AVAILABLE
4122 047532  032764  000020  000014          BIT     #ABTFLG,LUNFLG(R4)      ;ABORT LOCAL PROGRAM ?
4123 047540  001010                          BNE     20$                     ;YES, ISSUE ABORT COMMAND
4124 047542  005002                          CLR     R2                      ;NO, SET UP DELAY LOW COUNT
4125 047544  012703  000020                  MOV     #20,R3                  ;SET UP DELAY HIGH COUNT
4126 047550  005202                  10$:    INC     R2                      ;DELAY
4127 047552  001376                          BNE     10$
4128 047554  005303                          DEC     R3
4129 047556  001374                          BNE     10$
4130 047560  000727                          BR      1$                      ;POLL DIAGL2 PROGRESS
4131 047562  012705  002554          20$:    MOV     #ABORT,R5               ;SET UP TO DO ABORT COMMAND
4132 047566  012737  000001  002272          MOV     #1,ITRCNT               ;DO IT ONCE
4133 047574  012737  032733  023042          MOV     #ABTCMD,CURCMD          ;SET UP COMMAND ASCII
4134 047602  004737  037274                  JSR     PC,CLSDRV               ;GO ISSUE THE COMMAND
4135 047606  032764  000040  000014          BIT     #CNTRLC,LUNFLG(R4)      ;CHECK IF ABORTING DUE TO "CONTROL C"
4136 047614  001401                          BEQ     TSTXEX                  ;IF NOT, EXIT
4137 047616                                  BREAK
     047616  104422                          TRAP    C$BRK
4138 047620                          TSTXEX: EXIT    TST
     047620  104432                          TRAP    C$EXIT
     047622  000002                          .WORD   L10030-.
4139 047624                                  ENDTST
     047624                          L10030:
     047624  104401                          TRAP    C$ETST
4140 047626     045     116     045  BYPASS::        .ASCIZ  /%N%A TEST %Z3%A BYPASSED%N/
4141                                         .EVEN
4142 047662                                  ENDMOD
4143                                 .TITLE PARAMETER CODING
4154
4155                                 .SBTTL  HARDWARF PARAMETER CODING SECTION
4183
4184 047662                                  BGNMOD
4185
4186                                 ;++
4187                                 ; THE HARDWARE PARAMETER CODING SECTION CONTAINS MACROS
4188                                 ; 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.
                                        ;

047662                                          BGNHRD
047662  000044                                  .WORD L10031-L$HARD/2
047664                                  L$HARD::

047664                                          GPRMA   TKIPAD,0,0,160002,177564,YES
047664  000031                                  .WORD   T$CODE
047666  047722                                  .WORD   TKIPAD
047670  160002                                  .WORD   T$LOLIM
047672  177564                                  .WORD   T$HILIM
047674                                          GPRMD   TKVECT,2,0,777,60,776,YES
047674  001032                                  .WORD   T$CODE
047676  047737                                  .WORD   TKVECT
047700  000777                                  .WORD   777
047702  000060                                  .WORD   T$LOLIM
047704  000776                                  .WORD   T$HILIM
047706                                          GPRMD   TKUNT,4,0,777,0,251,YES
047706  002032                                  .WORD   T$CODE
047710  047751                                  .WORD   TKUNT
047712  000777                                  .WORD   777
047714  000000                                  .WORD   T$LOLIM
047716  000251                                  .WORD   T$HILIM

047720                                          EXIT HRD
047720  026004                                  .WORD   T$CODE

047722    124     113     111   TKIPAD: .ASCIZ  ?TKIP ADDRESS?
047737    124     113     040   TKVECT: .ASCIZ  ?TK VECTOR?
047751    124     057     115   TKUNT:  .ASCIZ  ?T/MSCP UNIT NUMBER?
                                        .EVEN


047774                                          ENDHRD
                                                .EVEN
047774                                  L10031:
```

```
                                .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.
                                ;--

047774                                  BGNSFT
047774  000000                          .WORD L10032-L$SOFT/2
047776                          L$SOFT::


                                        .EVEN

047776                                  ENDSFT
                                        .EVEN
047776                          L10032:


                                ;;**********************************************************************
                                ;;**********************************************************************
                                ;
                                ;COMMUNICATIONS AREA
                                ;       THIS IS THE COMMUNICATIONS AREA THAT IS USED
                                ;       THROUGHOUT THE PROGRAM IN TESTING THE PERMUTATIONS
                                ;       OF THE UQ-PORT INIT SEQUENCE.  IT IS ESSENTIAL THAT
                                ;       THIS AREA RESIDE IN AN 8KBYTE AREA OF MEMORY FREE
                                ;       OF DIAGNOSTIC CODE SO THAT IT MAY BE SUCCESSFULLY
                                ;       RELOCATED THROUGHOUT UPPER MEMORY VIA MEMORY MAN-
                                ;       AGEMENT.
                                ;
                                ;;**********************************************************************
                                ;;**********************************************************************

060000                                  .=60000         ;START OF THE THIRD 8KBYTE BLOCK
                                                        ;OF VIRTUAL MEMORY SPACE.  ACCESIBLE
                                                        ;VIA PAR/PDR 2.
060000                          RDBUF::
060000                          COMMBF::
060000                                  .BLKW   20.     ;BUFFER SPACE PRECEDING COMM AREA
060050                          COMMAR::
060050                                  .BLKW   514.    ;MAXIMUM COMM AREA LENGTH
062054                          LASTBF::
062054                                  .BLKW   20.     ;BUFFER SPACE SUCCEEDING COMM AREA

062124                                  LASTAD
                                        .EVEN
062124  000000                          .WORD   0
062126  000000                          .WORD   0
062130                          L$LAST::
062130                                  ENDMOD
000001                          .END
```

Symbol table

```
ABORT   002554          CMDCNT  003034 G        C$MMU = 000103          EXIT    040610          G$RADL= 000120
ABTCMD  032733 G        CMDREF  003032 G        C$MSG = 000023          EXTINT  036070          G$RADO= 000020
ABTFLG= 000020 G        CMDRNG  003014 G        C$OPNR= 000034          EXTVEC  036404          G$XFER= 000004
ADR   = 000020 G        CMDSAV  023036 G        C$OPNW= 000104          E$END = 002100          G$YES = 000010
ASSEMB= 000010          CMMERR  002302 G        C$PNTB= 000014          E$LOAD= 000035          HBFADD  023362
BAKPAT  036560 G        CMPTBL  002260 G        C$PNTF= 000017          FLAG  = 040000 G        HELP  = 000000
BIT0  = 000001 G        CMTBLG  002304 G        C$PNTS= 000016          FLAGS   002334 G        HIADDR= 000002 G
BIT00 = 000001 G        CNTER = 000000 G        C$PNTX= 000015          FRUIS   002310 G        HOE   = 100000 G
BIT01 = 000002 G        CNTERR  023322          C$PUTB= 000072          F$AU  = 000015          HSTIMO= 000000 G
BIT02 = 000004 G        CNTFLG  003026 G        C$PUTW= 000073          F$AUTO= 000020          IBE   = 010000 G
BIT03 = 000010 G        CNTHI   003024 G        C$QIO = 000377          F$BGN = 000040          IDU   = 000040 G
BIT04 = 000020 G        CNTRLC= 000040 G        C$RDBU= 000007          F$CLEA= 000007          IER   = 020000 G
BIT05 = 000040 G        COMMAR  060050 G        C$REFG= 000047          F$DU  = 000016          ILLINT  036072 G
BIT06 = 000100 G        COMMBF  060000 G        C$REL = 000077          F$END = 000041          ILOO°   037072
BIT07 = 000200 G        CONID = 177777 G        C$RESE= 000033          F$HARD= 000004          IMM   = 000200 G
BIT08 = 000400 G        CRD   = 177776 G        C$REVI= 000004          F$HW  = 000013          IMSG    041046
BIT09 = 001000 G        CTRL    032640 G        C$RFLA= 000021          F$INIT= 000006          INISTP  002316 G
BIT1  = 000002 G        CURCMD  023042 G        C$RPT = 000025          F$JMP = 000050          INNER   002324 G
BIT10 = 002000 G        C$AU  = 000052          C$SEFG= 000046          F$MOD = 000000          INTFLG= 000002 G
BIT11 = 004000 G        C$AUTO= 000061          C$SPRI= 000041          F$MSG = 000011          INTMMU  036742 G
BIT12 = 010000 G        C$BRK = 000022          C$SVEC= 000037          F$PROT= 000021          INTRCV  036062 G
BIT13 = 020000 G        C$BSEG= 000004          C$TOME= 000076          F$PWR = 000017          INTTBL  037264
BIT14 = 040000 G        C$BSUB= 000002          DCERR   023312          F$RPT = 000012          INVSTA  023332
BIT15 = 100000 G        C$CLCK= 000062          DFPTBL  002202 G        F$SEG = 000003          ISR   = 000100 G
BIT2  = 000004 G        C$CLEA= 000012          DIAGMC= 000000          F$SOFT= 000005          ITRCNT  002272 G
BIT3  = 000010 G        C$CLOS= 000035          DRPFLG= 000001 G        F$SRV = 000010          IXE   = 004000 G
BIT4  = 000020 G        C$CLP1= 000006          DRVE    032655 G        F$SUB = 000002          I$AU  = 000041
BIT5  = 000040 G        C$CPBF= 000074          DRVER = 000011 G        F$SW  = 000014          I$AUTO= 000041
BIT6  = 000100 G        C$CPME= 000075          DSCEND  003024 G        F$TEST= 000001          I$CLN = 000041
BIT7  = 000200 G        C$CVEC= 000036          DSCRNG  003000 G        GDSCMD  032714 G        I$DU  = 000041
BIT8  = 000400 G        C$DCLN= 000044          DUPFLG= 000010 G        GDUST   002456          I$HRD = 000041
BIT9  = 001000 G        C$DODU= 000051          DUSTFL= 000017 G        GO    = 000001 G        I$INIT= 000041
BOE   = 000400 G        C$DRPT= 000024          EF.CON= 000036 G        GOABO   040600          I$MOD = 000041
BPNERR  023342          C$DU  = 000053          EF.NEW= 000035 G        GO10    047234          I$MSG = 000041
BRFLAG= 000004 G        C$EDIT= 000000          EF.PWR= 000034 G        GO2     041726          I$PROT= 000040
BYPASS  047626 G        C$ERDF= 000055          EF.RES= 000037 G        GO3     042510          I$PTAB= 000041
B.DI  = 000400 G        C$ERHR= 000056          EF.STA= 000040 G        GO4     043176          I$PWR = 000041
B.ER  = 100000 G        C$ERRO= 000060          ELPCMD  032721 G        GO5     043772          I$RPT = 000041
B.GO  = 000001 G        C$ERSF= 000054          EMSG10  030512 G        GO6     044440          I$SEG = 000041
B.IE  = 000200 G        C$ERSO= 000057          EMSG11  030540 G        GO7     045260          I$SETU= 000041
B.LF  = 000002 G        C$ESCA= 000010          EMSG12  030601 G        GO8     046100          I$SFT = 000041
B.MP  = 000100 G        C$ESEG= 000005          EMSG13  030650 G        GO9     047024          I$SRV = 000041
B.NV  = 002000 G        C$ESUB= 000003          EMSG14  030677 G        G$CNTO= 000200          I$SUB = 000041
B.OD  = 000200 G        C$ETST= 000001          EMSG15  030726 G        G$DELM= 000372          I$TST = 000041
B.PI  = 000001 G        C$EXIT= 000032          EMSG5   030334 G        G$DISP= 000003          J$JMP = 000167
B.PP  = 100000 G        C$FREQ= 000101          EMSG6   030355 G        G$EXCP= 000400          KPAR0 = 172340 G
B.QB  = 001000 G        C$FRME= 000100          EMSG7   030406 G        G$HILI= 000002          KPAR1 = 172342 G
B.S1  = 004000 G        C$GETB= 000026          EMSG8   030427 G        G$LOLI= 000001          KPAR2 = 172344 G
B.S2  = 010000 G        C$GETW= 000027          EMSG9   030465 G        G$NO  = 000000          KPAR3 = 172346 G
B.S3  = 020000 G        C$GMAN= 000043          END     041042          G$OFFS= 000400          KPAR4 = 172350 G
B.S4  = 040000 G        C$GPHR= 000042          ENDCLE  041110          G$OFSI= 000376          KPAR5 = 172352 G
B.WR  = 040000 G        C$GPRI= 000040          ERR   = 100000 G        G$PRMA= 000001          KPAR6 = 172354 G
CDRECV  037774 G        C$INIT= 000011          ERRBLK  023060 G        G$PRMD= 000002          KPAR7 = 172356 G
CHKCOM  036610 G        C$INLP= 000020          ERRMSG  023056 G        G$PRML= 000000          KPDR0 = 172300 G
CKCMEX  036740          C$MANI= 000050          ERRNBR  023054 G        G$RADA= 000140          KPDR1 = 172302 G
CLSDRV  037274 G        C$MAP = 000102          ERRTYP  023052 G        G$RADB= 000000          KPDR2 = 172304 G
CMARLG  002306 G        C$MEM = 000031          EVL   = 000004 G        G$RADD= 000040          KPDR3 = 172306 G
```

Symbol table

```
KPDR4 = 172310 G    L$LUN   002074 G    L2ELDF= 000156 G    L21     024417 G    MSCPER  040520
KPDR5 = 172312 G    L$MREV  002050 G    L2ELDS= 000166 G    L210    025073 G    MSCPUN= 000006 G
KPDR6 = 172314 G    L$NAME  002000 G    L2ELEC= 000140 G    L211    025137 G    MSCPVR= 000000 G
KPDR7 = 172316 G    L$PRIO  002042 G    L2ELEV= 000136 G    L212    025203 G    MSGLEN= 177774 G
KTEXT   036252      L$PROT  023044 G    L2ELFL= 000135 G    L213    025247 G    NEXT    040740
KTFLAG  002274 G    L$PRT   002112 G    L2ELFM= 000134 G    L214    025313 G    NOKT    036246
KTTEST  036102 G    L$REPP  002062 G    L2ELLB= 000162 G    L215    025357 G    NUPASS  040724
LASTBF  062054 G    L$REV   002010 G    L2ELOF= 000172 G    L216    025423 G    ONEFIL= 000001
LINE1   023420 G    L$RPT   035002 G    L2ELPB= 000160 G    L219    025467 G    ONLCMD  032670 G
LINE2   023454 G    L$SOFT  047776 G    L2ELP1= 000146 G    L22     024473 G    ONLINE  002406
LINE3   023534 G    L$SPC   002056 G    L2ELP2= 000150 G    L220    025533 G    OP.ABT= 000006 G
LINE4   023564 G    L$SPCP  002020 G    L2ELRL= 000144 G    L221    025601 G    OP.ELP= 000003 G
LINE5   023626 G    L$SPTP  002024 G    L2ELRT= 000145 G    L222    025646 G    OP.END= 000200 G
LINE6   023703 G    L$STA   002030 G    L2ELRW= 000170 G    L223    025710 G    OP.GDS= 000001 G
LINE7   023746 G    L$SW    002212 G    L2ELST= 000154 G    L224    025752 G    OP.ONL= 000011 G
LOE   = 040000 G    L$TEST  002114 G    L2ELTN= 000157 G    L225    026011 G    OP.REC= 000005 G
LOGUNT  002312 G    L$TIML  002014 G    L2ELTO= 000163 G    L226    026053 G    OP.SCC= 000004 G
LOOP    037062      L$UNIT  002012 G    L2ELT1= 000164 G    L227    026115 G    OUTER   002326 G
LOT   = 000010 G    L10000  002210      L2ELT2= 000165 G    L228    026154 G    OWN   = 100000 G
LUNBLK  002212 G    L10001  002212      L2ER1   030763 G    L229    026213 G    O$APTS= 000000
LUNFLG= 000014 G    L10003  033542      L2ER10  031211 G    L23     024531 G    O$AU  = 000000
L$ACP   002110 G    L10004  035000      L2ER11  031232 G    L230    026255 G    O$BGNR= 000001
L$APT   002036 G    L10005  036052      L2ER12  031246 G    L231    026317 G    O$BGNS= 000000
L$AU    041144 G    L10006  036060      L2ER13  031266 G    L232    026361 G    O$DU  = 000001
L$AUT   002070 G    L10007  036070      L2ER14  031306 G    L233    026423 G    O$ERRT= 000001
L$AUTO= ****** GX   L10010  036100      L2ER15  031334 G    L234    026462 G    O$GNSW= 000000
L$CCP   002106 G    L10011  041076      L2ER16  031364 G    L235    026524 G    O$POIN= 000001
L$CLEA  041100 G    L10012  041126      L2ER17  031412 G    L236    026566 G    O$SETU= 000000
L$CO    002032 G    L10013  041142      L2ER18  031430 G    L237    026630 G    PAROFF  002300 G
L$DEPO  002011 G    L10014  041150      L2ER19  031451 G    L238    026672 G    PASCNT  002270 G
L$DESC  002150 G    L10015  041646      L2ER2   031003 G    L239    026731 G    PCKSIZ  003030 G
L$DESP  002076 G    L10016  041336      L2ER20  031467 G    L24     024571 G    PDELAY  036406 G
L$DEVP  002060 G    L10017  041602      L2ER21  031551 G    L240    026770 G    PDLYEX  036432
L$DISP  002124 G    L10020  042430      L2ER22  031631 G    L241    027027 G    PDRECV  040102 G
L$DLY   002116 G    L10021  043116      L2ER23  031720 G    L242    027071 G    PNT   = 001000 G
L$DTP   002040 G    L10022  043712      L2ER24  032010 G    L244    027130 G    PRI   = 002000 G
L$DTYP  002034 G    L10023  044360      L2ER25  032076 G    L245    027224 G    PRIDAT  033074 G
L$DU    041130 G    L10024  045200      L2ER26  032167 G    L246    027320 G    PRIERR  033146 G
L$DUT   002072 G    L10025  046020      L2ER27  032261 G    L247    027414 G    PRIEX   033536
L$DVTY  023412 G    L10026  046744      L2ER3   031023 G    L248    027510 G    PRIINI  032740 G
L$EF    002052 G    L10027  047154      L2ER4   031040 G    L249    027604 G    PRIIP   033122 G
L$ENVI  002044 G    L10030  047624      L2ER5   031057 G    L25     024631 G    PRIPAD  033022 G
L$ERRT  023052 G    L10031  047774      L2ER6   031107 G    L250    027700 G    PRISA   032764 G
L$ETP   002102 G    L10032  047776      L2ER7   031127 G    L251    027774 G    PRIVAD  033046 G
L$EXP1  002046 G    L2BRD1= 000024 G    L2ER8   031145 G    L252    030070 G    PRIO0 = 000000 G
L$FXP4  002064 G    L2BRD2= 000030 G    L2ER9   031160 G    L253    030164 G    PRIO1 = 000040 G
L$EXP5  002066 G    L2BWR1= 000014 G    L2ETBL  023062 G    L254    030260 G    PRIO2 = 000100 G
L$HARD  047664 G    L2BWR2= 000020 G    L2MSG   023312      L26     024671 G    PRIO3 = 000140 G
L$HIME  002120 G    L2CMD = 000010 G    L2REP1= 000050 G    L27     024731 G    PRIO4 = 000200 G
L$HPCP  002016 G    L2CRC1= 000044 G    L2REP2= 000052 G    L28     024771 G    PRIO5 = 000240 G
L$HPTP  002022 G    L2CRC2= 000046 G    L2RSP = 000011 G    L29     025026 G    PRIO6 = 000300 G
L$HW    002202 G    L2DATA  040224 G    L2STA = 000002 G    MMON  = 000001 G    PRIO7 = 000340 G
L$ICP   002104 G    L2DRV = 000004 G    L2SWR1= 000034 G    MMUSR0= 177572 G    PRTDRV  037632 G
L$INIT  040620 G    L2DUMP  033544 G    L2SWR2= 000036 G    MMUSR1= 177574 G    PRTINT  037042 G
L$LADP  002026 G    L2ECC1= 000040 G    L2TRK = 000007 G    MMUSR2= 177576 G    P.BCNT= 000014 G
L$LAST  062130 G    L2ECC2= 000042 G    L2TST = 000006 G    MMUSR3= 172516 G    P.BUFF= 000020 G
L$LOAD  002100 G    L2ELDE= 000155 G    L2UNT = 000012 G    MM22ON= 000020 G    P.CRF = 000000 G
```

Symbol table

```
P.EXT1= 000014 G    STEPST  002320 G    T$EXCP= 000000      T$$SOF= 010032      WRCMD   032702 G
P.EXT2= 000015 G    STEP1   036434 G    T$FLAG= 000041      T$$SRV= 010010      WRCMDE  033256 G
P.EXT3= 000016 G    STPTBL  002250 G    T$GMAN= 000000      T$$SUB= 010017      WRDATA  002322 G
P.FLGS= 000011 G    STP1ER  036552      T$HILI= 000251      T$$SW = 010001      WRER1   032347 G
P.IND1= 000020 G    STP1EX  036556      T$LAST= 000001      T$$TES= 010030      WRER2   032401 G
P.IND2= 000022 G    SVCGBL= 000000      T$LOLI= 000000      T1      041152 G    WRER3   032422 G
P.MOD = 000012 G    SVCINS= 000000      T$LSYM= 010000      T1.1    041200      WRER4   032450 G
P.OPCD= 000010 G    SVCSUB= 000000      T$LTNO= 000012      T1.2    041364      WRER5   032474 G
P.STS = 000012 G    SVCTAG= 000000      T$NEST= 177777      T10     047156 G    WRER6   032525 G
P.UNIT= 000004 G    SVCTST= 000000      T$NS0 = 000000      T2      041650 G    WRER7   032546 G
RBUF  = 177562 G    S$LSYM= 010000      T$NS1 = 000005      T2EXT   042424      WRER8   032614 G
RCSR  = 177560 G    S1    = 004000 G    T$NS2 = 000002      T3      042432 G    WREX    033512 G
RCVCMD  032726 G    TEMP    002332 G    T$PTNU= 000000      T3EXT   043112      WRINTO  033176 G
RCVDAT  002524      TF.BLK= 000010 G    T$SAVL= 177777      T4      043120 G    WRPRTE  033222 G
RDBUF   060000 G    TIMOUT= 000024 G    T$SEGL= 177777      T4EXT   043702      WRSEQE  033410 G
RDCMD   032707 G    TKIP  = 000000 G    T$SUBN= 000000      T5      043714 G    WRTOE   033466 G
RESPBF  002570 G    TKIPAD  047722      T$TAGL= 177777      T5EXT   044350      WR1     023772 G
REWCMD  032675 G    TKIPSV= 000010 G    T$TAGN= 010033      T6      044362 G    WR2     024035 G
RNGSTP= 000004 G    TKSA  = 000002 G    T$TEMP= 000000      T6EXT   045174      WR3     024071 G
RSPADD  023352      TKSASV= 000012 G    T$TEST= 000012      T7      045202 G    WR4     024122 G
RSPBUF  002574 G    TKUNT   047751      T$TSTM= 177777      T7EXT   046014      WR5     024147 G
RSPEND  003004 G    TKVEC = 000004 G    T$TSTS= 000001      T8      046022 G    WR6     024211 G
RSPRNG  003004 G    TKVECT  047737      T$$AU = 010014      T8EXT   046734      WR7     024214 G
RSPSAV  023040 G    TOUT    002330 G    T$$CLE= 010012      T9      046746 G    WR8     024265 G
RSPSTP= 000104 G    TRAP4   036054 G    T$$DU = 010013      T9EXT   047150      WR9     024342 G
RSPTO   023402      TRP4FG  002276 G    T$$HAR= 010031      T9FLAG= ****** GX   W1      033322
RSTVEC  036266 G    TSTXEX  047620      T$$HW = 010000      UAM   = 000200 G    XLOCPR  002476
SAEXP   002314 G    TXFER = 000005 G    T$$INI= 010011      UNERLG  023372      X$ALWA= 000000
SCCCMD  032663 G    T$ARGC= 000002      T$$MSG= 010004      VECTOR  036316 G    X$FALS= 000040
SCTRLC  002342      T$CODE= 026004      T$$PRO= 010002      VEC4  = 000004 G    X$OFFS= 000400
SFPTBL  002212 G    T$ERRN= 000033      T$$RPT= 010005      WRBUF   003036 G    X$TRUE= 000020
START   040672

. ABS.  062130    000   (RW,I,GBL,ABS,OVR)
        000000    001   (RW,I,LCL,REL,CON)
Errors detected:  0

*** Assembler statistics


Work  file  reads: 353
Work  f'le writes: 347
Size of work file: 34208 Words  ( 134 Pages)
Size of core pool: 19402 Words  ( 74 Pages)
Operating  system: RSX-11M/PLUS (Under VAX/VMS)

Elapsed time: 00:18:51.24
CZTKAB.BIN,CZTKAB.LST/-SP/CR=SVC40R.MLB/ML,CZTKAB.MAC
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