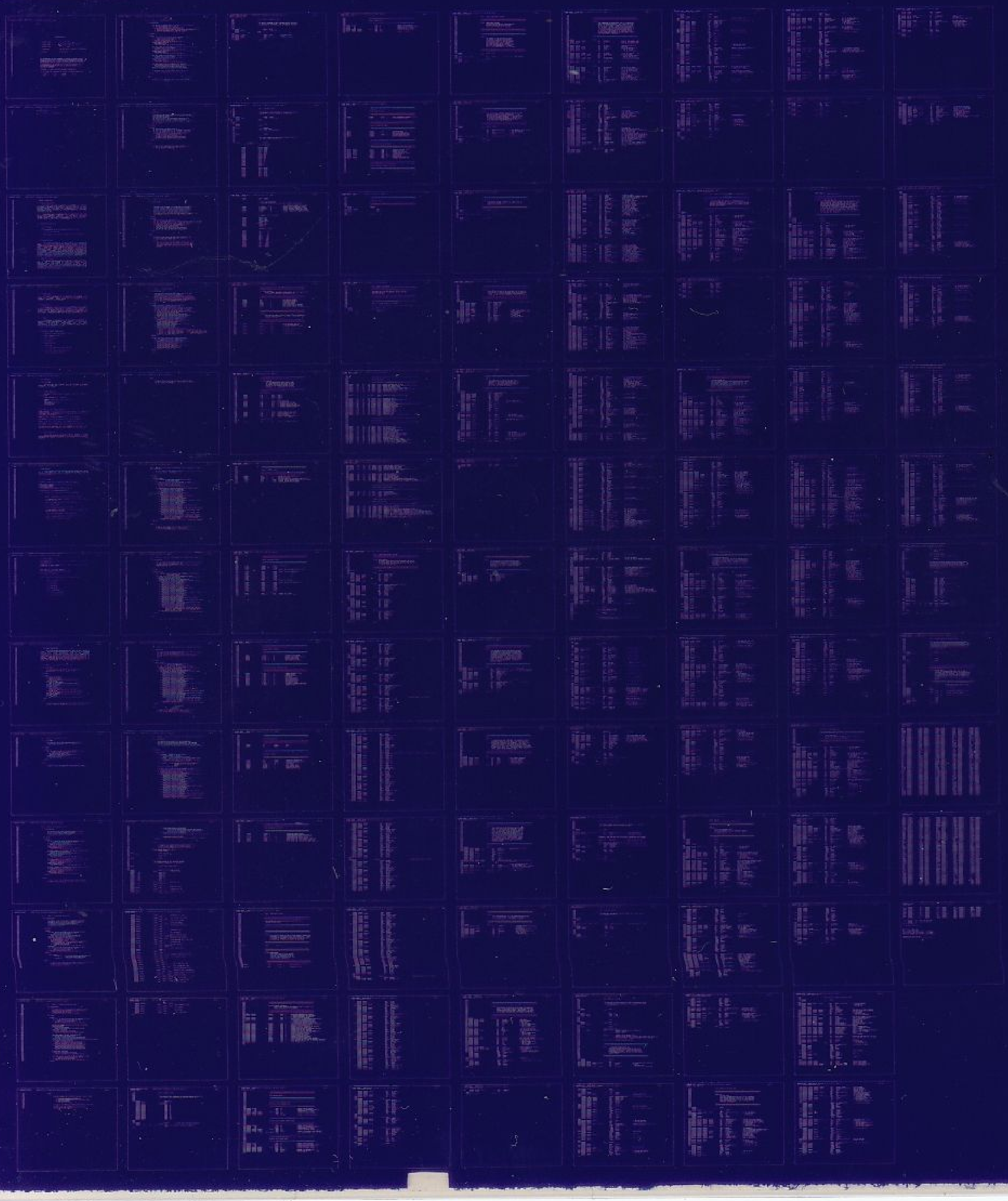
TU81

TU81 FRONT END FUNC
CZTU2A0

AH-FG16A-MC
1 OF 1 OCT 1985

digital
MADE IN USA



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                            IDENTIFICATION
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         PRODUCT CODE:           AC - FG15A - MC

         PRODUCT NAME:           CZTU2A0 TU81 FRONT END FUNC TEST

         PRODUCT DATE:           26 - JUL - 1985

         MAINTAINER:             TAPE AND OPTICAL DIAGNOSTIC ENGINEERING

         AUTHOR:                 RAYMOND CHANG





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                                 REVISION HISTORY

                                         JUL 1985        NEW RELEASE

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1 GENERAL INFORMATION

1.1 Product Description

The TU81 Functional Diagnostic is intended to provide confidence in the basic functionality of the TU81 subsystem. As such, this should be the first host level diagnost'c run on the TU81 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 TU81'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 TU81's in a sequential manner. To run a full pass of the program, a scratch tape must be mounted on 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 specified 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 TU81; 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 verif'ed 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 TU81 tape drives with controllers
7. 1 to 4 TU81 scratch tapes (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) 260?
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 TU81'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.

```
CZTU2  error  eeeee on unit ll test ttt sub sss PC: xxxxxx
SA CONTENTS IN ERROR
INIT SEQUENCE STEP #: n
SA RE: wwwwww EXPCTD: yyyyyy  ACTUAL SA: zzzzzz

****FAILING FRU: LESI/CONTROLLER/CABLE****
```

In this example, the fields have the following meanings:

- eeeee = discrete error number as defined by program
- ll = logical unit number assigned to unit-in-error during hardware questions
- ttt = test number during which error occurred
- sss = subtest number
- xxxxxx = program location of error call
- n = step number of the UQSSP initialization sequence which detected the error condition
- wwwwww = physical address of the SA register
- 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.

```
CZTU2A0 DVC FTL error  eeeee on unit ll test ttt sub sss  PC: xxxxxx
INTERNAL DRIVE TEST FAILED


FAULT CODE: ff    SUB-FAULT CODE: cc
REFER TO PATHFINDER FOR EXPLANATION OF CODES.

****FAILING FRU: DRIVE****
```

In this example, the fields have the following meanings:

- eeeee = see above
- ll = see above
- ttt = see above
- sss = see above
- xxxxxx = see above
- ff = refer to pathfinder
- cc = refer to pathfinder

4 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.

4.2 TEST 1 < Existence Verfication Test > -

TEST DESCRIPTION:

This test ver;fies the TU81 IP and SA registers can be accessed on the unitus through the UBA.

TEST STEPS:

```
BGNTEST
    Initialize the Unibus
    IF error on initialize
        THEN Print System error and ABORT program
    Clear UBA status
    IF error on Clear status
        THEN  Print System error and ABORT program
    Read the IP register
    Wait 100 microseconds for possible Unibus timeout
    Read UBA status
    IF Unibus timeout error
        THEN Print Fatal device error and drop unit
    IF any UBA error
        THEN Print Fatal device error and ABORT program
    Read the SA register
    Wait 100 microseconds for possible Unibus timeout
    Read UBA status
    IF any UBA error
        THEN Print Fatal device error and ABORT program
ENDTEST
```

DEBUG:

No error looping is allowed all errors abort the test or program
The FRU is the Lesi Adapter for all errors in this test.

```
4.2     TEST 2  < Initialization Test > -

 TEST DESCRIPTION:

        This test will do a TU81 controller hard initialize
        to cause the rom resident power up diagnostics
        in the tu81 to be run.

 TEST STEPS:

    BGNTEST
        Call dup__ipinit to write to the Ip register to begin
                hard initialize and wait for STEP 1.
        IF the TU81 fails to enter STEP 1
            THEN print fatal device error and drop unit
        Compare step 1 data expd with recv
        IF data compare error
            THEN print fatal device error and drop unit
    ENDTEST


 DEBUG:

        If loop on error specified then loop to start of test.
        The FRU is the Lesi Adapter for all errors in this test.
```

```
4.3     TEST 3 < Initialization Test > -

 TEST DESCRIPTION:

        This test will do a TU81 controller hard initialize
        then do initialization steps 1 through 3.
        It will wait for step 4 to be entered but no step 4
        testing will be done in this test.

 TEST STEPS:

    BGNTEST
        Call dup__ipinit to write to the Ip register to begin
                hard initialize and wait for STEP 1.
        IF the TU81 fails to enter STEP 1
            THEN print fatal device error and drop unit
        Compare step 1 data expd with recv
        IF data compare error
            THEN print fatal device error and drop unit

        Call dup__step1 to write step 1 bit pattern and wait step 2
        IF the TU81 fails to enter STEP 2
            THEN print fatal device error and drop unit
        Compare step 2 data expd with recv
        IF data compare error
            THEN print fatal device error and drop unit

        Call dup__step2 to write step 2 bit pattern and wait step 3
        IF the TU81 fails to enter STEP 3
            THEN print fatal device error and drop unit
        Compare step 3 data expd with recv
        IF data compare error
            THEN print fatal device error and drop unit

        Call dup__step3 to write step 3 bit pattern and wait step 4
        IF the TU81 fails to enter STEP 4
            THEN print fatal device error and drop unit
        Compare step 4 data expd with recv
        IF data compare error
            THEN print fatal device error and drop unit
    ENDTEST


DEBUG:

        If loop on error specified then loop to start of test.
        The FRU is the Lesi Adapter for all errors in this test.
```

```
4.4     TEST 4 < SA Register Wrap Test > -

 TEST DESCRIPTION:

        The TU81 will be initialized in diagnostic wrap mode
        and then a one (1) bit will be floated through the
        SA register to see that it echoes properly.
        The process will be repeated to float a zero (0)
        through the SA register.

 TEST STEPS:

    BGNTEST
        Call dup__ipinit to write to the Ip register to begin
                hard initialize and wait for STEP 1.
        IF the TU81 fails to enter STEP 1
            THEN print fatal device error and drop unit
        Call dup__step__1 to set diagnostic wrap mode
        REPEAT for all data in FLOAT__table
            Write data pattern into SA register
            Start a 10 second  timer
            Read SA register until the read pattern equals the
                write pattern or 10 second timer times out.
            IF 10 second timer expired
                THEN  Print Fatal device error and drop unit
        END-REPEAT
        Call dup__ipinit to write to the Ip register to begin
                hard initialize and wait for STEP 1.
        IF the TU81 fails to enter STEP 1
            THEN print fatal device error and drop unit
    ENDTEST

        FLOAT__table:
                FLOATING 1'S    1,2,4,10,20,40,100,200,400,1000,2000
                                4000,10000,20000,40000,100000
                FLOATING 0'S    Floating 1's complemented

 DEBUG:

        If loop on error specified then loop on failing write and read.
        The FRU is the Lesi Adapter and tu81 controller
        for all errors in this test.
```

```
4.5     TEST 5  < Vector And BR Level Test > -

 TEST DESCRIPTION:

        The TU81 will be initialized with interrupt enable
        set to verify that the TU81 interrupts to the
        correct vector and BR level.
        This test is only run on the first pass.

 TEST STEPS:

    BGNTEST
        Call dup__ipinit to write to the Ip register to begin
                hard initialize and wait for STEP 1.
        IF the TU81 fails to enter STEP 1
            THEN Print fatal device error and drop unit

        Set IPL to highest priority to lock out interrupts
        Clear UBA status
        IF error on Clear status
            THEN  Print System error and ABORT program
        Enable UBA interrupts
        IF error on enable uba interrupts
            THEN Print System error and ABORT program

        Call dup__step__1 to set interrupt enable
        IF the TU81 fails to enter STEP 2
            THEN Print Fatal device error and drop unit
        (A tu81 step 2 interrupt should be pending here)
        Lower the IPL until interrupt occurs or level equals X10 (lowest)
        IF no Tu81 interrupt occurred
            THEN Print Fatal device error and drop unit
        IF any error detected in interrupt service
            THEN Print Fatal system error and ABORT test
        IF the interrupt occurred at the wrong vector
            THEN Print Fatal device error and drop unit
        IF the interrupt occurred at the wrong BR level
            THEN Print Fatal device error and drop unit

        Disable UBA interrupts
        IF error on Disable uba interrupts
            THEN Print System error and ABORT program

        Call dup__ipinit to write to the Ip register to begin
                hard initialize and wait for STEP 1.
        IF the TU81 fails to enter STEP 1
            THEN Print Fatal device error and drop unit
    ENDTEST
```

```
DEBUG:

        Possible reasons for incorrect interrupt vector include:

            1. Incorrect hardware configuration
            2. The ATTACH command specified the wrong vector
            3. Bad Lesi adapter
            4. Bad TU81 controller

        If loop on error specified then loop to start of the test

        The FRU is the Lesi Adapter and tu81 controller
        for all errors in this test.
        4.6     TEST 6   < Purge And Poll Test > -

         TEST DESCRIPTION:

                This test will perform steps 1-3 of the initialize sequence
                then set the purge/poll bit in step 3.
                The purge/poll sequence will then proceed to:
                    1. Write 0's to the SA register to simulate uba purge complete.
                    2. Read and disregard the IP register to start polling
                    3. Wait for the controller to go into step 4.

         TEST STEPS:

            BGNTEST
                Call dup__ipinit to write to the Ip register to begin
                        hard initialize and wait for STEP 1.
                IF the TU81 fails to enter STEP 1
                    THEN Print fatal device error and drop unit
                Compare step 1 data expd with recv
                IF data compare error
                    THEN Print fatal device error and drop unit

                Call dup__step1 to write step 1 bit pattern and wait step 2
                IF the TU81 fails to enter STEP 2
                    THEN Print fatal device error and drop unit
                Compare step 2 data expd with recv
                IF data compare error
                    THEN Print fatal device error and drop unit

                Call dup__step2 to write step 2 bit pattern and wait step 3
                IF the TU81 fails to enter STEP 3
                    THEN Print fatal device error and drop unit
                Compare step 3 data expd with recv
                IF data compare error
                    THEN Print fatal device error and drop unit
        *
                Call dup__step3 to write purge/poll bit (sa_pp_3)
                IF the controller fails to clear the SA within 100 micros
                    THEN Print fatal device error and drop unit
                Write 0's to the SA to simulate uba purge complete
                Read and disregard the IP register to start polling
        *
                IF the TU81 fails to enter STEP 4 within 10 seconds
                    THEN Print fatal device error and drop unit
            ENDTEST


        DEBUG:

                If loop on error specified then loop to start of test.
                The FRU is the Lesi Adapter for all errors in this test.
```

```
4.7     TEST 7   < Small Ring Test > -

 TEST DESCRIPTION:

        This test will do steps 1-4 of the TU81 initialization,
        with the smallest ring buffer size (1 cmd and 1 rsp buffer)
        and interrupts disabled.
        The test will verify the controller clears the ring
        descriptor field in the host communications area.
        This is the first time the initialize sequence is carried
        out to the point where the controller npr's to memory
        are verified.

 TEST STEPS:

    BGNTEST
        Set cmd and rsp ring descriptors to -1
        Set cmd ring length word to 0 to indicate 1 cmd buffer
        Set rsp ring length word to 0 to indicate 1 rsp buffer
        Call Dup_Init to write to the Ip register to force
            a hard initialize, then perform steps 1-4.
        IF the TU81 fails to enter any step
            THEN print fatal device error and drop unit
        IF the cmd and rsp ring descriptors not cleared
            THEN print fatal device error and drop unit
    ENDTEST


 DEBUG:

        If loop on error specified then loop to start of test.
        The FRU is the Lesi Adapter and TU81 controller
            for all errors in this test.
```

```
4.8     TEST 8   < Maximum Ring Buffer Test > -

 TEST DESCRIPTION:



        This test will do steps 1-4 of the TU81 initialization,
        with the largest number of ring descriptors allowed
        (128 cmd and 128 rsp buffers) and interrupts disabled.
        The test will verify the controller clears the ring
        descriptor field in the host communications area.
        This test verifies the controller can access the complete
        host commmunication area in Vax memory (1024+4 words).

 TEST STEPS:

    BGNTEST
        Set cmd and rsp ring descriptors to -1
        Set cmd ring length word to 7 to indicate 128 cmd buffers (2**7=128)
        Set rsp ring length word to 7 to indicate 128 rsp buffers (2**7=128)
        Call Dup__Init to write to the Ip register to force
            a hard initialize, then perform steps 1-4.
        IF the TU81 fails to enter any step
            THEN print fatal device error and drop unit
        IF the cmd and rsp ring descriptors not cleared
            THEN print fatal device error and drop unit
    ENDTEST


DEBUG:

        If loop on error specified then loop to start of test.
        The FRU is the Lesi Adapter and TU81 controller
            for all errors in this test.
        Note:
            This test overlays the host communications area with
            128 cmd ring descriptors and 128 rsp ring descriptors.
            The actual associated ring buffers are not allocated.
            The rest of the tests use just one cmd and one rsp
            buffer.
```

```
                    4.9     TEST 9   < Get DUST Status > -

                     TEST DESCRIPTION:

                            This test will request the DUST status and verify the
                            response packet is received as expected.
                            It is also verifies invalid command status is returned
                            when illegal modifiers are specified in the command packet.
                            The GET DUST command does not allow any command modifiers.
                            This is the first time a command packet is actually sent to
                            the controller and a response packet received.

                     TEST STEPS:

                        BGNSUB 1 *Get DUST command with valid modifiers*
                            Set cmd and rsp ring descriptors to -1
                            Set cmd ring length word to 0 to indicate 1 cmd buffer
                            Set rsp ring length word to 0 to indicate 1 rsp buffer
                            Call Dup__Init to write to the Ip register to force
                                a hard initialize, then perform steps 1-4. Go bit set to 1
                            IF the TU81 fails to enter any step
                                THEN print fatal device error and drop unit
                            IF the cmd and rsp ring descriptors are not cleared
                                THEN print fatal device error and drop unit
                            Call exe_ getdust to execute a GET DUST command
                            IF Exe__getdust returns SS$__TIMEOUT code
                                THEN print fatal device timeout error and drop unit
                            IF the rsp Command reference number NOT = 1
                                THEN print hard device error
                            IF the rsp Endcode NOT= (get_dust code + 200 octal)
                                THEN print hard device error
                            IF the rsp Status NOT= success
                                THEN print hard device error
                            IF the rsp buffer FLAGS data is NOT as follows:
                                1. Bit<0> = 1  !du_p_dust__flag__dis    - disable other servers
                                2. Bit<1> = 1  !dup__dust__flag__media  - server has local media (rom)
                                3. Bit<2> = 1  !dup__dust__flag__nosup  - exe__supplied cmd not allowed
                                4. Bit<3> = 0  !dup__dust__fla_g_act          - server not active
                                THEN print hard device error
                        ENDSUB 1

                        BGNSUB 2 *Get DUST command with illegal modifiers*
                            Call exe__getdust to execute a GET DUST command
                            IF Exe__getdust returns SS$__TIMEOUT code
                                THEN print fatal device timeout error and drop unit
                            IF the rsp Command reference number NOT = 2
                                THEN print hard device error
                            IF the rsp Endcode NOT= (get__dust code + 80 hex)
                                THEN print hard device error
                            IF the rsp Status NOT= INVALID COMMAND
                                THEN print hard device error
                        ENDSUB 2

                        ENDTEST
```

```
                                        DEBUG:

                                                If loop or error specified then loop to start of test.
                                                The FRU is the lesi adapter or the TU81 controller/server
                                                for all errors in this test.
```

```
4.10    TEST 10  < Functional Fault Detection Test (Internal Drive Test 1 > -
 TEST DESCRIPTION:

        This is a manual (/sec:manual) intervention test that will execute
        the TU81 internal microdiagnostic _#1.


 TEST STEPS:

    BGNTEST <MANUAL>
        Print message to mount tape untensioned but loaded
                        "Is the tape ready?"
        Call dup_init to write to the Ip register to force
            a hard initialize, then perform steps 1-4. Go bit set to 1
        IF the TU81 fails to enter any step
            THEN print fatal device error and drop unit

        Call DUP_EXELOCAL to execute an EXECUTE LOCAL PROGRAM command
            IF Dup_exelocal returns SS_GETDUSTMO
                THEN print Get dust command timeout
            IF Dup_exelocal returns SS_NOTIDLE
                THEN print controller not in idle state
            IF Dup_exelocal returns SS$_TIMEOUT
                THEN print controller failed to return packet
            IF Dup_exelocal returns SS_EXEBADREF
                THEN print invalid command reference
            IF Dup_exelocal returns SS_NOTSUCCESS
                THEN print controller failed to return success in packet
            IF Dup_EXELOCAL returns SS_DUSTBADREF
                THEN print invalid command reference
            IF Dup_exelocal returns SS$_DEVINACT
                THEN print controller failed to enter active state
            IF Dup_exelocal returns SS_RECVTMO
                THEN print Controller failed to accept receive data command
            IF Dup_exelocal returns SS_PROGTMO
                THEN print progress indicator not updated before timeout
            IF Dup_exelocal returns SS_RECVINVMSG
                THEN print Receive data returned invalid message number
            IF Dup_exelocal returns SS_RECVERR2
                THEN print Receive data returned internal test failed
                     and print the message buffer fault code and subcode.
                     and print refer to SAMS for fault code meanings.
            IF Dup_exelocal returns SS_SAERR
                THEN print controller error while in execute local program
    ENDTEST


DEBUG:

        If loop on error specified then loop to start of test.
        The FRU is lesi Adapter for initialize errors
        or the TU81 controller/server for all other errors.
```

4.11 TEST 11 < Tension Fault Isolation Test (Internal Drive Test 2)> -

TEST DESCRIPTION:

This is a Fault (/sec:Fault) intervention test that will execute the TU81 internal microdiagnostic _#2. Internal test _#2 isolates servo faults by checking different assemblies of the STU.

TEST STEPS:

```
BGNTEST <Fault>
     Print message "Mount a scratch tape THREADED but UNTENSIONED"
                   "Is the tape ready?"
     Call dup__init to write to the Ip register to force
          a hard initialize, then perform steps 1-4. Go bit set to 1
     IF the TU81 fails to enter any step
          THEN print fatal device error and drop unit
     Call DUP_EXELOCAL to execute an EXECUTE LOCAL PROGRAM command
          IF Dup_exelocal returns SS_GETDUSTMO
               THEN print Get dust command timeout
          IF Dup_exelocal returns SS_NOTIDLE
               THEN print controller not in idle state
          IF Dup_exelocal returns SS$_TIMEOUT
               THEN print controller failed to return packet
          IF Dup_exelocal returns SS_EXEBADREF
               THEN print invalid command reference
          IF Dup_exelocal returns SS_NOTSUCCESS
               THEN print controller failed to return success in packet
          IF Dup_EXELOCAL returns SS_DUSTBADREF
               THEN print invalid command reference
          IF Dup_exelocal returns SS$_DEVINACT
               THEN print controller failed to enter active state
          IF Dup_exelocal returns SS_RECVTMO
               THEN print Controller failed to accept receive data command
          IF Dup_exelocal returns SS_PROGTMO
               THEN print progress indicator not updated before timeout
          IF Dup_exelocal returns SS_RECVINVMSG
               THEN print Receive data returned invalid message number
          IF Dup_exelocal returns SS_RECVERR2
               THEN print Receive data returned internal test failed
                    and print the message buffer fault code and subcode.
                    and print refer to SAMS for fault code meanings.
          IF Dup_exelocal returns SS_SAERR
               THEN print controller error while in execute local program
ENDTEST
```

DEBUG:

If loop on error specified then loop to start of test.

```
4.12    TEST 12  < Velocity Fault Isolation Test (Internal Drive Test 3)> -

 TEST DESCRIPTION:

        This is a Fault (/sec:Fault) intervention test that will execute
        the TU81 internal microdiagnostic _Ø3.
        Internal test _Ø3 isolates velocity servo faults by checking
        the take__up motor/tach assembly and the velocity servo
        loop.


 TEST STEPS:

    BGNTEST <Fault>
        Print message "Remove the tape from the drive"
                      "Is the tape REMOVED?"
        Call dup__init to write to the Ip register to force
            a hard initialize, then perform steps 1-4. Go bit set to 1
        IF the TU81 fails to enter any step
            THEN print fatal device error and drop unit
        Call DUP_EXELOCAL to execute an EXECUTE LOCAL PROGRAM command
            IF Dup_exelocal returns SS_GETDUSTMO
                THEN print Get dust command timeout
            IF Dup_exelocal returns SS_NOTIDLE
                THEN print controller not in idle state
            IF Dup_exelocal returns SS$_TIMEOUT
                THEN print controller failed to return packet
            IF Dup_exelocal returns SS_EXEBADREF
                THEN print invalid command reference
            IF Dup_exelocal returns SS_NOTSUCCESS
                THEN print controller failed to return success in packet
            IF Dup_EXELOCAL returns SS_DUSTBADREF
                THEN print invalid command reference
            IF Dup_exelocal returns SS$_DEVINACT
                THEN print controller failed to enter active state
            IF Dup_exelocal returns SS_RECVTMO
                THEN print Controller failed to accept receive data command
            IF Dup_exelocal returns SS_PROGTMO
                THEN print progress indicator not updated before timeout
            IF Dup_exelocal returns SS_RECVINVMSG
                THEN print Receive data returned invalid message number
            IF Dup_exelocal returns SS_RECVERR2
                THEN print Receive data returned internal test failed
                     and print the message buffer fault code and subcode.
                     and print refer to SAMS for fault code meanings.
            IF Dup_exelocal returns SS_SAERR
                THEN print controller error while in execute local program
    ENDTEST


DEBUG:

        If loop on error specified then loop to start of test.
        The FRU is lesi Adapter for initialize errors
        or the TU81 controller/server for all other errors.
```

```
4.13    TEST 13 < Select A Drive Resident Test (Internal Drive Tests 1-99) > -

 TEST DESCRIPTION:

        This section (/sec:FAULT) will ask the operator
        to select a drive resident microdiagnostic. The resident
        test will be started using the Dup Execute local program
        function and monitored by Dup Get Dust status function calls.
        The internal tests are described in the Drive maintenance manual.


 TEST STEPS:

    BGNTEST <FAULT>

        Print message   "Enter drive unit number :"
            IF the unit number is invalid
                THEN Print error message and ask again
        Print message   "Enter controller internal test number <1-99>:"
            IF the resident test name is not in the valid name table
                THEN Print error message and ask again

        Print message   "Setup the tape drive per the Maintenance
                                manual for this internal test
                                READY?
        Accept any response as ready

        Call dup__init to write to the Ip register to force
            a hard initialize, then perform steps 1-4. Go bit set to 1
        IF the TU81 fails to enter any step
            THEN print fatal device error and drop unit
        Call DUP_EXELOCAL to execute an EXECUTE LOCAL PROGRAM command
            IF Dup_exelocal returns SS_GETDUSTMO
                THEN print Get dust command timeout
            IF Dup_exelocal returns SS_NOTIDLE
                THEN print controller not in idle state
            IF Dup_exelocal returns SS$_TIMEOUT
                THEN print controller failed to return packet
            IF Dup_exelocal returns SS_EXEBADREF
                THEN print invalid command reference
            IF Dup_exelocal returns SS_NOTSUCCESS
                THEN print controller failed to return success in packet
            IF Dup_EXELOCAL returns SS_DUSTBADREF
                THEN print invalid command reference
            IF Dup_exelocal returns SS$_DEVINACT
                THEN print controller failed to enter active state
            IF Dup_exelocal returns SS_RECVTMO
                THEN print Controller failed to accept receive data command
            IF Dup_exelocal returns SS_PROGTMO
                THEN print progress indicator not updated before timeout
            IF Dup_exelocal returns SS_RECVINVMSG
                THEN print Receive data returned invalid message number
```

```


                                             IF Dup_exelocal returns SS_RECVERR2
                                                 THEN print Receive data returned internal test failed
                                                      and print the message buffer fault code and subcode.
                                                      and print refer to SAMS for fault code meanings.
                                             IF Dup_exelocal returns SS_RECVMSG3
                                                 THEN print contents of receive data message buffer (not an error)

                                             IF Dup_exelocal returns SS_SAERR
                                                 THEN print controller error while in execute local program
                                     ENDTEST


                                  DEBUG:

                                        If loop on error specified then loop to start of test.
                                        The FRU is lesi Adapter for initialize errors
                                        or the TU81 controller/server for all other errors.
                                @
                                .TITLE PROGRAM HEADER AND TABLES
                                .SBTTL  PROGRAM HEADER

000000                                  .ENABL  ABS,AMA
        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  CZTU2,A,0,120.,0,PRI00
002000                          L$NAME::                ;DIAGNOSTIC NAME
002000     103                          .ASCII /C/
002001     132                          .ASCII /Z/
002002     124                          .ASCII /T/
002003     125                          .ASCII /U/
002004     062                          .ASCII /2/
002005     000                          .BYTE   0
002006     000                          .BYTE   0
002007     000                          .BYTE   0
002010                          L$REV::                 ;REVISION LEVEL
002010     101                          .ASCII  /A/
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  043110                          .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  002224                          .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$PRIO::                        ;DIAGNOSTIC RUN PRIORITY
        002042  000000                          .WORD   PRIO0
        002044                          L$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$DEVP::                        ; POINTER TO DEVICE TYPE LIST
        002060  022766                          .WORD   L$DVTYP
        002062                          L$REPP::                        ;PTR. TO REPORT CODE
        002062  000000G                         .WORD   L$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  033774                          .WORD   L$DU
        002074                          L$LUN::                         ;LUN FOR EXERCISERS TO FILL
        002074  000000                          .WORD   0
        002076                          L$DESP::                        ;POINTER TO DIAG. DESCRIPTION
        002076  002156                          .WORD   L$DESC
        002100                          L$LOAD::                        ;GENERATE SPECIAL AUTOLOAD EMT
        002100  104035                          EMT     E$LOAD
        002102                          L$ETP::                         ;POINTER TO ERRTBL
        002102  000000G                         .WORD   L$ERRTBL
        002104                          L$ICP::                         ;PTR. TO INIT CODE
        002104  033464                          .WORD   L$INIT
        002106                          L$CCP::                         ;PTR. TO CLEAN-UP CODE
        002106  033744                          .WORD   L$CLEAN
        002110                          L$ACP::                         ;PTR. TO AUTO CODE
```

```
     002110  000000G                 .WORD   L$AUTO
     002112                  L$PRT::                 ;PTR. TO PROTECT TABLE
     002112  022760                  .WORD   L$PROT
     002114                  L$TEST::                ;TEST NUMBER
     002114  000000                  .WORD   0
     002116                  L$DLY::                 ;DELAY COUNT
     002116  000000                  .WORD   0
     002120                  L$HIME::                ;PTR. TO HIGH MEM
     002120  000000                  .WORD   0
```

```
                                .SBTTL  DISPATCH TABLE

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

002122                                  DISPATCH 13.
002122  000015                          .WORD   13
002124                          L$DISPATCH::
002124  034016                          .WORD   T1
002126  034514                          .WORD   T2
002130  034744                          .WORD   T3
002132  035362                          .WORD   T4
002134  036124                          .WORD   T5
002136  037256                          .WORD   T6
002140  040702                          .WORD   T7
002142  041444                          .WORD   T8
002144  042206                          .WORD   T9
002146  042270                          .WORD   T10
002150  042452                          .WORD   T11
002152  042574                          .WORD   T12
002154  042716                          .WORD   T13


002156                                  DESCRIPT        <CZTU2A0 TU81 FUNCTIONAL DIAGNOSTIC>
002156                          L$DESC::
002156     103     132     124          .ASCIZ  /CZTU2A0 TU81 FUNCTIONAL DIAGNOSTIC/
                                        .EVEN

```

```
                                   .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.
                                   ;--

002222                                     BGNHW   DFPTBL
002222  000003                             .WORD   L10000-L$HW/2
002224                             L$HW::
002224                             DFPTBL::

002224  174500                             .WORD   174500          ;TUIP BASE ADDRESS
002226  000260                             .WORD   260             ;VECTOR
002230  000000                             .WORD   0               ;T/MSCP UNIT NUMBER
002232                                     ENDHW
002232                             L10000:
 1056                               .SBTTL  SOFTWARE P-TABLE
 1057
 1058                               ;++
 1059                               ; THE SOFTWARE P-TABLE CONTAINS THE VALUES OF THE PROGRAM
 1060                               ; PARAMETERS THAT CAN BE CHANGED BY THE OPERATOR.
 1061                               ;--
 1062
 1063 002232                                BGNSW   SFPTBL
      002232  000000                        .WORD   L10001-L$SW/2
      002234                        L$SW::
      002234                        SFPTBL::
 1064
 1071
 1072 002234                                ENDSW
      002234                        L10001:
 1073
 1074 002234                                ENDMOD
 1086                               .TITLE GLOBAL AREAS
 1087                               .SBTTL  GLOBAL EQUATES SECTION
 1115
 1116
 1117 002234                                BGNMOD
 1118
 1119                               ;++
 1120                               ; THE GLOBAL EQUATES SECTION CONTAINS PROGRAM EQUATES THAT
 1121                               ; ARE USED IN MORE THAN ONE TEST.
 1122                               ;--
 1123
 1124 002234                                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                  PRI07== 340
        000300                  PRI06== 300
        000240                  PRI05== 240
        000200                  PRI04== 200
        000140                  PRI03== 140
        000100                  PRI02== 100
        000040                  PRI01== 40
        000000                  PRI00== 0
                                ;
                                ;OPERATOR FLAG BITS
                                ;
        000004                  EVL==        4
        000010                  LOT==       10
        000020                  ADR==       20
        000040                  IDU==       40
        000100                  ISR==      100
        000200                  UAM==      200
        000400                  BOE==      400
        001000                  PNT==     1000
        002000                  PRI==     2000
        004000                  IXE==     4000
        010000                  IBE==    10000
        020000                  IER==    20000
        040000                  LOE==    40000
        100000                  HOE==   100000
```

```
                        ;;***************************************************************
                        ;;***************************************************************
                        ;
                        ;LUN_BLOCK OFFSETS
                        ;       THESE LITERALS ARE USED AS WORD OFFSETS INTO THE LUNBLK, WHICH
                        ;       IS POINTED TO THROUGHOUT THE PROGRAM BY R4.
                        ;
                        ;;***************************************************************
                        ;;***************************************************************

000000                  TUIP    ==      0               ;TUIP REGISTER ADDRESS
000002                  TUSA    ==      2               ;TUSA REGISTER ADDRESS
000004                  TUVEC   ==      4               ;TU INTERRUPT VECTOR
000006                  MSCPUN  ==      6               ;T/MSCP UNIT NUMBER
000010                  TUIPSV  ==      10              ;SAVE LOCATION FOR IP CONTENTS
000012                  TUSASV  ==      12              ;SAVE LOCATION FOR SA CONTENTS
000014                  LUNFLG  ==      14              ;BIT-SPECIFIC MEANINGS AS DEFINED BELOW


                        ;;***************************************************************
                        ;;***************************************************************
                        ;
                        ;LUNFLG
                        ;       THIS WORD IN LUNBLK IS USED TO CONVEY VARIOUS INFORMATION
                        ;       IN A BIT-SPECIFIC MANNER.  BITS USED BY THE PROGRAM ARE
                        ;       DEFINED AS FOLLOWS.
                        ;
                        ;;***************************************************************
                        ;;***************************************************************

000001                  DRPFLG  ==      BIT0            ;=0 UUT AVAILABLE FOR TEST
                                                        ;=1 UUT HAS BEEN DROPPED
000002                  INTFLG  ==      BIT1            ;=1 EXPECTED INTERRUPT OCCURRED

000004                  BRFLAG  ==      BIT2            ;=1 INTERRUPT PRIORITY TEST

000010                  TEST.9  ==      BIT3            ;=1 TEST 9 FLAG

000020                  DONEFL  ==      BIT4            ;=1 INTERNAL DRIVE TEST DONE
```

```
                                        ;;*************************************************************
                                        ;;*************************************************************
                                        ;
                                        ;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.
000003                  CNTRLC  ==      3       ;CONTROL C (ASCII)
000014                  DISCAC  ==      14      ;BIT POSITIONS 2 AND 3 DISABLE CACHE IN CCR
177560                  RCSR    ==      177560  ;TERMINAL RECEIVE CONTROL/STATUS REGISTER ADDRESS
177562                  RBUF    ==      177562  ;TERMINAL RECEIVE BUFFER ADDRESS
177746                  CCR     ==      177746  ;CACHE CONTROL REGISTER ADDRESS
```

```
                                        ;;*****************************************************************
                                        ;;*****************************************************************
                                        ;
                                        ;MEMORY MANAGEMENT EQUATES
                                        ;
                                        ;;*****************************************************************
                                        ;;*****************************************************************

             177572                     MMUSR0  ==      177572  ;STATUS REG 0
             177574                     MMUSR1  ==      177574
             177576                     MMUSR2  ==      177576
             172516                     MMUSR3  ==      172516  ;SHOULD ONLY BE PRESENT ON 22 BIT CPU'S

             172340                     KPAR0   ==      172340  ;KERNEL MODE PAGE ADDRESS REG 0
             172342                     KPAR1   ==      172342
             172344                     KPAR2   ==      172344
             172346                     KPAR3   ==      172346
             172350                     KPAR4   ==      172350
             172352                     KPAR5   ==      172352
             172354                     KPAR6   ==      172354
             172356                     KPAR7   ==      172356  ;ALWAYS FOR I/O PAGE

             172300                     KPDR0   ==      172300  ;KERNEL MODE PAGE DESCRIPTOR REG 0
             172302                     KPDR1   ==      172302
             172304                     KPDR2   ==      172304
             172306                     KPDR3   ==      172306
             172310                     KPDR4   ==      172310
             172312                     KPDR5   ==      172312
             172314                     KPDR6   ==      172314
             172316                     KPDR7   ==      172316

             000001                     MMON    ==      BIT0    ;ENABLE MMU - MMUSR0
             000020                     MM22ON  ==      BIT4    ;ENABLE 22 BIT MMU - MMUSR3

```

```
                                   ;;*****************************************************************
                                   ;;*****************************************************************
                                   ;
                                   ;COMMAND PACKET OPCODES
                                   ;
                                   ;;*****************************************************************
                                   ;;*****************************************************************

        000001                     OP.GDS   ==      01              ;GET DUST STATUS OPCODE
        000003                     OP.ELP   ==      03              ;EXECUTE LOCAL PROGRAM OPCODE
        000005                     OP.REC   ==      05              ;RECEIVE DATA OPCODE
        000006                     OP.ABT   ==      06              ;ABORT PROGRAM OPCODE
        000200                     OP.END   ==      200             ;END MESSAGE FLAG OPCODE


                                   ;;*****************************************************************
                                   ;;*****************************************************************
                                   ;
                                   ;DUP COMMAND AND END MESSAGE OFFSETS
                                   ;
                                   ;;*****************************************************************
                                   ;;*****************************************************************

        000000                     P.CRF    ==       0              ;COMMAND REFERENCE NUMBER
        000010                     P.OPCD   ==      10              ;COMMAND OPCODE
        000012                     P.MOD    ==      12              ;COMMAND MODIFIERS
        000014                     P.BCNT   ==      14              ;BYTE COUNT
        000020                     P.BUFF   ==      20              ;BUFFER DESCRIPTOR
        000010                     P.ENDC   ==      10              ;END MESSAGE ENDCODE
        000012                     P.STS    ==      12              ;END MESSAGE STATUS
        000017                     P.FLGS   ==      17              ;END MESSAGE FLAGS
        000020                     P.IND1   ==      20              ;1ST WORD OF PROGRESS INDICATOR
        000022                     P.IND2   ==      22              ;2ND WORD OF PROGRESS INDICATOR
        000024                     P.TIMO   ==      24              ;TIMEOUT VALUE
```

```
                                ;;***************************************************************
                                ;;***************************************************************
                                ;
                                ;TUSA BIT DEFINITIONS
                                ;
                                ;;***************************************************************
                                ;;***************************************************************

          100000                ERR     ==      100000          ;ERROR
          004000                S1      ==      004000          ;STEP 1
          000001                GO      ==      000001          ;GO


                                ;;***************************************************************
                                ;;***************************************************************
                                ;
                                ;U/Q PORT LITERALS
                                ;
                                ;;***************************************************************
                                ;;***************************************************************

          100000                OWN     ==      100000          ;DESCRIPTOR OWNERSHIP BIT
          040000                FLAG    ==      040000          ;DESCRIPTOR INTERUPT FLAG BIT
          000200                IMM     ==      000200          ;IMMEDIATE COMMAND FLAG
          000010                TF.BLK  ==      10              ;TAPE FORMAT
          000000                HSTIMO  ==      0               ;HOST TIMEOUT VALUE
          000000                MSCPVR  ==      0               ;MSCP VERSION NUMBER
          000004                RNGSTP  ==       4.             ;DESCRIPTOR RING STEP
          000104                RSPSTP  ==      68.             ;RESPONCE BUFFER STEP
```

```
                                ;;**************************************************************
                                ;;**************************************************************
                                ;
                                ;TMSCP DRIVER BUFFER OFFSETS
                                ;
                                ;;**************************************************************
                                ;;**************************************************************

          000002                HIADDR  ==       2.             ;DESCRIPTOR ADDRESS OFFSET
          177777                CONID   ==      -1.             ;COMMAND/RESPONSE CONNECTION TYPE I.D.
          177776                CRD     ==      -2.             ;COMMAND/RESPONSE CREDIT LIMIT OFFSET
          177774                MSGLEN  ==      -4.             ;COMMAND/RESPONSE MESSAGE LENGTH
          000005                TXFER   ==       5.             ;ERROR FORMAT FOR "TAPE TRANSFER" ERROR LOG
          000011                DRVER   ==       9.             ;ERROR FORMAT FOR "DRIVE ERROR" ERROR LOG
          000000                CNTER   ==       0.             ;ERROR FORMAT FOR "CONTROLLER ERROR" ERROR LOG

```

```
                                        .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.
                                        ;
                                        ;;*************************************************************
                                        ;;*********  ***************************************************

 002234                                 LUNBLK::        .BLKW   15.


                                        ;;*************************************************************
                                        ;;*************************************************************
                                        ;
                                        ;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.
                                        ;
                                        ;;*************************************************************
                                        ;;*************************************************************

 002272                                 STPTBL::        .BLKW   4       ;VALUES WRITTEN TO THE PORT

 002302                                 CMPTBL::        .BLKW   4       ;COMPARISON VALUES

```

```
                                    ;;**************************************************************
                                    ;;**************************************************************
                                    ;
                                    ;PROGRAM CONTROL VARIABLES
                                    ;       THESE GLOBAL VARIABLES ARE GENERALLY USED TO CONTROL THE
                                    ;       OVERALL EXECUTION OF THE DIAGNOSTIC.
                                    ;
                                    ;;**************************************************************
                                    ;;**************************************************************

002312  000000                      PASCNT::        .WORD   0       ;CUMULATIVE PROGRAM PASS COUNTER
002314  000000                      KTFLAG::        .WORD   0       ;=0 MEMORY MANAGEMENT NOT AVAILABLE
                                                                    ;=1 MEMORY MANAGEMENT IS AVAILABLE
002316  000000                      TRP4FG::        .WORD   0       ;=1 TRAP TO VECTOR OCCURRED
002320  000000                      PAROFF::        .WORD   0       ;USED IN TEST 7 TO STEP THROUGH UPPER MEMORY
002322  000000                      CMMERR::        .WORD   0       ;=0 NO ERROR IN COMMUNICATION AREA
                                                                    ;=1 ERROR WITHIN COMMUNICATION AREA
                                                                    ;=-1 ERROR BEYOND BOUNDS OF COMM AREA
002324  000000                      CMTBLG::        .WORD   0       ;# OF CONTIGUOUS WORDS IN ERROR IN COMM AREA
002326  000000                      CMARLG::        .WORD   0       ;LENGTH OF COMM AREA FOR TEST N
002330  000000                      FRUIS::         .WORD   0       ;POINTER TO FAULTY FRU ASCII FOR PRINTOUT
002332  000000                      LOGUNT::        .WORD   0       ;LOGICAL UNIT # OF CURRENT UUT
002334  000000                      SAEXP::         .WORD   0       ;LOADED WITH EXPECTED SA FOR ERROR CHECKING
002336  000000                      INISTP::        .WORD   0       ;CURRENT STEP OF INIT SEQUENCE
002340  000000                      STEPST::        .WORD   0       ;SUCCESS/FAIL STATUS FROM STEP SUBROUTINES
002342  000000                      WRDATA::        .WORD   0       ;LOADED WITH DATA FRO WRAP MODE TEST
002344  000000                      INNER::         .WORD   0       ;COUNTER FOR PDELAY ROUTINE
002346  000000                      OUTER::         .WORD   0       ;OTHER COUNTER FOR PDELAY
002350  000000                      TOUT::          .WORD   0       ;TIMEOUT INDICATOR FOR PDELAY
002352  000000                      TEMP::          .WORD   0       ;TEMPORARY STORAGE LOCATION
002354  000000                      ANSWER::        .WORD   0       ;LOGICAL ANSWER IN MANUAL TEST SECTION
002356  000000                      PROGRL::        .WORD   0       ;SAVE LOCATION FOR 1ST WORD OF PROGRESS INDICATOR
002360  000000                      PROGRH::        .WORD   0       ;SAVE LOCATION FOR 2ND WORD OF PROGRESS INDICATOR
002362  000000                      CPFLAG::        .WORD   0       ;CACHE PRESENT FLAG
```

```
                               ;;**************************************************************
                               ;;**************************************************************
                               ;
                               ;DUP COMMAND PACKETS
                               ;
                               ;;**************************************************************
                               ;;**************************************************************

                               ;;**************************************************************
                               ;
                               ;GET DUST STATUS COMMAND PACKET
                               ;
                               ;;**************************************************************

002364  000020                         .WORD   16.                     ;PACKET LENGTH IN BYTES
002366     020                         .BYTE   20                      ;MSGTYP = 1 (DATAGRAM); CREDITS = 0
002367     002                         .BYTE   2                       ;CONNECTION ID = 2 (DUP)
002370  000001  000000         GDUST:  .WORD   1,0                     ;COMMAND REFERENCE NUMBER = 1
002374  000000  000000                 .WORD   0,0
002400  000001  000000                 .WORD   OP.GDS,0                ;OPCODE = 1 (GET DUST STATUS)


                               ;;**************************************************************
                               ;
                               ;EXECUTE LOCAL PROGRAM COMMAND PACKET
                               ;
                               ;;**************************************************************

002404  000022                         .WORD   18.                     ;PACKET LENGTH IN BYTES
002406     020                         .BYTE   20                      ;MSGTYP = 1 (DATAGRAM); CREDITS = 0
002407     002                         .BYTE   2                       ;CONNECTION ID = 2 (DUP)
002410  000002  000000         EXELOC: .WORD   2,0                     ;COMMAND REFERENCE NUMBER = 2
002414  000000  000000                 .WORD   0,0
002420  000003  000001                 .WORD   OP.ELP,1                ;OPCODE = 3 (EXECUTE LOCAL PROGRAM)
002424     040     040     040 TSTNAM: .ASCII  /      /                ;LOCAL PROGRAM NAME (FILLED AT TEST)


                               ;;**************************************************************
                               ;
                               ;RECEIVE DATA COMMAND PACKET
                               ;
                               ;;**************************************************************

002432  000024                         .WORD   20.                     ;PACKET LENGTH IN BYTES
002434     000                         .BYTE   0                       ;MSGTYP = 0 (SEQUENTIAL); CREDITS = 0
002435     002                         .BYTE   2                       ;CONNECTION ID = 2 (DUP)
002436  000003  000000         RCVDAT: .WORD   3,0                     ;COMMAND REFERENCE NUMBER = 3
002442  000000  000000                 .WORD   0,0
002446  000005  000000                 .WORD   OP.REC,0                ;OPCODE = 5 (RECEIVE DATA)
002452  000156  000000                 .WORD   110.,0                  ;BUFFER SIZE IN BYTES
002456  060000  000000                 .WORD   RDBUF,0                 ;BUFFER ADDRESS

```

```
                                      ;;****************************************************************
                                      ;
                                      ;ABORT COMMAND PACKET
                                      ;
                                      ;;****************************************************************

     002462  000014                          .WORD   12.                      ;PACKET LENGTH IN BYTES
     002464     020                          .BYTE   20                       ;MSGTYP = 1 (DATAGRAM); CREDITS = 0
     002465     002                          .BYTE   2                        ;CONNECTION ID = 2 (DUP)
     002466  000004  000000           ABORT: .WORD   4,0                      ;COMMAND REFERENCE NUMBER = 4
     002472  000000  000000                  .WORD   0,0
     002476  000006  000000                  .WORD   OP.ABT,0                 ;OPCODE = 6 (ABORT)
```

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

002502                           RESPBF::        .BLKW   2.      ;TOP 4 LOCATIONS OF RESPONSE BUFFER
002506                           RSPBUF::        .BLKW   66.     ;DRIVER RESPONSE BUFFER


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

002712                           DSCRNG::        .BLKW   2.      ;DESCRIPTOR RING
002716                           RSPEND::                        ;END OF RESPONSE BUFFER
002716                           RSPRNG::        .BLKW   4.      ;RESPONSE DESCRIPTOR RING
002726                           CMDRNG::        .BLKW   4.      ;COMMAND DESCRIPTOR RING
002736                           DSCEND::                        ;END OF DESCRIPTOR RING


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

002736  000000                   CNTHI::         .WORD   0       ;VALUE OF THE HIGH TIMEOUT
002740  000000                   CNTFLG::        .WORD   0       ;CONTROLLER FLAGS
002742  000000                   PCKSIZ::        .WORD   0       ;PACKET SIZE IN BYTES
002744  000000                   CMDREF::        .WORD   0       ;COMMAND REFERENCE NUMBER
002746  000000                   CMDCNT::        .WORD   0       ;COMMAND COUNT
002750                           WRBUF::         .BLKW   4096.   ;WRITE BUFFER
022750  000000                   CMDSAV::        .WORD   0       ;COMMAND DESCRIPTOR SAVE
022752  000000                   RSPSAV::        .WORD   0       ;RESPONSE DESCRIPTOR SAVE


                                 ;;************************************************************
                                 ;;************************************************************
                                 ;
                                 ;MANUAL INTERVENTION INPUT DATA TABLE
                                 ;
                                 ;;************************************************************
                                 ;;************************************************************

022754                           MANTBL::        .BLKB   3       ;TWO BYTES OF INPUT, 3RD BYTE ZERO
                                                 .EVEN
```

```
  1553                                          ;;**********************************************************************
  1554                                          ;;**********************************************************************
  1555                                          ;
  1556                                          ;PROTECTION TABLE
  1557                                          ;
  1558                                          ;;**********************************************************************
  1559                                          ;;**********************************************************************
  1563
  1564 022760                                   BGNPROT
       022760                                   L$PROT::
  1565 022760  000000                                   .WORD   0
  1566 022762  177777                                   .WORD    -1
  1567 022764  177777                                   .WORD    -1
  1568
  1569 022766                                   ENDPROT
  1570
```

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


                                ;;****************************************************************
                                ;
                                ; NAMES OF DEVICES SUPPORTED BY PROGRAM
                                ;
                                ;;****************************************************************

022766                                  DEVTYP  <TU81>
022766                          L$DVTYP::
022766     124     125     070          .ASCIZ  %TU81%
                                        .EVEN
```

```

                                          ;;*****************************************************************
                                          ;
                                          ;FORMAT STATEMENTS
                                          ;
                                          ;;*****************************************************************

 022774     045     101     111  LINE1:: .ASCIZ  ?%AINIT SEQUENCE STEP Ø: %D1?
 023030     045     116     045  LINE2:: .ASCIZ  ?%N%ASA REG: %06%A EXPCTD: %06%A  ACTUAL SA: %06?
 023110     045     116     045  LINE3:: .ASCIZ  ?%N%AIP REG ADDRESS: %06?
 023140     045     116     062  LINE4:: .ASCIZ  ?%N2%A****FAILING FRU: %T%A****%N%N?
 023203     045     101     122  LINE5:: .ASCIZ  ?%ARELOCATION CONSTANT: %06%A  VIRT. ADD: %06?
 023260     045     116     045  LINE6:: .ASCIZ  ?%N%AEXPECTED: %06%A  RECEIVED: %06?
 023323     045     101     120  LINC7:: .ASCIZ  ?%APHYSICAL ADD: %06?
                                                 .EVEN

 023350     045     116     045  WR1::   .ASCIZ  ?%N%ASA REG: %06%A SA CONTENTS: %06?
                                                 .EVEN

 023414     045     116     062  PKSENT::.ASCIZ  ?%N2%APACKET SENT:?
 023436     045     116     045  CREFNO::.ASCIZ  ?%N%ACOMMAND REFERENCE NUMBER: %06?
 023500     045     116     045  OPCODE::.ASCIZ  ?%N%AOPCODE: %03?
 023520     045     116     045  MODIFY::.ASCIZ  ?%N%AMODIFIERS: %06?
 023543     045     116     045  PRGNAM::.ASCIZ  ?%N%APROGRAM NAME: %03%A %03%A %03%A %03%A %03%A %03?
 023627     045     116     045  BYTCNT::.ASCIZ  ?%N%ABYTE COUNT: %06?
 023653     045     116     045  BUFDES::.ASCIZ  ?%N%ABUFFER DESCRIPTOR: %06?
 023706     045     116     062  PKRECV::.ASCIZ  ?%N2%APACKET RECEIVED:?
 023734     045     116     045  ENCODE::.ASCIZ  ?%N%AENDCODE: %03?
 023755     045     116     045  STATUS::.ASCIZ  ?%N%ASTATUS: %06?
 023775     045     116     045  PRGVER::.ASCIZ  ?%N%APROGRAM VERSION: %06?
 024026     045     116     045  TIMOUT::.ASCIZ  ?%N%ATIMEOUT: %03?
 024047     045     116     045  FLAGS:: .ASCIZ  ?%N%AFLAGS: %03?
 024066     045     116     045  FAULTC::.ASCIZ  ?%N%AFAULT CODE:       SUB-FAULT CODE:   ?
                                                 .EVEN

                                          ;;*****************************************************************
                                          ;
                                          ;ERROR MESSAGES
                                          ;
                                          ;;*****************************************************************


 024140     116     130     115  EMSG5:: .ASCIZ  ?NXM ON READ TUIP?
 024161     124     125     111  EMSG6:: .ASCIZ  ?TUIP NOT 0 ON FIRST READ?
 024212     116     130     115  EMSG7:: .ASCIZ  ?NXM ON READ TUSA?
 024233     123     101     040  EMSG8:: .ASCIZ  ?SA REG IN ERROR ON FIRST READ?
 024271     123     101     040  EMSG9:: .ASCIZ  ?SA CONTENTS IN ERROR?
 024316     123     101     040  EMSG10::.ASCIZ  ?SA WRONG IN DATA WRAP?
 024344     105     130     120  EMSG11::.ASCIZ  ?EXPECTED INTERRUPT DID NOT OCCUR?
 024405     111     116     124  EMSG12::.ASCIZ  ?INTRRPT OCCURRED WITH CPU PRIORITY = 7?
 024454     123     101     040  EMSG13::.ASCIZ  ?SA NOT 0 IN PURGE/POLL?
 024503     120     125     122  EMSG14::.ASCIZ  ?PURGE/POLL TEST FAILED?
 024532     105     130     124  EMSG15::.ASCIZ  ?EXTENDED ADDRESS TEST FAILED?
 024567     042     105     130  EMSG16::.ASCIZ  ?"EXECUTE LOCAL PROGRAM" COMMAND TIMEOUT?
 024637     042     107     105  EMSG17::.ASCIZ  ?"GET DUST STATUS" COMMAND TIMEOUT?
 024701     042     107     105  EMSG18::.ASCIZ  ?"GET DUST STATUS" COMMAND FAILURE?
 024743     042     105     130  EMSG19::.ASCIZ  ?'EXECUTE LOCAL PROGRAM" COMMAND FAILURE?
```

```
025013     042     122     105  EMSG20:::.ASCIZ  ?"RECEIVE DATA" COMMAND FAILURE?
025052     101     102     117  EMSG21:::.ASCIZ  ?ABORT COMMANDS DON'T WORK?
025104     111     116     124  EMSG22:::.ASCIZ  ?INTERNAL DRIVE TEST HUNG?
025135     111     116     126  EMSG23:::.ASCIZ  ?INVALID MESSAGE NUMBER FROM INTERNAL DRIVE TEST?
025215     111     116     124  EMSG24:::.ASCIZ  ?INTERNAL DRIVE TEST FAILED?
                                          .EVEN

025250     124     111     115  WRER1:: .ASCIZ  ?TIME OUT DURING PORT INIT?
025302     120     117     122  WRER2:: .ASCIZ  ?PORT INIT FAILED?
025323     124     115     123  WRER3:: .ASCIZ  ?TMSCP COMMAND FAILURE?
025351     120     117     122  WRER4:: .ASCIZ  ?PORT DETECTED ERROR?
025375     111     116     103  WRER5:: .ASCIZ  ?INCORRECT COMMAND REFERENCE NUMBER RECEIVED.?
025452     045     116     045  WRER6:: .ASCIZ  ?%N%AREFER TO PATHFINDER FOR EXPLANATION OF CODES.?
025534     045     116     045  WRER7:: .ASCIZ  ?%N%ARECEIVED INVALID MESSAGE NUMBER FROM INTERNAL DRIVE TEST.?
                                          .EVEN

                                ;;****************************************************************
                                ;
                                ;MISCELLANEOUS ERROR MESSAGES
                                ;
                                ;;****************************************************************

025632     114     105     123  LESI::  .ASCIZ  ?LESI ADAPTER?
025647     103     117     116  CTRL::  .ASCIZ  ?CONTROLLER/CABLE?
025670     114     105     123  LSCT::  .ASCIZ  ?LESI/CONTROLLER/CABLE?
025716     104     122     111  DRVE::  .ASCIZ  ?DRIVE?
                                          .EVEN

                                ;;****************************************************************
                                ;
                                ;MANUAL TEST MESSAGES
                                ;
                                ;;****************************************************************

025724     045     116     045  T10MS1:::.ASCIZ  \%N%ATest 10: FUNCTIONAL FAULT DETECTION TEST (Drive Resident Test #1)\
026032     045     116     062  T10MS2:::.ASCIZ  \%N2%A*** CAUTION ***\
026057     045     116     045  T10MS3:::.ASCIZ  \%N%AThis test will destroy the data on tape.\
026134     045     116     045  T10MS4:::.ASCIZ  \%N%AMount a scratch tape UNTENSIONED but THREADED.%N\
026221     045     116     045  T11MS1:::.ASCIZ  \%N%ATest 11: TENSION FAULT ISOLATION TEST (Drive Resident Test #2)\
026324     045     116     045  T12MS1:::.ASCIZ  \%N%ATest 12: VELOCITY FAULT ISOLATION TEST (Drive Resident Test #3)\
026430     045     116     045  T13MS1:::.ASCIZ  \%N%ATest 13: SELECT A DRIVE RESIDENT TEST (Drive Resident Tests 1-99)\
026536     045     116     062  MMSG::.ASCIZ     \%N2%A*** REFER TO PATHFINDER FOR TEST REQUIREMENTS BEFORE PROCEDING ***\
026646     105     156     164  SELTST:::.ASCIZ  \Enter drive resident test number (1-99)\
026716     111     163     040  QUESTN:::.ASCIZ  \Is the drive ready (To bypass this test hit return)\
                                          .EVEN
```

```
  1705                                          .SBTTL  GLOBAL ERROR REPORT SECTION
  1709                                          ;;****************************************************************
  1710                                          ;;****************************************************************
  1711                                          ;
  1712                                          ;GLOBAL ERROR REPORTS
  1713                                          ;       THE GLOBAL ERROR REPORT SECTION CONTAINS THE PRINTB
  1714                                          ;       AND PRINTX CALLS THAT ARE USED IN MORE THAN ONE TEST.
  1715                                          ;       IT ALSO INCLUDES THE ASCII MESSAGES THAT ARE USED BY
  1716                                          ;       THE PRINTB AND PRINTX CALLS.
  1717                                          ;
  1718                                          ;;****************************************************************
  1719                                          ;;****************************************************************
  1723
  1724 027002                                           BGNMSG
  1725
  1726 027002                                   PRIINI::
  1727 027002                                           PRINTX  #LINE1,INISTP
       027002  013746  002336                           MOV     INISTP,-(SP)
       027006  012746  022774                           MOV     #LINE1,-(SP)
       027012  012746  000002                           MOV     #2,-(SP)
       027016  010600                                   MOV     SP,R0
       027020  104415                                   TRAP    C$PNTX
       027022  062706  000006                           ADD     #6,SP
  1728
  1729 027026                                   PRISA::
  1730 027026                                           PRINTX  #LINE2,TUSA(R4),SAEXP,TUSASV(R4)
       027026  016446  000012                           MOV     TUSASV(R4),-(SP)
       027032  013746  002334                           MOV     SAEXP,-(SP)
       027036  016446  000002                           MOV     TUSA(R4),-(SP)
       027042  012746  023030                           MOV     #LINE2,-(SP)
       027046  012746  000004                           MOV     #4,-(SP)
       027052  010600                                   MOV     SP,R0
       027054  104415                                   TRAP    C$PNTX
       027056  062706  000012                           ADD     #12,SP
  1731 027062  000137  030624                           JMP     FRUERR
  1732
  1733 027066                                   PRIPAD::
  1734 027066                                           PRINTX  #LINE7,R2
       027066  010246                                   MOV     R2,-(SP)
       027070  012746  023323                           MOV     #LINE7,-(SP)
       027074  012746  000002                           MOV     #2,-(SP)
       027100  010600                                   MOV     SP,R0
       027102  104415                                   TRAP    C$PNTX
       027104  062706  000006                           ADD     #6,SP
  1735 027110  000137  027142                           JMP     PRIDAT
  1736
  1737 027114                                   PRIVAD::
  1738 027114                                           PRINTX  #LINE5,KPAR3,R2
       027114  010246                                   MOV     R2,-(SP)
       027116  013746  172346                           MOV     KPAR3,-(SP)
       027122  012746  023203                           MOV     #LINE5,-(SP)
       027126  012746  000003                           MOV     #3,-(SP)
       027132  010600                                   MOV     SP,R0
       027134  104415                                   TRAP    C$PNTX
       027136  062706  000010                           ADD     #10,SP
  1739
  1740 027142                                   PRIDAT::
```

```
 027142                                  PRINTX  #LINE6,R1,(R2)
 027142  011246                          MOV     (R2),-(SP)
 027144  010146                          MOV     R1,-(SP)
 027146  012746  023260                  MOV     #LINE6,-(SP)
 027152  012746  000003                  MOV     #3,-(SP)
 027156  010600                          MOV     SP,R0
 027160  104415                          TRAP    C$PNTX
 027162  062706  000010                  ADD     #10,SP
 027166  000137  030624                  JMP     FRUERR

 027172                          PRIIP::
 027172                                  PRINTX  #LINE3,TUIP(R4)
 027172  016446  000000                  MOV     TUIP(R4),-(SP)
 027176  012746  023110                  MOV     #LINE3,-(SP)
 027202  012746  000002                  MOV     #2,-(SP)
 027206  010600                          MOV     SP,R0
 027210  104415                          TRAP    C$PNTX
 027212  062706  000006                  ADD     #6,SP
 027216  000137  030624                  JMP     FRUERR

 027222                          PRIERR::
 027222  000137  030624                  JMP     FRUERR


 027226                          WRINTO::
 027226                                  PRINTX  #LINE1,INISTP
 027226  013746  002336                  MOV     INISTP,-(SP)
 027232  012746  022774                  MOV     #LINE1,-(SP)
 027236  012746  000002                  MOV     #2,-(SP)
 027242  010600                          MOV     SP,R0
 027244  104415                          TRAP    C$PNTX
 027246  062706  000006                  ADD     #6,SP

 027252                          WRPRTE::
 027252                                  PRINTX  #WR1,TUSA(R4),TUSASV(R4)
 027252  016446  000012                  MOV     TUSASV(R4),-(SP)
 027256  016446  000002                  MOV     TUSA(R4),-(SP)
 027262  012746  023350                  MOV     #WR1,-(SP)
 027266  012746  000003                  MOV     #3,-(SP)
 027272  010600                          MOV     SP,R0
 027274  104415                          TRAP    C$PNTX
 027276  062706  000010                  ADD     #10,SP
 027302  000137  030624                  JMP     FRUERR

 027306                          ELPERR::                                               ;COMMAND/RESPONSE PACKET PRINTOUT
 027306                                  PRINTB  #PKSENT
 027306  012746  023414                  MOV     #PKSENT,-(SP)
 027312  012746  000001                  MOV     #1,-(SP)
 027316  010600                          MOV     SP,R0
 027320  104414                          TRAP    C$PNTB
 027322  062706  000004                  ADD     #4,SP
 027326                                  PRINTB  #CREFNO,(R5)
 027326  011546                          MOV     (R5),-(SP)
 027330  012746  023436                  MOV     #CREFNO,-(SP)
 027334  012746  000002                  MOV     #2,-(SP)
 027340  010600                          MOV     SP,R0
 027342  104414                          TRAP    C$PNTB
```

```
     027344  062706  000006                  ADD     #6,SP
1762 027350                                  PRINTB  #OPCODE,<B,10(R5)>
     027350  005046                          CLR     -(SP)
     027352  156516  000010                  BISB    10(R5),(SP)
     027356  012746  023500                  MOV     #OPCODE,-(SP)
     027362  012746  000002                  MOV     #2,-(SP)
     027366  010600                          MOV     SP,R0
     027370  104414                          TRAP    C$PNTB
     027372  062706  000006                  ADD     #6,SP
1763 027376                                  PRINTB  #MODIFY,12(R5)
     027376  016546  000012                  MOV     12(R5),-(SP)
     027402  012746  023520                  MOV     #MODIFY,-(SP)
     027406  012746  000002                  MOV     #2,-(SP)
     027412  010600                          MOV     SP,R0
     027414  104414                          TRAP    C$PNTB
     027416  062706  000006                  ADD     #6,SP
1764 027422                                  PRINTB  #PRGNAM,<B,14(R5)>,<B,15(R5)>,<B,16(R5)>,<B,17(R5)>,<B,20(R5)>,<B,21(R5)>
     027422  005046                          CLR     -(SP)
     027424  156516  000021                  BISB    21(R5),(SP)
     027430  005046                          CLR     -(SP)
     027432  156516  000020                  BISB    20(R5),(SP)
     027436  005046                          CLR     -(SP)
     027440  156516  000017                  BISB    17(R5),(SP)
     027444  005046                          CLR     -(SP)
     027446  156516  000016                  BISB    16(R5),(SP)
     027452  005046                          CLR     -(SP)
     027454  156516  000015                  BISB    15(R5),(SP)
     027460  005046                          CLR     -(SP)
     027462  156516  000014                  BISB    14(R5),(SP)
     027466  012746  023543                  MOV     #PRGNAM,-(SP)
     027472  012746  000007                  MOV     #7,-(SP)
     027476  010600                          MOV     SP,R0
     027500  104414                          TRAP    C$PNTB
     027502  062706  000020                  ADD     #20,SP
1765 027506                                  PRINTB  #PKRECV
     027506  012746  023706                  MOV     #PKRECV,-(SP)
     027512  012746  000001                  MOV     #1,-(SP)
     027516  010600                          MOV     SP,R0
     027520  104414                          TRAP    C$PNTB
     027522  062706  000004                  ADD     #4,SP
1766 027526                                  PRINTB  #CREFNO,(R3)
     027526  011346                          MOV     (R3),-(SP)
     027530  012746  023436                  MOV     #CREFNO,-(SP)
     027534  012746  000002                  MOV     #2,-(SP)
     027540  010600                          MOV     SP,R0
     027542  104414                          TRAP    C$PNTB
     027544  062706  000006                  ADD     #6,SP
1767 027550                                  PRINTB  #ENCODE,<B,10(R3)>
     027550  005046                          CLR     -(SP)
     027552  156316  000010                  BISB    10(R3),(SP)
     027556  012746  023734                  MOV     #ENCODE,-(SP)
     027562  012746  000002                  MOV     #2,-(SP)
     027566  010600                          MOV     SP,R0
     027570  104414                          TRAP    C$PNTB
     027572  062706  000006                  ADD     #6,SP
1768 027576                                  PRINTB  #STATUS,12(R3)
     027576  016346  000012                  MOV     12(R3), (SP)
```

```
        027602  012746  023755                  MOV     #STATUS,-(SP)
        027606  012746  000002                  MOV     #2,-(SP)
        027612  010600                          MOV     SP,R0
        027614  104414                          TRAP    C$PNTB
        027616  062706  000006                  ADD     #6,SP
   1769 027622                                  PRINTB  #PRGVER,14(R3)
        027622  016346  000014                  MOV     14(R3),-(SP)
        027626  012746  023775                  MOV     #PRGVER,-(SP)
        027632  012746  000002                  MOV     #2,-(SP)
        027636  010600                          MOV     SP,R0
        027640  104414                          TRAP    C$PNTB
        027642  062706  000006                  ADD     #6,SP
   1770 027646                                  PRINTB  #TIMOUT,<B,15(R3)>
        027646  005046                          CLR     -(SP)
        027650  156316  000015                  BISB    15(R3),(SP)
        027654  012746  024026                  MOV     #TIMOUT,-(SP)
        027660  012746  000002                  MOV     #2,-(SP)
        027664  010600                          MOV     SP,R0
        027666  104414                          TRAP    C$PNTB
        027670  062706  000006                  ADD     #6,SP
   1771 027674                                  PRINTB  #FLAGS,<B,16(R3)>
        027674  005046                          CLR     -(SP)
        027676  156316  000016                  BISB    16(R3),(SP)
        027702  012746  024047                  MOV     #FLAGS,-(SP)
        027706  012746  000002                  MOV     #2,-(SP)
        027712  010600                          MOV     SP,R0
        027714  104414                          TRAP    C$PNTB
        027716  062706  000006                  ADD     #6,SP
   1772 027722  000137  030624                  JMP     FRUERR
   1773
   1774 027726                          RCVERR::                                        ;COMMAND/RESPONSE PACKET PRINTOUT
   1775 027726                                  PRINTB  #PKSENT
        027726  012746  023414                  MOV     #PKSENT,-(SP)
        027732  012746  000001                  MOV     #1,-(SP)
        027736  010600                          MOV     SP,R0
        027740  104414                          TRAP    C$PNTB
        027742  062706  000004                  ADD     #4,SP
   1776 027746                                  PRINTB  #CREFNO,(R5)
        027746  011546                          MOV     (R5),-(SP)
        027750  012746  023436                  MOV     #CREFNO,-(SP)
        027754  012746  000002                  MOV     #2,-(SP)
        027760  010600                          MOV     SP,R0
        027762  104414                          TRAP    C$PNTB
        027764  062706  000006                  ADD     #6,SP
   1777 027770                                  PRINTB  #OPCODE,<B,10(R5)>
        027770  005046                          CLR     -(SP)
        027772  156516  000010                  BISB    10(R5),(SP)
        027776  012746  023500                  MOV     #OPCODE,-(SP)
        030002  012746  000002                  MOV     #2,-(SP)
        030006  010600                          MOV     SP,R0
        030010  104414                          TRAP    C$PNTB
        030012  062706  000006                  ADD     #6,SP
   1778 030016                                  PRINTB  #MODIFY,12(R5)
        030016  016546  000012                  MOV     12(R5),-(SP)
        030022  012746  023520                  MOV     #MODIFY,-(SP)
        030026  012746  000002                  MOV     #2,-(SP)
        030032  010600                          MOV     SP,R0
```

```
      030034  104414                        TRAP    C$PNTB
      030036  062706  000006                ADD     #6,SP
 1779 030042                                PRINTB  #BYTCNT,14(R5)
      030042  016546  000014                MOV     14(R5),-(SP)
      030046  012746  023627                MOV     #BYTCNT,-(SP)
      030052  012746  000002                MOV     #2,-(SP)
      030056  010600                        MOV     SP,R0
      030060  104414                        TRAP    C$PNTB
      030062  062706  000006                ADD     #6,SP
 1780 030066                                PRINTB  #BUFDES,20(R5)
      030066  016546  000020                MOV     20(R5),-(SP)
      030072  012746  023653                MOV     #BUFDES,-(SP)
      030076  012746  000002                MOV     #2,-(SP)
      030102  010600                        MOV     SP,R0
      030104  104414                        TRAP    C$PNTB
      030106  062706  000006                ADD     #6,SP
 1781 030112                                PRINTB  #PKRECV
      030112  012746  023706                MOV     #PKRECV,-(SP)
      030116  012746  000001                MOV     #1,-(SP)
      030122  010600                        MOV     SP,R0
      030124  104414                        TRAP    C$PNTB
      030126  062706  000004                ADD     #4,SP
 1782 030132                                PRINTB  #CREFNO,(R3)
      030132  011346                        MOV     (R3),-(SP)
      030134  012746  023436                MOV     #CREFNO,-(SP)
      030140  012746  000002                MOV     #2,-(SP)
      030144  010600                        MOV     SP,R0
      030146  104414                        TRAP    C$PNTB
      030150  062706  000006                ADD     #6,SP
 1783 030154                                PRINTB  #ENCODE,<B,10(R3)>
      030154  005046                        CLR     -(SP)
      030156  156316  000010                BISB    10(R3),(SP)
      030162  012746  023734                MOV     #ENCODE,-(SP)
      030166  012746  000002                MOV     #2,-(SP)
      030172  010600                        MOV     SP,R0
      030174  104414                        TRAP    C$PNTB
      030176  062706  000006                ADD     #6,SP
 1784 030202                                PRINTB  #STATUS,12(R3)
      030202  016346  000012                MOV     12(R3),-(SP)
      030206  012746  023755                MOV     #STATUS,-(SP)
      030212  012746  000002                MOV     #2,-(SP)
      030216  010600                        MOV     SP,R0
      030220  104414                        TRAP    C$PNTB
      030222  062706  000006                ADD     #6,SP
 1785 030226                                PRINTB  #BYTCNT,14(R3)
      030226  016346  000014                MOV     14(R3),-(SP)
      030232  012746  023627                MOV     #BYTCNT,-(SP)
      030236  012746  000002                MOV     #2,-(SP)
      030242  010600                        MOV     SP,R0
      030244  104414                        TRAP    C$PNTB
      030246  062706  000006                ADD     #6,SP
 1786 030252  000137  030624                JMP     FRUERR
 1787
 1788 030256                        GDSERR::                                            ;COMMAND/RESPONSE PACKET PRINTOUT
 1789 030256                                PRINTB  #PKSENT
      030256  012746  023414                MOV     #PKSENT,-(SP)
      030262  012746  000001                MOV     #1,-(SP)
```

```
        030266  010600                          MOV     SP,R0
        030270  104414                          TRAP    C$PNTB
        030272  062706  000004                  ADD     #4,SP
   1790 030276                                  PRINTB  #CREFNO,(R5)
        030276  011546                          MOV     (R5),-(SP)
        030300  012746  023436                  MOV     #CREFNO,-(SP)
        030304  012746  000002                  MOV     #2,-(SP)
        030310  010600                          MOV     SP,R0
        030312  104414                          TRAP    C$PNTB
        030314  062706  000006                  ADD     #6,SP
   1791 030320                                  PRINTB  #OPCODE,<B,10(R5)>
        030320  005046                          CLR     -(SP)
        030322  156516  000010                  BISB    10(R5),(SP)
        030326  012746  023500                  MOV     #OPCODE,-(SP)
        030332  012746  000002                  MOV     #2,-(SP)
        030336  010600                          MOV     SP,R0
        030340  104414                          TRAP    C$PNTB
        030342  062706  000006                  ADD     #6,SP
   1792 030346                                  PRINTB  #MODIFY,12(R5)
        030346  016546  000012                  MOV     12(R5),-(SP)
        030352  012746  023520                  MOV     #MODIFY,-(SP)
        030356  012746  000002                  MOV     #2,-(SP)
        030362  010600                          MOV     SP,R0
        030364  104414                          TRAP    C$PNTB
        030366  062706  000006                  ADD     #6,SP
   1793 030372                                  PRINTB  #PKRECV
        030372  012746  023706                  MOV     #PKRECV,-(SP)
        030376  012746  000001                  MOV     #1,-(SP)
        030402  010600                          MOV     SP,R0
        030404  104414                          TRAP    C$PNTB
        030406  062706  000004                  ADD     #4,SP
   1794 030412                                  PRINTB  #CREFNO,(R3)
        030412  011346                          MOV     (R3),-(SP)
        030414  012746  023436                  MOV     #CREFNO,-(SP)
        030420  012746  000002                  MOV     #2,-(SP)
        030424  010600                          MOV     SP,R0
        030426  104414                          TRAP    C$PNTB
        030430  062706  000006                  ADD     #6,SP
   1795 030434                                  PRINTB  #ENCODE,<B,10(R3)>
        030434  005046                          CLR     -(SP)
        030436  156316  000010                  BISB    10(R3),(SP)
        030442  012746  023734                  MOV     #ENCODE,-(SP)
        030446  012746  000002                  MOV     #2,-(SP)
        030452  010600                          MOV     SP,R0
        030454  104414                          TRAP    C$PNTB
        030456  062706  000006                  ADD     #6,SP
   1796 030462                                  PRINTB  #STATUS,12(R3)
        030462  016346  000012                  MOV     12(R3),-(SP)
        030466  012746  023755                  MOV     #STATUS,-(SP)
        030472  012746  000002                  MOV     #2,-(SP)
        030476  010600                          MOV     SP,R0
        030500  104414                          TRAP    C$PNTB
        030502  062706  000006                  ADD     #6,SP
   1797 030506                                  PRINTB  #FLAGS,<B,17(R3)>
        030506  005046                          CLR     -(SP)
        030510  156316  000017                  BISB    17(R3),(SP)
        030514  012746  024047                  MOV     #FLAGS,-(SP)
```

```
      030520  012746  000002                    MOV     #2,-(SP)
      030524  010600                            MOV     SP,R0
      030526  104414                            TRAP    C$PNTB
      030530  062706  000006                    ADD     #6,SP
 1798 030534  000137  030624                    JMP     FRUERR
 1799
 1800 030540                            INTMSG::
 1801 030540                                    PRINTB  #FAULTC
      030540  012746  024066                    MOV     #FAULTC,-(SP)
      030544  012746  000001                    MOV     #1,-(SP)
      030550  010600                            MOV     SP,R0
      030552  104414                            TRAP    C$PNTB
      030554  062706  000004                    ADD     #4,SP
 1802 030560                                    PRINTB  #WRER6
      030560  012746  025452                    MOV     #WRER6,-(SP)
      030564  012746  000001                    MOV     #1,-(SP)
      030570  010600                            MOV     SP,R0
      030572  104414                            TRAP    C$PNTB
      030574  062706  000004                    ADD     #4,SP
 1803 030600  000137  030624                    JMP     FRUERR
 1804
 1805 030604                            INVMSG::
 1806 030604                                    PRINTB  #WRER7
      030604  012746  025534                    MOV     #WRER7,-(SP)
      030610  012746  000001                    MOV     #1,-(SP)
      030614  010600                            MOV     SP,R0
      030616  104414                            TRAP    C$PNTB
      030620  062706  000004                    ADD     #4,SP
 1807
 1808
 1809 030624                            FRUERR::
 1810 030624                                    PRINTB  #LINE4,FRUIS
      030624  013746  002330                    MOV     FRUIS,-(SP)
      030630  012746  023140                    MOV     #LINE4,-(SP)
      030634  012746  000002                    MOV     #2,-(SP)
      030640  010600                            MOV     SP,R0
      030642  104414                            TRAP    C$PNTB
      030644  062706  000006                    ADD     #6,SP
 1811
 1812 030650                            PRIEX:  EXIT    MSG
      030650  000167                            .WORD   J$JMP
      030652  000000                            .WORD   L10003-2-.
 1813
 1814 030654                                    ENDMSG
      030654                            L10003:
      030654  104423                            TRAP    C$MSG
 1815
```

```
                                        .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 TRPP OCCURRED.
                                ;
                                ;;****************************************************************
                                ;;****************************************************************

030656                                  BGNSRV  TRAP4
030656                          TRAP4::

030656  005237  002316                  INC     TRP4FG          ;SET THE FLAG - TRAP OCCURRED

030662                                  ENDSRV
030662                          L10004:
030662  000002                          RTI

```

```



                                  ;;*************************************************************
                                  ;;*************************************************************
                                  ;
                                  ;INTRCV
                                  ;       THIS IS THE TU81 INTERRUPT HANDLER USED BY THE PRO-
                                  ;       GRAM WHEN INTERRUPTS HAVE BEEN ENABLED.  IF THE
                                  ;       BRFALG IS CLEAR, THE ROUTINE SETS A FLAG INDICATING
                                  ;       THE EXPECTED INTERRUPT OCCURRED.  IF BRFLAG IS SET,
                                  ;       IT INDICATES THAT PROCESOR PRIORITY WAS SET TO A
                                  ;       LEVEL THAT SHOULD HAVE INHIBITED THE INTERRUPT, SO
                                  ;       THE ROUTINE SETS AN ERROR INDICATOR.
                                  ;
                                  ;;*************************************************************
                                  ;;*************************************************************

030664                                    BGNSRV  INTRCV
030664                            INTRCV::

                                  ;       BIT     #BRFLAG,LUNFLG(R4)      ;IF NOT PRIORITY LEVEL TESTING
                                  ;       BEQ     5$                      ;  THEN SKIP AROUND
                                  ;       MOV     #DRPFLG,LUNFLG(R4)      ;  ELSE SET FAILED BIT
                                  ;       BR      EXTINT                  ;RETURN

030664  052764  000002  000014    5$:     BIS     #INTFLG,LUNFLG(R4)      ;SET THE FLAG

030672                            EXTINT:
030672                                    ENDSRV
030672                            L10005:
030672  000002                            RTI

```

```

                                       ;;***************************************************************
                                       ;;***************************************************************
                                       ;
                                       ;ILLINT
                                       ;       THIS HANDLER ROUTINE'S ADDRESS IS LOADED INTO THE
                                       ;       CURRENT UUT'S VECTOR FOR ALL TESTS THAT DO NOT EN-
                                       ;       ABLE DEVICE INTERRUPTS.
                                       ;
                                       ;;***************************************************************
                                       ;;***************************************************************

 030674                                        BGNSRV  ILLINT
 030674                                ILLINT::

 030674  052764  000001  000014                BIS     #DRPFLG,LUNFLG(R4)


 030702                                        ENDSRV
 030702                                L10006:
 030702  000002                                RTI

```

```
                                    ;;*************************************************************
                                    ;;*************************************************************
                                    ;
                                    ;CHKCAC
                                    ;       THIS ROUTINE IS USED IN THE DATA WRAP TEST TO CHECK IF
                                    ;       CACHE MEMORY IS PRESENT AND ENABLED ON THE SYSTEM BEING
                                    ;       TESTED.  IF SO, CACHE IS DISABLED BEFORE PROCEEDING
                                    ;       TO PREVENT THE TEST FROM INCORRECTLY REPORTINC AN ERROR.
                                    ;
                                    ;;*************************************************************
                                    ;;*************************************************************

030704                              CHKCAC::
030704                                      SETVEC  #VEC4,#TRAP4,#PRIO7     ;SET UP FOR POSSIBLE ILLEGAL INT
030704  012746  000000G                     MOV     #PRIO7,-(SP)
030710  012746  030656                      MOV     #TRAP4,-(SP)
030714  012746  000004                      MOV     #VEC4,-(SP)
030720  012746  000003                      MOV     #3,-(SP)
030724  104437                              TRAP    C$SVEC
030726  062706  000010                      ADD     #10,SP
030732  005037  002362                      CLR     CPFLAG                  ;CLEAR "CACHE PRESENT" FLAG
030736  005737  177746                      TST     CCR                     ;READ CACHE CONTROL REGISTER
030742  005737  002316                      TST     TRP4FG                  ;CACHE PRESENT ?
030746  001005                              BNE     10$                     ;NO, BRANCH
030750  052737  000014  177746              BIS     #DISCAC,CCR             ;DISABLE CACHE
030756  005237  002362                      INC     CPFLAG                  ;SET "CACHE PRESENT" FLAG
030762                              10$:    CLRVEC  #VEC4                   ;RESTORE VECTOR
030762  012700  000004                      MOV     #VEC4,R0
030766  104436                              TRAP    C$CVEC
030770  005037  002316                      CLR     TRP4FG                  ;MORE HOUSEKEEPING
030774  000207                              RTS     PC
```

```

                                    ;;*************************************************************
                                    ;;*************************************************************

                                    ;
                                    ;KTTEST
                                    ;       THIS SUBROUTINE IS USED BY THE INIT CODE TO
                                    ;       DETERMINE IF THE MEMORY MANAGEMENT UNIT IS
                                    ;       PRESENT.  IF SO, IT RETURNS A FLAG IN THE
                                    ;       SET STATE.  OTHERWISE THE FALG IS CLEAR IN
                                    ;       WHICH CASE TEST SEVEN IS BYPASSED.
                                    ;
                                    ;;*************************************************************
                                    ;;*************************************************************

030776                              KTTEST::
030776                                      SETVEC  #VEC4,#TRAP4,#PRI07     ;SET UP FOR POSSIBLE NXM
030776  012746  000340                      MOV     #PRI07,-(SP)
031002  012746  030656                      MOV     #TRAP4,-(SP)
031006  012746  000004                      MOV     #VEC4,-(SP)
031012  012746  000003                      MOV     #3,-(SP)
031016  104437                              TRAP    C$SVEC
031020  062706  000010                      ADD     #10,SP
031024  005737  177572                      TST     MMUSR0          ;ARE YOU THERE, MMU?
031030                                      DELAY   1               ;GIVE NXM TIMEOUT A CHANCE
031030  012727  000001                      MOV     #1,(PC)+
031034  000000                              .WORD   0
031036  013727  002116                      MOV     L$DLY,(PC)+
031042  000000                              .WORD   0
031044  005367  177772                      DEC     -6(PC)
031050  001375                              BNE     .-4
031052  005367  177756                      DEC     -22(PC)
031056  001367                              BNE     .-20

031060  005737  002316                      TST     TRP4FG          ;IF NXM OCCURRED
031064  001026                              BNE     NOKT            ;  THEN NO MMU IS PRESENT
031066  005237  002314                      INC     KTFLAG          ;  ELSE SAY WE FOUND 18 BIT SO FAR

031072  005737  172516                      TST     MMUSR3          ;NOW LOOK FOR 22 BIT MAPPING
031076                                      DELAY   1               ;GIVE NXM A CHANCE
031076  012727  000001                      MOV     #1,(PC)+
031102  000000                              .WORD   0
031104  013727  002116                      MOV     L$DLY,(PC)+
031110  000000                              .WORD   0
031112  005367  177772                      DEC     -6(PC)
031116  001375                              BNE     .-4
031120  005367  177756                      DEC     -22(PC)
031124  001367                              BNE     .-20

031126  005737  002316                      TST     TRP4FG          ;IF NXM OCCURRED
031132  001005                              BNE     KTEXT           ;  THEN 18 BIT IS ALL WE'VE GOT
031134  005237  002314                      INC     KTFLAG          ;  ELSE SAY WE'VE GOT 22 BIT
031140  000402                              BR      KTEXT           ;   AND BRANCH AROUND NEXT

031142  005037  002314              NOKT:   CLR     KTFLAG          ;NO MMU - CLEAR FLAG

031146                              KTEXT:  CLRVEC  #VEC4           ;RESTORE VECTOR
031146  012700  000004                      MOV     #VEC4,R0
```

```
         031152  104436                         TRAP    C$CVEC
    1994 031154  005037  002316                 CLR     TRP4FG          ;MORE HOUSEKEEPING
    1995 031160  000207                         RTS     PC
    1996
    1997
```

```


                                ;;*****************************************************************
                                ;;*****************************************************************
                                ;
                                ;RSTVEC
                                ;       THIS ROUTINE IS CALLED FROM VARIOUS PLACES
                                ;       IN THE PROGRAM TO SET THE UUT'S INTERRUPT
                                ;       VECTOR WITH THE ADDRESS OF A HANDLER ROUTINE
                                ;       WHICH WILL CATCH ILLEGAL DEVICE INTERRUPTS.
                                ;       SPECIFICALLY "ILLINT".  INTERRUPT PRIORITY
                                ;       IS SET TO 0.
                                ;
                                ;;**********************`******************************************
                                ;;*****************************************************************

031162                          RSTVEC::
031162                                  SETVEC  TUVEC(R4),#ILLINT,#PRIO0
031162  012746  000000                  MOV     #PRIO0,-(SP)
031166  012746  030674                  MOV     #ILLINT,-(SP)
031172  016446  000004                  MOV     TUVEC(R4),-(SP)
031176  012746  000003                  MOV     #3,-(SP)
031202  104437                          TRAP    C$SVEC
031204  062706  000010                  ADD     #10,SP

031210  000207                          RTS     PC

```

```
                                        ;;*************************************************************
                                        ;;*************************************************************
                                        ;
                                        ;VECTOR
                                        ;       THIS ROUTINE IS CALLED FROM VARIOUS PLACES
                                        ;       IN THE PROGRAM TO SET THE UUT'S VECTOR WITH
                                        ;       THE ADDRESS OF A HANDLER ROUTINE WHEN DEVICE
                                        ;       INTERRUPTS HAVE BEEN ENABLED.  THE ROUTINE HAS
                                        ;       TWO MODES OF OPERATION: WHEN BRFLAG IS CLEAR,
                                        ;       PROCESSOR PRIORITY IS SET TO ZERO, ALLOWING
                                        ;       DEVICE INTERRUPTS.  IF BRFLAG IS SET, PRIORITY
                                        ;       IS SET TO 7.  IF AN INTERRUPT OCCURS IN THIS
                                        ;       CASE, AN ERROR IS RETURNED BY THE HANDLER
                                        ;       ROUTINE, "INTRCV".
                                        ;
                                        ;;*************************************************************
                                        ;;*************************************************************
031212                                  VECTOR::
031212  032764  000004  000014                  BIT     #BRFLAG,LUNFLG(R4)      ;IF FLAG IS SET
031220  001014                                  BNE     5$                      ;  THEN SKIP TO SECOND HALF
031222                                          SETVEC  TUVEC(R4),#INTRCV,#PRIO0        ;ELSE LOW PRIORITY
031222  012746  000000                          MOV     #PRI00,-(SP)
031226  012746  030664                          MOV     #INTRCV,-(SP)
031232  016446  000004                          MOV     TUVEC(R4),-(SP)
031236  012746  000003                          MOV     #3,-(SP)
031242  104437                                  TRAP    C$SVEC
031244  062706  000010                          ADD     #10,SP
031250  000413                                  BR      EXTVEC                  ;RETURN

031252                                  5$:     SETVEC  TUVEC(R4),#INTRCV,#PRI07        ;HIGH PRIORITY
031252  012746  000340                          MOV     #PRI07,-(SP)
031256  012746  030664                          MOV     #INTRCV,-(SP)
031262  016446  000004                          MOV     TUVEC(R4),-(SP)
031266  012746  000003                          MOV     #3,-(SP)
031272  104437                                  TRAP    C$SVEC
031274  062706  000010                          ADD     #10,SP

031300  000207                          EXTVEC: RTS     PC
```

```


                                        ;;**************************************************************
                                        ;;**************************************************************
                                        ;
                                        ;PDELAY
                                        ;       THIS ROUTINE IS USED THROUGHOUT THE PROGRAM TO PROVIDE
                                        ;       A VARIABLE AMOUNT OF DELAY TIME.  THE DELAY WILL BE
                                        ;       INSTRUCTION EXECUTION TIME DEPENDENT.  TWO VALUES MUST
                                        ;       BE LOADED BY MAINLINE CODE PRIOR TO CALLING PDELAY:
                                        ;       "INNER" AND "OUTER".  IF SUFFICIENT CALLS TO PDELAY ARE
                                        ;       MADE SUCH THAT THE OUTER COUNT IS EXHAUSTED, THE ROUTINE
                                        ;       RETURNS "TOUT" EQUAL TO 1, INDICATING TIMEOUT HAS OCCURRED.
                                        ;       "INNER" SHOULD BE RE-LOADED BY MAINLINE CODE, PRIOR TO
                                        ;       CALL TO PDELAY WITHIN A TIMING LOOP.
                                        ;
                                        ;;**************************************************************
                                        ;;**************************************************************


031302                                  PDELAY::
031302  005037  002350                          CLR     TOUT            ;CLEAR TIMEOUT INDICATOR
031306  005337  002344                          DEC     INNER           ;IF COUNT NOT EXHAUSTED
031312  001373                                  BNE     PDELAY          ;  THEN KEEP LOOPING
031314  005337  002346                          DEC     OUTER           ;IF MAJOR COUNT NOT 0
031320  001002                                  BNE     PDLYEX          ;  THEN LEAVE WITH STATUS = OK
031322  005237  002350                          INC     TOUT            ;  ELSE SET TIMEOUT
031326  000207                          PDLYEX: RTS     PC


```

```
                                ;;****************************************************************
                                ;;****************************************************************
                                ;
                                ;STEP1
                                ;       THIS SUBROUTINE IS RESPONSIBLE FOR PERFORMING
                                ;       STEP 1 OF THE UQ-PORT INIT SEQUENCE.  SPECIFI-
                                ;       CALLY, IT WILL INITIALIZE THE UUT BY WRITING
                                ;       TO ITS IP REGISTER.  AFTER A BRIEF DELAY, IT
                                ;       WILL READ THE SA REGISTER TO INSURE THAT THE
                                ;       STEP 1 BIT IS SET AND THE ERROR BIT IS CLEAR.
                                ;       IT WILL THEN WRITE THE FIRST LOCATION OF THE
                                ;       STEP TABLE (SET UP BY MAINLINE CODE) TO THE
                                ;       UUT'S SA REG.  IF ALL STEPS COMPLETE SUCCESS-
                                ;       FULLY THE ROUTINE RETURNS "STEPST" CLEARED;
                                ;       OTHERWISE "STEPST" IS RETURNED INDICATING A
                                ;       FAILURE OCCURRED.
                                ;
                                ;;****************************************************************
                                ;;****************************************************************

031330                          STEP1::
031330  005037  002340                  CLR     STEPST          ;CLEAR THE STATUS INDICATOR
031334  012774  000000  000000          MOV     #0,@TUIP(R4)    ;INIT THE UUT
031342  012727  000001                  MOV     #1,(PC)+
031346  000000                          .WORD   0
031350  013727  002116                  MOV     L$DLY,(PC)+
031354  000000                          .WORD   0
031356  005367  177772                  DEC     -6(PC)
031362  001375                          BNE     .-4
031364  005367  177756                  DEC     -22(PC)
031370  001367                          BNE     .-20
031372  017464  000002  000012          MOV     @TUSA(R4),TUSASV(R4)    ;GET THE SA REG CONTENTS
031400  022764  004600  000012          CMP     #B.S1!B.DI!B.OD,TUSASV(R4)

                                                                ;IF ALL THE RIGHT BITS AREN'T SET
031406  001004                          BNE     STP1ER          ;  THEN TAKE ERROR EXIT
031410  013774  002272  000002          MOV     STPTBL,@TUSA(R4);  ELSE WRITE HOST'S STEP 1 RESPONSE
031416  000402                          BR      STP1EX          ;    AND LEAVE SHOWING SUCCESS

031420  005237  002340          STP1ER: INC     STEPST          ;SET ERROR INDICATOR

031424  000207                  STP1EX: RTS     PC
```

```
 2146                                      ;;***************************************************************
 2147                                      ;;***************************************************************
 2148                                      ;
 2149                                      ;BAKPAT
 2150                                      ;       THIS SUBROUTINE WILL FILL THE COMMUNICATION WITH AN
 2151                                      ;       ALL 1'S DATA PATTERN.  THE LENGTH OF THE AREA IN USE
 2152                                      ;       BY THE CURRENT TEST IS CONTAINED IN "CMARLG".
 2153                                      ;
 2154                                      ;;***************************************************************
 2155                                      ;;***************************************************************
 2159
 2160 031426                               BAKPAT::
 2161 031426  012702  060000                       MOV     #COMMBF,R2              ;STARTING ADDRESS OF COMM AREA
 2162                                                                              ;-20 WORDS
 2163 031432  012703  000024                       MOV     #20.,R3                 ;BUFFER LENGTH IN FRONT OF AREA
 2164 031436  006303                               ASL     R3                      ;MULTIPLIED BY 2
 2165 031440  063703  002326                       ADD     CMARLG,R3               ;ADD COMM AREA LENGTH USED
 2166 031444  012722  177777             1$:       MOV     #-1,(R2)+               ;WRITE THE DATA
 2167 031450  005303                               DEC     R3                      ;IF NOT DONE YET
 2168 031452  001374                               BNE     1$                      ;  THEN DO IT AGAIN
 2169
 2170 031454  000207                               RTS     PC
 2171
```

```


                                        ;;****************************************************************
                                        ;;****************************************************************
                                        ;
                                        ;CHKCOM
                                        ;       THIS ROUTINE IS CALLED BY TESTS DOING THE PURGE/POLL
                                        ;       CHECK   IT IS USED TO VERIFY THAT THE PORT LEFT THE
                                        ;       COMMUNICATIONS AREA CLEARED.  ADDITIONALLY, IT CHECKS
                                        ;       THE 20 WORDS PRECEDING AND SUCCEEDING THE COMM AREA
                                        ;       TO MAKE SURE THE PORT DIDN'T GO OUTSIDE THE COMM AREA.
                                        ;
                                        ;;****************************************************************
                                        ;;****************************************************************

031456                                  CHKCOM::
031456  012701  177777                          MOV     #-1,R1                  ;TEST DATA
031462  012702  060000                          MOV     #COMMBF,R2              ;STARTING ADDRESS
031466  012703  000022                          MOV     #18.,R3                 ;FIRST COUNT
031472  020122                          1$:     CMP     R1,(R2)+                ;IF NOT ALL 1'S
031474  001022                                  BNE     15$                     ;  THEN GO REPORT ERROR
031476  005303                                  DEC     R3                      ;IF NOT ALL DONE
031500  001374                                  BNE     1$                      ;  THEN GO CHECK ANOTHER

031502  005001                                  CLR     R1                      ;TEST DATA FOR PRINTOUT
031504  013703  002326                          MOV     CMARLG,R3               ;SET UP COUNTER FOR COMM AREA
031510  005722                          5$      TST     (R2)+                   ;IF NOT 0
031512  001013                                  BNE     15$                     ;  THEN GO REPORT ERROR
031514  005303                                  DEC     R3                      ;IF NOT ALL DONE
031516  001374                                  BNE     5$                      ;  THEN GO CHECK ANOTHER

031520  012701  177777                          MOV     #-1,R1                  ;TEST DATA FOR PRINTOUT
031524  012703  000024                          MOV     #20.,R3                 ;SET UP COUNTER FOR POST COMM AREA
031530  020122                          10$:    CMP     R1,(R2)+                ;IF NOT ALL 1'S
031532  001003                                  BNE     15$                     ;  THEN GO REPORT ERROR
031534  005303                                  DEC     R3                      ;IF NOT ALL DONE
031536  001374                                  BNE     10$                     ;  THEN GO CHECK ANOTHER
031540  000425                                  BR      CKCMEX                  ;  ELSE RETURN

031542  162702  000002                  15$:    SUB     #2,R2                   ;ADJUST ADDRESS FOR PRINTOUT
031546  012737  025632  002330                  MOV     #LESI,FRUIS             ;LOAD FAILING FRU
031554  022737  000010  002114                  CMP     #8.,L$TEST              ;IF IN TEST 8
031562  001405                                  BEQ     20$                     ;  THEN DO ALTERNATE PRINTOUT
031564                                          ERRDF   1,EMSG14,PRIPAD         ;"PURGE/POLL TEST FAILED"
031564  104455                                  TRAP    C$ERDF
031566  000001                                  .WORD   1
031570  024503                                  .WORD   EMSG14
031572  027066                                  .WORD   PRIPAD
031574  000404                                  BR      25$                     ;COMMON EXIT

031576                                  20$:    ERRDF   2,EMSG15,PRIVAD         ;"EXTENDED ADDRESS TEST FAILED"
031576  104455                                  TRAP    C$ERDF
031600  000002                                  .WORD   2
031602  024532                                  .WORD   EMSG15
031604  027114                                  .WORD   PRIVAD

031606                                  25$:    DODU    LOGUNT
```

```
        031606  013700  002332                  MOV     LOGUNT,R0
        031612  104451                          TRAP    C$DODU
   2228
   2229 031614  000207                  CKCMEX: RTS     PC
   2230
```

```



                                          ;;*************************************************************
                                          ;;*************************************************************
                                          ;
                                          ;INTMMU
                                          ;       THIS SUBROUTINE IS CALLED FROM TEST 8 TO INITIALIZE
                                          ;       MEMORY MANAGEMENT REGISTERS.  ALL PAR'S EXCEPT ONE
                                          ;       ARE SET UP TO MAP VIRTUAL ADDRESSES INTO THE LOWEST
                                          ;       32K OF PHYSICAL MEMORY.  KPAR7 IS SET UP TO MAP TO
                                          ;       THE I/O PAGE.  THE PAR REGISTER THAT CORRESPONDS TO
                                          ;       THE VIRTUAL ADDRESS OF THE COMMUNICATION AREA IS SET
                                          ;       UP TO POINT TO THE SECOND 32K OF PHYSICAL MEMORY.
                                          ;       ALL PDR'S ARE INITIALIZED TO THE SAME VALUE; NAMELY,
                                          ;       UPWARD EXPANDABLE, READ/WRITE ACCESS ENABLED, AND THE
                                          ;       FULL 8KBYTE PAGE IS ACCESSIBLE.
                                          ;
                                          ;;*************************************************************
                                          ;;*************************************************************

 031616                                   INTMMU::
 031616  012703  172300                           MOV     #KPDR0,R3               ;START OF PDR ADDRESS RANGE
 031622  012702  172340                           MOV     #KPAR0,R2               ;START OF PAR ADDRESS RANGE
 031626  005001                                   CLR     R1                      ;STARTING RELOCATION VALUE

 031630  010122                           1$:     MOV     R1,(R2)+                ;LOAD RELOCATION VALUE
 031632  012723  077406                           MOV     #77406,(R3)+            ;LOAD PDR
 031636  062701  000200                           ADD     #200,R1                 ;ADJUST RELOCATION VALUE
 031642  022701  002000                           CMP     #2000,R1                ;IF NOT AT THE END
 031646  001370                                   BNE     1$                      ;  THEN DO ANOTHER ONE

 031650  010137  172346                           MOV     R1,KPAR3                ;  ELSE SET THIS REG TO NEXT 32K
 031654  012737  007600  172356                   MOV     #7600,KPAR7             ;18 BIT I/O PAGE
 031662  032737  000002  002314                   BIT     #BIT1,KTFLAG            ;IF 22 BIT BUS NOT AVAILABLE
 031670  001406                                   BEQ     2$                      ;  THEN GO TURN MMU ON
 031672  012737  177600  172356                   MOV     #177600,KPAR7           ;  ELSE SET 22 BIT I/O PAGE
 031700  012737  000020  172516                   MOV     #MM22ON,MMUSR3             AND ENABLE 22 BIT MAPPING

 031706  012737  000001  177572   2$:     MOV     #MMON,MMUSR0            ;TURN ON THE WHOLE THING
 031714  000207                                   RTS     PC


 031716                                   PRTINT::
 031716  010174  000000                           MOV     R1,@TUIP(R4)            ;INITIALIZE THE DRIVE
 031722  012703  032140                           MOV     #INTTBL,R3              ;PUT THE TABLE ADDRESS INTO R3
 031726  012701  004000                           MOV     #S1,R1                  ;SET UP TO BEGIN AT STEP 1
 031732  005037  002336                           CLR     INISTP                  ;CLEAR THE STEP TRACKER
 031736  012737  000030  002736   LOOP:   MOV     #24.,CNTHI              ;SET UP THE TIME OUT COUNTER
 031744  005002                                   CLR     R2                      ;CLEAR R2
 031746  005202                           ILOOP:  INC     R2                      ;INCREMENT HI TIME OUT VALUE ?
 031750  001016                                   BNE     2$                      ;IF NOT, BRANCH
 031752  005337  002736                           DEC     CNTHI                   ;ELSE, DECREMENT LO TIMEOUT
 031756  001013                                   BNE     2$                      ;BRANCH IF NO TIME OUT
 031760  017464  000002  000012                   MOV     @TUSA(R4),TUSASV(R4)    ;SAVE THE SA FOR THE ERROR PRINTOUT
 031766                                           ERRDF   51.,WRER1,WRINTO        ;PRINT PORT INIT FAILURE
 031766  104455                                   TRAP    C$ERDF
 031770  000063                                   .WORD   51
```

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      031772  025250                          .WORD    WRER1
      031774  027226                          .WORD    WRINTO
 2293 031776                                  DODU     LOGUNT                    ;DROP THE UNIT
      031776  013700  002332                  MOV      LOGUNT,R0
      032002  104451                          TRAP     C$DODU
 2294 032004  000454                          BR       100$                      ;EXIT ROUTINE
 2295 032006  037401  000002          2$:     BIT      @TUSA(R4),R1              ;TEST FOR STEP BIT FROM DRIVE
 2296 032012  001755                          BEQ      ILOOP                     ;LOOP UNTIL SOMETHING SETS
 2297 032014  032774  100000  000002          BIT      #ERR,@TUSA(R4)            ;CHECK FOR ERROR
 2298 032022  001413                          BEQ      3$                        ;NO ERROR, KEEP GOING
 2299 032024  017464  000002  000012          MOV      @TUSA(R4),TUSASV(R4)      ;SAVE THE SA CONTENTS
 2300 032032                                  ERRDF    52.,WRER2,WRPRTE          ;PRINT ERROR
      032032  104455                          TRAP     C$ERDF
      032034  000064                          .WORD    52
      032036  025302                          .WOPD    WRER2
      032040  027252                          .WORD    WRPRTE
 2301 032042                                  DODU     LOGUNT                    ;DROP THE UNIT
      032042  013700  002332                  MOV      LOGUNT,R0
      032046  104451                          TRAP     C$DODU
 2302 032050  000432                          BR       100$                      ;EXIT ROUTINE
 2303 032052  005237  002336          3$:     INC      INISTP                    ;INCREMENT THE STEP TRACKER
 2304 032056  012374  000002                  MOV      (R3)+,@TUSA(R4)           ;WRITE WOPD FROM TABLE TO CONTROLLER
 2305 032062  006301                          ASL      R1                        ;SHIFT TO NEXT STEP
 2306 032064  100324                          BPL      LOOP                      ;IF NOT AT LAST STEP LOOP
 2307 032066  012702  002716                  MOV      #RSPRNG,R2                ;PUT THE RESPONSE DESCRIPTOR ADD IN R2
 2308 032072  012703  002506                  MOV      #RSPBUF,R3                ;PUT THE RESPONSE BUFFER ADDRESS IN R3
 2309 032076  010322                  5$:     MOV      R3,(R2)+                  ;PUT THE BUFF ADD IN THE DESCRIPTOR
 2310 032100  012722  100000                  MOV      #OWN,(R2)+                ;SET THE DESCRIPTOR TO THE CONTROLLER
 2311 032104  062703  000104                  ADD      #RSPSTP,R3                ;STEP TO THE NEXT BUFFER SLOT
 2312 032110  022703  002716                  CMP      #RSPEND,R3                ;ARE WE AT THE END OF THE BUFFER ?
 2313 032114  001370                          BNE      5$                        ;NO, KEEP GOING
 2314 032116  012737  002716  022752          MOV      #RSPRNG,RSPSAV            ;SET UP TO USE FIRST RESPONSE BUFFER
 2315 032124  012737  002726  022750          MOV      #CMDRNG,CMDSAV            ;SET UP TO USE FIRST COMMAND BUFFER
 2316 032132  005037  002744                  CLR      CMDREF                    ;SET THE COMMAND REFERENCE # TO 0
 2317 032136  000207                  100$:   RTS      PC                        ;RETURN
 2318
 2319                                 ;INIT DATA TABLE
 2320 032140  104400                  INTTBL:          .WORD    104400
 2321 032142  002716                                   .WORD    RSPRNG
 2322 032144  000000                                   .WORD    0
 2323 032146  000001                                   .WORD    GO
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032150  005064  000014          DRVTST: CLR     LUNFLG(R4)              ;CLEAR ALL FLAGS
032154  005037  002356                  CLR     PROGRL                  ;CLEAR LOW WORD OF PROGRESS INDICATOR
032160  005037  002360                  CLR     PROGRH                  ;CLEAR HIGH WORD OF PROGRESS INDICATOR
032164  012737  025647  002330          MOV     #CTRL,FRUIS             ;DEFAULT FRU IS CONTROLLER
032172  004737  031716                  JSR     PC,PRTINT               ;GO DO A PORT INIT
032176  032764  000001  000014          BIT     #DRPFLG,LUNFLG(R4)      ;IS THE DRIVE AVAILABLE
032204  001060                          BNE     100$                    ;NO, BRANCH TO EXIT
032206  012705  002410                  MOV     #EXELOC,R5              ;SET UP FOR "EXECUTE LOCAL PROGRAM"
032212  004737  032350                  JSR     PC,CLSDRV               ;GO ISSUE THE COMMAND
032216  032764  000001  000014          BIT     #DRPFLG,LUNFLG(R4)      ;IS THE DRIVE AVAILABLE
032224  001050                          BNE     100$                    ;NO, BRANCH TO EXIT
032226  012705  002436                  MOV     #RCVDAT,R5              ;SET UP FOR "RECEIVE DATA"
032232  004737  032350                  JSR     PC,CLSDRV               ;GO ISSUE THE COMMAND
032236  005001                  10$:    CLR     R1                      ;CLEAR LOW DELAY COUNTER
032240  012702  000024                  MOV     #20.,R2                 ;SET UP HIGH DELAY COUNTER
032244  032737  000200  177560  30$:    BIT     #BIT7,RCSR              ;"CONTROL C" INPUT ?
032252  001021                          BNE     50$                     ;YES, BRANCH
032254  005201                          INC     R1                      ;DELAY BETWEEN "GET DUST STATUS" COMMANDS
032256  001372                          BNE     30$
032260  005302                          DEC     R2
032262  001370                          BNE     30$
032264  012705  002370                  MOV     #GDUST,R5               ;SET UP FOR "GET DUST STATUS"
032270  004737  032350                  JSR     PC,CLSDRV               ;GO ISSUE THE COMMAND
032274  032764  000001  000014          BIT     #DRPFLG,LUNFLG(R4)      ;IS THE DRIVE AVAILABLE
032302  001021                          BNE     100$                    ;NO, BRANCH TO EXIT
032304  032764  000020  000014          BIT     #DONEFL,LUNFLG(R4)      ;INTERNAL TEST DONE ?
032312  001015                          BNE     100$                    ;YES, BRANCH TO EXIT
032314  000750                          BR      10$                     ;LOOP
032316  013705  177562          50$:    MOV     RBUF,R5                 ;GET DATA INPUT FROM KEYBOARD
032322  042705  000200                  BIC     #BIT7,R5                ;STRIP PARITY
032326  022705  000003                  CMP     #CNTRLC,R5              ;"CONTROL C" INPUT ?
032332  001344                          BNE     30$                     ;NO, BRANCH
032334  012705  002466          40$:    MOV     #ABORT,R5               ;SET UP FOR "ABORT"
032340  004737  032350                  JSR     PC,CLSDRV               ;GO ISSUE THE COMMAND
032344                                  BREAK
032344  104422                          TRAP    C$BRK
032346  000207                  100$:   RTS     PC                      ;RETURN




032350                          CLSDRV::
032350  004737  032456          1$:     JSR     PC,PRTDRV               ;GO SEND THE COMMAND
032354  032764  000001  000014          BIT     #DRPFLG,LUNFLG(R4)      ;IS THE DRIVE AVAILABLE
032362  001034                          BNE     100$                    ;GET OUT IF NOT AVAILABLE
032364  020527  002436                  CMP     R5,#RCVDAT              ;"RECEIVE DATA" COMMAND JUST ISSUED ?
032370  001431                          BEQ     100$                    ;YES, BRANCH TO EXIT
032372  004737  032556                  JSR     PC,CDRECV               ;GO CHECK FOR ANY NEW RESPONSES
032376  032764  000001  000014          BIT     #DRPFLG,LUNFLG(R4)      ;IS THE DRIVE AVAILABLE
032404  001023                          BNE     100$                    ;GET OUT IF NOT AVAILABLE
032406  004737  033042                  JSR     PC,CHKRSP               ;GO CHECK CONTENTS OF RESPONSE
032412  032764  000001  000014          BIT     #DRPFLG,LUNFLG(R4)      ;IS THE DRIVE AVAILABLE
032420  001015                          BNE     100$                    ;GET OUT IF NOT AVAILABLE
032422  022705  002436                  CMP     #RCVDAT,R5              ;WAS IT A 'RECEIVE DATA" COMMAND ?
032426  001012                          BNE     100$                    ;NO, BRANCH TO EXIT
032430  004737  033326                  JSR     PC,CHKMSG               ;GO CHECK MESSAGE FROM INTERNAL TEST
032434  032764  000001  000014          BIT     #DRPFLG,LUNFLG(R4)      ;IS THE DRIVE AVAILABLE
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032442  001004                           BNE     100$                        ;GET OUT IF NOT AVAILABLE
032444  012705  002370                   MOV     #GDUST,R5                   ;"GET DUST STAUS" PACKET ADDRESS
032450  004737  032556                   JSR     PC,CDRECV                   ;GO GET LAST RESPONSE
032454  000207                   100$:   RTS     PC                          ;RETURN




032456                           PRTDRV::
032456  013701  022750                   MOV     CMDSAV,R1                   ;SET UP COMMAND RING POINTER
032462  010511                           MOV     R5,(R1)                     ;PUT THE PACKET ADDRESS INTO THE DESCRIPTOR
032464  012761  100000  000002           MOV     #OWN,HIADDR(R1)             ;SET THE OWNERSHIP BIT OF THE DESCRIPTOR
032472  005774  000000                   TST     @TUIP(R4)                   ;READ THE IP REGISTER
032476  005774  000002                   TST     @TUSA(R4)                   ;READ THE SA REGISTER
032502  001413                           BEQ     10$                         ;BRANCH IF NO ERRORS
032504  017464  000002  000012           MOV     @TUSA(R4),TUSASV(R4)        ;SAVE THE SA FOR THE ERROR PRINTOUT
032512                                   ERRDF   53.,WRER4,WRPRTE            ;PRINT PORT DETECTED ERROR
032512  104455                           TRAP    C$ERDF
032514  000065                           .WORD   53
032516  025351                           .WORD   WRER4
032520  027252                           .WORD   WRPRTE
032522                                   DODU    LOGUNT                      ;DROP THE UNIT
032522  013700  002332                   MOV     LOGUNT,R0
032526  104451                           TRAP    C$DODU
032530  000411                           BR      100$                        ;GET OUT
032532  062701  000004           10$:    ADD     #RNGSTP,R1                  ;ADJUST RESPONCE POINTER FOR NEXT TIME
032536  022701  002736                   CMP     #DSCEND,R1                  ;ARE WE AT THE END ?
032542  001002                           BNE     15$                         ;NO, GET OUT
032544  012701  002726                   MOV     #CMDRNG,R!                  ;SET R1 TO TOP BUFFER
032550  010137  022750           15$:    MOV     R1,CMDSAV                   ;SAVE THE COMMAND RING LOCATION
032554  000207                   100$:   RTS     PC                          ;RETURN




032556                           CDRECV::
032556  004737  032670           1$:     JSR     PC,PDRECV                   ;CALL PORT DRIVER RECEIVE
032562  032764  000001  000014           BIT     #DRPFLG,LUNFLG(R4)          ;IS THE DRIVE AVAILABLE
032570  001036                           BNE     100$                        ;GET OUT IF NOT AVAILABLE
032572  032764  000020  000014           BIT     #DONEFL,LUNFLG(R4)          ;INTERNAL TEST DONE ?
032600  001016                           BNE     10$                         ;YES, BRANCH
032602  011103                           MOV     (R1),R3                     ;SET UP RESPONCE BUFFER POINTER
032604  026365  000000  000000           CMP     P.CRF(R3),P.CRF(R5)         ;IS THIS THE RESPONSE THAT IS EXPECTED ?
032612  001411                           BEQ     10$                         ;YES, BRANCH
032614  022705  002370                   CMP     #GDUST,R5                   ;WAS IT A "GET DUST STATUS" COMMAND ?
032620  001022                           BNE     100$                        ;NO, BRANCH TO EXIT
032622  012705  002436                   MOV     #RCVDAT,R5                  ;GET START OF "RECEIVE DATA" PACKET
032626  026365  000000  000000           CMP     P.CRF(R3),P.CRF(R5)         ;IS IT A "RECEIVE DATA" RESPONSE ?
032634  001014                           BNE     100$                        ;NO, BRANCH TO EXIT
032636  012761  100000  000002   10$:    MOV     #OWN,HIADDR(R1)             ;GIVE THE CONTROLLER THE RING BACK
032644  062701  000004                   ADD     #RNGSTP,R1                  ;ADJUST RESPONCE POINTER FOR NEXT TIME
032650  022701  002726                   CMP     #CMDRNG,R1                  ;ARE WE AT THE END ?
032654  001002                           BNE     15$                         ;NO, GET OUT
032656  012701  002716                   MOV     #RSPRNG,R1                  ;SET R1 TO TOP BUFFER
032662  010137  022752           15$:    MOV     R1,RSPSAV                   ;SAVE THE POINTER FOR NEXT TIME
032666  000207                   100$:   RTS     PC                          ;RETURN

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   2432
   2433
   2434 032670                                      PDRECV::
   2435 032670  013701  022752                               MOV     RSPSAV,R1               ;PUT THE RESPONSE RING SAVE IN R1
   2436 032674  012737  000005  002736      1$:      MOV     #5,CNTHI                ;SET UP THE TIME OUT COUNTER
   2437 032702  005002                               CLR     R2                      ;CLEAR R2
   2438 032704  005202                      5$:      INC     R2                      ;INCREMENT HI TIME OUT VALUE ?
   2439 032706  001026                               BNE     10$                     ;NO OVERFLOW YET, BRANCH
   2440 032710  005337  002736                       DEC     CNTHI                   ;ELSE, INCREMENT HI TIMEOUT
   2441 032714  001023                               BNE     10$                     ;KEEP GOING ,NO TIME OUT YET
   2442 032716  022705  002370                       CMP     #GDUST,R5               ;WAS IT A "GET DUST STATUS" COMMAND ?
   2443 032722  001410                               BEQ     6$                      ;YES, PRINT ERROR
   2444 032724                                       ERRDF   54.,EMSG16,FRUERR       ;"EXECUTE LOCAL PROGRAM" COMMAND TIMEOUT
        032724  104455                               TRAP    C$ERDF
        032726  000066                               .WORD   54
        032730  024567                               .WORD   EMSG16
        032732  030624                               .WORD   FRUERR
   2445 032734                                       DODU    LOGUNT                  ;GO DROP THE UNIT
        032734  013700  002332                       MOV     LOGUNT,R0
        032740  104451                               TRAP    C$DODU
   2446 032742  000436                               BR      100$                    ;GET OUT ON ERROR
   2447 032744                              6$:      ERRDF   55.,EMSG17,FRUERR       ;"GET DUST STATUS" COMMAND TIMEOUT
        032744  104455                               TRAP    C$ERDF
        032746  000067                               .WORD   55
        032750  024637                               .WORD   EMSG17
        032752  030624                               .WORD   FRUERR
   2448 032754                                       DODU    LOGUNT                  ;GO DROP THE UNIT
        032754  013700  002332                       MOV     LOGUNT,R0
        032760  104451                               TRAP    C$DODU
   2449 032762  000426                               BR      100$                    ;GET OUT ON ERROR
   2450 032764  017464  000002  000012      10$:     MOV     @TUSA(R4),TUSASV(R4)    ;GET SA CONTENTS
   2451 032772  032764  100000  000012               BIT     #BIT15,TUSASV(R4)       ;CHECK FOR SA ERROR
   2452 033000  001413                               BEQ     20$                     ;NO ERROR, BRANCH
   2453 033002  012737  025670  002330               MOV     #LSCT,FRUIS             ;LOAD FAILING FRU
   2454 033010                                       ERRDF   56.,EMSG9,WRPRTE        ;PRINT "SA CONTENTS IN ERROR" MESSAGE
        033010  104455                               TRAP    C$ERDF
        033012  000070                               .WORD   56
        033014  024271                               .WORD   EMSG9
        033016  027252                               .WORD   WRPRTE
   2455 033020                                       DODU    LOGUNT                  ;DROP THE UNIT
        033020  013700  002332                       MOV     LOGUNT,R0
        033024  104451                               TRAP    C$DODU
   2456 033026  000404                               BR      100$                    ;GET OUT ON ERROR
   2457 033030  032761  100000  000002      20$:     BIT     #OWN,HIADDR(R1)         ;IS THE SLOT SET TO US ?
   2458 033036  001322                               BNE     5$                      ;KEEP GOING TILL TIMEOUT OR SUCCESS
   2459 033040  000207                      100$:    RTS     PC                      ;RETURN
   2460
   2461
   2462
   2463
   2464 033042  026365  000000  000000      CHKRSP:  CMP     P.CRF(R3),P.CRF(R5)     ;DID COMMAND REFERENCE NUMBERS MATCH ?
   2465 033050  001003                               BNE     5$                      ;NO, BRANCH
   2466 033052  005763  000012                       TST     P.STS(R3)               ;WAS STATUS "NORMAL"?
   2467 033056  001451                               BEQ     15$                     ;YES, BRANCH
   2468 033060  022705  002410              5$:      CMP     #EXELOC,R5              ;WAS IT AN "EXEC LOC PROG" COMMAND ?
   2469 033064  001416                               BEQ     7$                      ;YES, BRANCH
   2470 033066  022705  002436                       CMP     #RCVDAT,R5              ;WAS IT A "RECEIVE DATA" COMMAND ?
```

```
 2471 033072  001423                           BEQ     8$                              ;YES, BRANCH
 2472 033074  022705  002466                   CMP     #ABORT,R5                       ;WAS IT AN "ABORT" COMMAND ?
 2473 033100  001430                           BEQ     9$                              ;YES, BRANCH
 2474 033102                           6$:     ERRDF   57.,EMSG18,GDSERR               ;PRINT "GET DUST STATUS" COMMAND FAILURE
      033102  104455                           TRAP    C$ERDF
      033104  000071                           .WORD   57
      033106  024701                           .WORD   EMSG18
      033110  030256                           .WORD   GDSERR
 2475 033112                                   DODU    LOGUNT                          ;DROP THE UNIT
      033112  013700  002332                   MOV     LOGUNT,R0
      033116  104451                           TRAP    C$DODU
 2476 033120  000501                           BR      100$                            ;GET OUT ON ERROR
 2477 033122                           7$:     ERRDF   58.,EMSG19,ELPERR               ;PRINT "EXECUTE LOCAL PROGRAM" COMMAND FAILURE
      033122  104455                           TRAP    C$ERDF
      033124  000072                           .WORD   58
      033126  024743                           .WORD   EMSG19
      033130  027306                           .WORD   ELPERR
 2478 033132                                   DODU    LOGUNT                          ;DROP THE UNIT
      033132  013700  002332                   MOV     LOGUNT,R0
      033136  104451                           TRAP    C$DODU
 2479 033140  000471                           BR      100$                            ;GET OUT ON ERROR
 2480 033142                           8$:     ERRDF   59.,EMSG20,RCVERR               ;PRINT "RECEIVE DATA" COMMAND FAILURE
      033142  104455                           TRAP    C$ERDF
      033144  000073                           .WORD   59
      033146  025013                           .WORD   EMSG20
      033150  027726                           .WORD   RCVERR
 2481 033152                                   DODU    LOGUNT                          ;DROP THE UNIT
      033152  013700  002332                   MOV     LOGUNT,R0
      033156  104451                           TRAP    C$DODU
 2482 033160  000461                           BR      100$                            ;GET OUT ON ERROR
 2483 033162                           9$:     ERRDF   60.,EMSG21,FRUERR               ;PRINT "ABORT" COMMAND FAILURE
      033162  104455                           TRAP    C$ERDF
      033164  000074                           .WORD   60
      033166  025052                           .WORD   EMSG21
      033170  030624                           .WORD   FRUERR
 2484 033172                                   DODU    LOGUNT                          ;DROP THE UNIT
      033172  013700  002332                   MOV     LOGUNT,R0
      033176  104451                           TRAP    C$DODU
 2485 033200  000451                           BR      100$                            ;GET OUT ON ERROR
 2486 033202  022705  002370           15$:    CMP     #GDUST,R5                       ;WAS IT A GET DUST STATUS COMMAND ?
 2487 033206  001046                           BNE     100$                            ;NO, BRANCH TO EXIT
 2488 033210  032764  000010  000014           BIT     #TEST.9,LUNFLG(R4)              ;ARE WE IN TEST 9 ?
 2489 033216  001411                           BEQ     20$                             ;NO, GO CHECK PROGRESS INDICATOR
 2490 033220  126327  000010  000201           CMPB    P.ENDC(R3),#201                 ;CORRECT ENDCODE ?
 2491 033226  001325                           BNE     6$                              ;NO, ERROR
 2492 033230  126327  000017  000007           CMPB    P.FLGS(R3),#7                   ;CORRECT FLAGS ?
 2493 033236  001321                           BNE     6$                              ;NO, ERROR
 2494 033240  000431                           BR      100$                            ;SUCCESS, RETURN
 2495 033242  026337  000020  002356   20$:    CMP     P.IND1(R3),PROGRL               ;CHECK LOW WORD OF PROGRESS INDICATOR
 2496 033250  003017                           BGT     50$                             ;PROGRESS BEING MADE, BRANCH
 2497 033252  026337  000022  002360           CMP     P.IND2(R3),PROGRH               ;CHECK HIGH WORD OF PROGRESS INDICATOR
 2498 033260  003013                           BGT     50$                             ;PROGRESS BEING MADE, BRANCH
 2499 033262  012737  025716  002330   30$:    MOV     #DRVE,FRUIS                     ;LOAD FAILING FRU
 2500 033270                                   ERRDF   61.,EMSG22,FRUERR               ;PRINT "INTERNAL TEST HUNG" ERROR
      033270  104455                           TRAP    C$ERDF
      033272  000075                           .WORD   61
      033274  025104                           .WORD   EMSG22
```

```
033276  030624                                  .WORD   FRUERR
033300                                          DODU    LOGUNT                  ;DROP THE UNIT
033300  013700  002332                          MOV     LOGUNT,R0
033304  104451                                  TRAP    C$DODU
033306  000406                                  BR      100$                    ;GET OUT ON ERROR
033310  016337  000020  002356  50$:            MOV     P.IND1(R3),PROGRL       ;UPDATE LOW WORD OF PROGPESS INDICATOR
033316  016337  000022  002360                  MOV     P.IND2(R3),PROGRH       ;UPDATE HIGH WORD OF PROGRESS INDICATOR
033324  000207                          100$:   RTS     PC




033326  012701  060000                  CHKMSG: MOV     #RDBUF,R1               ;GET START ADDRESS OF MESSAGE BUFFER
033332  121127  000001                          CMPB    (R1),#1                 ;NORMAL COMPLETION MESSAGE ?
033336  001446                                  BEQ     100$                    ;YES, BRANCH TO EXIT
033340  121127  000002                          CMPB    (R1),#2                 ;ERROR COMPLETION MESSAGE ?
033344  001413                                  BEQ     1$                      ;YES, BRANCH
033346  121127  000003                          CMPB    (R1),#3                 ;NORMAL COMPLETION WITH INFO. MESSAGE ?
033352  001440                                  BEQ     100$                    ;YES, BRANCH TO EXIT
033354                                          ERRDF   62.,EMSG23,INVMSG       ;INVALID MESSAGE FROM INTERNAL TEST
033354  104455                                  TRAP    C$ERDF
033356  000076                                  .WORD   62
033360  025135                                  .WORD   EMSG23
033362  030604                                  .WORD   INVMSG
033364                                          DODU    LOGUNT                  ;DROP THE UNIT
033364  013700  002332                          MOV     LOGUNT,R0
033370  104451                                  TRAP    C$DODU
033372  000430                                  BR      100$                    ;GET OUT ON ERROR
033374  012737  025716  002330  1$:             MOV     #DRVE,FRUTS             ;GET FAILING FRU
033402  012702  024066                          MOV     #FAULTC,R2              ;GET ADDRESS OF ERROR MESSAGE
033406  116162  000002  000020                  MOVB    2(R1),20(R2)            ;1ST ASCII BYTE OF FAULT CODE INTO MESSAGE
033414  116162  000003  000021                  MOVB    3(R1),21(R2)            ;2ND ASCII BYTE OF FAULT CODE INTO MESSAGE
033422  116162  000004  000046                  MOVB    4(R1),46(R2)            ;1ST ASCII BYTE OF SUB-FAULT CODE INTO MESSAGE
033430  116162  000005  000047                  MOVB    5(R1),47(R2)            ;2ND ASCTI BYTE OF SUB-FAULT CODE INTO MESSAGE
033436                                          ERRDF   63.,EMSG24,INTMSG       ;PRINT ERROR MESSAGE
033436  104455                                  TRAP    C$ERDF
033440  000077                                  .WORD   63
033442  025215                                  .WORD   EMSG24
033444  030540                                  .WORD   INTMSG
033446                                          DODU    LOGUNT                  ;DROP THE UNIT
033446  013700  002332                          MOV     LOGUNT,R0
033452  104451                                  TRAP    C$DODU
033454  052764  000020  000014  100$:           BIS     #DONEFL,LUNFLG(R4)      ;SET DONE FLAG
033462  000207                                  RTS     PC                      ;RETURN

033464                                          ENDMOD

                                        .TITLE MISCELLANEOUS SECTIONS
                                        .SBTTL  REPORT CODING SECTION

033464                                          BGNMOD
                                        .SBTTL  INITIALIZE SECTION

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

```
 2580
 2581 033464                               BGNINIT
      033464                          L$INIT::
 2582
 2583
 2584 033464                               READEF  #EF.START                  ;IF THIS IS A FRESH START
      033464  012700  000040               MOV     #EF.START,R0
      033470  104447                       TRAP    C$REFG
 2585 033472                               BCOMPLETE       START              ;  THEN GO TO START
      033472  103421                       BCS     START
 2586
 2587 033474                               READEF  #EF.RESTART                ;IF THIS IS A RESTART
      033474  012700  000037               MOV     #EF.RESTART,R0
      033500  104447                       TRAP    C$REFG
 2588 033502                               BCOMPLETE       START              ;  THEN GO TO START
      033502  103415                       BCS     START
 2589
 2590 033504                               READEF  #EF.PWR                    ;IF POWER-FAIL OCCURRED
      033504  012700  000034               MOV     #EF.PWR,R0
      033510  104447                       TRAP    C$REFG
 2591 033512                               BCOMPLETE       START              ;  THEN START FROM THE BEGINNING
      033512  103411                       BCS     START
 2592
 2593 033514                               READEF  #EF.NEW                    ;IF THIS IS A NEW PASS
      033514  012700  000035               MOV     #EF.NEW,R0
      033520  104447                       TRAP    C$REFG
 2594 033522                               BCOMPLETE       NUPASS             ;  THEN SKIP START UP CODE
      033522  103422                       BCS     NUPASS
 2595
 2596 033524                               READEF  #EF.CONTINUE               ;IF THIS IS A CONTINUE
      033524  012700  000036               MOV     #EF.CONTINUE,R0
      033530  104447                       TRAP    C$REFG
 2597 033532                               BCOMPLETE       END                ;  THEN SKIP ALL INIT CODE
      033532  103465                       BCS     END
 2598
 2599 033534  000423                       BR      NEXT                       ;JUST HERE FOR NEXT UUT
 2600
 2601 033536                          START:
 2602 033536  012737  000000  002312       MOV     #0,PASCNT                  ;INITIALIZE PASS COUNT
 2603 033544  005037  002314               CLR     KTFLAG                     ;IN CASE WE'RE STARTED > THAN ONCE
 2604 033550  012704  002234               MOV     #LUNBLK,R4                 ;R4 WILL ALWAYS POINT TO LUNBLK
 2605 033554  022737  001400  002120       CMP     #1400,L$HIME               ;IF <= 28KWORDS OF MEMORY PRESENT
 2606 033562  103002                       BHIS    NUPASS                     ;  THEN SKIP NEXT
 2607 033564  004737  030776               JSR     PC,KTTEST                  ;  ELSE SEE IF MMU IS PRESENT
 2608
 2609 033570                          NUPASS: BRESET                             ;CLEAR THE WORLD
      033570  104433                       TRAP    C$RESET
 2610 033572  005237  002312               INC     PASCNT                     ;UPDATE THE PASS COUNT
 2611 033576  012737  177777  002332       MOV     #-1,LOGUNT                 ;INITIALIZE LOGICAL UNIT COUNT
 2612
 2613 033604  005237  002332          NEXT:   INC     LOGUNT                     ;POINT TO NEXT UUT
 2614 033610  023737  002332  002012       CMP     LOGUNT,L$UNIT              ;IF WE'VE PASSED MAXIMUM UUT'S
 2615 033616  001433                       BEQ     END                        ;  THEN LEAVE INIT
 2616
 2617 033620                               GPHARD  LOGUNT,R0                  ;GET P-TABLE FOR THIS UNIT
      033620  013700  002332               MOV     LOGUNT,R0
      033624  104442                       TRAP    C$GPHRD
```

```
     033626                                    BNCOMPLETE      NEXT            ;TRY AGAIN
     033626  103366                            BCC     NEXT

     033630  011064  000000                    MOV     (R0),TUIP(R4)           ;PUT IP REG ADDRESS IN LUNBLK
     033634  012064  000002                    MOV     (R0)+,TUSA(R4)          ; AND ANOTHER COPY IN LUNBLK
     033640  062764  000002  000002            ADD     #2,TUSA(R4)             ;MAKE IT THE SA REG ADDRESS
     033646  012064  000004                    MOV     (R0)+,TUVEC(R4)         ;GET THE VECTOR INTO THE LUNBLK
     033652  011064  000006                    MOV     (R0),MSCPUN(R4)         ;PUT THE T/MSCP UNIT # IN LUNBLK
     033656  004737  031162                    JSR     PC,RSTVEC               ;SET UUT VECTOR FOR ILLEGAL INTRPTS.
     033662                                    PRINTF  #IMSG,LOGUNT            ;"TESTING UNIT N"
     033662  013746  002332                    MOV     LOGUNT,-(SP)
     033666  012746  033712                    MOV     #IMSG,-(SP)
     033672  012746  000002                    MOV     #2,-(SP)
     033676  010600                            MOV     SP,R0
     033700  104417                            TRAP    C$PNTF
     033702  062706  000006                    ADD     #6,SP

     033706                            END:
     033706                                    EXIT    INIT
     033706  104432                            TRAP    C$EXIT
     033710  000032                            .WORD   L10007-.

     033712     045     116     045    IMSG:   .ASCIZ  ?%N%ATESTING UNIT %D1%N?
                                               .EVEN

     033742                                    ENDINIT
     033742                            L10007:
     033742  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.
                                        ;--

     033744                                     BGNCLN
     033744                             L$CLEAN::

     033744  032764  000000G 002234             BIT     #T9FLAG,LUNBLK(R4)      ;IF NOT HERE FROM TEST 9
     033752  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.

     033754  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.
     033760                                     CLRVEC  TUVEC(R4)               ;PUT "TRAP CATCHER" INTO VECTOR
     033760  016400  000004                     MOV     TUVEC(R4),R0
     033764  104436                             TRAP    C$CVEC

     033766                                     EXIT    CLN
     033766  104432                             TRAP    C$EXIT
     033770  000002                             .WORD   L10010-.


                                                .EVEN

     033772                                     ENDCLN
     033772                             L10010:
     033772  104412                             TRAP    C$CLEAN
```

```
                                        .SBTTL  DROP UNIT SECTION

                                        ;++
                                        ; THE DROP-UNIT SECTION CONTAINS THE CODING THAT CAUSES A DEVICE
                                        ; TO NO LONGER BE TESTED.
                                        ;--

033774                                          BGNDU
033774                                  L$DU::


033774  012764  000001  000014                  MOV     #DRPFLG,LUNFLG(R4)      ;LETS PROGRAM KNOW IT'S DEAD

034002                                          EXIT    DU
034002  000167                                  .WORD   J$JMP
034004  000000                                  .WORD   L10011-2-.


                                                .EVEN

034006                                          ENDDU
034006                                  L10011:
034006  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.
                                              ;--

 034010                                               BGNAU
 034010                                       L$AU::


 034010                                               EXIT    AU
 034010  000167                                       .WORD   J$JMP
 034012  000000                                       .WORD   L10012-2-.


                                                      .EVEN

 034014                                               ENDAU
 034014                                       L10012:
 034014  104452                                       TRAP    C$AU

 034016                                               ENDMOD

                                              .TITLE HARDWARE TEST
         000000                               HELP=0          ; CONTROL LISTING OF HELP INFORMATION
                                                              ; HELP=0   NO LIST
                                                              ; HELP=1   LIST

                                              ;ONEFILE=       ; CONTROL USE OF SOURCE FILES
                                                              ; ONEFILE IS NOT DEFINED   ASSEMBLE EACH SOURCE FILE SEPARATELY
                                                              ; ONEFILE=ANYTHING   ASSEMBLE ALL SOURCE FILES TOGETHER

                                              .SBTTL  TEST 1: EXISTENCE VERIFICATION TEST



                                              ;;*************************************************************
                                              ;;*************************************************************
                                              ;
                                              ;TEST 1  - EXISTENCE VERIFICATION TEST
                                              ;       THIS TEST VERIFIES THE EXISTENCE OF THE UUT BY
                                              ;       ATTEMPTING TO READ FIRST THE IP AND THEN THE SA
                                              ;       REGISTERS OF THE TU81.  VECTOR 4 IS SET UP WITH
                                              ;       A TRAP HANDLING ROUTINE IN CASE OF A NON-EXISTENT
                                              ;       MEMORY TIMEOUT.
                                              ;
                                              ;;*************************************************************
                                              ;;*************************************************************

 034016                                               BGNTST
 034016                                       T1::
 034016  000240                                       NOP
 034020  012737  000001  000000G                      MOV     #1,ITRCNT               ;SET UP FOR ONE TEST ITERATION
 034026  005737  002312                               TST     PASCNT                  ;IF PASS 0
 034032  001404                                       BEQ     T1.1                    ;  THEN START TEST
 034034  012737  000010  000000G                      MOV     #10,ITRCNT              ;  ELSE DO MULTIPLE ITERATIONS
 2817 034042  000240                            NOP
 2818 034044                                    BGNSUB
      034044                           T1.1:
      034044  104402                            TRAP    C$BSUB
 2819 034046  005037  002316           1$:      CLR     TRP4FG                  ;CLEAR NXM TRAP FLAG
 2820
 2821 034052                                    SETVEC  #VEC4,#TRAP4,#PRI07     ;SET UP VECTOR 4 FOR NXM TRAP
      034052  012746  000340                    MOV     #PRI07,-(SP)
      034056  012746  030656                    MOV     #TRAP4,-(SP)
      034062  012746  000004                    MOV     #VEC4,-(SP)
      034066  012746  000003                    MOV     #3,-(SP)
      034072  104437                            TRAP    C$SVEC
      034074  062706  000010                    ADD     #10,SP
 2822 034100  000240                            NOP
 2823 034102  005074  000000                    CLR     @TUIP(R4)               ;WRITE THE IP REGISTER
 2824 034106  000240                            NOP
 2825 034110                                    DELAY   1                       ;MAKE SURE TIMEOUT CAN OCCUR
      034110  012727  000001                    MOV     #1,(PC)+
      034114  000000                            .WORD   0
      034116  013727  002116                    MOV     L$DLY,(PC)+
      034122  000000                            .WORD   0
      034124  005367  177772                    DEC     -6(PC)
      034130  001375                            BNE     .-4
      034132  005367  177756                    DEC     -22(PC)
      034136  001367                            BNE     .-20
 2826
 2827 034140  005737  002316                    TST     TRP4FG                  ;IF NO TRAP OCCURRED
 2828 034144  001416                            BEQ     5$                      ;  THEN CONTINUE TEST
 2829 034146  000240                            NOP
 2830 034150  012737  025647  002330            MOV     #CTRL,FRUIS             ;IDENTIFY FAILING FRU FOR PRINTOUT
 2831 034156                                    ERRDF   5,EMSG5,PRIERR          ;"NXM ON READ TUIP"
      034156  104455                            TRAP    C$ERDF
      034160  000005                            .WORD   5
      034162  024140                            .WORD   EMSG5
      034164  027222                            .WORD   PRIERR
 2832 034166                                    CKLOOP                          ;LOOP ON ERROR?
      034166  104406                            TRAP    C$CLP1
 2833 034170                                    DODU    LOGUNT                  ;DROP UNIT
      034170  013700  002332                    MOV     LOGUNT,R0
      034174  104451                            TRAP    C$DODU
 2834 034176                                    ESCAPE  SUB                     ;CAN'T CONTINUE
      034176  104410                            TRAP    C$ESCAPE
      034200  000002                            .WORD   L10014-.
 2835
 2836 034202                           5$:      ENDSUB
      034202                           L10014:
      034202  104403                            TRAP    C$ESUB
 2837 034204  000240                            NOP
 2838 034206                                    CLRVEC  #VEC4                   ;RESTORE VECTOR 4
      034206  012700  000004                    MOV     #VEC4,R0
      034212  104436                            TRAP    C$CVEC
 2839 034214  032764  000001  000014            BIT     #DRPFLG,LUNFLG(R4)      ;IF UNIT WAS NOT DROPPED
 2840 034222  001402                            BEQ     T1.2                    ;  THEN CONTINUE TESTING
 2841 034224                                    ESCAPE  TST                     ;  ELSE LEAVE TEST
      034224  104410                            TRAP    C$ESCAPE
      034226  000264                            .WORD   L10013-.
 2842
 2843 034230                                    BGNSUB
      034230                          T1.2:
      034230  104402                            TRAP    C$BSUB
 2844 034232  005037  002316          10$:      CLR     TRP4FG                  ;CLEAR NXM ERROR FLAG
 2845
 2846 034236                                    SETVEC  #VEC4,#TRAP4,#PRI07     ;SET VECTOR 4 FOR NXM TRAPS
      034236  012746  000340                    MOV     #PRI07,-(SP)
      034242  012746  030656                    MOV     #TRAP4,-(SP)
      034246  012746  000004                    MOV     #VEC4,-(SP)
      034252  012746  000003                    MOV     #3,-(SP)
      034256  104437                            TRAP    C$SVEC
      034260  062706  000010                    ADD     #10,SP
 2847 034264  000240                            NOP
 2848 034266  005774  000002                    TST     @TUSA(R4)               ;READ THE SA REGISTER
 2849 034272  000240                            NOP
 2850 034274                                    DELAY   25.                     ;WAIT TO ALLOW NXM TRAP
      034274  012727  000031                    MOV     #25.,(PC)+
      034300  000000                            .WORD   0
      034302  013727  002116                    MOV     L$DLY,(PC)+
      034306  000000                            .WORD   0
      034310  005367  177772                    DEC      6(PC)
      034314  001375                            BNE     .-4
      034316  005367  177756                    DEC     -22(PC)
      034322  001367                            BNE     .-20
 2851
 2852 034324  005737  002316                    TST     TRP4FG                  ;IF NXM DID NOT OCCUR
 2853 034330  001416                            BEQ     15$                     ;  THEN CONTINUE TEST
 2854 034332  000240                            NOP
 2855 034334  012737  025647  002330            MOV     #CTRL,FRUIS             ;IDENTIFY FAILING FRU FOR PRINTOUT
 2856 034342                                    ERRDF   7,EMSG7,PRIERR          ;"NXM ON FIRST READ OF SA"
      034342  104455                            TRAP    C$ERDF
      034344  000007                            .WORD   7
      034346  024212                            .WORD   EMSG7
      034350  027222                            .WORD   PRIERR
 2857 034352                                    CKLOOP                          ;LOOP ON ERROR?
      034352  104406                            TRAP    C$CLP1
 2858 034354                                    DODU    LOGUNT                  ;DROP UNIT IF NOT
      034354  013700  002332                    MOV     LOGUNT,R0
      034360  104451                            TRAP    C$DODU
 2859 034362                                    ESCAPE  SUB                     ;LEAVE TEST
      034362  104410                            TRAP    C$ESCAPE
      034364  000062                            .WORD   L10015-.
 2860
 2861 034366  017464  000002  000012  15$:      MOV     @TUSA(R4),TUSASV(R4)    ;GET A COPY OF SA IN MEMORY
 2862 034374  032764  004000  000012            BIT     #B.S1,TUSASV(R4)        ;IF STEP 1 BIT IS SET
 2863 034402  001021                            BNE     16$                     ;  THEN TEST 1 IS COMPLETE
 2864 034404  000240                            NOP
 2865 034406  012737  004000  002334            MOV     #B.S1,SAEXP             ;LOAD "EXPECTED FOR PRINTOUT
 2866 034414  012737  025670  002330            MOV     #LSCT,FRUIS             ;IDENTIFY FAILING FRU FOR PRINTOUT
 2867 034422                                    ERRDF   8.,EMSG8,PRISA          ;"SA REG IN ERROR ON FIRST READ"
      034422  104455                            TRAP    C$ERDF
      034424  000010                            .WORD   8
      034426  024233                            .WORD   EMSG8
      034430  027026                            .WORD   PRISA
 2868 034432                                    CKLOOP                          ;LOOP ON ERROR?
      034432  104406                            TRAP    C$CLP1
 2869 034434                                    DODU    LOGUNT                  ;DROP UNIT IF NOT
```

```
034434  013700  002332                  MOV     LOGUNT,R0
034440  104451                          TRAP    C$DODU
034442                                  ESCAPE  SUB                     ;LEAVE TEST
034442  104410                          TRAP    C$ESCAPE
034444  000002                          .WORD   L10015 .
034446                          16$:    ENDSUB
034446                          L10015:
034446  104403                          TRAP    C$ESUB

034450  005037  002334          20$:    CLR     SAEXP                   ;CLEAR ERROR INDICATOR
034454                                  CLRVEC  #VEC4                   ;RESTORE VECTOR 4
034454  012700  000004                  MOV     #VEC4,R0
034460  104436                          TRAP    C$CVEC
034462  032764  000001  000014          BIT     #DRPFLG,LUNFLG(R4)      ;IF UNIT DROPPED
034470  001006                          BNE     25$                     ;  THEN LEAVE NOW
034472  005337  000000G                 DEC     ITRCNT                  ;IF ITERATIONS EQUAL 0
034476  000240                          NOP
034500  001402                          BEQ     25$                     ;  THEN LEAVE TEST
034502  000137  034044                  JMP     T1.1                    ;  ELSE GO BACK FOR MORE

034506                          25$:    EXIT    TST
034506  104432                          TRAP    C$EXIT
034510  000002                          .WORD   L10013-.



                                        .EVEN

034512                                  ENDTST
034512                          L10013:
034512  104401                          TRAP    C$ETST

```

```
                                .SBTTL TEST 2: INITIALIZATION TEST (POWER UP MICRODIAGNOSTICS)



                                ;;************************************************************
                                ;;************************************************************
                                ;
                                ;TEST 2 - INITIALIZATION TEST (POWER UP MICRODIAGNOSTICS)
                                ;       THIS TEST COMMENCES STEP 1 OF THE UQ-PORT INITIALIZATION
                                ;       SEQUENCE WITH INTERRUPTS DISABLED.  AS A RESULT, THE ROM
                                ;       RESIDENT MICRODIAGNOSTICS WILL BE RUN TO COMPLETION AND
                                ;       CHECKED FOR ANY ERRORS.
                                ;
                                ;;************************************************************
                                ;;************************************************************

034514                                  BGNTST
034514                          T2::

034514  032764  000001  000014          BIT     #DRPFLG,LUNFLG(R4)      ;IF UUT NOT DROPPED
034522  001402                          BEQ     1$                      ;  THEN DO TEST
034524                                  EXIT    TST                     ;  ELSE GET OUT
034524  104432                          TRAP    C$EXIT
034526  000214                          .WORD   L10016-.
034530  012737  025632  002330  1$:     MOV     #LESI,FRUIS             ;FAILING FRU IN CASE OF ERROR
034536  012737  000001  000000G         MOV     #1,ITRCNT               ;SET UP FOR ONE TEST ITERATION
034544  022737  000001  002312          CMP     #1,PASCNT               ;IF FIRST PASS
034552  001403                          BEQ     2$                      ;  THEN START TEST
034554  012737  000012  000000G         MOV     #10.,ITRCNT             ;  ELSE DO 10 ITERATIONS

034562  012705  000000          2$:     MOV     #0,R5                   ;SET UP R5 AS INDEX TO STEP TABLES
034566  012737  000001  002336          MOV     #1,INISTP               ;STEP 1 FOR ERROR PRINTOUT
034574  016437  000004  002272          MOV     TUVEC(R4),STPTBL        ;PUT VECTOR IN STEP 1
034602  006237  002272                  ASR     STPTBL                  ;DIVIDE BY TWO
034606  006237  002272                  ASR     STPTBL                  ;DIVIDE BY FOUR
034612  013737  002272  002306          MOV     STPTBL,CMPTBL+4         ;PUT VECTOR IN STEP 3 COMPARE
034620  052737  104400  002272          BIS     #104400,STPTBL          ;REST OF STEP ONE
034626  012737  005700  002302          MOV     #B.S1!B.QB!B.DI!B.OD!B.MP,CMPTBL
                                                                        ;STEP 1 COMPARE VALUE
034634  012737  060050  002274          MOV     #COMMAR,STPTBL+2        ;STEP 2 - COMM AREA ADDRESS
034642  012737  010211  002304          MOV     #010211,CMPTBL+2        ;STEP 2 COMPARE
034650  012737  000000  002276          MOV     #0,STPTBL+4             ;STEP 3 - HIGH ADDRESS
034656  112737  000040  002307          MOVB    #40,CMPTBL+5            ;REST OF STEP 3 COMPARE
034664  012737  000000  002300          MOV     #0,STPTBL+6             ;STEP 4
034672  012737  040000  002310          MOV     #040000,CMPTBL+6        ;STEP 4 COMPARE

034700  004737  031330                  JSR     PC,STEP1                ;GO DO IT
034704  005737  002340                  TST     STEPST                  ;IF STATUS OKAY
034710  001412                          BEQ     T2EXT                   ;  THEN DO NEXT TEST

034712                                  ERRDF   9.,EMSG9,PRIINI         ;"SA CONTENTS IN ERROR"
034712  104455                          TRAP    C$ERDF
034714  000011                          .WORD   9
034716  024271                          .WORD   EMSG9
034720  027002                          .WORD   PRIINI
034722                                  CKLOOP                          ;LOOP ON ERROR?
034722  104406                          TRAP    C$CLP1
034724                                  DODU    LOGUNT                  ;DROP UUT
```

```
      034724  013700  002332                  MOV     LOGUNT,R0
      034730  104451                          TRAP    C$DODU
      034732                                  ESCAPE  TST                         ;LEAVE TST
      034732  104410                          TRAP    C$ESCAPE
      034734  000006                          .WORD   L10016-.

      034736                          T2EXT:  EXIT    TST
      034736  104432                          TRAP    C$EXIT
      034740  000002                          .WORD   L10016-.

      034742                                  ENDTST
      034742                          L10016:
      034742  104401                          TRAP    C$ETST

```

```
                                  .SBTTL TEST 3: INITIALIZATION TEST


                                  ;;************************************************************
                                  ;;************************************************************
                                  ;
                                  ;TEST 3 - INITIALIZATION TEST
                                  ;       THIS TEST COMMENCES THE UQ-PORT INITIALIZATION SEQUENCE
                                  ;       WITH INTERRUPTS DISABLED.  IT VERIFIES THAT ALL STEP
                                  ;       TRANSITIONS OCCUR WITHIN THE ALLOTED TIME, AND THAT ALL
                                  ;       HOST SUPPLIED INFORMATION IS ECHOED BY THE UUT.  THE
                                  ;       PROGRAM FURTHER VERIFIES THAT NO INTERRUPTS OCCUR AS A
                                  ;       RESULT OF THE STEP TRANSITIONS.
                                  ;
                                  ;;************************************************************
                                  ;;************************************************************

034744                                    BGNTST
034744                            T3::

034744  032764  000001  000014            BIT     #DRPFLG,LUNFLG(R4)      ;IF UUT NOT DROPPED
034752  001402                            BEQ     1$                      ;  THEN DO TEST
034754                                    EXIT    TST                     ;  ELSE GET OUT
034754  104432                            TRAP    C$EXIT
034756  000402                            .WORD   L10017-.
034760  012737  000001  000000G   1$:     MOV     #1,ITRCNT               ;SET UP FOR ONE TEST ITERATION
034766  022737  000001  002312            CMP     #1,PASCNT               ;IF FIRST PASS
034774  001403                            BEQ     2$                      ;  THEN START TEST
034776  012737  000012  000000G           MOV     #10.,ITRCNT             ;  ELSE DO 10 ITERATIONS

035004  012705  000000            2$:     MOV     #0,R5                   ;SET UP R5 AS INDEX TO STEP TABLES
035010  012737  000001  002336            MOV     #1,INISTP               ;STEP 1 FOR ERROR PRINTOUT
035016  016437  000004  002272            MOV     TUVEC(R4),STPTBL        ;PUT VECTOR IN STEP 1
035024  006237  002272                    ASR     STPTBL                  ;DIVIDE BY TWO
035030  006237  002272                    ASR     STPTBL                  ;DIVIDE BY FOUR
035034  013737  002272  002306            MOV     STPTBL,CMPTBL+4         ;PUT VECTOR IN STEP 3 COMPARE
035042  052737  104400  002272            BIS     #104400,STPTBL          ;REST OF STEP ONE
035050  012737  005700  002302            MOV     #B.S1!B.QB!B.DI!B.OD!B.MP,CMPTBL
                                                                          ;STEP 1 COMPARE VALUE
035056  012737  060050  002274            MOV     #COMMAR,STPTBL+2        ;STEP 2 - COMM AREA ADDRESS
035064  012737  010211  002304            MOV     #010211,CMPTBL+2        ;STEP 2 COMPARE
035072  012737  000000  002276            MOV     #0,STPTBL+4             ;STEP 3 - HIGH ADDRESS
035100  112737  000040  002307            MOVB    #40,CMPTBL+5            ;REST OF STEP 3 COMPARE
035106  012737  000000  002300            MOV     #0,STPTBL+6             ;STEP 4
035114  012737  040000  002310            MOV     #040000,CMPTBL+6        ;STEP 4 COMPARE

035122  004737  031330                    JSR     PC,STEP1                ;GO DO IT
035126  005737  002340                    TST     STEPST                  ;IF STATUS OKAY
035132  001415                            BEQ     5$                      ;  THEN CONTINUE TEST

035134  012737  025632  002330            MOV     #LESI,FRUIS             ;FAILING FRU IN CASE OF ERROR
035142                                    ERRDF   9.,EMSG9,PRIINI         ;"SA CONTENTS IN ERROR"
035142  104455                            TRAP    C$ERDF
035144  000011                            .WORD   9
035146  024271                            .WORD   EMSG9
035150  027002                            .WORD   PRIINI
035152                                    CKLOOP                          ;LOOP ON ERROR?
```

```
      035152  104406                          TRAP     C$CLP1
 3010 035154                                  DODU     LOGUNT                   ;DROP UUT
      035154  013700  002332                  MOV      LOGUNT,R0
      035160  104451                          TRAP     C$DODU
 3011 035162                                  ESCAPE   TST                      ;LEAVE TST
      035162  104410                          TRAP     C$ESCAPE
      035164  000174                          .WORD    L10017-.
 3012
 3013 035166  005237  002336          5$:     INC      INISTP                   ;ADJUST STEP COUNTER
 3014 035172  062705  000002                  ADD      #2,R5                    ;ADJUST TABLE INDEX
 3015 035176  012737  000100  002346  6$:     MOV      #100,OUTER               ;SET UP FOR DELAY ROUTINE
 3016 035204  016537  002302  002334          MOV      CMPTBL(R5),SAEXP         ;SET UP FOR COMPARE
 3017 035212  012737  037200  002344  7$:     MOV      #16000.,INNER            ;SET UP INNER
 3018 035220  017464  000002  000012          MOV      @TUSA(R4),TUSASV(R4)     ;GET SA CONTENTS
 3019 035226  022705  000006                  CMP      #6,R5                    ;ARE WE IN STEP 4?
 3020 035232  001005                          BNE      8$                       ;BRANCH IF NOT
 3021 035234  033764  002334  000012          BIT      SAEXP,TUSASV(R4)         ;JUST LOOK FOR STEP 4 BIT
 3022 035242  001027                          BNE      10$                      ;IT'S SET SO LET'S GO
 3023 035244  000404                          BR       9$                       ;STAY IN LOOP OTHERWISE
 3024 035246  023764  002334  000012  8$:     CMP      SAEXP,TUSASV(R4)         ;IF SA IS WHAT WE EXPECT
 3025 035254  001422                          BEQ      10$                      ;  THEN MOVE ALONG
 3026 035256  004737  031302          9$:     JSR      PC,PDELAY                ;  ELSE GIVE UUT SOME TIME
 3027 035262  005737  002350                  TST      TOUT                     ;IF NO TIMEOUT YET
 3028 035266  001751                          BEQ      7$                       ;  THEN GO TAKE ANOTHER LOOK
 3029
 3030 035270  012737  025670  002330          MOV      #LSCT,FRUIS              ;FAILING FRU IN CASE OF ERROR
 3031 035276                                  ERRDF    13.,EMSG9,PRIINI         ;"SA CONTENTS IN ERROR"
      035276  104455                          TRAP     C$ERDF
      035300  000015                          .WORD    13
      035302  024271                          .WORD    EMSG9
      035304  027002                          .WORD    PRIINI
 3032 035306                                  CKLOOP
      035306  104406                          TRAP     C$CLP1
 3033 035310                                  DODU     LOGUNT
      035310  013700  002332                  MOV      LOGUNT,R0
      035314  104451                          TRAP     C$DODU
 3034 035316                                  ESCAPE   TST
      035316  104410                          TRAP     C$ESCAPE
      035320  000040                          .WORD    L10017-.
 3035
 3036 035322  016574  002272  000002  10$:    MOV      STPTBL(R5),@TUSA(R4)     ;WRITE NEXT STEP TO UUT
 3037 035330  022705  000006                  CMP      #6,R5                    ;IF NOT IN STEP 4
 3038 035334  001314                          BNE      5$                       ;GO BACK TO MAIN LOOP
 3039
 3040 035336  032764  000001  000014          BIT      #DRPFLG,LUNFLG(R4)       ;HAS UUT BEEN DROPPED
 3041 035344  001003                          BNE      T3EXT                    ;LEAVE NOW IF SO
 3042 035346  005337  000000G                 DEC      ITRCNT                   ;IF MORE ITERATIONS LEFT
 3043 035352  001214                          BNE      2$                       ;  THEN GO DO IT AGAIN
 3044
 3045 035354                          T3EXT:  EXIT     TST
      035354  104432                          TRAP     C$EXIT
      035356  000002                          .WORD    L10017-.
 3046
 3047 035360                                  ENDTST
      035360                          L10017:
      035360  104401                          TRAP     C$ETST
```

```
                                        .SBTTL TEST 4: SA REGISTER WRAP TEST

                                        ;;*****************************************************************
                                        ;;*****************************************************************
                                        ;
                                        ;TEST 4 - 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.
                                        ;
                                        ;;*****************************************************************
                                        ;;*****************************************************************
035362                                          BGNTST
035362                                  T4::

035362  004737  030704                          JSR     PC,CHKCAC
035366  032764  000001  000014                  BIT     #DRPFLG,LUNFLG(R4)      ;IF UUT NOT DROPPED
035374  001402                                  BEQ     1$                      ;  THEN DO TEST
035376                                          EXIT    TST                     ;  ELSE GET OUT
035376  104432                                  TRAP    C$EXIT
035400  000522                                  .WORD   L10020-.
035402  012737  000001  002336  1$:             MOV     #1,INISTP               ;STEP 1 FOR ERROR PRINTOUT
035410  012737  000001  000000G                 MOV     #1,ITRCNT               ;SET UP FOR ONE TEST ITERATION
035416  022737  000001  002312                  CMP     #1,PASCNT               ;IF FIRST PASS
035424  001403                                  BEQ     2$                      ;  THEN START TEST
035426  012737  000002  000000G                 MOV     #2,ITRCNT               ;  ELSE DO 2 ITERATIONS

035434  012737  140000  002334  2$:             MOV     #BIT15!B.WR,SAEXP       ;SET UP STEP 1 FOR DIAG. WRAP MODE
035442  013737  002334  002272                  MOV     SAEXP,STPTBL            ;PUT IT IN STEP 1 OF TABLE
035450  004737  031330                          JSR     PC,STEP1                ;GO DO IT

035454  005737  002340                          TST     STEPST                  ;IF STATUS OKAY
035460  001415                                  BEQ     5$                      ;  THEN CONTINUE TEST

035462  012737  025647  002330                  MOV     #CTRL,FRUIS             ;FAILING FRU FOR PRINTOUT
035470                                          ERRDF   9.,EMSG9,PRIINI         ;"SA CONTENTS IN ERROR"
035470  104455                                  TRAP    C$ERDF
035472  000011                                  .WORD   9
035474  024271                                  .WORD   EMSG9
035476  027002                                  .WORD   PRIINI
035500                                          CKLOOP                          ;LOOP ON ERROR?
035500  104406                                  TRAP    C$CLP1
035502                                          DODU    LOGUNT                  ;DROP UUT
035502  013700  002332                          MOV     LOGUNT,R0
035506  104451                                  TRAP    C$DODU
035510                                          ESCAPE  TST                     ;LEAVE TST
035510  104410                                  TRAP    C$ESCAPE
035512  000410                                  .WORD   L10020-.

035514  012737  000100  002346  5$:             MOV     #100,OUTER              ;SET UP FOR DELAY ROUTINE
035522  012737  006000  002344  6$:             MOV     #6000,INNER             ;SET UP INNER
035530  017464  000002  000012                  MOV     @TUSA(R4),TUSASV(R4)    ;GET SA CONTENTS
035536  023764  002334  000012                  CMP     SAEXP,TUSASV(R4)        ;IF SA IS WHAT WE EXPECT
035544  001422                                  BEQ     10$                     ;  THEN MOVE ALONG
```

```
 3101 035546  004737  031302                  JSR     PC,PDELAY              ;  ELSE GIVE UUT SOME TIME
 3102 035552  005737  002350                  TST     TOUT                   ;IF NO TIMEOUT YET
 3103 035556  001761                          BEQ     6$                     ;  THEN GO TAKE ANOTHER LOOK
 3104
 3105 035560  012737  02564   002330          MOV     #CTRL,FRUIS            ;FAILING FRU FOR PRINTOUT
 3106 035566                                  ERRDF   10.,EMSG9,PRIINI       ;"SA CONTENTS IN ERROR"
      035566  104455                          TRAP    C$ERDF
      035570  000012                          .WORD   10
      035572  024271                          .WORD   EMSG9
      035574  027002                          .WORD   PRIINI
 3107 035576                                  CKLOOP
      035576  104406                          TRAP    C$CLP1
 3108 035600                                  DODU    LOGUNT
      035600  013700  002332                  MOV     LOGUNT,R0
      035604  104451                          TRAP    C$DODU
 3109 035606                                  ESCAPE  TST
      035606  104410                          TRAP    C$ESCAPE
      035610  000312                          .WORD   L10020-.
 3110
 3111 035612  000261                  10$:    SEC                            ;SET CARRY BIT
 3112 035614  012737  177776  002342          MOV     #177776,WRDATA         ;SET UP FLOATING "0" PATTERN
 3113 035622  013774  002342  000002  11$:    MOV     WRDATA,@TUSA(R4)       ;SEND DATA TO UUT
 3114 035630  013737  002342  002334          MOV     WRDATA,SAEXP           ;SAVE A COPY FOR COMPARE
 3115 035636  012737  000100  002346          MOV     #100,OUTER             ;SET UP FOR DELAY ROUTINE
 3116
 3117 035644  012737  006000  002344  15$:    MOV     #6000,INNER            ;INNER TOO
 3118 035652  017464  000002  000012          MOV     @TUSA(R4),TUSASV(R4)   ;READ SA
 3119 035660  023764  002334  000012          CMP     SAEXP,TUSASV(R4)       ;IF DATA MATCHES
 3120 035666  001422                          BEQ     20$                    ;  THEN CHANGE DATA
 3121 035670  004737  031302                  JSR     PC,PDELAY              ;  ELSE GIVE UUT SOME TIME
 3122 035674  005737  002350                  TST     TOUT                   ;IF NO TIMEOUT YET
 3123 035700  001761                          BEQ     15$                    ;  THEN GO TAKE ANOTHER LOOK
 3124
 3125 035702  012737  025647  002330          MOV     #CTRL,FRUIS            ;FAILING FRU FOR PRINTOUT
 3126 035710                                  ERRDF   11.,EMSG10,PRIINI      ;"SA WRONG IN DATA WRAP"
      035710  104455                          TRAP    C$ERDF
      035712  000013                          .WORD   11
      035714  024316                          .WORD   EMSG10
      035716  027002                          .WORD   PRIINI
 3127 035720                                  CKLOOP
      035720  104406                          TRAP    C$CLP1
 3128 035722                                  DODU    LOGUNT
      035722  013700  002332                  MOV     LOGUNT,R0
      035726  104451                          TRAP    C$DODU
 3129 035730                                  ESCAPE TST                     ;GET OUT IF NOT LOOPING
      035730  104410                          TRAP    C$ESCAPE
      035732  000170                          .WORD   L10020-.
 3130
 3131 035734  006137  002342          20$:    ROL     WRDATA                 ;SHIFT TEST PATTERN
 3132 035740  103730                          BCS     11$                    ;WE'RE NOT DONE YET
 3133
 3134 035742  012737  000001  002342          MOV     #1,WRDATA              ;SET UP FOR FLOATING 1 PATTERN
 3135 035750  013774  002342  000002  24$:    MOV     WRDATA,@TUSA(R4)       ;SEND DATA TO UUT
 3136 035756  013737  002342  002334          MOV     WRDATA,SAEXP           ;KEEP A COPY FOR COMPARE
 3137 035764  012737  000100  002346          MOV     #100,OUTER             ;SET UP FOR DELAY ROUTINE
 3138
 3139 035772  012737  006000  002344  25$:    MOV     #6000,INNER            ;DELAY ROUTINE TOO
```

```
036000  017464  000002  000012          MOV     @TUSA(R4),TUSASV(R4)    ;READ THE SA
036006  023764  002334  000012          CMP     SAEXP,TUSASV(R4)        ;IF IT MATCHES
036014  001422                          BEQ     30$                     ;  THEN SEE IF WE'RE DONE
036016  004737  031302                  JSR     PC,PDELAY               ;  ELSE GIVE UUT SOME MORE TIME
036022  005737  002350                  TST     TOUT                    ;IF NO TIMEOUT YET
036026  001761                          BEQ     25$                     ;  THEN TAKE ANOTHER LOOK

036030  012737  025647  002330          MOV     #CTRL,FRUIS             ;FAILING FRU FOR PRINTOUT
036036                                  ERRDF   12.,EMSG10,PRIINI       ;"SA WRONG IN DATA WRAP"
036036  104455                          TRAP    C$ERDF
036040  000014                          .WORD   12
036042  024316                          .WORD   EMSG10
036044  027002                          .WORD   PRIINI
036046                                  CKLOOP
036046  104406                          TRAP    C$CLP1
036050                                  DODU    LOGUNT
036050  013700  002332                  MOV     LOGUNT,R0
036054  104451                          TRAP    C$DODU
036056                                  ESCAPE  TST                     ;LEAVE TEST IF NOT LOOPING
036056  104410                          TRAP    C$ESCAPE
036060  000042                          .WORD   L10020-.

036062  006137  002342          30$:    ROL     WRDATA                  ;SHIFT DATA PATTERN
036066  103330                          BCC     24$                     ;WE'RE NOT DONE YET
036070  005337  000000G                 DEC     ITRCNT                  ;IF ITERATIONS  = 0
036074  001402                          BEQ     T4EXT                   ;  THEN LEAVE TEST
036076  000137  035434                  JMP     2$                      ;  ELSE DO ANOTHER ONE

036102  005737  000000G         T4EXT:  TST     CPFLG                   ;CHECK IF CACHE WAS DISABLED
036106  001403                          BEQ     EXT                     ;NO, BRANCH
036110  042737  000014  177746          BIC     #DISCAC,CCR             ;RE-ENABLE CACHE
036116                          EXT:    EXIT    TST                     ;GET OUTTA HERE
036116  104432                          TRAP    C$EXIT
036120  000002                          .WORD   L10020-.

036122                                  ENDTST
036122                          L10020:
036122  104401                          TRAP    C$ETST
```

```
                                        .SBTTL  TEST 5:
                                        .SBTTL  SUBTEST 1: VECTOR AND INTERRUPT TEST

                                        ;;*****************************************************************
                                        ;;*****************************************************************
                                        ;
                                        ;TEST 5
                                        ;SUBTEST 1 -
                                        ;       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.
                                        ;
                                        ;;*****************************************************************
                                        ;;*****************************************************************

036124                                          BGNTST
036124                                  T5::
036124                                          BGNSUB
036124                                  T5.1:
036124  104402                                  TRAP    C$BSUB

036126  032764  000001  000014                  BIT     #DRPFLG,LUNFLG(R4)      ;IF UUT NOT DROPPED
036134  001402                                  BEQ     1$                      ;  THEN DO TEST
036136                                          EXIT    TST                     ;  ELSE GET OUT
036136  104432                                  TRAP    C$EXIT
036140  001114                                  .WORD   L10021-.
036142  042764  000004  000014  1$:             BIC     #BRFLAG,LUNFLG(R4)      ;DO TEST WITH PRIORITY SET TO 0
036150  012737  025647  002330                  MOV     #CTRL,FRUIS             ;FAILING FRU IN CASE OF ERROR
036156  012737  000001  000000G                 MOV     #1,ITRCNT               ;SET UP FOR ONE TEST ITERATION
036164  022737  000001  002312                  CMP     #1,PASCNT               ;IF FIRST PASS
036172  001403                                  BEQ     2$                      ;  THEN START TEST
036174  012737  000012  000000G                 MOV     #10.,ITRCNT             ;  ELSE DO 10 ITERATIONS

036202  004737  031212          2$:             JSR     PC,VECTOR               ;SET UP VECTOR WITH INTERRUPT HANDLER
036206  012705  000000                          MOV     #0,R5                   ;SET UP R5 AS INDEX TO STEP TABLES
036212  012737  000001  002336                  MOV     #1,INISTP               ;STEP 1 FOR ERROR PRINTOUT
036220  016437  000004  002272                  MOV     TUVEC(R4),STPTBL        ;PUT VECTOR IN STEP 1
036226  006237  002272                          ASR     STPTBL                  ;DIVIDE BY TWO
036232  006237  002272                          ASR     STPTBL                  ;DIVIDE BY FOUR
036236  013737  002272  002306                  MOV     STPTBL,CMPTBL+4         ;PUT VECTOR IN STEP 3 COMPARE
036244  052737  104600  002272                  BIS     #104600,STPTBL          ;REST OF STEP ONE
036252  012737  005700  002302                  MOV     #B.S1!B.QB!B.DI!B.OD!B.MP,CMPTBL
                                                                                ;STEP 1 COMPARE VALUE
036260  012737  060050  002274                  MOV     #COMMAR,STPTBL+2        ;STEP 2 - COMM AREA ADDRESS
036266  012737  010211  002304                  MOV     #010211,CMPTBL+2        ;STEP 2 COMPARE
036274  012737  000000  002276                  MOV     #0,STPTBL+4             ;STEP 3 - HIGH ADDRESS
036302  052737  000200  002306                  BIS     #B.IE,CMPTBL+4          ;SET THE INTERRUPT ENABLE BIT
036310  112737  000040  002307                  MOVB    #40,CMPTBL+5            ;REST OF STEP 3 COMPARE
036316  012737  000000  002300                  MOV     #0,STPTBL+6             ;STEP 4
036324  012737  040000  002310                  MOV     #040000,CMPTBL+6        ;STEP 4 COMPARE

036332  004737  031330                          JSR     PC,STEP1                ;GO DO IT
036336  005737  002340                          TST     STEPST                  ;IF STATUS OKAY
036342  001412                                  BEQ     5$                      ;  THEN CONTINUE TEST

036344                                          ERRDF   14.,EMSG9,PRIINI        ;"SA CONTENTS IN ERROR"
```

```
     036344  104455                                  TRAP    C$ERDF
     036346  000016                                  .WORD   14
     036350  024271                                  .WORD   EMSG9
     036352  027002                                  .WORD   PRIINI
3225 036354                                          CKLOOP                          ;LOOP ON ERROR?
     036354  104406                                  TRAP    C$CLP1
3226 036356                                          DODU    LOGUNT                  ;DROP UUT
     036356  013700  002332                          MOV     LOGUNT,R0
     036362  104451                                  TRAP    C$DODU
3227 036364                                          ESCAPE  TST                     ;LEAVE TST
     036364  104410                                  TRAP    C$ESCAPE
     036366  000666                                  .WORD   L10021-.
3228
3229 036370  012737  000100  002346  5$:             MOV     #100,OUTER              ;SET UP FOR DELAY ROUTINE
3230 036376  016537  002302  002334                  MOV     CMPTBL(R5),SAEXP        ;SET UP FOR COMPARE
3231 036404  012737  037200  002344  7$:             MOV     #16000.,INNER           ;SET UP INNER
3232 036412  032764  000002  000014                  BIT     #INTFLG,LUNFLG(R4)      ;IF INTERRUPT OCCURRED
3233 036420  001022                                  BNE     10$                     ;  THEN SEE IF SA IS CORRECT
3234 036422  004737  031302          9$:             JSR     PC,PDELAY               ;  ELSE GIVE UUT SOME TIME
3235 036426  005737  002350                          TST     TOUT                    ;IF NO TIMEOUT YET
3236 036432  001764                                  BEQ     7$                      ;  THEN GO TAKE ANOTHER LOOK
3237
3238 036434  012737  025632  002330                  MOV     #LESI,FRUIS             ;FAILING FRU
3239 036442                                          ERRDF   15.,EMSG11,PRIERR       ;"EXPECTED INTERRUPT DID NOT OCCUR"
     036442  104455                                  TRAP    C$ERDF
     036444  000017                                  .WORD   15
     036446  024344                                  .WORD   EMSG11
     036450  027222                                  .WORD   PRIERR
3240 036452                                          CKLOOP
     036452  104406                                  TRAP    C$CLP1
3241 036454                                          DODU    LOGUNT
     036454  013700  002332                          MOV     LOGUNT,R0
     036460  104451                                  TRAP    C$DODU
3242 036462                                          ESCAPE  TST
     036462  104410                                  TRAP    C$ESCAPE
     036464  000570                                  .WORD   L10021-.
3243
3244 036466  042764  000002  000014  10$:            BIC     #INTFLG,LUNFLG(R4)      ;CLEAR THE INTERRUPT FLAG
3245 036474  005237  002336                          INC     INISTP                  ;ADJUST THE STEP COUNTER
3246 036500  062705  000002                          ADD     #2,R5                   ;ADJUST TABLE INDEX
3247 036504  016537  002302  002334                  MOV     CMPTBL(R5),SAEXP        ;GET THE COMPARISON VALUE
3248 036512  017464  000002  000012                  MOV     @TUSA(R4),TUSASV(R4)    ;GET SA CONTENTS
3249 036520  022705  000006                          CMP     #6,R5                   ;ARE WE IN STEP 4?
3250 036524  001005                                  BNE     15$                     ;BRANCH IF NOT
3251 036526  033764  002334  000012                  BIT     SAEXP,TUSASV(R4)        ;JUST LOOK FOR STEP 4 BIT
3252 036534  001022                                  BNE     20$                     ;IT'S SET SO LET'S GO
3253 036536  000407                                  BR      16$                     ;ERROR
3254 036540  023764  002334  000012  15$:            CMP     SAEXP,TUSASV(R4)        ;IF SA IS WHAT WE EXPECT
3255 036546  001415                                  BEQ     20$                     ;  THEN MOVE ALONG
3256
3257 036550  012737  025632  002330                  MOV     #LESI,FRUIS             ;FAILING FRU
3258 036556                          16$:            ERRDF   16.,EMSG9,PRIINI                 ;"SA CONTENTS IN ERROR"
     036556  104455                                  TRAP    C$ERDF
     036560  000020                                  .WORD   16
     036562  024271                                  .WORD   EMSG9
     036564  027002                                  .WORD   PRIINI
3259 036566                                          CKLOOP
```

```
     036566  104406                             TRAP    C$CLP1
3260 036570                                     DODU    LOGUNT
     036570  013700  002332                     MOV     LOGUNT,R0
     036574  104451                             TRAP    C$DODU
3261 036576                                     ESCAPE  TST
     036576  104410                             TRAP    C$ESCAPE
     036600  000454                             .WORD   L10021-.
3262
3263 036602  016574  002272  000002  20$:      MOV     STPTBL(R5),@TUSA(R4)      ;WRITE NEXT STEP TO UUT
3264 036610  022705  000006                     CMP     #6,R5                     ;IF NOT IN STEP 4
3265 036614  001265                             BNE     5$                        ;GO BACK TO MAIN LOOP
3266
3267 036616  032764  000001  000014             BIT     #DRPFLG,LUNFLG(R4)        ;HAS UUT BEEN DROPPED
3268 036624  001005                             BNE     T5EXT                     ;LEAVE NOW IF SO
3269 036626  005237  000000G                    DEC     ITRCNT                    ;IF NO MORE ITERATIONS LEFT
3270 036632  001402                             BEQ     T5EXT                     ;  THEN EXIT
3271 036634  000137  036202                     JMP     2$                        ;  ELSE DO IT AGAIN
3272
3273 036640  004737  031162          T5EXT:     JSR     PC,RSTVEC                 ;CATCH ILLEGAL INTERRUPTS
3274 036644                                     EXIT    TST
     036644  104432                             TRAP    C$EXIT
     036646  000406                             .WORD   L10021-.
3275 036650                                     ENDSUB
     036650                          L10022:
     036650  104403                             TRAP    C$ESUB
```

```
                                              .SBTTL SUBTEST 2: BR LEVEL TEST

                                              ;;*****************************************************************
                                              ;;*****************************************************************
                                              ;
                                              ;SUBTEST 2 -
                                              ;       BR LEVEL TEST
                                              ;       THIS TEST INSURES THAT THE TU81 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.
                                              ;
                                              ;;*****************************************************************
                                              ;;*****************************************************************

     036652                                          BGNSUB
     036652                                   T5.2:
     036652  104402                                  TRAP    C$BSUB

     036654  032764  000001  000014                  BIT     #DRPFLG,LUNFLG(R4)       ;IF UUT NOT DROPPED
     036662  001402                                  BEQ     1$                       ;  THEN DO TEST
     036664                                          EXIT    TST                      ;  ELSE GET OUT
     036664  104432                                  TRAP    C$EXIT
     036666  000366                                  .WORD   L10021-.
     036670                                   1$:
     036670  052764  000004  000014                  BIS     #BRFLAG,LUNFLG(R4)       ;DO TEST WITH HIGH PRIORITY
     036676  012737  025647  002330                  MOV     #CTRL,FRUIS              ;FAILING FRU IN CASE OF ERROR
     036704  012737  000001  000000G                 MOV     #1,ITRCNT                ;SET UP FOR ONE TEST ITERATION
     036712  022737  000001  002312                  CMP     #1,PASCNT                ;IF FIRST PASS
     036720  001403                                  BEQ     2$                       ;  THEN START TEST
     036722  012737  000002  000000G                 MOV     #2,ITRCNT                ;  ELSE DO 10 ITERATIONS

     036730  106427  000340                   2$:    MTPS    #PRI07                   ;CPU PRIORITY = 7
     036734  004737  031212                          JSR     PC,VECTOR                ;SET UP VECTOR WITH INTERRUPT HANDLER
     036740  012705  000000                          MOV     #0,R5                    ;SET UP R5 AS INDEX TO STEP TABLES
     036744  012737  000001  002336                  MOV     #1,INISTP                ;STEP 1 FOR ERROR PRINTOUT
     036752  016437  000004  002272                  MOV     TUVEC(R4),STPTBL         ;PUT VECTOR IN STEP 1
     036760  006237  002272                          ASR     STPTBL                   ;DIVIDE BY TWO
     036764  006237  002272                          ASR     STPTBL                   ;DIVIDE BY FOUR
     036770  052737  104600  002272                  BIS     #104600,STPTBL           ;REST OF STEP ONE
     036776  016437  000004  002302                  MOV     TUVEC(R4),CMPTBL         ;STEP 1 COMPARE VALUE

     037004  004737  031330                          JSR     PC,STEP1                 ;GO DO IT
     037010  005737  002340                           ST     STEPST                   ;IF STATUS OKAY
     037014  001412                                  BEQ     5$                       ;  THEN CONTINUE TEST

     037016                                          ERRDF   14.,EMSG9,PRIINI         ;"SA CONTENTS IN ERROR"
     037016  104455                                  TRAP    C$ERDF
     037020  000016                                  .WORD   14
     037022  024271                                  .WORD   EMSG9
     037024  027002                                  .WORD   PRIINI
     037026                                          CKLOOP                           ;LOOP ON ERROR?
     037026  104406                                  TRAP    C$CLP1
     037030                                          DODU    LOGUNT                   ;DROP UUT
     037030  013700  002332                          MOV     LOGUNT,R0
     037034  104451                                  TRAP    C$DODU
```

```
037036                                  ESCAPE  TST                     ;LEAVE TST
037036  104410                          TRAP    C$ESCAPE
037040  000214                          .WORD   L10021-.

037042  012737  000100  002346  5$:     MOV     #100,OUTER              ;SET UP FOR DELAY ROUTINE
037050  016537  002302  002334          MOV     CMPTBL(R5),SAEXP        ;SET UP FOR COMPARE
037056  012737  037200  002344  7$:     MOV     #16000.,INNER           ;SET UP INNER
037064  004737  031302          9$:     JSR     PC,PDELAY               ;  ELSE GIVE UUT SOME TIME
037070  005737  002350                  TST     TOUT                    ;IF NO TIMEOUT YET
037074  001770                          BEQ     7$                      ;  THEN GO TAKE ANOTHER LOOK

037076  017464  000002  000012          MOV     @TUSA(R4),TUSASV(R4)    ;GET SA CONTENTS
037104  023764  002334  000012          CMP     SAEXP,TUSASV(R4)        ;IF CONTENTS OKAY
037112  001412                          BEQ     10$                     ;  THEN CHECK FOR INTERRUPT

037114                                  ERRDF   17.,EMSG9,PRIINI        ;"SA CONTENTS IN ERROR"
037114  104455                          TRAP    C$ERDF
037116  000021                          .WORD   17
037120  024271                          .WORD   EMSG9
037122  027002                          .WORD   PRIINI
037124                                  CKLOOP
037124  104406                          TRAP    C$CLP1
037126                                  DODU    LOGUNT
037126  013700  002332                  MOV     LOGUNT,R0
037132  104451                          TRAP    C$DODU
037134                                  ESCAPE  TST
037134  104410                          TRAP    C$ESCAPE
037136  000116                          .WORD   L10021-.

037140  032764  000002  000014  10$:    BIT     #INTFLG,LUNFLG(R4)      ;IF NO INTERRUPT OCCURRED
037146  001415                          BEQ     20$                     ;  THEN CARRY ON WITH TEST
037150  042764  000002  000014          BIC     #INTFLG,LUNFLG(R4)      ;CLEAR FLAG IN CASE WE'RE LOOPING
037156                                  ERRDF   18.,EMSG12,PRIINI       ;"INTRRPT WITH CPU PRIORITY =7"
037156  104455                          TRAP    C$ERDF
037160  000022                          .WORD   18
037162  024405                          .WORD   EMSG12
037164  027002                          .WORD   PRIINI
037166                                  CKLOOP
037166  104406                          TRAP    C$CLP1
037170                                  DODU    LOGUNT
037170  013700  002332                  MOV     LOGUNT,R0
037174  104451                          TRAP    C$DODU
037176                                  ESCAPE  TST
037176  104410                          TRAP    C$ESCAPE
037200  000054                          .WORD   L10021-.

037202  106427  000000          20$:    MTPS    #PRI00                  ;CPU PRIORITY = 0
037206  000240                          NOP
037210  000240                          NOP                             ;DELAY FOR PENDING INTERRUPT
037212  042764  000002  000014          BIC     #INTFLG,LUNFLG(R4)      ;CLEAR THE FLAG NOW

037220  032764  000001  000014          BIT     #DRPFLG,LUNFLG(R4)      ;HAS UUT BEEN DROPPED
037226  001005                          BNE     ST5EXT                  ;LEAVE NOW IF SO
037230  005337  000000G                 DEC     ITRCNT                  ;IF NO MORE ITERATIONS LEFT
037234  001402                          BEQ     ST5EXT                  ;  THEN EXIT
037236  000137  036730                  JMP     2$                      ;  ELSE DO IT AGAIN

```

```
 3367 037242  004737  031162        ST5EXT: JSR     PC,RSTVEC               ;CATCH ILLEGAL INTERRUPTS
 3368 037246                                EXIT    TST
      037246  104432                        TRAP    C$EXIT
      037250  000004                        .WORD   L10021-.
 3369
 3370 037252                                ENDSUB
      037252                        L10023:
      037252  104403                        TRAP    C$ESUB
 3371
 3372 037254                                ENDTST
      037254                        L10021:
      037254  104401                        TRAP    C$ETST
```

```
                                                .SBTTL TEST 6:
                                                .SBTTL SUBTEST 1: PURGE AND POLL TEST

                                                ;;*****************************************************************
                                                ;;*****************************************************************
                                                ;
                                                ;SUBTEST 6 - PURGE AND POLL TEST
                                                ;       THIS TEST WILL AGAIN RUN THROUGH THE INIT SEQUENCE, THIS
                                                ;       TIME SETTING THE 'PURGE AND POLL" BIT IN STEP 3.  THIS
                                                ;       SHOULD CAUSE THE PORT TO DMA VARIOUS DATA PATTERNS TO
                                                ;       AND FROM THE COMMUNICATIONS AREA AND FINALLY LEAVE IT
                                                ;       CLEARED BEFORE TRANSITIONING TO STEP 4.  THE PROGRAM WILL
                                                ;       HAVE FILLED THIS AREA WITH A BACKGROUND PATTERN OF ALL
                                                ;       1'S DATA PRIOR TO STARTING THE INIT.  WHNE STEP 4 IS
                                                ;       REACHED, THE PROGRAM WILL VERIFY THAT THE COMM AREA IS
                                                ;       ALL 0'S, AND THAT THE 20 WORDS PRECEDING AND SUCCEEDING
                                                ;       THE COMM AREA ARE UNTOUCHED.
                                                ;
                                                ;;*****************************************************************
                                                ;;*****************************************************************

037256                                                  BGNTST
037256                                          T6::
037256                                                  BGNSUB
037256                                          T6.1:
037256  104402                                          TRAP    C$BSUB

037260  032764  000001  000014                          BIT     #DRPFLG,LUNFLG(R4)      ;IF UUT NOT DROPPED
037266  001402                                          BEQ     1$                      ;  THEN DO TEST
037270                                                  EXIT    TST                     ;  ELSE GET OUT
037270  104432                                          TRAP    C$EXIT
037272  001406                                          .WORD   L10024-.
037274  012737  025647  002330  1$:                     MOV     #CTRL,FRUIS             ;FAILING FRU IN CASE OF ERROR
037302  012737  000001  000000G                         MOV     #1,ITRCNT               ;SET UP FOR ONE TEST ITERATION
037310  022737  000001  002312                          CMP     #1,PASCNT               ;IF FIRST PASS
037316  001403                                          BEQ     2$                      ;  THEN START TEST
037320  012737  000012  000000G                         MOV     #10.,ITRCNT             ;  ELSE DO 10 ITERATIONS

037326  012705  000000          2$:                     MOV     #0,R5                   ;SET UP R5 AS INDEX TO STEP TABLES
037332  012737  000001  002336                          MOV     #1,INISTP               ;STEP 1 FOR ERROR PRINTOUT
037340  016437  000004  002272                          MOV     TUVEC(R4),STPTBL        ;PUT VECTOR IN STEP 1
037346  006237  002272                                  ASR     STPTBL                  ;DIVIDE BY TWO
037352  006237  002272                                  ASR     STPTBL                  ;DIVIDE BY FOUR
037356  013737  002272  002306                          MOV     STPTBL,CMPTBL+4         ;PUT VECTOR IN STEP 3 COMPARE
037364  052737  111000  002272                          BIS     #111000,STPTBL          ;REST OF STEP ONE
037372  012737  005700  002302                          MOV     #B.S1!B.QB!B.DI!B.OD!B.MP,CMPTBL
                                                                                        ;STEP 1 COMPARE VALUE
037400  012737  060050  002274                          MOV     #COMMAR,STPTBL+2        ;STEP 2 - COMM AREA ADDRESS
037406  012737  010222  002304                          MOV     #010222,CMPTBL+2        ;STEP 2 COMPARE
037414  012737  100000  002276                          MOV     #B.PP,STPTBL+4          ;STEP 3 - HIGH ADDRESS AND PRGE/POLL
037422  112737  000040  002307                          MOVB    #40,CMPTBL+5            ;REST OF STEP 3 COMPARE
037430  012737  000000  002300                          MOV     #0,STPTBL+6             ;STEP 4
037436  012737  040000  002310                          MOV     #040000,CMPTBL+6        ;STEP 4 COMPARE

037444  012737  000022  002326                          MOV     #18.,CMARLG             ;LENGTH OF COMM AREA FOR THIS TEST
037452  004737  031426                                  JSR     PC,BAKPAT               ;FILL COMM AREA WITH ALL 1'S DATA

```

```
 3433 037456  004737  031330                 JSR     PC,STEP1                   ;GO DO IT
 3434 037462  005737  002340                 TST     STEPST                     ;IF STATUS OKAY
 3435 037466  001412                         BEQ     5$                         ;  THEN CONTINUE TEST
 3436
 3437 037470                                 ERRDF   19.,EMSG9,PRIINI           ;"SA CONTENTS IN ERROR"
      037470  104455                         TRAP    C$ERDF
      037472  000023                         .WORD   19
      037474  024271                         .WORD   EMSG9
      037476  027002                         .WORD   PRIINI
 3438 037500                                 CKLOOP                             ;LOOP ON ERROR?
      037500  104406                         TRAP    C$CLP1
 3439 037502                                 DODU    LOGUNT                     ;DROP UUT
      037502  013700  002332                 MOV     LOGUNT,R0
      037506  104451                         TRAP    C$DODU
 3440 037510                                 ESCAPE  TST                        ;LEAVE TST
      037510  104410                         TRAP    C$ESCAPE
      037512  001166                         .WORD   L10024-.
 3441
 3442 037514  005237  002336          5$:    INC     INISTP                     ;ADJUST STEP COUNTER
 3443 037520  062705  000002                 ADD     #2,R5                      ;ADJUST TABLE INDEX
 3444 037524  012737  000100  002346  6$:    MOV     #100,OUTER                 ;SET UP FOR DELAY ROUTINE
 3445 037532  016537  002302  002334         MOV     CMPTBL(R5),SAEXP           ;SET UP FOR COMPARE
 3446 037540  012737  037200  002344  7$:    MOV     #16000.,INNER              ;SET UP INNER
 3447 037546  017464  000002  000012         MOV     @TUSA(R4),TUSASV(R4)       ;GET SA CONTENTS
 3448 037554  022705  000006                 CMP     #6,R5                      ;ARE WE IN STEP 4?
 3449 037560  001005                         BNE     8$                         ;BRANCH IF NOT
 3450 037562  033764  002334  000012         BIT     SAEXP,TUSASV(R4)           ;JUST LOOK FOR STEP 4 BIT
 3451 037570  001027                         BNE     10$                        ;IT'S SET SO LET'S GO
 3452 037572  000404                         BR      9$                         ;STAY IN LOOP OTHERWISE
 3453 037574  023764  002334  000012  8$:    CMP     SAEXP,TUSASV(R4)           ;IF SA IS WHAT WE EXPECT
 3454 037602  001422                         BEQ     10$                        ;  THEN MOVE ALONG
 3455 037604  004737  031302          9$:    JSR     PC,PDELAY                  ;  ELSE GIVE UUT SOME TIME
 3456 037610  005737  002350                 TST     TOUT                       ;IF NO TIMEOUT YET
 3457 037614  001751                         BEQ     7$                         ;  THEN GO TAKE ANOTHER LOOK
 3458
 3459 037616  012737  025632  002330         MOV     #LESI,FRUIS                ;FAILING FRU
 3460 037624                                 ERRDF   20.,EMSG9,PRIINI           ;"SA CONTENTS IN ERROR"
      037624  104455                         TRAP    C$ERDF
      037626  000024                         .WORD   20
      037630  024271                         .WORD   EMSG9
      037632  027002                         .WORD   PRIINI
 3461 037634                                 CKLOOP
      037634  104406                         TRAP    C$CLP1
 3462 037636                                 DODU    LOGUNT
      037636  013700  002332                 MOV     LOGUNT,R0
      037642  104451                         TRAP    C$DODU
 3463 037644                                 ESCAPE  TST
      037644  104410                         TRAP    C$ESCAPE
      037646  001032                         .WORD   L10024 .
 3464
 3465 037650  016574  002272  000002  10$:   MOV     STPTBL(R5),@TUSA(R4)       ;WRITE NEXT STEP TO UUT
 3466 037656  022705  000004                 CMP     #4,R5                      ;IF STEP 3
 3467 037662  001404                         BEQ     15$                        ;  THEN DO PURGE/POLL STUFF
 3468 037664  022705  000006                 CMP     #6,R5                      ;IF NOT IN STEP 4
 3469 037670  001311                         BNE     5$                         ;  THEN GO BACK TO MAIN LOOP
 3470 037672  000440                         BR      20$                        ;  ELSE GO CHECK RESULTS
 3471
```

```
3472 037674                          15$:    DELAY   1                           ;GIVE PORT SOME TIME
     037674  012727  000001                  MOV     #1,(PC)+
     037700  000000                          .WORD   0
     037702  013727  002116                  MOV     L$DLY,(PC)+
     037706  000000                          .WORD   0
     037710  005367  177772                  DEC     -6(PC)
     037714  001375                          BNE     .-4
     037716  005367  177756                  DEC     -22(PC)
     037722  001367                          BNE     .-20
3473 037724  017464  000002  000012          MOV     @TUSA(R4),TUSASV(R4)        ;GET SA CONTENTS
3474 037732  001412                          BEQ     16$                         ;BRANCH IF OKAY
3475
3476 037734                                  ERRDF   21.,EMSG13,PRIINI           ;SA NOT 0 IN PURGE/POLL
     037734  104455                          TRAP    C$ERDF
     037736  000025                          .WORD   21
     037740  024454                          .WORD   EMSG13
     037742  027002                          .WORD   PRIINI
3477 037744                                  CKLOOP
     037744  104406                          TRAP    C$CLP1
3478 037746                                  DODU    LOGUNT
     037746  013700  002332                  MOV     LOGUNT,R0
     037752  104451                          TRAP    C$DODU
3479 037754                                  ESCAPE  TST
     037754  104410                          TRAP    C$ESCAPE
     037756  000722                          .WORD   L10024-.
3480
3481 037760  012774  000000  000002  16$:    MOV     #0,@TUSA(R4)                ;WRITE 0'S TO SA
3482 037766  005774  000000                  TST     @TUIP(R4)                   ;AND READ IP
3483 037772  000650                          BR      5$                          ;GO WAIT FOR NEXT TRANSITION
3484
3485 037774  004737  031456          20$:    JSR     PC,CHKCOM                   ;GO CHECK COMM AREA
3486 040000  032764  000001  000014          BIT     #DRPFLG,LUNFLG(R4)          ;HAS UUT BEEN DROPPED
3487 040006  001005                          BNE     T6EXT                       ;LEAVE NOW IF SO
3488 040010  005337  000000G                 DEC     ITRCNT                      ;IF NO MORE ITERATIONS LEFT
3489 040014  001402                          BEQ     T6EXT                       ;  THEN LEAVE TEST
3490 040016  000137  037326                  JMP     2$                          ;  ELSE DO IT AGAIN
3491
3492 040022                          T6EXT:  EXIT    TST
     040022  104432                          TRAP    C$EXIT
     040024  000654                          .WORD   L10024 .
3493 040026                                  ENDSUB
     040026                          L10025:
     040026  104403                          TRAP    C$ESUB
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```
 3496                                          .SBTTL  SUBTEST 2: EXTENDED ADDRESS TEST
 3497
 3498 040030                                           BGNSUB
      040030                                   T6.2:
      040030  104402                                   TRAP    C$BSUB
 3499
 3500 040032  032764  000001  000014                   BIT     #DRPFLG,LUNFLG(R4)      ;IF UUT NOT DROPPED
 3501 040040  001407                                   BEQ     1$                      ;  THEN DO TEST
 3502 040042                                           EXIT    TST                     ;  ELSE GET OUT
      040042  104432                                   TRAP    C$EXIT
      040044  000634                                   .WORD   L10024-.
 3503 040046  005737  002314                           TST     KTFLAG                  ;IF MEMORY MANAGEMENT AVAILABLE
 3504 040052  001002                                   BNE     1$                      ;  THEN DO TEST
 3505 040054                                           EXIT    TST                     ;  ELSE GET OUT
      040054  104432                                   TRAP    C$EXIT
      040056  000622                                   .WORD   L10024-.
 3506 040060  012737  025647  002330  1$:              MOV     #CTRL,FRUIS             ;FAILING FRU IN CASE OF ERROR
 3507 040066  012737  000001  000000G                  MOV     #1,ITRCNT               ;SET UP FOR ONE TEST ITERATION
 3508 040074  022737  000001  002312                   CMP     #1,PASCNT               ;IF FIRST PASS
 3509 040102  001403                                   BEQ     2$                      ;  THEN START TEST
 3510 040104  012737  000012  000000G                  MOV     #10.,ITRCNT             ;  ELSE DO 10 ITERATIONS
 3511
 3512 040112  004737  031616          2$:              JSR     PC,INTMMU               ;INITIALIZE MMU REGISTERS
 3513 040116  012705  000000          3$:              MOV     #0,R5                   ;SET UP R5 AS INDEX TO STEP TABLES
 3514 040122  012737  000001  002336                   MOV     #1,INISTP               ;STEP 1 FOR ERROR PRINTOUT
 3515 040130  016437  000004  002272                   MOV     TUVEC(R4),STPTBL        ;PUT VECTOR IN STEP 1
 3516 040136  006237  002272                           ASR     STPTBL                  ;DIVIDE BY TWO
 3517 040142  006237  002272                           ASR     STPTBL                  ;DIVIDE BY FOUR
 3518 040146  013737  002272  002306                   MOV     STPTBL,CMPTBL+4         ;PUT VECTOR IN STEP 3 COMPARE
 3519 040154  052737  111000  002272                   BIS     #111000,STPTBL          ;REST OF STEP ONE
 3520 040162  012737  005700  002302                   MOV     #B.S1!B.QB!B.DI!B.OD!B.MP,CMPTBL
 3521                                                                                  ;STEP 1 COMPARE VALUE
 3522 040170  012737  060050  002274                   MOV     #COMMAR,STPTBL+2        ;STEP 2 - COMM AREA ADDRESS
 3523 040176  042737  160000  002274                   BIC     #BIT15!BIT14!BIT13,STPTBL+2
 3524                                                                                  ;CLEAR THE ACTIVE PAGE FIELD
 3525 040204  012737  010222  002304                   MOV     #010222,CMPTBL+2        ;STEP 2 COMPARE
 3526 040212  013737  172346  002352                   MOV     KPAR3,TEMP              ;GET RELOCATION VALUE
 3527 040220  113737  002353  002276                   MOVB    TEMP+1,STPTBL+4         ;JUST THE HGH BYTE
 3528 040226  006237  002276                           ASR     STPTBL+4                ;MAKE IT THE EXTENDED
 3529 040232  006237  002276                           ASR     STPTBL+4                ;  ADDRESS OF THE COMM AREA
 3530 040236  052737  100000  002276                   BIS     #B.PP,STPTBL+4          ;NOW SET PURGE/POLL BIT
 3531 040244  112737  000040  002307                   MOVB    #40,CMPTBL+5            ;REST OF STEP 3 COMPARE
 3532 040252  012737  000000  002300                   MOV     #0,STPTBL+6             ;STEP 4
 3533 040260  012737  040000  002310                   MOV     #040000,CMPTBL+6        ;STEP 4 COMPARE
 3534
 3535 040266  012737  000022  002326                   MOV     #18.,CMARLG             ;LENGTH OF COMM AREA FOR THIS TEST
 3536 040274  004737  031426                           JSR     PC,BAKPAT               ;FILL COMM AREA WITH ALL 1'S DATA
 3537
 3538 040300  004737  031330                           JSR     PC,STEP1                ;GO DO IT
 3539 040304  005737  002340                           TST     STEPST                  ;IF STATUS OKAY
 3540 040310  001412                                   BEQ     5$                      ;  THEN CONTINUE TEST
 3541
 3542 040312                                           ERRDF   25.,EMSG9,PRIINI        ;"SA CONTENTS IN ERROR"
      040312  104455                                   TRAP    C$ERDF
      040314  000031                                   .WORD   25
      040316  024271                                   .WORD   EMSG9
      040320  027002                                   .WORD   PRIINI
```

```
3543 040322                                     CKLOOP                          ;LOOP ON ERROR?
     040322  104406                             TRAP    C$CLP1
3544 040324                                     DODU    LOGUNT                  ;DROP UUT
     040324  013700  002332                     MOV     LOGUNT,R0
     040330  104451                             TRAP    C$DODU
3545 040332                                     ESCAPE  TST                     ;LEAVE TST
     040332  104410                             TRAP    C$ESCAPE
     040334  000344                             .WORD   L10024-.
3546
3547 040336  005237  002336          5$:        INC     INISTP                  ;ADJUST STEP COUNTER
3548 040342  062705  000002                     ADD     #2,R5                   ;ADJUST TABLE INDEX
3549 040346  012737  000100  002346  6$:        MOV     #100,OUTER              ;SET UP FOR DELAY ROUTINE
3550 040354  016537  002302  002334             MOV     CMPTBL(R5),SAEXP        ;SET UP FOR COMPARE
3551 040362  012737  037200  002344  7$:        MOV     #16000.,INNER           ;SET UP INNER
3552 040370  017464  000002  000012             MOV     @TUSA(R4),TUSASV(R4)    ;GET SA CONTENTS
3553 040376  022705  000006                     CMP     #6,R5                   ;ARE WE IN STEP 4?
3554 040402  001005                             BNE     8$                      ;BRANCH IF NOT
3555 040404  033764  002334  000012             BIT     SAEXP,TUSASV(R4)        ;JUST LOOK FOR STEP 4 BIT
3556 040412  001024                             BNE     10$                     ;IT'S SET SO LET'S GO
3557 040414  000404                             BR      9$                      ;STAY IN LOOP OTHERWISE
3558 040416  023764  002334  000012  8$:        CMP     SAEXP,TUSASV(R4)        ;IF SA IS WHAT WE EXPECT
3559 040424  001417                             BEQ     10$                     ;  THEN MOVE ALONG
3560 040426  004737  031302          9$:        JSR     PC,PDELAY               ;  ELSE GIVE UUT SOME TIME
3561 040432  005737  002350                     TST     TOUT                    ;IF NO TIMEOUT YET
3562 040436  001751                             BEQ     7$                      ;  THEN GO TAKE ANOTHER LOOK
3563
3564 040440                                     ERRDF   26.,EMSG9,PRIINI        ;"SA CONTENTS IN ERROR"
     040440  104455                             TRAP    C$ERDF
     040442  000032                             .WORD   26
     040444  024271                             .WORD   EMSG9
     040446  027002                             .WORD   PRIINI
3565 040450                                     CKLOOP
     040450  104406                             TRAP    C$CLP1
3566 040452                                     DODU    LOGUNT
     040452  013700  002332                     MOV     LOGUNT,R0
     040456  104451                             TRAP    C$DODU
3567 040460                                     ESCAPE  TST
     040460  104410                             TRAP    C$ESCAPE
     040462  000216                             .WORD   L10024-.
3568
3569 040464  016574  002272  000002  10$:       MOV     STPTBL(R5),@TUSA(R4)    ;WRITE NEXT STEP TO UUT
3570 040472  022705  000004                     CMP     #4,R5                   ;IF STEP 3
3571 040476  001404                             BEQ     15$                     ;  THEN DO PURGE/POLL STUFF
'572 040500  022705  000006                     CMP     #6,R5                   ;IF NOT IN STEP 4
3573 040504  001314                             BNE     5$                      ;  THEN GO BACK TO MAIN LOOP
3574 040506  000440                             BR      20$                     ;  ELSE GO CHECK RESULTS
3575
3576 040510                          15$:       DELAY   1                       ;GIVE PORT SOME TIME
     040510  012727  000001                     MOV     #1,(PC)+
     040514  000000                             .WORD   0
     040516  013727  002116                     MOV     L$DLY,(PC)+
     040522  000000                             .WORD   0
     040524  005367  177772                     DEC     -6(PC)
     040530  001375                             BNE     .-4
     040532  005367  177756                     DEC     -22(PC)
     040536  001367                             BNE     .-20
3577 040540  017464  000002  000012             MOV     @TUSA(R4),TUSASV(R4)    ;GET SA CONTENTS
```

```
040546  001412                           BEQ     16$                  ;BRANCH IF OKAY

040550                                   ERRDF   27.,EMSG13.PRIINI    ;SA NOT 0 IN PURGE/POLL
040550  104455                           TRAP    C$ERDF
040552  000033                           .WORD   27
040554  024454                           .WORD   EMSG13
040556  027002                           .WORD   PRIINI
040560                                   CKLOOP
040560  104406                           TRAP    C$CLP1
040562                                   DODU    LOGUNT
040562  013700  002332                   MOV     LOGUNT,R0
040566  104451                           TRAP    C$DODU
040570                                   ESCAPE  TST
040570  104410                           TRAP    C$ESCAPE
040572  000106                           .WORD   L10024-.

040574  012774  000000  000002  16$:     MOV     #0,@TUSA(R4)         ;WRITE 0'S TO SA
040602  005774  000000                   TST     @TUIP(R4)            ;AND READ IP
040606  000653                           BR      5$                   ;GO WAIT FOR NEXT TRANSITION

040610  004737  031456          20$:     JSR     PC.CHKCOM            ;GO CHECK COMM AREA
040614  032764  000001  000014           BIT     #DRPFLG.LUNFLG(R4)   ;HAS UUT BEEN DROPPED
040622  001021                           BNE     ST6EXT               ;LEAVE NOW IF SO

040624  062737  002000  172346           ADD     #2000.KPAR3          ;POINT TO NEXT 32KWORDS
040632  103406                           BCS     25$                  ;DON'T ALLOW OVERFLOW IF 4 MBYTES
040634  023737  002120  172346           CMP     L$HIME.KPAR3         ;IF THERE'S NO MORE MEMORY AVAILABLE
040642  103402                           BLO     25$                  ;  THEN CHECK FOR MORE ITERATIONS
040644  000137  040116                   JMP     3$                   ;  ELSE DO IT AGAIN

040650  005037  177572          25$:     CLR     MMUSR0               ;SHUT DOWN MEMORY MANAGEMENT
040654  005337  000000G                  DEC     ITRCNT               ;IF NO MORE ITERATIONS LEFT
040660  001402                           BEQ     ST6EXT               ;  THEN LEAVE TEST
040662  000137  040112                   JMP     2$                   ;  ELSE DO IT AGAIN

040666  005037  177572          ST6EXT:  CLR     MMUSR0               ;MAKE SURE IT'S OFF
040672                                   EXIT    TST
040672  104432                           TRAP    C$EXIT
040674  000004                           .WORD   L10024-.

040676                                   ENDSUB
040676                          L10026:
040676  104403                           TRAP    C$ESUB

040700                                   ENDTST
040700                          L10024:
040700  104401                           TRAP    C$ETST
```

```
 3612                                              .SBTTL TEST 7: SMALL RING TEST
 3616
 3617                                              ;;*************************************************************
 3618                                              ;;*************************************************************
 3619                                              ;
 3620                                              ;TEST 7 - SMALL RING TEST
 3621                                              ;       THIS TEST IS SIMILAR TO TEST 6, HOWEVER, RING DEPTH
 3622                                              ;       USED IN THIS TEST IS THE MINIMUM.
 3623                                              ;
 3624                                              ;;*************************************************************
 3625                                              ;;*************************************************************
 3629
 3630 040702                                               BGNTST
      040702                                       T7::
 3631
 3632 040702  032764  000001  000014                       BIT     #DRPFLG,LUNFLG(R4)      ;IF UUT NOT DROPPED
 3633 040710  001402                                       BEQ     1$                      ;  THEN DO TEST
 3634 040712                                               EXIT    TST                     ;  ELSE GET OUT
      040712  104432                                       TRAP    C$EXIT
      040714  000526                                       .WORD   L10027-.
 3635 040716  012737  025647  002330  1$:                  MOV     #CTRL,FRUIS             ;FAILING FRU IN CASE OF ERROR
 3636 040724  012737  000001  000000G                      MOV     #1,ITRCNT               ;SET UP FOR ONE TEST ITERATION
 3637 040732  022737  000001  002312                       CMP     #1,PASCNT               ;IF FIRST PASS
 3638 040740  001403                                       BEQ     2$                      ;  THEN START TEST
 3639 040742  012737  000012  000000G                      MOV     #10.,ITRCNT             ;  ELSE DO 10 ITERATIONS
 3640
 3641 040750  012705  000000          2$:                  MOV     #0,R5                   ;SET UP R5 AS INDEX TO STEP TABLES
 3642 040754  012737  000001  002336                       MOV     #1,INISTP               ;STEP 1 FOR ERROR PRINTOUT
 3643 040762  016437  000004  002272                       MOV     TUVEC(R4),STPTBL        ;PUT VECTOR IN STEP 1
 3644 040770  006237  002272                               ASR     STPTBL                  ;DIVIDE BY TWO
 3645 040774  006237  002272                               ASR     STPTBL                  ;DIVIDE BY FOUR
 3646 041000  013737  002272  002306                       MOV     STPTBL,CMPTBL+4         ;PUT VECTOR IN STEP 3 COMPARE
 3647 041006  052737  104400  002272                       BIS     #104400,STPTBL          ;REST OF STEP ONE
 3648 041014  012737  005700  002302                       MOV     #B.S1!B.QB!B.DI!B.OD!B.MP,CMPTBL
 3649                                                                                      ;STEP 1 COMPARE VALUE
 3650 041022  012737  060050  002274                       MOV     #COMMAR,STPTBL+2        ;STEP 2 - COMM AREA ADDRESS
 3651 041030  012737  010211  002304                       MOV     #010211,CMPTBL+2        ;STEP 2 COMPARE
 3652 041036  012737  100000  002276                       MOV     #B.PP,STPTBL+4          ;STEP 3 - HIGH ADDRESS AND PRGE/POLL
 3653 041044  112737  000040  002307                       MOVB    #40,CMPTBL+5            ;REST OF STEP 3 COMPARE
 3654 041052  012737  000000  002300                       MOV     #0,STPTBL+6             ;STEP 4
 3655 041060  012737  040000  002310                       MOV     #040000,CMPTBL+6        ;STEP 4 COMPARE
 3656
 3657 041066  012737  000012  002326                       MOV     #10.,CMARLG             ;LENGTH OF COMM AREA FOR THIS TEST
 3658 041074  004737  031426                               JSR     PC,BAKPAT               ;FILL COMM AREA WITH ALL 1'S DATA
 3659
 3660 041100  004737  031330                               JSR     PC,STEP1                ;GO DO IT
 3661 041104  005737  002340                               TST     STEPST                  ;IF STATUS OKAY
 3662 041110  001412                                       BEQ     5$                      ;  THEN CONTINUE TEST
 3663
 3664 041112                                               ERRDF   19.,EMSG9,PRIINI        ;"SA CONTENTS IN ERROR"
      041112  104455                                       TRAP    C$ERDF
      041114  000023                                       .WORD   19
      041116  024271                                       .WORD   EMSG9
      041120  027002                                       .WORD   PRIINI
 3665 041122                                               CKLOOP                          ;LOOP ON ERROR?
      041122  104406                                       TRAP    C$CLP1
 3666 041124                                               DODU    LOGUNT                  ;DROP UUT
```

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        041124  013700  002332                      MOV     LOGUNT,R0
        041130  104451                              TRAP    C$DODU
   3667 041132                                      ESCAPE  TST                             ;LEAVE TST
        041132  104410                              TRAP    C$ESCAPE
        041134  000306                              .WORD   L10027-.
   3668
   3669 041136  005237  002336           5$:        INC     INISTP                          ;ADJUST STEP COUNTER
   3670 041142  062705  000002                      ADD     #2,R5                           ;ADJUST TABLE INDEX
   3671 041146  012737  000100  002346   6$:        MOV     #100,OUTER                      ;SET UP FOR DELAY ROUTINE
   3672 041154  016537  002302  002334              MOV     CMPTBL(R5),SAEXP                ;SET UP FOR COMPARE
   3673 041162  012737  037200  002344   7$:        MOV     #16000.,INNER                   ;SET UP INNER
   3674 041170  017464  000002  000012              MOV     @TUSA(R4),TUSASV(R4)            ;GET SA CONTENTS
   3675 041176  022705  000006                      CMP     #6,R5                           ;ARE WE IN STEP 4?
   3676 041202  001005                              BNE     8$                              ;BRANCH IF NOT
   3677 041204  033764  002334  000012              BIT     SAEXP,TUSASV(R4)                ;JUST LOOK FOR STEP 4 BIT
   3678 041212  001024                              BNE     10$                             ;IT'S SET SO LET'S GO
   3679 041214  000404                              BR      9$                              ;STAY IN LOOP OTHERWISE
   3680 041216  023764  002334  000012   8$:        CMP     SAEXP,TUSASV(R4)                ;IF SA IS WHAT WE EXPECT
   3681 041224  001417                              BEQ     10$                             ;  THEN MOVE ALONG
   3682 041226  004737  031302           9$:        JSR     PC,PDELAY                       ;  ELSE GIVE UUT SOME TIME
   3683 041232  005737  002350                      TST     TOUT                            ;IF NO TIMEOUT YET
   3684 041236  001751                              BEQ     7$                              ;  THEN GO TAKE ANOTHER LOOK
   3685
   3686 041240                                      ERRDF   20.,EMSG9,PRIINI                ;"SA CONTENTS IN ERROR"
        041240  104455                              TRAP    C$ERDF
        041242  000024                              .WORD   20
        041244  024271                              .WORD   EMSG9
        041246  027002                              .WORD   PRIINI
   3687 041250                                      CKLOOP
        041250  104406                              TRAP    C$CLP1
   3688 041252                                      DODU    LOGUNT
        041252  013700  002332                      MOV     LOGUNT,R0
        041256  104451                              TRAP    C$DODU
   3689 041260                                      ESCAPE  TST
        041260  104410                              TRAP    C$ESCAPE
        041262  000160                              .WORD   L10027-.
   3690
   3691 041264  016574  002272  000002  10$:        MOV     STPTBL(R5),@TUSA(R4)            ;WRITE NEXT STEP TO UUT
   3692 041272  022705  000004                      CMP     #4,R5                           ;IF STEP 3
   3693 041276  001404                              BEQ     15$                             ;  THEN DO PURGE/POLL STUFF
   3694 041300  022705  000006                      CMP     #6,R5                           ;IF NOT IN STEP 4
   3695 041304  001314                              BNE     5$                              ;  THEN GO BACK TO MAIN LOOP
   3696 041306  000440                              BR      20$                             ;  ELSE GO CHECK RESULTS
   3697
   3698 041310                           15$:       DELAY   1                               ;GIVE PORT SOME TIME
        041310  012727  000001                      MOV     #1,(PC)+
        041314  000000                              .WORD   0
        041316  013727  002116                      MOV     L$DLY,(PC)+
        041322  000000                              .WORD   0
        041324  005367  177772                      DEC     -6(PC)
        041330  001375                              BNE     .-4
        041332  005367  177756                      DEC     -22(PC)
        041336  001367                              BNE     .-20
   3699 041340  017464  000002  000012              MOV     @TUSA(R4),TUSASV(R4)            ;GET SA CONTENTS
   3700 041346  001412                              BEQ     16$                             ;BRANCH IF OKAY
   3701
   3702 041350                                      ERRDF   21.,EMSG13,PRIINI               ;SA NOT 0 IN PURGE/POLL
```

```
     041350  104455                              TRAP    C$ERDF
     041352  000025                              .WORD   21
     041354  024454                              .WORD   EMSG13
     041356  027002                              .WORD   PRIINI
     041360                                      CKLOOP
     041360  104406                              TRAP    C$CLP1
     041362                                      DODU    LOGUNT
     041362  013700  002332                      MOV     LOGUNT,R0
     041366  104451                              TRAP    C$DODU
     041370                                      ESCAPE  TST
     041370  104410                              TRAP    C$ESCAPE
     041372  000050                              .WORD   L10027-.

     041374  012774  000000  000002  16$:        MOV     #0,@TUSA(R4)            ;WRITE 0'S TO SA
     041402  005774  000000                      TST     @TUIP(R4)               ;AND READ IP
     041406  000653                              BR      5$                      ;GO WAIT FOR NEXT TRANSITION

     041410  004737  031456          20$:        JSR     PC,CHKCOM               ;GO CHECK COMM AREA
     041414  032764  000001  000014              BIT     #DRPFLG,LUNFLG(R4)      ;HAS UUT BEEN DROPPED
     041422  001005                              BNE     T7EXT                   ;LEAVE NOW IF SO
     041424  005337  000000G                     DEC     ITRCNT                  ;IF NO MORE ITERATIONS LEFT
     041430  001402                              BEQ     T7EXT                   ;  THEN LEAVE TEST
     041432  000137  040750                      JMP     2$                      ;  ELSE DO IT AGAIN

     041436                          T7EXT:      EXIT    TST
     041436  104432                              TRAP    C$EXIT
     041440  000002                              .WORD   L10027-.

     041442                                      ENDTST
     041442                          L10027:
     041442  104401                              TRAP    C$ETST
```

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    3723                                             .SBTTL TEST 8: MAXIMUM RING BUFFER TEST
    3724
    3725 041444                                                BGNTST
         041444                                      T8::
    3726
    3727 041444  032764  000001  000014                        BIT     #DRPFLG,LUNFLG(R4)       ;IF UUT NOT DROPPED
    3728 041452  001402                                        BEQ     1$                       ;  THEN DO TEST
    3729 041454                                                EXIT    TST                      ;  ELSE GET OUT
         041454  104432                                        TRAP    C$EXIT
         041456  000526                                        .WORD   L10030-.
    3730 041460  012737  025647  002330  1$:                   MOV     #CTRL,FRUIS              ;FAILING FRU IN CASE OF ERROR
    3731 041466  012737  000001  000000G                       MOV     #1,ITRCNT                ;SET UP FOR ONE TEST ITERATION
    3732 041474  022737  000001  002312                        CMP     #1,PASCNT                ;IF FIRST PASS
    3733 041502  001403                                        BEQ     2$                       ;  THEN START TEST
    3734 041504  012737  000012  000000G                       MOV     #10.,ITRCNT              ;  ELSE DO 10 ITERATIONS
    3735
    3736 041512  012705  000000          2$:                   MOV     #0,R5                    ;SET UP R5 AS INDEX TO STEP TABLES
    3737 041516  012737  000001  002336                        MOV     #1,INISTP                ;STEP 1 FOR ERROR PRINTOUT
    3738 041524  016437  000004  002272                        MOV     TUVEC(R4),STPTBL         ;PUT VECTOR IN STEP 1
    3739 041532  006237  002272                                ASR     STPTBL                   ;DIVIDE BY TWO
    3740 041536  006237  002272                                ASR     STPTBL                   ;DIVIDE BY FOUR
    3741 041542  013737  002272  002306                        MOV     STPTBL,CMPTBL+4          ;PUT VECTOR IN STEP 3 COMPARE
    3742 041550  052737  137400  002272                        BIS     #137400,STPTBL           ;REST OF STEP ONE
    3743 041556  012737  005700  002302                        MOV     #B.S1!B.QB!B.DI!B.OD!B.MP,CMPTBL
    3744                                                                                        ;STEP 1 COMPARE VALUE
    3745 041564  012737  060050  002274                        MOV     #COMMAR,STPTBL+2         ;STEP 2 - COMM AREA ADDRESS
    3746 041572  012737  010277  002304                        MOV     #010277,CMPTBL+2         ;STEP 2 COMPARE
    3747 041600  012737  100000  002276                        MOV     #B.PP,STPTBL+4           ;STEP 3 - HIGH ADDRESS AND PRGE/POLL
    3748 041606  112737  000040  002307                        MOVB    #40,CMPTBL+5             ;REST OF STEP 3 COMPARE
    3749 041614  012737  000000  002300                        MOV     #0,STPTBL+6              ;STEP 4
    3750 041622  012737  040000  002310                        MOV     #040000,CMPTBL+6         ;STEP 4 COMPARE
    3751
    3752 041630  012737  001002  002326                        MOV     #514.,CMARLG             ;LENGTH OF COMM AREA FOR THIS TEST
    3753 041636  004737  031426                                JSR     PC,BAKPAT                ;FILL COMM AREA WITH ALL 1'S DATA
    3754
    3755 041642  004737  031330                                JSR     PC,STEP1                 ;GO DO IT
    3756 041646  005737  002340                                TST     STEPST                   ;IF STATUS OKAY
    3757 041652  001412                                        BEQ     5$                       ;  THEN CONTINUE TEST
    3758
    3759 041654                                                ERRDF   22.,EMSG9,PRIINI         ;"SA CONTENTS IN ERROR"
         041654  104455                                        TRAP    C$ERDF
         041656  000026                                        .WORD   22
         041660  024271                                        .WORD   EMSG9
         041662  027002                                        .WORD   PRIINI
    3760 041664                                                CKLOOP                           ;LOOP ON ERROR?
         041664  104406                                        TRAP    C$CLP1
    3761 041666                                                DODU    LOGUNT                   ;DROP UUT
         041666  013700  002332                                MOV     LOGUNT,R0
         041672  104451                                        TRAP    C$DODU
    3762 041674                                                ESCAPE  TST                      ;LEAVE TST
         041674  104410                                        TRAP    C$ESCAPE
         041676  000306                                        .WORD   L10030-.
    3763
    3764 041700  005237  002336          5$:                   INC     INISTP                   ;ADJUST STEP COUNTER
    3765 041704  062705  000002                                ADD     #2,R5                    ;ADJUST TABLE INDEX
    3766 041710  012737  000100  002346  6$:                   MOV     #100,OUTER               ;SET UP FOR DELAY ROUTINE
    3767 041716  016537  002302  002334                        MOV     CMPTBL(R5),SAEXP         ;SCT UP FOR COMPARE
```

```
 3768 041724  012737  037200  002344  7$:    MOV     #16000.,INNER          ;SET UP INNER
 3769 041732  017464  000002  000012         MOV     @TUSA(R4),TUSASV(R4)   ;GET SA CONTENTS
 3770 041740  022705  000006                 CMP     #6,R5                  ;ARE WE IN STEP 4?
 3771 041744  001005                         BNE     8$                     ;BRANCH IF NOT
 3772 041746  033764  002334  000012         BIT     SAEXP,TUSASV(R4)       ;JUST LOOK FOR STEP 4 BIT
 3773 041754  001024                         BNE     10$                    ;IT'S SET SO LET'S GO
 3774 041756  000404                         BR      9$                     ;STAY IN LOOP OTHERWISE
 3775 041760  023764  002334  000012  8$:    CMP     SAEXP,TUSASV(R4)       ;IF SA IS WHAT WE EXPECT
 3776 041766  001417                         BEQ     10$                    ;  THEN MOVE ALONG
 3777 041770  004737  031302          9$:    JSR     PC,PDELAY              ;  ELSE GIVE UUT SOME TIME
 3778 041774  005737  002350                 TST     TOUT                   ;IF NO TIMEOUT YET
 3779 042000  001751                         BEQ     7$                     ;  THEN GO TAKE ANOTHER LOOK
 3780
 3781 042002                                 ERRDF   23.,EMSG9,PRIINI       ;"SA CONTENTS IN ERROR"
      042002  104455                         TRAP    C$ERDF
      042004  000027                         .WORD   23
      042006  024271                         .WORD   EMSG9
      042010  027002                         .WORD   PRIINI
 3782 042012                                 CKLOOP
      042012  104406                         TRAP    C$CLP1
 3783 042014                                 DODU    LOGUNT
      042014  013700  002332                 MOV     LOGUNT,R0
      042020  104451                         TRAP    C$DODU
 3784 042022                                 ESCAPE  TST
      042022  104410                         TRAP    C$ESCAPE
      042024  000160                         .WORD   L10030-.
 3785
 3786 042026  016574  002272  000002  10$:   MOV     STPTBL(R5),@TUSA(R4)   ;WRITE NEXT STEP TO UUT
 3787 042034  022705  000004                 CMP     #4,R5                  ;IF STEP 3
 3788 042040  001404                         BEQ     15$                    ;  THEN DO PURGE/POLL STUFF
 3789 042042  022705  000006                 CMP     #6,R5                  ;IF NOT IN STEP 4
 3790 042046  001314                         BNE     5$                     ;  THEN GO BACK TO MAIN LOOP
 3791 042050  000440                         BR      20$                    ;  ELSE GO CHECK RESULTS
 3792
 3793 042052                          15$:   DELAY   1                      ;GIVE PORT SOME TIME
      042052  012727  000001                 MOV     #1,(PC)+
      042056  000000                         .WORD   0
      042060  013727  002116                 MOV     L$DLY,(PC)+
      042064  000000                         .WORD   0
      042066  005367  177772                 DEC     -6(PC)
      042072  001375                         BNE     .-4
      042074  005367  177756                 DEC     -22(PC)
      042100  001367                         BNE     .-20
 3794 042102  017464  000002  000012         MOV     @TUSA(R4),TUSASV(R4)   ;GET SA CONTENTS
 3795 042110  001412                         BEQ     16$                    ;BRANCH IF OKAY
 3796
 3797 042112                                 ERRDF   24.,EMSG13,PRIINI      ;SA NOT 0 IN PURGE/POLL
      042112  104455                         TRAP    C$ERDF
      042114  000030                         .WORD   24
      042116  024454                         .WORD   EMSG13
      042120  027002                         .WORD   PRIINI
 3798 042122                                 CKLOOP
      042122  104406                         TRAP    C$CLP1
 3799 042124                                 DODU    LOGUNT
      042124  013700  002332                 MOV     LOGUNT,R0
      042130  104451                         TRAP    C$DODU
 3800 042132                                 ESCAPE  TST
```

```
042132  104410                                  TRAP    C$ESCAPE
042134  000050                                  .WORD   L10030-.

042136  012774  000000  000002  16$:            MOV     #0,@TUSA(R4)                    ;WRITE 0'S TO SA
042144  005774  000000                          TST     @TUIP(R4)                       ;AND READ IP
042150  000653                                  BR      5$                              ;GO WAIT FOR NEXT TRANSITION

042152  004737  031456          20$:            JSR     PC,CHKCOM                       ;GO CHECK COMM AREA
042156  032764  000001  000014                  BIT     #DRPFLG,LUNFLG(R4)              ;HAS UUT BEEN DROPPED
042164  001005                                  BNE     T8EXT                           ;LEAVE NOW IF SO
042166  005337  000000G                         DEC     ITRCNT                          ;IF NO MORE ITERATIONS LEFT
042172  001402                                  BEQ     T8EXT                           ;  THEN LEAVE TEST
042174  000137  041512                          JMP     2$                              ;  ELSE DO IT AGAIN

042200                          T8EXT:          EXIT    TST
042200  104432                                  TRAP    C$EXIT
042202  000002                                  .WORD   L10030-.

042204                                          ENDTST
042204                          L10030:
042204  104401                                  TRAP    C$ETST
```

```
 3819                                        .SBTTL  TEST 9:GET DUST STATUS
 3820
 3821 042206                                         BGNTST
      042206                                 T9::
 3822 042206  032764  000001  000014                 BIT     #DRPFLG,LUNFLG(R4)      ;IS THE DRIVE AVAILABLE
 3823 042214  001022                                 BNE     T9EXT                   ;GET OUT IF NOT AVAILABLE
 3824 042216  012737  025647  002330                 MOV     #CTRL,FRUIS             ;DEFAULT FRU IS CONTROLLER
 3825 042224  005064  000014                         CLR     LUNFLG(R4)              ;CLEAR ALL FLAGS
 3826 042230  004737  031716                         JSR     PC,PRTINT               ;GO DO A PORT INITIALIZE
 3827 042234  032764  000001  000014                 BIT     #DRPFLG,LUNFLG(R4)      ;IS THE DRIVE AVAILABLE
 3828 042242  001007                                 BNE     T9EXT                   ;NO, BRANCH TO EXIT
 3829 042244  052764  000010  000014                 BIS     #TEST.9,LUNFLG(R4)      ;SET TEST 9 FLAG
 3830 042252  012705  002370                         MOV     #GDUST,R5               ;SET UP TO DO GET DUST STATUS COMMAND
 3831 042256  004737  032350                         JSR     PC,CLSDRV               ;GO ISSUE THE COMMAND
 3832 042262                                 T9EXT:  EXIT    TST
      042262  104432                                 TRAP    C$EXIT
      042264  000002                                 .WORD   L10031-.
 3833 042266                                         ENDTST
      042266                                 L10031:
      042266  104401                                 TRAP    C$ETST
```

```
                                        .SBTTL  TEST 10: FUNCTIONAL FAULT DETECTION TEST (Internal Drive Test 1)

 042270                                         BGNTST
 042270                                 T10::
 042270  032764  000001  000014                 BIT     #DRPFLG,LUNFLG(R4)      ;IS THE DRIVE AVAILABLE
 042276  001062                                 BNE     T10EXT                  ;NO, BRANCH TO EXIT
 042300                                         MANUAL                          ;MANUAL INTERVENTION ALLOWED ?
 042300  104450                                 TRAP    C$MANI
 042302                                         BNCOMPLETE      T10EXT          ;NO, BRANCH TO EXIT
 042302  103060                                 BCC     T10EXT
 042304                                 1$:     PRINTF  #T10MS1                 ;PRINT TEST 10 MESSAGE
 042304  012746  025724                         MOV     #T10MS1,-(SP)
 042310  012746  000001                         MOV     #1,-(SP)
 042314  010600                                 MOV     SP,R0
 042316  104417                                 TRAP    C$PNTF
 042320  062706  000004                         ADD     #4,SP
 042324                                         PRINTF  #T10MS2                 ;PRINT TEST 10 MESSAGE
 042324  012746  026032                         MOV     #T10MS2,-(SP)
 042330  012746  000001                         MOV     #1,-(SP)
 042334  010600                                 MOV     SP,R0
 042336  104417                                 TRAP    C$PNTF
 042340  062706  000004                         ADD     #4,SP
 042344                                         PRINTF  #T10MS3                 ;PRINT TEST 10 MESSAGE
 042344  012746  026057                         MOV     #T10MS3,-(SP)
 042350  012746  000001                         MOV     #1,-(SP)
 042354  010600                                 MOV     SP,R0
 042356  104417                                 TRAP    C$PNTF
 042360  062706  000004                         ADD     #4,SP
 042364                                         PRINTF  #T10MS4                 ;PRINT TEST 10 MESSAGE
 042364  012746  026134                         MOV     #T10MS4,-(SP)
 042370  012746  000001                         MOV     #1,-(SP)
 042374  010600                                 MOV     SP,R0
 042376  104417                                 TRAP    C$PNTF
 042400  062706  000004                         ADD     #4,SP
 042404                                         GMANIL  QUESTN,ANSWER,1,YES     ;GET OPERATOR INPUT
 042404  104443                                 TRAP    C$GMAN
 042406  000404                                 BR      10000$
 042410  002354                                 .WORD   ANSWER
 042412  000130                                 .WORD   T$CODE
 042414  026716                                 .WORD   QUESTN
 042416  000001                                 .WORD   1
 042420                                 10000$:
 042420  005737  002354                         TST     ANSWER                  ;DID OPERATOR ANSWER YES ?
 042424  001407                                 BEQ     T10EXT                  ;NO, BRANCH TO EXIT
 042426  005037  002354                         CLR     ANSWER                  ;CLEAR OPERATOR ANSWER
 042432  112737  000061  002424                 MOVB    #61,TSTNAM              ;LOAD DRIVE TEST NAME (ASCII 1)
 042440  004737  032150                         JSR     PC,DRVTST               ;GO RUN THE INTERNAL DRIVE TEST
 042444                                 T10EXT: EXIT    TST
 042444  104432                                 TRAP    C$EXIT
 042446  000002                                 .WORD   L10032-.
 042450                                         ENDTST
 042450                                 L10032:
 042450  104401                                 TRAP    C$ETST
```

```
                                                .SBTTL  TEST 11: TENSION FAULT ISOLATION TEST (Internal Drive Test 2)

        042452                                          BGNTST
        042452                                  T11::
        042452  032764  000001  000014                  BIT     #DRPFLG,LUNFLG(R4)      ;IS THE DRIVE AVAILABLE
        042460  001042                                  BNE     T11EXT                  ;NO, BRANCH TO EXIT
        042462                                          MANUAL                          ;MANUAL INTERVENTION ALLOWED ?
        042462  104450                                  TRAP    C$MANI
        042464                                          BNCOMPLETE      T11EXT          ;NO, BRANCH TO EXIT
        042464  103040                                  BCC     T11EXT
        042466                                  1$:     PRINTF  #T11MS1                 ;PRINT TEST 11 MESSAGE
        042466  012746  026221                          MOV     #T11MS1,-(SP)
        042472  012746  000001                          MOV     #1,-(SP)
        042476  010600                                  MOV     SP,R0
        042500  104417                                  TRAP    C$PNTF
        042502  062706  000004                          ADD     #4,SP
        042506                                          PRINTF  #MMSG                   ;PRINT REQUIREMENT MESSAGE
        042506  012746  026536                          MOV     #MMSG,-(SP)
        042512  012746  000001                          MOV     #1,-(SP)
        042516  010600                                  MOV     SP,R0
        042520  104417                                  TRAP    C$PNTF
        042522  062706  000004                          ADD     #4,SP
        042526                                          GMANIL  QUESTN,ANSWER,1,YES     ;GET OPERATOR INPUT
        042526  104443                                  TRAP    C$GMAN
        042530  000404                                  BR      10000$
        042532  002354                                  .WORD   ANSWER
        042534  000130                                  .WORD   T$CODE
        042536  026716                                  .WORD   QUESTN
        042540  000001                                  .WORD   1
        042542                                  10000$:
        042542  005737  002354                          TST     ANSWER                  ;DID OPERATOR ANSWER YES ?
        042546  001407                                  BEQ     T11EXT                  ;NO, BRANCH TO EXIT
        042550  005037  002354                          CLR     ANSWER                  ;CLEAR OPERATOR ANSWER
        042554  112737  000062  002424                  MOVB    #62,TSTNAM              ;LOAD PROGRAM NAME (ASCII 2)
        042562  004737  032150                          JSR     PC,DRVTST               ;GO RUN THE INTERNAL DRIVE TEST
        042566                                  T11EXT: EXIT    TST
        042566  104432                                  TRAP    C$EXIT
        042570  000002                                  .WORD   L10033-.
        042572                                          ENDTST
        042572                                  L10033:
        042572  104401                                  TRAP    C$ETST
```

```
                                            .SBTTL  TEST 12: VELOCITY FAULT ISOLATION TEST (Internal Drive Test 3)

     042574                                         BGNTST
     042574                                 T12::
     042574  032764  000001  000014                 BIT     #DRPFLG,LUNFLG(R4)          ;IS THE DRIVE AVAILABLE
     042602  001042                                 BNE     T12EXT                      ;NO, BRANCH TO EXIT
     042604                                         MANUAL                              ;MANUAL INTERVENTION ALLOWED ?
     042604  104450                                 TRAP    C$MANI
     042606                                         BNCOMPLETE       T12EXT             ;NO, BRANCH TO EXIT
     042606  103040                                 BCC     T12EXT
     042610                                 1$:     PRINTF  #T12MS1                     ;PRINT TEST 12 MESSAGE
     042610  012746  026324                         MOV     #T12MS1,-(SP)
     042614  012746  000001                         MOV     #1,-(SP)
     042620  010600                                 MOV     SP,R0
     042622  104417                                 TRAP    C$PNTF
     042624  062706  000004                         ADD     #4,SP
     042630                                         PRINTF  #MMSG                       ;PRINT TEST REQUIREMENT MESSAGE
     042630  012746  026536                         MOV     #MMSG,-(SP)
     042634  012746  000001                         MOV     #1,-(SP)
     042640  010600                                 MOV     SP,R0
     042642  104417                                 TRAP    C$PNTF
     042644  062706  000004                         ADD     #4,SP
     042650                                         GMANIL  QUESTN,ANSWER,1,YES         ;GET OPERATOR INPUT
     042650  104443                                 TRAP    C$GMAN
     042652  000404                                 BR      10000$
     042654  002354                                 .WORD   ANSWER
     042656  000130                                 .WORD   T$CODE
     042660  026716                                 .WORD   QUESTN
     042662  000001                                 .WORD   1
     042664                                 10000$:
     042664  005737  002354                         TST     ANSWER                      ;DID OPERATOR ANSWER YES ?
     042670  001407                                 BEQ     T12EXT                      ;NO, BRANCH TO EXIT
     042672  005037  002354                         CLR     ANSWER                      ;CLEAR OPERATOR ANSWER
     042676  112737  000063  002424                 MOVB    #63,TSTNAM                  ;LOAD PROGRAM NAME (ASCII 3)
     042704  004737  032150                         JSR     PC,DRVTST                   ;GO RUN THE INTERNAL DRIVE TEST
     042710                                 T12EXT: EXIT    TST
     042710  104432                                 TRAP    C$EXIT
     042712  000002                                 .WORD   L10034-.
     042714                                         ENDTST
     042714                                 L10034:
     042714  104401                                 TRAP    C$ETST
```

```
 3891                                          .SBTTL  TEST 13: SELECT A DRIVE RESIDENT TEST (Internal Drive Tests 1-99)
 3892
 3893 042716                                           BGNTST
      042716                                   T13::
 3894 042716  032764  000001  000014                   BIT     #DRPFLG,LUNFLG(R4)       ;IS THE DRIVE AVAILABLE
 3895 042724  001065                                   BNE     T13EXT                   ;NO, BRANCH TO EXIT
 3896 042726                                           MANUAL                           ;MANUAL INTERVENTION ALLOWED ?
      042726  104450                                   TRAP    C$MANI
 3897 042730                                           BNCOMPLETE      T13EXT           ;NO, BRANCH TO EXIT
      042730  103063                                   BCC     T13EXT
 3898 042732                                   1$:     PRINTF  #T13MS1                  ;PRINT TEST 13 MESSAGE
      042732  012746  026430                           MOV     #T13MS1,-(SP)
      042736  012746  000001                           MOV     #1,-(SP)
      042742  010600                                   MOV     SP,R0
      042744  104417                                   TRAP    C$PNTF
      042746  062706  000004                           ADD     #4,SP
 3899 042752                                           PRINTF  #MMSG                    ;PRINT TEST REQUIREMENT MESSAGE
      042752  012746  026536                           MOV     #MMSG,-(SP)
      042756  012746  000001                           MOV     #1,-(SP)
      042762  010600                                   MOV     SP,R0
      042764  104417                                   TRAP    C$PNTF
      042766  062706  000004                           ADD     #4,SP
 3900 042772                                           GMANID  SELTST,MANTBL,A,,1,2,NO ;ASK OPERATOR FOR TEST NUMBER
      042772  104443                                   TRAP    C$GMAN
      042774  000406                                   BR      10000$
      042776  022754                                   .WORD   MANTBL
      043000  000142                                   .WORD   T$CODE
      043002  026646                                   .WORD   SELTST
      043004  000000                                   .WORD
      043006  000001                                   .WORD   T$LOLIM
      043010  000002                                   .WORD   T$HILIM
      043012                                   10000$:
 3901 043012  012702  002424                           MOV     #TSTNAM,R2               ;GET ADDRESS OF DRIVE TEST NAME
 3902 043016  012703  022754                           MOV     #MANTBL,R3               ;GET ADDRESS OF OPERATOR INPUT DATA
 3903 043022  112322                                   MOVB    (R3)+,(R2)+              ;LOAD 1ST DIGIT OF TEST NAME
 3904 043024  105713                                   TSTB    (R3)                     ;CHECK FOR A 2ND DIGIT
 3905 043026  001401                                   BEQ     10$                      ;BRANCH IF NONE
 3906 043030  111312                                   MOVB    (R3),(R2)                ;LOAD 2ND DIGIT OF TEST NAME
 3907 043032                                   10$:    GMANIL  QUESTN,ANSWER,1,YES      ;ASK OPERATOR IF READY
      043032  104443                                   TRAP    C$GMAN
      043034  000404                                   BR      10001$
      043036  002354                                   .WORD   ANSWER
      043040  000130                                   .WORD   T$CODE
      043042  026716                                   .WORD   QUESTN
      043044  000001                                   .WORD   1
      043046                                   10001$:
 3908 043046  005737  002354                           TST     ANSWER                   ;DID OPERATOR ANSWER YES ?
 3909 043052  001412                                   BEQ     T13EXT                   ;NO, BRANCH TO EXIT
 3910 043054  005037  002354                           CLR     ANSWER                   ;CLEAR OPERATOR ANSWER
 3911 043060  004737  032150                           JSR     PC,DRVTST                ;GO RUN THE INTERNAL DRIVE TEST
 3912 043064  012702  002424                           MOV     #TSTNAM,R2               ;GET ADDRESS OF DRIVE TEST NAME
 3913 043070  112722  000040                           MOVB    #40,(R2)+                ;RETURN DRIVE TEST NAME TO ASCII SPACES
 3914 043074  112712  000040                           MOVB    #40,(R2)
 3915 043100                                   T13EXT: EXIT    TST
      043100  104432                                   TRAP    C$EXIT
      043102  000002                                   .WORD   L10035-.
 3916 043104                                           ENDTST
```

```
043104                          L10035:
043104  104401                          TRAP    C$ETST
043106                                  ENDMOD

                                .TITLE PARAMETER CODING

                                .SBTTL  HARDWARE PARAMETER CODING SECTION

043106                                  BGNMOD

                                ;++
                                ; THE HARDWARE PARAMETER CODING SECTION CONTAINS MACROS
                                ; THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES.  THE
                                ; MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
                                ; INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES.  THE
                                ; MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
                                ; WITH THE OPERATOR.
                                ;--

043106                                  BGNHRD
043106  000044                          .WORD L10036-L$HARD/2
043110                          L$HARD::


043110                                  GPRMA   TUIPAD,0,0,160002,177564,YES
043110  000031                          .WORD   T$CODE
043112  043146                          .WORD   TUIPAD
043114  160002                          .WORD   T$LOLIM
043116  177564                          .WORD   T$HILIM
043120                                  GPRMD   TUVECT,2,0,777,60,776,YES
043120  001032                          .WORD   T$CODE
043122  043163                          .WORD   TUVECT
043124  000777                          .WORD   777
043126  000060                          .WORD   T$LOLIM
043130  000776                          .WORD   T$HILIM
043132                                  GPRMD   TUUNT,4,0,777,0,251,YES
043132  002032                          .WORD   T$CODE
043134  043175                          .WORD   TUUNT
043136  000777                          .WORD   777
043140  000000                          .WORD   T$LOLIM
043142  000251                          .WORD   T$HILIM

043144                                  EXIT HRD
043144  026004                          .WORD   T$CODE

043146     124     125     111  TUIPAD: .ASCIZ  ?TUIP ADDRESS?
043163     124     125     040  TUVECT: .ASCIZ  ?TU VECTOR?
043175     124     057     115  TUUNT:  .ASCIZ  ?T/MSCP UNIT NUMBER?
                                        .EVEN


043220                                  ENDHRD
                                        .EVEN
043220                          L10036:


 4002                                    .SBTTL  SOFTWARE PARAMETER CODING SECTION
 4003
 4004                                    ;++
 4005                                    ; THE SOFTWARE PARAMETER CODING SECTION CONTAINS MACROS
 4006                                    ; THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES.  THE
 4007                                    ; MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
 4008                                    ; INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES.  THE
 4009                                    ; MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
 4010                                    ; WITH THE OPERATOR.
 4011                                    ;--
 4012
 4013 043220                                     BGNSFT
      043220  000000                             .WORD L10037-L$SOFT/2
      043222                             L$SOFT::
 4014
 4021
 4022                                            .EVEN
 4023
 4024 043222                                     ENDSFT
                                                 .EVEN
      043222                             L10037:
 4025
 4026
 4036                                    ;;***************************************************************
 4037                                    ;;***************************************************************
 4038                                    ;
 4039                                    ;COMMUNICATIONS AREA
 4040                                    ;       THIS IS THE COMMUNICATIONS AREA THAT IS USED
 4041                                    ;       THROUGHOUT THE PROGRAM IN TESTING THE PERMUTATIONS
 4042                                    ;       OF THE UQ-PORT INIT SEQUENCE.  IT IS ESSENTIAL THAT
 4043                                    ;       THIS AREA RESIDE IN AN 8KBYTE AREA OF MEMORY FREE
 4044                                    ;       OF DIAGNOSTIC CODE SO THAT IT MAY BE SUCCESSFULLY
 4045                                    ;       RELOCATED THROUGHOUT UPPER MEMORY VIA MEMORY MAN-
 4046                                    ;       AGEMENT.
 4047                                    ;
 4048                                    ;;***************************************************************
 4049                                    ;;***************************************************************
 4050
 4051         060000                             .=60000         ;START OF THE THIRD 8KBYTE BLOCK
 4052                                                            ;OF VIRTUAL MEMORY SPACE.  ACCESIBLE
 4053                                                            ;VIA PAR/PDR 2.
 4054 060000                             RDBUF::
 4055 060000                             COMMBF::
 4056 060000                                     .BLKW   20.     ;BUFFER SPACE PRECEDING COMM AREA
 4057 060050                             COMMAR::
 4058 060050                                     .BLKW   514.    ;MAXIMUM COMM AREA LENGTH
 4059 062054                             LASTBF::
 4060 062054                                     .BLKW   20.     ;BUFFER SPACE SUCCEEDING COMM AREA
 4064
 4065 062124                                     LASTAD
                                                 .EVEN
      062124  000000                             .WORD   0
      062126  000000                             .WORD   0
      062130                             L$LAST::
 4066 062130                                     ENDMOD
 4067         000001                     .END
```

```
ABORT   002466      CKCMEX  031614      C$INLP= 000020      EMSG5   024140 G    G$RADA= 000140
ADR   = 000020 G    CLSDRV  032350 G    C$MANI= 000050      EMSG6   024161 G    G$RADB= 000000
ANSWER  002354 G    CMARLG  002326 G    C$MAP = 000102      EMSG7   024212 G    G$RADD= 000040
ASSEMB= 000010      CMDCNT  002746 G    C$MEM = 000031      EMSG8   024233 G    G$RADL= 000120
BAKPAT  031426 G    CMDREF  002744 G    C$MMU = 000103      EMSG9   024271 G    G$RADO= 000020
BIT0  = 000001 G    CMDRNG  002726 G    C$MSG = 000023      ENCODE  023734 G    G$XFER= 000004
BIT00 = 000001 G    CMDSAV  022750 G    C$OPNR= 000034      END     033706      G$YES = 000010
BIT01 = 000002 G    CMMERR  002322 G    C$OPNW= 000104      ENDCLE  033754      HELP  = 000000
BIT02 = 000004 G    CMPTBL  002302 G    C$PNTB= 000014      ERR   = 100000 G    HIADDR= 000002 G
BIT03 = 000010 G    CMTBLG  002324 G    C$PNTF= 000017      EVL   = 000004 G    HOE   = 100000 G
BIT04 = 000020 G    CNTER = 000000 G    C$PNTS= 000016      EXELOC  002410      HSTIMO= 000000 G
BIT05 = 000040 G    CNTFLG  002740 G    C$PNTX= 000015      EXT     036116      IBE   = 010000 G
BIT06 = 000100 G    CNTHI   002736 G    C$PUTB= 000072      EXTINT  030672      IDU   = 000040 G
BIT07 = 000200 G    CNTRLC= 000003 G    C$PUTW= 000073      EXTVEC  031300      IER   = 020000 G
BIT08 = 000400 G    COMMAR  060050 G    C$QIO = 000377      E$END = 002100      ILLINT  030674 G
BIT09 = 001000 G    COMMBF  060000 G    C$RDBU= 000007      E$LOAD= 000035      ILOOP   031746
BIT1  = 000002 G    CONID = 177777 G    C$REFG= 000047      FAULTC  024066 G    IMM   = 000200 G
BIT10 = 002000 G    CPFLAG  002362 G    C$REL = 000077      FLAG  = 040000 G    IMSG    033712
BIT11 = 004000 G    CPFLG = ****** GX   C$RESE= 000033      FLAGS   024047 G    INISTP  002336 G
BIT12 = 010000 G    CRD   = 177776 G    C$REVI= 000004      FRUERR  030624 G    INNER   002344 G
BIT13 = 020000 G    CREFNO  023436 G    C$RFLA= 000021      FRUIS   002330 G    INTFLG= 000002 G
BIT14 = 040000 G    CTRL    025647 G    C$RPT = 000025      F$AU  = 000015      INTMMU  031616 G
BIT15 = 100000 G    C$AU  = 000052      C$SEFG= 000046      F$AUTO= 000020      INTMSG  030540 G
BIT2  = 000004 G    C$AUTO= 000061      C$SPRI= 000041      F$BGN = 000040      INTRCV  030664 G
BIT3  = 000010 G    C$BRK = 000022      C$SVEC= 000037      F$CLEA= 000007      INTTBL  032140
BIT4  = 000020 G    C$BSEG= 000004      C$TOME= 000076      F$DU  = 000016      INVMSG  030604 G
BIT5  = 000040 G    C$BSUB= 000002      DFPTBL  002224 G    F$END = 000041      ISR   = 000100 G
BIT6  = 000100 G    C$CLCK= 000062      DIAGMC= 000000      F$HARD= 000004      ITRCNT= ****** GX
BIT7  = 000200 G    C$CLEA= 000012      DISCAC= 000014 G    F$HW  = 000013      IXE   = 004000 G
BIT8  = 000400 G    C$CLOS= 000035      DONEFL= 000020 G    F$INIT= 000006      I$AU  = 000041
BIT9  = 001000 G    C$CLP1= 000006      DRPFLG= 000001 G    F$JMP = 000050      I$AUTO= 000041
BOE   = 000400 G    C$CPBF= 000074      DRVE    025716 G    F$MOD = 000000      I$CLN = 000041
BRFLAG= 000004 G    C$CPME= 000075      DRVER = 000011 G    F$MSG = 000011      I$DU  = 000041
BUFDES  023653 G    C$CVEC= 000036      DRVTST  032150      F$PROT= 000021      I$HRD = 000041
BYTCNT  023627 G    C$DCLN= 000044      DSCEND  002736 G    F$PWR = 000017      I$INIT= 000041
B.DI  = 000400 G    C$DODU= 000051      DSCRNG  002712 G    F$RPT = 000012      I$MOD = 000041
B.ER  = 100000 G    C$DRPT= 000024      EF.CON= 000036 G    F$SEG = 000003      I$MSG = 000041
B.GO  = 000001 G    C$DU  = 000053      EF.NEW= 000035 G    F$SOFT= 000005      I$PROT= 000040
B.IE  = 000200 G    C$EDIT= 000000      EF.PWR= 000034 G    F$SRV = 000010      I$PTAB= 000041
B.LF  = 000002 G    C$ERDF= 000055      EF.RES= 000037 G    F$SUB = 000002      I$PWR = 000041
B.MP  = 000100 G    C$ERHR= 000056      EF.STA= 000040 G    F$SW  = 000014      I$RPT = 000041
B.NV  = 002000 G    C$ERRO= 000060      ELPERR  027306 G    F$TEST= 000001      I$SEG = 000041
B.OD  = 000200 G    C$ERSF= 000054      EMSG10  024316 G    GDSERR  030256 G    I$SETU= 000041
B.PI  = 000001 G    C$ERSO= 000057      EMSG11  024344 G    GDUST   002370      I$SFT = 000041
B.PP  = 100000 G    C$ESCA= 000010      EMSG12  024405 G    GO    = 000001 G    I$SRV = 000041
B.QB  = 001000 G    C$ESEG= 000005      EMSG13  024454 G    G$CNTO= 000200      I$SUB = 000041
B.S1  = 004000 G    C$ESUB= 000003      EMSG14  024503 G    G$DELM= 000372      I$TST = 000041
B.S2  = 010000 G    C$ETST= 000001      EMSG15  024532 G    G$DISP= 000003      J$JMP = 000167
B.S3  = 020000 G    C$EXIT= 000032      EMSG16  024567 G    G$EXCP= 000400      KPAR0 = 172340 G
B.S4  = 040000 G    C$FREQ= 000101      EMSG17  024637 G    G$HILI= 000002      KPAR1 = 172342 G
B.WR  = 040000 G    C$FRME= 000100      EMSG18  024701 G    G$LOLI= 000001      KPAR2 = 172344 G
CCR   = 177746 G    C$GETB= 000026      EMSG19  024743 G    G$NO  = 000000      KPAR3 = 172346 G
CDRECV  032556 G    C$GETW= 000027      EMSG20  025013 G    G$OFFS= 000400      KPAR4 = 172350 G
CHKCAC  030704 G    C$GMAN= 000043      EMSG21  025052 G    G$OFSI= 000376      KPAR5 = 172352 G
CHKCOM  031456 G    C$GPHR= 000042      EMSG22  025104 G    G$PRMA= 000001      KPAR6 = 172354 G
CHKMSG  033326      C$GPRI= 000040      EMSG23  025135 G    G$PRMD= 000002      KPAR7 = 172356 G
CHKRSP  033042      C$INIT= 000011      EMSG24  025215 G    G$PRML= 000000      KPDR0 = 172300 G
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KPDR1 = 172302 G    L$ICP   002104 G    MMUSR0= 177572 G    PRI06 = 000300 G    TSTNAM  002424
KPDR2 = 172304 G    L$INIT  033464 G    MMUSR1= 177574 G    PRI07 = 000340 G    TUIP  = 000000 G
KPDR3 = 172306 G    L$LADP  002026 G    MMUSR2= 177576 G    PROGRH  002360 G    TUIPAD  043146
KPDR4 = 172310 G    L$LAST  062130 G    MMUSR3= 172516 G    PROGRL  002356 G    TUIPSV= 000010 G
KPDR5 = 172312 G    L$LOAD  002100 G    MM22ON= 000020 G    PRTDRV  032456 G    TUSA  = 000002 G
KPDR6 = 172314 G    L$LUN   002074 G    MODIFY  023520 G    PRTINT  031716 G    TUSASV= 000012 G
KPDR7 = 172316 G    L$MREV  002050 G    MSCPUN= 000006 G    P.BCNT= 000014 G    TUUNT   043175
KTEXT   031146      L$NAME  002000 G    MSCPVR= 000000 G    P.BUFF= 000020 G    TUVEC = 000004 G
KTFLAG  002314 G    L$PRIO  002042 G    MSGLEN= 177774 G    P.CRF = 000000 G    TUVECT  043163
KTTEST  030776 G    L$PROT  022760 G    NEXT    033604      P.ENDC= 000010 G    TXFER = 000005 G
LASTBF  062054 G    L$PRT   002112 G    NOKT    031142      P.FLGS= 000017 G    T$ARGC= 000001
LESI    025632 G    L$REPP  002062 G    NUPASS  033570      P.IND1= 000020 G    T$CODE= 026004
LINE1   022774 G    L$REV   002010 G    ONEFIL= 000001      P.IND2= 000022 G    T$ERRN= 000030
LINE2   023030 G    L$RPT = ****** GX   OPCODE  023500 G    P.MOD = 000012 G    T$EXCP= 000000
LINE3   023110 G    L$SOFT  043222 G    OP.ABT= 000006 G    P.OPCD= 000010 G    T$FLAG= 000041
LINE4   023140 G    L$SPC   002056 G    OP.ELP= 000003 G    P.STS = 000012 G    T$GMAN= 000000
LINE5   023203 G    L$SPCP  002020 G    OP.END= 000200 G    P.TIMO= 000024 G    T$HILI= 000251
LINE6   023260 G    L$SPTP  002024 G    OP.GDS= 000001 G    QUESTN  026716 G    T$LAST= 000001
LINE7   023323 G    L$STA   002030 G    OP.REC= 000005 G    RBUF  = 177562 G    T$LOLI= 000000
LOE   = 040000 G    L$SW    002234 G    OUTER   002346 G    RCSR  = 177560 G    T$LSYM= 010000
LOGUNT  002332 G    L$TEST  002114 G    OWN   = 100000 G    RCVDAT  002436      T$LTNO= 000015
LOOP    031736      L$TIML  002014 G    O$APTS= 000000      RCVERR  027726 G    T$NEST= 177777
LOT   = 000010 G    L$UNIT  002012 G    O$AU  = 000000      RDBUF   060000 G    T$NS0 = 000000
LSCT    025670 G    L10000  002232      O$BGNR= 000001      RESPBF  002502 G    T$NS1 = 000005
LUNBLK  0C2234 G    L10001  002234      O$BGNS= 000000      RNGSTP= 000004 G    T$NS2 = 000002
LUNFLG= 000014 G    L10003  030654      O$DU  = 000001      RSPBUF  002506 G    T$PTNU= 000000
L$ACP   002110 G    L10004  030662      O$ERRT= 000001      RSPEND  002716 G    T$SAVL= 177777
L$APT   002036 G    L10005  030672      O$GNSW= 000000      RSPRNG  002716 G    T$SEGL= 177777
L$AU    034010 G    L10006  030702      O$POIN= 000001      RSPSAV  022752 G    T$SUBN= 000000
L$AUT   002070 G    L10007  033742      O$SETU= 000000      RSPSTP= 000104 G    T$TAGL= 177777
L$AUTO= ****** GX   L10010  033772      PAROFF  002320 G    RSTVEC  031162 G    T$TAGN= 010040
L$CCP   002106 G    L10011  034006      PASCNT  002312 G    SAEXP   002334 G    T$TEMP= 000000
L$CLEA  033744 G    L10012  034014      PCKSIZ  002742 G    SELTST  026646 G    T$TEST= 000015
L$CO    002032 G    L10013  034512      PDELAY  031302 G    SFPTBL  002234 G    T$TSTM= 177777
L$DEPO  002011 G    L10014  034202      PDLYEX  031326      START   033536      T$TSTS= 000001
L$DESC  002156 G    L10015  034446      PDRECV  032670 G    STATUS  023755 G    T$$AU = 010012
L$DESP  002076 G    L10016  034742      PKRECV  023706 G    STEPST  002340 G    T$$CLE= 010010
L$DEVP  002060 G    L10017  035360      PKSENT  023414 G    STEP1   031330 G    T$$DU = 010011
L$DISP  002124 G    L10020  036122      PNT   = 001000 G    STPTBL  002272 G    T$$HAR= 010036
L$DLY   002116 G    L10021  037254      PRGNAM  023543 G    STP1ER  031420      T$$HW = 010000
L$DTP   002040 G    L10022  036650      PRGVER  023775 G    STP1EX  031424      T$$INI= 010007
L$DTYP  002034 G    L10023  037252      PRI   = 002000 G    ST5EXT  037242      T$$MSG= 010003
L$DU    033774 G    L10024  040700      PRIDAT  027142 G    ST6EXT  040666      T$$PRO= 010002
L$DUT   002072 G    L10025  040026      PRIERR  027222 G    SVCGBL= 000000      T$$SOF= 010037
L$DVTY  022766 G    L10026  040676      PRIEX   030650      SVCINS= 000000      T$$SRV= 010006
L$EF    002052 G    L10027  041442      PRIINI  027002 G    SVCSUB= 000000      T$$SUB= 010026
L$ENVI  002044 G    L10030  042204      PRIIP   027172 G    SVCTAG= 000000      T$$SW = 010001
L$ERRT= ****** GX   L10031  042266      PRI07 = ****** GX   SVCTST= 000000      T$$TES= 010035
L$ETP   002102 G    L10032  042450      PRIPAD  027066 G    S$LSYM= 010000      T1      034016 G
L$EXP1  002046 G    L10033  042572      PRISA   027026 G    S1    = 004000 G    T1.1    034044
L$EXP4  002064 G    L10034  042714      PRIVAD  027114 G    TEMP    002352 G    T1.2    034230
L$EXP5  002066 G    L10035  043104      PRI00 = 000000 G    TEST.9= 000010 G    T10     042270 G
L$HARD  043110 G    L10036  043220      PRI01 = 000040 G    TF.BLK= 000010 G    T10EXT  042444
L$HIME  002120 G    L10037  043222      PRI02 = 000100 G    TIMOUT  024026 G    T10MS1  025724 G
L$HPCP  002016 G    MANTBL  022754 G    PRI03 = 000140 G    TOUT    002350 G    T10MS2  026032 G
L$HPTP  002022 G    MMON  = 000001 G    PRI04 = 000200 G    TRAP4   030656 G    T10MS3  026057 G
L$HW    002224 G    MMSG    026536 G    PRI05 = 000240 G    TRP4FG  002316 G    T10MS4  026134 G
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T11      042452 G    T2EXT    034736       T6EXT    040022       UAM    = 000200 G    WRER6    025452 G
T11EXT   042566      T3       034744 G     T6.1     037256       VECTOR   031212 G    WRER7    025534 G
T11MS1   026221 G    T3EXT    035354       T6.2     040030       VEC4   = 000004 G    WRINTO   027226 G
T12      042574 G    T4       035362 G     T7       040702 G     WRBUF    002750 G    WRPRTE   027252 G
T12EXT   042710      T4EXT    036102       T7EXT    041436       WRDATA   002342 G    WR1      023350 G
T12MS1   026324 G    T5       036124 G     T8       041444 G     WRER1    025250 G    X$ALWA=  000000
T13      042716 G    T5EXT    036640       T8EXT    042200       WRER2    025302 G    X$FALS=  000040
T13EXT   043100      T5.1     036124       T9       042206 G     WRER3    025323 G    X$OFFS=  000400
T13MS1   026430 G    T5.2     036652       T9EXT    042262       WRER4    025351 G    X$TRUE=  000020
T2       034514 G    T6       037256 G     T9FLAG=  ****** GX    WRER5    025375 G

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

*** Assembler statistics


Work  file  reads: 291
Work  file writes: 299
Size of work file: 34376 Words  ( 135 Pages)
Size of core pool: 19714 Words  ( 75 Pages)
Operating  system: RSX-11M/PLUS (Under VAX/VMS)

Elapsed time: 00:07:39.61
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