11/70–74

11/70 – 74 MEM MGMT

CEKBEDO

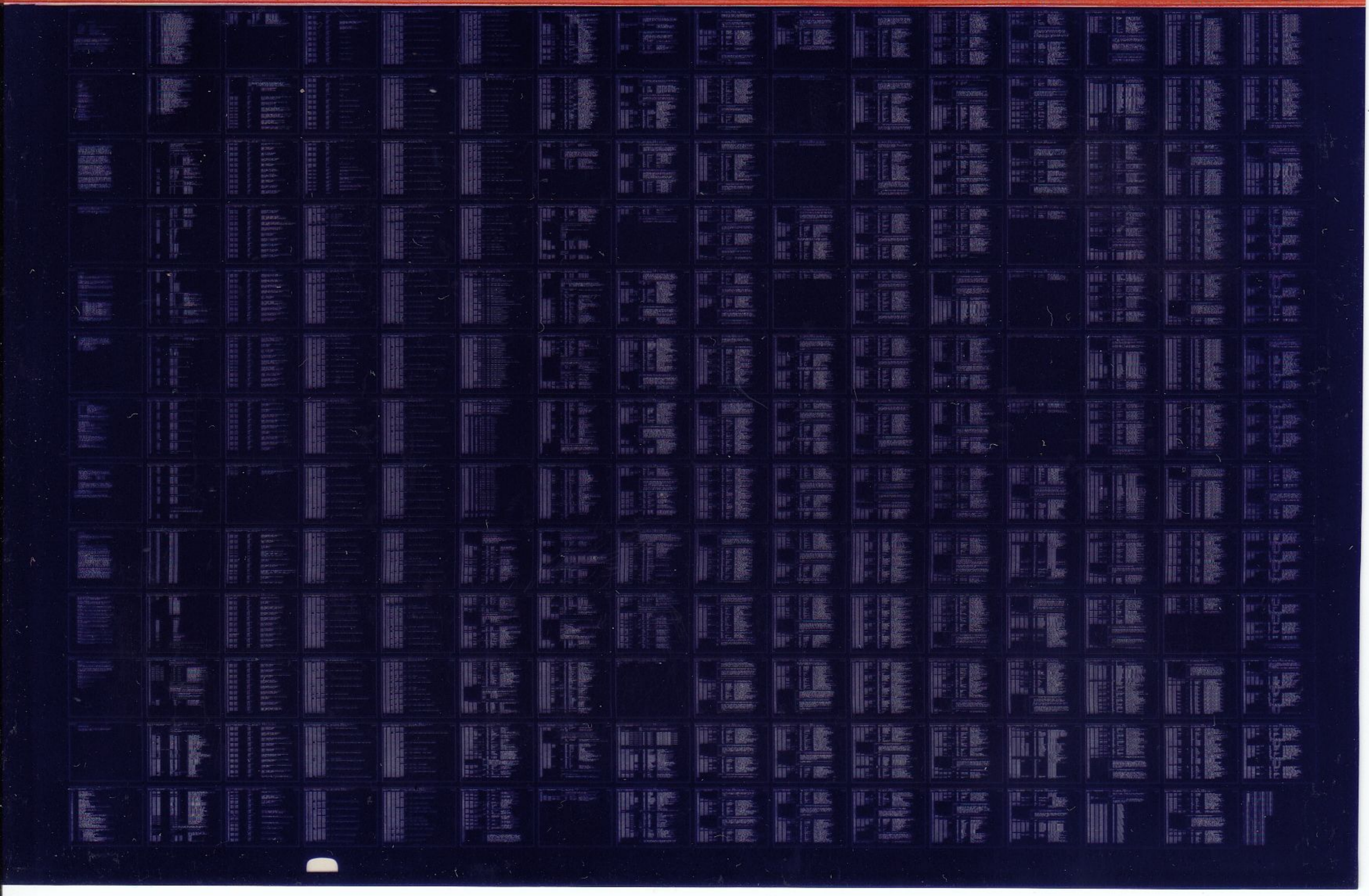
AH-7976D-MC

FICHE 1 OF 2

JAN 1980

digital

MADE IN USA



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FICHE 2 OF 2

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IDENTIFICATION

PRODUCT CODE: AC-7975D-MC

PRODUCT NAME: CEKBEDO PDP 11/70-74MP MEMORY MANAGEMENT DIAGNOSTIC

DATE CREATED: MAY, 1979

MAINTAINER: DIAGNOSTIC ENGINEERING

AUTHOR: DALE A. ROEDGER
MODIFIED BY: GEOFFREY A. WHITE (20-MAY-78)
ERNEST M. PREISIG (01-NOV-78)

TABLE OF CONTENTS

1. ABSTRACT

THIS PROGRAM WILL TEST ALL OF THE MEMORY MANAGEMENT LOGIC AND ENABLE THE FIELD SERVICE REPRESENTATIVE TO ISOLATE THE DETECTED FAILURES TO A REPLACABLE MODULE. IT IS ASSUMED THAT BOTH THE CPU AND THE CACHE HAVE BEEN TESTED, OR ARE KNOWN TO BE FUNCTIONING CORRECTLY, AND THAT THE PROGRAM IS STARTED FROM ADDRESS 200. THIS WILL PROVIDE THE EARLIEST DETECTION OF MEMORY MANAGEMENT RELATED ERRORS AND ENABLE LOOPING ON THE ERROR INVOLVING MINIMUM LOGIC. THIS PROGRAM MAY ALSO EXPOSE FAULTS THAT ARE ON THE INTERFACE BETWEEN MEMORY MANAGEMENT AND OTHER SECTIONS OF THE COMPUTER.

THIS PROGRAM HAS BEEN SEGMENTED IN THE FOLLOWING WAY:
ALL DATA TABLES, ERROR MESSAGES, AND SUBROUTINES RESIDE IN LOW CORE (VIRTUAL PAGES 0 & 1 IE. ADDRESSES 001100 THRU 037776). RIGHT NOW THE END OF THE SUBROUTINES IS AROUND 030300, SO THERE IS SOME ROOM FOR FUTURE EXPANSION. THE TEST CODE STARTS AT VIRTUAL PAGE 2 (ADDRESS 040000) AND EXPANDS TOWARD PAGE 4 (ADDRESS 100000). THE END OF THE PROGRAM IS NOW AROUND ADDRESS 077600, SO SMALL MODIFICATIONS CAN BE MADE WITHOUT RE-SEGMENTING THE PROGRAM.

THE REASON FOR THIS SEGMENTATION IS TWO-FOLD, FIRST IT ENABLES THE OPERATOR TO TELL FROM THE ADDRESS LIGHTS EXACTLY WHERE THE PROGRAM HAS HALTED OR 'HUNG-UP''. THAT IS, DID IT HALT IN THE ERROR ROUTINE OR IN A TRAP ROUTINE BECAUSE OF A CONDITION IMPOSSIBLE TO RECOVER FROM (ON PAGE 0 OR 1), OR DID IT GET 'HUNG-UP'' IN THE TEST CODE ON PAGE 2 OR 3.
THE OTHER REASON IS THAT CERTAIN MEMORY MANAGEMENT FUNCTIONS LOCK UP THE VIRTUAL PC OF THE INSTRUCTION AND THE PROGRAM, IN ORDER TO OPERATE PROPERLY, MUST KNOW WHERE IT IS AT ALL TIMES. IT SEEMS MUCH SIMPLER FOR THE CODE TO START AT A PREDETERMINED BOUNDARY SO THAT IF THE MESSAGES CHANGE OR A NEW SUBROUTINE IS ADDED THE PAGE THAT THE CODE IS ON WILL REMAIN THE SAME.

EACH TEST WILL SET THE LOOP ON ERROR POINTER ($LPERR) TO THE MINIMUM NECESSARY SETUP CODE, IF ANY, FOR THE FUNCTION UNDER TEST. A SYNCHRONIZATION INSTRUCTION (NOP) IS PROVIDED BEFORE THE INSTRUCTION(S) THAT TEST(S) EACH NEW FUNCTION. THIS WILL ENABLE THE FIELD SERVICE REPRESENTATIVE TO UTILIZE THE MICRO BREAK REGISTER TO GENERATE AN 'EXTERNAL SYNC'' PULSE ON THE BACK PLANE FOR BETTER PULSE RESOLUTION.

SECTION 8.2 OF THIS DOCUMENT CONTAINS SOME IDEAS THAT I HAD WHEN I WAS WRITING THIS PROGRAM ON HOW TO EFFECTIVELY UTILIZE IT TO MAKE FAULT ISOLATION EASIER. IF THESE IDEAS ARE NOT CORRECT OR NEED TO BE EXPANDED TO PROVIDE MORE INFORMATION PLEASE WRITE DOWN YOUR SUGGESTIONS AND FORWARD THEM TO THE DIAGNOSTIC DEPARTMENT.

IT SHOULD BE NOTED THAT THIS PROGRAM DOES NOT CHECK OUT THE

CONSOLE OR THE CONSOLE CABLES THAT PLUG INTO THE MEMORY
MANAGEMENT BOARDS. THE PROGRAM ASSUMES THAT THOSE COMPONENTS
HAVE BEEN TESTED OR ARE KNOWN TO BE GOOD.

THIS DIAGNOSTIC SUPPORTS THE KB11-B/C, AND KB11-CM
PROCESSORS. TESTS HAVE BEEN INCLUDED TO VERIFY THE PROPER
FUNCTIONALITY OF THE 'CACHE BYPASS' FEATURE OF THE 11/74.

2. REQUIREMENTS

2.1 EQUIPMENT

THE BASIC PDP-11/70-74MP COMPUTER, INCLUDING AN OPERATING CPU, CACHE, AND MEMORY. AN LA-30 OR EQUIVALENT DEVICE IS ALSO NEEDED FOR ERROR MESSAGES, AND END OF PASS REPORTS.

2.2 STORAGE

THIS PROGRAM REQUIRES 16K OF MEMORY TO LOAD AND AT LEAST 20K OF MEMORY TO RUN IN. IT WILL SCAN MEMORY FROM 16K TO 124K ON 2K BOUNDARIES, AND FROM 120K TO THE TOP OF MEMORY FOUND BY THE SIZE ROUTINE ON 8K BOUNDARIES.

2.3 PRELIMINARY PROGRAMS

THE CPU AND CACHE DIAGNOSTICS SHOULD BE RUN BEFORE THIS PROGRAM. MAIN MEMORY SHOULD BE SCANNED FOR AT LEAST THE FIRST 28K TO SEE THAT A PROGRAM WILL EXECUTE CORRECTLY BEFORE ANY PROGRAM IS RUN.

3. LOADING PROCEDURE

3.1 METHOD

THIS PROGRAM CAN BE LOADED FROM ANY DEVICE THAT IS SUPPORTED BY XXDP, AND SHOULD BE LOADED USING THE XXDP PROCEDURE FOR THAT DEVICE.

4. STARTING PROCEDURE

4.1 STARTING ADDRESSES

200 THIS ADDRESS WILL RUN THE COMPLETE PROGRAM

204 THIS ADDRESS WILL START THE PROGRAM AT ENTRY POINT 2
TEST THE READ/WRITE BITSIN THE MEMORY STATUS REGISTERS

210 THIS ADDRESS WILL START THE PROGRAM AT ENTRY POINT 3
PAGE ADDRESS AND PAGE DESCRIPTOR TESTS

214 THIS ADDRESS WILL START THE PROGRAM AT ENTRY POINT 4
RELOCATION AND ADDER TESTS

220 THIS ADDRESS WILL START THE PROGRAM AT ENTRY POINT 5
MEMORY MANAGEMENT ABORTS AND TRAPS LOGIC TESTS

224 THIS ADDRESS WILL START THE PROGRAM AT ENTRY POINT 6
D-SPACE TESTS, CORRECT TIMING OF I & D SPACE

230 THIS ADDRESS WILL START THE PROGRAM AT ENTRY POINT 7
A & W BIT LOGIC TEST AND DUAL MAPPING TESTS

234 THIS ADDRESS WILL START THE PROGRAM AT ENTRY POINT 8
MOVE FROM AND MOVE TO PERVIOUS MODE INSTRUCTION TESTS

4.2 PROGRAM AND OPERATOR ACTION

AFTER THE PROGRAM IS LOADED, THE FIRST TIME IT IS RUN IT WILL IDENTIFY ITSELF AND RUN A QUICK VERIFY PASS. AT THE END OF EACH PASS THE PROGRAM WILL TYPE OUT THE PASS NUMBER AND THE TOTAL NUMBER OF ERRORS FOUND ON THAT PASS.

4.3 SPECIAL STARTING PROCEDURE

IF IT APPEARS THAT THE CACHE IS CAUSING SOME TROUBLE AND YOU STILL WANT TO RUN THIS PROGRAM, IT IS POSSIBLE TO RUN THIS PROGRAM WITH THE CACHE DISABLED. SIMPLY LOAD THE CACHE CONTROL REGISTER (17777746) WITH THE DESIRED NUMBER, THEN LOAD THE PC (17777707) WITH THE STARTING ADDRESS AND PRESS CONTINUE. THE PROGRAM WILL NOW RUN AS IF YOU HAD LOADED THE STARTING ADDRESS AND PRESSED START BUT NOW THE CACHE CONTROL REGISTER IS DISABLING THE CACHE.

BIT00 -DISABLE TRAPS
BIT01 -DISABLE UNIBUS TRAPS
BIT02 -FORCE MISS ON READ GROUP 0
BIT03 -FORCE MISS ON READ GROUP 1
BIT04 -FORCE REPLACE GROUP 0
BIT05 -FORCE REPLACE GROUP 1

5. OPERATING PROCEDURE

5.1 OPERATIONAL SWITCH SETTINGS

SW15 1= HALT ON ERROR
SW14 1= LOOP ON THE TEST THAT YOU ARE IN
SW13 1= INHIBIT ALL ERROR TYPE OUTS
SW12 1= INHIBIT TRACE TRAP ON EVERY OTHER PASS
SW11 1= INHIBIT ITERATIONS AFTER FIRST PASS
SW10 1= RING BELL ON ERROR
SW09 1= LOOP ON ERROR
SW08 1= LOOP ON TEST IN SWR<06:00>
SW07 1= INHIBIT MULTIPLE ERROR TYPE OUTS

5.2 SUBROUTINE ABSTRACTS

ALL SUBROUTINE ABSTRACTS APPEAR IN THE CODE, BEFORE THEIR EXPANSION, AND IN THE DOCUMENT THAT IMMEDIATELY FOLLOWS THIS. THE FOLLOWING IS A LIST OF THEIR TITLES.

5.2.1 MACRO LIBRARY SUBROUTINES (FOUND IN MOST PROGRAMS)

END OF PASS ROUTINE
SCOPE HANDLER ROUTINE
ERROR HANDLER ROUTINE
ERROR MESSAGE TYPE OUT ROUTINE
CONVERT 16-BIT VIRTUAL ADDRESS TO 22-BIT PHYSICAL ADDRESS
SAVE & RESTORE R0-R5 ROUTINES
TYPE ROUTINE
BINARY TO OCTAL (ASCII) AND TYPE ROUTINE
CONVERT BINARY TO DECIMAL AND TYPE ROUTINE
TRAP DECODER
POWER DOWN AND UP ROUTINE
DOUBLE LENGTH BINARY TO OCTAL ASCII CONVERT ROUTINE

5.2.2 SUBROUTINES UNIQUE TO THIS PROGRAM

TURN OFF AND SAVE T-BIT
RESTORE T-BIT TO ITS PREVIOUS CONDITION
CLEAR 16 PAR'S OR PDR'S STARTING FROM ADDRESS IN R5
CLEANUP LOCATIONS THAT HOLD LOGICAL 'AND' AND 'OR'
P.A.R. OR P.D.R. ADDRESS TIMED OUT WHEN REFERENCED
DUAL ADDRESSING WHEN LOADING A P.A.R. OR P.D.R.
COUNT PATTERN ERROR IN P.A.R.'S OR P.D.R.'S

5.2.3 TRAP AND ABORT HANDLER ROUTINES

CPU TRAP HANDLER
CACHE TRAPS AND ABORTS HANDLER
MEMORY MANAGEMENT TRAPS AND ABORTS HANDLER
TRAP ROUTINES FOR ABORT IN SUPERVISOR AND USER MODE

6. ERRORS

6.1 ERROR HALTS AND DESCRIPTION

WHEN THE PROGRAM DETECTS AN ERROR CONDITION IT ISSUES AN 'ERROR' (EMT) CALL. THIS CAUSES THE CPU TO TRAP TO THE 'ERROR HANDLER RUOTINE' WHICH PRINTS OUT THE ERROR MESSAGE, IF ANY, AND CHECKS THE SWITCH REGISTER FOR THE MODE SELECTED. THE PROGRAM WILL REACT AS FOLLOWS:

HALT ON THE ERROR	IF SW15=1, IS UP
INHIBIT ERROR TYPE OUT	IF SW13=1, IS UP
RING BELL ON THE ERROR	IF SW10=1, IS UP
LOOP ON THE ERROR	IF SW09=1, IS UP
INHIBIT MULTIPLE TYPE OUTS	IF SW07=1, IS UP

6.2 ERROR RECOVERY

IF SWITCH 09 IS UP, THE PROGRAM WILL LOOP BACK TO WHERE THE LOOP ON ERROR POINTER ($LPERR) IS SET. THIS WILL PROVIDE THE TIGHTEST POSSIBLE SCOPING LOOP, AND PROVIDES ALL NECESSARY SETUP CODE TO RECREATE THE ERROR. IF A SYNC POINT IS DESIRED TO EXTERNAL SYNC THE SCOPE JUST PRIOR TO THE FAILING OPERATION LOAD THE MICRO BREAK REGISTER WITH '044' AND USE THE 'NOP' PROVIDED.

6.3 SAMPLE ERROR TYPE OUTS

```
CPU TRAP OR ABORT THRU 'ERRVEC' (004) HAD INCORRECT CONDITION
EXPECTD RECEIVD TESTNO PC AT ABORT
000040  000020  000047  XXXXXX
```

THIS ERROR MESSAGE INDICATES THAT THE CPU TIMED OUT OVER THE UNIBUS WHEN IT WAS EXPECTING A CACHE NON-EXISTANT MEMORY TRAP. THIS TEST IS CHECKING THE CARRY PROPAGATION, THAT IS DETERMINED FROM LOOKING AT THE INDEX AT THE FRONT OF THE LISTING.

7. RESTRICTIONS

7.1 STARTING RESTRICTIONS

IF A STARTING POINT OTHER THAN "200" IS USED AND ERRORS ARE REPORTED, THEY MAY BE DUE TO LOGIC THAT IS ASSUMED TO BE WORKING AS A RESULT OF TESTS THAT WERE NOT RUN.

7.2 OPERATING RESTRICTIONS

NONE

8. MISCELLANEOUS

8.1 EXECUTION TIME

THE RUN TIME FOR A SINGLE PASS WITH NO ITERATIONS IS APPROXIMATELY 10 SECONDS.

8.2 HINTS ON HOW TO GET MORE INFORMATION FROM THE PROGRAM

IF AN ERROR OCCURS THE FIRST THING THAT SHOULD BE NOTED IS WHAT PASS DID THE ERROR OCCUR ON. IF THE PASS HAS AN EVEN NUMBER AND SWITCH 12 IS DOWN THEN THE ERROR MIGHT BE T-BIT SENSITIVE. TRY TO RUN AGAIN WITH SWITCH 12 UP, THIS WILL INHIBIT T-BIT TRAPPING.
IF THE PASS NUMBER IS GREATER THAN ONE THE ERROR MIGHT BE ITERATION SENSITIVE. TRY TO RUN AGAIN WITH SWITCH 11 UP, THIS WILL INHIBIT ITERATIONS.
NOW THAT YOU HAVE DETERMINED HOW TO MAKE THE MACHINE FAIL LOOK IN THE INDEX AT THE FRONT OF THE LISTING TO FIND THE TITLE OF THE TEST THAT WAS RUNNING WHEN THE ERROR CONDITION OCCURRED.
GO TO THE LISTING AND READ THE PARAGRAPH AT THE BEGINNING OF THE TEST SO THAT YOU KNOW WHAT THE TEST IS TRYING TO DO.
NOW READ THE ERROR MESSAGE AND IF THERE IS A COLUMN LABELED "ERRORPC" GO TO THAT LOCATION IN THE TEST. THIS IS THE PC OF THE "ERROR" STATEMENT. THE NUMBER IS THE ERROR MESSAGE NUMBER AND IN THE FRONT OF THE LISTING IS THE "ERROR MESSAGE POINTER TABLE" WHICH WILL TELL YOU WHAT WORDS WERE TYPED OUT.
IF YOU WANT TO SCOPE THIS ERROR CONDITION, PUT UP SWITCH 09 (LOOP ON ERROR) OR IF YOU WANT TO LOOP ON THE ENTIRE TEST PUT UP SWITCH 14. YOU WILL PROBABLY WANT TO INHIBIT THE ERROR TYPE OUT AT THIS POINT, SWITCH 13 WILL DO THAT.
IF YOU NEED TO DO ACCURATE SCOPING AND NEED A GOOD SYNC POINT THEN MAKE SURE THAT THE MICRO BREAK REGISTER (1777770) HAS "044" IN IT. THIS WILL CAUSE A PULSE ON THE BACK PLANE AT PIN # AE1 (SLOT 10) WHENEVER A "NOP" IS EXECUTED, AND THAT PULSE WILL MAKE AN EXCELLENT "EXTERNAL SYNC" SIGNAL FOR YOUR SCOPE.
THERE IS A "NOP" JUST BEFORE EACH INSTRUCTION THAT TESTS A MEMORY MANAGEMENT FUNCTION FOR THE FIRST TIME, SO YOU SHOULD BE ABLE TO SCOPE ON ANY FAILURE THAT THIS PROGRAM CAN DETECT.

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SEQ 0010

8.3 ROM STATE DESCRIPTIONS
THIS IS A LIST OF THE ROM OUTPUTS FROM THE MEMORY MANAGEMENT
ROMS ON 'SSRA', WITH A SENTENCE OR TWO DESCRIBING THEIR
MEANING AS IT RELATES TO MEMORY MANAGEMENT.

ROM OUT01 - ROM OUT03
THESE OUTPUTS ARE SENT TO MULTIPLEXERS AND REGISTERS ON 'SSRA'
TO INDICATE A PARTICULAR MACHINE FUNCTION. THE ENCODING OF
THESE OUTPUTS IS SHOWN IN A TRUTH TABLE ON 'SSRA'.

ROM OUT04
DESTINATION MODE -- THIS IS USED TO ENABLE RELOCATION IF BIT08
OF MMR0 IS SET AND THIS IS THE DESTINATION CYCLE OF THE INSTRUCTION.

ROM OUT05
MFP + MTP -- THIS IS USED TO CLOCK THE PREVIOUS MODE INTO THE
''SPACE'' FLIP-FLOPS ON 'SSRB', DURING A MFP + MTP INST.

ROM OUT06
TRAP OR ABORT -- THIS IS USED TO FORCE SETTING OF THE
'KERNEL SPACE' FLIP-FLOP ON 'SSRB' DURING A TRAP OR ABORT SEQUENCE.

ROM OUT07
BUST -- THIS IS USED TO CLOCK MOST OF THE LATCHES IN MEMORY
MANAGEMENT SUCH AS: 'SPACE' F/F'S, STATUS REGISTERS,...

ROM OUT08
MFP + MTP -- THIS ASSERTS 'SSRB I SPACEB' TO FORCE I-SPACE ON
MFPI + MTPI INSTRUCTIONS IF THE PSW IS NOT (USER MODE/
PREVIOUS USER MODE).

ROM OUT09
INST + INDEX FETCH -- THIS ASSERTS 'SSRB I SPACEA' WHICH
FORCES I-SPACE DURING AN INSTRUCTION OR INDEX WORD FETCH.

ROM OUT10
THIS DOES NOT EXIST.

ROM OUT11
INST STARTED IN I-SPACE -- THIS ASSERTS 'SSRB I SPACEB' TO FORCE
I-SPACE IF 'SSRB PREV=I' IS SET.

ROM OUT12
CONSOLE -- THIS ASSERTS 'SSRB I SPACEA' IF 'SSRK CNSL I SPACE H'
IS TRUE AND YOU EXAMINE OR DEPOSIT.

ROM OUT13
SRCM = 1+2+3+4+5 -- IF THE SOURCE FIELD IS 7 THIS ASSERTS 'SSRB
I SPACEB' WHICH FORCES I-SPACE.

ROM OUT14
DSTM = 1+2 -- IF THE DESTINATION FIELD IS 7 THIS ASSERTS 'SSRB
I SPACEB' WHICH FORCES I-SPACE.

ROM OUT15
DSTM = 3 -- IF THE DESTINATION FIELD IS 7 THIS ASSERTS 'SSRB I
SPACEA' WHICH FORCES I-SPACE DURING THE DESTINATION CYCLE.

ROM OUT16
FLOATING POINT -- IF THE DSTF = 7 AND THE DSTM = 2 THEN THIS
ASSERTS 'SSRB I SPACEA' WHICH FORCES I-SPACE ON IMMEDIATE F.P.INST.

NOTE: THE FOLLOWING ROM STATES ARE NOT EXPLICITLY TESTED DUE
TO THE FACT THAT I COULDN'T FIGURE OUT A WAY TO TEST THEM UNDER
RUN CONDITIONS. THE LOGIC ASSOCIATED WITH THEM HAS BEEN TESTED
BY OTHER ROM STATES BUT THESE STATES ARE NOT TESTED.

ROM OUT05
SHR.00, NEG.00, D12.90, D40.30, D12.30

ROM OUT09
FET.06, FET.08, FET.09
THESE NEXT ARE TESTED ON PASSES WITH T-BIT TRAPPING
(PASS 2, 4, ...)
FET.01, FET.02, FET.03

ROM OUT12
EXM.10, EXM.20, DEP.10, DEP.20

ROM OUT13
S45.10

ROM OUT16 FLOATING POINT
FSV.00, FSV.10

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SEQ 0012

9. PROGRAM DESCRIPTION

THE LISTING THAT FOLLOWS THIS ONE HAS A PARAGRAPH DESCRIBING
EACH OF THE TESTS. THERE IS ALSO A PARAGRAPH DESCRIBING
EACH MAJOR GROUP OF TESTS.

```
                        .TITLE  PDP-11/70-74MP MEMORY MANAGEMENT DIAGNOSTIC
                        ;*COPYRIGHT (C) 1975,1978
                        ;*DIGITAL EQUIPMENT CORP.
                        ;*MAYNARD, MASS. 01754
                        ;*
                        ;*PROGRAM BY DALE A. ROEDGER
                        ;*
                        ;*THIS PROGRAM WAS ASSEMBLED USING THE PDP-11 MAINDEC SYSMAC
                        ;*PACKAGE (MAINDEC-11-DZQAC-A3-1).
                        ;*

                        .SBTTL  OPERATIONAL SWITCH SETTINGS
                        ;*
                        ;*      SWITCH              USE
                        ;*      ------          --------------------
                        ;*        15            HALT ON ERROR
                        ;*        14            LOOP ON TEST
                        ;*        13            INHIBIT ERROR TYPEOUTS
                        ;*        12            INHIBIT TRACE TRAP
                        ;*        11            INHIBIT ITERATIONS
                        ;*        10            BELL ON ERROR
                        ;*         9            LOOP ON ERROR
                        ;*         8            LOOP ON TEST IN SWR<6:0>
                        ;*         7            INHIBIT MULTIPLE ERROR TYPEOUTS

                        .SBTTL  BASIC DEFINITIONS

                        ;*INITIAL ADDRESS OF THE STACK POINTER *** 1100 ***
001100                  STACK=  1100            ;;FIRST ADDRESS OF THE STACK
001100                  KERSTK= STACK           ;;KERNEL STACK
000700                  SUPSTK= STACK-200       ;;SUPERVISOR STACK
000600                  USESTK= STACK-300       ;;USER STACK
                        .EQUIV  EMT,ERROR       ;;BASIC DEFINITION OF ERROR CALL
                        .EQUIV  IOT,SCOPE       ;;BASIC DEFINITION OF SCOPE CALL
177776                  PS=     177776          ;;PROCESSOR STATUS WORD
                        .EQUIV  PS,PSW
177774                  STKLMT= 177774          ;;STACK LIMIT REGISTER
177772                  PIRQ=   177772          ;;PROGRAM INTERRUPT REQUEST REGISTER
177570                  SWR=    177570          ;;SWITCH REGISTER
177570                  DISPLAY=SWR

                        ;*MISCELLANEOUS DEFINITIONS
000011                  HT=     11              ;;CODE FOR HORIZONTAL TAB
000012                  LF=     12              ;;CODE LINE FEED
000015                  CR=     15              ;;CODE CARRIAGE RETURN
000200                  CRLF=   200             ;;CODE FOR CARRIAGE RETURN-LINE FEED

                        ;*GENERAL PURPOSE REGISTER DEFINITIONS
000000                  R0=     %0              ;;GENERAL REGISTER
000001                  R1=     %1              ;;GENERAL REGISTER
000002                  R2=     %2              ;;GENERAL REGISTER
000003                  R3=     %3              ;;GENERAL REGISTER
000004                  R4=     %4              ;;GENERAL REGISTER
000005                  R5=     %5              ;;GENERAL REGISTER
000006                  R6=     %6              ;;GENERAL REGISTER
000007                  R7=     %7              ;;GENERAL REGISTER
```

```
                        .EQUIV  R0,R10          ;;GENERAL REGISTER
                        .EQUIV  R1,R11          ;;GENERAL REGISTER
                        .EQUIV  R2,R12          ;;GENERAL REGISTER
                        .EQUIV  R3,R13          ;;GENERAL REGISTER
                        .EQUIV  R4,R14          ;;GENERAL REGISTER
                        .EQUIV  R5,R15          ;;GENERAL REGISTER
000006                  SP=%6
                        .EQUIV  SP,KSP          ;;KERNEL STACK POINTER
                        .EQUIV  SP,SSP          ;;SUPERVISOR STACK POINTER
                        .EQUIV  SP,USP          ;;USER STACK POINTER
000007                  PC=%7

                        ;*PRIORITY LEVEL DEFINITIONS
000000                  PR0=    0               ;;PRIORITY LEVEL 0
000040                  PR1=    40              ;;PRIORITY LEVEL 1
000100                  PR2=    100             ;;PRIORITY LEVEL 2
000140                  PR3=    140             ;;PRIORITY LEVEL 3
000200                  PR4=    200             ;;PRIORITY LEVEL 4
000240                  PR5=    240             ;;PRIORITY LEVEL 5
000300                  PR6=    300             ;;PRIORITY LEVEL 6
000340                  PR7=    340             ;;PRIORITY LEVEL 7

                        ;*''SWITCH REGISTER'' SWITCH DEFINITIONS
100000                  SW15=   100000
040000                  SW14=   40000
020000                  SW13=   20000
010000                  SW12=   10000
004000                  SW11=   4000
002000                  SW10=   2000
001000                  SW09=   1000
000400                  SW08=   400
000200                  SW07=   200
000100                  SW06=   100
000040                  SW05=   40
000020                  SW04=   20
000010                  SW03=   10
000004                  SW02=   4
000002                  SW01=   2
000001                  SW00=   1
                        .EQUIV  SW09,SW9
                        .EQUIV  SW08,SW8
                        .EQUIV  SW07,SW7
                        .EQUIV  SW06,SW6
                        .EQUIV  SW05,SW5
                        .EQUIV  SW04,SW4
                        .EQUIV  SW03,SW3
                        .EQUIV  SW02,SW2
                        .EQUIV  SW01,SW1
                        .EQUIV  SW00,SW0

                        ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
100000                  BIT15=  100000
040000                  BIT14=  40000
020000                  BIT13=  20000
010000                  BIT12=  10000
004000                  BIT11=  4000
```

```
                        BIT10=  2000
                        BIT09=  1000
                        BIT08=  400
                        BIT07=  200
                        BIT06=  100
                        BIT05=  40
                        BIT04=  20
                        BIT03=  10
                        BIT02=  4
                        BIT01=  2
                        BIT00=  1
                        .EQUIV  BIT09,BIT9
                        .EQUIV  BIT08,BIT8
                        .EQUIV  BIT07,BIT7
                        .EQUIV  BIT06,BIT6
                        .EQUIV  BIT05,BIT5
                        .EQUIV  BIT04,BIT4
                        .EQUIV  BIT03,BIT3
                        .EQUIV  BIT02,BIT2
                        .EQUIV  BIT01,BIT1
                        .EQUIV  BIT00,BIT0

                        ;*BASIC ''CPU'' TRAP VECTOR ADDRESSES
000004                  ERRVEC= 4               ;;TIME OUT AND OTHER ERRORS
000010                  RESVEC= 10              ;;RESERVED AND ILLEGAL INSTRUCTIONS
000014                  TBITVEC=14              ;;''T'' BIT
000014                  TRTVEC= 14              ;;TRACE TRAP
000014                  BPTVEC= 14              ;;BREAKPOINT TRAP (BPT)
000020                  IOTVEC= 20              ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
000024                  PWRVEC= 24              ;;POWER FAIL
000030                  EMTVEC= 30              ;;EMULATOR TRAP (EMT) **ERROR**
000034                  TRAPVEC=34              ;;''TRAP'' TRAP
000060                  TKVEC=  60              ;;TTY KEYBOARD VECTOR
000064                  TPVEC=  64              ;;TTY PRINTER VECTOR
000114                  CACHVEC=114             ;;CACHE ERROR INTERRUPT VECTOR
000240                  PIRQVEC=240             ;;PROGRAM INTERRUPT REQUEST VECTOR
000250                  MMVEC=  250             ;;MEMORY MANAGEMENT VECTOR

                        .SBTTL  CACHE   REGISTER DEFINITIONS


177740                  LOADRS = 177740         ;;LOWER 16 BITS OF ADDRESS THAT CAUSED ERROR
177742                  HIADRS = 177742         ;;UPPER SIX BITS OF ADDRESS THAT CAUSED ERROR
177744                  MEMERR = 177744         ;;CACHE ERROR REGISTER
177746                  CONTRL = 177746         ;;MEMORY CONTROL REGISTER
177750                  MAINT  = 177750         ;;MEMORY MAINTENENCE REGISTER
177752                  HITMIS = 177752         ;;HIT MISS REGISTER ''1'' IMPLIES HIT IN CACHE


                        .SBTTL  CPU REGISTER DEFINITIONS


177760                  SIZELO = 177760         ;;MEMORY SIZE REGISTER NUMBER TO PUT INTO A PAR
                                                ;;TO GET TO THE LAST 32 WORDS OF MEMORY
177762                  SIZEHI = 177762         ;;HIGH SIZE REGISTER, RESERVED FOR FUTURE USE
                                                ;;CURRENTLY ALL ZERO
```

```
                        SYSTID = 177764         ;;SYSTEM ID REGISTER
                        CPUERR = 177766         ;;CPU ERROR REGISTER HOLDS CONDITION THAT CAUSED
                                                ;;THE TRAP TO ERRVEC (000004)



                        .SBTTL  MEMORY MANAGEMENT DEFINITIONS


                        ;*MEMORY MANAGEMENT STATUS REGISTER ADDRESSES

                        MMR0=   177572
                        MMR1=   177574
                        MMR2=   177576
                        MMR3=   172516
                        .EQUIV  MMR0,SR0
                        .EQUIV  MMR1,SR1
                        .EQUIV  MMR2,SR2
                        .EQUIV  MMR3,SR3

                        ;*USER "I" PAGE DESCRIPTOR REGISTERS

                        UIPDR0= 177600
                        UIPDR1= 177602
                        UIPDR2= 177604
                        UIPDR3= 177606
                        UIPDR4= 177610
                        UIPDR5= 177612
                        UIPDR6= 177614
                        UIPDR7= 177616

                        ;*USER "D" PAGE DESCRIPTOR REGISTORS

                        UDPDR0= 177620
                        UDPDR1= 177622
                        UDPDR2= 177624
                        UDPDR3= 177626
                        UDPDR4= 177630
                        UDPDR5= 177632
                        UDPDR6= 177634
                        UDPDR7= 177636

                        ;*USER "I" PAGE ADDRESS REGISTERS

                        UIPAR0= 177640
                        UIPAR1= 177642
                        UIPAR2= 177644
                        UIPAR3= 177646
                        UIPAR4= 177650
                        UIPAR5= 177652
                        UIPAR6= 177654
                        UIPAR7= 177656

                        ;*USER "D" PAGE ADDRESS REGISTERS
```

```
                        UDPAR0= 177660
                        UDPAR1= 177662
                        UDPAR2= 177664
                        UDPAR3= 177666
                        UDPAR4= 177670
                        UDPAR5= 177672
                        UDPAR6= 177674
                        UDPAR7= 177676

                        ;*SUPERVISOR ''I'' PAGE DESCRIPTOR REGISTERS

                        SIPDR0= 172200
                        SIPDR1= 172202
                        SIPDR2= 172204
                        SIPDR3= 172206
                        SIPDR4= 172210
                        SIPDR5= 172212
                        SIPDR6= 172214
                        SIPDR7= 172216

                        ;*SUPERVISOR 'D'' PAGE DESCRIPTOR REGISTERS

                        SDPDR0= 172220
                        SDPDR1= 172222
                        SDPDR2= 172224
                        SDPDR3= 172226
                        SDPDR4= 172230
                        SDPDR5= 172232
                        SDPDR6= 172234
                        SDPDR7= 172236

                        ;*SUPERVISOR ''I'' PAGE ADDRESS REGISTERS

                        SIPAR0= 172240
                        SIPAR1= 172242
                        SIPAR2= 172244
                        SIPAR3= 172246
                        SIPAR4= 172250
                        SIPAR5= 172252
                        SIPAR6= 172254
                        SIPAR7= 172256

                        ;*SUPERVISOR 'D'' PAGE ADDRESS REGISTERS

                        SDPAR0= 172260
                        SDPAR1= 172262
                        SDPAR2= 172264
                        SDPAR3= 172266
                        SDPAR4= 172270
                        SDPAR5= 172272
                        SDPAR6= 172274
                        SDPAR7= 172276

                        ;*KERNEL ''I'' PAGE DESCRIPTOR REGISTERS

                        KIPDR0= 172300
```

```
                        172302          KIPDR1= 172302
                        172304          KIPDR2= 172304
                        172306          KIPDR3= 172306
                        172310          KIPDR4= 172310
                        172312          KIPDR5= 172312
                        172314          KIPDR6= 172314
                        172316          KIPDR7= 172316

                                        ;*KERNEL 'D' PAGE DESCRIPTOR REGISTERS

                        172320          KDPDR0= 172320
                        172322          KDPDR1= 172322
                        172324          KDPDR2= 172324
                        172326          KDPDR3= 172326
                        172330          KDPDR4= 172330
                        172332          KDPDR5= 172332
                        172334          KDPDR6= 172334
                        172336          KDPDR7= 172336

                                        ;*KERNEL 'I' PAGE ADDRESS REGISTERS

                        172340          KIPAR0= 172340
                        172342          KIPAR1= 172342
                        172344          KIPAR2= 172344
                        172346          KIPAR3= 172346
                        172350          KIPAR4= 172350
                        172352          KIPAR5= 172352
                        172354          KIPAR6= 172354
                        172356          KIPAR7= 172356

                                        ;*KERNEL 'D' PAGE ADDRESS REGISTERS

                        172360          KDPAR0= 172360
                        172362          KDPAR1= 172362
                        172364          KDPAR2= 172364
                        172366          KDPAR3= 172366
                        172370          KDPAR4= 172370
                        172372          KDPAR5= 172372
                        172374          KDPAR6= 172374
                        172376          KDPAR7= 172376



                                        .SBTTL  UNIBUS MAP REGISTER DEFINITIONS


                                        ;*THE LOWER 16 BITS OF THE MAP REGISTERS ARE LABELED 'MAPLXX'
                                        ;*THE UPPER 6 BITS OF THE MAP REGISTERS ARE LABELED 'MAPHXX'


                        170200          MAPL00 = 170200
                        170202          MAPH00 = 170202
                        170204          MAPL01 = 170204
                        170206          MAPH01 = 170206
                        170210          MAPL02 = 170210
```

```
  337          170212          MAPH02 = 170212
  338          170214          MAPL03 = 170214
  339          170216          MAPH03 = 170216
  340          170220          MAPL04 = 170220
  341          170222          MAPH04 = 170222
  342          170224          MAPL05 = 170224
  343          170226          MAPH05 = 170226
  344          170230          MAPL06 = 170230
  345          170232          MAPH06 = 170232
  346          170234          MAPL07 = 170234
  347          170236          MAPH07 = 170236
  348          170240          MAPL10 = 170240
  349          170242          MAPH10 = 170242
  350          170244          MAPL11 = 170244
  351          170246          MAPH11 = 170246
  352          170250          MAPL12 = 170250
  353          170252          MAPH12 = 170252
  354          170254          MAPL13 = 170254
  355          170256          MAPH13 = 170256
  356          170260          MAPL14 = 170260
  357          170262          MAPH14 = 170262
  358          170264          MAPL15 = 170264
  359          170266          MAPH15 = 170266
  360          170270          MAPL16 = 170270
  361          170272          MAPH16 = 170272
  362          170274          MAPL17 = 170274
  363          170276          MAPH17 = 170276
  364          170300          MAPL20 = 170300
  365          170302          MAPH20 = 170302
  366          170304          MAPL21 = 170304
  367          170306          MAPH21 = 170306
  368          170310          MAPL22 = 170310
  369          170312          MAPH22 = 170312
  370          170314          MAPL23 = 170314
  371          170316          MAPH23 = 170316
  372          170320          MAPL24 = 170320
  373          170320          MAPH24 = 170320
  374          170324          MAPL25 = 170324
  375          170326          MAPH25 = 170326
  376          170330          MAPL26 = 170330
  377          170332          MAPH26 = 170332
  378          170334          MAPL27 = 170334
  379          170336          MAPH27 = 170336
  380          170340          MAPL30 = 170340
  381          170342          MAPH30 = 170342
  382          170344          MAPL31 = 170344
  383          170346          MAPH31 = 170346
  384          170350          MAPL32 = 170350
  385          170352          MAPH32 = 170352
  386          170354          MAPL33 = 170354
  387          170356          MAPH33 = 170356
  388          170360          MAPL34 = 170360
  389          170362          MAPH34 = 170362
  390          170364          MAPL35 = 170364
  391          170366          MAPH35 = 170366
  392          170370          MAPL36 = 170370
```

```
                        170372          MAPH36 = 170372
                        170374          MAPL37 = 170374
                        170376          MAPH37 = 170376
                                        .EQUIV  MAPL00,MAPL0
                                        .EQUIV  MAPH00,MAPH0
                                        .EQUIV  MAPL01,MAPL1
                                        .EQUIV  MAPH01,MAPH1
                                        .EQUIV  MAPL02,MAPL2
                                        .EQUIV  MAPH02,MAPH2
                                        .EQUIV  MAPL03,MAPL3
                                        .EQUIV  MAPH03,MAPH3
                                        .EQUIV  MAPL04,MAPL4
                                        .EQUIV  MAPH04,MAPH4
                                        .EQUIV  MAPL05,MAPL5
                                        .EQUIV  MAPH05,MAPH5
                                        .EQUIV  MAPL06,MAPL6
                                        .EQUIV  MAPH06,MAPH6
                                        .EQUIV  MAPL07,MAPL7
                                        .EQUIV  MAPH07,MAPH7


                                        ;DEFINITIONS

                        100000          VSPE=BIT15
                        040000          IVSS=BIT14
                        020000          VSIU=BIT13
                        010000          VCIP=BIT12
                        004000          DMMA=BIT11
                        002000          FVPE=BIT10
                        001000          UCB=BIT9
                        000400          FCAC=BIT8
                        000040          S1=BIT5
                        000020          S0=BIT4
                        000010          M1=BIT3
                        000004          M0=BIT2
                        000002          DUT=BIT1
                        000001          DT=BIT0

                        100000          BYP=BIT15

                        000054          S1M0M1=BIT5+BIT3+BIT2
                        000034          S0M0M1=BIT4+BIT3+BIT2
                        000014          M0M1=BIT3+BIT2

                        177746          CONTRL=177746
                        177752          HITMIS=177752
                        177744          MSER=177744

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

                .SBTTL  TRAP CATCHER

                        000000          .=0
                ;*ALL UNUSED LOCATIONS FROM 4 - 776 CONTAIN A ".+2,HALT"
```

```
                                ;*SEQUENCE TO CATCH ILLEGAL TRAPS AND INTERRUPTS
                                ;*LOCATION 0 CONTAINS 0 TO CATCH IMPROPERLY LOADED VECTORS

                                .SBTTL  STARTING ADDRESS(ES)
            000200                      .=200

000200  000137  040000                  JMP     @#STRT1         ;;JUMP TO STARTING ADDRESS OF PROGRAM
                                                                ;RUN ENTIRE PROGRAM (ALL TESTS)
000204  000137  040010                  JMP     STRT2           ;STARTING AT ENTRY POINT 2
                                                                ;MEMORY MANAGEMENT STATUS REGISTERS
000210  000137  040020                  JMP     STRT3           ;STARTING AT ENTRY POINT 3
                                                                ;PAGE ADDRESS AND DESCRIPTOR REGISTERS
000214  000137  040030                  JMP     STRT4           ;STARTING AT ENTRY POINT 4
                                                                ;RELOCATION AND ADDER TESTS
000220  000137  040040                  JMP     STRT5           ;STARTING AT ENTRY POINT 5
                                                                ;MEMORY MANAGEMENT TRAP AND ABORT LOGIC
000224  000137  040050                  JMP     STRT6           ;STARTING AT ENTRY POINT 6
                                                                ;D-SPACE ENABLING
000230  000137  040060                  JMP     STRT7           ;STARTING AT ENTRY POINT 7
                                                                ;A & W BIT LOGIC & DUAL MAPPING
000234  000137  040070                  JMP     STRT8           ;STARTING AT ENTRY POINT 8
                                                                ;MFP & MTP LOGIC TESTS
                                ;;*****************************************************************

                                .SBTTL          ACT11 HOOKS

                                ;*THE FOLLOWING LOCATIONS ARE SETUP TO BE USED WITH ACT11
                                ;*
                                ;*LOCATION 46 WILL CONTAIN THE ADDRESS OF THE LOCICAL
                                ;*END OF THE PROGRAM.
                                ;*LOCATION 52 IS USED TO SPECIFY PROGRAM OPERATING REQUIREMENTS
                                ;*AND/OR RESTRICTIONS. THIS IS ACCOMPLISHED BY SETTING VARIOUS BITS
                                ;*TO A ONE OR A ZERO. THE BITS USED AND THERE MEANING ARE:
                                ;*
                                ;*      BIT 15=1 PROGRAM SHOULD BE POWER FAILED WHILE RUNNING
                                ;*            =0 NO POWER FAIL DESIRED
                                ;*
                                ;*      BIT 14=1 PROGRAM RUN TIME IS MEMORY SIZE DEPENDENT
                                ;*            =0 RUN TIME IS NOT MEMORY SIZE DEPENDENT
                                ;*
                                ;*      BITS 13-0  MUST BE ZERO'S

            000240              $SVPC=.                         ;;SAVE LOCATION COUNTER
            000046              .=46                            ;;SET LOCATION COUNTER
000046  025412                  .WORD   $ENDAD                  ;;SET LOC.46 TO ADDRESS $ENDAD
            000052              .=52                            ;;SET LOCATION COUNTER
000052  000000                  .WORD   0                       ;;SET LOC.52 TO ZERO
            000240              .=$SVPC                         ;; RESTORE LOCATION COUNTER
```

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

                        .SBTTL  COMMON TAGS

                        ;*THIS TABLE CONTAINS VARIOUS COMMON STORAGE LOCATIONS
                        ;*USED IN THE PROGRAM.

        001100                  .=1100

001100                  $CMTAG:                         ;;START OF COMMON TAGS
001100  000000          $PASS:  .WORD   0               ;;CONTAINS PASS COUNT
001102  000             $TSTNM: .BYTE   0               ;;CONTAINS THE TEST NUMBER
001103  000             $ERFLG: .BYTE   0               ;;CONTAINS ERROR FLAG
001104  000000          $$TSTNM:.WORD   0               ;;TEST NUMBER STORAGE
001106  000000          $ICNT:  .WORD   0               ;;CONTAINS SUBTEST ITERATION COUNT
001110  000000          $LPADR: .WORD   0               ;;CONTAINS SCOPE LOOP
001112  000000          $LPERR: .WORD   0               ;;CONTAINS SCOPE RETURN FOR ERRORS
001114  000000          $ERTTL: .WORD   0               ;;CONTAINS TOTAL ERRORS DETECTED
001116  000             $ITEMB: .BYTE   0               ;;CONTAINS ITEM CONTROL BYTE
001117  001             $ERMAX: .BYTE   1               ;;CONTAINS MAX. ERRORS PER TEST
001120  000000          $ERRPC: .WORD   0               ;;CONTAINS PC OF LAST ERROR INSTRUCTION
001122  000000          $GDADR: .WORD   0               ;;CONTAINS  OF 'GOOD' DATA
001124  000000          $BDADR: .WORD   0               ;;CONTAINS  OF 'BAD' DATA
001126  000000          $GDDAT: .WORD   0               ;;CONTAINS 'GOOD' DATA
001130  000000          $BDDAT: .WORD   0               ;;CONTAINS 'BAD' DATA
001132  000000  000000  000000  .WORD   0,0,0           ;;RESERVED--NOT TO BE USED
001140  177560          $TKS:   177560                  ;;TTY KBD STATUS
001142  177562          $TKB:   177562                  ;;TTY KBD BUFFER
001144  177564          $TPS:   177564                  ;;TTY PRINTER STATUS REG.
001146  177566          $TPB:   177566                  ;;TTY PRINTER BUFFER REG.
001150  000             $NULL:  .BYTE   0               ;;CONTAINS NULL CHARACTER FOR FILLS
001151  002             $FILLS: .BYTE   2               ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
001152  012             $FILLC: .BYTE   12              ;;INSERT FILL CHARS. AFTER A 'LINE FEED''
001153  000             $TPFLG: .BYTE   0               ;;'TERMINAL AVAILABLE'' FLAG (BIT<07>=0=YES)
001154  000000          $REGAD: .WORD   0               ;;CONTAINS THE  FROM
                                                        ;;WHICH  ($REG0) WAS OBTAINED
001156  000000          $REG0:  .WORD   0               ;;CONTAINS (($REGAD)+0)
001160  000000          $REG1:  .WORD   0               ;;CONTAINS (($REGAD)+2)
001162  000000          $REG2:  .WORD   0               ;;CONTAINS (($REGAD)+4)
001164  000000          $REG3:  .WORD   0               ;;CONTAINS (($REGAD)+6)
001166  000000          $REG4:  .WORD   0               ;;CONTAINS (($REGAD)+10)
001170  000000          $REG5:  .WORD   0               ;;CONTAINS (($REGAD)+12)
001172  000000          $TMP0:  .WORD   0               ;;USER DEFINED
001174  000000          $TMP1:  .WORD   0               ;;USER DEFINED
001176  000000          $TMP2:  .WORD   0               ;;USER DEFINED
001200  000000          $TMP3:  .WORD   0               ;;USER DEFINED
001202  000000          $TMP4:  .WORD   0               ;;USER DEFINED
001204  000000          $TMP5:  .WORD   0               ;;USER DEFINED
001206  000000          $TIMES: 0                       ;;MAX. NUMBER OF ITERATIONS
001210  000000          $ESCAPE:0                       ;;ESCAPE ON ERROR
001212  177607  000377    $BELL:  .ASCIZ  <207><377><377> ;;CODE FOR BELL
001216  077               $QUES:  .ASCII  /?/            ;;QUESTION MARK
001217  015               $CRLF:  .ASCII  <15>           ;;CARRIAGE RETURN
001220  000012            $LF:    .ASCIZ  <12>           ;;LINE FEED
001222  000000          FSTTST: .WORD   0               ;HOLDS THE INDEX TO
                                                        ;THE STARTING ADDRESS TABLE
```

```
553  001224  000000                CPUEXP: .WORD   0               ;HOLDS EXPECTED CPU ERROR CONDITION
554  001226  000000                MMEXP:  .WORD                   ;HOLDS EXPECTED MEMORY MANAGEMENT ABORT CONDITION
555  001230  000000                PADRSL: .WORD   0               ;HOLDS THE LOWER 16 BITS OF A 22-BIT
556                                                                ;ADDRESS GENERATED FOR TYPE OUT
557  001232  000000                PADRSH: .WORD   0               ;HOLDS THE UPPER 6 BITS OF A 22-BIT
558                                                                ;ADDRESS GENERATED FOR TYPE OUT
559  001234  000000                PLOADR: .WORD   0               ;HOLDS CACHE LO ADDR REG
560  001236  000000                PHIADR: .WORD   0               ;HOLDS CACHE HI ADDR REG
561  001240  000000                PPARER: .WORD   0               ;HOLDS PARITY ERROR REG
562  001242  000000                PCONTR: .WORD   0               ;HOLDS CACHE CONTROL REG
563  001244  000000                PMAINT: .WORD   0               ;HOLDS CACHE MAINTENENCE REG
564  001246  000000                PHITMI: .WORD   0               ;HOLDS CACHE HIT MISS REG
565  001250  000000                PMMR0:  .WORD   0               ;HOLDS MEMORY MANAGEMENT REGISTER 0
566  001252  000000                PMMR1:  .WORD   0               ;HOLDS MEMORY MANAGEMENT REGISTER 1
567  001254  000000                PMMR2:  .WORD   0               ;HOLDS MEMORY MANAGEMENT REGISTER 2
568  001256  000000                PMMR3:  .WORD   0               ;HOLDS MEMORY MANAGEMENT REGISTER 3
569  001260  000000                PCPUER: .WORD   0               ;HOLDS CPU ERROR REGISTER.
570  001262  000000                BADPC:  .WORD   0               ;HOLDS PC AT ABORT OR TRAP TIME.
571  001264  000000                TESTNO: .WORD   0               ;HOLDS TEST NUMBER OF LAST ERROR.
572  001266  000000                DATAOR: .WORD   0               ;HOLDS LOGICAL OR OF BAD DATA
573  001270  000000                DATAND: .WORD   0               ;HOLDS LOGICAL AND OF BAD DATA
574  001272  000000                PATTOR: .WORD   0               ;HOLDS LOGICAL OR OF PATTERN LOADED
575  001274  000000                PATAND: .WORD   0               ;HOLDS LOGICAL AND OF PATTERN LOADED
576  001276  000000                ADDROR: .WORD   0               ;HOLDS LOGICAL OR OF ADDRESS
577  001300  000000                ADRAND: .WORD   0               ;HOLDS LOGICAL AND OF ADDRESS
578  001302  000000                ERRCNT: .WORD   0               ;HOLDS NUMBER OF ERRORS ON TEST
579  001304  000000                HOLFLG: .WORD   0               ;HOLDS NUMBER OF CONSECUTIVE TIME OUTS
580                                                                ;OCCURRING IN A HOLE IN MEMORY
581  001306  000000                OLDPC:  .WORD   0               ;HOLDS THE RETURN ADDRESS
582                                                                ;IN CASE OF A LOOP ON ERROR
583  001310  000000                OLDPS:  .WORD   0               ;HOLDS THE OLD PROCESSOR STATUS
584                                                                ;IN CASE OF A LOOP ON ERROR
585  001312  000340                OLDPSW: .WORD   000340          ;HOLDS THE OLD PSW SO THAT THE T-BIT
586                                                                ;CAN BE RESTORED PROPERLY
587  001314  000000                RETRY:  .WORD   0               ;FLAG TO DECIDE IF ONE PARITY HAS
588                                                                ;HAS BEEN ATTEMPTED
589  001316  000000                NXTTST: .WORD   0               ;HOLDS ADDRESS OF THE NEXT TEST
590
591                                ;:  THIS AREA STARTS THE DATA TABLE WHERE ANY TABLE REFERENCE WILL
592                                ;:  REFER TO.  ALL DATA WORDS WILL BE LOADED HERE IN ONE SPOT SO THAT
593                                ;:  IT WILL BE EASIER FOR YOU TO FIND OUT WHAT THAT WORD IS.
594
595  001320  020000                READON: .WORD   20000           ;READ ONLY BIT IN MMR0
596
597
598  001322                        PARTAB:                         ;THIS IS THE TABLE OF THE FIRST
599                                                                ;PAR OR PDR OF EACH GROUP.  THEY
600                                                                ;WILL BE USED FOR A DUAL ADDRESSING
601                                                                ;TEST BETWEEN GROUPS.
602  001322  172200                        .WORD   172200          ;SIPDR0
603  001324  172240                        .WORD   172240          ;SIPAR0
604  001326  172300                        .WORD   172300          ;KIPDR0
605  001330  172340                        .WORD   172340          ;KIPAR0
606  001332  177600                        .WORD   177600          ;UIPDR0
607  001334  177640                        .WORD   177640          ;UIPAR0
608  001336  040670                STRTAB: .WORD   TST1            ;STARTING ADDRESS OF TEST ONE
```

```
  609  001340  041636                        .WORD   ENTPT2          ;ADDRESS OF ENTRY POINT 2
  610  001342  043014                        .WORD   ENTPT3          ;ADDRESS OF ENTRY POINT 3
  611  001344  047524                        .WORD   ENTPT4          ;ADDRESS OF ENTRY POINT 4
  612  001346  052652                        .WORD   ENTPT5          ;ADDRESS OF ENTRY POINT 5
  613  001350  060024                        .WORD   ENTPT6          ;ADDRESS OF ENTRY POINT 6
  614  001352  062514                        .WORD   ENTPT7          ;ADDRESS OF ENTRY POINT 7
  615  001354  070214                        .WORD   ENTPT8          ;ADDRESS OF ENTRY POINT 8
  616  001356  001000              ENMMTR:   .WORD   BIT9            ;ENABLE MEMORY MANAGEMENT TRAPS  BIT
  617  001360     000              KB11E:    .BYTE   0               ;KB-11E WITHOUT MP CACHE FLAG
  618  001361     000              KB11EM:   .BYTE   0               ;KB-11EM WITH MP CACHE FLAG
  619  001362     000              KB11CM:   .BYTE   0               ;MODIFIED PROCESSOR FLAG (11/70 WITH MP MODS)
  620  001363     000              CISP:     .BYTE   0               ;CISP OPTION FLAG (NOT PRESENTLY NEEDED)
  621
  622                              ;OPCODE FOR MFPT INSTRUCTION (AVAILABLE ON KB11-E AND KB11-EM ONLY)
  623          000007                      MFPT=7
```

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

                                .SBTTL  ERROR POINTER TABLE

                                ;*THIS TABLE CONTAINS THE INFORMATION FOR EACH ERROR THAT CAN OCCUR.
                                ;*THE INFORMATION IS OBTAINED BY USING THE INDEX NUMBER FOUND IN
                                ;*LOCATION $ITEMB. THIS NUMBER INDICATES WHICH ITEM IN THE TABLE IS PERTINENT.
                                ;*NOTE1:         IF $ITEMB IS 0 THE ONLY PERTINENT DATA IS ($ERRPC).
                                ;*NOTE2:         EACH ITEM IN THE TABLE CONTAINS 4 POINTERS EXPLAINED AS FOLLOWS:

                                ;*      EM              ;;POINTS TO THE ERROR MESSAGE
                                ;*      DH              ;;POINTS TO THE DATA HEADER
                                ;*      DT              ;;POINTS TO THE DATA
                                ;*      DF              ;;POINTS TO THE DATA FORMAT

001364                          $ERRTB:

                                ;ITEM 1
001364  003447                  EM1                     ;NOT THE CORRECT CPU ABORT CONDITION THRU 'ERRVEC' (004)
001366  017003                  DH1                     ;EXPECTD RECEIVD TESTNO  PC AT ABORT
001370  023532                  DT1                     ;CPUEXP,PCPUER,TESTNO,BADPC,0
001372  024650                  DF1                     ;0,0,0,0

                                ;ITEM 2
001374  003537                  EM2                     ;UNEXPECTED CPU TRAP OR ABORT THRU 'ERRVEC' (004)
001376  017013                  DH2                     ;RECEIVD TESTNO  PC AT ABORT
001400  023534                  DT2                     ;PCPUER,TESTNO,BADPC,0
001402  024651                  DF2                     ;0,0,0

                                ;ITEM 3
001404  003620                  EM3                     ;UNEXPECTED CACHE PARITY ERROR THRU 'CACHVEC' (114)
001406  017047                  DH3                     ;PARITY  ADDRESS   CONTROL MAINTEN
                                                        ;RECEIVD REFERENCD REGISTR REGISTR TESTNO  PC AT ABORT
001410  023544                  DT3                     ;PPARER,PLOADR,PCONTR,PMAINT,TESTNO,BADPC,0
001412  024654                  DF3                     ;0,2,0,0,0,0

                                ;ITEM 4
001414  003736                  EM4                     ;UNEXPECTED MAIN MEMORY PARITY ERROR THRU 'CACHVEC' (114)
001416  017047                  DH3                     ;PARITY  ADDRESS   CONTROL MAINTEN
                                                        ;RECEIVD REFERENCD REGISTR REGISTR TESTNO  PC AT ABORT
001420  023544                  DT3                     ;PPARER,PLOADR,PCONTR,PMAINT,TESTNO,BADPC,0
001422  024654                  DF3                     ;0,2,0,0,0,0

                                ;ITEM 5
001424  004061                  EM5                     ;UNEXPECTED MEMORY MANAGEMENT TRAP OR ABORT
001426  017177                  DH5                     ;ERROR   AUTOI/D VIRTUAL
                                                        ;REGISTR REGISTR ADDRESS TESTNO  PC AT ABORT
001430  023562                  DT5                     ;PMMR0,PMMR1,PMMR2,TESTNO,BADPC,0
001432  024662                  DF5                     ;0,0,0,0,0

                                ;ITEM 6
001434  004134                  EM6                     ;MEMORY MANAGEMENT TRAP OR ABORT HAD INCORRECT CONDITION
001436  017303                  DH6                     ;EXPECTD ERROR   AUTOI/D VIRTUAL
                                                        ;CONDITN REGISTR REGISTR ADDRESS TESTNO  PC AT ABORT
```

```
                                        ;ITEM 7
001444  004224                          EM7             ;MEMORY MANAGEMENT REGISTER 0 WILL NOT CLEAR
001446  017427                          DH7             ;(MMR0)  TESTNO  ERRORPC
001450  023614                          DT7             ;$REG1,TESTNO,$ERRPC,0
001452  024675                          DF7             ;0,0,0
                                        ;ITEM 10
001454  004300                          EM10            ;CAN'T SET 171000 INTO MMR0
001456  017427                          DH7             ;(MMR0)  TESTNO  ERRORPC
001460  023614                          DT7             ;$REG1,TESTNO,$ERRPC,0
001462  024675                          DF7             ;0,0,0
                                        ;ITEM 11
001464  004331                          EM11            ;GOT THE WRONG DATA BACK FROM MMR0
001466  017457                          DH11            ;LOADED  RECEIVD TESTNO  ERRORPC
001470  023624                          DT11            ;$REG2,$REG1,TESTNO,$ERRPC,0
001472  024700                          DF11            ;0,0,0,0
                                        ;ITEM 12
001474  004373                          EM12            ;MEMORY MANAGEMENT REGISTER 1 WILL NOT CLEAR
001476  017527                          DH12            ;(MMR1)  TESTNO  ERRORPC
001500  023636                          DT12            ;$REG2,TESTNO,$ERRPC,0
001502  024704                          DF12            ;0,0,0
                                        ;ITEM 13
001504  004447                          EM13            ;MMR1 DID NOT TRACK PROPERLY
001506  017517                          DH13            ;EXPECTD (MMR1)  TESTNO  ERRORPC
001510  023646                          DT13            ;$REG3,$REG2,TESTNO,$ERRPC,0
001512  024707                          DF13            ;0,0,0,0
                                        ;ITEM 14
001514  004503                          EM14            ;MMR2 DID NOT TRACK PROPERLY
001516  017557                          DH14            ;EXPECTD (MMR2)  TESTNO  ERRORPC
001520  023646                          DT13            ;$REG3,$REG2,TESTNO,$ERRPC
001522  024707                          DF13            ;0,0,0,0
                                        ;ITEM 15
001524  004537                          EM15            ;MEMORY MANAGEMENT REGISTER 3 WILL NOT CLEAR
001526  017627                          DH15            ;(MMR3)  TESTNO  ERRORPC
001530  023636                          DT12            ;$REG,TESTNO,$ERRPC,0
001532  024704                          DF12            ;0,0,0
                                        ;ITEM 16
001534  004613                          EM16            ;MMR3 IS HOLDING THE WRONG DATA
001536  017617                          DH16            ;LOADED (MMR3)  TESTNO  ERRORPC
001540  023660                          DT16            ;$REG1,$REG2,TESTNO,$ERRPC,0
001542  024713                          DF16            ;0,0,0,0
                                        ;ITEM 17
001544  004646                          EM17            ;SUMMARY OF PAR/PDR REFERENCE TIMEOUTS
001546  017657                          DH17            ;ADDROR  ADDRAND TESTNO  #ERRORS
001550  023672                          DT17            ;ADDROR,ADRAND,TESTNO,ERRCNT,0
001552  024722                          DF17            ;0,0,0,1
```

```
                                        ;ITEM 20
001554  004714                          EM20            ;FOLLOWING PAR/PDR WILL NOT ZERO
001556  017717                          DH20            ;ADDRESS DATA    TESTNO  ERRORPC
001560  023704                          DT20            ;$REG0,$REG2,TESTNO,$ERRPC,0
001562  024726                          DF20            ;0,0,0,0

                                        ;ITEM 21
001564  004755                          EM21            ;SUMMARY OF DUAL ADDRESSING ERRORS
001566  017757                          DH21            ;ADDROR  ADDRAND ADDROR  ADDRAND
                                                        ;LOADED  LOADED ENABLED ENABLED TESTNO  #ERRORS
001570  023716                          DT21            ;ADDROR,ADRAND,DATAOR,DATAND,TESTNO,ERRCNT,0
001572  024732                          DF21            ;0,0,0,0,0,1

                                        ;ITEM 22
001574  005017                          EM22            ;SUMMARY OF COUNT PATTERN FAILURES
001576  020077                          DH22            ;ADDROR  ADDRAND PATRNOR PATRNAD DATAOR  DATAAND TESTNO  #ERRORS
001600  023734                          DT22            ;ADDROR ADRAND,PATTOR,PATAMD,DATAOR,DATAND,TESTNO,ERRCNT,0
001602  024740                          DF22            ;0,0,0,0,0,0,0,1

                                        ;ITEM 23
001604  005061                          EM23            ;ERROR IN BYTE ADDRESSING OF PAR/PDR
001606  020176                          DH23            ;ADDRESS EXPECTD RECEIVD TESTNO  ERRORPC
001610  023756                          DT23            ;$REG0,$REG2,$REG1,TESTNO,$ERRPC,0
001612  024750                          DF23            ;0,0,0,0,0

                                        ;ITEM 24
001614  005125                          EM24            ;ONE OF THE REGISTERS TIMED OUT
001616  020246                          DH24            ;REGADDR TESTNO  ERRORPC
001620  023772                          DT24            ;$REG0,TESTNO,$ERRPC,0
001622  024755                          DF24            ;0,0,0

                                        ;ITEM 25
001624  005164                          EM25            ;LOW BYTE OF LOW SIZE REGISTER IS NOT ALL ONES
001626  020276                          DH25            ;REGADDR DATA    TESTNO  ERRORPC
001630  024002                          DT25            ;$REG0,$REG1,TESTNO,$ERRPC,0
001632  024760                          DF25            ;0,0,0,0

                                        ;ITEM 26
001634  005242                          EM26            ;COULD WRITE ONE OF THE SIZE REGISTERS
001636  020276                          DH25            ;REGADDR DATA    TESTNO  ERRORPC
001640  024002                          DT25            ;$REG0,$REG2,TESTNO,$ERRPC,0
001642  024760                          DF25            ;0,0,0,0

                                        ;ITEM 27
001644  005310                          EM27            ;HIGH SIZE REGISTER IS NOT ZERO
001646  020276                          DH25            ;REGADDR DATA    TESTNO  ERRORPC
001650  024002                          DT25            ;$REG0,$REG1,TESTNO,$ERRPC,0
001652  024760                          DF25            ;0,0,0,0

                                        ;ITEM 30
001654  005347                          EM30            ;CPU ERROR REGISTER NOT ZERO AFTER LOADING NEGATIVE ONE.
001656  020276                          DH25            ;REGADDR DATA    TESTNO  ERRORPC
001660  024002                          DT25            ;$REG0,$REG1,TESTNO,$ERRPC
001662  024760                          DF25            ;0,0,0,0
```

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792                                     ;ITEM 31
793  001664  005436                     EM31            ;LOWER BYTE OF P.S.W. NOT CORRECT
794  001666  020336                     DH31            ;REGADDR DATAREC DATAEXP TESTNO  ERRORPC
795  001670  024014                     DT31            ;$REG0,$REG1,$REG2,TESTNO,$ERRPC,0
796  001672  024764                     DF31            ;0,0,0,0,0
797
798                                     ;ITEM 32
799  001674  005477                     EM32            ;MICRO BREAK REG LOADED INCORECTLY
800  001676  020336                     DH31            ;REGADDR DATAREC DATAEXP TESTNO  ERRORPC
801  001700  024014                     DT31            ;$REG0,$REG1,$REG2,TESTNO,$ERRPC,0
802  001702  024764                     DF31            ;0,0,0,0,0
803
804                                     ;ITEM 33
805  001704  005711                     EM33            ;DIDN'T LOAD PROGRAM INTERRUPT REQUEST REGISTER
806  001706  020336                     DH31            ;REGADDR DATAREC DATAEXP TESTNO  ERRORPC
807  001710  024014                     DT31            ;$REG0,$REG1,$REG2,TESTNO,$ERRPC,0
808  001712  024764                     DF31            ;0,0,0,0,0
809
810                                     ;ITEM 34
811  001714  005770                     EM34            ;LOADED MORE THAN UPPER BYTE OF STACK LIMIT REGISTER
812  001716  020336                     DH31            ;REGADDR DATAREC DATAEXP TESTNO  ERRORPC
813  001720  024014                     DT31            ;$REG0,$REG1,$REG2,TESTNO,$ERRPC,0
814  001722  024764                     DF31            ;0,0,0,0,0
815
816                                     ;ITEM 35
817  001724  006054                     EM35            ;KERNEL STACK POINTER NOT 1100 AFTER LOADING SSP AND USP
818  001726  020406                     DH35            ;KSP     TESTNO  ERRORPC
819  001730  024030                     DT35            ;$REG0,TESTNO,$ERRPC,0
820  001732  024771                     DF35            ;0,0,0
821
822                                     ;ITEM 36
823  001734  006142                     EM36            ;DUAL ADDRESSING BETWEEN PAR/PDR GROUPS
824  001736  020436                     DH36            ;INDEX   INDEX   PAR/PDR
825                                                     ;EXPECTD RECEIVD ADRREAD TESTNO  ERRORPC
826  001740  024040                     DT36            ;$REG0,$REG1,$REG2,TESTNO,$ERRPC,0
827  001742  024774                     DF36            ;0,0,0,0,0
828
829                                     ;ITEM 37
830  001744  006211                     EM37            ;BAD RELOCATION, ON STORING DATA 18-BIT MAPPING
831  001746  020536                     DH37            ;ADDRESS GDDATA  BADDATA TESTNO  ERRORPC
832  001750  024054                     DT37            ;$REG0,$REG1,$REG2,TESTNO,$ERRPC,0
833  001752  025001                     DF37            ;3,0,0,0,0
834
835                                     ;ITEM 40
836  001754  006270                     EM40            ;18-BIT MAPPING POSSIBLE HOLE IN MAIN MEMORY FROM
837  001756  020606                     DH40            ;STARTADR  FINISHADR TESTNO  ERRORPC
838  001760  024070                     DT40            ;$TMP1,$TMP2,TESTNO,$ERRPC,0
839  001762  025006                     DF40            ;4,4,0,0
840
841                                     ;ITEM 41
842  001764  006351                     EM41            ;18-BIT MAPPING POSSIBLE HOLE AT THE TOP OF MEMORY
843  001766  020652                     DH41            ;STARTADR  TESTNO  ERRORPC
844  001770  024102                     DT41            ;$TMP1,TESTNO,$ERRPC,0
845  001772  025012                     DF41            ;4,0,0
846
847                                     ;ITEM 42
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                                EM42                    ;FAULTY CARRY PROPAGATION 18-BIT MAPPING.
                                DH42                    ;PATTERN DATA    ADDRESS
                                                        ;LOADED  FETCHED INTENDED  TESTNO  ERRORPC
                                DT42                    ;$REG2,$REG3,$REG0,TESTNO,$ERRPC,0
                                DF42                    ;0,0,3,0,0

                                ;ITEM 43
                                EM43                    ;NO TRAP THRU ERRVEC, AT 18-BIT ADDRESS 760000
                                DH43                    ;TESTNO  ERRORPC
                                DT43                    ;TESTNO,$ERRPC,0
                                DF43                    ;0,0

                                ;ITEM 44
                                EM44                    ;DIDN'T GET WRAP AROUND TO ADDRESS ZERO
                                DH44                    ;DATA    TESTNO  ERRORPC
                                DT44                    ;$REG1,TESTNO,$ERRPC,0
                                DF44                    ;0,0,0

                                ;ITEM 45
                                EM45                    ;NO TRAP THRU ERRVEC, ON NON-EXISTANT ADDRESS
                                DH45                    ;NON-EXADDR TESTNO  ERRORPC
                                DT45                    ;$REG0,TESTNO,$ERRPC,0
                                DF45                    ;3,0,0

                                ;ITEM 46
                                EM46                    ;BAD RELOCATION, CARRY PROPAGATION 22-BIT MAPPING
                                DH42                    ;PATTERN DATA    ADDRESS
                                                        ;LOADED  FETCHED INTENDED  TESTNO  ERRORPC
                                DT42                    ;$REG2,$REG3,$REG0,TESTNO,$ERRPC
                                DF42                    ;0,0,3,0,0

                                ;ITEM 47
                                EM47                    ;DID NOT GET UNIBUS ADDRESS
                                DH42                    ;PATTERN DATA    ADDRESS
                                                        ;LOADED  FETCHED INTENDED  TESTNO  ERRORPC
                                DT42                    ;$REG2,$REG3,$REG0,TESTNO.$ERRPC,0
                                DF42                    ;0,0,3,0,0

                                ;ITEM 50
                                EM50                    ;COMPARE CIRCUIT FOR TOP OF MEMORY BAD
                                DH50                    ;KIPAR4    SIZELO    TESTNO  ERRORPC
                                DT50                    ;KIPAR4,SIZELO,TESTNO,$ERRPC,0
                                DF50                    ;4,4,0,0

                                ;ITEM 51
                                EM51                    ;PAGE LENGTH ABORT AT WRONG VIRTUAL ADDRESS
                                DH51                    ;PGLENFD VABLKNO TESTNO  ERRORPC
                                DT51                    ;$REG1,$REG3,TESTNO,$ERRPC,0
                                DF51                    ;0,0,0,0

                                ;ITEM 52
                                EM52                    ;NO PAGE LENGTH ABORT, WHEN CONDITION CORRECT
                                DH51                    ;PGLENFD VABLKNO TESTNO  ERRORPC
                                DT51                    ;$REG1,$REG3,TESTNO,$ERRPC,0
                                DF51                    ;0,0,0,0
```

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                                ;ITEM 53
002104  007220                  EM53            ;DID NOT ABORT ON NON-RESIDENT PAGE KIPDR5
002106  021215                  DH53            ;TESTNO  ERRORPC
002110  024200                  DT53            ;TESTNO,$ERRPC,0
002112  025042                  DF53            ;0,0

                                ;ITEM 54
002114  007272                  EM54            ;DID NOT ABORT ON READ ONLY PAGE KIPDR4
002116  021215                  DH53            ;TESTNO  ERRORPC
002120  024200                  DT53            ;TESTNO,$ERRPC,0
002122  025042                  DF53            ;0,0

                                ;ITEM 55
002124  007341                  EM55            ;INCORRECT READ FROM PAGE KIPDR4 BIT09 (MMR0) CLEAR
002126  021235                  DH55            ;EXPDATA RECDATA TESTNO  ERRORPC
002130  024206                  DT55            ;$REG0,$REG1,TESTNO,$ERRPC,0
002132  025044                  DF55            ;0,0,0,0

                                ;ITEM 56
002134  007424                  EM56            ;NO M.M. TRAP WHEN BIT09 (MMR0) SET PAGE KIPDR4
002136  021275                  DH56            ;(MMR0)  KIPDR4  TESTNO  ERRORPC
002140  024220                  DT56            ;MMR0,KIPDR4,TESTNO,$ERRPC,0
002142  025050                  DF56            ;0,0,0,0

                                ;ITEM 57
002144  007503                  EM57            ;INCORRECT READ FROM PAGE KIPDR4, BIT09 (MMR0) SET
002146  021235                  DH55            ;EXPDATA RECDATA TESTNO  ERRORPC
002150  024206                  DT55            ;$REG0,$REG1,TESTNO,$ERRPC,0
002152  025044                  DF55            ;0,0,0,0

                                ;ITEM 60
002154  007565                  EM60            ;INCORRECT WRITE TO PAGE KIPDR4, BIT09 (MMR0) SET
002156  021215                  DH53            ;TESTNO  ERRORPC
002160  024200                  DT53            ;TESTNO,$ERRPC,0
002162  025042                  DF53            ;0,0

                                ;ITEM 61
002164  007646                  EM61            ;NO M.M. TRAP WHEN BIT09 (MMR0) SET PAGE KIPDR7
002166  021275                  DH56            ;(MMR0)  KIPDR4  TESTNO  ERRORPC
002170  024220                  DT56            ;MMR0,KIPDR4,TESTNO,$ERRPC,0
002172  025050                  DF56            ;0,0,0,0

                                ;ITEM 62
002174  007725                  EM62            ;INCORRECT READ FROM PAGE KIPDR7, BIT09 (MMR0) SET
002176  021235                  DH55            ;EXPDATA RECDATA TESTNO  ERRORPC
002200  024206                  DT55            ;$REG0,$REG1,TESTNO,$ERRPC,0
002202  025044                  DF55            ;0,0,0,0

                                ;ITEM 63
002204  010007                  EM63            ;TRAP WHEN NO RELOCATION
002206  021215                  DH53            ;TESTNO  ERRORPC
002210  024200                  DT53            ;TESTNO,$ERRPC,0
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   956  002212  025042                  DF53                    ;0,0
   957
   958                                  ;ITEM 64
   959  002214  010037                  EM64                    ;TOOK TWO VECTORS WITH TRAP AND ABORT ON SAME INSTRUCTION
   960                                                          ;EXPECTING "1074" FOR KERNEL STACK POINTER
   961  002216  021335                  DH64                    ;RECEIVD TESTNO  ERRORPC
   962  002220  024232                  DT64                    ;$TMP0,TESTNO,$ERRPC,0
   963  002222  025054                  DF64                    ;0,0,0
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                                        ;ITEM 65
002224  010202                          EM65            ;MEMORY MANAGEMENT ABORT CONDITION WRONG
002226  021365                          DH65            ;EXPCOND ABRTCND TESTNO  ERRORPC
002230  024242                          DT65            ;MMEXP,PMMR0,TESTNO,$ERRPC,0
002232  025057                          DF65            ;0,0,0,0

                                        ;ITEM 66
002234  010252                          EM66            ;BIT 12 OF MMR0 WAS NOT SET WHEN A.C.F. SATISFIED
002236  021425                          DH66            ;(MMR0)  TESTNO  ERRORPC
002240  024254                          DT66            ;PMMR0,TESTNO,$ERRPC,0
002242  025063                          DF66            ;0,0,0

                                        ;ITEM 67
002244  010333                          EM67            ;NO TRAP WHEN INSTRUCTION CLEARING BIT09 (MMR0) CAUSES TRAP COND
002246  021215                          DH53            ;TESTNO  ERRORPC
002250  024200                          DT53            ;TESTNO,$ERRPC,0
002252  025042                          DF53            ;0,0

                                        ;ITEM 70
002254  010434                          EM70            ;ERROR DURING M.M. ABORT IN TRAP SEQUENCE
                                                        ;EXPECTED:
002256  021455                          DH70            ;XXX017  040241  173366  000004
                                                        ;PROSTAT (MMR0)  (MMR1)  (MMR2)  TESTNO  ERRORPC
                                                        ;RECEIVED:
002260  024264                          DT70            ;$REG1,PMMR0,PMMR1,PMMR2,TESTNO,$ERRPC,0
002262  025066                          DF70            ;0,0,0,0,0,0

                                        ;ITEM 71
002264  010517                          EM71            ;INSTRUCTION FETCH DID NOT ABORT IN ILLEGAL MODE (10)
002266  021215                          DH53            ;TESTNO  ERRORPC
002270  024200                          DT53            ;TESTNO,$ERRPC,0
002272  025042                          DF53            ;0,0

                                        ;ITEM 72
002274  010604                          EM72            ;ERROR CONDITION NOT CORRECT IN ILLEGAL MODE (10)
002276  021606                          DH72            ;EXPSTAT (MMR0)  TESTNO  ERRORPC
002300  024302                          DT72            ;$REG1,PMMR0,TESTNO,$ERRPC,0
002302  025074                          DF72            ;0,0,0,0

                                        ;ITEM 73
002304  010665                          EM73            ;AT LEAST ONE M.M. STATUS REGISTERS WAS CLOCKED AFTER BEING LOCK
002306  021646                          DH73            ;ORIGINAL DATA          NEW DATA
                                                        ;(MMR0)  (MMR1)  (MMR2)  (MMR0)  (MMR1)  (MMR2)  TESTNO  ERRORPC
002310  024314                          DT73            ;PMMR0,PMMR1,PMMR2,$TMP0,$TMP1,$TMP2,TESTNO,$ERRPC,0
002312  025100                          DF73            ;0,0,0,0,0,0,0,0

                                        ;ITEM 74
002314  010767                          EM74            ;DID NOT CHANGE MAPPING TO SUPERVISOR MODE
002316  021215                          DH53            ;TESTNO  ERRORPC
002320  024200                          DT53            ;TESTNO,$ERRPC,0
002322  025042                          DF53            ;0,0

                                        ;ITEM 75
002324  011041                          EM75            ;ABORT CONDITION INCORRECT EXPECTING 100051
002326  021777                          DH75            ;RECEIVD (MMR1)  (MMR2)  TESTNO  ERRORPC
```

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1020  002330  024336                DT75                ;PMMR0,PMMR1,PMMR2,TESTNO,$ERRPC,0
1021  002332  025110                DF75                ;0,0,0,0,0
1022
1023                                ;ITEM 76
1024  002334  011114                EM76                ;DID NOT CHANGE MAPPING TO USER MODE
1025  002336  021215                DH53                ;TESTNO  ERRORPC
1026  002340  024200                DT53                ;TESTNO,$ERRPC,0
1027  002342  025042                DF53                ;0,0
1028
1029                                ;ITEM 77
1030  002344  011160                EM77                ;ABORT CONDITION INCORRECT EXPECTING 100153
1031  002346  021777                DH75                ;RECEIVD (MMR1)  (MMR2)  TESTNO  ERRORPC
1032  002350  024336                DT75                ;PMMR0,PMMR1,PMMR2,TESTNO,$ERRPC,0
1033  002352  025110                DF75                ;0,0,0,0,0
1034
1035                                ;ITEM 100
1036  002354  011233                EM100               ;MMR2 LOCKED UP THE WRONG VIRTUAL ADDRESS
1037  002356  022047                DH100               ;VIRTADR (MMR2)  TESTNO  ERRORPC
1038  002360  024352                DT100               ;$REG1,PMMR2,TESTNO,$ERRPC,0
1039  002362  025115                DF100               ;0,0,0,0
1040
1041                                ;ITEM 101
1042  002364  011304                EM101               ;MMR0 LOCKED UP THE WRONG PAGE NUMBER
1043  002366  022107                DH101               ;EXPECTD (MMR0)  TESTNO  ERRORPC
1044  002370  024364                DT101               ;$REG2,PMMR0,TESTNO,$ERRPC,0
1045  002372  025121                DF101               ;0,0,0,0
1046
1047                                ;ITEM 102
1048  002374  011351                EM102               ;W-BIT NOT SET ON WRITE TO PAGE 4
1049  002376  022147                DH102               ;KIPDR4  TESTNO  ERRORPC
1050  002400  024376                DT102               ;$TMP0,TESTNO,$ERRPC,0
1051  002402  025125                DF102               ;0,0,0
1052
1053                                ;ITEM 103
1054  002404  011412                EM103               ;W-BIT DID NOT REMAIN SET ON M.M. ABORT AT PAGE 4
1055  002406  022147                DH102               ;KIPDR4  TESTNO  ERRORPC
1056  002410  024376                DT102               ;$TMP0,TESTNO,$ERRPC,0
1057  002412  025125                DF102               ;0,0,0
1058
1059                                ;ITEM 104
1060  002414  011473                EM104               ;W-BIT DID NOT CLEAR ON WRITE TO KIPDR4
1061  002416  022147                DH102               ;KIPDR4  TESTNO  ERRORPC
1062  002420  024376                DT102               ;$TMP0,TESTNO,$ERRPC,0
1063  002422  025125                DF102               ;0,0,0
1064
1065                                ;ITEM 105
1066  002424  011542                EM105               ;A-BIT DID NOT SET ON READ TO PAGE 4 A.C.F.=4
1067  002426  022147                DH102               ;KIPDR4  TESTNO  ERRORPC
1068  002430  024376                DT102               ;$TMP0,TESTNO,$ERRPC,0
1069  002432  025125                DF102               ;0,0,0
1070
1071                                ;ITEM 106
1072  002434  011617                EM106               ;A-BIT DID NOT REMAIN SET ON M.M. ABORT AT PAGE 4
1073  002436  022147                DH102               ;KIPDR4  TESTNO  ERRORPC
1074  002440  024376                DT102               ;$TMP0,TESTNO,$ERRPC,0
1075  002442  025125                DF102               ;0,0,0
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1076
1077                                    ;ITEM 107
1078  002444  011700                    EM107                   ;A-BIT DID NOT CLEAR ON WRITE TO KIPAR4
1079  002446  022147                    DH102                   ;KIPDR4  TESTNO  ERRORPC
1080  002450  024376                    DT102                   ;$TMP0,TESTNO,$ERRPC,0
1081  002452  025125                    DF102                   ;0,0,0
1082
1083                                    ;ITEM 110
1084  002454  011747                    EM110                   ;W-BIT DID NOT SET ON WRITE TO I/O PAGE
1085  002456  022177                    DH110                   ;KIPDR7  TESTNO  ERRORPC
1086  002460  024376                    DT102                   ;$TMP0,TESTNO,$ERRPC,0
1087  002462  025125                    DF102                   ;0,0,0
1088
1089                                    ;ITEM 111
1090  002464  012016                    EM111                   ;W-BIT DID NOT REMAIN SET AFTER INTERNAL REGISTER WRITE
1091  002466  022177                    DH110                   ;KIPDR7  TESTNO  ERRORPC
1092  002470  024376                    DT102                   ;$TMP0,TESTNO,$ERRPC,0
1093  002472  025125                    DF102                   ;0,0,0
1094
1095                                    ;ITEM 112
1096  002474  012105                    EM112                   ;DUAL MAPPING BETWEEN PAGES
1097  002476  022227                    DH112                   ;GDPAGE  BDPAGE  TESTNO  ERRORPC
1098  002500  024406                    DT112                   ;$REG3,$REG1,TESTNO,$ERRPC,0
1099  002502  025130                    DF112                   ;0,0,0,0
1100
1101                                    ;ITEM 113
1102  002504  012140                    EM113                   ;NO PAGE HAD BOTH ITS A & W BITS SET
1103  002506  022267                    DH113                   ;TSTPAGE CONTENT TESTNO  ERRORPC
1104  002510  024420                    DT113                   ;$REG3,$REG0,TESTNO,$ERRPC,0
1105  002512  025134                    DF113                   ;0,0,0,0
1106
1107                                    ;ITEM 114
1108  002514  012204                    EM114                   ;DID NOT PICK UP CORRECT STACK POINTER
1109  002516  022327                    DH114                   ;EXPECTD RECEIVD TESTNO  ERRORPC
1110  002520  024432                    DT114                   ;$REG2,$REG1,TESTNO,$ERRORPC,0
1111  002522  025140                    DF114                   ;0,0,0,0
1112
1113                                    ;ITEM 115
1114  002524  012252                    EM115                   ;CURRENT MODE STACK NOT PUSHED IN MFP INSTRUCTION
1115  002526  021215                    DH53                    ;TESTNO  ERRORPC
1116  002530  024200                    DT53                    ;TESTNO,$ERRPC,0
1117  002532  025042                    DF53                    ;0,0
1118
1119                                    ;ITEM 116
1120  002534  012333                    EM116                   ;WRONG DATA FETCHED BY MFP INSTRUCTION
1121  002536  022367                    DH116                   ;EXPECTD RECEIVD TESTNO  ERRORPC
1122  002540  024444                    DT116                   ;$REG0,$REG1,TESTNO,$ERRPC,0
1123  002542  025144                    DF116                   ;0,0,0,0
1124
1125                                    ;ITEM 117
1126  002544  012401                    EM117                   ;TRIED TO REFERENCE NON-RESIDENT PAGE
1127  002546  022427                    DH117                   ;(MMR0)  (MMR1)  (MMR2)  TESTNO  ERRORPC
1128  002550  024456                    DT117                   ;PMMR0,PMMR1,PMMR2,TESTNO,$ERRPC,0
1129  002552  025150                    DF117                   ;0,0,0,0,0
1130
1131                                    ;ITEM 120
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1132  002554  012446                EM120           ;STACK POINTER NOT CHANGED BY MTP INSTRUCTION
1133  002556  022477                DH120           ;STKPTR  TESTNO  ERRORPC
1134  002560  024472                DT120           ;$REG1,TESTNO,$ERRPC,0
1135  002562  025155                DF120           ;0,0,0
1136
1137                                ;ITEM 121
1138  002564  012523                EM121           ;INCORRECT STORE BY MTP INSTRUCTION
1139  002566  022527                DH121           ;GDDATA  STORED  TESTNO  ERRORPC
1140  002570  024444                DT116           ;$REG0,$REG1,TESTNO,$ERRPC,0
1141  002572  025144                DF116           ;0,0,0,0
1142
1143                                ;ITEM 122
1144  002574  012566                EM122           ;ABORTED THRU RIGHT VECTOR BUT PICKED UP WRONG PSW
1145  002576  022567                DH122           ;(PSW)   TESTNO  ERRORPC EXPECTING XXX340
1146  002600  024502                DT122           ;$REG0,TESTNO,$ERRPC,0
1147  002602  025160                DF122           ;0,0,0
1148
1149                                ;ITEM 123
1150  002604  012650                EM123           ;ABORTED THRU SUPERVISOR SPACE, SUPERVISOR PSW IS XXX140
1151  002606  022640                DH123           ;(PSW)   TESTNO  ERRORPC
1152  002610  024502                DT122           ;$REG0,TESTNO,$ERRPC,0
1153  002612  025160                DF122           ;0,0,0
1154
1155                                ;ITEM 124
1156  002614  012740                EM124           ;ABORTED THRU USER SPACE, USER PSW IS XXX000
1157  002616  022640                DH123           ;(PSW)   TESTNO  ERRORPC
1158  002620  024502                DT122           ;$REG0,TESTNO,$ERRPC,0
1159  002622  025160                DF122           ;0,0,0
1160
1161                                ;ITEM 125
1162  002624  013014                EM125           ;22-BIT MAPPING POSSIBLE HOLE IN MAIN MEMORY FROM
1163  002626  020606                DH40            ;STARTADR  FINISHADR TESTNO  ERRORPC
1164  002630  024070                DT40            ;$TMP1,$TMP2,TESTNO,$ERRPC,0
1165  002632  025006                DF40            ;4,4,0,0
1166
1167                                ;ITEM 126
1168  002634  013075                EM126           ;22-BIT MAPPING POSSIBLE HOLE AT THE TOP OF MEMORY
1169  002636  020652                DH41            ;STARTADR  TESTNO  ERRORPC
1170  002640  024102                DT41            ;$TMP1,TESTNO,$ERRPC,0
1171  002642  025012                DF41            ;4,0,0
1172
1173                                ;ITEM 127
1174  002644  013157                EM127           ;DID NOT ABORT REFERENCE TO A MEMORY MANAGEMENT REGISTER
1175  002646  022670                DH127           ;TESTNO  ERRORPC
1176  002650  024512                DT127           ;TESTNO,$ERRPC,0
1177  002652  025163                DF127           ;0,0
1178
1179                                ;ITEM 130
1180  002654  013247                EM130           ;ABORT IN KERNEL D-SPACE PICKED UP VECTOR FROM I-SPACE
1181  002656  022567                DH122           ;(PSW)   TESTNO  ERRORPC EXPECTING XXX340
1182  002660  024502                DT122           ;$REG0,TESTNO,$ERRPC,0
1183  002662  025160                DF122           ;0,0,0
1184
1185                                ;ITEM 131
1186  002664  013335                EM131           ;M.M. ABORT IN KERNEL D-SPACE HAD WRONG CONDITION
1187  002666  022707                DH131           ;(MMR0)  (MMR1)  (MMR2)  TESTNO  ERRORPC EXPECTING 020031
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1188  002670  024520                DT131                   ;PMMR0,PMMR1,PMMR2,TESTNO,$ERRPC,0
1189  002672  025165                DF131                   ;0,0,0,0,0
1190
1191                                ;ITEM 132
1192  002674  013416                EM132                   ;D SPACE ENABLE CIRCUITRY HAS FAILED
1193  002676  017177                DH5                     ;ERROR   AUTOI/D VIRTUAL
1194                                                        ;REGISTR REGISTR ADDRESS TESTNO  PC AT ABORT
1195  002700  023562                DT5                     ;PMMR0,PMMR1,PMMR2,TESTNO,BADPC,0
1196  002702  024662                DF5                     ;0,0,0,0,0
1197                                ;ITEM 133
1198  002704  013462                EM133                   ;BYP BIT IN KIPDR COULD NOT BE CLEARED
1199  002706  023000                DH133                   ;    PC   KIPDR   (KIPDR)
1200  002710  024534                DT133                   ;$ERRPC,$REG0,$REG1,0
1201  002712  024651                DF2                     ;0,0,0
1202                                ;ITEM 134
1203  002714  013530                EM134                   ;BYP BIT IN KIPDR COULD NOT BE SET
1204  002716  023000                DH133
1205  002720  024534                DT133
1206  002722  024651                DF2
1207
1208                                ;ITEM 135
1209  002724  013572                EM135                   ;TEST DATA COULD NOT BE MADE HIT
1210  002726  023027                DH135                   ; PC   CCR   PARADR  PAR  PDR   TST-DATA-ADR
1211  002730  024544                DT135                   ;$ERRPC,$REG0,$REG1,$REG2,$REG3,$REG4,0
1212  002732  024667                DF6
1213
1214                                ;ITEM 136
1215  002734  013632                EM136                   ;TEST DATA REFERENCE NOT A MISS
1216                                                        ;CACHED DATA WAS NOT FORCED A MISS ON VIRTUAL PAGE BYPASS
1217  002736  023027                DH135
1218  002740  024544                DT135
1219  002742  024667                DF6
1220
1221                                ;ITEM 137
1222  002744  013763                EM137                   ;TEST DATA REFERENCE NOT A MISS
1223                                                        ;CACHED DATA WAS NOT INVALIDATED ON VIRTUAL BYPASS
1224  002746  023027                DH135
1225  002750  024544                DT135
1226  002752  024667                DF6
1227                                ;ITEM 140
1228  002754  014112                EM140                   ;BYP BIT IN SIPDR COULD NOT BE CLEARED
1229  002756  023116                DH140                   ;    PC    SIPDR    (SIPDR)
1230  002760  024534                DT133
1231  002762  024651                DF2
1232
1233                                ;ITEM 141
1234  002764  014160                EM141                   ;BYP IN SIPDR COULD NOT BE SET
1235  002766  023116                DH140
1236  002770  024534                DT133
1237  002772  024651                DF2
1238
1239                                ;ITEM 142
1240  002774  014222                EM142                   ;BYP BIT IN UIPDR COULD NOT BE CLEARED
1241  002776  023145                DH142                   ;   PC     UIPDR    (UIPDR)
1242  003000  024534                DT133
1243  003002  024651                DF2
```

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1244
1245                                    ;ITEM 143
1246  003004  014270                    EM143                   ;BYP BIT IN UIPDR COULD NOT BE SET
1247  003006  023145                    DH142
1248  003010  024534                    DT133
1249  003012  024651                    DF2
1250
1251                                    ;ITEM 144
1252  003014  005606                    EM32M                   ;MICRO BREAK REG LOADED INCORECTLY. 16 BITS WRITABLE
1253  003016  020336                    DH31                    ;REGADDR DATAREC DATAEXP TESTNO  ERRORPC
1254  003020  024014                    DT31                    ;$REG0,$REG1,$REG2,TESTNO,$ERRPC,0
1255  003022  024764                    DF31                    ;0,0,0,0,0
1256
1257                                    ;ITEM 145
1258  003024  014332                    EM145                   ;DPAR READ BACK INCORRECTLY
1259  003026  023174                    DH145                   ;ADDR EXP REC TEST ERR
1260  003030  024562                    DT145                   ;$TMP0,$TMP1,$TMP2,TESTNO,ERRORPC,0
1261  003032  024764                    DF31                    ;0,0,0,0,0
1262
1263                                    ;ITEM 146
1264  003034  014461                    EM146                   ;NO KT ABORT
1265  003036  023243                    DH146
1266  003040  024576                    DT146
1267  003042  025163                    DF127
1268
1269                                    ;ITEM 147
1270  003044  014637                    EM147                   ;PS<08> FAILED TO SET
1271  003046  023243                    DH146
1272  003050  024576                    DT146
1273  003052  025163                    DF127
1274
1275                                    ;ITEM 150
1276  003054  014671                    EM150                   ;KT ABORT TRAPPED TO 4
1277  003056  023243                    DH146
1278  003060  024576                    DT146
1279  003062  025163                    DF127
1280
1281                                    ;ITEM 151
1282  003064  014775                    EM151                   ;KT ABORT TRAPPED TO 10
1283  003066  023243                    DH146
1284  003070  024576                    DT146
1285  003072  025163                    DF127
1286
1287                                    ;ITEM 152
1288  003074  015044                    EM152                   ;KT ABORT TRAPPED TO 240
1289  003076  023243                    DH146
1290  003100  024576                    DT146
1291  003102  025163                    DF127
1292
1293                                    ;ITEM 153
1294  003104  015110                    EM153                   ;KT TRAP DID NOT WORK
1295  003106  023243                    DH146
1296  003110  024576                    DT146
1297  003112  025163                    DF127
1298
1299                                    ;ITEM 154
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1300  003114  000000          0                       ;DELETED
1301  003116  000000          0
1302  003120  000000          0
1303  003122  000000          0
1304
1305                          ;ITEM 155
1306  003124  015217          EM155                   ;NO KT TRAP ON SOURCE OPERAND
1307  003126  023243          DH146
1308  003130  024576          DT146
1309  003132  025163          DF127
1310
1311                          ;ITEM 156
1312  003134  015337          EM156                   ;NO ABORT ON NEXM
1313  003136  023243          DH146
1314  003140  024576          DT146
1315  003142  025163          DF127
1316
1317                          ;ITEM 157
1318  003144  000000          0                       ;DELETED
1319  003146  000000          0
1320  003150  000000          0
1321  003152  000000          0
1322
1323                          ;ITEM 160
1324  003154  015472          EM160                   ;NEXM BIT DID NOT SET IN CPUERR REG
1325  003156  023267          DH147
1326  003160  024604          DT147
1327  003162  025130          DF112
1328
1329                          ;ITEM 161
1330  003164  015600          EM161                   ;NEXM BIT DID NOT CLEAR IN CPUERR REG
1331  003166  023243          DH146
1332  003170  024576          DT146
1333  003172  025163          DF127
1334
1335                          ;ITEM 162
1336  003174  015651          EM162                   ;KT ABORT ON NEXM (KB11-B/C)
1337  003176  023243          DH146
1338  003200  024576          DT146
1339  003202  025163          DF127
1340
1341                          ;ITEM 163
1342  003204  015730          EM163                   ;KT ABORT ON SL RED
1343  003206  023243          DH146
1344  003210  024576          DT146
1345  003212  025163          DF127
1346
1347                          ;ITEM 164
1348  003214  016005          EM164                   ;KT ABORT ON ODD  ADDRESS
1349  003216  023243          DH146
1350  003220  024576          DT146
1351  003222  025163          DF127
1352
1353                          ;ITEM 165
1354  003224  016070          EM165                   ;KT ABORT FAILED TO OVER-RIDE NEXM (KB11-E/EM)
1355  003226  023243          DH146
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1356  003230  024576                  DT146
1357  003232  025163                  DF127
1358
1359                                  ;ITEM 166
1360  003234  016154                  EM166                   ;TMCE CACHE BEND DID NOT GO
1361  003236  023243                  DH146
1362  003240  024576                  DT146
1363  003242  025163                  DF127
1364
1365                                  ;ITEM 167
1366  003244  016231                  EM167                   ;
1367  003246  023342                  DH150
1368  003250  000000                  0
1369  003252  000000                  0
1370
1371                                  ;ITEM 170
1372  003254  016425                  EM170                   ;BEN 6 FAILED ON PS RESTORE
1373  003256  023243                  DH146
1374  003260  024576                  DT146
1375  003262  025163                  DF127
1376
1377                                  ;ITEM 171
1378  003264  016521                  EM171                   ;GOING TO NEXT TEST
1379  003266  000000                  0
1380  003270  000000                  0
1381  003272  000000                  0
1382  003274                          ER200:                  ;STARTING ADDRESS FOR ITEM 201-377
1383
1384                                  ;ITEM 201
1385  003274  016546                  EM201                   ;THE FOLLOWING ARE PAR/PDR REFERENCE TIMEOUTS
1386  003276  023370                  DH201                   ;ADDRESS TESTNO
1387
1388                                  ;ITEM 301
1389  003300  024616                  DT201                   ;$REG0,,TESTNO,0
1390  003302  025172                  DF201                   ;0,0
1391
1392                                  ;ITEM 202
1393  003304  016623                  EM202                   ;THE FOLLOWING ARE DUAL ADDRESSING ERRORS FOR PAR'S/PDR'S
1394  003306  023407                  DH202                   ;ADDRESS ADDRESS
1395                                                          ;LOADED  JUST READ TESTNO
1396
1397                                  ;ITEM 302
1398  003310  024624                  DT202                   ;$REG0,$REG1,TESTNO,0
1399  003312  025174                  DF202                   ;0,0,0
1400
1401                                  ;ITEM 203
1402  003314  016714                  EM203                   ;THE FOLLOWING ARE COUNT PATTERN ERRORS FOR PAR'S/PDR'S
1403  003316  023457                  DH203                   ;ADDRESS DATA RED PATTERN COUNT   TESTNO
1404
1405                                  ;ITEM 303
1406  003320  024634                  DT203                   ;$REG0,$REG2,$REG4,$REG1,TESTNO,0
1407  003322  025177                  DF203                   ;0,0,0,0,0
1408
1409
1410                                  ;MESSAGES
1411
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1412  003324  041600  052520  052440  MSG1:   .ASCIZ<CRLF>    ''CPU UNDER TEST FOUND TO BE A ''
1413  003332  042116  051105  052040
1414  003340  051505  020124  047506
1415  003346  047125  020104  047524
1416  003354  041040  020105  020101
1417  003362     000
1418  003363     113  030502  026461  MSG2:   .ASCIZ  'KB11-EM'<CRLF>
1419  003370  046505  000200
1420  003374  041113  030461  041055  MSG3:   .ASCIZ  'KB11-B/C'<CRLF>
1421  003402  041457  000200
1422  003406  041113  030461  041455  MSG4:   .ASCIZ  'KB11-CM                  ''<CRLF>
1423  003414  020115  020040  020040
1424  003422  020040  020040  020040
1425  003430  020040  020040  100040
1426  003436     000
1427  003437     113  030502  026461  MSG5:   .ASCIZ  'KB11-E''<CRLF>
1428  003444  100105     000
1429
1430                                  .SBTTL  ERROR TABLE MESSAGES AND DATA POINTERS
1431  003447     116  052117  052040  EM1:    .ASCIZ  ?NOT THE CORRECT CPU ABORT CONDITION THRU 'ERRVEC' (004)?
1432  003454  042510  041440  051117
1433  003462  042522  052103  041440
1434  003470  052520  040440  047502
1435  003476  052122  041440  047117
1436  003504  044504  044524  047117
1437  003512  052040  051110  020125
1438  003520  042447  051122  042526
1439  003526  023503  024040  030060
1440  003534  024464     000
1441  003537     125  042516  050130  EM2:    .ASCIZ  ?UNEXPECTED CPU TRAP OR ABORT THRU 'ERRVEC' (004)?
1442  003544  041505  042524  020104
1443  003552  050103  020125  051124
1444  003560  050101  047440  020122
1445  003566  041101  051117  020124
1446  003574  044124  052522  023440
1447  003602  051105  053122  041505
1448  003610  020047  030050  032060
1449  003616  000051
1450  003620  047125  054105  042520  EM3:    .ASCII  ?UNEXPECTED CACHE PARITY ERROR THRU 'CACHVEC' (114)?<CRLF>
1451  003626  052103  042105  041440
1452  003634  041501  042510  050040
1453  003642  051101  052111  020131
1454  003650  051105  047522  020122
1455  003656  044124  052522  023440
1456  003664  040503  044103  042526
1457  003672  023503  024040  030461
1458  003700  024464     200
1459  003703     127  046111  020114          .ASCIZ  ?WILL RETRY THIS TEST ONCE.?
1460  003710  042522  051124  020131
1461  003716  044124  051511  052040
1462  003724  051505  020124  047117
1463  003732  042503  000056
1464  003736  047125  054105  042520  EM4:    .ASCII  ?UNEXPECTED MAIN MEMORY PARITY ERROR THRU 'CACHVEC' (114)?<CRLF>
1465  003744  052103  042105  046440
1466  003752  044501  020116  042515
1467  003760  047515  054522  050040
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 1468  003766  051101  052111  020131
 1469  003774  051105  047522  020122
 1470  004002  044124  052522  023440
 1471  004010  040503  044103  042526
 1472  004016  023503  024040  030461
 1473  004024  024464     200
 1474  004027     127  046111  020114          .ASCIZ  ?WILL RETRY THIS TEST ONCE?
 1475  004034  042522  051124  020131
 1476  004042  044124  051511  052040
 1477  004050  051505  020124  047117
 1478  004056  042503     000
 1479
 1480  004061     125  042516  050130  EM5:    .ASCIZ  ?UNEXPECTED MEMORY MANAGEMENT TRAP OR ABORT?
 1481  004066  041505  042524  020104
 1482  004074  042515  047515  054522
 1483  004102  046440  047101  043501
 1484  004110  046505  047105  020124
 1485  004116  051124  050101  047440
 1486  004124  020122  041101  051117
 1487  004132  000124
 1488  004134  042515  047515  054522  EM6:    .ASCIZ  ?MEMORY MANAGEMENT TRAP OR ABORT HAD INCORRECT CONDITION?
 1489  004142  046440  047101  043501
 1490  004150  046505  047105  020124
 1491  004156  051124  050101  047440
 1492  004164  020122  041101  051117
 1493  004172  020124  040510  020104
 1494  004200  047111  047503  051122
 1495  004206  041505  020124  047503
 1496  004214  042116  052111  047511
 1497  004222  000116
 1498  004224  042515  047515  054522  EM7:    .ASCIZ  ?MEMORY MANAGEMENT REGISTER 0 WILL NOT CLEAR?
 1499  004232  046440  047101  043501
 1500  004240  046505  047105  020124
 1501  004246  042522  044507  052123
 1502  004254  051105  030040  053440
 1503  004262  046111  020114  047516
 1504  004270  020124  046103  040505
 1505  004276  000122
 1506  004300  040503  023516  020124  EM10:   .ASCIZ  ?CAN'T SET 171000 IN MMR0?
 1507  004306  042523  020124  033461
 1508  004314  030061  030060  044440
 1509  004322  020116  046515  030122
 1510  004330     000
 1511  004331     107  052117  052040  EM11:   .ASCIZ  ?GOT THE WRONG DATA BACK FROM MMR0?
 1512  004336  042510  053440  047522
 1513  004344  043516  042040  052101
 1514  004352  020101  040502  045503
 1515  004360  043040  047522  020115
 1516  004366  046515  030122     000
 1517  004373     115  046505  051117  EM12:   .ASCIZ  ?MEMORY MANAGEMENT REGISTER 1 WILL NOT CLEAR?
 1518  004400  020131  040515  040516
 1519  004406  042507  042515  052116
 1520  004414  051040  043505  051511
 1521  004422  042524  020122  020061
 1522  004430  044527  046114  047040
 1523  004436  052117  041440  042514
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1524  004444  051101     000
1525  004447     115  051115  020061  EM13:   .ASCIZ  ?MMR1 DID NOT TRACK PROPERLY?
1526  004454  044504  020104  047516
1527  004462  020124  051124  041501
1528  004470  020113  051120  050117
1529  004476  051105  054514     000
1530  004503     115  051115  020062  EM14:   .ASCIZ  ?MMR2 DID NOT TRACK PROPERLY?
1531  004510  044504  020104  047516
1532  004516  020124  051124  041501
1533  004524  020113  051120  050117
1534  004532  051105  054514     000
1535  004537     115  046505  051117  EM15:   .ASCIZ  ?MEMORY MANAGEMENT REGISTER 3 WILL NOT CLEAR?
1536  004544  020131  040515  040516
1537  004552  042507  042515  052116
1538  004560  051040  043505  051511
1539  004566  042524  020122  020063
1540  004574  044527  046114  047040
1541  004602  052117  041440  042514
1542  004610  051101     000
1543  004613     115  051115  020063  EM16:   .ASCIZ  ?MMR3 IS HOLDING WRONG DATA?
1544  004620  051511  044040  046117
1545  004626  044504  043516  053440
1546  004634  047522  043516  042040
1547  004642  052101  000101
1548  004646  052523  046515  051101  EM17:   .ASCIZ  ?SUMMARY OF PAR/PDR REFERENCE TIMEOUTS?
1549  004654  020131  043117  050040
1550  004662  051101  050057  051104
1551  004670  051040  043105  051105
1552  004676  047105  042503  052040
1553  004704  046511  047505  052125
1554  004712  000123
1555  004714  047506  046114  053517  EM20:   .ASCIZ  ?FOLLOWING PAR/PDR WILL NOT CLEAR?
1556  004722  047111  020107  040520
1557  004730  027522  042120  020122
1558  004736  044527  046114  047040
1559  004744  052117  041440  042514
1560  004752  051101     000
1561  004755     123  046525  040515  EM21:   .ASCIZ  ?SUMMARY OF DUAL ADDRESSING ERRORS?
1562  004762  054522  047440  020106
1563  004770  052504  046101  040440
1564  004776  042104  042522  051523
1565  005004  047111  020107  051105
1566  005012  047522  051522     000
1567  005017     123  046525  040515  EM22:   .ASCIZ  ?SUMMARY OF COUNT PATTERN FAILURES?
1568  005024  054522  047440  020106
1569  005032  047503  047125  020124
1570  005040  040520  052124  051105
1571  005046  020116  040506  046111
1572  005054  051125  051505     000
1573  005061     105  051122  051117  EM23:   .ASCIZ  ?ERROR IN BYTE ADDRESSING OF PAR/PDR?
1574  005066  044440  020116  054502
1575  005074  042524  040440  042104
1576  005102  042522  051523  047111
1577  005110  020107  043117  050040
1578  005116  051101  050057  051104
1579  005124     000
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1580  005125     117  042516  047440  EM24:   .ASCIZ  ?ONE OF THE REGISTERS TIMED OUT?
1581  005132  020106  044124  020105
1582  005140  042522  044507  052123
1583  005146  051105  020123  044524
1584  005154  042515  020104  052517
1585  005162  000124
1586  005164  047514  020127  054502  EM25:   .ASCIZ  ?LOW BYTE OF LOW SIZE REGISTER IS NOT ALL ONES?
1587  005172  042524  047440  020106
1588  005200  047514  020127  044523
1589  005206  042532  051040  043505
1590  005214  051511  042524  020122
1591  005222  051511  047040  052117
1592  005230  040440  046114  047440
1593  005236  042516  000123
1594  005242  047503  046125  020104  EM26:   .ASCIZ  ?COULD WRITE ONE OF THE SIZE REGISTERS?
1595  005250  051127  052111  020105
1596  005256  047117  020105  043117
1597  005264  052040  042510  051440
1598  005272  055111  020105  042522
1599  005300  044507  052123  051105
1600  005306  000123
1601  005310  044510  044107  051440  EM27:   .ASCIZ  ?HIGH SIZE REGISTER IS NOT ZERO?
1602  005316  055111  020105  042522
1603  005324  044507  052123  051105
1604  005332  044440  020123  047516
1605  005340  020124  042532  047522
1606  005346     000
1607  005347     103  052520  042440  EM30:   .ASCIZ  ?CPU ERROR REGISTER NOT ZERO AFTER LOADING NEGATIVE ONE?
1608  005354  051122  051117  051040
1609  005362  043505  051511  042524
1610  005370  020122  047516  020124
1611  005376  042532  047522  040440
1612  005404  052106  051105  046040
1613  005412  040517  044504  043516
1614  005420  047040  043505  052101
1615  005426  053111  020105  047117
1616  005434  000105
1617  005436  047514  042527  020122  EM31:   .ASCIZ  ?LOWER BYTE OF P.S.W. NOT CORRECT?
1618  005444  054502  042524  047440
1619  005452  020106  027120  027123
1620  005460  027127  047040  052117
1621  005466  041440  051117  042522
1622  005474  052103     000
1623  005477     115  041511  030122  EM32:   .ASCIZ  ?MICRO BREAK REG LOADED INCORRECTLY. ONLY LOWER BYTE SHOULD BE WRITABLE?
1624  005504  041040  042522  045501
1625  005512  051040  043505  046040
1626  005520  040517  042504  020104
1627  005526  047111  047503  051122
1628  005534  041505  046124  027131
1629  005542  047440  046116  020131
1630  005550  047514  042527  020122
1631  005556  054502  042524  051440
1632  005564  047510  046125  020104
1633  005572  042502  053440  044522
1634  005600  040524  046102  000105
1635  005606  044515  051103  020060  EM32M:  .ASCIZ  ?MICRO BREAK REG LOADED INCORRECTLY. ALL 16 BITS SHOULD BE WRITABLE?
```

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1636  005614  051102  040505  020113
1637  005622  042522  020107  047514
1638  005630  042101  042105  044440
1639  005636  041516  051117  042522
1640  005644  052103  054514  020056
1641  005652  046101  020114  033061
1642  005660  041040  052111  020123
1643  005666  044123  052517  042114
1644  005674  041040  020105  051127
1645  005702  052111  041101  042514
1646  005710     000
1647  005711     104  042111  023516  EM33:   .ASCIZ  ?DIDN'T LOAD PROGRAM INTERRUPT REQUEST REGISTER?
1648  005716  020124  047514  042101
1649  005724  050040  047522  051107
1650  005732  046501  044440  052116
1651  005740  051105  052522  052120
1652  005746  051040  050505  042525
1653  005754  052123  051040  043505
1654  005762  051511  042524  000122
1655  005770  047514  042101  042105  EM34:   .ASCIZ  ?LOADED MORE THAN UPPER BYTE OF STACK LIMIT REGISTER?
1656  005776  046440  051117  020105
1657  006004  044124  047101  052440
1658  006012  050120  051105  041040
1659  006020  052131  020105  043117
1660  006026  051440  040524  045503
1661  006034  046040  046511  052111
1662  006042  051040  043505  051511
1663  006050  042524  000122
1664  006054  042513  047122  046105  EM35:   .ASCIZ  ?KERNEL STACK POINTER NOT 1100 AFTER LOADING SSP & USP?
1665  006062  051440  040524  045503
1666  006070  050040  044517  052116
1667  006076  051105  047040  052117
1668  006104  030440  030061  020060
1669  006112  043101  042524  020122
1670  006120  047514  042101  047111
1671  006126  020107  051523  020120
1672  006134  020046  051525  000120
1673  006142  052504  046101  040440  EM36:   .ASCIZ  ?DUAL ADDRESSING BETWEEN PAR/PDR GROUPS?
1674  006150  042104  042522  051523
1675  006156  047111  020107  042502
1676  006164  053524  042505  020116
1677  006172  040520  027522  042120
1678  006200  020122  051107  052517
1679  006206  051520     000
1680  006211     102  042101  051040  EM37:   .ASCIZ  ?BAD RELOCATION, ON STORING DATA 18-BIT MAPPING?
1681  006216  046105  041517  052101
1682  006224  047511  026116  047440
1683  006232  020116  052123  051117
1684  006240  047111  020107  040504
1685  006246  040524  030440  026470
1686  006254  044502  020124  040515
1687  006262  050120  047111  000107
1688  006270  034061  041055  052111  EM40:   .ASCIZ  ?18-BIT MAPPING POSSIBLE HOLE IN MAIN MEMORY FROM?
1689  006276  046440  050101  044520
1690  006304  043516  050040  051517
1691  006312  044523  046102  020105
```

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1692  006320  047510  042514  044440
1693  006326  020116  040515  047111
1694  006334  046440  046505  051117
1695  006342  020131  051106  046517
1696  006350     000
1697  006351     061  026470  044502  EM41:   .ASCIZ  ?18-BIT MAPPING POSSIBLE HOLE AT THE TOP OF MEMORY?
1698  006356  020124  040515  050120
1699  006364  047111  020107  047520
1700  006372  051523  041111  042514
1701  006400  044040  046117  020105
1702  006406  052101  052040  042510
1703  006414  052040  050117  047440
1704  006422  020106  042515  047515
1705  006430  054522     000
1706  006433     106  052501  052114  EM42:   .ASCIZ  ?FAULTY CARRY PROPAGATION 18-BIT MAPPING.?
1707  006440  020131  040503  051122
1708  006446  020131  051120  050117
1709  006454  043501  052101  047511
1710  006462  020116  034061  041055
1711  006470  052111  046440  050101
1712  006476  044520  043516  000056
1713  006504  047516  052040  040522  EM43:   .ASCIZ  ?NO TRAP THRU ERRVEC, AT 18-BIT ADDRESS 760000?
1714  006512  020120  044124  052522
1715  006520  042440  051122  042526
1716  006526  026103  040440  020124
1717  006534  034061  041055  052111
1718  006542  040440  042104  042522
1719  006550  051523  033440  030066
1720  006556  030060  000060
1721  006562  044504  047104  052047  EM44:   .ASCIZ  ?DIDN'T GET WRAP AROUND TO ADDRESS ZERO?
1722  006570  043440  052105  053440
1723  006576  040522  020120  051101
1724  006604  052517  042116  052040
1725  006612  020117  042101  051104
1726  006620  051505  020123  042532
1727  006626  047522     000
1728  006631     116  020117  051124  EM45:   .ASCIZ  ?NO TRAP THRU ERRVEC, ON NON-EXISTANT ADDRESS?
1729  006636  050101  052040  051110
1730  006644  020125  051105  053122
1731  006652  041505  020054  047117
1732  006660  047040  047117  042455
1733  006666  044530  052123  047101
1734  006674  020124  042101  051104
1735  006702  051505  000123
1736  006706  040502  020104  042522  EM46:   .ASCIZ  ?BAD RELOCATION, CARRY PROPAGATION 22-BIT MAPPING?
1737  006714  047514  040503  044524
1738  006722  047117  020054  040503
1739  006730  051122  020131  051120
1740  006736  050117  043501  052101
1741  006744  047511  020116  031062
1742  006752  041055  052111  046440
1743  006760  050101  044520  043516
1744  006766     000
1745  006767     104  042111  047040  EM47:   .ASCIZ  ?DID NOT GET UNIBUS ADDRESS?
1746  006774  052117  043440  052105
1747  007002  052440  044516  052502
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 1748  007010  020123  042101  051104
 1749  007016  051505  000123
 1750  007022  047503  050115  051101  EM50:   .ASCIZ  ?COMPARE CIRCUIT FOR TOP OF MEMORY BAD?
 1751  007030  020105  044503  041522
 1752  007036  044525  020124  047506
 1753  007044  020122  047524  020120
 1754  007052  043117  046440  046505
 1755  007060  051117  020131  040502
 1756  007066  000104
 1757  007070  040520  042507  046040  EM51:   .ASCIZ  ?PAGE LENGTH ABORT AT WRONG VIRTUAL ADDRESS?
 1758  007076  047105  052107  020110
 1759  007104  041101  051117  020124
 1760  007112  052101  053440  047522
 1761  007120  043516  053040  051111
 1762  007126  052524  046101  040440
 1763  007134  042104  042522  051523
 1764  007142     000
 1765  007143     116  020117  040520  EM52:   .ASCIZ  ?NO PAGE LENGTH ABORT, WHEN CONDITION CORRECT?
 1766  007150  042507  046040  047105
 1767  007156  052107  020110  041101
 1768  007164  051117  026124  053440
 1769  007172  042510  020116  047503
 1770  007200  042116  052111  047511
 1771  007206  020116  047503  051122
 1772  007214  041505  000124
 1773  007220  044504  020104  047516  EM53:   .ASCIZ  ?DID NOT ABORT ON NON-RESIDENT PAGE KIPDR5?
 1774  007226  020124  041101  051117
 1775  007234  020124  047117  047040
 1776  007242  047117  051055  051505
 1777  007250  042111  047105  020124
 1778  007256  040520  042507  045440
 1779  007264  050111  051104  000065
 1780  007272  044504  020104  047516  EM54:   .ASCIZ  ?DID NOT ABORT ON READ ONLY PAGE KIPDR4?
 1781  007300  020124  041101  051117
 1782  007306  020124  047117  051040
 1783  007314  040505  020104  047117
 1784  007322  054514  050040  043501
 1785  007330  020105  044513  042120
 1786  007336  032122     000
 1787  007341     111  041516  051117  EM55:   .ASCIZ  ?INCORRECT READ FROM PAGE KIPDR4 BIT09 (MMR0) CLEAR?
 1788  007346  042522  052103  051040
 1789  007354  040505  020104  051106
 1790  007362  046517  050040  043501
 1791  007370  020105  044513  042120
 1792  007376  032122  041040  052111
 1793  007404  034460  024040  046515
 1794  007412  030122  020051  046103
 1795  007420  040505  000122
 1796  007424  047516  046440  046456  EM56:   .ASCIZ  ?NO M.M. TRAP WHEN BIT09 (MMR0) SET PAGE KIPDR4?
 1797  007432  020056  051124  050101
 1798  007440  053440  042510  020116
 1799  007446  044502  030124  020071
 1800  007454  046450  051115  024460
 1801  007462  051440  052105  050040
 1802  007470  043501  020105  044513
 1803  007476  042120  032122     000
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1804  007503    111  041516  051117  EM57:   .ASCIZ  ?INCORRECT READ FROM PAGE KIPDR4, BIT09 (MMR0) SET?
1805  007510  042522  052103  051040
1806  007516  040505  020104  051106
1807  007524  046517  050040  043501
1808  007532  020105  044513  042120
1809  007540  032122  020054  044502
1810  007546  030124  020071  046450
1811  007554  051115  024460  051440
1812  007562  052105     000
1813  007565    111  041516  051117  EM60:   .ASCIZ  ?INCORRECT WRITE TO PAGE KIPDR4, BIT09 (MMR0) SET?
1814  007572  042522  052103  053440
1815  007600  044522  042524  052040
1816  007606  020117  040520  042507
1817  007614  045440  050111  051104
1818  007622  026064  041040  052111
1819  007630  034460  024040  046515
1820  007636  030122  020051  042523
1821  007644  000124
1822  007646  047516  046440  046456  EM61:   .ASCIZ  ?NO M.M. TRAP WHEN BIT09 (MMR0) SET PAGE KIPDR7?
1823  007654  020056  051124  050101
1824  007662  053440  042510  020116
1825  007670  044502  030124  020071
1826  007676  046450  051115  024460
1827  007704  051440  052105  050040
1828  007712  043501  020105  044513
1829  007720  042120  033522     000
1830  007725    111  041516  051117  EM62:   .ASCIZ  ?INCORRECT READ FROM PAGE KIPDR7, BIT09 (MMR0) SET?
1831  007732  042522  052103  051040
1832  007740  040505  020104  051106
1833  007746  046517  050040  043501
1834  007754  020105  044513  042120
1835  007762  033522  020054  044502
1836  007770  030124  020071  046450
1837  007776  051115  024460  051440
1838  010004  052105     000
1839  010007    124  040522  020120  EM63:   .ASCIZ  ?TRAP WHEN NO RELOCATION?
1840  010014  044127  047105  047040
1841  010022  020117  042522  047514
1842  010030  040503  044524  047117
1843  010036     000
1844  010037    124  047517  020113  EM64:   .ASCII  ?TOOK TWO VECTORS WITH TRAP AND ABORT ON SAME INSTRUCTION?<CRLF>
1845  010044  053524  020117  042526
1846  010052  052103  051117  020123
1847  010060  044527  044124  052040
1848  010066  040522  020120  047101
1849  010074  020104  041101  051117
1850  010102  020124  047117  051440
1851  010110  046501  020105  047111
1852  010116  052123  052522  052103
1853  010124  047511  100116
1854  010130  054105  042520  052103          .ASCIZ  ?EXPECTING "1074" FOR KERNEL STACK POINTER?
1855  010136  047111  020107  030442
1856  010144  033460  021064  043040
1857  010152  051117  045440  051105
1858  010160  042516  020114  052123
1859  010166  041501  020113  047520
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 1860  010174  047111  042524  000122
 1861  010202  042515  047515  054522  EM65:   .ASCIZ  ?MEMORY MANAGEMENT ABORT CONDITION WRONG?
 1862  010210  046440  047101  043501
 1863  010216  046505  047105  020124
 1864  010224  041101  051117  020124
 1865  010232  047503  042116  052111
 1866  010240  047511  020116  051127
 1867  010246  047117  000107
 1868  010252  044502  020124  031061  EM66:   .ASCIZ  ?BIT 12 OF MMR0 WAS NOT SET WHEN A.C.F. SATISFIED?
 1869  010260  047440  020106  046515
 1870  010266  030122  053440  051501
 1871  010274  047040  052117  051440
 1872  010302  052105  053440  042510
 1873  010310  020116  027101  027103
 1874  010316  027106  051440  052101
 1875  010324  051511  044506  042105
 1876  010332     000
 1877  010333     116  020117  051124  EM67:   .ASCIZ  ?NO TRAP WHEN INSTRUCTION CLEARING BIT09 (MMR0) CAUSES TRAP COND.?
 1878  010340  050101  053440  042510
 1879  010346  020116  047111  052123
 1880  010354  052522  052103  047511
 1881  010362  020116  046103  040505
 1882  010370  044522  043516  041040
 1883  010376  052111  034460  024040
 1884  010404  046515  030122  020051
 1885  010412  040503  051525  051505
 1886  010420  052040  040522  020120
 1887  010426  047503  042116  000056
 1888  010434  051105  047522  020122  EM70:   .ASCII  ?ERROR DURING M.M. ABORT IN TRAP SEQUENCE?<CRLF>
 1889  010442  052504  044522  043516
 1890  010450  046440  046456  020056
 1891  010456  041101  051117  020124
 1892  010464  047111  052040  040522
 1893  010472  020120  042523  052521
 1894  010500  047105  042503     200
 1895  010505     105  050130  041505          .ASCIZ  ?EXPECTED:?
 1896  010512  042524  035104     000
 1897  010517     111  051516  051124  EM71:   .ASCIZ  ?INSTRUCTION FETCH DID NOT ABORT IN ILLEGAL MODE (10)?
 1898  010524  041525  044524  047117
 1899  010532  043040  052105  044103
 1900  010540  042040  042111  047040
 1901  010546  052117  040440  047502
 1902  010554  052122  044440  020116
 1903  010562  046111  042514  040507
 1904  010570  020114  047515  042504
 1905  010576  024040  030061  000051
 1906  010604  051105  047522  020122  EM72:   .ASCIZ  ?ERROR CONDITION NOT CORRECT IN ILLEGAL MODE (10)?
 1907  010612  047503  042116  052111
 1908  010620  047511  020116  047516
 1909  010626  020124  047503  051122
 1910  010634  041505  020124  047111
 1911  010642  044440  046114  043505
 1912  010650  046101  046440  042117
 1913  010656  020105  030450  024460
 1914  010664     000
 1915  010665     101  020124  042514  EM73:   .ASCIZ  ?AT LEAST ONE M.M. STATUS REGISTERS WAS CLOCKED AFTER BEING LOCKED?
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 1916  010672  051501  020124  047117
 1917  010700  020105  027115  027115
 1918  010706  051440  040524  052524
 1919  010714  020123  042522  044507
 1920  010722  052123  051105  020123
 1921  010730  040527  020123  046103
 1922  010736  041517  042513  020104
 1923  010744  043101  042524  020122
 1924  010752  042502  047111  020107
 1925  010760  047514  045503  042105
 1926  010766     000
 1927  010767     104  042111  047040  EM74:   .ASCIZ  ?DID NOT CHANGE MAPPING TO SUPERVISOR MODE?
 1928  010774  052117  041440  040510
 1929  011002  043516  020105  040515
 1930  011010  050120  047111  020107
 1931  011016  047524  051440  050125
 1932  011024  051105  044526  047523
 1933  011032  020122  047515  042504
 1934  011040     000
 1935  011041     101  047502  052122  EM75:   .ASCIZ  ?ABORT CONDITION INCORRECT EXPECTING 100051?
 1936  011046  041440  047117  044504
 1937  011054  044524  047117  044440
 1938  011062  041516  051117  042522
 1939  011070  052103  042440  050130
 1940  011076  041505  044524  043516
 1941  011104  030440  030060  032460
 1942  011112  000061
 1943  011114  044504  020104  047516  EM76:   .ASCIZ  ?DID NOT CHANGE MAPPING TO USER MODE?
 1944  011122  020124  044103  047101
 1945  011130  042507  046440  050101
 1946  011136  044520  043516  052040
 1947  011144  020117  051525  051105
 1948  011152  046440  042117  000105
 1949  011160  041101  051117  020124  EM77:   .ASCIZ  ?ABORT CONDITION INCORRECT EXPECTING 100153?
 1950  011166  047503  042116  052111
 1951  011174  047511  020116  047111
 1952  011202  047503  051122  041505
 1953  011210  020124  054105  042520
 1954  011216  052103  047111  020107
 1955  011224  030061  030460  031465
 1956  011232     000
 1957  011233     115  051115  020062  EM100:  .ASCIZ  ?MMR2 LOCKED UP THE WRONG VIRTUAL ADDRESS?
 1958  011240  047514  045503  042105
 1959  011246  052440  020120  044124
 1960  011254  020105  051127  047117
 1961  011262  020107  044526  052122
 1962  011270  040525  020114  042101
 1963  011276  051104  051505  000123
 1964  011304  046515  030122  046040  EM101:  .ASCIZ  ?MMR0 LOCKED UP THE WRONG PAGE NUMBER?
 1965  011312  041517  042513  020104
 1966  011320  050125  052040  042510
 1967  011326  053440  047522  043516
 1968  011334  050040  043501  020105
 1969  011342  052516  041115  051105
 1970  011350     000
 1971  011351     127  041055  052111  EM102:  .ASCIZ  ?W-BIT NOT SET ON WRITE TO PAGE 4?
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 1972  011356  047040  052117  051440
 1973  011364  052105  047440  020116
 1974  011372  051127  052111  020105
 1975  011400  047524  050040  043501
 1976  011406  020105  000064
 1977  011412  026527  044502  020124  EM103:  .ASCIZ  ?W-BIT DID NOT REMAIN SET ON M.M. ABORT AT PAGE 4?
 1978  011420  044504  020104  047516
 1979  011426  020124  042522  040515
 1980  011434  047111  051440  052105
 1981  011442  047440  020116  027115
 1982  011450  027115  040440  047502
 1983  011456  052122  040440  020124
 1984  011464  040520  042507  032040
 1985  011472     000
 1986  011473     127  041055  052111  EM104:  .ASCIZ  ?W-BIT DID NOT CLEAR ON WRITE TO KIPDR4?
 1987  011500  042040  042111  047040
 1988  011506  052117  041440  042514
 1989  011514  051101  047440  020116
 1990  011522  051127  052111  020105
 1991  011530  047524  045440  050111
 1992  011536  051104  000064
 1993  011542  026501  044502  020124  EM105:  .ASCIZ  ?A-BIT DID NOT SET ON READ TO PAGE 4 A.C.F.=4?
 1994  011550  044504  020104  047516
 1995  011556  020124  042523  020124
 1996  011564  047117  051040  040505
 1997  011572  020104  047524  050040
 1998  011600  043501  020105  020064
 1999  011606  027101  027103  027106
 2000  011614  032075     000
 2001  011617     101  041055  052111  EM106:  .ASCIZ  ?A-BIT DID NOT REMAIN SET ON M.M. ABORT AT PAGE 4?
 2002  011624  042040  042111  047040
 2003  011632  052117  051040  046505
 2004  011640  044501  020116  042523
 2005  011646  020124  047117  046440
 2006  011654  046456  020056  041101
 2007  011662  051117  020124  052101
 2008  011670  050040  043501  020105
 2009  011676  000064
 2010  011700  026501  044502  020124  EM107:  .ASCIZ  ?A-BIT DID NOT CLEAR ON WRITE TO KIPAR4?
 2011  011706  044504  020104  047516
 2012  011714  020124  046103  040505
 2013  011722  020122  047117  053440
 2014  011730  044522  042524  052040
 2015  011736  020117  044513  040520
 2016  011744  032122     000
 2017  011747     127  041055  052111  EM110:  .ASCIZ  ?W-BIT DID NOT SET ON WRITE TO I/O PAGE?
 2018  011754  042040  042111  047040
 2019  011762  052117  051440  052105
 2020  011770  047440  020116  051127
 2021  011776  052111  020105  047524
 2022  012004  044440  047457  050040
 2023  012012  043501  000105
 2024  012016  026527  044502  020124  EM111:  .ASCIZ  ?W-BIT DID NOT REMAIN SET AFTER INTERNAL REGISTER WRITE?
 2025  012024  044504  020104  047516
 2026  012032  020124  042522  040515
 2027  012040  047111  051440  052105
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 2028  012046  040440  052106  051105
 2029  012054  044440  052116  051105
 2030  012062  040516  020114  042522
 2031  012070  044507  052123  051105
 2032  012076  053440  044522  042524
 2033  012104     000
 2034  012105     104  040525  020114  EM112:  .ASCIZ  ?DUAL MAPPING BETWEEN PAGES?
 2035  012112  040515  050120  047111
 2036  012120  020107  042502  053524
 2037  012126  042505  020116  040520
 2038  012134  042507  000123
 2039  012140  047516  050040  043501  EM113:  .ASCIZ  ?NO PAGE HAD BOTH ITS A & W BITS SET?
 2040  012146  020105  040510  020104
 2041  012154  047502  044124  044440
 2042  012162  051524  040440  023040
 2043  012170  053440  041040  052111
 2044  012176  020123  042523  000124
 2045  012204  044504  020104  047516  EM114:  .ASCIZ  ?DID NOT PICK UP CORRECT STACK POINTER?
 2046  012212  020124  044520  045503
 2047  012220  052440  020120  047503
 2048  012226  051122  041505  020124
 2049  012234  052123  041501  020113
 2050  012242  047520  047111  042524
 2051  012250  000122
 2052  012252  052503  051122  047105  EM115:  .ASCIZ  ?CURRENT MODE STACK NOT PUSHED IN MFP INSTRUCTION?
 2053  012260  020124  047515  042504
 2054  012266  051440  040524  045503
 2055  012274  047040  052117  050040
 2056  012302  051525  042510  020104
 2057  012310  047111  046440  050106
 2058  012316  044440  051516  051124
 2059  012324  041525  044524  047117
 2060  012332     000
 2061  012333     127  047522  043516  EM116:  .ASCIZ  ?WRONG DATA FETCHED BY MFP INSTRUCTION?
 2062  012340  042040  052101  020101
 2063  012346  042506  041524  042510
 2064  012354  020104  054502  046440
 2065  012362  050106  044440  051516
 2066  012370  051124  041525  044524
 2067  012376  047117     000
 2068  012401     124  044522  042105  EM117:  .ASCIZ  ?TRIED TO REFERENCE NON-RESIDENT PAGE?
 2069  012406  052040  020117  042522
 2070  012414  042506  042522  041516
 2071  012422  020105  047516  026516
 2072  012430  042522  044523  042504
 2073  012436  052116  050040  043501
 2074  012444  000105
 2075  012446  052123  041501  020113  EM120:  .ASCIZ  ?STACK POINTER NOT CHANGED BY MTP INSTRUCTION?
 2076  012454  047520  047111  042524
 2077  012462  020122  047516  020124
 2078  012470  044103  047101  042507
 2079  012476  020104  054502  046440
 2080  012504  050124  044440  051516
 2081  012512  051124  041525  044524
 2082  012520  047117     000
 2083  012523     111  041516  051117  EM121:  .ASCIZ  ?INCORRECT STORE BY MTP INSTRUCTION?
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2084  012530  042522  052103  051440
2085  012536  047524  042522  041040
2086  012544  020131  052115  020120
2087  012552  047111  052123  052522
2088  012560  052103  047511  000116
2089  012566  041101  051117  042524  EM122:  .ASCIZ  ?ABORTED THRU RIGHT VECTOR BUT PICKED UP WRONG PSW?
2090  012574  020104  044124  052522
2091  012602  051040  043511  052110
2092  012610  053040  041505  047524
2093  012616  020122  052502  020124
2094  012624  044520  045503  042105
2095  012632  052440  020120  051127
2096  012640  047117  020107  051520
2097  012646  000127
2098  012650  041101  051117  042524  EM123:  .ASCIZ  ?ABORTED THRU SUPERVISOR SPACE, SUPERVISOR PSW IS XXX340?
2099  012656  020104  044124  052522
2100  012664  051440  050125  051105
2101  012672  044526  047523  020122
2102  012700  050123  041501  026105
2103  012706  051440  050125  051105
2104  012714  044526  047523  020122
2105  012722  051520  020127  051511
2106  012730  054040  054130  032063
2107  012736  000060
2108  012740  041101  051117  042524  EM124:  .ASCIZ  ?ABORTED THRU USER SPACE, USER PSW IS XXX000?
2109  012746  020104  044124  052522
2110  012754  052440  042523  020122
2111  012762  050123  041501  026105
2112  012770  052440  042523  020122
2113  012776  051520  020127  051511
2114  013004  054040  054130  030060
2115  013012  000060
2116  013014  031062  041055  052111  EM125:  .ASCIZ  ?22-BIT MAPPING POSSIBLE HOLE IN MAIN MEMORY FROM?
2117  013022  046440  050101  044520
2118  013030  043516  050040  051517
2119  013036  044523  046102  020105
2120  013044  047510  042514  044440
2121  013052  020116  040515  047111
2122  013060  046440  046505  051117
2123  013066  020131  051106  046517
2124  013074     000
2125  013075     062  026462  044502  EM126:  .ASCIZ  ?22-BIT MAPPING POSSIBLE HOLE AT THE TOP OF MEMORY?
2126  013102  020124  040515  050120
2127  013110  047111  020107  047520
2128  013116  051523  041111  042514
2129  013124  044040  046117  020105
2130  013132  052101  052040  042510
2131  013140  052040  050117  047440
2132  013146  020106  042515  047515
2133  013154  054522     000
2134  013157     104  042111  047040  EM127:  .ASCIZ  ?DID NOT ABORT REFERENCE TO A MEMORY MAMAGEMENT REGISTER?
2135  013164  052117  040440  047502
2136  013172  052122  051040  043105
2137  013200  051105  047105  042503
2138  013206  052040  020117  020101
2139  013214  042515  047515  054522
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2140  013222  046440  046501  043501
2141  013230  046505  047105  020124
2142  013236  042522  044507  052123
2143  013244  051105     000
2144  013247     101  047502  052122  EM130:  .ASCIZ  ?ABORT IN KERNAL D-SPACE PICKED UP VECTOR FROM I-SPACE?
2145  013254  044440  020116  042513
2146  013262  047122  046101  042040
2147  013270  051455  040520  042503
2148  013276  050040  041511  042513
2149  013304  020104  050125  053040
2150  013312  041505  047524  020122
2151  013320  051106  046517  044440
2152  013326  051455  040520  042503
2153  013334     000
2154
2155  013335     115  046456  020056  EM131:  .ASCIZ  ?M.M. ABORT IN KERNEL D-SPACE HAD WRONG CONDITION?
2156  013342  041101  051117  020124
2157  013350  047111  045440  051105
2158  013356  042516  020114  026504
2159  013364  050123  041501  020105
2160  013372  040510  020104  051127
2161  013400  047117  020107  047503
2162  013406  042116  052111  047511
2163  013414  000116
2164  013416  026504  050123  041501  EM132:  .ASCIZ  ?D-SPACE ENABLE CIRCUITRY HAS FAILED?
2165  013424  020105  047105  041101
2166  013432  042514  041440  051111
2167  013440  052503  052111  054522
2168  013446  044040  051501  043040
2169  013454  044501  042514  000104
2170  013462  054502  020120  044502  EM133:  .ASCIZ  ?BYP BIT IN KIPDR COULD NOT BE CLEARED?
2171  013470  020124  047111  045440
2172  013476  050111  051104  041440
2173  013504  052517  042114  047040
2174  013512  052117  041040  020105
2175  013520  046103  040505  042522
2176  013526  000104
2177  013530  054502  020120  044502  EM134:  .ASCIZ  ?BYP BIT IN KIPDR COULD NOT BE SET?
2178  013536  020124  047111  045440
2179  013544  050111  051104  041440
2180  013552  052517  042114  047040
2181  013560  052117  041040  020105
2182  013566  042523  000124
2183  013572  042524  052123  042055  EM135:  .ASCIZ  /TEST-DATA COULD NOT BE MADE HIT/
2184  013600  052101  020101  047503
2185  013606  046125  020104  047516
2186  013614  020124  042502  046440
2187  013622  042101  020105  044510
2188  013630  000124
2189  013632  042524  052123  042055   EM136: .ASCII  /TEST-DATA REFERENCE NOT A MISS/
2190  013640  052101  020101  042522
2191  013646  042506  042522  041516
2192  013654  020105  047516  020124
2193  013662  020101  044515  051523
2194  013670  005015  040503  044103          .ASCIZ  <15><12>/CACHED DATA WAS NOT FORCED A MISS ON VIRTUAL PAGE BYPASS/
2195  013676  042105  042040  052101
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 2196  013704  020101  040527  020123
 2197  013712  047516  020124  047506
 2198  013720  041522  042105  040440
 2199  013726  046440  051511  020123
 2200  013734  047117  053040  051111
 2201  013742  052524  046101  050040
 2202  013750  043501  020105  054502
 2203  013756  040520  051523     000
 2204  013763     124  051505  020124   EM137: .ASCII  /TEST DATA REFERENCE NOT A MISS/
 2205  013770  040504  040524  051040
 2206  013776  043105  051105  047105
 2207  014004  042503  047040  052117
 2208  014012  040440  046440  051511
 2209  014020     123
 2210  014021     015  041412  041501          .ASCIZ  <15><12>/CACHED DATA WAS NOT INVALIDATED ON VIRTUAL PAGE BYPASS/
 2211  014026  042510  020104  040504
 2212  014034  040524  053440  051501
 2213  014042  047040  052117  044440
 2214  014050  053116  046101  042111
 2215  014056  052101  042105  047440
 2216  014064  020116  044526  052122
 2217  014072  040525  020114  040520
 2218  014100  042507  041040  050131
 2219  014106  051501  000123
 2220  014112  054502  020120  044502  EM140:  .ASCIZ  ?BYP BIT IN SIPDR COULD NOT BE CLEARED?
 2221  014120  020124  047111  051440
 2222  014126  050111  051104  041440
 2223  014134  052517  042114  047040
 2224  014142  052117  041040  020105
 2225  014150  046103  040505  042522
 2226  014156  000104
 2227  014160  054502  020120  044502  EM141:  .ASCIZ  ?BYP BIT IN SIPDR COULD NOT BE SET?
 2228  014166  020124  047111  051440
 2229  014174  050111  051104  041440
 2230  014202  052517  042114  047040
 2231  014210  052117  041040  020105
 2232  014216  042523  000124
 2233  014222  054502  020120  044502  EM142:  .ASCIZ  ?BYP BIT IN UIPDR COULD NOT BE CLEARED?
 2234  014230  020124  047111  052440
 2235  014236  050111  051104  041440
 2236  014244  052517  042114  047040
 2237  014252  052117  041040  020105
 2238  014260  046103  040505  042522
 2239  014266  000104
 2240  014270  054502  020120  044502  EM143:  .ASCIZ  ?BYP BIT IN UIPDR COULD NOT BE SET?
 2241  014276  020124  047111  052440
 2242  014304  050111  051104  041440
 2243  014312  052517  042114  047040
 2244  014320  052117  041040  020105
 2245  014326  042523  000124
 2246  014332  050104  051101  051040  EM145:  .ASCIZ  /DPAR READ BACK INCORRECTLY/
 2247  014340  040505  020104  040502
 2248  014346  045503  044440  041516
 2249  014354  051117  042522  052103
 2250  014362  054514     000
 2251  014365     012  042015  040520  ECO:    .ASCIZ  <12><15>/DPAR READ BACK PROBLEM CORRECTED BY ECO NO. M8140-00002/<12><15
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2252  014372  020122  042522  042101
2253  014400  041040  041501  020113
2254  014406  051120  041117  042514
2255  014414  020115  047503  051122
2256  014422  041505  042524  020104
2257  014430  054502  042440  047503
2258  014436  047040  027117  046440
2259  014444  030470  030064  030055
2260  014452  030060  031060  006412
2261  014460     000
2262  014461     015  051412  051123  EM146:  .ASCII  <CR><LF>/SSRC KT ABORT FLG DOESN'T GET TO TMCC E34(10) OR/<CR><LF>
2263  014466  020103  052113  040440
2264  014474  047502  052122  043040
2265  014502  043514  042040  042517
2266  014510  047123  052047  043440
2267  014516  052105  052040  020117
2268  014524  046524  041503  042440
2269  014532  032063  030450  024460
2270  014540  047440  006522     012
2271  014545     105  032063  030450          .ASCIZ  /E34(10) BAD OR TMCC AERF(1) DOESN'T GO HIGH ON A KT ABORT/
2272  014552  024460  041040  042101
2273  014560  047440  020122  046524
2274  014566  041503  040440  051105
2275  014574  024106  024461  042040
2276  014602  042517  047123  052047
2277  014610  043440  020117  044510
2278  014616  044107  047440  020116
2279  014624  020101  052113  040440
2280  014632  047502  052122     000
2281  014637     015  050012  053523  EM147:  .ASCIZ<CR><LF>/PSW BIT 8 FAILED TO SET/
2282  014644  041040  052111  034040
2283  014652  043040  044501  042514
2284  014660  020104  047524  051440
2285  014666  052105     000
2286  014671     015  052012  041515  EM150:  .ASCII<CR><LF>/TMCB SEGT DOESN'T GO LOW ON A KT ABORT OR/<CR><LF>
2287  014676  020102  042523  052107
2288  014704  042040  042517  047123
2289  014712  052047  043440  020117
2290  014720  047514  020127  047117
2291  014726  040440  045440  020124
2292  014734  041101  051117  020124
2293  014742  051117  005015
2294  014746  052111  042040  042517          .ASCIZ  /IT DOESN'T GET TO DAPE/
2295  014754  047123  052047  043440
2296  014762  052105  052040  020117
2297  014770  040504  042520     000
2298  014775     015  042012  050101  EM151:  .ASCIZ<CR><LF>/DAPE TV05*07 DOESN'T GO HIGH ON SEGT/
2299  015002  020105  053124  032460
2300  015010  030052  020067  047504
2301  015016  051505  023516  020124
2302  015024  047507  044040  043511
2303  015032  020110  047117  051440
2304  015040  043505  000124
2305  015044  005015  040504  042520  EM152:  .ASCIZ<CR><LF>/DAPE TV03 DOESN'T GO HIGH ON SEGT/
2306  015052  052040  030126  020063
2307  015060  047504  051505  023516
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 2308  015066  020124  047507  044040
 2309  015074  043511  020110  047117
 2310  015102  051440  043505  000124
 2311  015110  005015  046524  040503  EM153:  .ASCII<CR><LF>/TMCA SEG+CON+PAR DOESN'T GO LOW OR IT DOES/<CR><LF>
 2312  015116  051440  043505  041453
 2313  015124  047117  050053  051101
 2314  015132  042040  042517  047123
 2315  015140  052047  043440  020117
 2316  015146  047514  020127  051117
 2317  015154  044440  020124  047504
 2318  015162  051505  005015
 2319  015166  047516  020124  042507          .ASCIZ  /NOT GET THRU TMCB E70(2)/
 2320  015174  020124  044124  052522
 2321  015202  052040  041515  020102
 2322  015210  033505  024060  024462
 2323  015216     000
 2324  015217     015  052012  041515  EM155:  .ASCII<CR><LF>/TMCA SEGTF DOESN'T GET TO E44 OR TMCE PAUSES H/<CR><LF>
 2325  015224  020101  042523  052107
 2326  015232  020106  047504  051505
 2327  015240  023516  020124  042507
 2328  015246  020124  047524  042440
 2329  015254  032064  047440  020122
 2330  015262  046524  042503  050040
 2331  015270  052501  042523  020123
 2332  015276  006510     012
 2333  015301     104  042517  047123          .ASCIZ  /DOESN'T GET TO E44 OR E44 BAD/
 2334  015306  052047  043440  052105
 2335  015314  052040  020117  032105
 2336  015322  020064  051117  042440
 2337  015330  032064  041040  042101
 2338  015336     000
 2339  015337     015  052012  041515  EM156:  .ASCII<CR><LF>/TMCC NEXM DOESN'T GO LOW OR IT DOESN'T GET THRU E34/<CR><LF>
 2340  015344  020103  042516  046530
 2341  015352  042040  042517  047123
 2342  015360  052047  043440  020117
 2343  015366  047514  020127  051117
 2344  015374  044440  020124  047504
 2345  015402  051505  023516  020124
 2346  015410  042507  020124  044124
 2347  015416  052522  042440  032063
 2348  015424  005015
 2349  015426  051117  044440  020124          .ASCIZ  /OR IT DOESN'T GET TO E14 OR E40 BAD/
 2350  015434  047504  051505  023516
 2351  015442  020124  042507  020124
 2352  015450  047524  042440  032061
 2353  015456  047440  020122  032105
 2354  015464  020060  040502  000104
 2355  015472  005015  042516  046530  EM160:  .ASCII<CR><LF>/NEXM BIT DIDN'T SET IN CPU ERROR REG/<CR><LF>
 2356  015500  041040  052111  042040
 2357  015506  042111  023516  020124
 2358  015514  042523  020124  047111
 2359  015522  041440  052520  042440
 2360  015530  051122  051117  051040
 2361  015536  043505  005015
 2362  015542  051117  052040  041515          .ASCIZ  /OR TMCC ABORT DOESN'T GO HIGH/
 2363  015550  020103  041101  051117
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 2364  015556  020124  047504  051505
 2365  015564  023516  020124  047507
 2366  015572  044040  043511  000110
 2367  015600  005015  042516  046530  EM161:  .ASCIZ  <CR><LF>/NEXM BIT DIDN'T CLEAR IN CPU ERROR REG/
 2368  015606  041040  052111  042040
 2369  015614  042111  023516  020124
 2370  015622  046103  040505  020122
 2371  015630  047111  041440  052520
 2372  015636  042440  051122  051117
 2373  015644  051040  043505     000
 2374  015651     015  052012  041515  EM162:  .ASCIZ<CR><LF>/TMCE KT BEND DOESN'T GO LOW ON TMCC NEXM LOW/
 2375  015656  020105  052113  041040
 2376  015664  047105  020104  047504
 2377  015672  051505  023516  020124
 2378  015700  047507  046040  053517
 2379  015706  047440  020116  046524
 2380  015714  041503  047040  054105
 2381  015722  020115  047514  000127
 2382  015730  005015  046524  042503  EM163:  .ASCIZ<CR><LF>/TMCE KT BEND DOESN'T GO LOW ON TMCD SL RED/
 2383  015736  045440  020124  042502
 2384  015744  042116  042040  042517
 2385  015752  047123  052047  043440
 2386  015760  020117  047514  020127
 2387  015766  047117  052040  041515
 2388  015774  020104  046123  051040
 2389  016002  042105     000
 2390  016005     015  052012  041515  EM164:  .ASCIZ<CR><LF>/TMCE KT BEND DOESN'T GO LOW ON TMCC ODD ADRS ERR/
 2391  016012  020105  052113  041040
 2392  016020  047105  020104  047504
 2393  016026  051505  023516  020124
 2394  016034  047507  046040  053517
 2395  016042  047440  020116  046524
 2396  016050  041503  047440  042104
 2397  016056  040440  051104  020123
 2398  016064  051105  000122
 2399  016070  005015  052113  040440  EM165:  .ASCIZ<CR><LF>?KT ABORT FAILED TO OVER-RIDE NEXM TRAP (KB11-E/EM?
 2400  016076  047502  052122  043040
 2401  016104  044501  042514  020104
 2402  016112  047524  047440  042526
 2403  016120  026522  044522  042504
 2404  016126  047040  054105  020115
 2405  016134  051124  050101  024040
 2406  016142  041113  030461  042455
 2407  016150  042457  000115
 2408  016154  005015  046524  042503  EM166:  .ASCIZ<CR><LF>/TMCE CACHE BEND DIDN'T GO HIGH ON KT ABORT/
 2409  016162  041440  041501  042510
 2410  016170  041040  047105  020104
 2411  016176  044504  047104  052047
 2412  016204  043440  020117  044510
 2413  016212  044107  047440  020116
 2414  016220  052113  040440  047502
 2415  016226  052122     000
 2416
 2417  016231     015  043012  046117  EM167:  .ASCII<CR><LF>/FOLLOWING IS A LIST OF THE STACK LIMIT REG/<CR><LF>
 2418  016236  047514  044527  043516
 2419  016244  044440  020123  020101
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2420  016252  044514  052123  047440
2421  016260  020106  044124  020105
2422  016266  052123  041501  020113
2423  016274  044514  044515  020124
2424  016302  042522  006507     012
2425  016307     046  051440  020120          .ASCII/& SP VALUES THAT CAUSED AN ERROR.  THEY ARE/<CR><LF>
2426  016314  040526  052514  051505
2427  016322  052040  040510  020124
2428  016330  040503  051525  042105
2429  016336  040440  020116  051105
2430  016344  047522  027122  020040
2431  016352  044124  054505  040440
2432  016360  042522  005015
2433  016364  051107  052517  042520          .ASCIZ  /GROUPED ACCORDING TO ERROR TYPES/
2434  016372  020104  041501  047503
2435  016400  042122  047111  020107
2436  016406  047524  042440  051122
2437  016414  051117  052040  050131
2438  016422  051505     000
2439
2440  016425     015  051412  051123  EM170:  .ASCII<CR><LF>/SSRA PS RESTORE(1) DOESN'T GET TO RACK E63/<CR><LF>
2441  016432  020101  051520  051040
2442  016440  051505  047524  042522
2443  016446  030450  020051  047504
2444  016454  051505  023516  020124
2445  016462  042507  020124  047524
2446  016470  051040  041501  020113
2447  016476  033105  006463     012
2448  016503     117  020122  033105          .ASCIZ  /OR E63(5) BAD/
2449  016510  024063  024465  041040
2450  016516  042101     000
2451  016521     015  043412  044517  EM171:  .ASCIZ<CR><LF>  /GOING TO NEXT TEST/
2452  016526  043516  052040  020117
2453  016534  042516  052130  052040
2454  016542  051505  000124
2455  016546  044124  020105  047506  EM201:  .ASCIZ  ?THE FOLLOWING ARE PAR/PDR REFERENCE TIMEOUTS?
2456  016554  046114  053517  047111
2457  016562  020107  051101  020105
2458  016570  040520  027522  042120
2459  016576  020122  042522  042506
2460  016604  042522  041516  020105
2461  016612  044524  042515  052517
2462  016620  051524     000
2463  016623     124  042510  043040  EM202:  .ASCIZ  ?THE FOLLOWING ARE DUAL ADDRESSING ERRORS FOR PAR'S/PDR'S?
2464  016630  046117  047514  044527
2465  016636  043516  040440  042522
2466  016644  042040  040525  020114
2467  016652  042101  051104  051505
2468  016660  044523  043516  042440
2469  016666  051122  051117  020123
2470  016674  047506  020122  040520
2471  016702  023522  027523  042120
2472  016710  023522  000123
2473  016714  044124  020105  047506  EM203:  .ASCIZ  ?THE FOLLOWING ARE COUNT PATTERN ERRORS FOR PAR'S/PDR'S?
2474  016722  046114  053517  047111
2475  016730  020107  051101  020105
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 2476  016736  047503  047125  020124
 2477  016744  040520  052124  051105
 2478  016752  020116  051105  047522
 2479  016760  051522  043040  051117
 2480  016766  050040  051101  051447
 2481  016774  050057  051104  051447
 2482  017002     000
 2483
 2484
 2485  017003     105  050130  041505  DH1:    .ASCII  ?EXPECTD ?
 2486  017010  042124     040
 2487  017013     122  041505  044505  DH2:    .ASCIZ  ?RECEIVD TESTNO  PC AT ABORT?
 2488  017020  042126  052040  051505
 2489  017026  047124  020117  050040
 2490  017034  020103  052101  040440
 2491  017042  047502  052122     000
 2492  017047     120  051101  052117  DH3:    .ASCII  ?PARITY  ADDRESS   CONTROL MAINTEN?<CRLF>
 2493  017054  020131  040440  042104
 2494  017062  042522  051523  020040
 2495  017070  041440  047117  051124
 2496  017076  046117  046440  044501
 2497  017104  052116  047105     200
 2498  017111     103  047117  044504          .ASCIZ  ?CONDITN REFERENCD REGISTR REGISTR TESTNO  PC AT ABORT?
 2499  017116  047124  051040  043105
 2500  017124  051105  047105  042103
 2501  017132  051040  043505  051511
 2502  017140  051124  051040  043505
 2503  017146  051511  051124  052040
 2504  017154  051505  047124  020117
 2505  017162  050040  020103  052101
 2506  017170  040440  047502  052122
 2507  017176     000
 2508  017177     105  051122  051117  DH5:    .ASCII  ?ERROR   AUTOI/D VIRTUAL?<CRLF>
 2509  017204  020040  040440  052125
 2510  017212  044517  042057  053040
 2511  017220  051111  052524  046101
 2512  017226     200
 2513  017227     122  043505  051511          .ASCIZ  ?REGISTR REGISTR ADDRESS TESTNO  PC AT ABORT?
 2514  017234  051124  051040  043505
 2515  017242  051511  051124  040440
 2516  017250  042104  042522  051523
 2517  017256  052040  051505  047124
 2518  017264  020117  050040  020103
 2519  017272  052101  040440  047502
 2520  017300  052122     000
 2521  017303     105  050130  041505  DH6:    .ASCII  ?EXPECTD ERROR   AUTOI/D VIRTUAL?<CRLF>
 2522  017310  042124  042440  051122
 2523  017316  051117  020040  040440
 2524  017324  052125  044517  042057
 2525  017332  053040  051111  052524
 2526  017340  046101     200
 2527  017343     103  047117  044504          .ASCIZ  ?CONDITN REGISTR REGISTR ADDRESS TESTNO  PC AT ABORT?
 2528  017350  047124  051040  043505
 2529  017356  051511  051124  051040
 2530  017364  043505  051511  051124
 2531  017372  040440  042104  042522
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2532  017400  051523  052040  051505
2533  017406  047124  020117  050040
2534  017414  020103  052101  040440
2535  017422  047502  052122     000
2536  017427     050  046515  030122  DH7:    .ASCIZ  ?(MMR0)  TESTNO  ERRORPC?
2537  017434  020051  052040  051505
2538  017442  047124  020117  042440
2539  017450  051122  051117  041520
2540  017456     000
2541  017457     114  040517  042504  DH11:   .ASCIZ  ?LOADED  RECEIVD TESTNO  ERRORPC?
2542  017464  020104  051040  041505
2543  017472  044505  042126  052040
2544  017500  051505  047124  020117
2545  017506  042440  051122  051117
2546  017514  041520     000
2547  017517     105  050130  041505  DH13:   .ASCII  ?EXPECTD ?
2548  017524  042124     040
2549  017527     050  046515  030522  DH12:   .ASCIZ  ?(MMR1)  TESTNO  ERRORPC?
2550  017534  020051  052040  051505
2551  017542  047124  020117  042440
2552  017550  051122  051117  041520
2553  017556     000
2554  017557     105  050130  041505  DH14:   .ASCIZ  ?EXPECTD (MMR2)  TESTNO  ERRORPC?
2555  017564  042124  024040  046515
2556  017572  031122  020051  052040
2557  017600  051505  047124  020117
2558  017606  042440  051122  051117
2559  017614  041520     000
2560  017617     114  040517  042504  DH16:   .ASCII  ?LOADED  ?
2561  017624  020104     040
2562  017627     050  046515  031522  DH15:   .ASCIZ  ?(MMR3)  TESTNO  ERRORPC?
2563  017634  020051  052040  051505
2564  017642  047124  020117  042440
2565  017650  051122  051117  041520
2566  017656     000
2567  017657     101  042104  047522  DH17:   .ASCIZ  ?ADDROR  ADDRAND TESTNO  #ERRORS?
2568  017664  020122  040440  042104
2569  017672  040522  042116  052040
2570  017700  051505  047124  020117
2571  017706  021440  051105  047522
2572  017714  051522     000
2573  017717     101  042104  042522  DH20:   .ASCIZ  ?ADDRESS DATA    TESTNO  ERRORPC?
2574  017724  051523  042040  052101
2575  017732  020101  020040  052040
2576  017740  051505  047124  020117
2577  017746  042440  051122  051117
2578  017754  041520     000
2579  017757     101  042104  047522  DH21:   .ASCII  ?ADDROR  ADDRAND ADDROR  ADDRAND?<CRLF>
2580  017764  020122  040440  042104
2581  017772  040522  042116  040440
2582  020000  042104  047522  020122
2583  020006  040440  042104  040522
2584  020014  042116     200
2585  020017     114  040517  042504          .ASCIZ  ?LOADED  LOADED  ENABLED ENABLED TESTNO  #ERRORS?
2586  020024  020104  046040  040517
2587  020032  042504  020104  042440
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 2588  020040  040516  046102  042105
 2589  020046  042440  040516  046102
 2590  020054  042105  052040  051505
 2591  020062  047124  020117  021440
 2592  020070  051105  047522  051522
 2593  020076     000
 2594  020077     101  042104  047522  DH22:   .ASCIZ  ?ADDROR  ADDRAND PATRNOR PATRNAD DATAOR  DATAND TESTNO  #ERRORS?
 2595  020104  020122  040440  042104
 2596  020112  040522  042116  050040
 2597  020120  052101  047122  051117
 2598  020126  050040  052101  047122
 2599  020134  042101  042040  052101
 2600  020142  047501  020122  042040
 2601  020150  052101  047101  020104
 2602  020156  042524  052123  047516
 2603  020164  020040  042443  051122
 2604  020172  051117  000123
 2605  020176  042101  051104  051505  DH23:   .ASCIZ  ?ADDRESS EXPECTD RECEIVD TESTNO  ERRORPC?
 2606  020204  020123  054105  042520
 2607  020212  052103  020104  042522
 2608  020220  042503  053111  020104
 2609  020226  042524  052123  047516
 2610  020234  020040  051105  047522
 2611  020242  050122  000103
 2612  020246  042522  040507  042104  DH24:   .ASCIZ  ?REGADDR TESTNO  ERRORPC?
 2613  020254  020122  042524  052123
 2614  020262  047516  020040  051105
 2615  020270  047522  050122  000103
 2616  020276  042522  040507  042104  DH25:   .ASCIZ  ?REGADDR DATA    TESTNO  ERRORPC?
 2617  020304  020122  040504  040524
 2618  020312  020040  020040  042524
 2619  020320  052123  047516  020040
 2620  020326  051105  047522  050122
 2621  020334  000103
 2622  020336  042522  040507  042104  DH31:   .ASCIZ  ?REGADDR DATAREC DATAEXP TESTNO  ERRORPC?
 2623  020344  020122  040504  040524
 2624  020352  042522  020103  040504
 2625  020360  040524  054105  020120
 2626  020366  042524  052123  047516
 2627  020374  020040  051105  047522
 2628  020402  050122  000103
 2629  020406  051513  020120  020040  DH35:   .ASCIZ  ?KSP     TESTNO  ERRORPC?
 2630  020414  020040  042524  052123
 2631  020422  047516  020040  051105
 2632  020430  047522  050122  000103
 2633  020436  047111  042504  020130  DH36:   .ASCII  ?INDEX   INDEX   PAR/PDR?<CRLF>
 2634  020444  020040  047111  042504
 2635  020452  020130  020040  040520
 2636  020460  027522  042120  100122
 2637  020466  054105  042520  052103          .ASCIZ  ?EXPECTD RECEIVD ADRREAD TESTNO  ERRORPC?
 2638  020474  020104  042522  042503
 2639  020502  053111  020104  042101
 2640  020510  051122  040505  020104
 2641  020516  042524  052123  047516
 2642  020524  020040  051105  047522
 2643  020532  050122  000103
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2644  020536  042101  051104  051505  DH37:   .ASCIZ  ?ADDRESS GDDATA  BADDATA TESTNO  ERRORPC?
2645  020544  020123  042107  040504
2646  020552  040524  020040  040502
2647  020560  042104  052101  020101
2648  020566  042524  052123  047516
2649  020574  020040  051105  047522
2650  020602  050122  000103
2651  020606  052123  051101  040524  DH40:   .ASCIZ  ?STARTADR  FINISHADR TESTNO  ERRORPC?
2652  020614  051104  020040  044506
2653  020622  044516  044123  042101
2654  020630  020122  042524  052123
2655  020636  047516  020040  051105
2656  020644  047522  050122  000103
2657  020652  052123  051101  040524  DH41:   .ASCIZ  ?STARTADR  TESTNO  ERRORPC?
2658  020660  051104  020040  042524
2659  020666  052123  047516  020040
2660  020674  051105  047522  050122
2661  020702  000103
2662  020704  040520  052124  051105  DH42:   .ASCII  ?PATTERN DATA    ADDRESS?<CRLF>
2663  020712  020116  040504  040524
2664  020720  020040  020040  042101
2665  020726  051104  051505  100123
2666  020734  047514  042101  042105          .ASCIZ  ?LOADED  FETCHED INTENDED  TESTNO  ERRORPC?
2667  020742  020040  042506  041524
2668  020750  042510  020104  047111
2669  020756  042524  042116  042105
2670  020764  020040  042524  052123
2671  020772  047516  020040  051105
2672  021000  047522  050122  000103
2673  021006  042524  052123  047516  DH43:   .ASCIZ  ?TESTNO  ERRORPC?
2674  021014  020040  051105  047522
2675  021022  050122  000103
2676  021026  040504  040524  020040  DH44:   .ASCIZ  ?DATA    TESTNO  ERRORPC?
2677  021034  020040  042524  052123
2678  021042  047516  020040  051105
2679  021050  047522  050122  000103
2680  021056  047516  026516  054105  DH45:   .ASCIZ  ?NON-EXADDR TESTNO  ERRORPC?
2681  021064  042101  051104  052040
2682  021072  051505  047124  020117
2683  021100  042440  051122  051117
2684  021106  041520     000
2685  021111     113  050111  051101  DH50:   .ASCIZ  ?KIPAR4    SIZELO    TESTNO  ERRORPC?
2686  021116  020064  020040  051440
2687  021124  055111  046105  020117
2688  021132  020040  052040  051505
2689  021140  047124  020117  042440
2690  021146  051122  051117  041520
2691  021154     000
2692  021155     120  046107  047105  DH51:   .ASCIZ  ?PGLENFD VABLKNO TESTNO  ERRORPC?
2693  021162  042106  053040  041101
2694  021170  045514  047516  052040
2695  021176  051505  047124  020117
2696  021204  042440  051122  051117
2697  021212  041520     000
2698  021215     124  051505  047124  DH53:   .ASCIZ  ?TESTNO  ERRORPC?
2699  021222  020117  042440  051122
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 2700  021230  051117  041520     000
 2701  021235     105  050130  040504  DH55:   .ASCIZ  ?EXPDATA RECDATA TESTNO  ERRORPC?
 2702  021242  040524  051040  041505
 2703  021250  040504  040524  052040
 2704  021256  051505  047124  020117
 2705  021264  042440  051122  051117
 2706  021272  041520     000
 2707  021275     050  046515  030122  DH56:   .ASCIZ  ?(MMR0)  KIPDR4  TESTNO  ERRORPC?
 2708  021302  020051  045440  050111
 2709  021310  051104  020064  052040
 2710  021316  051505  047124  020117
 2711  021324  042440  051122  051117
 2712  021332  041520     000
 2713  021335     122  041505  044505  DH64:   .ASCIZ  ?RECEIVD TESTNO  ERRORPC?
 2714  021342  042126  052040  051505
 2715  021350  047124  020117  042440
 2716  021356  051122  051117  041520
 2717  021364     000
 2718  021365     105  050130  047503  DH65:   .ASCIZ  ?EXPCOND ABRTCND TESTNO  ERRORPC?
 2719  021372  042116  040440  051102
 2720  021400  041524  042116  052040
 2721  021406  051505  047124  020117
 2722  021414  042440  051122  051117
 2723  021422  041520     000
 2724  021425     050  046515  030122  DH66:   .ASCIZ  ?(MMR0)  TESTNO  ERRORPC?
 2725  021432  020051  052040  051505
 2726  021440  047124  020117  042440
 2727  021446  051122  051117  041520
 2728  021454     000
 2729  021455     130  054130  030460  DH70:   .ASCII  ?XXX017  040241  173366  000004?<CRLF>
 2730  021462  020067  030040  030064
 2731  021470  032062  020061  030440
 2732  021476  031467  033063  020066
 2733  021504  030040  030060  030060
 2734  021512  100064
 2735  021514  051120  051517  040524          .ASCII  ?PROSTAT (MMR0)  (MMR1)  (MMR2)  TESTNO  ERRORPC?<CRLF>
 2736  021522  020124  046450  051115
 2737  021530  024460  020040  046450
 2738  021536  051115  024461  020040
 2739  021544  046450  051115  024462
 2740  021552  020040  042524  052123
 2741  021560  047516  020040  051105
 2742  021566  047522  050122  100103
 2743  021574  042522  042503  053111          .ASCIZ  ?RECEIVED:?
 2744  021602  042105  000072
 2745  021606  054105  051520  040524  DH72:   .ASCIZ  ?EXPSTAT (MMR0)  TESTNO  ERRORPC?
 2746  021614  020124  046450  051115
 2747  021622  024460  020040  042524
 2748  021630  052123  047516  020040
 2749  021636  051105  047522  050122
 2750  021644  000103
 2751  021646  051117  043511  047111  DH73:   .ASCII  ?ORIGINAL DATA          NEW DATA?<CRLF>
 2752  021654  046101  042040  052101
 2753  021662  004501  020011  042516
 2754  021670  020127  040504  040524
 2755  021676     200
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2756  021677      050  046515  030122          .ASCIZ  ?(MMR0)  (MMR1)  (MMR2)  (MMR0)  (MMR1)  (MMR2)  TESTNO  ERRORPC?
2757  021704   020051  024040  046515
2758  021712   030522  020051  024040
2759  021720   046515  031122  020051
2760  021726   024040  046515  030122
2761  021734   020051  024040  046515
2762  021742   030522  020051  024040
2763  021750   046515  031122  020051
2764  021756   052040  051505  047124
2765  021764   020117  042440  051122
2766  021772   051117  041520     000
2767  021777      122  041505  044505  DH75:   .ASCIZ  ?RECEIVD (MMR1)  (MMR2)  TESTNO  ERRORPC?
2768  022004   042126  024040  046515
2769  022012   030522  020051  024040
2770  022020   046515  031122  020051
2771  022026   052040  051505  047124
2772  022034   020117  042440  051122
2773  022042   051117  041520     000
2774  022047      126  051111  040524  DH100:  .ASCIZ  ?VIRTADR (MMR2)  TESTNO  ERRORPC?
2775  022054   051104  024040  046515
2776  022062   031122  020051  052040
2777  022070   051505  047124  020117
2778  022076   042440  051122  051117
2779  022104   041520     000
2780  022107      105  050130  041505  DH101:  .ASCIZ  ?EXPECTD (MMR0)  TESTNO  ERRORPC?
2781  022114   042124  024040  046515
2782  022122   030122  020051  052040
2783  022130   051505  047124  020117
2784  022136   042440  051122  051117
2785  022144   041520     000
2786  022147      113  050111  051104  DH102:  .ASCIZ  ?KIPDR4  TESTNO  ERRORPC?
2787  022154   020064  052040  051505
2788  022162   047124  020117  042440
2789  022170   051122  051117  041520
2790  022176      000
2791  022177      113  050111  051104  DH110:  .ASCIZ  ?KIPDR7  TESTNO  ERRORPC?
2792  022204   020067  052040  051505
2793  022212   047124  020117  042440
2794  022220   051122  051117  041520
2795  022226      000
2796  022227      107  050104  043501  DH112:  .ASCIZ  ?GDPAGE  BDPAGE  TESTNO  ERRORPC?
2797  022234   020105  041040  050104
2798  022242   043501  020105  052040
2799  022250   051505  047124  020117
2800  022256   042440  051122  051117
2801  022264   041520     000
2802  022267      124  052123  040520  DH113:  .ASCIZ  ?TSTPAGE CONTENT TESTNO  ERRORPC?
2803  022274   042507  041440  047117
2804  022302   042524  052116  052040
2805  022310   051505  047124  020117
2806  022316   042440  051122  051117
2807  022324   041520     000
2808  022327      105  050130  041505  DH114:  .ASCIZ  ?EXPECTD RECEIVD TESTNO  ERRORPC?
2809  022334   042124  051040  041505
2810  022342   044505  042126  052040
2811  022350   051505  047124  020117
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2812  022356  042440  051122  051117
2813  022364  041520     000
2814  022367     105  050130  041505  DH116:  .ASCIZ  ?EXPECTD RECEIVD TESTNO  ERRORPC?
2815  022374  042124  051040  041505
2816  022402  044505  042126  052040
2817  022410  051505  047124  020117
2818  022416  042440  051122  051117
2819  022424  041520     000
2820  022427     050  046515  030122  DH117:  .ASCIZ  ?(MMR0)  (MMR1)  (MMR2)  TESTNO  ERRORPC?
2821  022434  020051  024040  046515
2822  022442  030522  020051  024040
2823  022450  046515  031122  020051
2824  022456  052040  051505  047124
2825  022464  020117  042440  051122
2826  022472  051117  041520     000
2827  022477     123  045524  052120  DH120:  .ASCIZ  ?STKPTR  TESTNO  ERRORPC?
2828  022504  020122  052040  051505
2829  022512  047124  020117  042440
2830  022520  051122  051117  041520
2831  022526     000
2832  022527     107  042104  052101  DH121:  .ASCIZ  ?GDDATA  STORED  TESTNO  ERRORPC?
2833  022534  020101  051440  047524
2834  022542  042522  020104  052040
2835  022550  051505  047124  020117
2836  022556  042440  051122  051117
2837  022564  041520     000
2838  022567     050  051520  024527  DH122:  .ASCIZ  ?(PSW)   TESTNO  ERRORPC EXPECTING XXX340?
2839  022574  020040  052040  051505
2840  022602  047124  020117  042440
2841  022610  051122  051117  041520
2842  022616  042440  050130  041505
2843  022624  044524  043516  054040
2844  022632  054130  032063  000060
2845  022640  050050  053523  020051  DH123:  .ASCIZ  ?(PSW)   TESTNO  ERRORPC?
2846  022646  020040  042524  052123
2847  022654  047516  020040  051105
2848  022662  047522  050122  000103
2849  022670  042524  052123  047516  DH127:  .ASCIZ  ?TESTNO ERRORPC?
2850  022676  042440  051122  051117
2851  022704  041520     000
2852  022707     050  046515  030122  DH131:  .ASCIZ  ?(MMR0)  (MMR1)  (MMR2)  TESTNO  ERRORPC EXPECTING 020031?
2853  022714  020051  024040  046515
2854  022722  030522  020051  024040
2855  022730  046515  031122  020051
2856  022736  052040  051505  047124
2857  022744  020117  042440  051122
2858  022752  051117  041520  042440
2859  022760  050130  041505  044524
2860  022766  043516  030040  030062
2861  022774  031460  000061
2862  023000  020040  041520  020040  DH133:  .ASCIZ  ?  PC    KIPDR  (KIPDR)?
2863  023006  020040  044513  042120
2864  023014  020122  024040  044513
2865  023022  042120  024522     000
2866  023027     040  050040  020103  DH135:  .ASCIZ  /  PC    CCR  PAR-ADR   (PAR)  (PDR)  TST-DATA-ADRS(VA)/
2867  023034  020040  041440  051103
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 2868  023042  020040  040520  026522
 2869  023050  042101  020122  020040
 2870  023056  050050  051101  020051
 2871  023064  024040  042120  024522
 2872  023072  020040  051524  026524
 2873  023100  040504  040524  040455
 2874  023106  051104  024123  040526
 2875  023114  000051
 2876  023116  020040  041520  020040  DH140:  .ASCIZ  ? PC    SIPDR  (SIPDR)?
 2877  023124  020040  044523  042120
 2878  023132  020122  024040  044523
 2879  023140  042120  024522     000
 2880  023145     040  050040  020103  DH142:  .ASCIZ  ? PC    UIPDR  (UIPDR)?
 2881  023152  020040  052440  050111
 2882  023160  051104  020040  052450
 2883  023166  050111  051104  000051
 2884  023174  042101  051104  051505  DH145:  .ASCIZ  /ADDRESS EXPECT RECEIVE TESTNO  ERRORPC/
 2885  023202  020123  054105  042520
 2886  023210  052103  051040  041505
 2887  023216  044505  042526  052040
 2888  023224  051505  047124  020117
 2889  023232  042440  051122  051117
 2890  023240  041520     000
 2891  023243     105  051122  051117  DH146:  .ASCIZ  /ERRORPC TEST NUMBER/
 2892  023250  041520  052040  051505
 2893  023256  020124  052516  041115
 2894  023264  051105     000
 2895  023267     105  051122  051117  DH147:  .ASCII  /ERRORPC        CPUERR REG      TST NUM/<CR><LF>
 2896  023274  041520  041411  052520
 2897  023302  051105  020122  042522
 2898  023310  004507  051524  020124
 2899  023316  052516  006515     012
 2900  023323     011  054105  042520          .ASCIZ  /       EXPECT  ACTUAL/
 2901  023330  052103  040411  052103
 2902  023336  040525  000114
 2903  023342  051105  047522  050122  DH150:  .ASCIZ  /ERRORPC TEST NUMBER/<CR><LF>
 2904  023350  020103  042524  052123
 2905  023356  047040  046525  042502
 2906  023364  006522  000012
 2907  023370  042101  051104  051505  DH201:  .ASCIZ  ?ADDRESS TESTNO?
 2908  023376  020123  042524  052123
 2909  023404  047516     000
 2910  023407     101  042104  042522  DH202:  .ASCII  ?ADDRESS ADDRESS?<CRLF>
 2911  023414  051523  040440  042104
 2912  023422  042522  051523     200
 2913  023427     114  040517  042504          .ASCIZ  ?LOADED  JUSTREAD TESTNO?
 2914  023434  020104  045040  051525
 2915  023442  051124  040505  020104
 2916  023450  042524  052123  047516
 2917  023456     000
 2918  023457     101  042104  042522  DH203:  .ASCIZ  ?ADDRESS DATARED PATTERN COUNT   TESTNO?
 2919  023464  051523  042040  052101
 2920  023472  051101  042105  050040
 2921  023500  052101  042524  047122
 2922  023506  041440  052517  052116
 2923  023514  020040  052040  051505
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2924  023522  047124  000117
2925  023526  020040     000          TWOSP:  .ASCIZ  /  /
2926          023532                          .EVEN
2927
2928
2929  023532  001224                   DT1:    .WORD   CPUEXP
2930  023534  001260  001264  001262   DT2:    .WORD   PCPUER,TESTNO,BADPC,0
2931  023542  000000
2932  023544  001240  001234  001242   DT3:    .WORD   PPARER,PLOADR,PCONTR,PMAINT,TESTNO,BADPC,0
2933  023552  001244  001264  001262
2934  023560  000000
2935  023562  001250  001252  001254   DT5:    .WORD   PMMR0,PMMR1,PMMR2,TESTNO,BADPC,0
2936  023570  001264  001262  000000
2937  023576  001226  001250  001252   DT6:    .WORD   MMEXP,PMMR0,PMMR1,PMMR2,TESTNO,BADPC,0
2938  023604  001254  001264  001262
2939  023612  000000
2940  023614  001160  001264  001120   DT7:    .WORD   $REG1,TESTNO,$ERRPC,0
2941  023622  000000
2942  023624  001162  001160  001264   DT11:   .WORD   $REG2,$REG1,TESTNO,$ERRPC,0
2943  023632  001120  000000
2944  023636  001162  001264  001120   DT12:   .WORD   $REG2,TESTNO,$ERRPC,0
2945  023644  000000
2946  023646  001164  001162  001264   DT13:   .WORD   $REG3,$REG2,TESTNO,$ERRPC,0
2947  023654  001120  000000
2948  023660  001160                   DT16:   .WORD   $REG1
2949  023662  001162  001264  001120   DT15:   .WORD   $REG2,TESTNO,$ERRPC,0
2950  023670  000000
2951  023672  001276  001300  001264   DT17:   .WORD   ADDROR,ADRAND,TESTNO,ERRCNT,0
2952  023700  001302  000000
2953  023704  001156  001162  001264   DT20:   .WORD   $REG0,$REG2,TESTNO,$ERRPC,0
2954  023712  001120  000000
2955  023716  001276  001300  001266   DT21:   .WORD   ADDROR,ADRAND,DATAOR,DATAND,TESTNO,ERRCNT,0
2956  023724  001270  001264  001302
2957  023732  000000
2958  023734  001276  001300  001272   DT22:   .WORD   ADDROR,ADRAND,PATTOR,PATAND,DATAOR,DATAND,TESTNO,ERRCNT,0
2959  023742  001274  001266  001270
2960  023750  001264  001302  000000
2961  023756  001156  001162  001160   DT23:   .WORD   $REG0,$REG2,$REG1,TESTNO,$ERRPC,0
2962  023764  001264  001120  000000
2963  023772  001156  001264  001120   DT24:   .WORD   $REG0,TESTNO,$ERRPC,0
2964  024000  000000
2965  024002  001156  001160  001264   DT25:   .WORD   $REG0,$REG1,TESTNO,$ERRPC,0
2966  024010  001120  000000
2967  024014  001156  001160  001162   DT31:   .WORD   $REG0,$REG1,$REG2,TESTNO,$ERRPC,0
2968  024022  001264  001120  000000
2969  024030  001156  001264  001120   DT35:   .WORD   $REG0,TESTNO,$ERRPC,0
2970  024036  000000
2971  024040  001156  001160  001162   DT36:   .WORD   $REG0,$REG1,$REG2,TESTNO,$ERRPC,0
2972  024046  001264  001120  000000
2973  024054  001156  001160  001162   DT37:   .WORD   $REG0,$REG1,$REG2,TESTNO,$ERRPC,0
2974  024062  001264  001120  000000
2975  024070  001174  001176  001264   DT40:   .WORD   $TMP1,$TMP2,TESTNO,$ERRPC,0
2976  024076  001120  000000
2977  024102  001174  001264  001120   DT41:   .WORD   $TMP1,TESTNO,$ERRPC,0
2978  024110  000000
2979  024112  001162  001164  001156   DT42:   .WORD   $REG2,$REG3,$REG0,TESTNO,$ERRPC,0
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2980  024120  001264  001120  000000
2981  024126  001264  001120  000000  DT43:   .WORD   TESTNO,$ERRPC,0
2982  024134  001160  001264  001120  DT44:   .WORD   $REG1,TESTNO,$ERRPC,0
2983  024142  000000
2984  024144  001156  001264  001120  DT45:   .WORD   $REG0,TESTNO,$ERRPC,0
2985  024152  000000
2986  024154  172350  177760  001264  DT50:   .WORD   KIPAR4,SIZELO,TESTNO,$ERRPC,0
2987  024162  001120  000000
2988  024166  001160  001164  001264  DT51:   .WORD   $REG1,$REG3,TESTNO,$ERRPC,0
2989  024174  001120  000000
2990  024200  001264  001120  000000  DT53:   .WORD   TESTNO,$ERRPC,0
2991  024206  001156  001160  001264  DT55:   .WORD   $REG0,$REG1,TESTNO,$ERRPC,0
2992  024214  001120  000000
2993  024220  177572  172310  001264  DT56:   .WORD   MMR0,KIPDR4,TESTNO,$ERRPC,0
2994  024226  001120  000000
2995  024232  001172  001264  001120  DT64:   .WORD   $TMP0,TESTNO,$ERRPC,0
2996  024240  000000
2997  024242  001226  001250  001264  DT65:   .WORD   MMEXP,PMMR0,TESTNO,$ERRPC,0
2998  024250  001120  000000
2999  024254  001250  001264  001120  DT66:   .WORD   PMMR0,TESTNO,$ERRPC,0
3000  024262  000000
3001  024264  001160  001250  001252  DT70:   .WORD   $REG1,PMMR0,PMMR1,PMMR2,TESTNO,$ERRPC,0
3002  024272  001254  001264  001120
3003  024300  000000
3004  024302  001160  001250  001264  DT72:   .WORD   $REG1,PMMR0,TESTNO,$ERRPC,0
3005  024310  001120  000000
3006  024314  001250  001252  001254  DT73:   .WORD   PMMR0,PMMR1,PMMR2,$TMP0,$TMP1,$TMP2,TESTNO,$ERRPC,0
3007  024322  001172  001174  001176
3008  024330  001264  001120  000000
3009  024336  001250  001252  001254  DT75:   .WORD   PMMR0,PMMR1,PMMR2,TESTNO,$ERRPC,0
3010  024344  001264  001120  000000
3011  024352  001160  001254  001264  DT100:  .WORD   $REG1,PMMR2,TESTNO,$ERRPC,0
3012  024360  001120  000000
3013  024364  001162  001250  001264  DT101:  .WORD   $REG2,PMMR0,TESTNO,$ERRPC,0
3014  024372  001120  000000
3015  024376  001172  001264  001120  DT102:  .WORD   $TMP0,TESTNO,$ERRPC,0
3016  024404  000000
3017  024406  001164  001160  001264  DT112:  .WORD   $REG3,$REG1,TESTNO,$ERRPC,0
3018  024414  001120  000000
3019  024420  001164  001156  001264  DT113:  .WORD   $REG3,$REG0,TESTNO,$ERRPC,0
3020  024426  001120  000000
3021  024432  001162  001160  001264  DT114:  .WORD   $REG2,$REG1,TESTNO,$ERRORPC,0
3022  024440  025760  000000
3023  024444  001156  001160  001264  DT116:  .WORD   $REG0,$REG1,TESTNO,$ERRPC,0
3024  024452  001120  000000
3025  024456  001250  001252  001254  DT117:  .WORD   PMMR0,PMMR1,PMMR2,TESTNO,$ERRPC,0
3026  024464  001264  001120  000000
3027  024472  001160  001264  001120  DT120:  .WORD   $REG1,TESTNO,$ERRPC,0
3028  024500  000000
3029  024502  001156  001264  001120  DT122:  .WORD   $REG0,TESTNO,$ERRPC,0
3030  024510  000000
3031  024512  001264  001120  000000  DT127:  .WORD   TESTNO,$ERRPC,0
3032  024520  001250  001252  001254  DT131:  .WORD   PMMR0,PMMR1,PMMR2,TESTNO,$ERRPC,0
3033  024526  001264  001120  000000
3034  024534  001120  001156  001160  DT133:  .WORD   $ERRPC,$REG0,$REG1,0
3035  024542  000000
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 3036  024544  001120  001156  001160  DT135:  .WORD   $ERRPC,$REG0,$REG1,$REG2,$REG3,$REG4,0
 3037  024552  001162  001164  001166
 3038  024560  000000
 3039  024562  001172  001174  001176  DT145:  .WORD   $TMP0,$TMP1,$TMP2,TESTNO,$ERRPC,0
 3040  024570  001264  001120  000000
 3041  024576  001120  001264  000000  DT146:  .WORD   $ERRPC,TESTNO,0
 3042  024604  001120  001172  001174  DT147:  .WORD   $ERRPC,$TMP0,$TMP1,TESTNO,0
 3043  024612  001264  000000
 3044  024616  001156  001264  000000  DT201:  .WORD   $REG0,TESTNO,0
 3045  024624  001156  001160  001264  DT202:  .WORD   $REG0,$REG1,TESTNO,0
 3046  024632  000000
 3047  024634  001156  001162  001166  DT203:  .WORD   $REG0,$REG2,$REG4,$REG1,TESTNO,0
 3048  024642  001160  001264  000000
 3049
 3050
 3051  024650      000                   DF1:    .BYTE   0
 3052  024651      000      000      000 DF2:    .BYTE   0,0,0
 3053  024654      000      002      000 DF3:    .BYTE   0,2,0,0,0,0
 3054  024657      000      000      000
 3055  024662      000      000      000 DF5:    .BYTE   0,0,0,0,0
 3056  024665      000      000
 3057  024667      000      000      000 DF6:    .BYTE   0,0,0,0,0,0
 3058  024672      000      000      000
 3059  024675      000      000      000 DF7:    .BYTE   0,0,0
 3060  024700      000      000      000 DF11:   .BYTE   0,0,0,0
 3061  024703      000
 3062  024704      000      000      000 DF12:   .BYTE   0,0,0
 3063  024707      000      000      000 DF13:   .BYTE   0,0,0,0
 3064  024712      000
 3065  024713      000      000      000 DF16:   .BYTE   0,0,0
 3066  024716      000      000      000 DF15:   .BYTE   0,0,0,0
 3067  024721      000
 3068  024722      000      000      000 DF17:   .BYTE   0,0,0,1
 3069  024725      001
 3070  024726      000      000      000 DF20:   .BYTE   0,0,0,0
 3071  024731      000
 3072  024732      000      000      000 DF21:   .BYTE   0,0,0,0,0,1
 3073  024735      000      000      001
 3074  024740      000      000      000 DF22:   .BYTE   0,0,0,0,0,0,0,1
 3075  024743      000      000      000
 3076  024746      000      001
 3077  024750      000      000      000 DF23:   .BYTE   0,0,0,0,0
 3078  024753      000      000
 3079  024755      000      000      000 DF24:   .BYTE   0,0,0
 3080  024760      000      000      000 DF25:   .BYTE   0,0,0,0
 3081  024763      000
 3082  024764      000      000      000 DF31:   .BYTE   0,0,0,0,0
 3083  024767      000      000
 3084  024771      000      000      000 DF35:   .BYTE   0,0,0
 3085  024774      000      000      000 DF36:   .BYTE   0,0,0,0,0
 3086  024777      000      000
 3087  025001      003      000      000 DF37:   .BYTE   3,0,0,0,0
 3088  025004      000      000
 3089  025006      004      004      000 DF40:   .BYTE   4,4,0,0
 3090  025011      000
 3091  025012      004      000      000 DF41:   .BYTE   4,0,0
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 3092  025015  000  000  003  DF42:  .BYTE  0,0,3,0,0
 3093  025020  000  000
 3094  025022  000  000       DF43:  .BYTE  0,0
 3095  025024  000  000  000  DF44:  .BYTE  0,0,0
 3096  025027  003  000  000  DF45:  .BYTE  3,0,0
 3097  025032  004  004  000  DF50:  .BYTE  4,4,0,0
 3098  025035  000
 3099  025036  000  000  000  DF51:  .BYTE  0,0,0,0
 3100  025041  000
 3101  025042  000  000       DF53:  .BYTE  0,0
 3102  025044  000  000  000  DF55:  .BYTE  0,0,0,0
 3103  025047  000
 3104  025050  000  000  000  DF56:  .BYTE  0,0,0,0
 3105  025053  000
 3106  025054  000  000  000  DF64:  .BYTE  0,0,0
 3107  025057  000  000  000  DF65:  .BYTE  0,0,0,0
 3108  025062  000
 3109  025063  000  000  000  DF66:  .BYTE  0,0,0
 3110  025066  000  000  000  DF70:  .BYTE  0,0,0,0,0,0
 3111  025071  000  000  000
 3112  025074  000  000  000  DF72:  .BYTE  0,0,0,0
 3113  025077  000
 3114  025100  000  000  000  DF73:  .BYTE  0,0,0,0,0,0,0,0
 3115  025103  000  000  000
 3116  025106  000  000
 3117  025110  000  000  000  DF75:  .BYTE  0,0,0,0,0
 3118  025113  000  000
 3119  025115  000  000  000  DF100: .BYTE  0,0,0,0
 3120  025120  000
 3121  025121  000  000  000  DF101: .BYTE  0,0,0,0
 3122  025124  000
 3123  025125  000  000  000  DF102: .BYTE  0,0,0
 3124  025130  000  000  000  DF112: .BYTE  0,0,0,0
 3125  025133  000
 3126  025134  000  000  000  DF113: .BYTE  0,0,0,0
 3127  025137  000
 3128  025140  000  000  000  DF114: .BYTE  0,0,0,0
 3129  025143  000
 3130  025144  000  000  000  DF116: .BYTE  0,0,0,0
 3131  025147  000
 3132  025150  000  000  000  DF117: .BYTE  0,0,0,0,0
 3133  025153  000  000
 3134  025155  000  000  000  DF120: .BYTE  0,0,0
 3135  025160  000  000  000  DF122: .BYTE  0,0,0
 3136  025163  000  000       DF127: .BYTE  0,0
 3137  025165  000  000  000  DF131: .BYTE  0,0,0,0,0
 3138  025170  000  000
 3139
 3140
 3141
 3142  025172  000  000       DF201: .BYTE  0,0
 3143  025174  000  000  000  DF202: .BYTE  0,0,0
 3144  025177  000  000  000  DF203: .BYTE  0,0,0,0,0
 3145  025202  000  000
 3146                         .EVEN
 3147
```

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

                                .SBTTL  END OF PASS ROUTINE

                                ;*INCREMENT THE PASS NUMBER ($PASS)
                                ;*INDICATE END-OF-PROGRAM AFTER 1 PASSES THRU THE PROGRAM
                                ;*TYPE 'END PASS #XXXXX TOTAL NUMBER OF ERRORS SINCE LAST REPORT YYYYY''
                                ;*WHERE XXXXX AND YYYYY ARE DECIMAL NUMBERS
                                ;*IF SW12=1 INHIBIT TRACE TRAP
                                ;*IF THERES A MONITOR GO TO IT
                                ;*IF THERE ISN'T JUMP TO LOOP

025204                          $EOP:
025204  000240                          NOP
025206  005037  001102                  CLR     $TSTNM          ;;ZERO THE TEST NUMBER
025212  005037  001206                  CLR     $TIMES          ;;ZERO THE NUMBER OF ITERATIONS
025216  005237  001100                  INC     $PASS           ;;INCREMENT THE PASS NUMBER
025222  042737  100000  001100        BIC     #100000,$PASS   ;;DON'T ALLOW A NEG. NUMBER
025230  005327                  DEC     (PC)+           ;;LOOP?
025232  000001                  $EOPCT: .WORD   1
025234  003072                  BGT     $DOAGN          ;;YES
025236  012737                  MOV     (PC)+,@(PC)+    ;;RESTORE COUNTER
025240  000001                  $ENDCT: .WORD   1
025242  025232                          $EOPCT
025244  104400  025252                  TYPE    ,65$            ;;TYPE ASCIZ STRING
025250  000407                  BR      64$             ;;GET OVER THE ASCIZ
                                ;;65$:  .ASCIZ  <12><15>/END PASS #/
025270                          64$:
025270  013746  001100                  MOV     $PASS,-(SP)     ;;SAVE $PASS FOR TYPEOUT
                                                        ;;TYPE PASS NUMBER
025274  104410                  TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
025276  104400  025304                  TYPE    ,67$            ;;TYPE ASCIZ STRING
025302  000421                  BR      66$             ;;GET OVER THE ASCIZ
                                ;;67$:  .ASCIZ  /  TOTAL ERRORS SINCE LAST REPORT /
025346                          66$:
025346  013746  001114                  MOV     $ERTTL,-(SP)    ;;SAVE $ERTTL FOR TYPEOUT
                                                        ;;TOTAL NUMBER OF ERRORS
025352  104410                  TYPDS                   ;;GO TYPE--DECIMAL ASCII WITH SIGN
025354  104400  001217                  TYPE    ,$CRLF          ;;TYPE CARRIAGE RETURN, LINE FEED
025360  005037  001114                  CLR     $ERTTL          ;;CLEAR ERROR TOTAL
025364  013700  000042          $GET42: MOV     @#42,R0         ;;GET MONITOR ADDRESS
025370  001414                  BEQ     $DOAGN          ;;BRANCH IF NO MONITOR
025372  005046                  CLR     -(SP)           ;;INSURE THE 'T' BIT IS CLEAR
025374  012746  025402                  MOV     #$CLR.T,-(SP)   ;;SETUP FOR AN RTI OR RTT
025400  000427                  BR      $RTRN           ;;GO DO AN RTI OR RTT TO LOAD THE PSW
                                                        ;;WITH A CLEARED 'T' BIT
025402                          $CLR.T:
025402  013700  000042                  MOV     @#42,R0         ;;INSURE R0 CONTAINS THE MONITORS
025406  001405                  BEQ     $DOAGN          ;;RETURN ADDRESS
025410  000005                  RESET                   ;;CLEAR THE WORLD
025412  004710                  $ENDAD: JSR     PC,(R0)         ;;GO TO MONITOR
025414  000240                  NOP                     ;;SAVE ROOM
025416  000240                  NOP                     ;;FOR
025420  000240                  NOP                     ;;ACT11
025422                          $DOAGN:
```

```
3204  025422  013746  177776            MOV     @#PS,-(SP)      ;;PUT THE PS ON THE STACK AND
3205  025426  042716  000020            BIC     #20,(SP)        ;;CLEAR THE 'T' BIT
3206  025432  032737  010000  177570      BIT     #BIT12,@#SWR    ;;RUN WITH TRACE TRAP?
3207  025440  001005                     BNE     1$              ;;BR IF NO
3208  025442  005137  025466            COM     $TBIT           ;;IS IT TIME FOR TRACE TRAP
3209  025446  100402                     BMI     1$              ;;BR IF NO
3210  025450  052716  000020            BIS     #20,(SP)        ;;SET TRACE TRAP
3211  025454  012746  025462  1$:       MOV     #$LOOP,-(SP)    ;;JUMP TO START OF TEST
3212  025460  000002        $RTRN:      RTI                     ;;RETURN--THIS IS CHANGED TO
3213                                                            ;;AN 'RTT' IF 'RTT' IS A LEGAL
3214                                                            ;;INSTRUCTION
3215  025462                $LOOP:
3216  025462  000137  040272            JMP     @#LOOP          ;;RETURN
3217  025466  000000        $TBIT:      .WORD   0               ;;'T' BIT STATE INDICATOR
3218  025470     377     377     000    $ENULL: .BYTE   -1,-1,0         ;;NULL CHARACTER STRING
3219        025474                      .EVEN
3220                        ;;**************************************************************
3221
3222                        .SBTTL  SCOPE HANDLER ROUTINE
3223
3224                        ;*THIS ROUTINE CONTROLS THE LOOPING OF SUBTESTS. IT WILL INCREMENT
3225                        ;*AND LOAD THE TEST NUMBER($TSTNM) INTO THE DISPLAY REG.(DISPLAY<7:0>)
3226                        ;*AND LOAD THE ERROR FLAG ($ERFLG) INTO DISPLAY<15:08>
3227                        ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
3228                        ;*SW14=1        LOOP ON TEST
3229                        ;*SW11=1        INHIBIT ITERATIONS
3230                        ;*SW09=1        LOOP ON ERROR
3231                        ;*SW08=1        LOOP ON TEST IN SWR<6:0>
3232                        ;*CALL
3233                        ;*      SCOPE           ;;SCOPE=IOT
3234
3235  025474                $SCOPE:
3236  025474  005037  001314            CLR     RETRY           ;CLEAR THE RETRY FLAG BEFORE THIS TEST
3237  025500  005037  001302            CLR     ERRCNT          ;CLEAR THE MULTIPLE ERROR COUNTER
3238  025504  006137  177570            ROL     @#SWR           ;;LOOP ON PRESENT TEST?
3239  025510  100514                     BMI     $OVER           ;;YES IF SW14=1
3240                        ;#####START OF CODE FOR THE XOR TESTER#####
3241  025512  000416        $XTSTR: BR      6$                  ;;IF RUNNING ON THE 'XOR' TESTER CHANGE
3242                                                            ;;THIS INSTRUCTION TO A 'NOP' (NOP=240)
3243  025514  013746  000004            MOV     @#ERRVEC,-(SP)  ;;SAVE THE CONTENTS OF THE ERROR VECTOR
3244  025520  012737  025540  000004      MOV     #5$,@#ERRVEC    ;;SET FOR TIMEOUT
3245  025526  005737  177060            TST     @#177060        ;;TIME OUT ON XOR?
3246  025532  012637  000004            MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
3247  025536  000466                     BR      $SVLAD          ;;GO TO THE NEXT TEST
3248  025540  022626        5$:         CMP     (SP)+,(SP)+     ;;CLEAR THE STACK AFTER A TIME OUT
3249  025542  012637  000004            MOV     (SP)+,@#ERRVEC  ;;RESTORE THE ERROR VECTOR
3250  025546  000426                     BR      7$              ;;LOOP ON THE PRESENT TEST
3251  025550                6$:;#####END OF CODE FOR THE XOR TESTER#####
3252  025550  032737  000400  177570      BIT     #BIT08,@#SWR    ;;LOOP ON SPEC. TEST?
3253  025556  001407                     BEQ     2$              ;;BR IF NO
3254  025560  013746  177570            MOV     @#SWR,-(SP)     ;;SET DESIRED TEST NUM. FROM SWR
3255  025564  042716  000200            BIC     #$SWRMK,(SP)    ;;STRIP AWAY UNDESIRED BITS
3256  025570  122637  001102            CMPB    (SP)+,$TSTNM    ;;ON THE RIGHT TEST?
3257  025574  001462                     BEQ     $OVER           ;;BR IF YES
3258  025576  105737  001103  2$:       TSTB    $ERFLG          ;;HAS AN ERROR OCCURRED?
3259  025602  001421                     BEQ     3$              ;;BR IF NO
```

```
3260  025604  123737  001117  001103          CMPB    $ERMAX,$ERFLG   ;;MAX. ERRORS FOR THIS TEST OCCURRED?
3261  025612  101015                          BHI     3$              ;;BR IF NO
3262  025614  032737  001000  177570          BIT     #BIT09,@#SWR    ;;LOOP ON ERROR?
3263  025622  001404                          BEQ     4$              ;;BR IF NO
3264  025624  013737  001112  001110  7$:     MOV     $LPERR,$LPADR   ;;SET LOOP ADDRESS TO LAST SCOPE
3265  025632  000443                          BR      $OVER
3266  025634  105037  001103          4$:     CLRB    $ERFLG          ;;ZERO THE ERROR FLAG
3267  025640  005037  001206                  CLR     $TIMES          ;;CLEAR THE NUMBER OF ITERATIONS TO MAKE
3268  025644  000415                          BR      1$              ;;ESCAPE TO THE NEXT TEST
3269  025646  032737  004000  177570  3$:     BIT     #BIT11,@#SWR    ;;INHIBIT ITERATIONS?
3270  025654  001011                          BNE     1$              ;;BR IF YES
3271  025656  005737  001100                  TST     $PASS           ;;IF FIRST PASS OF PROGRAM
3272  025662  001406                          BEQ     1$              ;;      INHIBIT ITERATIONS
3273  025664  005237  001106                  INC     $ICNT           ;;INCREMENT ITERATION COUNT
3274  025670  023737  001206  001106          CMP     $TIMES,$ICNT    ;;CHECK THE NUMBER OF ITERATIONS MADE
3275  025676  002021                          BGE     $OVER           ;;BR IF MORE ITERATION REQUIRED
3276  025700  012737  000001  001106  1$:     MOV     #1,$ICNT        ;;REINITIALIZE THE ITERATION COUNTER
3277  025706  013737  025756  001206          MOV     $MXCNT,$TIMES   ;;SET NUMBER OF ITERATIONS TO DO
3278  025714  105237  001102          $SVLAD: INCB    $TSTNM          ;;COUNT TEST NUMBERS
3279  025720  011637  001110                  MOV     (SP),$LPADR     ;;SAVE SCOPE LOOP ADDRESS
3280  025724  011637  001112                  MOV     (SP),$LPERR     ;;SAVE ERROR LOOP ADDRESS
3281  025730  005037  001210                  CLR     $ESCAPE         ;;CLEAR THE ESCAPE FROM ERROR ADDRESS
3282  025734  112737  000001  001117          MOVB    #1,$ERMAX       ;;ONLY ALLOW ONE(1) ERROR ON NEXT TEST
3283  025742  013737  001102  177570  $OVER:  MOV     $TSTNM,@#DISPLAY ;;DISPLAY TEST NUMBER
3284  025750  013716  001110                  MOV     $LPADR,(SP)     ;;FUDGE RETURN ADDRESS
3285  025754  000002                          RTI                     ;;FIXES PS
3286  025756  000310                  $MXCNT: 200.                    ;;MAX. NUMBER OF ITERATIONS
3287                                  ;;**************************************************************
3288
3289                                  .SBTTL  ERROR HANDLER ROUTINE
3290
3291                                  ;*THIS ROUTINE WILL INCREMENT THE ERROR FLAG AND THE ERROR COUNT,
3292                                  ;*SAVE THE ERROR ITEM NUMBER AND THE ADDRESS OF THE ERROR CALL
3293                                  ;*AND GO TO ERTYPE ON ERROR
3294                                  ;*THE SWITCH OPTIONS PROVIDED BY THIS ROUTINE ARE:
3295                                  ;*SW15=1         HALT ON ERROR
3296                                  ;*               HALT CAN OCCUR BEFORE AND AFTER THE ERROR TYPEOUT
3297                                  ;*SW13=1         INHIBIT ERROR TYPEOUTS
3298                                  ;*SW10=1         BELL ON ERROR
3299                                  ;*SW09=1         LOOP ON ERROR
3300                                  ;*CALL
3301                                  ;*      ERROR   N       ;;ERROR=EMT AND N=ERROR ITEM NUMBER
3302
3303  025760                          $ERROR:
3304  025760  113737  001102  001264          MOVB    $TSTNM,TESTNO   ;SAVE TEST NUMBER FOR ERROR TYPE OUT
3305  025766  005237  001302                  INC     ERRCNT          ;KEEP COUNT OF MULTIPLE ERRORS
3306  025772  010037  001156                  MOV     R0,$REG0        ;SAVE R0
3307  025776  010137  001160                  MOV     R1,$REG1        ;SAVE R1
3308  026002  010237  001162                  MOV     R2,$REG2        ;SAVE R2
3309  026006  010337  001164                  MOV     R3,$REG3        ;SAVE R3
3310  026012  010437  001166                  MOV     R4,$REG4        ;SAVE R4
3311  026016  010537  001170                  MOV     R5,$REG5        ;SAVE R5
3312  026022  105237  001103          7$:     INCB    $ERFLG          ;;SET THE ERROR FLAG
3313  026026  001775                          BEQ     7$              ;;DON'T LET THE FLAG GO TO ZERO
3314  026030  013737  001102  177570          MOV     $TSTNM,@#DISPLAY ;;DISPLAY TEST NUMBER AND ERROR FLAG
3315  026036  005737  177570                  TST     @#SWR           ;;HALT ON ERROR = 1?
```

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3316  026042  100001                      BPL     8$              ;;BRANCH IF NO
3317  026044  000000                      HALT                    ;;YES--HALT
3318  026046  032737  002000  177570  8$: BIT     #BIT10,@#SWR    ;;BELL ON ERROR?
3319  026054  001402                      BEQ     1$              ;;NO - SKIP
3320  026056  104400  001212              TYPE    ,$BELL          ;;RING BELL
3321  026062  005237  001114          1$: INC     $ERTTL          ;;COUNT THE NUMBER OF ERRORS
3322  026066  011637  001120              MOV     (SP),$ERRPC     ;;GET ADDRESS OF ERROR INSTRUCTION
3323  026072  162737  000002  001120      SUB     #2,$ERRPC
3324  026100  117737  153014  001116      MOVB    @$ERRPC,$ITEMB  ;;STRIP AND SAVE THE ERROR ITEM CODE
3325  026106  032737  020000  177570      BIT     #BIT13,@#SWR    ;;SKIP TYPEOUT IF SET
3326  026114  001004                      BNE     2$              ;;SKIP TYPEOUTS
3327  026116  004737  026666              JSR     PC,ERTYPE       ;;GO TO USER ERROR ROUTINE
3328  026122  104400  001217              TYPE    ,$CRLF
3329  026126  005737  177570          2$: TST     @#SWR           ;;HALT ON ERROR
3330  026132  100001                      BPL     9$              ;;SKIP IF CONTINUE
3331  026134  000000                      HALT                    ;;HALT ON ERROR!
3332  026136  022737  025412  000042  9$: CMP     #$ENDAD,42      ;;ACT-11?
3333  026144  001001                      BNE     3$              ;;BRANCH IF NO
3334  026146  000000                      HALT                    ;;YES
3335  026150  032737  001000  177570  3$: BIT     #BIT09,@#SWR    ;;LOOP ON ERROR SWITCH SET?
3336  026156  001402                      BEQ     4$              ;;BR IF NO
3337  026160  013716  001112              MOV     $LPERR,(SP)     ;;FUDGE RETURN FOR LOOPING
3338  026164  005737  001210          4$: TST     $ESCAPE         ;;CHECK FOR AN ESCAPE ADDRESS
3339  026170  001402                      BEQ     5$              ;;BR IF NONE
3340  026172  013716  001210              MOV     $ESCAPE,(SP)    ;;FUDGE RETURN ADDRESS FOR ESCAPE
3341  026176                          5$:
3342  026176  032737  001000  177570      BIT     #SW9,SWR        ;IS THE LOOP ON ERROR SWITCH UP?
3343  026204  001421                      BEQ     EREXIT          ;BRANCH IF NOT LOOPING ON ERROR
3344  026206  005037  177766              CLR     CPUERR          ;CLEAR CPU ERROR REGISTER
3345  026212  012737  177777  177744      MOV     #-1,MEMERR      ;CLEAR MEMORY ERROR REGISTER
3346  026220  042737  176776  177572      BIC     #176776,MMR0    ;CLEAR MEMORY MANAGEMENT REG 0
3347                                                              ;LEAVE BIT0 AND BIT9 UNCHANGED
3348  026226  012737  177777  031672      MOV     #-1,CPFLAG      ;RE-INITIALIZE CP TRAP FLAG
3349  026234  012737  177777  031776      MOV     #-1,PAFLAG      ;RE-INITIALIZE PARITY TRAP FLAG
3350  026242  012737  177777  032230      MOV     #-1,MMFLAG      ;RE-INITIALIZE MEMORY MANAGE. TRAP FLAG
3351  026250  000002              EREXIT: RTI                     ;RETURN TO TEST AFTER ERROR
3352                                  .SBTTL  SPURIOUS ERROR HANDLER
3353                                  ;*      THIS ROUTINE IS ENTERED BY AN UNEXPECTED TRAP TO 4 OR 114.
3354                                  ;*       IF SWITCH 13 IS OFF, AN ERROR MESSAGE, THE ERROR REGISTER,
3355                                  ;*      THE ERROR PC, AND THE TEST NUMBER ARE TYPED OUT.
3356                                  ;*       IF SWITCH 13 IS ON, ONLY THE ERROR MESSAGE WILL BE TYPED.
3357                                  ;;*****************************************************************
3358  026252  011637  001120      CPUSPUR:MOV     (SP),$ERRPC             ;SAVE THE ERROR PC
3359  026256  012706  001100              MOV     #STACK,SP       ;RESTORE THE SP
3360  026262  104400  026270              TYPE    ,65$            ;;TYPE ASCIZ STRING
3361  026266  000414                      BR      64$             ;;GET OVER THE ASCIZ
3362                                  ;;65$:  .ASCIZ  /UNEXPECTED TRAP TO 4/<15><12>
3363  026320                          64$:
3364  026320  032737  020000  177570      BIT     #BIT13,@#SWR    ;IS INHIBIT ERROR TYPEOUT ON?
3365  026326  001045                      BNE     1$              ;BRANCH IF YES
3366  026330  104400  026336              TYPE    ,67$            ;;TYPE ASCIZ STRING
3367  026334  000417                      BR      66$             ;;GET OVER THE ASCIZ
3368                                  ;;67$:  .ASCIZ  /ERRORPC TSTNUM  CPUERR REG/<15><12>
3369  026374                          66$:
3370  026374  013737  177766  001172      MOV     @#CPUERR,$TMP0  ;GET CPU ERROR REG
3371  026402  113737  001102  001104      MOVB    $TSTNM,$$TSTNM  ;GET TEST NUMBER
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3372  026410  013746  001120                  MOV     $ERRPC,-(SP)    ;;SAVE $ERRPC FOR TYPEOUT
3373                                                                    ;;TYPE ERROR PC
3374  026414  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
3375  026416  104400  023526                  TYPE    ,TWOSP
3376  026422  013746  001104                  MOV     $$TSTNM,-(SP)   ;;SAVE $$TSTNM FOR TYPEOUT
3377                                                                    ;;TYPE TEST NUMBER
3378  026426  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
3379  026430  104400  023526                  TYPE    ,TWOSP
3380  026434  013746  001172                  MOV     $TMP0,-(SP)     ;;SAVE $TMP0 FOR TYPEOUT
3381                                                                    ;;TYPE ERROR REGISTER
3382  026440  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
3383  026442  005037  177766          1$:     CLR     @#CPUERR        ;CLEAR CPU ERROR REG
3384  026446  013737  001316  001210          MOV     NXTTST,$ESCAPE  ;SETUP ESCAPE ADDRESS
3385  026454  104171                          ERROR   171             ;MAKE THE ERROR CALL TO SYSMAC
3386  026456  011637  001120  CACHSPU:MOV     (SP),$ERRPC     ;SAVE ERROR PC
3387  026462  012706  001100                  MOV     #STACK,SP       ;RESTORE STACK
3388  026466  104400  026474                  TYPE    ,65$            ;;TYPE ASCIZ STRING
3389  026472  000415                          BR      64$             ;;GET OVER THE ASCIZ
3390                                  ;;65$:  .ASCIZ  /UNEXPECTED TRAP TO 114/<15><12>
3391  026526                          64$:
3392  026526  032737  020000  177570          BIT     #BIT13,@#SWR    ;IS SWITCH 13 ON?
3393  026534  001045                          BNE     1$              ;BRANCH IF YES
3394  026536  104400  026544                  TYPE    ,67$            ;;TYPE ASCIZ STRING
3395  026542  000417                          BR      66$             ;;GET OVER THE ASCIZ
3396                                  ;;67$:  .ASCIZ  /ERRORPC TSTNUM  MEMERR REG/<15><12>
3397  026602                          66$:
3398  026602  013737  177744  001172          MOV     @#MEMERR,$TMP0  ;SAVE MEMORY ERROR REG
3399  026610  113737  001102  001104          MOVB    $TSTNM,$$TSTNM  ;SAVE TEST NUMBER
3400  026616  013746  001120                  MOV     $ERRPC,-(SP)    ;;SAVE $ERRPC FOR TYPEOUT
3401                                                                    ;;TYPE ERROR PC
3402  026622  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
3403  026624  104400  023526                  TYPE    ,TWOSP
3404  026630  013746  001104                  MOV     $$TSTNM,-(SP)   ;;SAVE $$TSTNM FOR TYPEOUT
3405                                                                    ;;TYPE TEST NUMBER
3406  026634  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
3407  026636  104400  023526                  TYPE    ,TWOSP
3408  026642  013746  001172                  MOV     $TMP0,-(SP)     ;;SAVE $TMP0 FOR TYPEOUT
3409                                                                    ;;TYPE MEM ERROR REG
3410  026646  104402                          TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
3411  026650  013737  177744  177744  1$:     MOV     @#MEMERR,@#MEMERR  ;CLEAR MEMERR REG.
3412  026656  013737  001316  001210          MOV     NXTTST,$ESCAPE  ;SETUP ESCAPE ADDRESS
3413  026664  104171                          ERROR   171
3414
3415
3416                                  .SBTTL  ERROR MESSAGE TYPE OUT ROUTINE
3417
3418
3419                                  ;*      THIS SUBROUTINE IS CALLED BY THE ERROR HANDLER TO TYPE
3420                                  ;*      THE ERROR MESSAGES.  IT PICKS UP THE ITEM BYTE ($ITEMB) NUMBER
3421                                  ;*      AND USES THAT TO INDEX THROUGH THE ERROR TABLE.  THE ERROR
3422                                  ;*      TABLE STARTS AT '$ERRTB'' AND HAS FOUR (4) POINTERS FOR EACH
3423                                  ;*      ENTRY, 'EM', 'DH', 'DT', 'DF'.  THE 'EM' POINTS TO THE ERROR
3424                                  ;*      MESSAGE WHICH IS AN ASCIZ STRING.  THE 'DH' POINTS TO THE DATA
3425                                  ;*      HEADER WHICH IS ANOTHER ASCIZ STRING.  THE 'DT' POINTS TO THE
3426                                  ;*      DATA TABLE WHICH IS A GROUP OF WORDS CONTAINING THE ADDRESSES
3427                                  ;*      OF THE DATA TO BY TYPED.  THE FORMAT OF THIS DATA IS
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                                        ;*      CONTROLLED BY THE 'DF' WHICH IS THE POINTER TO THE DATA FORMAT.
                                        ;*      THE DATA FORMAT IS A GROUP OF BYTES WHICH CONTAIN NUMBERS
                                        ;*      THAT CORRESPOND TO DIFFERENT TYPING FORMATS.
                                        ;*      0       -16 BIT OCTAL FORMAT
                                        ;*      1       -DECIMAL FORMAT
                                        ;*      2       -22 BIT OCTAL FORMAT.  DATA IS LOWER 16 BITS OF THE
                                        ;*               PHYSICAL ADDRESS, UPPER 6 BITS ARE ADJACENT TO LOWER 16
                                        ;*      3       -22 BIT OCTAL FORMAT.  DATA IS THE 16 BIT VIRTUAL
                                        ;*               ADDRESS IN KERNEL I-SPACE.
                                        ;*      4       -22 BIT OCTAL FORMAT.  DATA IS A P.A.R. AND THE
                                        ;*               OUTPUT IS THE BASE ADDRESS THAT THE P.A.R. POINTS TO.
026666  010046                  ERTYPE: MOV     R0,-(KSP)       ;SAVE R0 ON STACK
026670  005000                          CLR     R0              ;CLEAR R0
026672  113700  001116                  MOVB    @#$ITEMB,R0     ;PUT ITEM NUMBER IN R0
026676  001004                          BNE     1$              ;BRANCH IF IT IS NON-ZERO
026700  013746  001120                  MOV     $ERRPC,-(KSP)   ;PUT ERROR PC ON STACK FOR TYPING
026704  104402                          TYPOC                   ;TYPE FAILING PC
026706  000551                          BR      13$             ;GO TO RETURN
026710  005300                  1$:     DEC     R0              ;ADJUST ITEM NUMBER TO BE A POINTER
026712  072027  000003                  ASH     #3,R0           ;LEFT SHIFT ITEM NO. 3 PLACES
026716  100024                          BPL     22$             ;BRANCH IF ITEM #LESS THAN 200
026720  032700  001000                  BIT     #BIT9,R0        ;SEE IF ITEM # WAS 3XX
026724  001415                          BEQ     21$             ;BRANCH IF ITEM # WAS 2XX
                                                                ;AND TYPE ERROR MESSAGE
026726  032737  000200  177570          BIT     #SW7,@#SWR      ;SEE IF SWITCH 7 IS UP
026734  001404                          BEQ     20$             ;BRANCH IF SWITCH IS NOT UP
                                                                ;AND TYPE DATA, ON MULTIPLE ERRORS
026736  062766  000004  000002          ADD     #4,2(KSP)       ;SKIP 'TYPE  ,$CRLF' IF SW 7 IS UP
                                                                ;INHIBIT MULTIPLE ERROR TYPEOUTS
026744  000532                          BR      13$             ;BRANCH TO EXIT
026746  042700  177000          20$:    BIC     #177000,R0      ;CLEAR UPPER BYTE OF R0
026752  062700  003300                  ADD     #ER200+4,R0     ;POINT TO DATA TABLE ENTRY
026756  000424                          BR      5$              ;GO TYPE DATA TABLE
026760  042700  177000          21$:    BIC     #177000,R0      ;CLEAR UPPER BYTE OF R0
026764  062700  001710                  ADD     #<ER200-$ERRTB>,R0 ;ADD DIFFERENCE BETWEEN
                                                                ;ITEM 1 AND ITEM 201
                                        ;:                              GET POINTER TO ERROR MESSAGE AND TYPE IT
                                        ;:                              IF THE POINTER IS NOT ZERO
026770  062700  001364          22$:    ADD     #$ERRTB,R0      ;ADD BASE OF ERROR TABLE
026774  012037  027004                  MOV     (R0)+,2$        ;PUT MESSAGE POINTER IN TYPE STATEMENT
027000  001404                          BEQ     3$              ;BRANCH IF NO ERROR MESSAGE
027002  104400                          TYPE                    ;TYPE ERROR MESSAGE
027004  000000                  2$:     .WORD   0               ;POINTER TO ERROR MESSAGE
027006  104400  001217                  TYPE    ,$CRLF          ;TYPE CRLF
                                        ;:                              GET THE POINTER TO THE DATA HEADER AND
                                        ;:                              TYPE IT IF THE POINTER IS NOT ZERO
027012  012037  027022          3$:     MOV     (R0)+,4$        ;PUT HEADER POINTER IN TYPE STATEMENT
027016  001404                          BEQ     5$              ;BRANCH IF NO DATA HEADER
027020  104400                          TYPE                    ;TYPE THE DATA HEADER
027022  000000                  4$:     .WORD   0               ;POINTER TO DATA HEADER
027024  104400  001217                  TYPE    ,$CRLF          ;TYPE CRLF
                                        ;:                              THIS IS THE START OF THE DATA OUTPUT IF THE
                                        ;:                              DATA POINTER IS NOT ZERO.  R0 POINTS TO THE
                                        ;:                              DATA FORMAT, R1 POINTS TO THE ADDRESS OF
                                        ;:                              THE DATA WORDS.
027030  010146                  5$:     MOV     R1,-(KSP)       ;SAVE R1 ON THE STACK
```

```
3484  027032  012001                    MOV     (R0)+,R1        ;PUT DATA TABLE POINTER IN R1
3485  027034  001475                    BEQ     12$             ;BRANCH IF NO DATA TABLE
3486  027036  012000                    MOV     (R0)+,R0        ;PICK UP DATA FORMAT POINTER
3487  027040  105710            6$:     TSTB    (R0)            ;IS THIS WORD OCTAL
3488  027042  001003                    BNE     7$              ;BRANCH IF NOT 16-BIT OCTAL
3489                            ;;                      THIS IS 16 BIT OCTAL FORMAT (DF = 0)
3490  027044  013146                    MOV     @(R1)+,-(KSP)   ;PUT WORD ON STACK FOR TYPING
3491  027046  104402                    TYPOC                   ;TYPE THE WORD ON STACK AS 16 BIT OCTAL
3492  027050  000461                    BR      11$             ;GET READY FOR NEXT WORD
3493  027052  122710  000001    7$:     CMPB    #1,(R0)         ;IS THE WORD DECIMAL
3494  027056  001003                    BNE     8$              ;BRANCH IF NOT DECIMAL
3495                            ;;                      THIS IS DECIMAL FORMAT (DF = 1)
3496  027060  013146                    MOV     @(R1)+,-(KSP)   ;PUT WORD ON STACK FOR TYPING
3497  027062  104410                    TYPDS                   ;TYPE THE WORD ON STACK AS DECIMAL
3498  027064  000453                    BR      11$             ;GET READY FOR NEXT WORD
3499  027066  122710  000002    8$:     CMPB    #2,(R0)         ;IS WORD 22-BIT PHYSICAL ADDRESS
3500  027072  001012                    BNE     9$              ;BRANCH IF NOT 22-BIT PHYSICAL ADDR
3501                            ;;                      THIS IS 22-BIT PHYSICAL FORMAT (DF = 2)
3502  027074  012146                    MOV     (R1)+,-(KSP)    ;PUT ADDR OF LOW WORD ON STACK
3503  027076  004737  031144            JSR     PC,$DB2O        ;CONVERT NUMBER TO OCTAL ASCIZ
3504  027102  062716  000003            ADD     #3,(KSP)                ;ONLY WANT 8 DIGITS
3505  027106  012637  027114            MOV     (KSP)+,30$      ;PUT POINTER AFTER 'TYPE' CALL
3506  027112  104400                    TYPE                    ;TYPE ASCIZ STRING
3507  027114  000000            30$:    .WORD   0               ;WORD HOLDS POINTER TO ASCIZ STRING
3508  027116  000436                    BR      11$             ;GET READY FOR NEXT WORD
3509  027120  122710  000003    9$:     CMPB    #3,(R0)         ;IS THIS A 16-BIT VIRTUAL ADDRESS
3510  027124  001004                    BNE     10$             ;BRANCH IF NOT 16-BIT VIRT. ADDR.
3511                            ;;                      THIS IS 22-BIT VIRTUAL ADDRESS FORMAT
3512                            ;;                      KERNEL I-SPACE ASSUMED.  (DF = 3)
3513  027126  013146                    MOV     @(R1)+,-(KSP)   ;PUT 16-BIT VIRTUAL ADDR ON STACK
3514  027130  004737  027242            JSR     PC,TYPVAD       ;GO TYPE 22-BIT ADDRESS FROM 16-BIT V.A.
3515  027134  000427                    BR      11$             ;GET READY FOR NEXT WORD
3516                            ;;                      THIS IS FORMAT 4.  DATA WORD IS A P.A.R.
3517                            ;;                      OUTPUT WILL BE 22-BIT. PAR LEFT SHIFTED 6.
3518  027136  010246            10$:    MOV     R2,-(KSP)       ;SAVE R2 ON THE STACK
3519  027140  010346                    MOV     R3,-(KSP)       ;SAVE R3 ON THE STACK
3520  027142  013103                    MOV     @(R1)+,R3       ;LOAD DATA WORD INTO R3
3521  027144  005002                    CLR     R2              ;R2 WILL HOLD UPPER SIX BITS OF NUMBER
3522  027146  073227  000006            ASHC    #6,R2           ;LEFT SHIFT <R2:R3> 6 PLACES
3523  027152  010237  001232            MOV     R2,PADRSH       ;STORE UPPER BITS OF ADDRESS
3524  027156  010337  001230            MOV     R3,PADRSL       ;STORE LOWER 16 BITS OF ADDRESS
3525  027162  012746  001230            MOV     #PADRSL,-(KSP)  ;PUT ADDRESS OF LOWER 16 BITS ON STACK
3526  027166  004737  031144            JSR     PC,$DB2O        ;CONVERT TWO WORDS TO ASCIZ
3527  027172  062716  000003            ADD     #3,(KSP)        ;I ONLY WANT 8 DIGITS
3528  027176  012637  027204            MOV     (KSP)+,31$      ;PUT POINTER AFTER TYPE CALL
3529  027202  104400                    TYPE                    ;POINTER TO ASCIZ STRING FOLLOWS
3530  027204  000000            31$:    .WORD   0               ;POINTER TO ASCIZ STRING
3531  027206  011603                    MOV     (KSP),+R3       ;RESTORE R3 FROM STACK
3532  027210  012602                    MOV     (KSP)+,R2       ;RESTORE R2 FROM STACK
3533  027212  000400                    BR      11$             ;GET READY FOR NEXT WORD
3534  027214  005200            11$:    INC     R0              ;POINT TO NEXT FORMAT BYTE
3535  027216  104400  027236            TYPE    ,32$            ;TYPE TWO SPACES
3536  027222  005711                    TST     (R1)            ;IS THERE ANOTHER WORD?
3537  027224  001401                    BEQ     12$             ;BRANCH IF ALL DONE
3538  027226  000704                    BR      6$              ;GO BACK FOR NEXT NUMBER
3539  027230  012601            12$:    MOV     (KSP)+,R1       ;RESTORE R1
```

```
3540  027232  012600            13$:    MOV     (KSP)+,R0       ;RESTORE R0
3541  027234  000207                    RTS     PC              ;RETURN TO ERROR ROUTINE
3542  027236  020040  000       32$:    .ASCIZ  ? ?             ;TWO SPACES
3543          027242                    .EVEN
3544
3545
3546                            .SBTTL  CONVERT 16-BIT VIRTUAL ADDRESS TO 22-BIT PHYSICAL ADDRESS
3547                            ;*
3548                            ;*      THIS ROUTINE IS CALLED BY A 'JSR PC' AFTER THE VIRTUAL ADDRESS
3549                            ;*      IS PUSHED ON THE KERNEL STACK.  THE V.A. IS THEN LOADED INTO
3550                            ;*      R1 AND THE UPPER 3 BITS ARE SHIFTED INTO R0 TO SELECT THE
3551                            ;*      CORRECT KERNEL I-SPACE PAR.  THE LOWER 12 BITS OF THE VIRTUAL
3552                            ;*      ADDRESS ARE ADDED TO THE PAR AS THEY ARE BY MEMORY MANAGEMENT
3553                            ;*      AND THE PHYSICAL ADDRESS IS SAVED IN MEMORY TO BE CONVERTED
3554                            ;*      TO ASCIZ AND TYPED.
3555                            ;*
3556  027242  104412            TYPVAD: SAVREG                  ;SAVE ALL REGISTERS
3557  027244  016601  000002            MOV     2(KSP),R1       ;PUT VIRTUAL ADDR IN R1
3558  027250  005000                    CLR     R0              ;CLEAR R0 FOR CALCULATIONS
3559  027252  073027  000003            ASHC    #3,R0           ;LEFT SHIFT R0,R1 3 PLACES
3560  027256  006300                    ASL     R0              ;LEFT SHIFT R0 ONE MORE PLACE
3561  027260  006001                    ROR     R1              ;RIGHT SHIFT R1 SO OFFSET IS CORRECT
3562  027262  006001                    ROR     R1              ;RIGHT SHIFT R1
3563  027264  006001                    ROR     R1              ;RIGHT SHIFT R1
3564  027266  062700  172340            ADD     #KIPAR0,R0      ;FORM DESIRED PAR ADDR IN R0
3565  027272  011003                    MOV     (R0),R3         ;PUT CONTENTS OF PAR IN R3
3566  027274  005002                    CLR     R2              ;CLEAR R2 FOR PHYSICAL ADDR CALCULATIONS
3567  027276  073227  000006            ASHC    #6,R2           ;LEFT SHIFT <R2,R3> 6 PLACES
```

```
3568  027302  060103                    ADD     R1,R3           ;ADD OFFSET IN R1 TO BASE IN R3
3569  027304  005502                    ADC     R2              ;ADD ANY POSSIBLE CARRY TO UPPER 6 BITS
3570  027306  010237  001232            MOV     R2,PADRSH       ;PUT UPPER 6 BITS OF ADDR IN CORE
3571  027312  010337  001230            MOV     R3,PADRSL       ;PUT LOWER 16 BITS OF ADDR IN CORE
3572  027316  012746  001230            MOV     #PADRSL,-(KSP)  ;PUT POINTER TO LOWER 16 BITS ON STACK
3573  027322  004737  031144            JSR     PC,$DB2O        ;CONVERT NUMBER TO OCTAL ASCIZ
3574  027326  062716  000003            ADD     #3,(KSP)        ;ONLY TYPE 8 DIGITS
3575  027332  012637  027340            MOV     (KSP)+,3$       ;PUT POINTER AFTER TYPE INST
3576  027336  1044C0                    TYPE                    ;TYPE THE 22-BIT VIRTUAL ADDRESS
3577  027340  000000            3$:     .WORD   0               ;THIS WORD HOLDS THE POINTER TO
3578                                                            ;THE ASCIZ STRING
3579  027342  104414                    RESREG                  ;RESTORE ALL THE REGISTERS
3580  027344  012616                    MOV     (KSP)+,(KSP)    ;LEAVE ONLY RETURN ADDR ON STACK
3581  027346  000207                    RTS     PC              ;RETURN TO ERROR HANDLER
3582
3583
3584                            ;;**********************************************************************
3585
3586                            .SBTTL  SAVE AND RESTORE R0-R5 ROUTINES
3587
3588                            ;*SAVE R0-R5
3589                            ;*CALL:
3590                            ;*      SAVREG
3591                            ;*UPON RETURN FROM $SAVREG THE STACK WILL LOOK LIKE:
3592                            ;*
3593                            ;*TOP---(+16)
3594                            ;* +2---(+18)
3595                            ;* +4---R5
3596                            ;* +6---R4
3597                            ;* +8---R3
3598                            ;*+10---R2
3599                            ;*+12---R1
3600                            ;*+14---R0
3601
3602  027350                    $SAVREG:
3603  027350  010046                    MOV     R0,-(SP)        ;;PUSH R0 ON STACK
3604  027352  010146                    MOV     R1,-(SP)        ;;PUSH R1 ON STACK
3605  027354  010246                    MOV     R2,-(SP)        ;;PUSH R2 ON STACK
3606  027356  010346                    MOV     R3,-(SP)        ;;PUSH R3 ON STACK
3607  027360  010446                    MOV     R4,-(SP)        ;;PUSH R4 ON STACK
3608  027362  010546                    MOV     R5,-(SP)        ;;PUSH R5 ON STACK
3609  027364  016646  000022            MOV     22(SP),-(SP)    ;;SAVE PS OF MAIN FLOW
3610  027370  016646  000022            MOV     22(SP),-(SP)    ;;SAVE PC OF MAIN FLOW
3611  027374  016646  000022            MOV     22(SP),-(SP)    ;;SAVE PS OF CALL
3612  027400  016646  000022            MOV     22(SP),-(SP)    ;;SAVE PC OF CALL
3613  027404  000002                    RTI
3614
3615                            ;*RESTORE R0-R5
3616                            ;*CALL:
3617                            ;*      RESREG
3618  027406                    $RESREG:
3619  027406  012666  000022            MOV     (SP)+,22(SP)    ;;RESTORE PC OF CALL
3620  027412  012666  000022            MOV     (SP)+,22(SP)    ;;RESTORE PS OF CALL
3621  027416  012666  000022            MOV     (SP)+,22(SP)    ;;RESTORE PC OF MAIN FLOW
3622  027422  012666  000022            MOV     (SP)+,22(SP)    ;;RESTORE PS OF MAIN FLOW
3623  027426  012605                    MOV     (SP)+,R5        ;;POP STACK INTO R5
```

```
                        MOV     (SP)+,R4        ;;POP STACK INTO R4
                        MOV     (SP)+,R3        ;;POP STACK INTO R3
                        MOV     (SP)+,R2        ;;POP STACK INTO R2
                        MOV     (SP)+,R1        ;;POP STACK INTO R1
                        MOV     (SP)+,R0        ;;POP STACK INTO R0
                        RTI
                ;;**************************************************************************

                .SBTTL  TYPE ROUTINE

                ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
                ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
                ;*NOTE1:         $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
                ;*NOTE2:         $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
                ;*NOTE3:         $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
                ;*
                ;*CALL:
                ;*1) USING A TRAP INSTRUCTION
                ;*      TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
                ;*OR
                ;*      TYPE
                ;*      MESADR
                ;*
                ;*2) USING A JSR INSTRUCTION
                ;*      MOV     PS,-(SP)        ;;PUSH PROCESSOR STATUS WORD ON THE STACK
                ;*      JSR     PC,$TYPE        ;;CALL TYPE ROUTINE
                ;*      MESADDR                 ;;FIRST ADRESS OF MESSAGE

001153  $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
                BPL     1$              ;;BR IF YES
                HALT                    ;;HALT HERE IF NO TERMINAL
                BR      3$              ;;LEAVE
        1$:     MOV     R0,-(SP)        ;;SAVE R0
000002          MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
        2$:     MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
                BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
                TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
                MOV     (SP)+,R0        ;;RESTORE R0
000002  3$:     ADD     #2,(SP)         ;;ADJUST RETURN PC
                RTI                     ;;RETURN
000011  4$:     CMPB    #HT,(SP)        ;;BRANCH IF <HT>
                BEQ     8$
000200          CMPB    #CRLF,(SP)      ;;BRANCH IF NOT
                BNE     5$
                TST     (SP)+           ;;POP  <CR><LF> EQUIV
001217          TYPE    ,$CRLF
                BR      2$              ;;GET NEXT CHARACTER
027604  5$:     JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
001152  6$:     CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
                BNE     2$              ;;IF NO GO GET NEXT CHAR.
001150          MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
                                        ;;AND THE NULL CHAR.
000001  7$:     DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
                BLT     6$              ;;BR IF NO--GO POP THE NULL OFF OF STACK
027604          JSR     PC,$TYPEC       ;;GO TYPE A NULL
                BR      7$              ;;LOOP
```

```
3680
3681                                    ;;HORIZONTAL TAB PROCESSOR
3682
3683  027560  112716  000040            8$:     MOVB    #' ,(SP)        ;;REPLACE TAB WITH SPACE
3684  027564  004737  027604            9$:     JSR     PC,$TYPEC       ;;TYPE A SPACE
3685  027570  132737  000007  027650            BITB    #7,$CHARCNT     ;;BRANCH IF NOT AT
3686  027576  001372                            BNE     9$              ;;TAB STOP
3687  027600  005726                            TST     (SP)+           ;;POP SPACE OFF STACK
3688  027602  000730                            BR      2$              ;;GET NEXT CHARACTER
3689  027604  105777  151334          $TYPEC: TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
3690  027610  100375                            BPL     $TYPEC
3691  027612  116677  000002  151326            MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
3692  027620  122766  000015  000002            CMPB    #CR,2(SP)       ;;BRANCH IF
3693  027626  001003                            BNE     1$              ;;NOT <CR>
3694  027630  105037  027650                    CLRB    $CHARCNT        ;;
3695  027634  000406                            BR      $TYPEX          ;;EXIT
3696  027636  122766  000012  000002  1$:      CMPB    #LF,2(SP)       ;;BRANCH IF
3697  027644  001402                            BEQ     $TYPEX          ;;<LF>
3698  027646  105227                            INCB    (PC)+           ;;INC SPACE
3699  027650  000000                    $CHARCNT:.WORD  0               ;;COUNT
3700  027652  000207                    $TYPEX: RTS     PC
3701
3702                                    ;;**************************************************************************
3703
3704                                    .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE
3705
3706                                    ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
3707                                    ;*OCTAL (ASCII) NUMBER AND TYPE IT.
3708                                    ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
3709                                    ;*CALL:
3710                                    ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
3711                                    ;*      TYPOS                   ;;CALL FOR TYPEOUT
3712                                    ;*      .BYTE   N               ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
3713                                    ;*      .BYTE   M               ;;M=1 OR 0
3714                                    ;*                                      ;;1=TYPE LEADING ZEROS
3715                                    ;*                                      ;;0=SUPPRESS LEADING ZEROS
3716                                    ;*
3717                                    ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
3718                                    ;*$TYPOS OR $TYPOC
3719                                    ;*CALL:
3720                                    ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
3721                                    ;*      TYPON                   ;;CALL FOR TYPEOUT
3722                                    ;*
3723                                    ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
3724                                    ;*CALL:
3725                                    ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
3726                                    ;*      TYPOC                   ;;CALL FOR TYPEOUT
3727
3728  027654  017646  000000            $TYPOS: MOV     @(SP),-(SP)     ;;PICKUP THE MODE
3729  027660  116637  000001  030077            MOVB    1(SP),$OFILL    ;;LOAD ZERO FILL SWITCH
3730  027666  112637  030101                    MOVB    (SP)+,$OMODE+1  ;;NUMBER OF DIGITS TO TYPE
3731  027672  062716  000002                    ADD     #2,(SP)         ;;ADJUST RETURN ADDRESS
3732  027676  000406                            BR      $TYPON
3733  027700  112737  000001  030077  $TYPOC: MOVB    #1,$OFILL       ;;SET THE ZERO FILL SWITCH
3734  027706  112737  000006  030101            MOVB    #6,$OMODE+1     ;;SET FOR SIX(6) DIGITS
3735  027714  112737  000005  030076  $TYPON: MOVB    #5,$OCNT        ;;SET THE ITERATION COUNT
```

```
3736  027722  010346                      MOV     R3,-(SP)        ;;SAVE R3
3737  027724  010446                      MOV     R4,-(SP)        ;;SAVE R4
3738  027726  010546                      MOV     R5,-(SP)        ;;SAVE R5
3739  027730  113704  030101              MOVB    $OMODE+1,R4     ;;GET THE NUMBER OF DIGITS TO TYPE
3740  027734  005404                      NEG     R4
3741  027736  062704  000006              ADD     #6.R4           ;;SUBTRACT IT FOR MAX. ALLOWED
3742  027742  110437  030100              MOVB    R4,$OMODE       ;;SAVE IT FOR USE
3743  027746  113704  030077              MOVB    $OFILL,R4       ;;GET THE ZERO FILL SWITCH
3744  027752  016605  000012              MOV     12(SP),R5       ;;PICKUP THE INPUT NUMBER
3745  027756  005003                      CLR     R3              ;;CLEAR THE OUTPUT WORD
3746  027760  006105              1$:     ROL     R5              ;;ROTATE MSB INTO "C"
3747  027762  000404                      BR      3$              ;;GO DO MSB
3748  027764  006105              2$:     ROL     R5              ;;FORM THIS DIGIT
3749  027766  006105                      ROL     R5
3750  027770  006105                      ROL     R5
3751  027772  010503                      MOV     R5,R3
3752  027774  006103              3$:     ROL     R3              ;;GET LSB OF THIS DIGIT
3753  027776  105337  030100              DECB    $OMODE          ;;TYPE THIS DIGIT?
3754  030002  100016                      BPL     7$              ;;BR IF NO
3755  030004  042703  177770              BIC     #177770,R3      ;;GET RID OF JUNK
3756  030010  001002                      BNE     4$              ;;TEST FOR 0
3757  030012  005704                      TST     R4              ;;SUPPRESS THIS 0?
3758  030014  001403                      BEQ     5$              ;;BR IF YES
3759  030016  005204              4$:     INC     R4              ;;DON'T SUPPRESS ANYMORE 0'S
3760  030020  052703  000060              BIS     #'0,R3          ;;MAKE THIS DIGIT ASCII
3761  030024  052703  000040      5$:     BIS     #' ,R3          ;;MAKE ASCII IF NOT ALREADY
3762  030030  110337  030074              MOVB    R3,8$           ;;SAVE FOR TYPING
3763  030034  104400  030074              TYPE    ,8$             ;;GO TYPE THIS DIGIT
3764  030040  105337  030076      7$:     DECB    $OCNT           ;;COUNT BY 1
3765  030044  003347                      BGT     2$              ;;BR IF MORE TO DO
3766  030046  002402                      BLT     6$              ;;BR IF DONE
3767  030050  005204                      INC     R4              ;;INSURE LAST DIGIT ISN'T A BLANK
3768  030052  000744                      BR      2$              ;;GO DO THE LAST DIGIT
3769  030054  012605              6$:     MOV     (SP)+,R5        ;;RESTORE R5
3770  030056  012604                      MOV     (SP)+,R4        ;;RESTORE R4
3771  030060  012603                      MOV     (SP)+,R3        ;;RESTORE R3
3772  030062  016666  000002  000004      MOV     2(SP),4(SP)     ;;SET THE STACK FOR RETURNING
3773  030070  012616                      MOV     (SP)+,(SP)
3774  030072  000002                      RTI                     ;;RETURN
3775  030074     000              8$:     .BYTE   0               ;;STORAGE FOR ASCII DIGIT
3776  030075     000                      .BYTE   0               ;;TERMINATOR FOR TYPE ROUTINE
3777  030076     000              $OCNT:  .BYTE   0               ;;OCTAL DIGIT COUNTER
3778  030077     000              $OFILL: .BYTE   0               ;;ZERO FILL SWITCH
3779  030100  000000              $OMODE: .WORD   0               ;;NUMBER OF DIGITS TO TYPE
3780                                ;;**************************************************************
3781
3782                                .SBTTL  CONVERT BINARY TO DECIMAL AND TYPE ROUTINE
3783
3784                                ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 5-DIGIT
3785                                ;*SIGNED DECIMAL (ASCII) NUMBER AND TYPE IT. DEPENDING ON WHETHER THE
3786                                ;*NUMBER IS POSITIVE OR NEGATIVE A SPACE OR A MINUS SIGN WILL BE TYPED
3787                                ;*BEFORE THE FIRST DIGIT OF THE NUMBER. LEADING ZEROS WILL ALWAYS BE
3788                                ;*REPLACED WITH SPACES.
3789                                ;*CALL:
3790                                ;*      MOV     NUM,-(SP)       ;;PUT THE BINARY NUMBER ON THE STACK
3791                                ;*      TYPDS                   ;;GO TO THE ROUTINE
```

```
3792
3793  030102                          $TYPDS:
3794  030102  010046                          MOV     R0,-(SP)        ;;PUSH R0 ON STACK
3795  030104  010146                          MOV     R1,-(SP)        ;;PUSH R1 ON STACK
3796  030106  010246                          MOV     R2,-(SP)        ;;PUSH R2 ON STACK
3797  030110  010346                          MOV     R3,-(SP)        ;;PUSH R3 ON STACK
3798  030112  010546                          MOV     R5,-(SP)        ;;PUSH R5 ON STACK
3799  030114  012746  020200                  MOV     #20200,-(SP)    ;;SET BLANK SWITCH AND SIGN
3800  030120  016605  000020                  MOV     20(SP),R5       ;;GET THE INPUT NUMBER
3801  030124  100004                          BPL     1$              ;;BR IF INPUT IS POS.
3802  030126  005405                          NEG     R5              ;;MAKE THE BINARY NUMBER POS.
3803  030130  112766  000055  000001          MOVB    #'-,1(SP)       ;;MAKE THE ASCII NUMBER NEG.
3804  030136  005000                  1$:     CLR     R0              ;;ZERO THE CONSTANTS INDEX
3805  030140  012703  030316                  MOV     #$DBLK,R3       ;;SETUP THE OUTPUT POINTER
3806  030144  112723  000040                  MOVB    #' ,(R3)+       ;;SET THE FIRST CHARACTER TO A BLANK
3807  030150  005002                  2$:     CLR     R2              ;;CLEAR THE BCD NUMBER
3808  030152  016001  030306                  MOV     $DTBL(R0),R1    ;;GET THE CONSTANT
3809  030156  160105                  3$:     SUB     R1,R5           ;;FORM THIS BCD DIGIT
3810  030160  002402                          BLT     4$              ;;BR IF DONE
3811  030162  005202                          INC     R2              ;;INCREASE THE BCD DIGIT BY 1
3812  030164  000774                          BR      3$
3813  030166  060105                  4$:     ADD     R1,R5           ;;ADD BACK THE CONSTANT
3814  030170  005702                          TST     R2              ;;CHECK IF BCD DIGIT=0
3815  030172  001002                          BNE     5$              ;;FALL THROUGH IF 0
3816  030174  105716                          TSTB    (SP)            ;;STILL DOING LEADING 0'S?
3817  030176  100407                          BMI     7$              ;;BR IF YES
3818  030200  106316                  5$:     ASLB    (SP)            ;;MSD?
3819  030202  103003                          BCC     6$              ;;BR IF NO
3820  030204  116663  000001  177777          MOVB    1(SP),-1(R3)    ;;YES--SET THE SIGN
3821  030212  052702  000060          6$:     BIS     #'0,R2          ;;MAKE THE BCD DIGIT ASCII
3822  030216  052702  000040          7$:     BIS     #' ,R2          ;;MAKE IT A SPACE IF NOT ALREADY A DIGIT
3823  030222  110223                          MOVB    R2,(R3)+        ;;PUT THIS CHARACTER IN THE OUTPUT BUFFER
3824  030224  005720                          TST     (R0)+           ;;JUST INCREMENTING
3825  030226  020027  000010                  CMP     R0,#10          ;;CHECK THE TABLE INDEX
3826  030232  002746                          BLT     2$              ;;GO DO THE NEXT DIGIT
3827  030234  003002                          BGT     8$              ;;GO TO EXIT
3828  030236  010502                          MOV     R5,R2           ;;GET THE LSD
3829  030240  000764                          BR      6$              ;;GO CHANGE TO ASCII
3830  030242  105726                  8$.     TSTB    (SP)+           ;;WAS THE LSD THE FIRST NON-ZERO?
3831  030244  100003                          BPL     9$              ;;BR IF NO
3832  030246  116663  177777  177776          MOVB    -1(SP),-2(R3)   ;;YES--SET THE SIGN FOR TYPING
3833  030254  105013                  9$:     CLRB    (R3)            ;;SET THE TERMINATOR
3834  030256  012605                          MOV     (SP)+,R5        ;;POP STACK INTO R5
3835  030260  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
3836  030262  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
3837  030264  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
3838  030266  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
3839  030270  104400  030316                  TYPE    ,$DBLK          ;;NOW TYPE THE NUMBER
3840  030274  016666  000002  000004          MOV     2(SP),4(SP)     ;;ADJUST THE STACK
3841  030302  012616                          MOV     (SP)+,(SP)
3842  030304  000002                          RTI                     ;;RETURN TO USER
3843  030306  023420                  $DTBL:  10000.
3844  030310  001750                          1000.
3845  030312  000144                          100.
3846  030314  000012                          10.
3847  030316  000004                  $DBLK:  .BLKW   4
```

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

                        .SBTTL  TRAP DECODER

                        ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE ''TRAP'' INSTRUCTION
                        ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
                        ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
                        ;*GO TO THAT ROUTINE.

030326  010046          $TRAP:  MOV     R0,-(SP)        ;;SAVE R0
030330  016600  000002          MOV     2(SP),R0        ;;GET TRAP ADDRESS
030334  005740                  TST     -(R0)           ;;BACKUP BY 2
030336  111000                  MOVB    (R0),R0         ;;GET RIGHT BYTE OF TRAP
030340  016000  030346          MOV     $TRPAD(R0),R0   ;;INDEX TO TABLE
030344  000200                  RTS     R0              ;;GO TO ROUTINE


                        .SBTTL  TRAP TABLE

                        ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
                        ;*BY THE ''TRAP'' INSTRUCTION.

                        ;       ROUTINE
                        ;       -------
030346                  $TRPAD:
030346  027444                  $TYPE   ;;CALL=TYPE     TRAP+0(104400)  TTY TYPEOUT ROUTINE
030350  027700                  $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
030352  027654                  $TYPOS  ;;CALL=TYPOS    TRAP+4(104404)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
030354  027714                  $TYPON  ;;CALL=TYPON    TRAP+6(104406)  TYPE OCTAL NUMBER (AS PER LAST CALL)
030356  030102                  $TYPDS  ;;CALL=TYPDS    TRAP+10(104410) TYPE DECIMAL NUMBER (WITH SIGN)
030360  027350                  $SAVREG ;;CALL=SAVREG   TRAP+12(104412) SAVE R0-R5 ROUTINE
030362  027406                  $RESREG ;;CALL=RESREG   TRAP+14(104414) RESTORE R0-R5 ROUTINE
030364  031264                  TBITOFF ;;CALL=TBITO    TRAP+16(104416) THIS WILL TURN OFF T BIT TRAPPING
030366  031312                  TBITRESTORE     ;;CALL=TBITR    TRAP+20(104420) THIS WILL RETURN THE T BIT TO PR

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

                        .SBTTL  POWER DOWN AND UP ROUTINES

                        ;POWER DOWN ROUTINE
030370  012737  030516  000024  $PWRDN: MOV     #$ILLUP,@#PWRVEC ;;SET FOR FAST UP
030376  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;PRIO:7
030404  010046                  MOV     R0,-(SP)        ;;PUSH R0 ON STACK
030406  010146                  MOV     R1,-(SP)        ;;PUSH R1 ON STACK
030410  010246                  MOV     R2,-(SP)        ;;PUSH R2 ON STACK
030412  010346                  MOV     R3,-(SP)        ;;PUSH R3 ON STACK
030414  010446                  MOV     R4,-(SP)        ;;PUSH R4 ON STACK
030416  010546                  MOV     R5,-(SP)        ;;PUSH R5 ON STACK
030420  010637  030522          MOV     SP,$SAVR6       ;;SAVE SP
030424  012737  030436  000024          MOV     #$PWRUP,@#PWRVEC ;;SET UP VECTOR
030432  000000                  HALT
030434  000776                  BR      .-2             ;;HANG UP

                        ;POWER UP ROUTINE
030436  013706  030522  $PWRUP: MOV     $SAVR6,SP       ;;GET SP
030442  005037  030522          CLR     $SAVR6          ;;WAIT LOOP FOR THE TTY
```

```
3904  030446  005237  030522          1$:     INC     $SAVR6          ;;WAIT FOR THE INC
3905  030452  001375                          BNE     1$              ;;OF  WORD
3906  030454  012605                          MOV     (SP)+,R5        ;;POP STACK INTO R5
3907  030456  012604                          MOV     (SP)+,R4        ;;POP STACK INTO R4
3908  030460  012603                          MOV     (SP)+,R3        ;;POP STACK INTO R3
3909  030462  012602                          MOV     (SP)+,R2        ;;POP STACK INTO R2
3910  030464  012601                          MOV     (SP)+,R1        ;;POP STACK INTO R1
3911  030466  012600                          MOV     (SP)+,R0        ;;POP STACK INTO R0
3912  030470  012737  030370  000024          MOV     #$PWRDN,@#PWRVEC ;;SET UP THE POWER DOWN VECTOR
3913  030476  012737  000340  000026          MOV     #340,@#PWRVEC+2 ;;PRIO:7
3914  030504  104400                          TYPE                    ;;REPORT THE POWER FAILURE
3915  030506  030524                  $PWRMG: .WORD   PWRMSG          ;;POWER FAIL MESSAGE POINTER
3916  030510  012716                          MOV     (PC)+,(SP)      ;;RESTART AT START
3917  030512  040076                  $PWRAD: .WORD   START           ;;RESTART ADDRESS
3918  030514  000002                          RTI
3919  030516  000000                  $ILLUP: HALT                    ;;THE POWER UP SEQUENCE WAS STARTED
3920  030520  000776                          BR      .-2             ;; BEFORE THE POWER DOWN WAS COMPLETE
3921  030522  000000                  $SAVR6: 0                       ;;PUT THE SP HERE
3922  030524  006412  047520  042527  PWRMSG: .ASCIZ  <12><15>?POWER FAILURE, RESTARTING PROGRAM?
3923  030532  020122  040506  046111
3924  030540  051125  026105  051040
3925  030546  051505  040524  052122
3926  030554  047111  020107  051120
3927  030562  043517  040522  000115
3928                                    ;;*****************************************************************
3929
3930                                    .SBTTL  ROUTINE TO SIZE MEMORY
3931
3932                                    ;*CALL:
3933                                    ;*      JSR     PC,$SIZE
3934                                    ;*      RETURN
3935                                    ;*$LSTAD WILL CONTAIN:
3936                                    ;*      WITH KT11 OPTION        -- LAST VIRTUAL ADDRESS OF THE LAST BANK
3937                                    ;*      WITHOUT KT11 OPTION     -- LAST ABSOLUTE ADDRESS OF AVAILABLE MEMORY
3938                                    ;*$LSTBK WILL CONTAIN THE LAST BANK AS A SAF
3939                                    ;*$KT11 IS THE MEMORY MANAGEMENT KEY
3940                                    ;*BIT07 = 0 DON'T USE MEMORY MANAGEMENT
3941                                    ;*      MUST BE SETUP BEFORE THE CALL
3942                                    ;*BIT15 = 0 DON'T HAVE MEMORY MANAGEMENT OPTION
3943                                    ;*      DETERMINED BY ROUTINE
3944                                    ;* --NOTE--
3945                                    ;*THIS ROUTINE SUPPORTS PDP 11/74.
3946                                    ;*IF ACTUAL MEMORY IS LESS THAN THAT INDICATED BY SIZE REGISTER
3947                                    ;*AND A REFERENCE IS MADE TO A MEMORY ADDRESS THAT IS GREATER THAN
3948                                    ;*ACTUAL MEMORY BUT LESS THAN SIZE REGISTER (INDICATED), THEN A
3949                                    ;*MEMORY REFERENCE TIMEOUT TO VECTOR 114 WILL OCCUR.
3950
3951  030570  010046                  $SIZE:  MOV     R0,-(SP)        ;;SAVE R0 ON THE STACK
3952  030572  010146                          MOV     R1,-(SP)        ;;SAVE R1 ON THE STACK
3953  030574  010246                          MOV     R2,-(SP)        ;;SAVE R2 ON THE STACK
3954  030576  010346                          MOV     R3,-(SP)        ;;SAVE R3 ON THE STACK
3955  030600  013746  000004                  MOV     @#ERRVEC,-(SP)  ;;SAVE PRESENT ERROR VECTOR PS & PC
3956  030604  013746  000006                  MOV     @#ERRVEC+2,-(SP)
3957  030610  013746  000114                  MOV     @#114,-(SP)     ;;SAVE PRESENT PARITY VECTOR PS &PC
3958  030614  013746  000116                  MOV     @#116,-(SP)
3959  030620  010600                          MOV     SP,R0           ;;SAVE THE STACK POINTER
```

```
3960  030622  013737  177776  000006          MOV     @#PS,@#ERRVEC+2 ;;SET ERRVEC PS TO PRESENT PS
3961  030630  012701  003776                  MOV     #3776,R1        ;;SETUP ADDRESS
3962  030634  105727                          TSTB    (PC)+           ;;USE MEMORY MANAGEMENT?
3963  030636  000200                $KT11:    .WORD   200             ;;SET TO USE MEMORY MANAGEMENT
3964  030640  100060                          BPL     $CORE           ;;BR IF NO
3965  030642  012737  030774  000004          MOV     #$KTNEX,@#ERRVEC ;;SET FOR TIMEOUT
3966  030650  005737  177572                  TST     @#SR0           ;;KT11 ARE YOU THERE?
3967  030654  052737  100000  030636          BIS     #100000,$KT11   ;;YES--SET KT11 KEY
3968  030662  005046                          CLR     -(SP)           ;;INITIALIZE FOR 'PAR' LOADING
3969  030664  012702  172340                  MOV     #KIPAR0,R2      ;;ADDRESS OF FIRST 'PAR'
3970  030670  012703  000010                  MOV     #^D8,R3         ;;LOAD EIGHT 'PAR.'S' AND EIGHT 'PDR.'S'
3971  030674  012762  077406  177740  1$:     MOV     #77406,-40(R2)  ;;PDR = 4K, UP, READ/WRITE
3972  030702  011622                          MOV     (SP),(R2)+      ;;LOAD 'PAR'
3973  030704  062716  000200                  ADD     #200,(SP)       ;;UPDATE FOR NEXT 'PAR'
3974  030710  077307                          SOB     R3,1$           ;;LOOP UNTIL ALL EIGHT ARE LOADED
3975  030712  012742  177600                  MOV     #177600,-(R2)   ;;SETUP KIPAR7 FOR I/O
3976  030716  005042                          CLR     -(R2)           ;;SETUP KIPAR6 FOR TESTING
3977  030720  012737  000020  172516          MOV     #20,@#SR3       ;;ENABLE 22-BIT ADDRESSING
3978  030726  005237  177572                  INC     @#SR0           ;;TURN ON MEMORY MANAGEMENT
3979  030732  012737  030764  000004          MOV     #$KTOUT,@#ERRVEC ;;SET FOR TIME OUT
3980  030740  012737  031106  000114          MOV     #$MTMOUT,@#114  ;;SET FOR MEM REF TIMEOUT
3981  030746  005737  143776          2$:     TST     @#143776        ;;TRAP ON NON-EX-MEM
3982  030752  062712  000040                  ADD     #40,(R2)        ;;MAKE A 1K STEP
3983  030756  023712  172356                  CMP     @#KIPAR7,(R2)   ;;LAST ONE?
3984  030762  101371                          BHI     2$              ;;NO--TRY IT
3985  030764  011202                $KTOUT:   MOV     (R2),R2         ;;GET LAST BANK+1
3986  030766  005037  177572                  CLR     @#SR0           ;;TURN OFF MEMORY MANAGEMENT
3987  030772  000421                          BR      $SIZEX
3988  030774  042737  100000  030636  $KTNEX: BIC     #100000,$KT11   ;;KT11 NON-EXISTENT
3989  031002  012737  031032  000004  $CORE:  MOV     #$CROUT,@#ERRVEC ;;SET FOR TIMEOUT
3990  031010  005002                          CLR     R2              ;;SET UP BANK
3991  031012  062701  004000          1$:     ADD     #4000,R1        ;;INCREMENT BY 1K
3992  031016  062702  000040                  ADD     #40,R2          ;;1K STEP
3993  031022  005711                          TST     (R1)            ;;TRAP ON TIME OUT
3994  031024  022701  177776                  CMP     #177776,R1      ;;LAST ONE
3995  031030  001370                          BNE     1$              ;;NO--TRY AGAIN
3996  031032  162701  004000          $CROUT: SUB     #4000,R1
3997  031036  162702  000040          $SIZEX: SUB     #40,R2          ;;DROP BACK
3998  031042  010006                          MOV     R0,SP           ;;RESTORE THE STACK
3999  031044  012637  000116                  MOV     (SP)+,@#116     ;;RESTORE PARITY VECTOR
4000  031050  012637  000114                  MOV     (SP)+,@#114
4001  031054  012637  000006                  MOV     (SP)+,@#ERRVEC+2 ;;RESTORE ERROR VECTOR
4002  031060  012637  000004                  MOV     (SP)+,@#ERRVEC
4003  031064  010137  031140                  MOV     R1,$LSTAD       ;;LAST ADDRESS
4004  031070  010237  031142                  MOV     R2,$LSTBK       ;;LAST BANK
4005  031074  012603                          MOV     (SP)+,R3        ;;RESTORE R3
4006  031076  012602                          MOV     (SP)+,R2        ;;RESTORE R2
4007  031100  012601                          MOV     (SP)+,R1        ;;RESTORE R1
4008  031102  012600                          MOV     (SP)+,R0        ;;RESTORE R0
4009  031104  000207                          RTS     PC
4010  031106  032737  000001  177744  $MTMOUT: BIT    #BIT0,@#MEMERR  ;;MAKE SURE TRAP TO 114 IS
4011  031114  001005                          BNE     1$              ;;DUE TO MEM REF TIMEOUT
4012                                                                  ;;IF NOT, IS IT AN ABORT?
4013  031116  032737  100000  177744          BIT     #BIT15,@#MEMERR ;;CPU ABORT?
4014  031124  001001                          BNE     1$              ;;IF YES EXIT OUT
4015  031126  000002                          RTI                     ;;IF NOT, CONTINUE
```

```
                                                        ;;CLEAR MEM ERROR REG
                                                        ;;CONTAINS THE LAST ADDRESS
                                                        ;;CONTAINS THE LAST BANK
                                                        ;;**********************************************************************
                                                        .SBTTL  DOUBLE LENGTH BINARY TO OCTAL ASCII CONVERT ROUTINE
                                                        ;*THIS ROUTINE WILL CONVERT A 32-BIT UNSIGNED BINARY NUMBER TO AN
                                                        ;*UNSIGNED OCTAL ASCIZ NUMBER.
                                                        ;*CALL
                                                        ;*      MOV     #PNTR,-(SP)     ;;POINTER TO LOW WORD OF BINARY NUMBER
                                                        ;*      JSR     PC,@#$DB2O      ;;CALL THE ROUTINE
                                                        ;*      RETURN                  ;;THE ADDRESS OF THE FIRST ASCIZ CHAR. IS ON THE STACK
                                                        $DB2O:  SAVREG                  ;;SAVE ALL REGISTERS
                                                                MOV     2(SP),R1        ;;PICKUP THE POINTER TO LOW WORD
                                                                MOV     #$OCTVL+13.,R5  ;;POINTER TO DATA TABLE
                                                                MOV     #12.,R4         ;;DO ELEVEN CHARACTERS
                                                                MOV     #^C7,R3         ;;MASK
                                                                MOV     (R1)+,R0        ;;LOWER WORD
                                                                MOV     (R1)+,R1        ;;HIGH WORD
                                                                CLR     R2              ;;TERMINATOR
                                                        1$:     MOVB    R2,-(R5)        ;;PUT CHARACTER IN DATA TABLE
                                                                MOV     R0,R2           ;;GET THIS DIGIT
                                                                DEC     R4              ;;COUNT THIS CHARACTER
                                                                BGT     3$              ;;BR IF NOT THE LAST DIGIT
                                                                BEQ     2$              ;;BR IF IT IS THE LAST DIGIT
                                                                INC     R5              ;;ALL DIGITS DONE-ADJUST POINTER FOR FIRST
                                                                MOV     R5,2(SP)        ;;ASCIZ CHAR. & PUT IT ON THE STACK
                                                                RESREG                  ;;RESTORE ALL REGISTERS
                                                                RTS     PC              ;;RETURN TO USER
                                                        2$:     ASR     R3              ;;POSITION THE MASK FOR THE LAST DIGIT
                                                        3$:     ROR     R1              ;;POSITION THE BINARY NUMBER FOR
                                                                ROR     R0              ;;      THE NEXT OCTAL DIGIT
                                                                ROR     R1
                                                                ROR     R0
                                                                ROR     R1
                                                                ROR     R0
                                                                BIC     R3,R2           ;;MASK OUT ALL JUNK
                                                                ADD     #'0,R2          ;;MAKE THIS CHAR. ASCII
                                                                BR      1$              ;;GO PUT IT IN THE DATA TABLE
                                                        $OCTVL: .BLKB   14.             ;;RESERVE DATA TABLE
                                                        .SBTTL  ************* SUBROUTINES UNIQUE TO THIS PROGRAM ***************
                                                        .SBTTL  TURN OFF AND SAVE T-BIT
                                                        ;*
                                                        ;*      THIS SUBROUTINE IS REACHED BY THE TRAP CALL 'TBITO', IT IS
                                                        ;*      USED TO TURN OFF THE T-BIT IF IT IS ON.  THE PROCESSOR STATUS
```

```
4072                                    ;*      IS SAVED IN ''OLDPSW'' SO THAT THE T-BIT CAN BE RESTORED TO ITS
4073                                    ;*      PREVIOUS STATUS WHEN CONDITIONS WARRANT.
4074                                    ;*
4075                                            .EQUIV  BIT4,TBIT       ;T-BIT IS BIT04 IN PROC. STATUS
4076  031264                            TBITOFF:
4077  031264  032766  000020  000002           BIT     #TBIT,2(KSP)    ;IS THE T-BIT ON?
4078  031272  001406                           BEQ     1$              ;BRANCH TO EXIT IF IT IS NOT ON
4079  031274  016637  000002  001312           MOV     2(KSP),OLDPSW   ;SAVE OLD PSW FOR RESTORING T BIT
4080  031302  042766  000020  000002           BIC     #TBIT,2(KSP)    ;CLEAR T BIT IF IT IS ON
4081  031310  000006                    1$:     RTT                     ;RETURN TO PROGRAM
4082
```

```
                                        .SBTTL  RESTORE T-BIT TO ITS PREVIOUS CONDITION
                                        ;*
                                        ;*      THIS SUBROUTINE CAN BE REACHED BY THE TRAP CALL 'TBITR', IT IS
                                        ;*      USED TO RESTORE THE T-BIT AFTER A PARTICULAR TEST THAT CANNOT
                                        ;*      BE RUN WITH THE T-BIT ON.  IT USES THE PROCESSOR STATUS STORED
                                        ;*      IN ''OLDPSW'' BY 'TBITO', REPLACES THE PS ON THE STACK WITH IT
                                        ;*      AND DOES AN 'RTT'.
                                        ;*
031312                                  TBITRESTORE:
031312  013766  001312  000002                MOV     OLDPSW,2(KSP)   ;PUT OLD PSW ON STACK
031320  042737  000020  001312                BIC     #TBIT,OLDPSW    ;CLEAR T-BIT IN ''OLDPSW'' SO THAT
                                                                        ;IT WON'T BE TURNED ON BY ACCIDENT
031326  000006                                RTT                     ;RETURN TO PROGRAM AND INHIBIT
                                                                        ;T BIT TRAP AFTER THIS INSTRUCTION.


                                        .SBTTL  CLEAR 16 PARS OR PDRS STARTING FROM ADDRESS IN R5
                                        ;;**************************************************************************
                                        ;*      SUBROUTINE CLRREG
                                        ;*
                                        ;*      THIS SUBROUTINE CLEARS 16 CONSECUTIVE MEMORY MANAGEMENT
                                        ;*      REGISTERS STARTING WITH THE REGISTER POINTED TO BY R5.
                                        ;*      IT SAVES R0 ON THE STACK AND LOADS A COUNT IN R0,
                                        ;*      CLEARS THE PAR'S OR PDR'S, AND THEN RESTORES R0 BEFORE
                                        ;*      RETURNING.
                                        ;*      THE CALLING SEQUENCE IS:
                                        ;*      MOV     #KIPAR0,R5      ;PUT ADDRESS OF FIRST KERNEL PAR IN R5
                                        ;*      JSR     PC,CLRREG       ;GO CLEAR ALL KERNEL PAR'S
                                        ;*
                                        ;;**************************************************************************

031330  010046                          CLRREG: MOV     R0,-(KSP)       ;SAVE R0 ON STACK
031332  012700  000020                        MOV     #20,R0          ;PUT COUNT IN R0
031336  005025                          1$:     CLR     (R5)+           ;CLEAR PAR ORPDR POINTED TO BY R5
031340  077002                                SOB     R0,1$           ;BRANCH BACK 15 DECIMAL TIMES.
031342  012600                                MOV     (KSP)+,R0       ;RESTORE R0 FROM STACK
031344  000207                                RTS     PC              ;RETURN TO TEST

                                        .SBTTL  CLEANUP LOCATIONS THAT HOLD LOGICAL 'AND' AND 'OR'
                                        ;;**************************************************************************
                                        ;*      SUBROUTINE CLEANUP
```

```
                        ;*
                        ;*      THIS SUBROUTINE IS USED TO INITIALIZE ALL THE LOCATIONS THAT
                        ;*      HOLD THE ''LOGICAL AND'' AND ''LOGICAL OR'' OF THE DATA AND ADDRESSES
                        ;*      THAT FAILED DURING THE EXECUTION OF A TEST.
                        ;*
                        ;;*************************************************************************

031346                  CLEANUP:                        ;STARTING ADDRESS OF SUBROUTINE.
031346  005037  001266          CLR     DATAOR          ;LOCATION FOR LOGICAL OR OF BAD DATA
031352  005037  001276          CLR     ADDROR          ;LOCATION FOR LOGICAL OR OF ADDRESS
031356  005037  001272          CLR     PATTOR          ;LOCATION FOR LOGICAL OR OF PATTERN LOADED
031362  012700  177777          MOV     #-1,R0          ;LOAD -1 INTO R0 TO INITIALIZE LOGICAL AND LOCS
031366  010037  001270          MOV     R0,DATAND       ;LOCATION FOR LOGICAL AND OF BAD DATA
031372  010037  001300          MOV     R0,ADRAND       ;LOCATION FOR LOGICAL AND OF ADDRESS
031376  010037  001274          MOV     R0,PATAND       ;LOCATION FOR LOGICAL AND OF PATTERN LOADED
031402  000207                  RTS     PC              ;RETURN TO TEST

                        .SBTTL  P.A.R. OR P.D.R. ADDRESS TIMED OUT WHEN REFERENCED
                        ;;*************************************************************************
                        ;*
                        ;*      THIS SUBROUTINE IS USED TO LOG AND REPORT THE FACT THAT A
                        ;*      REFERENCE TO A P.A.R. OR A P.D.R. TIMED OUT ON THE UNIBUS.  IT
                        ;*      KEEPS A LOGICAL AND AND A LOGICAL OR OF EACH ADDRESS THAT TIMES
                        ;*      OUT.
                        ;;*************************************************************************
031404                  TIMEOUT:                        ;STARTING ADDRESS OF SUBROUTINE
031404  005227                  INC     (PC)+           ;INCREMENT ONE TIME GATE
031406  177777  TOFLAG: .WORD   -1                      ;ONE TIME ENTANCE FLAG
031410  001401          BEQ     10$                     ;BRANCH IF FLAG IS NOW ZERO
031412  000000          HALT                            ;I HAVE ENTERED THIS ROUTINE BEFORE
                                                        ;I FINISHED REPORTING THE FIRST ERROR
                                                        ;THE SECOND ENTRY ADDRESS IS ON THE
                                                        ;STACK AND THE FIRST ERROR CONDITION
                                                        ;IS PROBABLY STILL LOCKED UP .
031414  012637  001306  10$:    MOV     (KSP)+,OLDPC    ;SAVE RETURN ADDRESS
031420  012637  001310          MOV     (KSP)+,OLDPS    ;SAVE OLD PSW
031424  013737  177766  001260  MOV     @#CPUERR,PCPUER ;SAVE CPU ERROR REGISTER
031432  013737  001260  177766  MOV     PCPUER,@#CPUERR ;CLEAR CPU ERROR REGISTER
031440  023737  001260  001224  CMP     PCPUER,CPUEXP   ;SEE IF EXPECTEED CONDITION CAME UP.
031446  001402          BEQ     1$                      ;BRANCH IF IT WAS A TIMEOUT
031450  104001          ERROR   1                       ;NOT RIGHT CONDITION
031452  000414          BR      3$                      ;BRANCH TO EXIT
031454  050037  001276  1$:     BIS     R0,ADDROR       ;PERFORM LOGIAL OR OF FAILING ADDRESS
031460  005100          COM     R0                      ;GET R0 READY FOR AND
031462  040037  001300          BIC     R0,ADRAND               ;PERFORM LOGICAL AND
031466  005100          COM     R0                      ;PUT R0 BACK AS IT WAS
031470  105737  001103          TSTB    $ERFLG          ;IS HIS THE FIRST ERROR
031474  001002          BNE     2$                      ;BRANCH IF NOT FIRST ERROR
031476  104201          ERROR   201                     ;NO REGISTER RESPONSE.
031500  000401          BR      3$                      ;BRANCH TO EXIT
031502  104301  2$:     ERROR   301                     ;CONTINUE NO RESPONSE TABLE
031504  012737  177777  031406  3$:     MOV     #-1,TOFLAG      ;RESET ONE TIME GATE
031512  013746  001310          MOV     OLDPS,-(KSP)    ;RESTORE OLD PSW
031516  013746  001306          MOV     OLDPC,-(KSP)    ;PUSH RETURN ADDRESS BACK ON THE STACK
031522  000006          RTT                             ;RETURN TO THE TEST
```

```
                                .SBTTL  DUAL ADDRESSING WHEN LOADING A P.A.R. OR P.D.R.
                                ;;*************************************************************************
                                ;*
                                ;*      THIS SUBROUTINE WILL LOG AND REPORT ALL DUAL ADDRESSING ERRORS
                                ;*      FOUND IN BOTH P.A.R.'S AND P.D.R.'S.  A 'LOGICAL OR'' AND A
                                ;*      'LOGICAL AND'' OF THE WRITTEN ADDRESSES WILL BE MAINTAINED IN
                                ;*      'ADDROR' AND 'ADRAND'.  THE LOG ON THE ADDITIONAL OR FAILING,
                                ;*      ADDRESSES WILL BE MAINTAINED IN 'DATAOR' AND 'DATAND'.
                                ;*
                                ;;*************************************************************************
031524                          DUALADR:                        ;STARTING LOCATION OF SUBROUTINE
031524  012637  001306                  MOV     (KSP)+,OLDPC    ;SAVE RETURN ADDRESS IN CASE OF LOOP
031530  050037  001276                  BIS     R0,ADDROR       ;LOGICAL OR OF WRITTEN ADDRESS
031534  005100                          COM     R0              ;GET R0 READY FOR AND
031536  040037  001300                  BIC     R0,ADRAND               ;PERFORM LOGICAL AND
031542  005100                          COM     R0              ;PUT R0 BACK AS IT WAS
031544  050137  001266                  BIS     R1,DATAOR       ;LOGICAL OR OF DUALED ADDRESS
031550  005101                          COM     R1              ;GET R1 READY FOR AND
031552  040137  001270                  BIC     R1,DATAND               ;PERFORM LOGICAL AND
031556  005101                          COM     R1              ;PUT R1 BACK AS IT WAS
031560  105737  001103                  TSTB    $ERFLG          ;SEE IF THIS IS FIRST ERROR
031564  001002                          BNE     1$              ;BRANCH IF NOT FIRST ERROR
031566  104202                          ERROR   202
031570  000401                          BR      2$              ;BRANCH TO EXIT
031572  104302                  1$:     ERROR   302
031574  000177  147506          2$:     JMP     @OLDPC          ;RETURN TO TEST

                                .SBTTL  COUNT PATTERN ERRORS IN P.A.R.'S OR P.D.R.'S
                                ;;*************************************************************************
                                ;*
                                ;*      THIS SUBROUTINE IS USED TO LOG AND REPORT THE COUNT PATTERN
                                ;*      ERRORS OCCURRING WHEN TESTING THE P.A.R.'S AND P.D.R.'S.
                                ;*      THE '' OGICAL OR'' AND 'LOGICAL AND'' OF VARIOUS DATA WILL BE
                                ;*      MAINTAINED AS FOLLOWS:
                                ;*      ADDRESSES OF FAILING REGISTERS IN 'ADDROR' AND 'ADRAND'
                                ;*      DATA FETCHED FROM REGISTERS IN 'DATAOR' AND 'DATAND'
                                ;*      PATTERN LOADED INTO THE REGISTERS IN 'PATTOR' AND 'PATAND'.
                                ;*
                                ;;*************************************************************************
031600                          PARCOUNT:                       ;STARTING ADDRESS OF THIS SUBROUTINE
031600  012637  001306                  MOV     (KSP)+,OLDPC    ;SAVE RETURN ADDRESS IN CASE OF LOOP
031604  050037  001276                  BIS     R0,ADDROR       ;LOGICAL OR OF FAILING ADDRESS
031610  005100                          COM     R0              ;GET R0 READY FOR AND
031612  040037  001300                  BIC     R0,ADRAND               ;PERFORM LOGICAL AND
031616  005100                          COM     R0              ;PUT R0 BACK AS IT WAS
031620  050137  001272                  BIS     R1,PATTOR       ;LOGICAL OR OF PATTERN LOADED
031624  005101                          COM     R1              ;GET R1 READY FOR AND
031626  040137  001274                  BIC     R1,PATAND               ;PERFORM LOGICAL AND
031632  005101                          COM     R1              ;PUT R1 BACK AS IT WAS
031634  050237  001266                  BIS     R2,DATAOR       ;LOGICAL OR OF DATA FETCHED
031640  005102                          COM     R2              ;GET R2 READY FOR AND
031642  040237  001270                  BIC     R2,DATAND               ;PERFORM LOGICAL AND
031646  005102                          COM     R2              ;PUT R2 BACK AS IT WAS
```

```
 4237  031650  105737  001103                  TSTB    $ERFLG          ;SEE IF THIS IS THE FIRST ERROR
 4238  031654  001002                          BNE     1$              ;BRANCH IF NOT FIRST ERROR
 4239  031656  104203                          ERROR   203
 4240  031660  000401                          BR      2$              ;BRANCH TO EXIT
 4241  031662  104303              1$:         ERROR   303
 4242  031664  000177  147416      2$:         JMP     @OLDPC          ;RETURN TO TEST
 4243
 4244
 4245                              .SBTTL  ********************* TRAP HANDLING ROUTINES *********************
 4246
 4247                              .SBTTL  CPU TRAP HANDLER ROUTINE
 4248                              ;;*************************************************************************
 4249                              ;*
 4250                              ;*      THIS SUBROUTINE WILL HANDLE ALL CPU TRAPS AND ABORTS, THRU
 4251                              ;*      'ERRVEC' (000004).  IF THIS SUBROUTINE IS ENTERED BY A SECOND
```

```
                        ;*      TRAP BEFORE THE FIRST HAS BEEN PROCESSED A HALT IS EXECUTED.
                        ;*      IF THE WORD 'CPUEXP' IS ZERO, NO TRAP WAS EXPECTED AND AN
                        ;*      UNEXPECTED ERROR MESSAGE IS GIVEN.  IF THE WORD 'CPUEXP' IS
                        ;*      NOT ZERO THEN THE CPU ERROR REGISTER 'CPUERR' IS COMPARED WITH
                        ;*      'CPUEXP' TO SEE IF THE PROPER CONDITION OCCURRED.  'PCPUER' CAN
                        ;*      BE USED AS A FLAG TO INDICATE THAT A TRAP HAS OCCURRED SINCE IT
                        ;*      IS LOADED WITH THE ERROR REGISTER IF A TRAP VECTORS HERE
                        ;*
                        ;;*************************************************************************
031670  005227          CPUER:  INC     (PC)+           ;MAKE FLAG ZERO IF FIRST TIME
031672  177777          CPFLAG: .WORD   -1              ;NEGATIVE ONE FOR A FLAG
031674  001401                  BEQ     10$             ;BRANCH IF FIRST TIME IN
031676  000000                  HALT                    ;I HAVE ENTERED THIS ROUTINE BEFORE
                                                        ;I FINISHED REPORTING THE FIRST ERROR
                                                        ;THE SECOND ENTRY ADDRESS IS ON THE
                                                        ;STACK AND THE FIRST ERROR CONDITION
                                                        ;IS PROBABLY STILL LOCKED UP .
031700  012637  001306          10$:    MOV     (KSP)+,OLDPC    ;SAVE RETURN ADDRESS IN CASE OF LOOP
031704  012637  001310                  MOV     (KSP)+,OLDPS    ;SAVE OLD PSW IN CASE OF LOOP
031710  013737  177766  001260          MOV     CPUERR,PCPUER   ;SAVE CPU ERROR REGISTER
031716  013737  001306  001262          MOV     OLDPC,BADPC     ;SAVE PC+2 AT TIME OF ABORT
031724  005737  001224                  TST     CPUEXP          ;SEE IF ANY CONDITION WAS EXPECTED
031730  001406                          BEQ     2$              ;BRANCH IF NO TRAP WAS EXPECTED
031732  023737  001260  001224          CMP     PCPUER,CPUEXP   ;SEE IF EXPECTED ERROR OCCURED
031740  001403                          BEQ     1$              ;BRANCH IF ERROR CODES MATCH
031742  104001                          ERROR   1               ;ERROR TYPE OUT ITEM 1
031744  000401                          BR      1$              ;SKIP NEXT INSTRUCTION
031746  104002                  2$:     ERROR   2               ;ERROR ITEM 2 NO CPU TRAP EXPECTED
031750  005037  177766          1$:     CLR     CPUERR          ;CLEAR CPU ERROR REGISTER
031754  012737  177777  031672          MOV     #-1,CPFLAG      ;MAKE FLAG NEGATIVE ONE FOR NEXT TIME
031762  013746  001310                  MOV     OLDPS,-(KSP)    ;PUSH OLD PSW BACK ON STACK
031766  013746  001306                  MOV     OLDPC,-(KSP)    ;PUSH RETURN ADDRESS BACK ON STACK
031772  000006                          RTT                     ;RETURN FROM INTERRUPT OR ABORT


                        .SBTTL  CACHE TRAPS AND ABORTS HANDLER ROUTINE
                        ;;*************************************************************************
                        ;*
                        ;*      THIS SUBROUTINE WILL HANDLE ALL UNEXPECTED PARITY ERRORS.  IF
                        ;*      THE PARITY ERROR IS AN ABORT THE TEST THAT WAS RUNNING WILL
                        ;*      BE RESTARTED ONCE AFTER THE ABORT CONDITION IS REPORTED.  ON THE
                        ;*      SECOND ABORT IN A SINGLE TEST THE NEXT TEST IS ATTEMPTED
                        ;*      AFTER THE ABORT IS REPORTED.
                        ;*      IF THE PARITY ERROR IS A TRAP THE CACHE WILL BE CLEANED UP BY
                        ;*      REMOVING THE BAD WORD THAT MAY BE IN THE CACHE, AND THE TEST
                        ;*      WILL BE CONTINUED AFTER THE PARITY ERROR IS REPORTED.
                        ;*
                        ;;*************************************************************************
031774  005227          MEMER:  INC     (PC)+           ;MAKE FLAG ZERO IF FIRST TIME
031776  177777          PAFLAG: .WORD   -1              ;NEGATIVE ONE FOR A FLAG
032000  001401                  BEQ     10$             ;BRANCH IF FIRST TIME IN
032002  000000                  HALT                    ;I HAVE ENTERED THIS ROUTINE BEFORE
                                                        ;I FINISHED REPORTING THE FIRST ERROR
                                                        ;THE SECOND ENTRY ADDRESS IS ON THE
                                                        ;STACK AND THE FIRST ERROR CONDITION
```

```
                                                        ;IS PROBABLY STILL LOCKED UP .
032004  012737  032224  000114  10$:    MOV     #5$,CACHVEC     ;SE1 CACHE VECTOR TO RTI UNTIL THE
                                                        ;THE CACHE HAS BEEN FIXED.
032012  012637  001306                   MOV     (KSP)+,OLDPC    ;SAVE RETURN ADDRESS IN CASE OF LOOP
032016  012637  001310                   MOV     (KSP)+,OLDPS    ;SAVE OLD PSW IN CASE OF LOOP
032022  013737  177740  001234           MOV     @#LOADRS,PLOADR ;SAVE LOWER CACHE ADDR REG
032030  013737  177742  001236           MOV     @#HIADRS,PHIADR ;SAVE HIGH BITS OF FAILING ADDR
032036  013737  177744  001240           MOV     @#MEMERR,PPARER ;SAVE MEMORY ERROR REGISTER
032044  013737  177746  001242           MOV     @#CONTRL,PCONTR ;SAVE CONTROL REGISTER FOR TYPE OUT
032052  013737  177750  001244           MOV     @#MAINT,PMAINT  ;SAVE MAINTENENCE REGISTER
032060  013737  177752  001246           MOV     @#HITMIS,PHITMI ;SAVE HIT/MISS REGISTER
032066  013737  001306  001262           MOV     OLDPC,BADPC     ;SAVE PC+2 AT TIME OF ABORT
032074  032737  000014  001240           BIT     #14,PPARER      ;WAS THIS A MAIN MEMORY REFERENCE
032102  001005                           BNE     1$              ;BRANCH IF IT WAS A MAIN MEMORY ERROR
032104  012737  031774  000114           MOV     #MEMER,CACHVEC  ;LOAD ADDRESS OF THIS ROUTINE IN VECTOR
032112  104003                           ERROR   3               ;UNEXPECTED CACHE PARITY ERROR
032114  000415                           BR      2$              ;BRANCH TO EXIT POINT
032116  010046          1$:      MOV     R0,-(KSP)       ;SAVE R0 ON STACK
032120  013700  001234                   MOV     PLOADR,R0       ;PUT LOW 16 BITS OF BAD ADDR IN R0
032124  042700  176000                   BIC     #176000,R0      ;CLEAR UPPER 6 BITS OF ADDRESS
032130  074027  000002                   XOR     R0,#BIT1        ;REFERENCE OTHER WORD OF PAIR
032134  005710                           TST     (R0)            ;READ AT SAME INDEX AS BAD WORD
032136  012600                           MOV     (KSP)+,R0       ;RESTORE R0 FROM STACK
032140  012737  031774  000114           MOV     #MEMER,CACHVEC  ;LOAD ADDRESS OF THIS ROUTINE IN VECTOR
032146  104004                           ERROR   4               ;UNEXPECTED MAIN MEMORY PARITY ERROR
032150  005737  001314          2$:      TST     RETRY           ;ARE YOU RETRYING THIS TEST?
032154  001006                           BNE     3$              ;BRANCH IF THIS IS SECOND TRY
032156  005237  001314                   INC     RETRY           ;SET RETRY FLAG
032162  013737  001110  001306           MOV     $LPADR,OLDPC    ;RETURN TO START OF THIS TEST
032170  000403                           BR      4$              ;BRANCH TO EXIT
032172  013737  001316  001306  3$:      MOV     NXTTST,OLDPC    ;RETURN TO START OF NEXT TEST
                                                        ;SINCE THIS IS THE SECOND ABORT
032200  013737  001240  177744  4$:      MOV     PPARER,MEMERR   ;CLEAR MEMORY ERROR REGISTER
032206  012737  177777  031776           MOV     #-1,PAFLAG      ;RESTORE A NEGATIVE ONE FOR NEXT TIME
032214  013746  001310                   MOV     OLDPS,-(KSP)    ;PUSH OLD PSW BACK ON STACK
032220  013746  001306                   MOV     OLDPC,-(KSP)    ;PUSH RETURN ADDRESS BACK ON STACK
032224  000006          5$:      RTT                     ;RETURN FROM INTERRUPT.


                         .SBTTL  MEMORY MANAGEMENT TRAPS AND ABORTS HANDLER ROUTINE
                         ;;*************************************************************************
                         ;*
                         ;*      THIS SUBROUTINE WILL HANDLE MOST OF THE MEMORY MANAGEMENT TRAPS
                         ;*      AND ABORTS THAT ARE GENERATED DURING THIS PROGRAM.  ANY M.M.
                         ;*      ABORTS OR TRAPS THAT OCCUR WHILE 'MMEXP' IS ZERO ARE UNEXPECTED
                         ;*      AND WILL BE REPORTED AS SUCH.  THIS MAY OCCUR BECAUSE SOME LOGIC
                         ;*      THAT IS TO INHIBIT A TRAP HAS FAILED.
                         ;*      THERE ARE ALSO TIMES WHEN I AM EXPECTING A CERTAIN CONDITION TO
                         ;*      OCCUR, AND WHEN THIS CONDITION IN 'MMEXP' DOES NOT MATCH THE
                         ;*      CONTENTS OF 'PMMR0' (SAME AS 'MMR0') AN ERROR IS REPORTED.
                         ;*
                         ;;*************************************************************************
032226  005227  MMTRAP: INC     (PC)+           ;MAKE FLAG ZERO IF FIRST TIME
032230  177777  MMFLAG: .WORD   -1              ;FLAG SHOULD BE NEG ONE
032232  001401          BEQ     10$             ;BRANCH IF FIRST TIME INTO ROUTINE
```

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4364  032234  000000                          HALT                    ;I HAVE ENTERED THIS ROUTINE BEFORE
4365                                                                  ;I FINISHED REPORTING THE FIRST ERROR
4366                                                                  ;THE SECOND ENTRY ADDRESS IS ON THE
4367                                                                  ;STACK AND THE FIRST ERROR CONDITION
4368                                                                  ;IS PROBABLY STILL LOCKED UP .
4369  032236  011637  001262          10$:    MOV     (KSP),BADPC     ;SAVE PC AT TIME OF ABORT OR TRAP
4370  032242  012637  001306                  MOV     (KSP)+,OLDPC    ;SAVE RETURN ADDRESS IN CASE OF LOOP
4371  032246  012637  001310                  MOV     (KSP)+,OLDPS    ;SAVE OLD PSW IN CASE OF LOOP
4372  032252  013737  177572  001250          MOV     MMR0,PMMR0      ;SAVE STATUS REGISTER
4373  032260  013737  177574  001252          MOV     MMR1,PMMR1      ;SAVE AUTO INC/DEC REGISTER
4374  032266  013737  177576  001254          MOV     MMR2,PMMR2      ;SAVE VIRTUAL ADDRESS REGISTER
4375  032274  005737  001226                  TST     MMEXP           ;SEE IF ANY M.M. TRAPS WERE EXPECTED
4376  032300  001002                          BNE     5$              ;BRANCH IF ONE WAS EXPECTED
4377  032302  104005                          ERROR   5               ;UNEXPECTED M.M. ABORT OR TRAP
4378  032304  000405                          BR      1$              ;BRANCH TO EXIT
4379  032306  023737  001226  001250  5$:     CMP     MMEXP,PMMR0     ;SEE IF ABORT OR TRAP WAS EXPECTED
4380  032314  001401                          BEQ     1$              ;BRANCH IF CONDITION CORRECT
4381  032316  104006                          ERROR   6               ;ERROR TYPE OUT ITEM 6
4382  032320  042737  177376  177572  1$:     BIC     #177376,@#MMR0  ;CLEAR ALL BITS EXCEPT 0 AND 8
4383  032326  012737  177777  032230          MOV     #-1,MMFLAG      ;RESTORE A NEGATIVE ONE TO FLAG
4384  032334  013746  001310                  MOV     OLDPS,-(KSP)    ;PUSH OLD PSW ONTO STACK
4385  032340  013746  001306                  MOV     OLDPC,-(KSP)    ;PUSH RETURN ADDRESS ON STACK
4386  032344  000006                          RTT                     ;RETURN TO MAIN PROGRAM
4387
4388
4389                                  .SBTTL  D-SPACE TESTS MEMORY MANAGEMENT ABORT SERVICE ROUTINE
4390                                  ;;**********************************************************************
4391                                  ;*
4392                                  ;*      THIS ROUTINE WILL BE ENTERED IF A MEMORY MANAGEMENT ABORT
4393                                  ;*      OCCURS DURING THE D-SPACE ENABLE TESTS.  IF THE ABORT IS A
4394                                  ;*      NON-RESIDENT ABORT THE PROBLEM IS PROBABLY IN THE D-SPACE
4395                                  ;*      ENABLE LOGIC ON PAGES 'SAPK' AND 'SSRB' IN THE PRINTS.
4396                                  ;*      IN ALL OF THE D-SPACE ENABLE TESTS, D-SPACE PAGES 2 & 3
4397                                  ;*      ARE MAPPED NON-RESIDENT AND I-SPACE PAGE 4 IS MAPPED NON-
4398                                  ;*      RESIDENT.  ALL OTHER PAGES ARE MAPPED RESIDENT, 4K, READ/WRITE.
4399                                  ;*      THEREFORE IF THE N.R. PAGE IS 2 OR 3 YOU ARE PROBABLY NOT
4400                                  ;*      FORCING I-SPACE WHEN YOU SHOULD.  BUT IF THE N.R. PAGE IS 4
4401                                  ;*      YOU ARE PROBABLY FORCING I-SPACE WHEN YOU SHOULD ALLOW D-SPACE
4402                                  ;*
4403                                  ;;**********************************************************************
4404  032346                          NODSPAC:                        ;STARTING ADDRESS FOR ABORT SERVICE
4405  032346  005227                          INC     (PC)+           ;MAKE FLAG ZERO IF FIRST TIME
4406  032350  177777                  NDFLAG: .WORD   -1              ;FLAG SHOULD BE NEG ONE
4407  032352  001401                          BEQ     10$             ;BRANCH IF FIRST TIME INTO ROUTINE
4408  032354  000000                          HALT                    ;I HAVE ENTERED THIS ROUTINE BEFORE
4409                                                                  ;I FINISHED REPORTING THE FIRST ERROR
4410                                                                  ;THE SECOND ENTRY ADDRESS IS ON THE
4411                                                                  ;STACK AND THE FIRST ERROR CONDITION
4412                                                                  ;IS PROBABLY STILL LOCKED UP .
4413  032356  011637  001262          10$:    MOV     (KSP),BADPC     ;SAVE PC AT TIME OF ABORT OR TRAP
4414  032362  012637  001306                  MOV     (KSP)+,OLDPC    ;SAVE RETURN ADDRESS IN CASE OF LOOP
4415  032366  012637  001310                  MOV     (KSP)+,OLDPS    ;SAVE OLD PSW IN CASE OF LOOP
4416  032372  013737  177572  001250          MOV     MMR0,PMMR0      ;SAVE STATUS REGISTER
4417  032400  013737  177574  001252          MOV     MMR1,PMMR1      ;SAVE AUTO INC/DEC REGISTER
4418  032406  013737  177576  001254          MOV     MMR2,PMMR2      ;SAVE VIRTUAL ADDRESS REGISTER
4419  032414  005737  001250                  TST     PMMR0           ;WAS ABORT NON-RESIDENT?
```

```
                                        BPL     1$              ;BRANCH IF NOT, IT IS UNEXPECTED.
                                        ERROR   132             ;D-SPACE ENABLE FAULTY
                                        BR      2$              ;BRANCH TO EXIT
                                1$:     ERROR   5               ;UNEXPECTED M.M. ABORT
                                2$:     BIC     #177376,MMR0    ;CLEAR ALL BITS EXCEPT 0 AND 8
                                        MOV     #-1,NDFLAG      ;RESTORE A NEGATIVE ONE TO FLAG
                                        MOV     OLDPS,-(KSP)    ;PUSH OLD PSW ONTO STACK
                                        MOV     OLDPC,-(KSP)    ;PUSH RETURN ADDRESS ON STACK
                                        RTT                     ;RETURN TO MAIN PROGRAM


                                .SBTTL  TRAP ROUTINES FOR ABORT IN SUPERVISOR OR USER MODE
                                ;;**************************************************************************
                                ;*
                                ;*      THESE NEXT THREE SUBROUTINES ARE USED FOR THE TESTS THAT VERIFY
                                ;*      THE VECTOR IS PICKED UP FROM KERNEL SPACE DURING AN ABORT.
                                ;*      'KERVEC' IS WHERE I SHOULD GO SINCE IT IS AT 250 WHICH IS
                                ;*              KERNEL SPACE VIRTUAL 250.
                                ;*      'SUPVEC' IS AT 350 WHICH IS SUPERVISOR VIRTUAL 250
                                ;*      'USEVEC' IS AT 450 WHICH IS USER SPACE VIRTUAL 250
                                ;*
                                ;*      THEY ALL READ THE PROCESSOR STATUS WHICH IS DIFFERENT FOR EACH
                                ;*      VECTOR AND THEN JUMP TO 'RDMMR0'.  'RDMMR0' READS MMR0, MMR1,
                                ;*      AND MMR2 AND RETURNS TO THE TEST WHERE THEY ARE TESTED.
                                ;*
                                ;;**************************************************************************
                                KERVEC: MOV     PSW,R0          ;PUT PROCESSOR STATUS INTO R0
                                        MOV     (KSP)+,OLDPC    ;SAVE RETURN ADDRESS
                                        MOV     (KSP)+,OLDPS    ;SAVE OLD PROCESSOR STATUS
                                        CMPB    #340,R0         ;SEE IF CORRECT PSW WAS PICKED UP
                                        BEQ     1$              ;BRANCH IF PSW IS CORRECT
                                        ERROR   122             ;WRONG PSW PICKED UP
                                1$:     JMP     RDMMR0          ;JUMP TO READ MMR0

                                SUPVEC: MOV     (KSP)+,OLDPC    ;SAVE RETURN ADDRESS
                                        MOV     (KSP)+,OLDPS    ;SAVE OLD PROCESSOR STATUS
                                        MOV     PSW,R0          ;READ PSW FOR ERROR PRINT OUT
                                        ERROR   123             ;WRONG VECTOR, POSSIBLE WRONG PSW
                                        JMP     RDMMR0          ;GO READ MMR0

                                USEVEC: MOV     (KSP)+,OLDPC    ;SAVE RETURN ADDRESS
                                        MOV     (KSP)+,OLDPS    ;SAVE OLD PROCESSOR STATUS
                                        MOV     PSW,R0          ;READ PSW FOR ERROR PRINT OUT
                                        ERROR   124             ;WRONG VECTOR, POSSIBLE WRONG PSW


                                RDMMR0: MOV     MMR0,PMMR0      ;READ MMR0 TO BE CHECKED LATER
                                        MOV     MMR1,PMMR1      ;READ MMR1 FOR POSSIBLE ERROR REPORT
                                        MOV     MMR2,PMMR2      ;READ MMR2 FOR POSSIBLE ERROR REPORT
                                        MOV     OLDPS,-(KSP)    ;PUSH OLD PROCESSOR STATUS ON STACK
                                        MOV     OLDPC,-(KSP)    ;PUSH RETURN ADDRESS ON STACK
                                        RTT                     ;RETURN TO TEST TO CHECK PMMR0


                                ;;
                                ;;*** TEST FOR VARIOUS KB11 PROCESSORS ***
```

```
                                ;;
                                ;;*THIS ROUTINE POLES THE RESULTS OF ATTEMPTS TO SET TO ONE
                                ;;*CERTAIN CRITICAL BITS THAT ARE KNOWN TO BE OPERATIVE ON A KB11CM,
                                ;;*OR KB11EM PROCESSOR. IF TWO OUT OF FOUR OF THE TESTS ARE
                                ;;*POSITIVE THEN THE KB11CM OR KB11EM FLAG IS SET,IF LESS THAN TWO OF THE
                                ;;*TESTS ARE POSITIVE THEN THE KB11E FLAG OR NO FLAG IS SET. THE DETERMINATION
                                ;;*OF WHICH PAIR IS VALID IS BASED ON THE RESULTS OF EXECUTING AN MFPT OPCODE
                                ;;*(OPCODE 7).  IF THIS INSTRUCTION TRAPS THIS IS AN KB11CM OR
                                ;;*A PLAIN 1170 (KB11-B OR KB11-C).  IF THE INSTRUCTION DOES NOT TRAP THEN
                                ;;*THIS IS A KB11-E OR KB11-EM.
                                ;
032602  105037  001362        KBTST:  CLRB    @#KB11CM        ;RESET THE MP FLAG
032606  005037  001360                CLR     @#KB11E         ;CLEAR KB11E AND KB11EM FLAGS
032612  012737  033050  000010        MOV     #MFPTTR,@#RESVEC ;SET UP TRAP ADDRESS FOR MFPT AT RESERV VECTOR
032620  000007                        MFPT                    ;EXECUTE MFPT. WILL TRAP ON 1170 (KB11B/C) OR
                                                                ;KB11CM (11/74                    )
032622  012737  000001  001360        MOV     #1,@#KB11E      ;HERE IF KB11E OR KB11EM. SET FLAG
032630  005037  177750        T1:     CLR     @#MAINT         ;CLEAR THE MAINTENANCE REGISTER
032634  005005                        CLR     R5              ;RESET THE TEST COUNTER
032636  012700  177746                MOV     #CONTRL,R0      ;GET THE ADDRESS OF...
032642  012701  177750                MOV     #MAINT,R1       ;CCR,MAINT,AND MAPH00...
032646  012702  170202                MOV     #MAPH00,R2      ;AND PLACE IN R0-R2
032652  052710  040000                BIS     #BIT14,(R0)     ;TRY TO SET IVSS BIT
032656  032710  040000                BIT     #BIT14,(R0)     ;DID IT SET?
032662  001403                        BEQ     T2              ;NO,GO TO NEXT TEST
032664  042710  040000                BIC     #BIT14,(R0)     ;CLEAR IT.
032670  005205                        INC     R5              ;TEST IS POSITIVE
032672  052711  000001        T2:     BIS     #BIT0,(R1)      ;SET EDMA IN MAINT REGISTER
032676  032711  000001                BIT     #BIT0,(R1)
032702  001410                        BEQ     T3
032704  052710  004000                BIS     #BIT11,(R0)     ;TRY TO SET DMMA IN CCR
032710  032710  004000                BIT     #BIT11,(R0)
032714  001403                        BEQ     T3
032716  042710  004000                BIC     #BIT11,(R0)
032722  005205                        INC     R5
032724  042711  000001        T3:     BIC     #BIT0,(R1)      ;MAKE SURE EDMA IS CLEAR
032730  052737  100000  172300        BIS     #BIT15,KIPDR0   ;TRY TO SET BYP ON A PDR
032736  032737  100000  172300        BIT     #BIT15,KIPDR0
032744  001404                        BEQ     T4
032746  042737  100000  172300        BIC     #BIT15,KIPDR0
032754  005205                        INC     R5
032756  052712  100000        T4:     BIS     #BIT15,(R2)     ;TRY TO SET BYP ON UNIBUS MAP
032762  032712  100000                BIT     #BIT15,(R2)
032766  001403                        BEQ     T.END
032770  042712  100000                BIC     #BIT15,(R2)
032774  005205                        INC     R5
032776  022705  000002        T.END:  CMP     #2,R5           ;IS THE RESULT OF THE TEST >=2
033002  101021                        BHI     2$              ;NO,THIS IS A KB11E OR KB11-B/C (11/70)
033004  005000                        CLR     R0
033006  005037  177746                CLR     @#CONTRL
033012  013701  177746        3$:     MOV     @#CONTRL,R1
033016  001402                        BEQ     4$
033020  005200                        INC     R0
033022  001373                        BNE     3$
033024                          4$:
033024  005737  001360                TST     @#KB11E         ;IS IT A KB11-E OR KB11-EM?
```

```
4532  033030  001404                        BEQ     1$                      ;BR IF NEITHER. MUST BE KB11CM
4533  033032  012737  000400  001360        MOV     #BIT8,@#KB11E           ;SET UPPER BYTE (KB11-EM)
4534  033040  000402                        BR      2$                      ;DONE
4535  033042  105237  001362        1$:     INCB    @#KB11CM                ;YES, FLAG THIS AS A MODIFIED PROCESSOR
4536  033046  000207                2$:     RTS     PC                      ;DONE
4537
4538  033050                        MFPTTR:                                 ;HERE IF MFPT TRAPPED. SEE IF 1170 OR KB11CM
4539  033050  012716  032630                MOV     #T1,(SP)                ;SET UP RETURN ADDRESS FOR RTI
4540  033054  000002                        RTI                             ;RETURN
4541  033056                        ENDKB:
4542                                ;;**********************************************************************
4543                                ;*
4544                                ;SIZE MEMORY AND COMPARE IT WITH THE SYSTEM SIZE REGISTER
4545                                ;PRINT A WARNING IF THEY DISAGREE.
4546                                ;*
4547                                ;;**********************************************************************
4548
4549  033056  052737  000200  030636  SIZMEM: BIS     #BIT07,$KT11
4550  033064  004737  030570                JSR     PC,$SIZE
4551  033070  062737  000037  031142        ADD     #37,$LSTBK
4552  033076  023737  177760  031142        CMP     @#SIZELO,$LSTBK         ;EQUAL?
4553  033104  001550                        BEQ     OKSIZ
4554  033106  104400  033114                TYPE    ,65$                    ;;TYPE ASCIZ STRING
4555  033112  000433                        BR      64$                     ;;GET OVER THE ASCIZ
4556                                ;;65$:  .ASCIZ  <15><12>/WARNING- THE SIZE OF MEMORY IS DIFFERENT FROM THAT/
4557  033202                        64$:
4558  033202  104400  033210                TYPE    ,67$                    ;;TYPE ASCIZ STRING
4559  033206  000425                        BR      66$                     ;;GET OVER THE ASCIZ
4560                                ;;67$:  .ASCIZ  <15><12>/INDICATED BY THE SYSTEM SIZE REGISTER./
4561  033262                        66$:
4562  033262  104400  033270                TYPE    ,69$                    ;;TYPE ASCIZ STRING
4563  033266  000421                        BR      68$                     ;;GET OVER THE ASCIZ
4564                                ;;69$:  .ASCIZ  <15><12>/     SIZEHI  SIZELO      ACTUAL/
4565  033332                        68$:
4566  033332  104400  001217                TYPE    ,$CRLF
4567  033336  013746  177762                MOV     @#SIZEHI,-(SP)  ;;SAVE @#SIZEHI FOR TYPEOUT
4568  033342  104404                        TYPOS                   ;;GO TYPE--OCTAL ASCII
4569  033344     006                        .BYTE   6               ;;TYPE 6 DIGIT(S)
4570  033345     000                        .BYTE   0               ;;SUPPRESS LEADING ZEROS
4571  033346  104400  033354                TYPE    ,71$            ;;TYPE ASCIZ STRING
4572  033352  000404                        BR      70$             ;;GET OVER THE ASCIZ
4573                                ;;71$:  .ASCIZ  /      /
4574  033364                        70$:
4575  033364  013746  177760                MOV     @#SIZELO,-(SP)  ;;SAVE @#SIZELO FOR TYPEOUT
4576  033370  104404                        TYPOS                   ;;GO TYPE--OCTAL ASCII
4577  033372     006                        .BYTE   6               ;;TYPE 6 DIGIT(S)
4578  033373     000                        .BYTE   0               ;;SUPPRESS LEADING ZEROS
4579  033374  104400  033402                TYPE    ,73$            ;;TYPE ASCIZ STRING
4580  033400  000404                        BR      72$             ;;GET OVER THE ASCIZ
4581                                ;;73$:  .ASCIZ  /      /
4582  033412                        72$:
4583  033412  013746  031142                MOV     $LSTBK,-(SP)    ;;SAVE $LSTBK FOR TYPEOUT
4584  033416  104404                        TYPOS                   ;;GO TYPE--OCTAL ASCII
4585  033420     006                        .BYTE   6               ;;TYPE 6 DIGIT(S)
4586  033421     000                        .BYTE   0               ;;SUPPRESS LEADING ZEROS
4587  033422  104400  001217                TYPE    ,$CRLF          ;DO CARRIAGE RETURN,LINE FEED
```

```
 4588  033426  000207                OKSIZ:  RTS     PC              ;RETURN
 4589
 4590
 4591
 4592
```

```
                                        .SBTTL
                                        .SBTTL  ************ ENTRY POINT 1 --- STARTING ADDRESS 200 ************
                                        .SBTTL  ********** TEST CODE STARTS AT ADDRESS 40000  **********
                040000                  .=40000

040000  012737  000000  001222  STRT1:  MOV     #0,FSTTST       ;LOAD INDEX TO START TABLE
040006  000433                  STRT2:  BR      START           ;BRANCH TO STARTING ADDRESS OF PROGRAM
040010  012737  000002  001222          MOV     #2,FSTTST       ;LOAD INDEX TO START TABLE
040016  000427                  STRT3:  BR      START           ;BRANCH TO STARTING ADDRESS OF PROGRAM
040020  012737  000004  001222          MOV     #4,FSTTST       ;LOAD INDEX TO START TABLE
040026  000423                  STRT4:  BR      START           ;BRANCH TO STARTING ADDRESS OF PROGRAM
040030  012737  000006  001222          MOV     #6,FSTTST       ;LOAD INDEX TO START TABLE
040036  000417                  STRT5:  BR      START           ;BRANCH TO STARTING ADDRESS OF PROGRAM
040040  012737  000010  001222          MOV     #10,FSTTST      ;LOAD INDEX TO START TABLE
040046  000413                  STRT6:  BR      START           ;BRANCH TO STARTING ADDRESS OF PROGRAM
040050  012737  000012  001222          MOV     #12,FSTTST      ;LOAD INDEX TO START TABLE
040056  000407                  STRT7:  BR      START           ;BRANCH TO STARTING ADDRESS OF PROGRAM
040060  012737  000014  001222          MOV     #14,FSTTST      ;LOAD INDEX TO START TABLE
040066  000403                  STRT8:  BR      START           ;BRANCH TO STARTING ADDRESS OF PROGRAM
040070  012737  000016  001222          MOV     #16,FSTTST      ;LOAD INDEX TO START TABLE

040076  012706  001100          START:  MOV     #KERSTK,KSP     ;SET UP KERNAL STACK
040102  012737  001014  177746          MOV     #1014,CONTRL    ;TURN OFF CACHE
040110  012706  001100                  MOV     #$CMTAG,R6      ;;FIRST LOCATION TO BE CLEARED
040114  005026                  2$:     CLR     (R6)+           ;;CLEAR MEMORY LOCATION
040116  022706  001140                  CMP     #$TKS,R6        ;;DONE?
040122  001374                          BNE     2$              ;;LOOP BACK IF NO
040124  012737  025474  000020          MOV     #$SCOPE,IOTVEC  ;;IOT VECTOR FOR SCOPE ROUTINE
040132  012737  000340  000022          MOV     #340,IOTVEC+2   ;;PRIORITY LEVEL 7
040140  012737  025760  000030          MOV     #$ERROR,EMTVEC  ;;EMT VECTOR FOR ERROR ROUTINE
040146  012737  000340  000032          MOV     #340,EMTVEC+2   ;;PRIORITY LEVEL 7
040154  012737  030326  000034          MOV     #$TRAP,TRAPVEC  ;;TRAP VECTOR FOR TRAP CALLS
040162  012737  000340  000036          MOV     #340,TRAPVEC+2  ;;PRIORITY LEVEL 7
040170  012737  030370  000024          MOV     #$PWRDN,PWRVEC  ;;POWER FAILURE VECTOR
040176  012737  000340  000026          MOV     #340,PWRVEC+2   ;;PRIORITY LEVEL 7
040204  013737  025240  025232          MOV     $ENDCT,$EOPCT   ;;SET UP END-OF-PROGRAM COUNTER
040212  005037  001206                  CLR     $TIMES          ;;INITIALIZE NUMBER OF ITERATIONS
040216  005037  001210                  CLR     $ESCAPE         ;;CLEAR THE ESCAPE ON ERROR ADDRESS
040222  112737  000001  001117          MOVB    #1,$ERMAX       ;;ALLOW ONE ERROR PER TEST
040230  012737  025460  000014          MOV     #$RTRN,TBITVEC  ;;SET "T" BIT VECTOR TO $RTRN
040236  012737  000340  000016          MOV     #340,TBITVEC+2  ;;PRIORITY LEVEL 7
040244  012737  000006  025460          MOV     #RTT,$RTRN      ;;SET $RTRN TO A RTT
040252  005037  025466                  CLR     $TBIT           ;;CLEAR 'T" BIT SWITCH
040256  012737  040256  001110          MOV     #.,$LPADR       ;;INITIALIZE LOOP ADDRESS
040264  012737  040264  001112          MOV     #.,$LPERR       ;;INITIALIZE LOOP ON ERROR

040272  005037  177572          LOOP:   CLR     MMR0            ;GET INTO 16 BIT MODE ON SECOND PASS

040276  004737  032602                  JSR     PC,KBTST        ;SEE IF KB11-E PROCESSOR
040302  005037  172516                  CLR     MMR3            ;TURN OFF EVERY THING POSSIBLE
040306  012700  177777                  MOV     #-1,R0          ;PUT NEG ONE IN R0 TO INITIALIZE FLAGS
040312  010037  031672                  MOV     R0,CPFLAG       ;INITIALIZE CPU ERROR FLAG
040316  010037  031776                  MOV     R0,PAFLAG       ;INITIALIZE PARITY ERROR FLAG
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 4649  040322  010037  032230                 MOV     R0,MMFLAG       ;INITIALIZE MEMORY MANAGEMENT TRAP FLAG
 4650  040326  010037  032350                 MOV     R0,NDFLAG       ;INITIALIZE NO D-SPACE TRAP FLAG
 4651  040332  010037  177744                 MOV     R0,MEMERR       ;CLEAR PARITY ERROR REGISTER (177744)
 4652  040336  010037  177766                 MOV     R0,CPUERR       ;CLEAR CPU ERROR REGISTER (177766)
 4653  040342  005037  001224                 CLR     CPUEXP          ;NOT EXPECTING ANY CPU TRAPS
 4654  040346  005037  001226                 CLR     MMEXP           ;NOT EXPECTING ANY MEMORY MANAGEMENT TRAPS
 4655  040352  012737  031670  000004         MOV     #CPUER,ERRVEC   ;LOAD ADDRESS OF CPU TRAP ROUTINE
 4656  040360  012737  000340  000006         MOV     #340,ERRVEC+2   ;SET PRIORITY LEVEL 7
 4657  040366  012737  031774  000114         MOV     #MEMER,CACHVEC  ;LOAD ADDRESS OF PARITY TRAP ROUTINE
 4658  040374  012737  000340  000116         MOV     #340,CACHVEC+2  ;SET PRIORITY LEVEL 7
 4659  040402  012737  032226  000250         MOV     #MMTRAP,MMVEC   ;LOAD ADDRESS OF MEMORY MANAGEMENT TRAP
 4660  040410  012737  000340  000252         MOV     #340,MMVEC+2    ;SET PRIORITY LEVEL 7
 4661  040416  004737  031346                 JSR     PC,CLEANUP      ;INITIALIZE ALL ERROR LOCATIONS
 4662  040422  012706  001100                 MOV     #KERSTK,KSP     ;SET UP KERNEL STACK POINTER
 4663  040426  005227  177777                 INC     #-1             ;;FIRST TIME?
 4664  040432  001036                         BNE     64$             ;;BRANCH IF NO
 4665  040434  022737  025412  000042         CMP     #$ENDAD,@#42    ;;ACT-11?
 4666  040442  001432                         BEQ     64$             ;;BRANCH IF YES
 4667  040444  104400  040452                 TYPE    ,65$            ;;TYPE ASCIZ STRING
 4668  040450  000427                         BR      64$             ;;GET OVER THE ASCIZ
 4669                          ;;65$:  .ASCIZ  <CRLF>?CEKBE-D  PDP 11/70-74MP MEMORY MANAGEMENT ?<CRLF>
 4670  040530                  64$:
 4671
 4672  040530  005227  177777                 INC     #-1             ;FIRST TIME?
 4673  040534  001026                         BNE     100$            ;BR IF NO
 4674  040536  104400  003324                 TYPE    ,MSG1           ;<15><12>CPU UNDER TEST FOUND TO BE A
 4675  040542  005737  001360                 TST     @#KB11E         ;IS THIS A KB11-E OR KB11-EM?
 4676  040546  001011                         BNE     101$            ;BR IF EITHER ONE
 4677  040550  105737  001362                 TSTB    @#KB11CM        ;IS IT A 11/74           (KB11CM)
 4678  040554  001003                         BNE     1$              ;BR IF IT IS
 4679  040556  104400  003374                 TYPE    ,MSG3           ;KB11-B/C<15><12>
 4680  040562  000413                         BR      100$            ;SKIP OTHER MESSAGE
 4681  040564  104400  003406          1$:    TYPE    ,MSG4           ;11/74           (KB11CM)<15><12>
 4682  040570  000410                         BR      100$            ;SKIP CISP MESSAGE
 4683  040572  105737  001360          101$:  TSTB    @#KB11E         ;IS IT A KB11-E?
 4684  040576  001403                         BEQ     102$            ;BR IF NOT. MUST BE KB11-EM
 4685  040600  104400  003437                 TYPE    ,MSG5           ;KB11-E<15><12>
 4686  040604  000402                         BR      100$            ;SKIP KB11-EM MESSAGE
 4687  040606  104400  003363          102$:  TYPE    ,MSG2           ;KB11-EM<15><12>
 4688  040612                  100$:
 4689  040612  005227  177777                 INC     #-1             ;FIRST TIME?
 4690  040616  001002                         BNE     110$            ;BR IF NOT
 4691  040620  004737  033056                 JSR     PC,SIZMEM       ;SIZE MEM AND COMPARE WITH SIZE REG
 4692  040624  013700  001222          110$:  MOV     FSTTST,R0       ;LOAD START TABLE INDEX
 4693  040630  001417                         BEQ     TST1            ;;START WITH TEST ONE IF ZERO
 4694  040632  012737  040000  177776         MOV     #40000,PSW      ;GO TO SUPERVISOR MODE
 4695  040640  012706  000700                 MOV     #SUPSTK,SSP     ;SET UP SUPERVISOR STACK POINTER
 4696  040644  012737  140000  177776         MOV     #140000,PSW     ;GO TO USER MODE
 4697  040652  012706  000600                 MOV     #USESTK,USP     ;SET UP USER STACK POINTER
 4698  040656  012737  000340  177776         MOV     #340,PSW        ;GO TO KERNEL MODE PRIORITY LEVEL 7
 4699  040664  000170  001336                 JMP     @STRTAB(R0)     ;JUMP TO CORRECT ENTRY POINT
 4700
 4701
 4702                          ;*      THIS FIRST GROUP OF TESTS IS FOR TESTING THE ADDRESS DECODE
 4703                          ;*      LOGIC FOR THE INTERNAL REGISTERS ON PAGE 'SCCE' AND TO MAKE
 4704                          ;*      SOME DETERMINATION ABOUT THE RESPONDING ADDRESSES.  IF AN
```

```
                                        ;*      ADDRESS DOES NOT FUNCTION AS THE CORRESPONDING REGISTER SHOULD
                                        ;*      AN ERROR WILL BE FLAGGED.  THE MULTIPLEXERS AND INTERNAL BUS
                                        ;*      DRIVERS ON PAGES 'SCCM' AND 'SCCN' ARE ALSO UTILIZED IN
                                        ;*      THESE TESTS AND COULD BE THE SOURCE OF ANY PROBLEMS ENCOUNTERED.
                                        ;;*****************************************************************
                                        ;*TEST 1        TRY TO READ ALL CPU REGISTERS
                                        ;*
                                        ;*      THIS TEST ENSURES THAT SOMETHING RESPONDS TO ADDRESSES 177760
                                        ;*      THRU 177776.  IF A TRAP TO 'ERRVEC' (004) OCCURS IT IS ASSUMED
                                        ;*      THAT A REGISTER HAS TIMED OUT, AND AN ERROR IS REPORTED.
                                        ;*
                                        ;*      ERRORS THAT OCCUR IN THIS TEST ARE REPORTED FROM AN AREA
                                        ;*      AT THE END OF THIS TEST, STARTING AT '50$'.
                                        ;*
                                        ;;*****************************************************************
040670                                  TST1:
040670  012737  040726  001110                MOV     #20$,$LPADR     ;SET LOOP ADDRESS POINTER TO 20$
040676  012737  040726  001112                MOV     #20$,$LPERR     ;SET LOOP ON ERROR POINTER TO 20$
040704  012737  000001  001102                MOV     #1,$TSTNM       ;LOAD TEST NUMBER INTO MEMORY
040712  013737  001102  177570                MOV     $TSTNM,DISPLAY  ;DISPLAY TEST NUMBER FOR THIS TEST
040720  012737  041012  001316                MOV     #TST2,NXTTST    ;SAVE STARTING ADDRESS OF NEXT TEST
                                                                        ;FOR ESCAPE ON PARITY ERRORS
040726  012737  040752  001112  20$:   MOV     #1$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
040734  012737  041002  000004                MOV     #50$,ERRVEC     ;SET TIME OUT VECTOR TO SPECIAL ROUTINE
040742  012706  001100                        MOV     #1100,KSP       ;SET KERNEL STACK POINTER TO 1100
040746  012700  177760                        MOV     #177760,R0      ;PUT FIRST CPU REGISTER ADDRESS IN R0
040752  000240                        1$:     NOP                     ;THIS IS A SYNC POINT FOR SCOPING
040754  011001                                MOV     (R0),R1         ;TRY TO READ THE CPU REGISTERS
040756  062700  000002                100$:   ADD     #2,R0           ;POINT TO NEXT CPU REGISTER
040762  001373                                BNE     1$              ;BRANCH IF NOT ALL READ YET
040764  012737  040726  001112                MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
040772  012737  031670  000004                MOV     #CPUER,ERRVEC   ;SET UP C.P.U. ERROR VECTOR
041000  000404                                BR      TST2            ;;TEST OVER BRANCH TO NEXT TEST

041002  062706  000004                50$:    ADD     #4,KSP          ;RE ADJUST KERNEL STACK POINTER
041006  104024                                ERROR   24              ;CPU REGISTER TIMED OUT
041010  000762                                BR      100$            ;GO BACK AND FINISH TEST


                                        ;;*****************************************************************
                                        ;*TEST 2        SYSTEM SIZE REGISTERS
                                        ;*
                                        ;*      BOTH THE LO SIZE AND THE HI SIZE REGISTERS ARE READ TO SEE THAT
                                        ;*      THEY HOLD SOMETHING THAT LOOKS CORRECT.  (IE. LO SIZE SHOULD
                                        ;*      HAVE 377 IN ITS LOW BYTE, AND HI SIZE SHOULD BE ZERO)  THEY
                                        ;*      ARE ALSO VERIFIED TO BE READ ONLY REGISTERS.
                                        ;*
                                        ;;*****************************************************************
041012                                  TST2:
041012  000004                                SCOPE
041014  012737  041146  001316                MOV     #TST3,NXTTST    ;SAVE STARTING ADDRESS OF NEXT
                                                                        ;TEST FOR ESCAPE ON PARITY ERRORS
041022  012737  041034  001112  20$:   MOV     #21$,$LPERR     ;SET LOOP ON ERROR POINTER TO 21$
```

```
4761  041030  012700  177760            MOV     #177760,R0      ;PUT ADDRESS OF SIZE LO REGISTER INTO R0
4762  041034  000240            21$:    NOP                     ;THIS IS A SYNC POINT FOR SCOPING
4763  041036  011001                    MOV     (R0),R1         ;READ SYSTEM SIZE LO REGISTER
4764  041040  122701  000377            CMPB    #377,R1         ;SEE IF LOW BYTE IS ALL ONES
4765  041044  001401                    BEQ     1$              ;BRANCH IF LOW BYTE IS ALL ONES
4766  041046  104025                    ERROR   25              ;LOW BYTE OF LO SIZE IS NOT -1
4767  041050  012737  041056  001112 1$:     MOV     #22$,$LPERR     ;SET LOOP ON ERROR POINTER TO 22$
4768  041056  000240            22$:    NOP                     ;THIS IS A SYNC POINT FOR SCOPING
4769  041060  005010                    CLR     (R0)            ;TRY TO CLEAR SIZE LO REGISTER
4770  041062  011002                    MOV     (R0),R2         ;READ SIZE LO REGISTER INTO R2
4771  041064  001002                    BNE     2$              ;BRANCH IF IT IS NOT ZERO
4772  041066  104026                    ERROR   26              ;COULD WRITE SIZE LO REG
4773  041070  010110                    MOV     R1,(R0)         ;RESTORE DATA TO ADDRESS
4774  041072  012737  041104  001112 2$:     MOV     #23$,$LPERR     ;SET LOOP ON ERROR POINTER TO 23$
4775  041100  012700  177762            MOV     #177762,R0      ;PUT ADDRESS OF SIZE HIGH REG INTO R0
4776  041104  000240            23$:    NOP                     ;THIS IS A SYNC POINT FOR SCOPING
4777  041106  011001                    MOV     (R0),R1         ;READ SYSTEM SIZE HIGH REGISTER
4778  041110  001401                    BEQ     3$              ;BRANCH IF IT IS ZERO
4779  041112  104027                    ERROR   27              ;(177762) IS NOT ZERO
4780  041114  012737  041122  001112 3$:     MOV     #24$,$LPERR     ;SET LOOP ON ERROR POINTER TO 24$
4781  041122  000240            24$:    NOP                     ;THIS IS A SYNC POINT FOR SCOPING
4782  041124  012710  177777            MOV     #-1,(R0)        ;TRY TO LOAD SIZE HIGH REGISTER
4783  041130  011002                    MOV     (R0),R2         ;READ SIZE HIGH REGISTER
4784  041132  001402                    BEQ     4$              ;BRANCH IF REGISTER IS STILL ZERO
4785  041134  104026                    ERROR   26              ;COULD WRITE SIZE REGISTER
4786  041136  010110                    MOV     R1,(R0)         ;RESTORE DATA TO ADDRESS
4787  041140  012737  041022  001112 4$:     MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
4788
4789
4790                                    ;;**************************************************************************
4791                                    ;*TEST 3         CPU ERROR REGISTER
4792                                    ;*
4793                                    ;*      THE CPU ERROR REGISTER IS TESTED TO SEE THAT IT IS CLEAR
4794                                    ;*      AFTER A NEGATIVE ONE HAS BEEN LOADED INTO IT.  THERE IS NO
4795                                    ;*      WAY TO SET ANY BITS UNDER PROGRAM CONTROL.
4796                                    ;*
4797                                    ;;**************************************************************************
4798  041146                    TST3:
4799  041146  000004                    SCOPE
4800  041150  012737  041212  001316    MOV     #TST4,NXTTST    ;SAVE STARTING ADDRESS OF NEXT
4801                                                            ;TEST FOR ESCAPE ON PARITY ERRORS
4802  041156  012737  041170  001112 20$:     MOV     #1$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
4803  041164  012700  177766            MOV     #177766,R0      ;LOAD ADDRESS OF C.P.U. ERROR REG
4804  041170  000240            1$:     NOP                     ;THIS IS A SYNC POINT FOR SCOPING
4805  041172  012710  177777            MOV     #-1,(R0)        ;WRITE A NEGATIVE ONE INTO CPU ERROR REG
4806  041176  011001                    MOV     (R0),R1         ;READ C.P.U. ERROR REGISTER
4807  041200  001401                    BEQ     2$              ;CPU ERROR REGISTER SHOULD BE ZERO
4808  041202  104030                    ERROR   30              ;C.P.U. ERROR REGISTER NOT ZERO
4809  041204  012737  041156  001112 2$:     MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
4810
4811
4812
4813                                    ;;**************************************************************************
4814                                    ;*TEST 4         MICRO PROGRAM BREAK REGISTER
4815                                    ;*
4816                                    ;*      IN A STANDARD KB11-C PROCESSOR
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                                        ;*      THE MICRO BREAK REGISTER IS A LOW BYTE ONLY REGISTER, WITH
                                        ;*      THE UPPER BYTE ALWAYS ZERO.  THIS TEST LOADS A FULL WORD INTO
                                        ;*      ADDRESS 177770 AND CHECKS TO SEE THAT ONLY THE LOW BYTE IS
                                        ;*      STORED IN THE REGISTER.  IF THIS IS A (KB11-E)
                                        ;*      THEN ALL 16 BITS ARE WRITABLE AND THE REG IS TESTED AS SUCH.
                                        ;*      A ONE IS SHIFTED ACROSS THE REG IN BOTH CASES IN THIS TEST.
                                        ;*
                                        ;;*********************************************************************
041212                                  TST4:
041212  000004                                  SCOPE
041214  012737  041334  001316                  MOV     #TST5,NXTTST    ;SAVE STARTING ADDRESS OF NEXT
                                                                        ;TEST FOR ESCAPE ON PARITY ERRORS
041222  012737  041234  001112  20$:     MOV     #1$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
041230  012700  177770                  MOV     #177770,R0      ;LOAD ADDRESS OF MICRO BREAK REGISTER
041234  000240                  1$:     NOP                     ;THIS IS A SYNC POINT FOR SCOPING
041236  005010                          CLR     (R0)            ;START WITH ALL ZERO DATA
041240  011001                          MOV     (R0),R1         ;READ MICRO BREAK REGISTER
041242  005002                          CLR     R2              ;CHECK FOR ZERO
041244  020102                          CMP     R1,R2           ;DID YOU REFERENCE THE MICRO BREAK REG
041246  001020                          BNE     3$              ;BRANCH IF DATA WRONG
041250  012703  000001                  MOV     #1,R3           ;START SHIFTING A ONE
041254  010302                  6$:     MOV     R3,R2           ;SET UP EXPECTED DATA IN R2
041256  010310                          MOV     R3,(R0)         ;WRITE MICRO BREAK REG
041260  011001                          MOV     (R0),R1         ;READ IT BACK
041262  005737  001360                  TST     KB11E           ;IS THIS A KB11E OR KB11EM PROCESSOR?
041266  001002                          BNE     5$              ;BR IF KB11-E
041270  042702  177400                  BIC     #177400,R2      ;ONLY LOWER BYTE SHOULD BE WRITTEN
041274  020102                  5$:     CMP     R1,R2           ;MATCH?
041276  001004                          BNE     3$              ;BR IF NOT
041300  000241                          CLC                     ;CLEAR CARRY FOR ROTATE
041302  006103                          ROL     R3              ;SHIFT A 1 IN DATA TO WRITE
041304  103407                          BCS     2$              ;DONE IF CARRY SETS
041306  000762                          BR      6$              ;REPEAT IF NOT DONE
041310  005737  001360          3$:     TST     KB11E           ;ERROR COMES HERE. IS THIS A KB11-E OR KB11-EM?
041314  001402                          BEQ     4$              ;BR TO ERROR EM32 IF NOT KB11-E OR KB11-EM
041316  104144                          ERROR   144             ;ERROR FOR KB11-E PROCESSOR
041320  000401                          BR      2$              ;DONE
041322  104032                  4$:     ERROR   32              ;DIDN'T LOAD MICRO BREAK REGISTER
041324  005010                  2$:     CLR     (R0)            ;LEAVE MICRO BREAK REGISTER ZERO
041326  012737  041222  001112          MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST


                                        ;;*********************************************************************
                                        ;*TEST 5        PROGRAM INTERRUPT REQUEST REGISTER
                                        ;*
                                        ;*      THE PROGRAM INTERRUPT REQUEST REGISTER'S UPPER BYTE IS LOADED
                                        ;*      DIRECTLY AND THE LOWER BYTE IS AN ENCODE OF THE UPPER BYTE.
                                        ;*      THIS TEST LOADS A FULL WORD INTO ADDRESS 177772 AND CHECKS
                                        ;*      THAT THE UPPER BYTE IS LOADED DIRECTLY AND THE LOWER BYTE
                                        ;*      IS ENCODED CORRECTLY.
                                        ;*
                                        ;;*********************************************************************
041334                                  TST5:
041334  000004                                  SCOPE
041336  012737  041412  001316                  MOV     #TST6,NXTTST    ;SAVE STARTING ADDRESS OF NEXT
```

```
 4873                                                          ;TEST FOR ESCAPE ON PARITY ERRORS
 4874  041344  012737  041360  001112  20$:    MOV     #1$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
 4875  041352  000237                          SPL     7               ;SET PRIORITY LEVEL AT SEVEN
 4876  041354  012700  177772                  MOV     #177772,R0      ;LOAD ADDRESS OF PROGRAM INTERRUPT REG
 4877  041360  000240                  1$:     NOP                     ;THIS IS A SYNC POINT FOR SCOPING
 4878  041362  012710  004777                  MOV     #004777,(R0)    ;ONLY UPPER BYTE (LESS BIT 8) IS LOADED
 4879                                                                  ;DIRECTLY, LOWER BYTE IS ENCODED
 4880  041366  011001                          MOV     (R0),R1         ;READ PROGRAM INTERRUPT REGISTER
 4881  041370  012702  004146                  MOV     #004146,R2      ;LOAD EXPECTED DATA
 4882  041374  020102                          CMP     R1,R2           ;DID YOU REFERENCE PROGRAM INTERRUPT REG
 4883  041376  001401                          BEQ     2$              ;BRANCH IF IT WAS THE PROG. INTERRUPT
 4884  041400  104033                          ERROR   33              ;NOT THE PROG. INT. REQUEST REGISTER
 4885  041402  005010                  2$:     CLR     (R0)            ;LEAVE THE P.I.R. REGISTER ZERO
 4886  041404  012737  041344  001112          MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
 4887
 4888
 4889                          ;;*****************************************************************
 4890                          ;*TEST 6        STACK LIMIT REGISTER
 4891                          ;*
 4892                          ;*      THE STACK LIMIT REGISTER IS A HIGH BYTE ONLY REGISTER, SO THIS
 4893                          ;*      TEST TRIES TO LOAD BOTH BYTES OF ADDRESS 177774 AND CHECKS
 4894                          ;*      THAT ONLY THE HIGH BYTE IS LOADED.  THE LOW BYTE WILL ALWAYS
 4895                          ;*      BE READ AS ZERO.
 4896                          ;*
 4897                          ;;*****************************************************************
 4898  041412                  TST6:
 4899  041412  000004                          SCOPE
 4900  041414  012737  041466  001316          MOV     #TST7,NXTTST    ;SAVE STARTING ADDRESS OF NEXT
 4901                                                                  ;TEST FOR ESCAPE ON PARITY ERRORS
 4902  041422  012737  041434  001112  20$:    MOV     #1$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
 4903  041430  012700  177774                  MOV     #177774,R0      ;LOAD ADDRESS OF STACK LIMIT REGISTER
 4904  041434  000240                  1$:     NOP                     ;THIS IS A SYNC POINT FOR SCOPING
 4905  041436  012710  000777                  MOV     #777,(R0)       ;ONLY HIGH BYTE SHOULD BE LOADED
 4906  041442  011001                          MOV     (R0),R1         ;READ STACK LIMIT REGISTER
 4907  041444  005010                          CLR     (R0)            ;LEAVE STACK LIMIT REGISTER CLEAR
 4908  041446  012702  000400                  MOV     #400,R2         ;LOAD EXPECTED DATA INTO R2
 4909  041452  020102                          CMP     R1,R2           ;DID YOU REFERENCE THE STACK LIMIT REG
 4910  041454  001401                          BEQ     2$              ;BRANCH IF IT WAS STACK LIMIT
 4911  041456  104034                          ERROR   34              ;NOT STACK LIMIT REGISTER
 4912  041460  012737  041422  001112  2$:     MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
 4913
 4914
 4915
 4916                          ;;*****************************************************************
 4917                          ;*TEST 7        PROCESSOR STATUS WORD
 4918                          ;*
 4919                          ;*      THIS TEST SETS THE PRIORITY LEVEL TO 7 AND CLEARS THE
 4920                          ;*      CONDITION CODES AND CHECKS TO SEE THAT ADDRESS 177776
 4921                          ;*      HAS 340 IN ITS LOW BYTE.
 4922                          ;*
 4923                          ;;*****************************************************************
 4924  041466                  TST7:
 4925  041466  000004                          SCOPE
 4926  041470  012737  041544  001316          MOV     #TST10,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
 4927                                                                  ;TEST FOR ESCAPE ON PARITY ERRORS
 4928  041476  012737  041514  001112  20$:    MOV     #1$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
```

```
 4929  041504  012700  177776                MOV     #177776,R0      ;LOAD ADDRESS OF P.S.W. INTO R0
 4930  041510  012702  177740                MOV     #177740,R2      ;LOAD EXPECTED DATA INTO R2
 4931  041514  000237                1$:     SPL     7               ;SET PRIORITY TO LEVEL SEVEN
 4932  041516  000257                        CCC                     ;CLEAR ALL CONDITION CODES
 4933  041520  000240                        NOP                     ;THIS IS A SYNC POINT FOR SCOPING
 4934  041522  111001                        MOVB    (R0),R1         ;LOAD LOWER BYTE OF P.S.W. INTO R1
 4935  041524  042701  000020              BIC     #TBIT,R1        ;CLEAR T-BIT IF IT IS ON
 4936  041530  020201                      CMP     R2,R1           ;SIGN EXTEND OF LOWER BYTE OF PSW
 4937                                                              ;LOWER BYTE SHOULD BE 340
 4938  041532  001401                      BEQ     2$              ;BRANCH IF PSW IS CORRECT
 4939  041534  104031                      ERROR   31              ;MUST HAVE READ SOME OTHER REGISTER
 4940  041536  012737  041476  001112  2$:     MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
 4941
 4942
 4943                                  ;;*****************************************************************
 4944                                  ;*TEST 10       SET UP THE STACK POINTERS FOR REST OF TESTS
 4945                                  ;*
 4946                                  ;*      THIS TEST IS USED TO SET THE KERNEL STACK POINTER AT
 4947                                  ;*      1100, THE SUPERVISOR STACK POINTER AT 700, AND THE USER
 4948                                  ;*      STACK POINTER AT 600.  IT THEN RETURNS TO KERNEL MODE AND
 4949                                  ;*      VERIFIES THAT THE KERNEL STACK POINTER IS STILL AT 1100.
 4950                                  ;*
 4951                                  ;;*****************************************************************
 4952  041544                        TST10:
 4953  041544  000004                        SCOPE
 4954  041546  012737  041626  001316        MOV     #TST11,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
 4955                                                                ;TEST FOR ESCAPE ON PARITY ERRORS
 4956  041554  005037  177776                CLR     PSW             ;GET TO KERNEL MODE, PRIORITY 0
 4957  041560  012706  001100                MOV     #KERSTK,KSP     ;SETUP KERNEL STACK POINTER
 4958  041564  012737  040000  177776        MOV     #40000,PSW      ;GET INTO SUPERVISOR MODE
 4959  041572  012706  000700                MOV     #SUPSTK,SSP     ;SET UP SUPERVISOR STACK POINTER
 4960  041576  012737  140000  177776        MOV     #140000,PSW     ;GET INTO USER MODE
 4961  041604  012706  000600                MOV     #USESTK,USP     ;SET UP USER STACK POINTER
 4962  041610  005037  177776                CLR     PSW             ;GET BACK INTO KERNEL MODE
 4963  041614  010600                        MOV     KSP,R0          ;READ KSRNEL STACK POINTER
 4964  041616  022700  001100                CMP     #KERSTK,R0      ;SEE IF KERNEL STACK IS STILL 1100
 4965  041622  001401                        BEQ     TST11           ;;BRANCH IF KERNEL STACK IS OKAY
 4966  041624  104035                        ERROR   35              ;KERNEL STACK POINTER IS NOT RIGHT
 4967
 4968
 4969                                  .SBTTL  ************ ENTRY POINT 2 --- STARTING ADDRESS 204 ************
 4970                                  .SBTTL  ** TEST READ/WRITE BITS IN MEMORY MANAGEMENT STATUS REGISTERS **
 4971                                  ;*
 4972                                  ;*      THIS GROUP OF TESTS EXERCISES ALL OF THE READ/WRITE BITS
 4973                                  ;*      IN MMR0, TESTS THE PROPER FUNCTIONING OF MMR1, AND TRIES A
 4974                                  ;*      FEW VIRTUAL ADDRESSES IN MMR2.  IT ALSO EXERCISES THE BITS
 4975                                  ;*      IN MMR3.  THESE TESTS SHOW THAT ONCE THE 'SSRC NO ERROR' FLIP-
 4976                                  ;*      FLOP IS SET MMR1 AND MMR2 STOP TRACKING THE C.P.U. OPERATIONS.
 4977                                  ;*
 4978
 4979
 4980                                  ;;*****************************************************************
 4981                                  ;*TEST 11       BIT TEST OF MEMORY MANAGEMENT REGISTER 0
 4982                                  ;*
 4983                                  ;*      THIS TEST TRIES TO SET AND CLEAR BITS <15:12> AND <09> OF
 4984                                  ;*      MMR0.  'INIT' IS ISSUED TO SEE THAT IT WILL CLEAR THESE BITS.
```

```
                                ;*      THE OTHER BITS OF MMR0 ARE CLOCKED ONLY ON MEMORY
                                ;*      MANAGEMENT ERROR CONDITIONS IF RELOCATION IS ENABLED.
                                ;*      BIT <00> ENABLES FULL RELOCATION AND BIT <08> ENABLES
                                ;*      RELOCATION ON THE DESTINATION CYCLE ONLY.  THESE BITS WILL
                                ;*      BE TESTED IN A LATER TEST.
                                ;*
                                ;;*************************************************************************
041626                          TST11:
041626  000004                          SCOPE
041630  012737  042032  001316        MOV     #TST12,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
                                                                ;TEST FOR ESCAPE ON PARITY ERRORS
041636                          ENTPT2:
041636  012737  041666  001110        MOV     #20$,$LPADR     ;SET LOOP ADDRESS POINTER TO 20$
041644  012737  041666  001112        MOV     #20$,$LPERR     ;SET LOOP ON ERROR POINTER TO 20$
041652  012737  000011  001102        MOV     #11,$TSTNM      ;LOAD TEST NUMBER INTO MEMORY
041660  013737  001102  177570        MOV     $TSTNM,DISPLAY  ;DISPLAY TEST NUMBER FOR THIS TEST
041666  012700  177572          20$:  MOV     #MMR0,R0        ;PUT ADDRESS OF MMR0 IN R0
041672  012710  171000                MOV     #171000,(R0)    ;LOAD WRITABLE BITS IN MMR0
041676  000240                        NOP                     ;THIS IS A SYNC POINT FOR SCOPING
041700  000005                        RESET                   ;'INIT', SHOULD CLEAR ALL BITS OF MMR0
041702  011001                        MOV     (R0),R1         ;READ MMR0
041704  001401                        BEQ     1$              ;BRANCH IF MMR0 IS CLEAR
041706  104007                        ERROR   7               ;MMR0 WON'T CLEAR
041710  012737  041716  001112  1$:   MOV     #11$,$LPERR     ;SET LOOP ON ERROR POINTER TO 11$
041716  000240                11$:  NOP                     ;THIS IS SYNC POINT FOR SCOPING
041720  012710  171000                MOV     #171000,(R0)    ;SET BITS <15:12><9> OF MMR0
041724  011001                        MOV     (R0),R1         ;READ MMR0
041726  022701  171000                CMP     #171000,R1      ;SEE IF BITS <15:12><9> ARE SET
041732  001401                        BEQ     2$              ;BRANCH IF CORRECT BITS ARE SET
041734  104010                        ERROR   10              ;CAN'T SET 171000 IN MMR0
041736  012737  041744  001112  2$:   MOV     #12$,$LPERR     ;SET LOOP ON ERROR POINTER TO 12$
041744  000240                12$:  NOP                     ;THIS IS SYNC POINT FOR SCOPING
041746  005010                        CLR     (R0)            ;CLEAR UPPER 7 BITS OF MMR0
041750  011001                        MOV     (R0),R1         ;READ MMR0
041752  001401                        BEQ     3$              ;BRANCH IF MMR0 IS CLEAR
041754  104007                        ERROR   7               ;MMR0 WON'T CLEAR
041756  012737  041774  001112  3$:   MOV     #5$,$LPERR      ;SET LOOP ON ERROR POINTER TO 5$
041764  012702  100000                MOV     #BIT15,R2       ;SET BIT IN R2 TO FLOAT THRU MMR0
041770  012703  000007                MOV     #7,R3           ;PUT LOOP COUNT IN R3
041774  000240                5$:   NOP                     ;THIS A IS SYNC POINT FOR SCOPING
041776  010210                        MOV     R2,(R0)         ;LOAD R2 INTO MMR0
042000  011001                        MOV     (R0),R1         ;READ MMR0 IN R1
042002  005010                        CLR     (R0)            ;CLEAR MMR0
042004  010204                        MOV     R2,R4           ;PUT PATTERN IN R4
042006  042704  006777                BIC     #006777,R4      ;MASK OFF BITS <11:10><8:0>
042012  020401                        CMP     R4,R1           ;COMPARE PATTERN WITH MMR0
042014  001401                        BEQ     4$              ;BRANCH IF DATA MATCHES
042016  104011                        ERROR   11              ;GOT WRONG DATA FROM MMR0
042020  006002                4$:   ROR     R2              ;SHIFT BIT TO RIGHT
042022  077314                        SOB     R3,5$           ;LOOP BACK 6 TIMES
042024  012737  041666  001112        MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST


                                ;;*************************************************************************
                                ;*TEST 12       BIT TEST OF MEMORY MANAGEMENT REGISTER 1
                                ;*
```

```
                                ;*      THIS TEST WILL CAUSE BITS IN MMR1 TO BE LOCKED BY SETTING
                                ;*      BITS <15:13> IN MMR0.  THE REGISTER ONLY GETS CLOCKED ON
                                ;*      AN INSTRUCTION THAT AUTO INCREMENTS OR AUTO DECREMENTS A
                                ;*      REGISTER.  THE LOWER BYTE IS ALWAYS CLOCKED FIRST AND THE
                                ;*      UPPER BYTE IS CLOCKED ONLY IF BOTH SOURCE AND DESTINATION
                                ;*      AUTO INCREMENT OR DECREMENT A REGISTER.
                                ;*      ALL COUNTS (+1,-1,+2,-2) THAT CAN BE GENERATED WITH JUST THE
                                ;*      C.P. ARE CLOCKED INTO BOTH HIGH AND LOW BYTES.  ALL REGISTER
                                ;*      NUMBERS ARE GENERATED, INCLUDING ALL 3 R6'S, AND ALL THE
                                ;*      BITS THAT HOLD THE REGISTER NUMBER IN BOTH BYTES ARE TESTED.
                                ;*      HOWEVER NOT ALL REGISTER NUMBERS ARE CLOCKED INTO BOTH HIGH
                                ;*      AND LOW BYTES, BUT ENOUGH ARE USED TO TEST THE LOGIC.
                                ;*
                                ;;**********************************************************************
042032                          TST12:
042032  000004                          SCOPE
042034  012737  042464  001316          MOV     #TST13,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
                                                                ;TEST FOR ESCAPE ON PARITY ERRORS
042042  012701  177574          20$:    MOV     #MMR1,R1        ;PUT ADDRESS OF MMR1 IN R1
042046  012704  020000                  MOV     #BIT13,R4       ;SET READ ONLY BIT IN R4
042052  012737  042060  001112          MOV     #11$,$LPERR     ;SET LOOP ON ERROR POINTER TO 11$
042060  000240                  11$:    NOP                     ;THIS IS SYNC POINT FOR SCOPING
042062  012737  100000  177572          MOV     #BIT15,@#MMR0   ;LOCK UP MMR1 LOWER BYTE 027
                                                                ;UPPER BYTE 027-WORD 013427
042070  012703  013427                  MOV     #013427,R3      ;PUT EXPECTED DATA IN R3
042074  011102                          MOV     (R1),R2         ;READ MMR1 INTO R2
042076  020203                          CMP     R2,R3           ;SEE IF DATA MATCHES
042100  001401                          BEQ     10$             ;BRANCH IF DATA MATCHES
042102  104013                          ERROR   13              ;MMR1 DID NOT TRACK PROPERLY
042104  012737  042112  001112  10$:    MOV     #12$,$LPERR     ;SET LOOP ON ERROR POINTER TO 12$
042112  000240                  12$:    NOP                     ;THIS IS SYNC POINT FOR SCOPING
042114  000005                          RESET                   ;ISSUE INIT
042116  011102                          MOV     (R1),R2         ;SEE IF MMR1 IS CLEARED
042120  001401                          BEQ     1$              ;BRANCH IF MMR1 IS ZERO
042122  104012                          ERROR   12              ;CAN'T CLEAR MMR1
042124  012737  042132  001112  1$:     MOV     #13$,$LPERR     ;SET LOOP ON ERROR POINTER TO 13$
042132  012700  177572          13$:    MOV     #MMR0,R0        ;PUT ADDRESS OF MMR0 INTO R0
042136  000240                          NOP                     ;THIS IS SYNC POINT FOR SCOPING
042140  012720  040000                  MOV     #BIT14,(R0)+    ;LOCK UP MMR1-LOWER BYTE 027
                                                                ;UPPER BYTE 020-WORD 010027
042144  011102                          MOV     (R1),R2         ;READ MMR1
042146  012703  010027                  MOV     #010027,R3      ;PUT EXPECTED DATA IN R3
042152  020203                          CMP     R2,R3           ;SEE IF DATA MATCHES
042154  001401                          BEQ     2$              ;BRANCH IF DATA MATCHES
042156  104013                          ERROR   13              ;MMR1 DID NOT TRACK PROPERLY
042160  005037  177572          2$:     CLR     @#MMR0          ;CLEAR MMR0
042164  012737  042172  001112          MOV     #14$,$LPERR     ;SET LOOP ON ERROR POINTER TO 14$
042172  012700  177574          14$:    MOV     #MMR0+2,R0      ;PUT ADDRESS OF MMR0 PLUS 2 IN R0
042176  000240                          NOP                     ;THIS IS SYNC POINT FOR SCOPING
042200  010440                          MOV     R4,-(R0)        ;LOCK UP MMR1-LOWER BYTE 360
                                                                ;UPPER BYTE 000-WORD 000360
042202  011102                          MOV     (R1),R2         ;READ MMR1
042204  012703  000360                  MOV     #000360,R3      ;PUT EXPECTED DATA IN R3
042210  020203                          CMP     R2,R3           ;SEE IF DATA MATCHES
042212  001401                          BEQ     3$              ;BRANCH IF DATA MATCHES
042214  104013                          ERROR   13              ;MMR1 DID NOT TRACK PROPERLY
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5097  042216  005010                        3$:   CLR     (R0)            ;CLEAR MMR0
5098  042220  012737  042226  001112              MOV     #15$,$LPERR     ;SET LOOP ON ERROR POINTER TO 15$
5099  042226  012705  177573              15$:  MOV     #MMR0+1,R5      ;PUT ADDRESS OF MMR0'S UPPER BYTE IN R5
5100  042232  012702  001321                    MOV     #READON+1,R2    ;PUT ADDRESS OF READ ONLY BIT <13> IN R2
5101  042236  000240                           NOP                     ;THIS IS SYNC POINT FOR SCOPING
5102  042240  112225                           MOVB    (R2)+,(R5)+     ;LOCK UP MMR1-LOWER BYTE 012
5103                                                                    ;UPPER BYTE 015-WORD 006412
5104  042242  011102                           MOV     (R1),R2         ;READ MMR1
5105  042244  012703  006412                   MOV     #006412,R3      ;PUT EXPECTED DATA IN R3
5106  042250  020203                           CMP     R2,R3           ;SEE IF DATA MATCHES
5107  042252  001401                           BEQ     4$              ;BRANCH IF DATA MATCHES
5108  042254  104013                           ERROR   13              ;MMR1 DID NOT TRACK PROPERLY
5109  042256  005010                        4$:   CLR     (R0)            ;CLEAR MMR0
5110  042260  012737  042266  001112              MOV     #16$,$LPERR     ;SET LOOP ON ERROR POINTER TO 16$
5111  042266  012702  177574              16$:  MOV     #MMR0+2,R2      ;PUT ADDRESS OF MMR0'S UPPER BYTE
5112                                                                    ;PLUS 1 INTO R2
5113  042272  012705  001322                    MOV     #READON+2,R5    ;PUT ADDRESS OF READ ONLY BIT <13>
5114                                                                    ;PLUS 2 IN R5
5115  042276  000240                           NOP                     ;THIS IS SYNC POINT FOR SCOPING
5116  042300  114542                           MOVB    -(R5),-(R2)     ;LOCK UP MMR1-LOWER BYTE 375
5117                                                                    ;UPPER BYTE 372-WORD 175375
5118  042302  011102                           MOV     (R1),R2         ;READ MMR1
5119  042304  012703  175375                   MOV     #175375,R3      ;PUT EXPECTED DATA IN R3
5120  042310  020203                           CMP     R2,R3           ;SEE IF DATA MATCHES
5121  042312  001401                           BEQ     5$              ;BRANCH IF DATA MATCHES
5122  042314  104013                           ERROR   13              ;MMR1 DID NOT TEACH PROPERLY
5123  042316  005010                        5$:   CLR     (R0)            ;CLEAR MMR0
5124  042320  012737  042340  001112              MOV     #17$,$LPERR     ;SET LOOP ON ERROR POINTER TO 17$
5125  042326  012737  040000  177776              MOV     #40000,@#PSW    ;SET SUPERVISOR MODE
5126  042334  010637  001172                    MOV     SSP,@#$TMP0     ;SAVE SUPERVISOR STACK POINTER
5127  042340  012706  177574              17$:  MOV     #MMR0+2,SSP     ;PUT ADDRESS OF MMR0+2 IN SSP
5128  042344  000240                           NOP                     ;THIS IS SYNC POINT FOR SCOPING
5129  042346  012746  040000                   MOV     #40000,-(SSP)   ;LOCK UP MMR1-LOWER BYTE 027
5130                                                                    ;UPPER BYTE 366-WORD 173027
5131  042352  011102                           MOV     (R1),R2         ;READ MMR1
5132  042354  012703  173027                   MOV     #173027,R3      ;PUT EXPECTED DATA IN R3
5133  042360  020203                           CMP     R2,R3           ;SEE IF DATA MATCHES
5134  042362  001401                           BEQ     6$              ;BRANCH IF DATA MATCHES
5135  042364  104013                           ERROR   13              ;MMR1 DID NOT TRACK PROPERLY
5136  042366  013706  001172              6$:   MOV     $TMP0,SSP       ;RESTORE THE SUPERVISOR STACK POINTER
5137  042372  005010                           CLR     (R0)            ;CLEAR MMR0
5138  042374  012737  042414  001112              MOV     #18$,$LPERR     ;SET LOOP ON ERROR POINTER TO 18$
5139  042402  012737  140000  177776              MOV     #140000,@#PSW   ;SET USER MODE
5140  042410  010637  001172                    MOV     USP,@#$TMP0     ;SAVE USER STACK POINTER
5141  042414  012706  177572              18$:  MOV     #MMR0,USP       ;PUT ADDRESS OF MMR0 IN USP
5142  042420  000240                           NOP                     ;THIS IS SYNC POINT FOR SCOPING
5143  042422  012726  100000                   MOV     #100000,(USP)+  ;LOCK UP MMR1-LOWER BYTE 027
5144                                                                    ;UPPER BYTE 026-WORD 013027
5145  042426  011102                           MOV     (R1),R2         ;READ MMR1
5146  042430  012703  013027                   MOV     #013027,R3      ;PUT EXPECTED DATA IN R3
5147  042434  020203                           CMP     R2,R3           ;SEE IF DATA MATCHES
5148  042436  001401                           BEQ     7$              ;BRANCH IF DATA IS GOOD
5149  042440  104013                           ERROR   13              ;MMR1 DID NOT TRACK PROPERLY
5150  042442  013706  001172              7$:   MOV     @#$TMP0,USP     ;RESTORE USER STACK POINTER
5151  042446  005037  177776                   CLR     @#PSW           ;GO BACK TO KERNEL MODE
5152  042452  005037  177572                   CLR     @#MMR0          ;LET ALL M.M.R'S TRACK
```

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5153  042456  012737  042042  001112          MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
5154
5155
5156                                  ;;*****************************************************************
5157                                  ;*TEST 13       BIT TEST OF MEMORY MANAGEMENT REGISTER 2
5158                                  ;*
5159                                  ;*      HERE MMR2 WILL BE READ SEVERAL DIFFERENT TIMES TO
5160                                  ;*      SEE THAT IT IS TRACKING PROPERLY.  THEN IT WILL BE
5161                                  ;*      LOCKED UP AND READ IT TO SEE THAT IT DOES NOT CHANGE AFTER
5162                                  ;*      IT IS ONCE LOCKED UP.  NOT ALL BITS WILL BE TESTED IN THIS
5163                                  ;*      TEST BUT A LATER TEST RUNS A COUNT PATTERN THROUGH MMR2.  THIS
5164                                  ;*      CANNOT BE DONE HERE SINCE IT REQUIRES THAT THE ABORT LOGIC IS
5165                                  ;*      FUNCTIONING PROPERLY.
5166                                  ;*
5167                                  ;;*****************************************************************
5168  042464                          TST13:
5169  042464  000004                         SCOPE
5170  042466  012737  042640  001316          MOV     #TST14,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
5171                                                                  ;TEST FOR ESCAPE ON PARITY ERRORS
5172  042474  012700  177572          20$:    MOV     #MMR0,R0        ;PUT ADDRESS OF MMR0 IN R0
5173  042500  012701  177576                  MOV     #MMR2,R1        ;PUT ADDRESS OF MMR2 IN R1
5174  042504  012737  042516  001112          MOV     #11$,$LPERR     ;SET LOOP ON ERROR POINTER TO 11$
5175  042512  005037  177572                  CLR     @#MMR0          ;MAKE SURE THAT MMR0 IS CLEAR
5176  042516  000240                  11$:    NOP                     ;THIS A IS SYNC POINT FOR SCOPING
5177  042520  011102                  21$:    MOV     (R1),R2         ;READ MMR2 TO R2
5178  042522  012703  042520                  MOV     #21$,R3         ;PUT ADDRESS OF LAST INST IN R3
5179  042526  020203                          CMP     R2,R3           ;SEE IF MMR2 HELD CORRECT ADDRESS
5180  042530  001401                          BEQ     1$              ;BRANCH IF DATA MATCHES
5181  042532  104014                          ERROR   14              ;MMR2 DID NOT TRACK PROPERLY
5182  042534  012737  042542  001112  1$:     MOV     #12$,$LPERR     ;SET LOOP ON ERROR POINTER TO 12$
5183  042542  000240                  12$:    NOP                     ;THIS A IS SYNC POINT FOR SCOPING
5184  042544  013702  177576          22$:    MOV     @#MMR2,R2       ;READ MMR2 TO R2
5185  042550  012703  042544                  MOV     #22$,R3         ;PUT ADDRESS OF LAST INST IN R3
5186  042554  020203                          CMP     R2,R3           ;SEE IF MMR2 HELD CORRECT ADDRESS
5187  042556  001401                          BEQ     2$              ;BRANCH IF DATA MATCHES
5188  042560  104014                          ERROR   14              ;MMR2 DID NOT TRACK PROPERLY
5189  042562  012737  042570  001112  2$:     MOV     #13$,$LPERR     ;SET LOOP ON ERROR POINTER TO 13$
5190  042570  000240                  13$:    NOP                     ;THIS A IS SYNC POINT FOR SCOPING
5191  042572  012710  040000          23$:    MOV     #40000,(R0)     ;LOCK UP MMR1 AND MMR2
5192  042576  011102                          MOV     (R1),R2         ;READ MMR2 INTO R2
5193  042600  012703  042572                  MOV     #23$,R3         ;PUT LOCKING INST'S ADDRESS IN R3
5194  042604  020203                          CMP     R2,R3           ;SEE IF MMR2 HOLDS RIGHT ADDRESS
5195  042606  001401                          BEQ     3$              ;BRANCH IF DATA MATCHES
5196  042610  104014                          ERROR   14              ;MMR2 DID NOT TRACK PROPERLY
5197  042612  012737  042620  001112  3$:     MOV     #14$,$LPERR     ;SET LOOP ON ERROR POINTER TO 14$
5198  042620  000005                  14$:    RESET                   ;ISSUE INIT TO CLEAR MMR1 & 2
5199  042622  000240                  15$:    NOP                     ;THIS A IS SYNC POINT FOR SCOPING
5200  042624  011102                  25$:    MOV     (R1),R2         ;READ MMR2 INTO R2
5201  042626  012703  042624                  MOV     #25$,R3         ;PUT ADDRESS OF LAST INST IN R3
5202  042632  020203                          CMP     R2,R3           ;SEE IF MMR2 IS STILL TRACKING
5203  042634  001401                          BEQ     TST14           ;;GO TO NEXT TEST IF IT IS
5204  042636  104014                          ERROR   14              ;MMR2 DID NOT TRACK PROPERLY
5205
5206                                  ;;*****************************************************************
5207                                  ;*TEST 14       BIT TEST OF MEMORY MANAGEMENT REGISTER 3
5208                                  ;*
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```
                                ;*      THIS TEST SETS AND CLEARS BITS <05:04> AND <02:00> OF MMR3
                                ;*      IT DOES NOT TEST THAT THE BITS FUNCTION PROPERLY SINCE THAT
                                ;*      REQUIRES MORE LOGIC.  BUT IT DOES TEST THE REGISTER AND THE
                                ;*      DATA PATH TO  AND FROM THE REGISTER.  THE PROPER FUNCTIONING
                                ;*      OF THESE BITS IS TESTED LATER IN SEVERAL TESTS.
                                ;*
                                ;;*****************************************************************
042640                          TST14:
042640  000004                          SCOPE
042642  012737  043004  001316          MOV     #TST15,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
                                                                ;TEST FOR ESCAPE ON PARITY ERRORS
042650  012700  172516          20$:    MOV     #MMR3,R0        ;PUT ADDRESS OF MMR3 IN R0
042654  012701  000001                  MOV     #1,R1           ;SET BIT TO FLOAT THRU MMR3
042660  005010                          CLR     (R0)            ;CLEAR MMR3
042662  011002                          MOV     (R0),R2         ;READ MMR3 INTO R2
042664  001401                          BEQ     5$              ;BRANCH IF ZERO
042666  104015                          ERROR   15              ;CAN'T CLEAR MMR3
042670  012703  000006          5$:     MOV     #6,R3           ;SET UP LOOP COUNT
042674  012737  042702  001112          MOV     #1$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
042702  000240                  1$:     NOP                     ;THIS A IS SYNC POINT FOR SCOPING
042704  010110                          MOV     R1,(R0)         ;LOAD MMR3
042706  011002                          MOV     (R0),R2         ;READ MMR3 INTO R2
042710  020102                          CMP     R1,R2           ;DOES DATTA MATHC PATTERN
042712  001404                          BEQ     2$              ;BRANCH IF IT MATCHES
042714  032701  000010                  BIT     #BIT3,R1        ;WAS THIS BIT 3
042720  001001                          BNE     2$              ;BRANCH IF IT WAS
042722  104016                          ERROR   16              ;MMR3 HELD WRONG DATA
042724  006301                  2$:     ASL     R1              ;LEFT SHIFT DATA PATTERN
042726  077313                          SOB     R3,1$           ;BRANCH BACK IF R3 NOT 0
042730  012701  000067                  MOV     #67,R1          ;PUT DATA PATTERN IN R1
042734  012737  042742  001112          MOV     #12$,$LPERR     ;SET LOOP ON ERROR POINTER TO 12$
042742  000240                  12$:    NOP                     ;THIS A IS SYNC POINT FOR SCOPING
042744  010110                          MOV     R1,(R0)         ;TRY TO SET ALL BITS IN MMR3
042746  011002                          MOV     (R0),R2         ;READ MMR3 INTO R2
042750  020102                          CMP     R1,R2           ;SEE IF ALL BITS GOT SET
042752  001401                          BEQ     3$              ;BRANCH IF ALL BITS WERE SET
042754  104016                          ERROR   16              ;MMR3 HELD WRONG DATA

042756  012737  042764  001112  3$:     MOV     #13$,$LPERR     ;SET LOOP ON ERROR POINTER TO 13$
042764  000240                  13$:    NOP                     ;THIS A IS SYNC POINT FOR SCOPING
042766  000005                          RESET                   ;ISSUE  'INIT'
042770  011001                          MOV     (R0),R1         ;READ MMR3 INTO R2
042772  001401                          BEQ     4$              ;BRANCH IF MMR3 INTO R2
042774  104015                          ERROR   15              ;CAN'T CLEAR MMR3
042776  012737  042650  001112  4$:     MOV     #20$,$LPERR     ;RESTORE LOOP POINTER TO FIRST INST.

                                .SBTTL  ************ ENTRY POINT 3 --- STARTING ADDRESS 210 ************
                                .SBTTL  ********** PAGE ADDRESS AND DESCRIPTOR REGISTER TESTS **********
                                ;*
                                ;*      THIS GROUP OF TESTS IS USED TO CHECK ALL THE PAR'S AND
                                ;*      PDR'S; THEIR ADDRESS DECODING ON DIRECT REFERENCES, THEIR
                                ;*      READ/WRITE BITS, AND DUAL ADDRESSING WITHIN A GROUP OR BETWEEN
                                ;*      TWO GROUPS.
                                ;*
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```
                                .SBTTL          TEST THAT ALL P.A.R.'S & P.D.R.'S RESPOND
                                ;*      THESE NEXT SIX (6) TESTS VERIFY THAT THERE ARE 6 GROUPS OF
                                ;*      16 CONTIGUOUS ADDRESSES IN THE I/O PAGE THAT WILL RESPOND
                                ;*      WITHOUT TIMING OUT.  AT THIS POINT THE TEST IS NOT CONCERNED
                                ;*      WITH EXACTLY WHAT IS RESPONDING, JUST THAT SOMETHING RESPONDS.
                                ;*
                                ;;*****************************************************************
                                ;*TEST 15       READ ALL KERNEL PAGE ADDRESS REGISTERS, CHECK FOR TIMEOUT
                                ;*
                                ;*      THIS TEST DOES A READ FROM ALL THE KERNEL PAGE ADDRESS REGISTERS
                                ;*      'ERRVEC' IS SET TO 'TIMEOUT' AT THE BEGINNING OF THE TEST AND
                                ;*      IF ANY OF THE 16 KERNEL ADDRESS REGISTERS TIME OUT THEIR I/O
                                ;*      PAGE ADDRESS IS REPORTED AND LOGGED.  AT THE END OF THE TEST A
                                ;*      SUMMARY OF THE ERRORS IS GIVEN AND 'ERRVEC' IS RE-SET TO 'CPUER'.
                                ;*
                                ;*      ALL ERRORS IN THIS TEST ARE REPORTED BY SUBROUTINE ''TIMEOUT''
                                ;*
                                ;;*****************************************************************
043004                          TST15:
043004  000004                         SCOPE
043006  012737  043140  001316          MOV     #TST16,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
                                                                ;TEST FOR ESCAPE ON PARITY ERRORS
043014                          ENTPT3:
043014  012737  043044  001110          MOV     #20$,$LPADR     ;SET LOOP ADDRESS POINTER TO 20$
043022  012737  043044  001112          MOV     #20$,$LPERR     ;SET LOOP ON ERROR POINTER TO 20$
043030  012737  000015  001102          MOV     #15,$TSTNM      ;LOAD TEST NUMBER INTO MEMORY
043036  013737  001102  177570          MOV     $TSTNM,DISPLAY  ;DISPLAY TEST NUMBER FOR THIS TEST
043044  004737  031346          20$:    JSR     PC,CLEANUP      ;INITIALIZE ERROR LOCATIONS
043050  012737  031404  000004          MOV     #TIMEOUT,ERRVEC ;SET CPU TRAP VECTOR TO TIMEOUT ROUTINE
043056  012737  043070  001112          MOV     #1$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
043064  012700  172340                  MOV     #KIPAR0,R0      ;PUT ADDRESS OF FIRST PAR IN R0
043070  000240                  1$:     NOP                     ;THIS IS A SYNC POINT FOR SCOPING
043072  011001                          MOV     (R0),R1         ;THIS WILL TIMEOUT IF REGISTER DECODING BAD
043074  062700  000002                  ADD     #2,R0           ;POINT TO NEXT REGISTER
043100  022700  172376                  CMP     #KDPAR7,R0      ;SEE IF KDPAR7 HAS BEEN TRIED
043104  103371                          BHIS    1$              ;BRANCH IF NOT DONE
043106  012737  043044  001112          MOV     #20$,$LPERR     ;PUT LOOP ON ERROR POINTER TO START OF TEST
043114  012737  031670  000004          MOV     #CPUER,ERRVEC   ;RE-SET NORMAL CPU TRAP SERVICE ROUTINE
043122  005737  001302                  TST     ERRCNT          ;SEE IF ANY ERRORS OCCURRED ON THIS TEST
043126  001404                          BEQ     TST16           ;;BRANCH TO NEXT TEST IF NO ERRORS
043130  013737  001302  001204          MOV     ERRCNT,$TMP5    ;SAVE NUMBER OF ERRORS FOR TYPEOUT
043136  104017                          ERROR   17              ;SUMMARY OF PAR ERRORS

                                ;;*****************************************************************
                                ;*TEST 16       READ ALL SUPERVISOR PAGE ADDRESS REGISTERS, CHECK FOR TIMEOUT
                                ;;
                                ;;      THIS TEST DOES A READ FROM ALL THE SUPERVISOR PAGE ADDRESS
                                ;;      REGISTERS.  'ERRVEC' IS SET TO 'TIMEOUT' AT THE BEGINNING OF THE
                                ;;      TEST, AND IF ANY OF THE 16 SUPERVISOR ADDRESS REGISTERS TIME OUT
                                ;;      THEIR I/O PAGE ADDRESS IS REPORTED AND LOGGED.  AT THE END
                                ;;      OF THE TEST A SUMMARY OF ERRORS IS GIVEN AND 'ERRVEC' IS SET TO
                                ;;      'CPUER'.
                                ;;      ALL ERRORS IN THIS TEST ARE REPORTED BY SUBROUTINE ''TIMEOUT''
                                ;;
                                ;;*****************************************************************
043140                          TST16:
```

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                                        SCOPE
043140  000004
043142  012737  043244  001316        MOV     #TST17,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
                                                                ;TEST FOR ESCAPE ON PARITY ERRORS
043150  004737  031346          20$:  JSR     PC,CLEANUP      ;INITIALIZE ERROR LOCATIONS
043154  012737  031404  000004        MOV     #TIMEOUT,ERRVEC ;SET CPU TRAP VECTOR TO TIMEOUT ROUTINE
043162  012737  043174  001112        MOV     #1$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
043170  012700  172240                MOV     #SIPAR0,R0      ;PUT ADDRESS OF FIRST PAR IN R0
043174  000240                  1$:   NOP                     ;THIS IS A SYNC POINT FOR SCOPING
043176  011001                        MOV     (R0),R1         ;THIS WILL TIMEOUT IF REGISTER DECODING BAD
043200  062700  000002                ADD     #2,R0           ;POINT TO NEXT REGISTER
043204  022700  172276                CMP     #SDPAR7,R0      ;SEE IF SDPAR7 HAS BEEN TRIED
043210  103371                        BHIS    1$              ;BRANCH IF NOT DONE
043212  012737  043150  001112        MOV     #20$,$LPERR     ;PUT LOOP ON ERROR POINTER TO START OF TEST
043220  012737  031670  000004        MOV     #CPUER,ERRVEC   ;RE-SET NORMAL CPU TRAP SERVICE ROUTINE
043226  005737  001302                TST     ERRCNT          ;SEE IF ANY ERRORS OCCURRED ON THIS TEST
043232  001404                        BEQ     TST17           ;;BRANCH TO NEXT TEST IF NO ERRORS
043234  013737  001302  001204        MOV     ERRCNT,$TMP5    ;SAVE NUMBER OF ERRORS FOR TYPEOUT
043242  104017                        ERROR   17              ;SUMMARY OF PAR ERRORS

                                ;;**************************************************************
                                ;*TEST 17       READ ALL USER PAGE ADDRESS REGISTERS, CHECK FOR TIMEOUT
                                ;;
                                ;;      THIS TEST DOES A READ FROM ALL THE USER PAGE ADDRESS
                                ;;      REGISTERS.  'ERRVEC' IS SET TO 'TIMEOUT' AT THE BEGINNING OF THE
                                ;;      TEST, AND IF ANY OF THE 16 USER ADDRESS REGISTERS TIME OUT
                                ;;      THEIR I/O PAGE ADDRESS IS REPORTED AND LOGGED.  AT THE END
                                ;;      OF THE TEST A SUMMARY OF ERRORS IS GIVEN AND 'ERRVEC' IS SET TO
                                ;;      'CPUER'.
                                ;;      ALL ERRORS IN THIS TEST ARE REPORTED BY SUBROUTINE 'TIMEOUT''
                                ;;
                                ;;**************************************************************
043244                          TST17:
                                        SCOPE
043244  000004
043246  012737  043350  001316        MOV     #TST20,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
                                                                ;TEST FOR ESCAPE ON PARITY ERRORS
043254  004737  031346          20$:  JSR     PC,CLEANUP      ;INITIALIZE ERROR LOCATIONS
043260  012737  031404  000004        MOV     #TIMEOUT,ERRVEC ;SET CPU TRAP VECTOR TO TIMEOUT ROUTINE
043266  012737  043300  001112        MOV     #1$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
043274  012700  177640                MOV     #UIPAR0,R0      ;PUT ADDRESS OF FIRST PAR IN R0
043300  000240                  1$:   NOP                     ;THIS IS A SYNC POINT FOR SCOPING
043302  011001                        MOV     (R0),R1         ;THIS WILL TIMEOUT IF REGISTER DECODING BAD
043304  062700  000002                ADD     #2,R0           ;POINT TO NEXT REGISTER
043310  022700  177676                CMP     #UDPAR7,R0      ;SEE IF UDPAR7 HAS BEEN TRIED
043314  103371                        BHIS    1$              ;BRANCH IF NOT DONE
043316  012737  043254  001112        MOV     #20$,$LPERR     ;PUT LOOP ON ERROR POINTER TO START OF TEST
043324  012737  031670  000004        MOV     #CPUER,ERRVEC   ;RE-SET NORMAL CPU TRAP SERVICE ROUTINE
043332  005737  001302                TST     ERRCNT          ;SEE IF ANY ERRORS OCCURRED ON THIS TEST
043336  001404                        BEQ     TST20           ;;BRANCH TO NEXT TEST IF NO ERRORS
043340  013737  001302  001204        MOV     ERRCNT,$TMP5    ;SAVE NUMBER OF ERRORS FOR TYPEOUT
043346  104017                        ERROR   17              ;SUMMARY OF PAR ERRORS

                                ;;**************************************************************
                                ;*TEST 20       READ ALL KERNEL PAGE DESCRIPTOR REGISTERS, CHECK FOR TIMEOUT
                                ;;
                                ;;      THIS TEST DOES A READ FROM ALL THE KERNEL PAGE DESCRIPTOR
                                ;;      REGISTERS.  'ERRVEC' IS SET TO 'TIMEOUT' AT THE BEGINNING OF THE
```

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                                ;;
                                ;;      TEST, AND IF ANY OF THE 16 KERNEL DESCRIPTOR REGISTERS TIME OUT
                                ;;      THEIR I/O PAGE ADDRESS IS REPORTED AND LOGGED.  AT THE END
                                ;;      OF THE TEST A SUMMARY OF ERRORS IS GIVEN AND 'ERRVEC' IS SET TO
                                ;;      'CPUER'.
                                ;;      ALL ERRORS IN THIS TEST ARE REPORTED BY SUBROUTINE 'TIMEOUT'
                                ;;
                                ;;*********************************************************************
043350                          TST20:
043350  000004                          SCOPE
043352  012737  043454  001316         MOV     #TST21,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
                                                                ;TEST FOR ESCAPE ON PARITY ERRORS
043360  004737  031346          20$:    JSR     PC,CLEANUP      ;INITIALIZE ERROR LOCATIONS
043364  012737  031404  000004         MOV     #TIMEOUT,ERRVEC ;SET CPU TRAP VECTOR TO TIMEOUT ROUTINE
043372  012737  043404  001112         MOV     #1$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
043400  012700  172300                 MOV     #KIPDR0,R0      ;PUT ADDRESS OF FIRST PDR IN R0
043404  000240                  1$:     NOP                     ;THIS IS A SYNC POINT FOR SCOPING
043406  011001                         MOV     (R0),R1         ;THIS WILL TIMEOUT IF REGISTER DECODING BAD
043410  062700  000002                 ADD     #2,R0           ;POINT TO NEXT REGISTER
043414  022700  172336                 CMP     #KDPDR7,R0      ;SEE IF KDPDR7 HAS BEEN TRIED
043420  103371                         BHIS    1$              ;BRANCH IF NOT DONE
043422  012737  043360  001112         MOV     #20$,$LPERR     ;PUT LOOP ON ERROR POINTER TO START OF TEST
043430  012737  031670  000004         MOV     #CPUER,ERRVEC   ;RE-SET NORMAL CPU TRAP SERVICE ROUTINE
043436  005737  001302                 TST     ERRCNT          ;SEE IF ANY ERRORS OCCURRED ON THIS TEST
043442  001404                         BEQ     TST21           ;;BRANCH TO NEXT TEST IF NO ERRORS
043444  013737  001302  001204         MOV     ERRCNT,$TMP5    ;SAVE NUMBER OF ERRORS FOR TYPEOUT
043452  104017                         ERROR   17              ;SUMMARY OF PDR ERRORS
                                ;;*********************************************************************
                                ;*TEST 21        READ ALL SUPERVISOR PAGE DESCRIPTOR REGISTERS, CHECK FOR TIMEOUT
                                ;;
                                ;;      THIS TEST DOES A READ FROM ALL THE SUPERVISOR PAGE DESCRIPTOR
                                ;;      REGISTERS.  'ERRVEC' IS SET TO 'TIMEOUT' AT THE BEGINNING OF THE
                                ;;      TEST, AND IF ANY OF THE 16 SUPERVISOR DESCRIPTOR REGISTERS TIME OUT
                                ;;      THEIR I/O PAGE ADDRESS IS REPORTED AND LOGGED.  AT THE END
                                ;;      OF THE TEST A SUMMARY OF ERRORS IS GIVEN AND 'ERRVEC' IS SET TO
                                ;;      'CPUER'.
                                ;;      ALL ERRORS IN THIS TEST ARE REPORTED BY SUBROUTINE 'TIMEOUT'
                                ;;
                                ;;*********************************************************************
043454                          TST21:
043454  000004                          SCOPE
043456  012737  043560  001316         MOV     #TST22,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
                                                                ;TEST FOR ESCAPE ON PARITY ERRORS
043464  004737  031346          20$:    JSR     PC,CLEANUP      ;INITIALIZE ERROR LOCATIONS
043470  012737  031404  000004         MOV     #TIMEOUT,ERRVEC ;SET CPU TRAP VECTOR TO TIMEOUT ROUTINE
043476  012737  043510  001112         MOV     #1$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
043504  012700  172200                 MOV     #SIPDR0,R0      ;PUT ADDRESS OF FIRST PDR IN R0
043510  000240                  1$:     NOP                     ;THIS IS A SYNC POINT FOR SCOPING
043512  011001                         MOV     (R0),R1         ;THIS WILL TIMEOUT IF REGISTER DECODING BAD
043514  062700  000002                 ADD     #2,R0           ;POINT TO NEXT REGISTER
043520  022700  172236                 CMP     #SDPDR7,R0      ;SEE IF SDPDR7 HAS BEEN TRIED
043524  103371                         BHIS    1$              ;BRANCH IF NOT DONE
043526  012737  043464  001112         MOV     #20$,$LPERR     ;PUT LOOP ON ERROR POINTER TO START OF TEST
043534  012737  031670  000004         MOV     #CPUER,ERRVEC   ;RE-SET NORMAL CPU TRAP SERVICE ROUTINE
043542  005737  001302                 TST     ERRCNT          ;SEE IF ANY ERRORS OCCURRED ON THIS TEST
043546  001404                         BEQ     TST22           ;;BRANCH TO NEXT TEST IF NO ERRORS
```

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                                ;;*****************************************************************
                                ;*TEST 22       READ ALL USER PAGE DESCRIPTOR REGISTERS, CHECK FOR TIMEOUT
                                ;;
                                ;;      THIS TEST DOES A READ FROM ALL THE USER PAGE DESCRIPTOR
                                ;;      REGISTERS.  'ERRVEC' IS SET TO 'TIMEOUT' AT THE BEGINNING OF THE
                                ;;      TEST, AND IF ANY OF THE 16 USER DESCRIPTOR REGISTERS TIME OUT
                                ;;      THEIR I/O PAGE ADDRESS IS REPORTED AND LOGGED.  AT THE END
                                ;;      OF THE TEST A SUMMARY OF ERRORS IS GIVEN AND 'ERRVEC' IS SET TO
                                ;;      'CPUER'.
                                ;;      ALL ERRORS IN THIS TEST ARE REPORTED BY SUBROUTINE 'TIMEOUT''
                                ;;
                                ;;*****************************************************************
043560                          TST22:
                                        SCOPE
043562  012737  043664  001316          MOV     #TST23,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
                                                                ;TEST FOR ESCAPE ON PARITY ERRORS
043570  004737  031346          20$:    JSR     PC,CLEANUP      ;INITIALIZE ERROR LOCATIONS
043574  012737  031404  000004          MOV     #TIMEOUT,ERRVEC ;SET CPU TRAP VECTOR TO TIMEOUT ROUTINE
043602  012737  043614  001112          MOV     #1$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
043610  012700  177600                  MOV     #UIPDR0,R0      ;PUT ADDRESS OF FIRST PDR IN R0
043614  000240                  1$:     NOP                     ;THIS IS A SYNC POINT FOR SCOPING
043616  011001                          MOV     (R0),R1         ;THIS WILL TIMEOUT IF REGISTER DECODING BAD
043620  062700  000002                  ADD     #2,R0           ;POINT TO NEXT REGISTER
043624  022700  177636                  CMP     #UDPDR7,R0      ;SEE IF UDPDR7 HAS BEEN TRIED
043630  103371                          BHIS    1$              ;BRANCH IF NOT DONE
043632  012737  043570  001112          MOV     #20$,$LPERR     ;PUT LOOP ON ERROR POINTER TO START OF TEST
043640  012737  031670  000004          MOV     #CPUER,ERRVEC   ;RE-SET NORMAL CPU TRAP SERVICE ROUTINE
043646  005737  001302                  TST     ERRCNT          ;SEE IF ANY ERRORS OCCURRED ON THIS TEST
043652  001404                          BEQ     TST23           ;;BRANCH TO NEXT TEST IF NO ERRORS
043654  013737  001302  001204          MOV     ERRCNT,$TMP5    ;SAVE NUMBER OF ERRORS FOR TYPEOUT
043662  104017                          ERROR   17              ;SUMMARY OF PDR ERRORS

                                .SBTTL          TEST FOR DUAL ADDRESSING ON LOAD WITHIN GROUPS
                                ;*      THESE NEXT SIX (6) TESTS WILL CHECK FOR DUAL ADDRESSING WITHIN A
                                ;*      GROUP OF PAR'S OR PDR'S.  FIRST ALL OF THE REGISTERS IN A GROUP
                                ;*      ARE CLEARED AND READ TO SEE THAT THEY CAN EACH HOLD ZEROES, AND
                                ;*      THAT THE DATA PATH DOES NOT HAVE A BIT STUCK AT ONE.
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5473                                    ;*      THEN ONE REGISTER AT A TIME, WITHIN THAT GROUP, IS LOADED
```

```
                                ;*      WITH A NEGATIVE ONE WHILE ALL REGISTERS ARE READ TO SEE
                                ;*      THAT ONLY THE REGISTER UNDER TEST WAS NOT ZERO.
                                ;*
```

```
                                ;;*****************************************************************
                                ;*TEST 23       DUAL ADDRESS KERNEL PAGE ADDRESS REGISTERS, ON LOADING
                                ;*
                                ;*      THIS TEST FIRST CLEARS ALL THE KERNEL PAGE ADDRESS REGISTERS,
                                ;*      AND CHECKS TO SEE THAT THEY EACH HOLD ZERO.  THEN, STARTING
                                ;*
                                ;*      WITH I-SPACE ADDRESS REGISTER ZERO, ONE REGISTER AT A TIME
                                ;*      IS LOADED WITH A NEGATIVE ONE.  ALL KERNEL ADDRESS REGISTERS
                                ;*      ARE NOW READ TO SEE THAT ONLY THE REGISTER UNDER TEST IS NON-
                                ;*      ZERO.  INDIVIDUAL ERRORS ARE REPORTED AND A SUMMARY OF THEM
                                ;*      IS GIVEN AT THE END OF THIS TEST.
                                ;*
                                ;*      ALL ERRORS IN THIS TEST ARE REPORTED AND ANALYZED BY SUBROUTINE
                                ;*      'DUALADR'.
                                ;;*****************************************************************
043664                          TST23:
043664  000004                          SCOPE
043666  012737  044074  001316          MOV     #TST24,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
                                                                ;TEST FOR ESCAPE ON PARITY ERRORS
043674  004737  031346          20$:    JSR     PC,CLEANUP      ;INITIALIZE ERROR LOCATIONS
043700  012737  043726  001112          MOV     #1$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
043706  012705  172340                  MOV     #KIPAR0,R5      ;PUT ADDRESS OF FIRST PAR IN R5
043712  004737  031330                  JSR     PC,CLRREG       ;CLEAR 16 REGISTERS POINTED TO BY R5
043716  012700  172340                  MOV     #KIPAR0,R0      ;PUT ADDRESS OF FIRST PAR IN R0
043722  012701  000020                  MOV     #20,R1          ;BRANCH COUNT IS 16 DECIMAL
043726  000240                  1$:     NOP                     ;THIS IS A SYNC POINT FOR SCOPING
043730  011002                          MOV     (R0),R2         ;READ PAR TO R2
043732  001401                          BEQ     2$              ;BRANCH IF PAR IS 0
043734  104020                          ERROR   20              ;PAR NOT ZERO
043736  062700  000002          2$:     ADD     #2,R0           ;POINT TO NEXT REGISTER
043742  077107                          SOB     R1,1$           ;BRANCH BACK TO 1$ 15 TIMES
                                ;;
                                ;;  NOW START DUAL ADDRESSING TEST BY LOADING -1 INTO ONE
                                ;;  REGISTER AND READING THE REST TO SEE ONLY THAT REGISTER
                                ;;  IS NON-ZERO. (DROPPED BITS  WILL BE FOUND IN NEXT TEST.)
                                ;;
043744  012737  043756  001112          MOV     #3$,$LPERR      ;SET LOOP ON ERROR POINTER TO 3$
043752  012700  172340                  MOV     #KIPAR0,R0      ;PUT ADDRESS OF FIRST PAR IS R0
043756  012705  172340          3$:     MOV     #KIPAR0,R5      ;LOAD STARTING ADDRESS INTO R5
043762  004737  031330                  JSR     PC,CLRREG       ;CLEAR 16 REGISTERS POINTED TO BY R5
043766  012701  172376                  MOV     #KDPAR7,R1      ;PUT KDPAR7 ADDRESS IN R1
043772  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
043774  012710  177777                  MOV     #-1,(R0)        ;LOAD REGISTER UNDER TEST
044000  005037  001172          4$:     CLR     $TMP0           ;FLAG TO INDICATE THERE WAS A MATCH
044004  011102                          MOV     (R1),R2         ;READ ALL REGISTERS
044006  001406                          BEQ     6$              ;BRANCH IF REGISTER IS 0
044010  020001                          CMP     R0,R1           ;IS ADDRESS OF NON-ZERO REGISTER SAME
                                                                ;AS THAT OF REGISTER UNDER TEST
044012  001402                          BEQ     5$              ;BRANCH IF ADDRESSES MATCH
044014  004737  031524                  JSR     PC,DUALADR      ;LOG AND REPORT ERRORS
044020  005237  001172          5$:     INC     $TMP0           ;SET FLAG WHEN ADDRESSES MATCH
044024  162701  000002          6$:     SUB     #2,R1           ;POINT TO NEXT REGISTER
044030  022701  172340                  CMP     #KIPAR0,R1      ;SEE IF ALL REGISTERS HAVE BEEN READ
044034  101761                          BLOS    4$              ;BRANCH IF MORE TO READ
044036  062700  000002                  ADD     #2,R0           ;NOW LOAD NEXT REGISTER
044042  022700  172376                  CMP     #KDPAR7,R0      ;SEE IF THERE ARE MORE REGISTERS TO TEST
```

```
5533  044046  103343                  BHIS    3$              ;BRANCH IF MORE REGISTERS TO TEST
5534  044050  012737  043674  001112  MOV     #20$,$LPERR     ;SET LOOP ON ERROR POINTER TO START OF TEST
5535  044056  005737  001302          TST     ERRCNT          ;SEE IF THERE WERE ANY ERRORS
5536  044062  001404                  BEQ     TST24           ;;BRANCH TO NEXT TEST IF NO ERRORS
5537  044064  013737  001302  001204  MOV     ERRCNT,$TMP5    ;SAVE NUMBER OF ERRORS FOR PAR OUT
5538  044072  104021                  ERROR   21              ;SUMMARY OF DUAL ADDRESSING ERRORS
5539
```

```
                                ;;*****************************************************************
                                ;*TEST 24       DUAL ADDRESS SUPERVISOR PAGE ADDRESS REGISTERS, ON LOADING
                                ;;
                                ;;      THIS TEST FIRST CLEARS ALL THE SUPERVISOR PAGE ADDRESS
                                ;;      AND CHECKS TO SEE THAT THEY EACH HOLD ZERO.  THEN, STARTING WITH
                                ;;      I-SPACE ADDRESS REGISTER ZERO, ONE REGISTER AT A TIME IS
                                ;;      LOADED WITH A NEGATIVE ONE.  ALL SUPERVISOR ADDRESS REGISTERS
                                ;;      ARE NOW READ TO SEE THAT ONLY THE ONE UNDER TEST IS NON-ZERO.
                                ;;      INDIVIDUAL ERRORS ARE REPORTED AND A SUMMARY OF THEM IS GIVEN AT
                                ;;      THE END OF THIS TEST.
                                ;;
                                ;;      ALL ERRORS IN THIS TEST ARE REPORTED AND ANALYZED BY SUBROUTINE
                                ;;      'DUALADR'.
                                ;;*****************************************************************
044074                          TST24:
044074  000004                          SCOPE
044076  012737  044304  001316          MOV     #TST25,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
                                                                ;TEST FOR ESCAPE ON PARITY ERRORS
044104  004737  031346          20$:    JSR     PC,CLEANUP      ;INITIALIZE ERROR LOCATIONS
044110  012737  044136  001112          MOV     #1$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
044116  012705  172240                  MOV     #SIPAR0,R5      ;PUT ADDRESS OF FIRST PAR IN R5
044122  004737  031330                  JSR     PC,CLRREG       ;CLEAR 16 REGISTERS POINTED TO BY R5
044126  012700  172240                  MOV     #SIPAR0,R0      ;PUT ADDRESS OF FIRST PAR IN R0
044132  012701  000020                  MOV     #20,R1          ;BRANCH COUNT IS 16 DECIMAL
044136  000240                  1$:     NOP                     ;THIS IS A SYNC POINT FOR SCOPING
044140  011002                          MOV     (R0),R2         ;READ PAR TO R2
044142  001401                          BEQ     2$              ;BRANCH IF PAR IS 0
044144  104020                          ERROR   20              ;PAR NOT ZERO
044146  062700  000002          2$:     ADD     #2,R0           ;POINT TO NEXT REGISTER
044152  077107                          SOB     R1,1$           ;BRANCH BACK TO 1$ 15 TIMES
                                ;;
                                ;;  NOW START DUAL ADDRESSING TEST BY LOADING -1 INTO ONE
                                ;;  REGISTER AND READING THE REST TO SEE ONLY THAT REGISTER
                                ;;  IS NON-ZERO. (DROPPED BITS  WILL BE FOUND IN NEXT TEST.)
                                ;;
044154  012737  044166  001112          MOV     #3$,$LPERR      ;SET LOOP ON ERROR POINTER TO 3$
044162  012700  172240                  MOV     #SIPAR0,R0      ;PUT ADDRESS OF FIRST PAR IS R0
044166  012705  172240          3$:     MOV     #SIPAR0,R5      ;LOAD STARTING ADDRESS INTO R5
044172  004737  031330                  JSR     PC,CLRREG       ;CLEAR 16 REGISTERS POINTED TO BY R5
044176  012701  172276                  MOV     #SDPAR7,R1      ;PUT SDPAR7 ADDRESS IN R1
044202  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
044204  012710  177777                  MOV     #-1,(R0)        ;LOAD REGISTER UNDER TEST
044210  005037  001172          4$:     CLR     $TMP0           ;FLAG TO INDICATE THERE WAS A MATCH
044214  011102                          MOV     (R1),R2         ;READ ALL REGISTERS
044216  001406                          BEQ     6$              ;BRANCH IF REGISTER IS 0
044220  020001                          CMP     R0,R1           ;IS ADDRESS OF NON-ZERO REGISTER SAME
                                                                ;AS THAT OF REGISTER UNDER TEST
044222  001402                          BEQ     5$              ;BRANCH IF ADDRESSES MATCH
044224  004737  031524                  JSR     PC,DUALADR      ;LOG AND REPORT ERRORS
044230  005237  001172          5$:     INC     $TMP0           ;SET FLAG WHEN ADDRESSES MATCH
044234  162701  000002          6$:     SUB     #2,R1           ;POINT TO NEXT REGISTER
044240  022701  172240                  CMP     #SIPAR0,R1      ;SEE IF ALL REGISTERS HAVE BEEN READ
044244  101761                          BLOS    4$              ;BRANCH IF MORE TO READ
044246  062700  000002                  ADD     #2,R0           ;NOW LOAD NEXT REGISTER
044252  022700  172276                  CMP     #SDPAR7,R0      ;SEE IF THERE ARE MORE REGISTERS TO TEST
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5596  044256  103343                        BHIS    3$              ;BRANCH IF MORE REGISTERS TO TEST
5597  044260  012737  044104  001112        MOV     #20$,$LPERR     ;SET LOOP ON ERROR POINTER TO START OF TEST
5598  044266  005737  001302                TST     ERRCNT          ;SEE IF THERE WERE ANY ERRORS
5599  044272  001404                        BEQ     TST25           ;;BRANCH TO NEXT TEST IF NO ERRORS
5600  044274  013737  001302  001204        MOV     ERRCNT,$TMP5    ;SAVE NUMBER OF ERRORS FOR PAR OUT
5601  044302  104021                        ERROR   21              ;SUMMARY OF DUAL ADDRESSING ERRORS
5602
5603                                ;;*****************************************************************
5604                                ;*TEST 25       DUAL ADDRESS USER PAGE ADDRESS REGISTERS, ON LOADING
5605                                ;;
5606                                ;;      THIS TEST FIRST CLEARS ALL THE USER PAGE ADDRESS
5607                                ;;      AND CHECKS TO SEE THAT THEY EACH HOLD ZERO.  THEN, STARTING WITH
5608                                ;;      I-SPACE ADDRESS REGISTER ZERO, ONE REGISTER AT A TIME IS
5609                                ;;      LOADED WITH A NEGATIVE ONE.  ALL USER ADDRESS REGISTERS
5610                                ;;      ARE NOW READ TO SEE THAT ONLY THE ONE UNDER TEST IS NON-ZERO.
5611                                ;;      INDIVIDUAL ERRORS ARE REPORTED AND A SUMMARY OF THEM IS GIVEN AT
5612                                ;;      THE END OF THIS TEST.
5613                                ;;
5614                                ;;      ALL ERRORS IN THIS TEST ARE REPORTED AND ANALYZED BY SUBROUTINE
5615                                ;;      'DUALADR'.
5616                                ;;*****************************************************************
5617  044304                        TST25:
5618  044304  000004                        SCOPE
5619  044306  012737  044514  001316        MOV     #TST26,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
5620                                                                ;TEST FOR ESCAPE ON PARITY ERRORS
5621  044314  004737  031346        20$:    JSR     PC,CLEANUP      ;INITIALIZE ERROR LOCATIONS
5622  044320  012737  044346  001112        MOV     #1$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
5623  044326  012705  177640                MOV     #UIPAR0,R5      ;PUT ADDRESS OF FIRST PAR IN R5
5624  044332  004737  031330                JSR     PC,CLRREG       ;CLEAR 16 REGISTERS POINTED TO BY R5
5625  044336  012700  177640                MOV     #UIPAR0,R0      ;PUT ADDRESS OF FIRST PAR IN R0
5626  044342  012701  000020                MOV     #20,R1          ;BRANCH COUNT IS 16 DECIMAL
5627  044346  000240                1$:     NOP                     ;THIS IS A SYNC POINT FOR SCOPING
5628  044350  011002                        MOV     (R0),R2         ;READ PAR TO R2
5629  044352  001401                        BEQ     2$              ;BRANCH IF PAR IS 0
5630  044354  104020                        ERROR   20              ;PAR NOT ZERO
5631  044356  062700  000002        2$:     ADD     #2,R0           ;POINT TO NEXT REGISTER
5632  044362  077107                        SOB     R1,1$           ;BRANCH BACK TO 1$ 15 TIMES
5633                                ;;
5634                                ;;  NOW START DUAL ADDRESSING TEST BY LOADING -1 INTO ONE
5635                                ;;  REGISTER AND READING THE REST TO SEE ONLY THAT REGISTER
5636                                ;;  IS NON-ZERO. (DROPPED BITS  WILL BE FOUND IN NEXT TEST.)
5637                                ;;
5638  044364  012737  044376  001112        MOV     #3$,$LPERR      ;SET LOOP ON ERROR POINTER TO 3$
5639  044372  012700  177640                MOV     #UIPAR0,R0      ;PUT ADDRESS OF FIRST PAR IS R0
5640  044376  012705  177640        3$:     MOV     #UIPAR0,R5      ;LOAD STARTING ADDRESS INTO R5
5641  044402  004737  031330                JSR     PC,CLRREG       ;CLEAR 16 REGISTERS POINTED TO BY R5
5642  044406  012701  177676                MOV     #UDPAR7,R1      ;PUT UDPAR7 ADDRESS IN R1
5643  044412  000240                        NOP                     ;THIS IS A SYNC POINT FOR SCOPING
5644  044414  012710  177777                MOV     #-1,(R0)        ;LOAD REGISTER UNDER TEST
5645  044420  005037  001172        4$:     CLR     $TMP0           ;FLAG TO INDICATE THERE WAS A MATCH
5646  044424  011102                        MOV     (R1),R2         ;READ ALL REGISTERS
5647  044426  001406                        BEQ     6$              ;BRANCH IF REGISTER IS 0
5648  044430  020001                        CMP     R0,R1           ;IS ADDRESS OF NON-ZERO REGISTER SAME
5649                                                                ;AS THAT OF REGISTER UNDER TEST
5650  044432  001402                        BEQ     5$              ;BRANCH IF ADDRESSES MATCH
5651  044434  004737  031524                JSR     PC,DUALADR      ;LOG AND REPORT ERRORS
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5652  044440  005237  001172          5$:     INC     $TMP0           ;SET FLAG WHEN ADDRESSES MATCH
5653  044444  162701  000002          6$:     SUB     #2,R1           ;POINT TO NEXT REGISTER
5654  044450  022701  177640                  CMP     #UIPAR0,R1      ;SEE IF ALL REGISTERS HAVE BEEN READ
5655  044454  101761                          BLOS    4$              ;BRANCH IF MORE TO READ
5656  044456  062700  000002                  ADD     #2,R0           ;NOW LOAD NEXT REGISTER
5657  044462  022700  177676                  CMP     #UDPAR7,R0      ;SEE IF THERE ARE MORE REGISTERS TO TEST
5658  044466  103343                          BHIS    3$              ;BRANCH IF MORE REGISTERS TO TEST
5659  044470  012737  044314  001112          MOV     #20$,$LPERR     ;SET LOOP ON ERROR POINTER TO START OF TEST
5660  044476  005737  001302                  TST     ERRCNT          ;SEE IF THERE WERE ANY ERRORS
5661  044502  001404                          BEQ     TST26           ;;BRANCH TO NEXT TEST IF NO ERRORS
5662  044504  013737  001302  001204          MOV     ERRCNT,$TMP5    ;SAVE NUMBER OF ERRORS FOR PAR OUT
5663  044512  104021                          ERROR   21              ;SUMMARY OF DUAL ADDRESSING ERRORS
5664
5665                                  ;;**********************************************************************
5666                                  ;*TEST 26       DUAL ADDRESS KERNEL PAGE DESCRIPTOR REGISTERS, ON LOADING
5667                                  ;;
5668                                  ;;      THIS TEST FIRST CLEARS ALL THE KERNEL PAGE DESCRIPTOR
5669                                  ;;      AND CHECKS TO SEE THAT THEY EACH HOLD ZERO.  THEN, STARTING WITH
5670                                  ;;      I-SPACE DESCRIPTOR REGISTER ZERO, ONE REGISTER AT A TIME IS
5671                                  ;;      LOADED WITH A NEGATIVE ONE.  ALL KERNEL DESCRIPTOR REGISTERS
5672                                  ;;      ARE NOW READ TO SEE THAT ONLY THE ONE UNDER TEST IS NON-ZERO.
5673                                  ;;      INDIVIDUAL ERRORS ARE REPORTED AND A SUMMARY OF THEM IS GIVEN AT
5674                                  ;;      THE END OF THIS TEST.
5675                                  ;;
5676                                  ;;      ALL ERRORS IN THIS TEST ARE REPORTED AND ANALYZED BY SUBROUTINE
5677                                  ;;      'DUALADR'.
5678                                  ;;**********************************************************************
5679  044514                          TST26:
5680  044514  000004                          SCOPE
5681  044516  012737  044724  001316          MOV     #TST27,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
5682                                                                  ;TEST FOR ESCAPE ON PARITY ERRORS
5683  044524  004737  031346          20$:    JSR     PC,CLEANUP      ;INITIALIZE ERROR LOCATIONS
5684  044530  012737  044556  001112          MOV     #1$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
5685  044536  012705  172300                  MOV     #KIPDR0,R5      ;PUT ADDRESS OF FIRST PDR IN R5
5686  044542  004737  031330                  JSR     PC,CLRREG       ;CLEAR 16 REGISTERS POINTED TO BY R5
5687  044546  012700  172300                  MOV     #KIPDR0,R0      ;PUT ADDRESS OF FIRST PDR IN R0
5688  044552  012701  000020                  MOV     #20,R1          ;BRANCH COUNT IS 16 DECIMAL
5689  044556  000240                  1$:     NOP                     ;THIS IS A SYNC POINT FOR SCOPING
5690  044560  011002                          MOV     (R0),R2         ;READ PDR TO R2
5691  044562  001401                          BEQ     2$              ;BRANCH IF PDR IS 0
5692  044564  104020                          ERROR   20              ;PDR NOT ZERO
5693  044566  062700  000002          2$:     ADD     #2,R0           ;POINT TO NEXT REGISTER
5694  044572  077107                          SOB     R1,1$           ;BRANCH BACK TO 1$ 15 TIMES
5695                                  ;;
5696                                  ;;  NOW START DUAL ADDRESSING TEST BY LOADING -1 INTO ONE
5697                                  ;;  REGISTER AND READING THE REST TO SEE ONLY THAT REGISTER
5698                                  ;;  IS NON-ZERO. (DROPPED BITS  WILL BE FOUND IN NEXT TEST.)
5699                                  ;;
5700  044574  012737  044606  001112          MOV     #3$,$LPERR      ;SET LOOP ON ERROR POINTER TO 3$
5701  044602  012700  172300                  MOV     #KIPDR0,R0      ;PUT ADDRESS OF FIRST PDR IS R0
5702  044606  012705  172300          3$:     MOV     #KIPDR0,R5      ;LOAD STARTING ADDRESS INTO R5
5703  044612  004737  031330                  JSR     PC,CLRREG       ;CLEAR 16 REGISTERS POINTED TO BY R5
5704  044616  012701  172336                  MOV     #KDPDR7,R1      ;PUT KDPDR7 ADDRESS IN R1
5705  044622  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
5706  044624  012710  177777                  MOV     #-1,(R0)        ;LOAD REGISTER UNDER TEST
5707  044630  005037  001172          4$:     CLR     $TMP0           ;FLAG TO INDICATE THERE WAS A MATCH
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```
5708  044634  011102                          MOV     (R1),R2         ;READ ALL REGISTERS
5709  044636  001406                          BEQ     6$              ;BRANCH IF REGISTER IS 0
5710  044640  020001                          CMP     R0,R1           ;IS ADDRESS OF NON-ZERO REGISTER SAME
5711                                                                  ;AS THAT OF REGISTER UNDER TEST
5712  044642  001402                          BEQ     5$              ;BRANCH IF ADDRESSES MATCH
5713  044644  004737  031524                  JSR     PC,DUALADR      ;LOG AND REPORT ERRORS
5714  044650  005237  001172          5$:     INC     $TMP0           ;SET FLAG WHEN ADDRESSES MATCH
5715  044654  162701  000002          6$:     SUB     #2,R1           ;POINT TO NEXT REGISTER
5716  044660  022701  172300                  CMP     #KIPDR0,R1      ;SEE IF ALL REGISTERS HAVE BEEN READ
5717  044664  101761                          BLOS    4$              ;BRANCH IF MORE TO READ
5718  044666  062700  000002                  ADD     #2,R0           ;NOW LOAD NEXT REGISTER
5719  044672  022700  172336                  CMP     #KDPDR7,R0      ;SEE IF THERE ARE MORE REGISTERS TO TEST
5720  044676  103343                          BHIS    3$              ;BRANCH IF MORE REGISTERS TO TEST
5721  044700  012737  044524  001112          MOV     #20$,$LPERR     ;SET LOOP ON ERROR POINTER TO START OF TEST
5722  044706  005737  001302                  TST     ERRCNT          ;SEE IF THERE WERE ANY ERRORS
5723  044712  001404                          BEQ     TST27           ;;BRANCH TO NEXT TEST IF NO ERRORS
5724  044714  013737  001302  001204          MOV     ERRCNT,$TMP5    ;SAVE NUMBER OF ERRORS FOR PDR OUT
5725  044722  104021                          ERROR   21              ;SUMMARY OF DUAL ADDRESSING ERRORS
5726
5727                                  ;;**********************************************************************
5728                                  ;*TEST 27        DUAL ADDRESS SUPERVISOR PAGE DESCRIPTOR REGISTERS, ON LOADING
5729                                  ;;
5730                                  ;;      THIS TEST FIRST CLEARS ALL THE SUPERVISOR PAGE DESCRIPTOR
5731                                  ;;      AND CHECKS TO SEE THAT THEY EACH HOLD ZERO.  THEN, STARTING WITH
5732                                  ;;      I-SPACE DESCRIPTOR REGISTER ZERO, ONE REGISTER AT A TIME IS
5733                                  ;;      LOADED WITH A NEGATIVE ONE.  ALL SUPERVISOR DESCRIPTOR REGISTERS
5734                                  ;;      ARE NOW READ TO SEE THAT ONLY THE ONE UNDER TEST IS NON-ZERO.
5735                                  ;;      INDIVIDUAL ERRORS ARE REPORTED AND A SUMMARY OF THEM IS GIVEN AT
5736                                  ;;      THE END OF THIS TEST.
5737                                  ;;
5738                                  ;;      ALL ERRORS IN THIS TEST ARE REPORTED AND ANALYZED BY SUBROUTINE
5739                                  ;;      'DUALADR'.
5740                                  ;;**********************************************************************
5741  044724                          TST27:
5742  044724  000004                          SCOPE
5743  044726  012737  045134  001316          MOV     #TST30,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
5744                                                                  ;TEST FOR ESCAPE ON PARITY ERRORS
5745  044734  004737  031346          20$:    JSR     PC,CLEANUP      ;INITIALIZE ERROR LOCATIONS
5746  044740  012737  044766  001112          MOV     #1$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
5747  044746  012705  172200                  MOV     #SIPDR0,R5      ;PUT ADDRESS OF FIRST PDR IN R5
5748  044752  004737  031330                  JSR     PC,CLRREG       ;CLEAR 16 REGISTERS POINTED TO BY R5
5749  044756  012700  172200                  MOV     #SIPDR0,R0      ;PUT ADDRESS OF FIRST PDR IN R0
5750  044762  012701  000020                  MOV     #20,R1          ;BRANCH COUNT IS 16 DECIMAL
5751  044766  000240                  1$:     NOP                     ;THIS IS A SYNC POINT FOR SCOPING
5752  044770  011002                          MOV     (R0),R2         ;READ PDR TO R2
5753  044772  001401                          BEQ     2$              ;BRANCH IF PDR IS 0
5754  044774  104020                          ERROR   20              ;PDR NOT ZERO
5755  044776  062700  000002          2$:     ADD     #2,R0           ;POINT TO NEXT REGISTER
5756  045002  077107                          SOB     R1,1$           ;BRANCH BACK TO 1$ 15 TIMES
5757                                  ;;
5758                                  ;;  NOW START DUAL ADDRESSING TEST BY LOADING -1 INTO ONE
5759                                  ;;  REGISTER AND READING THE REST TO SEE ONLY THAT REGISTER
5760                                  ;;  IS NON-ZERO. (DROPPED BITS  WILL BE FOUND IN NEXT TEST.)
5761                                  ;;
5762  045004  012737  045016  001112          MOV     #3$,$LPERR      ;SET LOOP ON ERROR POINTER TO 3$
5763  045012  012700  172200                  MOV     #SIPDR0,R0      ;PUT ADDRESS OF FIRST PDR IS R0
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```
5764  045016  012705  172200          3$:   MOV     #SIPDR0,R5      ;LOAD STARTING ADDRESS INTO R5
5765  045022  004737  031330                JSR     PC,CLRREG       ;CLEAR 16 REGISTERS POINTED TO BY R5
5766  045026  012701  172236                MOV     #SDPDR7,R1      ;PUT SDPDR7 ADDRESS IN R1
5767  045032  000240                        NOP                     ;THIS IS A SYNC POINT FOR SCOPING
5768  045034  012710  177777                MOV     #-1,(R0)        ;LOAD REGISTER UNDER TEST
5769  045040  005037  001172          4$:   CLR     $TMP0           ;FLAG TO INDICATE THERE WAS A MATCH
5770  045044  011102                        MOV     (R1),R2         ;READ ALL REGISTERS
5771  045046  001406                        BEQ     6$              ;BRANCH IF REGISTER IS 0
5772  045050  020001                        CMP     R0,R1           ;IS ADDRESS OF NON-ZERO REGISTER SAME
5773                                                                ;AS THAT OF REGISTER UNDER TEST
5774  045052  001402                        BEQ     5$              ;BRANCH IF ADDRESSES MATCH
5775  045054  004737  031524                JSR     PC,DUALADR      ;LOG AND REPORT ERRORS
5776  045060  005237  001172          5$:   INC     $TMP0           ;SET FLAG WHEN ADDRESSES MATCH
5777  045064  162701  000002          6$:   SUB     #2,R1           ;POINT TO NEXT REGISTER
5778  045070  022701  172200                CMP     #SIPDR0,R1      ;SEE IF ALL REGISTERS HAVE BEEN READ
5779  045074  101761                        BLOS    4$              ;BRANCH IF MORE TO READ
5780  045076  062700  000002                ADD     #2,R0           ;NOW LOAD NEXT REGISTER
5781  045102  022700  172236                CMP     #SDPDR7,R0      ;SEE IF THERE ARE MORE REGISTERS TO TEST
5782  045106  103343                        BHIS    3$              ;BRANCH IF MORE REGISTERS TO TEST
5783  045110  012737  044734  001112        MOV     #20$,$LPERR     ;SET LOOP ON ERROR POINTER TO START OF TEST
5784  045116  005737  001302                TST     ERRCNT          ;SEE IF THERE WERE ANY ERRORS
5785  045122  001404                        BEQ     TST30           ;;BRANCH TO NEXT TEST IF NO ERRORS
5786  045124  013737  001302  001204        MOV     ERRCNT,$TMP5    ;SAVE NUMBER OF ERRORS FOR PDR OUT
5787  045132  104021                        ERROR   21              ;SUMMARY OF DUAL ADDRESSING ERRORS
5788
5789                                  ;;*****************************************************************
5790                                  ;*TEST 30       DUAL ADDRESS USER PAGE DESCRIPTOR REGISTERS, ON LOADING
5791                                  ;;
5792                                  ;;      THIS TEST FIRST CLEARS ALL THE USER PAGE DESCRIPTOR
5793                                  ;;      AND CHECKS TO SEE THAT THEY EACH HOLD ZERO.  THEN, STARTING WITH
5794                                  ;;      I-SPACE DESCRIPTOR REGISTER ZERO, ONE REGISTER AT A TIME IS
5795                                  ;;      LOADED WITH A NEGATIVE ONE.  ALL USER DESCRIPTOR REGISTERS
5796                                  ;;      ARE NOW READ TO SEE THAT ONLY THE ONE UNDER TEST IS NON-ZERO.
5797                                  ;;      INDIVIDUAL ERRORS ARE REPORTED AND A SUMMARY OF THEM IS GIVEN AT
5798                                  ;;      THE END OF THIS TEST.
5799                                  ;;
5800                                  ;;      ALL ERRORS IN THIS TEST ARE REPORTED AND ANALYZED BY SUBROUTINE
5801                                  ;;      'DUALADR'.
5802                                  ;;*****************************************************************
5803  045134                          TST30:
5804  045134  000004                        SCOPE
5805  045136  012737  045344  001316        MOV     #TST31,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
5806                                                                ;TEST FOR ESCAPE ON PARITY ERRORS
5807  045144  004737  031346          20$:  JSR     PC,CLEANUP      ;INITIALIZE ERROR LOCATIONS
5808  045150  012737  045176  001112        MOV     #1$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
5809  045156  012705  177600                MOV     #UIPDR0,R5      ;PUT ADDRESS OF FIRST PDR IN R5
5810  045162  004737  031330                JSR     PC,CLRREG       ;CLEAR 16 REGISTERS POINTED TO BY R5
5811  045166  012700  177600                MOV     #UIPDR0,R0      ;PUT ADDRESS OF FIRST PDR IN R0
5812  045172  012701  000020                MOV     #20,R1          ;BRANCH COUNT IS 16 DECIMAL
5813  045176  000240                  1$:   NOP                     ;THIS IS A SYNC POINT FOR SCOPING
5814  045200  011002                        MOV     (R0),R2         ;READ PDR TO R2
5815  045202  001401                        BEQ     2$              ;BRANCH IF PDR IS 0
5816  045204  104020                        ERROR   20              ;PDR NOT ZERO
5817  045206  062700  000002          2$:   ADD     #2,R0           ;POINT TO NEXT REGISTER
5818  045212  077107                        SOB     R1,1$           ;BRANCH BACK TO 1$ 15 TIMES
5819                                  ;:
```

```
                                ;:  NOW START DUAL ADDRESSING TEST BY LOADING -1 INTO ONE
                                ;:  REGISTER AND READING THE REST TO SEE ONLY THAT REGISTER
                                ;:  IS NON-ZERO. (DROPPED BITS  WILL BE FOUND IN NEXT TEST.)
                                ;:
045214  012737  045226  001112          MOV     #3$,$LPERR      ;SET LOOP ON ERROR POINTER TO 3$
045222  012700  177600                  MOV     #UIPDR0,R0      ;PUT ADDRESS OF FIRST PDR IS R0
045226  012705  177600          3$:     MOV     #UIPDR0,R5      ;LOAD STARTING ADDRESS INTO R5
045232  004737  031330                  JSR     PC,CLRREG       ;CLEAR 16 REGISTERS POINTED TO BY R5
045236  012701  177636                  MOV     #UDPDR7,R1      ;PUT UDPDR7 ADDRESS IN R1
045242  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
045244  012710  177777                  MOV     #-1,(R0)        ;LOAD REGISTER UNDER TEST
045250  005037  001172          4$:     CLR     $TMP0           ;FLAG TO INDICATE THERE WAS A MATCH
045254  011102                          MOV     (R1),R2         ;READ ALL REGISTERS
045256  001406                          BEQ     6$              ;BRANCH IF REGISTER IS 0
045260  020001                          CMP     R0,R1           ;IS ADDRESS OF NON-ZERO REGISTER SAME
                                                                ;AS THAT OF REGISTER UNDER TEST
045262  001402                          BEQ     5$              ;BRANCH IF ADDRESSES MATCH
045264  004737  031524                  JSR     PC,DUALADR      ;LOG AND REPORT ERRORS
045270  005237  001172          5$:     INC     $TMP0           ;SET FLAG WHEN ADDRESSES MATCH
045274  162701  000002          6$:     SUB     #2,R1           ;POINT TO NEXT REGISTER
045300  022701  177600                  CMP     #UIPDR0,R1      ;SEE IF ALL REGISTERS HAVE BEEN READ
045304  101761                          BLOS    4$              ;BRANCH IF MORE TO READ
045306  062700  000002                  ADD     #2,R0           ;NOW LOAD NEXT REGISTER
045312  022700  177636                  CMP     #UDPDR7,R0      ;SEE IF THERE ARE MORE REGISTERS TO TEST
045316  103343                          BHIS    3$              ;BRANCH IF MORE REGISTERS TO TEST
045320  012737  045144  001112          MOV     #20$,$LPERR     ;SET LOOP ON ERROR POINTER TO START OF TEST
045326  005737  001302                  TST     ERRCNT          ;SEE IF THERE WERE ANY ERRORS
045332  001404                          BEQ     TST31           ;;BRANCH TO NEXT TEST IF NO ERRORS
045334  013737  001302  001204          MOV     ERRCNT,$TMP5    ;SAVE NUMBER OF ERRORS FOR PDR OUT
045342  104021                          ERROR   21              ;SUMMARY OF DUAL ADDRESSING ERRORS

                        .SBTTL          TEST FOR BAD READ/WRITE BITS IN P.A.R.'S & P.D.R.'S
                        ;*      THESE NEXT SIX (6) TESTS CHECK FOR BAD BITS IN THE MEMORY CHIPS
                        ;*      THAT MAKE UP THE PAR'S AND PDR'S.  THE REGISTERS ARE LOADED WITH
                        ;*      ZERO AND MODIFIED BY ''401'' UNTIL 177777 IS REACHED IN EACH ONE
                        ;*      (THE NUMBER 401 WAS CHOSEN FOR FASTER RUN-TIME).  THE BITS THAT
                        ;*      ARE NOT IMPLEMENTED OR THAT ARE NOT READ/WRITE ARE MASKED OUT
                        ;*      OF THE DATA COMPARE.  A LOG OF MULTIPLE ERRORS IS KEPT FOR EACH
                        ;*      GROUP AND IT IS REPORTED AT THE CONCLUSION OF EACH TEST.
                        ;*
                        ;;*********************************************************************
                        ;*TEST 31       COUNT PATTERN IN KERNEL PAGE ADDRESS REGISTERS
                        ;*
                        ;*      THIS TEST RUNS A COUNT PATTERN THRU THE KERNEL PAGE ADDRESS
                        ;*      REGISTERS.  SINCE ALL THE BITS ARE IMPLEMENTED, NONE NEED
                        ;*      TO BE MASKED OUT OF THE COMPARE.  IF THE COUNT PATTERN DOES
                        ;*      NOT MATCH THE DATA RECEVIED, THE REGISTER ADDRESS, DATA
                        ;*      PATTERN, AND BAD DATA ARE REPORTED.  AT THE END OF THE TEST A
                        ;*      SUMMARY OF THE ERRORS IS GIVEN.
                        ;*
                        ;*      ALL ERRORS FOUND BY THIS TEST ARE REPORTED AND ANALYZED BY
                        ;*      SUBROUTINE 'PARCOUNT''.
                        ;*
                        ;;*********************************************************************
045344                  TST31:
045344  000004                  SCOPE
```

```
5876  045346  012737  045474  001316          MOV     #TST32,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
5877                                                                  ;TEST FOR ESCAPE ON PARITY ERRORS
5878  045354  012737  000012  001206          MOV     #12,$TIMES      ;;DO 12 ITERATIONS
5879  045362  004737  031346          20$:    JSR     PC,CLEANUP      ;INITIALIZE ERROR LOCATIONS
5880  045366  012737  045402  001112          MOV     #2$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
5881  045374  005001                          CLR     R1              ;CLEAR REGISTER TO HOLD COUNT PATTERN
5882  045376  012700  172340          1$:     MOV     #KIPAR0,R0      ;PUT ADDRESS OF FIRST REGISTER IS R0
5883  045402  000240                  2$:     NOP                     ;THIS IS A SYNC POINT FOR SCOPING
5884  045404  010110                          MOV     R1,(R0)         ;LOAD COUNT INTO REGISTER
5885  045406  011002                          MOV     (R0),R2         ;READ REGISTER BACK TO R2
5886  045410  010104                          MOV     R1,R4           ;PUT PATTERN IS R4
5887  045412  020402                          CMP     R4,R2           ;SEE IF DATA MATCHES PATTERN
5888  045414  001402                          BEQ     3$              ;BRANCH IF DATA IS GOOD
5889  045416  004737  031600                  JSR     PC,PARCOUNT     ;LOG AND REPORT COUNT ERROR
5890  045422  062700  000002          3$:     ADD     #2,R0           ;POINT TO  NEXT REGISTER
5891  045426  022700  172376                  CMP     #KDPAR7,R0      ;SEE IF YOU PASSED THE KDPAR7 PAR
5892  045432  103363                          BHIS    2$              ;BRANCH IF MORE PAR''S TO TEST
5893  045434  022701  177777                  CMP     #177777,R1      ;SEE IF COUNT HAS REACHED 177777
5894  045440  001403                          BEQ     4$              ;BRANCH IF COUNT IS 177777
5895  045442  062701  000401                  ADD     #401,R1         ;INCREASE COUNT PATTERN
5896  045446  000753                          BR      1$              ;BRANCH TO CONTINUE TEST
5897  045450  012737  045362  001112  4$:     MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
5898  045456  005737  001302                  TST     ERRCNT          ;SEE IF THERE WERE ANY ERRORS
5899  045462  001404                          BEQ     TST32           ;;BRANCH TO NEXT TEST IF NO ERRORS
5900  045464  013737  001302  001204          MOV     ERRCNT,$TMP5    ;SAVE NUMBER OF ERRORS FOR TYPEOUT
5901  045472  104022                          ERROR   22              ;SUMMARY OF COUNT PATTERN FAILURES
5902
5903                          ;;*****************************************************************
5904                          ;*TEST 32       COUNT PATTERN IN SUPERVISOR PAGE ADDRESS REGISTERS
5905                          ;;
5906                          ;;      THIS TEST RUNS A COUNT PATTERN THRU THE SUPERVISOR PAGE ADDRESS
5907                          ;;      REGISTERS.  SINCE ALL THE BITS ARE IMPLEMENTED, NONE NEED
5908                          ;;      TO BE MASKED OUT OF THE COMPARE.  IF THE COUNT PATTERN DOES
5909                          ;;      NOT MATCH THE DATA RECEVIED, THE REGISTER ADDRESS, DATA
5910                          ;;      PATTERN, AND BAD DATA ARE REPORTED.  AT THE END OF THE TEST A
5911                          ;;      SUMMARY OF THE ERRORS IS GIVEN.
5912                          ;;
5913                          ;;      ALL ERRORS FOUND BY THIS TEST ARE REPORTED AND ANALYZED BY
5914                          ;;      SUBROUTINE 'PARCOUNT''.
5915                          ;;
5916                          ;;*****************************************************************
5917  045474                  TST32:
5918  045474  000004                  SCOPE
5919  045476  012737  045624  001316          MOV     #TST33,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
5920                                                                  ;TEST FOR ESCAPE ON PARITY ERRORS
5921  045504  012737  000012  001206          MOV     #12,$TIMES      ;;DO 12 ITERATIONS
5922  045512  004737  031346          20$:    JSR     PC,CLEANUP      ;INITIALIZE ERROR LOCATIONS
5923  045516  012737  045532  001112          MOV     #2$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
5924  045524  005001                          CLR     R1              ;CLEAR REGISTER TO HOLD COUNT PATTERN
5925  045526  012700  172240          1$:     MOV     #SIPAR0,R0      ;PUT ADDRESS OF FIRST REGISTER IS R0
5926  045532  000240                  2$:     NOP                     ;THIS IS A SYNC POINT FOR SCOPING
5927  045534  010110                          MOV     R1,(R0)         ;LOAD COUNT INTO REGISTER
5928  045536  011002                          MOV     (R0),R2         ;READ REGISTER BACK TO R2
5929  045540  010104                          MOV     R1,R4           ;PUT PATTERN IS R4
5930  045542  020402                          CMP     R4,R2           ;SEE IF DATA MATCHES PATTERN
5931  045544  001402                          BEQ     3$              ;BRANCH IF DATA IS GOOD
```

```
                                                ;;*****************************************************************
                                                ;*TEST 33       COUNT PATTERN IN USER PAGE ADDRESS REGISTERS
                                                ;:
                                                ;:      THIS TEST RUNS A COUNT PATTERN THRU THE USER PAGE ADDRESS
                                                ;:      REGISTERS.  SINCE ALL THE BITS ARE IMPLEMENTED, NONE NEED
                                                ;:      TO BE MASKED OUT OF THE COMPARE.  IF THE COUNT PATTERN DOES
                                                ;:      NOT MATCH THE DATA RECEVIED, THE REGISTER ADDRESS, DATA
                                                ;:      PATTERN, AND BAD DATA ARE REPORTED.  AT THE END OF THE TEST A
                                                ;:      SUMMARY OF THE ERRORS IS GIVEN.
                                                ;:
                                                ;:      ALL ERRORS FOUND BY THIS TEST ARE REPORTED AND ANALYZED BY
                                                ;:      SUBROUTINE 'PARCOUNT'.
                                                ;:
                                                ;;*****************************************************************
045624                                  TST33:
045624  000004                                  SCOPE
045626  012737  045754  001316                  MOV     #TST34,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
                                                                        ;TEST FOR ESCAPE ON PARITY ERRORS
045634  012737  000012  001206                  MOV     #12,$TIMES      ;;DO 12 ITERATIONS
045642  004737  031346          20$:            JSR     PC,CLEANUP      ;INITIALIZE ERROR LOCATIONS
045646  012737  045662  001112                  MOV     #2$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
045654  005001                                  CLR     R1              ;CLEAR REGISTER TO HOLD COUNT PATTERN
045656  012700  177640          1$:             MOV     #UIPAR0,R0      ;PUT ADDRESS OF FIRST REGISTER IS R0
045662  000240                  2$:             NOP                     ;THIS IS A SYNC POINT FOR SCOPING
045664  010110                                  MOV     R1,(R0)         ;LOAD COUNT INTO REGISTER
045666  011002                                  MOV     (R0),R2         ;READ REGISTER BACK TO R2
045670  010104                                  MOV     R1,R4           ;PUT PATTERN IS R4
045672  020402                                  CMP     R4,R2           ;SEE IF DATA MATCHES PATTERN
045674  001402                                  BEQ     3$              ;BRANCH IF DATA IS GOOD
045676  004737  031600                          JSR     PC,PARCOUNT     ;LOG AND REPORT COUNT ERROR
045702  062700  000002          3$:             ADD     #2,R0           ;POINT TO  NEXT REGISTER
045706  022700  177676                          CMP     #UDPAR7,R0      ;SEE IF YOU PASSED THE UDPAR7 PAR
045712  103363                                  BHIS    2$              ;BRANCH IF MORE PAR''S TO TEST
045714  022701  177777                          CMP     #177777,R1      ;SEE IF COUNT HAS REACHED 177777
045720  001403                                  BEQ     4$              ;BRANCH IF COUNT IS 177777
045722  062701  000401                          ADD     #401,R1         ;INCREASE COUNT PATTERN
045726  000753                                  BR      1$              ;BRANCH TO CONTINUE TEST
045730  012737  045642  001112          4$:     MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
045736  005737  001302                          TST     ERRCNT          ;SEE IF THERE WERE ANY ERRORS
045742  001404                                  BEQ     TST34           ;;BRANCH TO NEXT TEST IF NO ERRORS
045744  013737  001302  001204                  MOV     ERRCNT,$TMP5    ;SAVE NUMBER OF ERRORS FOR TYPEOUT
045752  104022                                  ERROR   22              ;SUMMARY OF COUNT PATTERN FAILURES
```

```
                        ;;*****************************************************************
                        ;*TEST 34       COUNT PATTERN IN KERNEL PAGE DESCRIPTOR REGISTERS
                        ;*
                        ;*      THIS TEST RUNS A COUNT PATTERN THRU THE KERNEL PAGE DESCRIPTOR
                        ;*      REGISTERS.  SINCE BITS <15> AND <05:04> ARE NOT IMPLEMENTED
                        ;*      AND BITS <07:06> CANNOT BE SET BY DIRECT LOAD, THEY ARE MASKED
                        ;*      OUT OF THE DATA COMPARE.  THESE BITS ARE STILL SENT TO THE
                        ;*      DESCRIPTOR REGISTER TO FIND BAD ETCHES.  IF THE COUNT PATTERN
                        ;*      DOES NOT MATCH THE DATA RECEVIED, THE REGISTER ADDRESS, DATA
                        ;*      PATTERN, AND BAD DATA ARE REPORTED.  AT THE END OF THE TEST A
                        ;*      SUMMARY OF THE ERRORS IS GIVEN.
                        ;*
                        ;;*****************************************************************
045754                  TST34:
045754  000004                  SCOPE
045756  012737  046132  001316  MOV     #TST35,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
                                                        ;TEST FOR ESCAPE ON PARITY ERRORS
045764  012737  000012  001206  MOV     #12,$TIMES      ;;DO 12 ITERATIONS
045772  004737  031346  20$:    JSR     PC,CLEANUP      ;INITIALIZE ERROR LOCATIONS
045776  012737  046012  001112  MOV     #2$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
046004  005001                  CLR     R1              ;CLEAR REGISTER TO HOLD COUNT PATTERN
046006  012700  172300  1$:     MOV     #KIPDR0,R0      ;PUT ADDRESS OF FIRST REGISTER IS R0
046012  000240          2$:     NOP                     ;THIS IS A SYNC POINT FOR SCOPING
046014  010110                  MOV     R1,(R0)         ;LOAD COUNT INTO REGISTER
046016  011002                  MOV     (R0),R2         ;READ REGISTER BACK TO R2
046020  010104                  MOV     R1,R4           ;PUT PATTERN IS R4
046022  105737  001362          TSTB    KB11CM          ;IS THIS A MODIFIED CPU?
046026  001003                  BNE     6$              ;YES
046030  005737  001360          TST     KB11E           ;IS IT A KB11E OR KB11EM?
046034  001403                  BEQ     5$              ;BR IF NOT
046036  012737  000360  046046  6$:     MOV     #360,5$+2       ;DIDDLE 100360
046044  042704  100360          5$:     BIC     #100360,R4      ;CLEAR BITS NOT FOUND IN REGISTER.
046050  020402                  CMP     R4,R2           ;SEE IF DATA MATCHES PATTERN
046052  001402                  BEQ     3$              ;BRANCH IF DATA IS GOOD
046054  004737  031600          JSR     PC,PARCOUNT     ;LOG AND REPORT COUNT ERROR
046060  062700  000002  3$:     ADD     #2,R0           ;POINT TO  NEXT REGISTER
046064  022700  172336          CMP     #KDPDR7,R0      ;SEE IF YOU PASSED THE KDPDR7 PDR
046070  103350                  BHIS    2$              ;BRANCH IF MORE PDR''S TO TEST
046072  022701  177777          CMP     #177777,R1      ;SEE IF COUNT HAS REACHED 177777
046076  001403                  BEQ     4$              ;BRANCH IF COUNT IS 177777
046100  062701  000401          ADD     #401,R1         ;INCREASE COUNT PATTERN
046104  000740                  BR      1$              ;BRANCH TO CONTINUE TEST
046106  012737  045772  001112  4$:     MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
046114  005737  001302          TST     ERRCNT          ;SEE IF THERE WERE ANY ERRORS
046120  001404                  BEQ     TST35           ;;BRANCH TO NEXT TEST IF NO ERRORS
046122  013737  001302  001204  MOV     ERRCNT,$TMP5    ;SAVE NUMBER OF ERRORS FOR TYPEOUT
046130  104022                  ERROR   22              ;SUMMARY OF COUNT PATTERN FAILURES
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6037
6038                                    ;;*********************************************************************
6039                                    ;*TEST 35       COUNT PATTERN IN SUPERVISOR PAGE DESCRIPTOR REGISTERS
6040                                    ;;
6041                                    ;;      THIS TEST RUNS A COUNT PATTERN THRU THE SUPERVISOR PAGE DESCRIPTOR
6042                                    ;;      REGISTERS.  SINCE BITS <15> AND <05:04> ARE NOT IMPLEMENTED
6043                                    ;;      AND BITS <07:06> CANNOT BE SET BY DIRECT LOAD, THEY ARE MASKED
6044                                    ;;      OUT OF THE DATA COMPARE.  THESE BITS ARE STILL SENT TO THE
6045                                    ;;      DESCRIPTOR REGISTER TO FIND BAD ETCHES.  IF THE COUNT PATTERN
6046                                    ;;      DOES NOT MATCH THE DATA RECEVIED, THE REGISTER ADDRESS, DATA
6047                                    ;;      PATTERN, AND BAD DATA ARE REPORTED.  AT THE END OF THE TEST A
6048                                    ;;      SUMMARY OF THE ERRORS IS GIVEN.
6049                                    ;;
6050                                    ;;*********************************************************************
6051  046132                            TST35:
6052  046132  000004                           SCOPE
6053  046134  012737  046310  001316           MOV     #TST36,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
6054                                                                    ;TEST FOR ESCAPE ON PARITY ERRORS
6055  046142  012737  000012  001206           MOV     #12,$TIMES      ;;DO 12 ITERATIONS
6056  046150  004737  031346          20$:     JSR     PC,CLEANUP      ;INITIALIZE ERROR LOCATIONS
6057  046154  012737  046170  001112           MOV     #2$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
6058  046162  005001                           CLR     R1              ;CLEAR REGISTER TO HOLD COUNT PATTERN
6059  046164  012700  172200          1$:      MOV     #SIPDR0,R0      ;PUT ADDRESS OF FIRST REGISTER IS R0
6060  046170  000240                  2$:      NOP                     ;THIS IS A SYNC POINT FOR SCOPING
6061  046172  010110                           MOV     R1,(R0)         ;LOAD COUNT INTO REGISTER
6062  046174  011002                           MOV     (R0),R2         ;READ REGISTER BACK TO R2
6063  046176  010104                           MOV     R1,R4           ;PUT PATTERN IS R4
6064  046200  105737  001362                  TSTB    KB11CM          ;IS THIS A MODIFIED CPU?
6065  046204  001003                           BNE     6$              ;YES
6066  046206  005737  001360                  TST     KB11E           ;IS IT A KB11E OR KB11EM?
6067  046212  001403                           BEQ     5$              ;BR IF NOT
6068  046214  012737  000360  046224  6$:      MOV     #360,5$+2       ;DIDDLE 100360
6069  046222  042704  100360          5$:      BIC     #100360,R4      ;CLEAR BITS NOT FOUND IN REGISTER.
6070  046226  020402                           CMP     R4,R2           ;SEE IF DATA MATCHES PATTERN
6071  046230  001402                           BEQ     3$              ;BRANCH IF DATA IS GOOD
6072  046232  004737  031600                  JSR     PC,PARCOUNT     ;LOG AND REPORT COUNT ERROR
6073  046236  062700  000002          3$:      ADD     #2,R0           ;POINT TO  NEXT REGISTER
6074  046242  022700  172236                  CMP     #SDPDR7,R0      ;SEE IF YOU PASSED THE SDPDR7 PDR
6075  046246  103350                           BHIS    2$              ;BRANCH IF MORE PDR''S TO TEST
6076  046250  022701  177777                  CMP     #177777,R1      ;SEE IF COUNT HAS REACHED 177777
6077  046254  001403                           BEQ     4$              ;BRANCH IF COUNT IS 177777
6078  046256  062701  000401                  ADD     #401,R1         ;INCREASE COUNT PATTERN
6079  046262  000740                           BR      1$              ;BRANCH TO CONTINUE TEST
6080  046264  012737  046150  001112  4$:      MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
6081  046272  005737  001302                  TST     ERRCNT          ;SEE IF THERE WERE ANY ERRORS
6082  046276  001404                           BEQ     TST36           ;;BRANCH TO NEXT TEST IF NO ERRORS
6083  046300  013737  001302  001204           MOV     ERRCNT,$TMP5    ;SAVE NUMBER OF ERRORS FOR TYPEOUT
6084  046306  104022                           ERROR   22              ;SUMMARY OF COUNT PATTERN FAILURES
6085
6086                                    ;;*********************************************************************
6087                                    ;*TEST 36       COUNT PATTERN IN USER PAGE DESCRIPTOR REGISTERS
6088                                    ;;
6089                                    ;;      THIS TEST RUNS A COUNT PATTERN THRU THE USER PAGE DESCRIPTOR
6090                                    ;;      REGISTERS.  SINCE BITS <15> AND <05:04> ARE NOT IMPLEMENTED
6091                                    ;;      AND BITS <07:06> CANNOT BE SET BY DIRECT LOAD, THEY ARE MASKED
6092                                    ;;      OUT OF THE DATA COMPARE.  THESE BITS ARE STILL SENT TO THE
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                                        ;;      DESCRIPTOR REGISTER TO FIND BAD ETCHES.  IF THE COUNT PATTERN
                                        ;;      DOES NOT MATCH THE DATA RECEVIED, THE REGISTER ADDRESS, DATA
                                        ;;      PATTERN, AND BAD DATA ARE REPORTED.  AT THE END OF THE TEST A
                                        ;;      SUMMARY OF THE ERRORS IS GIVEN.
                                        ;;
                                        ;;*********************************************************************
046310                                  TST36:
                                                SCOPE
046310  000004
046312  012737  046466  001316                 MOV     #TST37,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
                                                                        ;TEST FOR ESCAPE ON PARITY ERRORS
046320  012737  000012  001206                 MOV     #12,$TIMES      ;;DO 12 ITERATIONS
046326  004737  031346          20$:    JSR     PC,CLEANUP      ;INITIALIZE ERROR LOCATIONS
046332  012737  046346  001112                 MOV     #2$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
046340  005001                                  CLR     R1              ;CLEAR REGISTER TO HOLD COUNT PATTERN
046342  012700  177600          1$:     MOV     #UIPDR0,R0      ;PUT ADDRESS OF FIRST REGISTER IS R0
046346  000240          2$:     NOP             ;THIS IS A SYNC POINT FOR SCOPING
046350  010110                                  MOV     R1,(R0)         ;LOAD COUNT INTO REGISTER
046352  011002                                  MOV     (R0),R2         ;READ REGISTER BACK TO R2
046354  010104                                  MOV     R1,R4           ;PUT PATTERN IS R4
046356  105737  001362                         TSTB    KB11CM          ;IS THIS A MODIFIED CPU?
046362  001003                                  BNE     6$              ;YES
046364  005737  001360                         TST     KB11E           ;IS IT A KB11E OR KB11EM?
046370  001403                                  BEQ     5$              ;BR IF NOT
046372  012737  000360  046402  6$:     MOV     #360,5$+2       ;DIDDLE 100360
046400  042704  100360          5$:     BIC     #100360,R4      ;CLEAR BITS NOT FOUND IN REGISTER.
046404  020402                                  CMP     R4,R2           ;SEE IF DATA MATCHES PATTERN
046406  001402                                  BEQ     3$              ;BRANCH IF DATA IS GOOD
046410  004737  031600                         JSR     PC,PARCOUNT     ;LOG AND REPORT COUNT ERROR
046414  062700  000002          3$:     ADD     #2,R0           ;POINT TO  NEXT REGISTER
046420  022700  177636                         CMP     #UDPDR7,R0      ;SEE IF YOU PASSED THE UDPDR7 PDR
046424  103350                                  BHIS    2$              ;BRANCH IF MORE PDR''S TO TEST
046426  022701  177777                         CMP     #177777,R1      ;SEE IF COUNT HAS REACHED 177777
046432  001403                                  BEQ     4$              ;BRANCH IF COUNT IS 177777
046434  062701  000401                         ADD     #401,R1         ;INCREASE COUNT PATTERN
046440  000740                                  BR      1$              ;BRANCH TO CONTINUE TEST
046442  012737  046326  001112  4$:     MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
046450  005737  001302                         TST     ERRCNT          ;SEE IF THERE WERE ANY ERRORS
046454  001404                                  BEQ     TST37           ;;BRANCH TO NEXT TEST IF NO ERRORS
046456  013737  001302  001204                 MOV     ERRCNT,$TMP5    ;SAVE NUMBER OF ERRORS FOR TYPEOUT
046464  104022                                  ERROR   22              ;SUMMARY OF COUNT PATTERN FAILURES

                                        .SBTTL          TEST FOR CORRECT BYTE ADDRESSING OF P.A.R.'S & P.D.R.'S
                                        ;*      THESE NEXT SIX (6) TESTS ARE USED TO TEST THE LOGIC THAT
                                        ;*      ALLOWS BYTE ADDRESSING OF THE PAR'S AND PDR'S.  IN EACH
                                        ;*      CASE THE I-SPACE REGISTER 0 IS USED, SINCE IT IS REALLY
                                        ;*      THE WRITE PULSE TO THE REGISTER SET THAT IS BEING TESTED.
                                        ;*      IT IS ASSUMED THAT IF ONE REGISTER OF A GROUP FUNCTIONS
                                        ;*      PROPERLY THAT THEY ALL WILL, SINCE ALL REGISTERS HAVE BEEN
                                        ;*      BIT TESTED EARLIER.
                                        ;*
                                        ;;*********************************************************************
                                        ;*TEST 37       BYTE ADDRESSING OF KERNEL PAGE ADDRESS REGISTERS
                                        ;*
                                        ;*      THIS TEST CHECKS THE 'SAPA WRITE LOBYTE' AND 'SAPA WRITE HIBYTE'
                                        ;*      SIGNAL GENERATION FOR KERNEL PAGE ADDRESS REGISTERS.
                                        ;*      BOTH SIGNALS ARE CONTROLLED BY THE LOGIC ON 'SAPK' THAT
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```
6149                                    ;*      GENERATES 'SAPK LO BYTE B H' AND 'SAPK HI BYTE B H'.
6150                                    ;*
6151                                    ;;**********************************************************************
6152  046466                            TST37:
6153  046466  000004                            SCOPE
6154  046470  012737  046604  001316            MOV     #TST40,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
6155                                                                    ;TEST FOR ESCAPE ON PARITY ERRORS
6156  046476  012737  046514  001112  20$:      MOV     #11$,$LPERR     ;SET LOOP ON ERROR POINTER TO 11$
6157  046504  012702  000015                    MOV     #15,R2          ;PUT EXPECTED DATA IN R2
6158  046510  012700  172340                    MOV     #KIPAR0,R0      ;PUT ADDRESS OF REGISTER IN R0
6159  046514  005037  172340            11$:    CLR     KIPAR0          ;CLEAR THE REGISTER UNDER TEST
6160  046520  000240                            NOP                     ;THIS IS A SYNC POINT FOR SCOPING
6161  046522  112710  172015                    MOVB    #172015,(R0)    ;LOAD LOWER BYTE OF REGISTER
6162  046526  013701  172340                    MOV     KIPAR0,R1       ;READ REGISTER INTO R1
6163  046532  020102                            CMP     R1,R2           ;SEE IF ONLY LOWER BYTE WAS WRITTEN
6164  046534  001401                            BEQ     1$              ;BRANCH IF DATA MATCHES
6165  046536  104023                            ERROR   23              ;DIDN'T LOAD CORRECT BYTE
6166  046540  012737  046556  001112  1$:       MOV     #12$,$LPERR     ;SET LOOP ON ERROR POINTER TO 12$
6167  046546  012700  172341                    MOV     #KIPAR0+1,R0    ;POINT TO UPPER BYTE OF REGISTER
6168  046552  012702  052015                    MOV     #052015,R2      ;LOAD EXPECTED DATA IN R2
6169  046556  000240                    12$:    NOP                     ;THIS IS A SYNC POINT FOR SCOPING
6170  046560  112710  000124                    MOVB    #124,(R0)       ;WRITE THE UPPER BYTE OF REGISTER
6171  046564  013701  172340                    MOV     KIPAR0,R1       ;READ REGISTER INTO R1
6172  046570  020102                            CMP     R1,R2           ;SEE IF REGISTER HOLDS CORRECT DATA
6173  046572  001401                            BEQ     2$              ;BRANCH TO EXIT IF DATA RIGHT
6174  046574  104023                            ERROR   23              ;DIDN'T LOAD CORRECT BYTE
6175  046576  012737  046476  001112  2$:       MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
6176
6177
6178                                    ;;**********************************************************************
6179                                    ;*TEST 40       BYTE ADDRESSING OF SUPERVISOR PAGE ADDRESS REGISTERS
6180                                    ;;
6181                                    ;;      THIS TEST CHECKS THE 'SAPB WRITE LOBYTE' AND 'SAPB WRITE HIBYTE'
6182                                    ;;      SIGNAL GENERATION FOR SUPERVISOR PAGE ADDRESS REGISTERS.
6183                                    ;;      BOTH SIGNALS ARE CONTROLLED BY THE LOGIC ON 'SAPK' THAT
6184                                    ;;      GENERATES 'SAPK LO BYTE B H' AND 'SAPK HI BYTE B H'.
6185                                    ;;
6186                                    ;;**********************************************************************
6187  046604                            TST40:
6188  046604  000004                            SCOPE
6189  046606  012737  046722  001316            MOV     #TST41,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
6190                                                                    ;TEST FOR ESCAPE ON PARITY ERRORS
6191  046614  012737  046632  001112  20$:      MOV     #11$,$LPERR     ;SET LOOP ON ERROR POINTER TO 11$
6192  046622  012702  000015                    MOV     #15,R2          ;PUT EXPECTED DATA IN R2
6193  046626  012700  172240                    MOV     #SIPAR0,R0      ;PUT ADDRESS OF REGISTER IN R0
6194  046632  005037  172240            11$:    CLR     SIPAR0          ;CLEAR THE REGISTER UNDER TEST
6195  046636  000240                            NOP                     ;THIS IS A SYNC POINT FOR SCOPING
6196  046640  112710  172015                    MOVB    #172015,(R0)    ;LOAD LOWER BYTE OF REGISTER
6197  046644  013701  172240                    MOV     SIPAR0,R1       ;READ REGISTER INTO R1
6198  046650  020102                            CMP     R1,R2           ;SEE IF ONLY LOWER BYTE WAS WRITTEN
6199  046652  001401                            BEQ     1$              ;BRANCH IF DATA MATCHES
6200  046654  104023                            ERROR   23              ;DIDN'T LOAD CORRECT BYTE
6201  046656  012737  046674  001112  1$:       MOV     #12$,$LPERR     ;SET LOOP ON ERROR POINTER TO 12$
6202  046664  012700  172241                    MOV     #SIPAR0+1,R0    ;POINT TO UPPER BYTE OF REGISTER
6203  046670  012702  052015                    MOV     #052015,R2      ;LOAD EXPECTED DATA IN R2
6204  046674  000240                    12$:    NOP                     ;THIS IS A SYNC POINT FOR SCOPING
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6205  046676  112710  000124                  MOVB    #124,(R0)       ;WRITE THE UPPER BYTE OF REGISTER
6206  046702  013701  172240                  MOV     SIPAR0,R1       ;READ REGISTER INTO R1
6207  046706  020102                          CMP     R1,R2           ;SEE IF REGISTER HOLDS CORRECT DATA
6208  046710  001401                          BEQ     2$              ;BRANCH TO EXIT IF DATA RIGHT
6209  046712  104023                          ERROR   23              ;DIDN'T LOAD CORRECT BYTE
6210  046714  012737  046614  001112  2$:     MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
6211
6212
6213                                  ;;**********************************************************************
6214                                  ;*TEST 41        BYTE ADDRESSING OF USER PAGE ADDRESS REGISTERS
6215                                  ;;
6216                                  ;;      THIS TEST CHECKS THE 'SAPC WRITE LOBYTE' AND 'SAPC WRITE HIBYTE'
6217                                  ;;      SIGNAL GENERATION FOR USER PAGE ADDRESS REGISTERS.
6218                                  ;;      BOTH SIGNALS ARE CONTROLLED BY THE LOGIC ON 'SAPK' THAT
6219                                  ;;      GENERATES 'SAPK LO BYTE B H' AND 'SAPK HI BYTE B H'.
6220                                  ;;
6221                                  ;;**********************************************************************
6222  046722                          TST41:
6223  046722  000004                          SCOPE
6224  046724  012737  047040  001316          MOV     #TST42,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
6225                                                                  ;TEST FOR ESCAPE ON PARITY ERRORS
6226  046732  012737  046750  001112  20$:     MOV     #11$,$LPERR     ;SET LOOP ON ERROR POINTER TO 11$
6227  046740  012702  000015                  MOV     #15,R2          ;PUT EXPECTED DATA IN R2
6228  046744  012700  177640                  MOV     #UIPAR0,R0      ;PUT ADDRESS OF REGISTER IN R0
6229  046750  005037  177640          11$:    CLR     UIPAR0          ;CLEAR THE REGISTER UNDER TEST
6230  046754  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
6231  046756  112710  172015                  MOVB    #172015,(R0)    ;LOAD LOWER BYTE OF REGISTER
6232  046762  013701  177640                  MOV     UIPAR0,R1       ;READ REGISTER INTO R1
6233  046766  020102                          CMP     R1,R2           ;SEE IF ONLY LOWER BYTE WAS WRITTEN
6234  046770  001401                          BEQ     1$              ;BRANCH IF DATA MATCHES
6235  046772  104023                          ERROR   23              ;DIDN'T LOAD CORRECT BYTE
6236  046774  012737  047012  001112  1$:     MOV     #12$,$LPERR     ;SET LOOP ON ERROR POINTER TO 12$
6237  047002  012700  177641                  MOV     #UIPAR0+1,R0    ;POINT TO UPPER BYTE OF REGISTER
6238  047006  012702  052015                  MOV     #052015,R2      ;LOAD EXPECTED DATA IN R2
6239  047012  000240                  12$:    NOP                     ;THIS IS A SYNC POINT FOR SCOPING
6240  047014  112710  000124                  MOVB    #124,(R0)       ;WRITE THE UPPER BYTE OF REGISTER
6241  047020  013701  177640                  MOV     UIPAR0,R1       ;READ REGISTER INTO R1
6242  047024  020102                          CMP     R1,R2           ;SEE IF REGISTER HOLDS CORRECT DATA
6243  047026  001401                          BEQ     2$              ;BRANCH TO EXIT IF DATA RIGHT
6244  047030  104023                          ERROR   23              ;DIDN'T LOAD CORRECT BYTE
6245  047032  012737  046732  001112  2$:     MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
6246
6247
6248                                  ;;**********************************************************************
6249                                  ;*TEST 42        BYTE ADDRESSING OF KERNEL PAGE DESCRIPTOR REGISTERS
6250                                  ;;
6251                                  ;;      THIS TEST CHECKS THE 'SAPD WRITE LOBYTE' AND 'SAPD WRITE HIBYTE'
6252                                  ;;      SIGNAL GENERATION FOR KERNEL PAGE ADDRESS REGISTERS.
6253                                  ;;      BOTH SIGNALS ARE CONTROLLED BY THE LOGIC ON 'SAPK' THAT
6254                                  ;;      GENERATES 'SAPK LO BYTE B H' AND 'SAPK HI BYTE B H'.
6255                                  ;;
6256                                  ;;**********************************************************************
6257  047040                          TST42:
6258  047040  000004                          SCOPE
6259  047042  012737  047156  001316          MOV     #TST43,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
6260                                                                  ;TEST FOR ESCAPE ON PARITY ERRORS
```

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6261  047050  012737  047066  001112  20$:    MOV     #11$,$LPERR     ;SET LOOP ON ERROR POINTER TO 11$
6262  047056  012702  000015                  MOV     #15,R2          ;PUT EXPECTED DATA IN R2
6263  047062  012700  172300                  MOV     #KIPDR0,R0      ;PUT ADDRESS OF REGISTER IN R0
6264  047066  005037  172300          11$:    CLR     KIPDR0          ;CLEAR THE REGISTER UNDER TEST
6265  047072  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
6266  047074  112710  172015                  MOVB    #172015,(R0)    ;LOAD LOWER BYTE OF REGISTER
6267  047100  013701  172300                  MOV     KIPDR0,R1       ;READ REGISTER INTO R1
6268  047104  020102                          CMP     R1,R2           ;SEE IF ONLY LOWER BYTE WAS WRITTEN
6269  047106  001401                          BEQ     1$              ;BRANCH IF DATA MATCHES
6270  047110  104023                          ERROR   23              ;DIDN'T LOAD CORRECT BYTE
6271  047112  012737  047130  001112  1$:     MOV     #12$,$LPERR     ;SET LOOP ON ERROR POINTER TO 12$
6272  047120  012700  172301                  MOV     #KIPDR0+1,R0    ;POINT TO UPPER BYTE OF REGISTER
6273  047124  012702  052015                  MOV     #052015,R2      ;LOAD EXPECTED DATA IN R2
6274  047130  000240                  12$:    NOP                     ;THIS IS A SYNC POINT FOR SCOPING
6275  047132  112710  000124                  MOVB    #124,(R0)       ;WRITE THE UPPER BYTE OF REGISTER
6276  047136  013701  172300                  MOV     KIPDR0,R1       ;READ REGISTER INTO R1
6277  047142  020102                          CMP     R1,R2           ;SEE IF REGISTER HOLDS CORRECT DATA
6278  047144  001401                          BEQ     2$              ;BRANCH TO EXIT IF DATA RIGHT
6279  047146  104023                          ERROR   23              ;DIDN'T LOAD CORRECT BYTE
6280  047150  012737  047050  001112  2$:     MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
6281
6282
6283                                  ;;**********************************************************************
6284                                  ;*TEST 43       BYTE ADDRESSING OF SUPERVISOR PAGE DESCRIPTOR REGISTERS
6285                                  ;;
6286                                  ;;      THIS TEST CHECKS THE 'SAPE WRITE LOBYTE' AND 'SAPE WRITE HIBYTE'
6287                                  ;;      SIGNAL GENERATION FOR SUPERVISOR PAGE ADDRESS REGISTERS.
6288                                  ;;      BOTH SIGNALS ARE CONTROLLED BY THE LOGIC ON 'SAPK' THAT
6289                                  ;;      GENERATES 'SAPK LO BYTE B H' AND 'SAPK HI BYTE B H'.
6290                                  ;;
6291                                  ;;**********************************************************************
6292  047156                          TST43:
6293  047156  000004                          SCOPE
6294  047160  012737  047274  001316          MOV     #TST44,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
6295                                                                  ;TEST FOR ESCAPE ON PARITY ERRORS
6296  047166  012737  047204  001112  20$:     MOV     #11$,$LPERR     ;SET LOOP ON ERROR POINTER TO 11$
6297  047174  012702  000015                  MOV     #15,R2          ;PUT EXPECTED DATA IN R2
6298  047200  012700  172200                  MOV     #SIPDR0,R0      ;PUT ADDRESS OF REGISTER IN R0
6299  047204  005037  172200          11$:    CLR     SIPDR0          ;CLEAR THE REGISTER UNDER TEST
6300  047210  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
6301  047212  112710  172015                  MOVB    #172015,(R0)    ;LOAD LOWER BYTE OF REGISTER
6302  047216  013701  172200                  MOV     SIPDR0,R1       ;READ REGISTER INTO R1
6303  047222  020102                          CMP     R1,R2           ;SEE IF ONLY LOWER BYTE WAS WRITTEN
6304  047224  001401                          BEQ     1$              ;BRANCH IF DATA MATCHES
6305  047226  104023                          ERROR   23              ;DIDN'T LOAD CORRECT BYTE
6306  047230  012737  047246  001112  1$:     MOV     #12$,$LPERR     ;SET LOOP ON ERROR POINTER TO 12$
6307  047236  012700  172201                  MOV     #SIPDR0+1,R0    ;POINT TO UPPER BYTE OF REGISTER
6308  047242  012702  052015                  MOV     #052015,R2      ;LOAD EXPECTED DATA IN R2
6309  047246  000240                  12$:    NOP                     ;THIS IS A SYNC POINT FOR SCOPING
6310  047250  112710  000124                  MOVB    #124,(R0)       ;WRITE THE UPPER BYTE OF REGISTER
6311  047254  013701  172200                  MOV     SIPDR0,R1       ;READ REGISTER INTO R1
6312  047260  020102                          CMP     R1,R2           ;SEE IF REGISTER HOLDS CORRECT DATA
6313  047262  001401                          BEQ     2$              ;BRANCH TO EXIT IF DATA RIGHT
6314  047264  104023                          ERROR   23              ;DIDN'T LOAD CORRECT BYTE
6315  047266  012737  047166  001112  2$:     MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
6316
```

```
                                ;;*****************************************************************
                                ;*TEST 44       BYTE ADDRESSING OF USER PAGE DESCRIPTOR REGISTERS
                                ;;
                                ;;      THIS TEST CHECKS THE 'SAPF WRITE LOBYTE' AND 'SAPF WRITE HIBYTE'
                                ;;      SIGNAL GENERATION FOR USER PAGE ADDRESS REGISTERS.
                                ;;      BOTH SIGNALS ARE CONTROLLED BY THE LOGIC ON 'SAPK' THAT
                                ;;      GENERATES 'SAPK LO BYTE B H' AND 'SAPK HI BYTE B H'.
                                ;;
                                ;;*****************************************************************
047274                          TST44:
047274  000004                          SCOPE
047276  012737  047412  001316          MOV     #TST45,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
                                                                ;TEST FOR ESCAPE ON PARITY ERRORS
047304  012737  047322  001112  20$:    MOV     #11$,$LPERR     ;SET LOOP ON ERROR POINTER TO 11$
047312  012702  000015                  MOV     #15,R2          ;PUT EXPECTED DATA IN R2
047316  012700  177600                  MOV     #UIPDR0,R0      ;PUT ADDRESS OF REGISTER IN R0
047322  005037  177600          11$:    CLR     UIPDR0          ;CLEAR THE REGISTER UNDER TEST
047326  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
047330  112710  172015                  MOVB    #172015,(R0)    ;LOAD LOWER BYTE OF REGISTER
047334  013701  177600                  MOV     UIPDR0,R1       ;READ REGISTER INTO R1
047340  020102                          CMP     R1,R2           ;SEE IF ONLY LOWER BYTE WAS WRITTEN
047342  001401                          BEQ     1$              ;BRANCH IF DATA MATCHES
047344  104023                          ERROR   23              ;DIDN'T LOAD CORRECT BYTE
047346  012737  047364  001112  1$:     MOV     #12$,$LPERR     ;SET LOOP ON ERROR POINTER TO 12$
047354  012700  177601                  MOV     #UIPDR0+1,R0    ;POINT TO UPPER BYTE OF REGISTER
047360  012702  052015                  MOV     #052015,R2      ;LOAD EXPECTED DATA IN R2
047364  000240                  12$:    NOP                     ;THIS IS A SYNC POINT FOR SCOPING
047366  112710  000124                  MOVB    #124,(R0)       ;WRITE THE UPPER BYTE OF REGISTER
047372  013701  177600                  MOV     UIPDR0,R1       ;READ REGISTER INTO R1
047376  020102                          CMP     R1,R2           ;SEE IF REGISTER HOLDS CORRECT DATA
047400  001401                          BEQ     2$              ;BRANCH TO EXIT IF DATA RIGHT
047402  104023                          ERROR   23              ;DIDN'T LOAD CORRECT BYTE
047404  012737  047304  001112  2$:     MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST

                                .SBTTL          DUAL ADDRESSING BETWEEN GROUPS OF REGISTERS
                                ;;*****************************************************************
                                ;*TEST 45       DUAL ADDRESSING FOR ALL PAR'S AND PDR'S
                                ;*
                                ;*      THIS TEST WILL ENSURE THAT THERE IS NO DUAL ADDRESSING BETWEEN
                                ;*      GROUPS OF PAR'S AND PDR'S.  THAT IS, WHEN YOU REFERENCE A KERNEL
                                ;*      I-SPACE PAR YOU ARE REALLY REFERENCING THAT PAR.  FIRST EACH
                                ;*      I-SPACE PAR0 OR PDR0 IS LOADED WITH A UNIQUE NUMBER 0-12 AND
                                ;*      THEN THEY ARE EACH CHECKED FOR THE CORRECT DATA.
                                ;*      EACH GROUP HAS ALREADY BEEN CHECKED FOR DUAL ADDRESSING WITHIN
                                ;*      ITS OWN GROUP, SO ONLY ONE REGISTER FROM EACH GROUP NEEDS TO
                                ;*      BE TESTED HERE.
                                ;*
                                ;;*****************************************************************
047412                          TST45:
047412  000004                          SCOPE
047414  012737  047514  001316          MOV     #TST46,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
                                                                ;TEST FOR ESCAPE ON PARITY ERRORS
047422  012737  047436  001112  20$:    MOV     #1$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
047430  005000                          CLR     R0              ;THIS WILL HOLD THE INDEX OF EACH REGISTER
```

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6373                                                    ;AND THE COUNT LOADED
6374  047432  012704  000006            MOV     #6,R4   ;THIS IS THE NUMBER OF TIMES TO DO THIS LOOP
6375  047436  010070  001322      1$:   MOV     R0,@PARTAB(R0)  ;LOAD PAR OR PDR WITH INDEX NUMBER
6376  047442  062700  000002            ADD     #2,R0   ;CHANGE INDEX TO POINT TO NEXT REGISTER
6377  047446  077405                    SOB     R4,1$   ;BRANCH BACK 5 TIMES
6378  047450  012704  000006            MOV     #6,R4   ;DO NEXT LOOP 6 TIMES ALSO
6379  047454  012737  047466  001112    MOV     #10$,$LPERR     ;SET LOOP ON ERROR POINTER TO 10$
6380  047462  162700  000002      2$:   SUB     #2,R0   ;ADJUST INDEX FOR REGISTER DESIRED
6381  047466  017001  001322      10$:  MOV     @PARTAB(R0),R1  ;READ PAR OR PDR INTO R1
6382  047472  020001                    CMP     R0,R1   ;SEE IF INDEX EQUALS DATA
6383  047474  001403                    BEQ     3$      ;BRANCH IFCORRECT REGISTER WAS READ.
6384  047476  016002  001322            MOV     PARTAB(R0),R2   ;SAVE ADDRESS OF BAD REGISTER
6385  047502  104036                    ERROR   36      ;DUAL ADDRESSING
6386  047504  077412                3$: SOB     R4,2$   ;BRANCH BACK 5 TIMES
6387  047506  012737  047422  001112    MOV     #20$,$LPERR     ;SET LOOP ON ERROR POINTER TO START OF TEST
6388
6389
6390                              .SBTTL  ************ ENTRY POINT 4 --- STARTING ADDRESS 214 ************
6391                              .SBTTL  ****************** RELOCATION AND ADDER TESTS ******************
6392                              ;*
6393                              ;*      THIS GROUP OF TESTS CHECKS MEMORY MANAGEMENT'S RELOCATION ADDER
6394                              ;*      FIRST USING DESTINATION ONLY RELOCATION, THEN WITH FULL 18-BIT
6395                              ;*      RELOCATION AND FINALLY WITH 22-BIT RELOCATION.
6396                              ;*
6397
6398
6399                              ;;*********************************************************************
6400                              ;*TEST 46       18-BIT MAPPING ADDER TESTING
6401                              ;*
6402                              ;*      THIS TEST USES 'DESTINATION ONLY' RELOCATION TO CHECK THE
6403                              ;*      FULL ADD PROPERTIES OF THE RELOCATION ADDER.  TWELVE PAIRS
6404                              ;*      OF NUMBERS ARE ADDED, GENERATING PHYSICAL ADDRESSES ABOVE
6405                              ;*      16K.
6406                              ;*
6407                              ;;*********************************************************************
6408  047514                      TST46:
6409  047514  000004                     SCOPE
6410  047516  012737  051130  001316      MOV     #TST47,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
6411                                                              ;TEST FOR ESCAPE ON PARITY ERRORS
6412                              ;
6413                              ;       THE FOLLOWING CODE WILL CLEAR ALL PAR'S AND PDR'S SO THAT
6414                              ;       THE RELOCATION ADDERS CAN BE CHECKED, ONLY THE KERNEL I-SPACE
6415                              ;       PDR'S AND PAR'S WILL BE MAPPED RESIDENT AND READ WRITE.
6416                              ;
6417  047524                      ENTPT4:
6418  047524  012737  050740  001110      MOV     #20$,$LPADR     ;SET LOOP ADDRESS POINTER TO 20$
6419  047532  012737  050740  001112      MOV     #20$,$LPERR     ;SET LOOP ON ERROR POINTER TO 20$
6420  047540  012737  000046  001102      MOV     #46,$TSTNM      ;LOAD TEST NUMBER INTO MEMORY
6421  047546  013737  001102  177570      MOV     $TSTNM,DISPLAY  ;DISPLAY TEST NUMBER FOR THIS TEST
6422  047554  012705  172300            MOV     #KIPDR0,R5      ;PUT ADDRESS OF KIPDR0 IN R5
6423  047560  004737  031330            JSR     PC,CLRREG       ;CLEAR KERNEL PDR'S
6424  047564  012705  172340            MOV     #KIPAR0,R5      ;PUT ADDRESS OF KIPAR0 IN R5
6425  047570  004737  031330            JSR     PC,CLRREG       ;CLEAR KERNEL PAR'S
6426  047574  012705  172200            MOV     #SIPDR0,R5      ;PUT ADDRESS OF SIPDR0 IN R5
6427  047600  004737  031330            JSR     PC,CLRREG       ;CLEAR SUPERVISOR PDR'S
6428  047604  012705  172240            MOV     #SIPAR0,R5      ;PUT ADDRESS OF SIPAR0 IN R5
```

```
6429  047610  004737  031330                  JSR     PC,CLRREG       ;CLEAR SUPERVISOR PAR'S
6430  047614  012705  177600                  MOV     #UIPDR0,R5      ;PUT ADDRESS OF UIPDR0 IN R5
6431  047620  004737  031330                  JSR     PC,CLRREG       ;CLEAR USER PDR'S
6432  047624  012705  177640                  MOV     #UIPAR0,R5      ;PUT ADDRESS OF UIPAR0 IN R5
6433  047630  004737  031330                  JSR     PC,CLRREG       ;CLEAR USER PAR'S
6434  047634  012700  077406          30$:    MOV     #77406,R0       ;MAKE KERNEL I PAGES 4K, R/W, EXPAND UP
6435  047640  012702  000010                  MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
6436  047644  012701  172300                  MOV     #KIPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
6437  047650  010021                  64$:    MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
6438  047652  077202                          SOB     R2,64$          ;BRANCH BACK TO 64$ IF R2 IS NOT ZERO
6439  047654  012737  000000  172340          MOV     #000,KIPAR0     ;MAP PAGE 0 TO 0 - 4K
6440  047662  012737  000200  172342          MOV     #200,KIPAR1     ;MAP PAGE 1 TO 4K - 8K
6441  047670  012737  000400  172344          MOV     #400,KIPAR2     ;MAP PAGE 2 TO 8K - 12K
6442  047676  012737  000600  172346          MOV     #600,KIPAR3     ;MAP PAGE 3 TO 12K - 16K
6443  047704  012737  177600  172356          MOV     #177600,KIPAR7  ;MAP PAGE 7 TO I/O PAGE
6444  047712  012737  047744  001112          MOV     #1$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
6445  047720  013737  100000  001172          MOV     @#100000,$TMP0  ;SAVE DATA AT TEST LOCATION
6446  047726  012737  001000  172350          MOV     #1000,@#KIPAR4  ;LOAD PAR4 WITH 1000
6447  047734  012700  100000                  MOV     #100000,R0      ;PUT VIRTUAL ADDRESS IN R0
6448  047740  012701  125200                  MOV     #125200,R1      ;PUT DATA PATTERN IN R1
6449  047744  052737  000400  177572  1$:     BIS     #BIT8,@#MMR0    ;TURN ON DESTINATION ONLY RELOCATION
6450  047752  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
6451  047754  010110                          MOV     R1,(R0)         ;TRY TO LOAD DATA PATTERN INTO 100000
6452  047756  013702  100000                  MOV     @#100000,R2     ;READ (100000) INTO R2
6453  047762  000005                          RESET                   ;CLEAR MMR0
6454  047764  020102                          CMP     R1,R2           ;SEE IF DATA MATCHES PATTERN
6455  047766  001401                          BEQ     2$              ;BRANCH IF DATA MATCHES
6456  047770  104037                          ERROR   37              ;RELOCATION FAILED
6457  047772  013737  001172  100000  2$:     MOV     $TMP0,@#100000  ;RESTORE ORIGINAL DATA TO TEST LOCATION
6458  050000  012737  050032  001112          MOV     #3$,$LPERR      ;SET LOOP ON ERROR POINTER TO 3$
6459  050006  013737  137776  001172          MOV     @#137776,$TMP0  ;SAVE DATA AT TEST LOCATION
6460  050014  012737  001252  172350          MOV     #1252,@#KIPAR4  ;LOAD PAR4 WITH 1252
6461  050022  012700  112576                  MOV     #112576,R0      ;PUT VIRTUAL ADDRESS IN R0
6462  050026  012701  125201                  MOV     #125201,R1      ;PUT DATA PATTERN IN R1
6463  050032  052737  000400  177572  3$:     BIS     #BIT8,@#MMR0    ;TURN ON DESTINATION ONLY RELOCATION
6464  050040  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
6465  050042  010110                          MOV     R1,(R0)         ;TRY TO LOAD DATA PATTERN INTO 137776
6466  050044  013702  137776                  MOV     @#137776,R2     ;READ (137776) INTO R2
6467  050050  000005                          RESET                   ;CLEAR MMR0
6468  050052  020102                          CMP     R1,R2           ;SEE IF DATA MATCHES PATTERN
6469  050054  001401                          BEQ     4$              ;BRANCH IF DATA MATCHES
6470  050056  104037                          ERROR   37              ;RELOCATION FAILED
6471  050060  013737  001172  137776  4$:     MOV     $TMP0,@#137776  ;RESTORE ORIGINAL DATA TO TEST LOCATION
6472  050066  012737  050120  001112          MOV     #5$,$LPERR      ;SET LOOP ON ERROR POINTER TO 5$
6473  050074  013737  117776  001172          MOV     @#117776,$TMP0  ;SAVE DATA AT TEST LOCATION
6474  050102  012737  001125  172350          MOV     #1125,@#KIPAR4  ;LOAD PAR4 WITH 1125
6475  050110  012700  105276                  MOV     #105276,R0      ;PUT VIRTUAL ADDRESS IN R0
6476  050114  012701  125202                  MOV     #125202,R1      ;PUT DATA PATTERN IN R1
6477  050120  052737  000400  177572  5$:     BIS     #BIT8,@#MMR0    ;TURN ON DESTINATION ONLY RELOCATION
6478  050126  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
6479  050130  010110                          MOV     R1,(R0)         ;TRY TO LOAD DATA PATTERN INTO 117776
6480  050132  013702  117776                  MOV     @#117776,R2     ;READ (117776) INTO R2
6481  050136  000005                          RESET                   ;CLEAR MMR0
6482  050140  020102                          CMP     R1,R2           ;SEE IF DATA MATCHES PATTERN
6483  050142  001401                          BEQ     6$              ;BRANCH IF DATA MATCHES
6484  050144  104037                          ERROR   37              ;RELOCATION FAILED
```

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6485  050146  013737  001172  117776  6$:     MOV     $TMP0,@#117776  ;RESTORE ORIGINAL DATA TO TEST LOCATION
6486  050154  012737  050206  001112          MOV     #7$,$LPERR      ;SET LOOP ON ERROR POINTER TO 7$
6487  050162  013737  102000  001172          MOV     @#102000,$TMP0  ;SAVE DATA AT TEST LOCATION
6488  050170  012737  001010  172350          MOV     #1010,@#KIPAR4  ;LOAD PAR4 WITH 1010
6489  050176  012700  101000                  MOV     #101000,R0      ;PUT VIRTUAL ADDRESS IN R0
6490  050202  012701  125203                  MOV     #125203,R1      ;PUT DATA PATTERN IN R1
6491  050206  052737  000400  177572  7$:     BIS     #BIT8,@#MMR0    ;TURN ON DESTINATION ONLY RELOCATION
6492  050214  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
6493  050216  010110                          MOV     R1,(R0)         ;TRY TO LOAD DATA PATTERN INTO 102000
6494  050220  013702  102000                  MOV     @#102000,R2     ;READ (102000) INTO R2
6495  050224  000005                          RESET                   ;CLEAR MMR0
6496  050226  020102                          CMP     R1,R2           ;SEE IF DATA MATCHES PATTERN
6497  050230  001401                          BEQ     8$              ;BRANCH IF DATA MATCHES
6498  050232  104037                          ERROR   37              ;RELOCATION FAILED
6499  050234  013737  001172  102000  8$:     MOV     $TMP0,@#102000  ;RESTORE ORIGINAL DATA TO TEST LOCATION
6500  050242  012737  050274  001112          MOV     #9$,$LPERR      ;SET LOOP ON ERROR POINTER TO 9$
6501  050250  013737  142000  001172          MOV     @#142000,$TMP0  ;SAVE DATA AT TEST LOCATION
6502  050256  012737  001314  172350          MOV     #1314,@#KIPAR4  ;LOAD PAR4 WITH 1314
6503  050264  012700  110400                  MOV     #110400,R0      ;PUT VIRTUAL ADDRESS IN R0
6504  050270  012701  125204                  MOV     #125204,R1      ;PUT DATA PATTERN IN R1
6505  050274  052737  000400  177572  9$:     BIS     #BIT8,@#MMR0    ;TURN ON DESTINATION ONLY RELOCATION
6506  050302  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
6507  050304  010110                          MOV     R1,(R0)         ;TRY TO LOAD DATA PATTERN INTO 142000
6508  050306  013702  142000                  MOV     @#142000,R2     ;READ (142000) INTO R2
6509  050312  000005                          RESET                   ;CLEAR MMR0
6510  050314  020102                          CMP     R1,R2           ;SEE IF DATA MATCHES PATTERN
6511  050316  001401                          BEQ     10$             ;BRANCH IF DATA MATCHES
6512  050320  104037                          ERROR   37              ;RELOCATION FAILED
6513  050322  013737  001172  142000  10$:    MOV     $TMP0,@#142000  ;RESTORE ORIGINAL DATA TO TEST LOCATION
6514  050330  012737  050362  001112          MOV     #11$,$LPERR     ;SET LOOP ON ERROR POINTER TO 11$
6515  050336  013737  122000  001172          MOV     @#122000,$TMP0  ;SAVE DATA AT TEST LOCATION
6516  050344  012737  001104  172350          MOV     #1104,@#KIPAR4  ;LOAD PAR4 WITH 1104
6517  050352  012700  111400                  MOV     #111400,R0      ;PUT VIRTUAL ADDRESS IN R0
6518  050356  012701  125205                  MOV     #125205,R1      ;PUT DATA PATTERN IN R1
6519  050362  052737  000400  177572  11$:    BIS     #BIT8,@#MMR0    ;TURN ON DESTINATION ONLY RELOCATION
6520  050370  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
6521  050372  010110                          MOV     R1,(R0)         ;TRY TO LOAD DATA PATTERN INTO 122000
6522  050374  013702  122000                  MOV     @#122000,R2     ;READ (122000) INTO R2
6523  050400  000005                          RESET                   ;CLEAR MMR0
6524  050402  020102                          CMP     R1,R2           ;SEE IF DATA MATCHES PATTERN
6525  050404  001401                          BEQ     12$             ;BRANCH IF DATA MATCHES
6526  050406  104037                          ERROR   37              ;RELOCATION FAILED
6527  050410  013737  001172  122000  12$:    MOV     $TMP0,@#122000  ;RESTORE ORIGINAL DATA TO TEST LOCATION
6528  050416  012737  050450  001112          MOV     #13$,$LPERR     ;SET LOOP ON ERROR POINTER TO 13$
6529  050424  013737  142000  001172          MOV     @#142000,$TMP0  ;SAVE DATA AT TEST LOCATION
6530  050432  012737  001356  172350          MOV     #1356,@#KIPAR4  ;LOAD PAR4 WITH 1356
6531  050440  012700  104200                  MOV     #104200,R0      ;PUT VIRTUAL ADDRESS IN R0
6532  050444  012701  125206                  MOV     #125206,R1      ;PUT DATA PATTERN IN R1
6533  050450  052737  000400  177572  13$:    BIS     #BIT8,@#MMR0    ;TURN ON DESTINATION ONLY RELOCATION
6534  050456  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
6535  050460  010110                          MOV     R1,(R0)         ;TRY TO LOAD DATA PATTERN INTO 142000
6536  050462  013702  142000                  MOV     @#142000,R2     ;READ (142000) INTO R2
6537  050466  000005                          RESET                   ;CLEAR MMR0
6538  050470  020102                          CMP     R1,R2           ;SEE IF DATA MATCHES PATTERN
6539  050472  001401                          BEQ     14$             ;BRANCH IF DATA MATCHES
6540  050474  104037                          ERROR   37              ;RELOCATION FAILED
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6541  050476  013737  001172  142000  14$:  MOV     $TMP0,@#142000  ;RESTORE ORIGINAL DATA TO TEST LOCATION
6542  050504  012737  050536  001112        MOV     #15$,$LPERR     ;SET LOOP ON ERROR POINTER TO 15$
6543  050512  013737  142000  001172        MOV     @#142000,$TMP0  ;SAVE DATA AT TEST LOCATION
6544  050520  012737  001242  172350        MOV     #1242,@#KIPAR4  ;LOAD PAR4 WITH 1242
6545  050526  012700  115600                MOV     #115600,R0      ;PUT VIRTUAL ADDRESS IN R0
6546  050532  012701  125207                MOV     #125207,R1      ;PUT DATA PATTERN IN R1
6547  050536  052737  000400  177572  15$:  BIS     #BIT8,@#MMR0    ;TURN ON DESTINATION ONLY RELOCATION
6548  050544  000240                        NOP                     ;THIS IS A SYNC POINT FOR SCOPING
6549  050546  010110                        MOV     R1,(R0)         ;TRY TO LOAD DATA PATTERN INTO 142000
6550  050550  013702  142000                MOV     @#142000,R2     ;READ (142000) INTO R2
6551  050554  000005                        RESET                   ;CLEAR MMR0
6552  050556  020102                        CMP     R1,R2           ;SEE IF DATA MATCHES PATTERN
6553  050560  001401                        BEQ     16$             ;BRANCH IF DATA MATCHES
6554  050562  104037                        ERROR   37              ;RELOCATION FAILED
6555  050564  013737  001172  142000  16$:  MOV     $TMP0,@#142000  ;RESTORE ORIGINAL DATA TO TEST LOCATION
6556  050572  012737  050624  001112        MOV     #17$,$LPERR     ;SET LOOP ON ERROR POINTER TO 17$
6557  050600  013737  142000  001172        MOV     @#142000,$TMP0  ;SAVE DATA AT TEST LOCATION
6558  050606  012737  001377  172350        MOV     #1377,@#KIPAR4  ;LOAD PAR4 WITH 1377
6559  050614  012700  102100                MOV     #102100,R0      ;PUT VIRTUAL ADDRESS IN R0
6560  050620  012701  125210                MOV     #125210,R1      ;PUT DATA PATTERN IN R1
6561  050624  052737  000400  177572  17$:  BIS     #BIT8,@#MMR0    ;TURN ON DESTINATION ONLY RELOCATION
6562  050632  000240                        NOP                     ;THIS IS A SYNC POINT FOR SCOPING
6563  050634  010110                        MOV     R1,(R0)         ;TRY TO LOAD DATA PATTERN INTO 142000
6564  050636  013702  142000                MOV     @#142000,R2     ;READ (142000) INTO R2
6565  050642  000005                        RESET                   ;CLEAR MMR0
6566  050644  020102                        CMP     R1,R2           ;SEE IF DATA MATCHES PATTERN
6567  050646  001401                        BEQ     18$             ;BRANCH IF DATA MATCHES
6568  050650  104037                        ERROR   37              ;RELOCATION FAILED
6569  050652  013737  001172  142000  18$:  MOV     $TMP0,@#142000  ;RESTORE ORIGINAL DATA TO TEST LOCATION
6570  050660  012737  050712  001112        MOV     #19$,$LPERR     ;SET LOOP ON ERROR POINTER TO 19$
6571  050666  013737  142000  001172        MOV     @#142000,$TMP0  ;SAVE DATA AT TEST LOCATION
6572  050674  012737  001221  172350        MOV     #1221,@#KIPAR4  ;LOAD PAR4 WITH 1221
6573  050702  012700  117700                MOV     #117700,R0      ;PUT VIRTUAL ADDRESS IN R0
6574  050706  012701  125211                MOV     #125211,R1      ;PUT DATA PATTERN IN R1
6575  050712  052737  000400  177572  19$:  BIS     #BIT8,@#MMR0    ;TURN ON DESTINATION ONLY RELOCATION
6576  050720  000240                        NOP                     ;THIS IS A SYNC POINT FOR SCOPING
6577  050722  010110                        MOV     R1,(R0)         ;TRY TO LOAD DATA PATTERN INTO 142000
6578  050724  013702  142000                MOV     @#142000,R2     ;READ (142000) INTO R2
6579  050730  000005                        RESET                   ;CLEAR MMR0
6580  050732  020102                        CMP     R1,R2           ;SEE IF DATA MATCHES PATTERN
6581  050734  001401                        BEQ     20$             ;BRANCH IF DATA MATCHES
6582  050736  104037                        ERROR   37              ;RELOCATION FAILED
6583  050740  013737  001172  142000  20$:  MOV     $TMP0,@#142000  ;RESTORE ORIGINAL DATA TO TEST LOCATION
6584  050746  012737  051000  001112        MOV     #21$,$LPERR     ;SET LOOP ON ERROR POINTER TO 21$
6585  050754  013737  140000  001172        MOV     @#140000,$TMP0  ;SAVE DATA AT TEST LOCATION
6586  050762  012737  001377  172350        MOV     #1377,@#KIPAR4  ;LOAD PAR4 WITH 1377
6587  050770  012700  100100                MOV     #100100,R0      ;PUT VIRTUAL ADDRESS IN R0
6588  050774  012701  125212                MOV     #125212,R1      ;PUT DATA PATTERN IN R1
6589  051000  052737  000400  177572  21$:  BIS     #BIT8,@#MMR0    ;TURN ON DESTINATION ONLY RELOCATION
6590  051006  000240                        NOP                     ;THIS IS A SYNC POINT FOR SCOPING
6591  051010  010110                        MOV     R1,(R0)         ;TRY TO LOAD DATA PATTERN INTO 140000
6592  051012  013702  140000                MOV     @#140000,R2     ;READ (140000) INTO R2
6593  051016  000005                        RESET                   ;CLEAR MMR0
6594  051020  020102                        CMP     R1,R2           ;SEE IF DATA MATCHES PATTERN
6595  051022  001401                        BEQ     22$             ;BRANCH IF DATA MATCHES
6596  051024  104037                        ERROR   37              ;RELOCATION FAILED
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6597  051026  013737  001172  140000  22$:    MOV     $TMP0,@#140000  ;RESTORE ORIGINAL DATA TO TEST LOCATION
6598  051034  012737  051066  001112          MOV     #23$,$LPERR     ;SET LOOP ON ERROR POINTER TO 23$
6599  051042  013737  140000  001172          MOV     @#140000,$TMP0  ;SAVE DATA AT TEST LOCATION
6600  051050  012737  001370  172350          MOV     #1370,@#KIPAR4  ;LOAD PAR4 WITH 1370
6601  051056  012700  101000                  MOV     #101000,R0      ;PUT VIRTUAL ADDRESS IN R0
6602  051062  012701  125213                  MOV     #125213,R1      ;PUT DATA PATTERN IN R1
6603  051066  052737  000400  177572  23$:    BIS     #BIT8,@#MMR0    ;TURN ON DESTINATION ONLY RELOCATION
6604  051074  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
6605  051076  010110                          MOV     R1,(R0)         ;TRY TO LOAD DATA PATTERN INTO 140000
6606  051100  013702  140000                  MOV     @#140000,R2     ;READ (140000) INTO R2
6607  051104  000005                          RESET                   ;CLEAR MMR0
6608  051106  020102                          CMP     R1,R2           ;SEE IF DATA MATCHES PATTERN
6609  051110  001401                          BEQ     24$             ;BRANCH IF DATA MATCHES
6610  051112  104037                          ERROR   37              ;RELOCATION FAILED
6611  051114  013737  001172  140000  24$:    MOV     $TMP0,@#140000  ;RESTORE ORIGINAL DATA TO TEST LOCATION
6612  051122  012737  047634  001112          MOV     #30$,$LPERR     ;SET LOOP ON ERROR POINTER TO START OF TEST
6613
6614                                  ;;*****************************************************************
6615                                  ;*TEST 47       18-BIT MAPPING CARRY PROPAGATION
6616                                  ;*
6617                                  ;*      THIS TEST USES FULL 18-BIT RELOCATION TO CHECK THE CARRY
6618                                  ;*      PROPAGATION OF THE RELOCATION ADDER.  SINCE THIS TEST SCANS
6619                                  ;*      MEMORY FROM 00100000 TO 00750000 ON 2K BOUNDARIES, IT WILL
6620                                  ;*      REPORT ANY HOLES THAT IT FINDS IN MEMORY UP TO THE SIZE
6621                                  ;*      JUMPERS.  THE INFORMATION GIVEN WILL BE THE ADDRESS WHERE
6622                                  ;*      THE HOLE WAS DISCOVERED AND THE FIRST GOOD ADDRESS AFTER THE
6623                                  ;*      HOLE.
6624                                  ;;*****************************************************************
6625  051130                          TST47:
6626  051130  000004                          SCOPE
6627  051132  012737  051760  001316          MOV     #TST50,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
6628                                                                  ;TEST FOR ESCAPE ON PARITY ERRORS
6629  051140  005037  001304          20$:    CLR     HOLFLG          ;MAKE SURE HOLE FLAG STARTS AT 0
6630  051144  012737  051574  000004          MOV     #10$,ERRVEC     ;SET ERRVEC POINTER TO 10$
6631  051152  012737  051740  000114          MOV     #30$,CACHVEC    ;SET UP CACHE VECTOR POINTER FOR SIZLO TO HIGH
6632  051160  012737  000777  172350          MOV     #777,KIPAR4     ;LOAD PAR4 WITH STARTING BASE
6633  051166  012737  001000  172352          MOV     #1000,KIPAR5    ;START ADDRESSING WITH 16K
6634  051174  012700  100100                  MOV     #100100,R0      ;LOAD VIRTUAL ADDR FOR PAR4 IN R0
6635  051200  012701  120000                  MOV     #120000,R1      ;LOAD VIRTUAL ADDR FOR PAR5 IN R1
6636  051204  012702  001000                  MOV     #1000,R2        ;LOAD DATA PATTERN INTO R2
6637  051210  012737  051300  001112          MOV     #2$,$LPERR      ;SET LOOP ON ERROR POINTER TO 2$
6638  051216  012737  000001  177572          MOV     #1,@#MMR0       ;TURN ON 18-BIT MAPPING
6639                                          ;
6640                                  ;FULL RELOCATION STARTS HERE AND CONTINUES FOR REST OF PROGRAM
6641                                          ;
6642  051224  012737  051300  001112  1$:     MOV     #2$,$LPERR      ;SET LOOP ON ERROR POINTER TO 2$
6643  051232  005037  001260                  CLR     PCPUER          ;CLEAR CPU ERROR FLAG
6644  051236  011137  001172                  MOV     (R1),$TMP0      ;SAVE DATA AT TEST LOCATION
6645  051242  005737  001260                  TST     PCPUER          ;SEE IF THERE WAS A CPU TRAP
6646  051246  001014                          BNE     2$              ;BRANCH IF TRAP OCCURRED
6647  051250  005737  001304                  TST     HOLFLG          ;SEE IF A HOLE WAS FOUND IN MEMORY
6648  051254  001411                          BEQ     2$              ;BRANCH IF NO HOLE WAS FOUND
6649  051256  013737  172352  001176          MOV     KIPAR5,$TMP2    ;SAVE PAR THAT POINTS TO END OF HOLE
6650  051264  012737  051140  001112          MOV     #20$,$LPERR     ;SET LOOP ON ERROR POINTER TO 20$
6651  051272  104040                          ERROR   40              ;HOLE IN MEMORY FROM $TMP1 TO $TMP2
6652  051274  005037  001304                  CLR     HOLFLG          ;CLEAR HOLE FLAG IN CASE THERE ARE MORE
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6653  051300  000240                    2$:   NOP                 ;THIS A IS SYNC POINT FOR SCOPING
6654  051302  010210                          MOV   R2,(R0)         ;LOAD TEST PATTERN INTO TEST LOCATION
6655  051304  011103                          MOV   (R1),R3         ;READ TEST LOCATION VIA DIFFERENT V. A.
6656  051306  020203                          CMP   R2,R3           ;SEE IF CORRECT LOCATION WAS REFERENCED
6657  051310  001401                          BEQ   3$              ;BRANCH IF CORRECT DATA WAS OBTAINED
6658  051312  104042                          ERROR 42              ;BAD RELOCATION
6659  051314  013711  001172          3$:   MOV   $TMP0,(R1)      ;RESTORE ORIGINAL DATA TO TEST LOCATION
6660  051320  062737  000100  172350        ADD   #100,KIPAR4     ;CHANGE BASE ADDRESS
6661  051326  062737  000100  172352        ADD   #100,KIPAR5     ;CHANGE BASE ADDRESS
6662  051334  005202                          INC   R2              ;CHANGE DATA PATTERN
6663  051336  022737  007500  172352        CMP   #7500,KIPAR5    ;SEE IF PAST LAST ADDRESS
6664  051344  103327                          BHIS  1$              ;BRANCH IF NOT PAST LAST ADDRESS
6665  051346  005737  001304                TST   HOLFLG          ;SEE IF YOU ARE IN THE MIDDLE OF A HOLE
6666  051352  001401                          BEQ   4$              ;BRANCH IF NOT IN MIDDLE OF A HOLE
6667  051354  104041                          ERROR 41              ;IN MIDDLE OF A HOLE IN MEMORY
6668                                                                ;HOLFLG HAS NO. OF TIME OUTS $TMP1
6669
6670                                                                ;HAS PAR OF FIRST TIMEOUT
6671                                .SBTTL          TEST 'SAPN UNIBUS ADRS L' IN 18-BIT MAPPING
6672                                ;*
6673                                ;*    ADDRESS 760000 IS GENERATED BY CARRY PROPAGATION WHILE THE
6674                                ;*    PROGRAM IS EXPECTING A TIME OUT.  (760000 IS THE FIRST I/O
6675                                ;*    PAGE ADDRESS AND IS NOT IMPLEMENTED EXCEPT FOR DIAGNOSTICS)
6676                                ;*    KIPAR4 WILL CONTAIN 007577 AND R0 HAS 100100 (WHICH
6677                                ;*    SELECTS KIPAR4 AND GENERATES ADDRESS 760000).
6678                                ;*    IF THE WRONG BIT IN THE CPU ERROR REGISTER IS SET OR IF
6679                                ;*    NO TRAP TO 'ERRVEC' OCCURS AN ERROR IS REPORTED.
6680                                ;*
6681
6682  051356  012737  031670  000004  4$:   MOV   #CPUER,ERRVEC   ;RESTORE NORMAL ROUTINE FOR TRAPS THRU 4
6683  051364  012737  031774  000114        MOV   #MEMER,CACHVEC  ;RESTORE NORMAL CACHE PARITY ERROR POINTER
6684  051372  012737  051424  001112        MOV   #40$,$LPERR     ;SET LOOP ON ERROR POINTER TO 40$
6685  051400  012737  007577  172350        MOV   #7577,KIPAR4    ;LOAD KIPAR4 WITH 007577
6686  051406  012702  007600                MOV   #7600,R2        ;LOAD DATA PATTERN INTO R2
6687  051412  012737  000020  001224        MOV   #20,CPUEXP      ;EXPECTING UNIBUS TIMEOUT
6688  051420  005037  001260                CLR   PCPUER          ;CLEAR CPU TRAP FLAG
6689  051424  000240                    40$:  NOP                 ;THIS A IS SYNC POINT FOR SCOPING
6690  051426  010210                        MOV   R2,(R0)         ;LOAD 760000 THRU PAGE 4
6691                                                              ;THIS INSTRUCTION SHOULD TIME OUT
6692                                                              ;OVER THE UNIBUS.
6693  051430  005737  001260                TST   PCPUER          ;SEE IF TRAP OCCURRED
6694  051434  001001                        BNE   6$              ;BRANCH IF TRAP
6695  051436  104043                        ERROR 43              ;NO CPU TRAP
6696
6697                                .SBTTL          TEST 'SAPN NOT CACHE ADRS H' 18-BIT MAPPING
6698                                ;*
6699                                ;*    ADDRESS 000000 IS GENERATED BY CARRY PROPAGATION, THIS WILL
6700                                ;*    CAUSE '18BIT WRAPAROUND' TO BE ASSERTED, KNOCKING DOWN
6701                                ;*    'NOT CACHE ADRS'.  THEN, IF THERE IS LESS THAN 120K OF MEMORY
6702                                ;*    ON THE SYSTEM, THE SIZE REGISTER IS USED AS A PAR AND A
6703                                ;*    CARRY IS PROPAGATED TO CAUSE '18BIT OVERFLOW' TO BE ASSERTED
6704                                ;*    WHICH SHOULD GENERATE 'NOT CACHE ADRS'.
6705                                ;*
6706
6707  051440  012737  051464  001112  6$:   MOV   #16$,$LPERR     ;SET LOOP ON ERROR POINTER TO 16$
6708  051446  005037  001224                CLR   CPUEXP          ;NO TRAPS THRU ERRVEC EXPECTED HERE
```

```
6709  051452  012737  007777  172350          MOV     #7777,KIPAR4    ;LOAD PAR 4 WITH HIGHEST VALUE POSSIBLE
6710  051460  005037  000000                  CLR     @#000000        ;CLEAR ADDRESS ZERO
6711  051464  000240                  16$:    NOP                     ;THIS A IS SYNC POINT FOR SCOPING
6712  051466  013701  100100                  MOV     @#100100,R1     ;THIS SHOULD READ ADDRESS ZERO INTO R1
6713  051472  005701                          TST     R1              ;SEE IF YOU REALLY READ ADDRESS ZERO
6714  051474  001401                          BEQ     7$              ;BRANCH IF YOU READ ADDRESS ZERO
6715  051476  104044                          ERROR   44              ;DIDN'T READ ADDRESS ZERO
6716  051500  012737  051536  001112  7$:     MOV     #17$,$LPERR     ;SET LOOP ON ERROR POINTER TO 17$
6717  051506  022737  000170  031142          CMP     #170,$LSTBK     ;IS THERE 120K ON THE SYSTEM?
6718  051514  101421                          BLOS    8$              ;BRANCH IF MORE THAN 120K ON SYSTEM
6719  051516  012737  000040  001224          MOV     #40,CPUEXP      ;EXPECTING CACHE NON-EXISTANT MEMORY
6720  051524  005037  001260                  CLR     PCPUER          ;CLEAR TRAP THRU ERRVEC FLAG
6721  051530  013737  177760  172350          MOV     SIZELO,KIPAR4   ;GET READY TO GENERATE NON-EXIST ADDR.
6722  051536  000240                  17$:    NOP                     ;THIS A IS SYNC POINT FOR SCOPING
6723  051540  013701  100100                  MOV     @#100100,R1     ;READ FROM NON-EXISTANT ADDRESS
6724  051544  005737  001260                  TST     PCPUER          ;SEE IF TRAP THRU ERRVEC OCCURRED
6725  051550  001003                          BNE     8$              ;BRANCH TO EXIT IF TRAP HAPPENED
6726  051552  012700  100100                  MOV     #100100,R0      ;SAVE VIRTUAL ADDRESS FOR ERROR TYPE OUT
6727  051556  104045                          ERROR   45              ;NO TRAP THRU ERRVEC
6728  051560  005037  001224          8$:     CLR     CPUEXP          ;NO CPU TRAPS EXPECTED
6729  051564  012737  051140  001112          MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
6730  051572  000472                          BR      TST50           ;;BRANCH TO NEXT TEST
6731
6732                          ;;******************  TRAP TO HERE THRU ERRVEC  **********************
6733
6734  051574  012637  001306          10$:    MOV     (KSP)+,OLDPC    ;SAVE RETURN ADDRESS
6735  051600  012637  001310                  MOV     (KSP)+,OLDPS    ;SAVE OLD PROCESSOR STATUS
6736  051604  013737  177766  001260          MOV     CPUERR,PCPUER   ;SAVE CPU ERROR REGISTER
6737  051612  022737  000040  001260          CMP     #40,PCPUER      ;WAS TRAP NON-EXISTANT MEMORY
6738  051620  001012                          BNE     12$             ;BRANCH IF MEMORY EXISTS
6739  051622  023737  172350  177760          CMP     KIPAR4,SIZELO   ;SEE IF PAR 4 MATCHES SIZE REGISTER
6740  051630  001004                          BNE     11$             ;BRANCH IF NO MATCH, POSSIBLE ERROR
6741                                                                  ;IN COMPARE CIRCUIT
6742  051632  012737  051356  001306          MOV     #4$,OLDPC       ;CHANGE RETURN ADDRESS IF AT TOP OF MEM
6743  051640  000430                          BR      14$             ;BRANCH TO EXIT
6744  051642  104050                  11$:    ERROR   50              ;COMPARE CIRCUIT FOR SIZE JUMPERS BAD
6745  051644  000426                          BR      14$             ;BRANCH TO EXIT & CONTINUE
6746                                  ;;
6747                                  ;;********** COME HERE IF YOU DON'T GET CACHE NON-EXISTANT MEMORY ERROR
6748                                  ;;*********  THERE MIGHT BE A HOLE IN MEMORY.
6749                                  ;;
6750  051646  022737  051140  001260  12$:    CMP     #20$,PCPUER     ;SEE IF ADDRESS TIMED OUT
6751  051654  001011                          BNE     13$             ;BRANCH IF NO TIME OUT, UNEXPECTED ERROR
6752  051656  005737  001304                  TST     HOLFLG          ;HAS THIS HAPPENED BEFORE?
6753  051662  001003                          BNE     15$             ;BRANCH IF NOT FIRST TIMEOUT
6754  051664  013737  172352  001174          MOV     KIPAR5,$TMP1    ;SAVE PAR WHEN HOLE FIRST DISCOVERED
6755  051672  005237  001304          15$:    INC     HOLFLG          ;KEEP COUNT OF CONSECUTIVE TIMEOUTS
6756  051676  000411                          BR      14$             ;BRANCH TO EXIT AND CONTINUE TEST
6757  051700  013737  001306  001262  13$:    MOV     OLDPC,BADPC     ;MOVE PC OF UNEXPECTED ERROR FOR TYPE OUT
6758  051706  104002                          ERROR   2               ;UNEXPECTED TRAP THRU ERRVEC
6759  051710  013737  001110  001306          MOV     $LPADR,OLDPC    ;RETURN TO START OF TEST
6760  051716  005037  001304                  CLR     HOLFLG          ;CLEAR HOLE FLAG IN CASE IT WAS SET
6761  051722  005037  177766          14$:    CLR     CPUERR          ;CLEAR THE CPU ERROR REGISTER
6762  051726  013746  001310                  MOV     OLDPS,-(KSP)    ;PUSH OLD PROCESSOR STATUS ON STACK
6763  051732  013746  001306                  MOV     OLDPC,-(KSP)    ;PUSH RETURN ADDRESS ON STACK
6764  051736  000002                          RTI                     ;RETURN TO TEST AND CONTINUE
```

```
                                ;;********* COME HERE IF TRAP TO 114 (SIZELO HIGHER THAN ACTUAL MEMORY)
                                ;;
051740  012637  001306    30$:  MOV     (KSP)+,OLDPC    ;
051744  012637  001310          MOV     (KSP)+,OLDPS
051750  012737  051356  001306  MOV     #4$,OLDPC
051756  000761                BR      14$             ;BRANCH TO EXIT


                                ;;*****************************************************************
                                ;*TEST 50       22-BIT MAPPING CARRY PROPAGATION
                                ;*
                                ;*      THIS TEST USES FULL 22-BIT RELOCATION TO CHECK THE CARRY
                                ;*      PROPAGATION THAT PERTAINS TO 22 BIT ADDRESSES.  THIS TEST
                                ;*      ALSO SCANS MEMORY THIS TIME FROM ADDRESS 00740000
                                ;*      TO 16740000 OR THE SIZE JUMPERS, ON 8K BOUNDARIES.  AGAIN
                                ;*      IF ANY HOLES ARE FOUND THE ADDRESS WHERE THEY ARE DISCOVERED
                                ;*      AND THE FIRST GOOD ADDRESS AFTER THE HOLE WILL BE REPORTED
                                ;*
                                ;;*****************************************************************
051760                  TST50:
051760  000004                  SCOPE
051762  012737  052634  001316  MOV     #TST51,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
                                                        ;TEST FOR ESCAPE ON PARITY ERRORS
                                ;
                                ;       22-BIT MAPPING STARTS HERE AND CONTINUES FOR THE REST OF
                                ;       THE PROGRAM.
                                ;
051770  022737  007377  177760         CMP     #7377,SIZELO    ;IS THERE AT LEAST 120K ON SYSTEM?
051776  003105                BGT     4$              ;BRANCH IF LESS THAN 120K
052000  012737  000020  172516  MOV     #BIT4,MMR3      ;ENABLE 22-BIT MAPPING
052006  012737  052450  000004  20$:   MOV     #10$,ERRVEC     ;SET ERRVEC POINTER TO 10$
052014  012737  052614  000114  MOV     #30$,CACHVEC    ;SET UP CACHE VECTOR POINTER FOR SIZLO TO HIGH (KB11-EM)
052022  005037  001304          CLR     HOLFLG          ;START HOLE FLAG AT ZERO
052026  012700  100100          MOV     #100100,R0      ;LOAD VIRTUAL ADDRESS FOR PAGE 4
052032  012701  120000          MOV     #120000,R1      ;LOAD VIRTUAL ADDRESS FOR PAGE 5
052036  012737  007377  172350  MOV     #7377,KIPAR4    ;LOAD BASE ADDRESS INTO PAR 4
052044  012737  007400  172352  MOV     #7400,KIPAR5    ;LOAD BASE ADDRESS +100 INTO PAR5
052052  012702  007400          MOV     #7400,R2        ;LOAD DATA PATTERN INTO R2
052056  012737  052132  001112  1$:    MOV     #2$,$LPERR      ;SET LOOP ON ERROR POINTER TO 2$
052064  005037  001260          CLR     PCPUER          ;CLEAR CPU TRAP FLAG
052070  011137  001172          MOV     (R1),$TMP0      ;SAVE DATA AT TEST LOCATION USING PAGE 5
052074  005737  001260          TST     PCPUER          ;SEE IF CPU TRAP OCCURRED
052100  001014                  BNE     2$              ;BRANCH IF TRAP OCCURED
052102  005737  001304          TST     HOLFLG          ;SEE IF A HOLE IN MEMORY WAS FOUND
052106  001411                  BEQ     2$              ;BRANCH IF NO HOLE WAS FOUND
052110  013737  172352  001176  MOV     KIPAR5,$TMP2    ;SAVE PAR THAT POINTS TO END OF HOLE
052116  012737  052006  001112  MOV     #20$,$LPERR     ;SET LOOP ON ERROR POINTER TO 20$
052124  104125                  ERROR   125             ;HOLE IN MEMORY FROM $TMP1 TO $TMP2
052126  005037  001304          CLR     HOLFLG          ;CLEAR FLAG IN CASE OF MORE HOLES
052132  000240          2$:     NOP                     ;THIS A IS SYNC POINT FOR SCOPING
052134  010210                  MOV     R2,(R0)         ;WRITE DATA PATTERN INTO TEST LOCATION
052136  011103                  MOV     (R1),R3         ;READ TEST LOCATION  VIA DIFFERENT VIRT.ADDR
052140  020203                  CMP     R2,R3           ;SEE IF DATA MATCHES
052142  001401                  BEQ     3$              ;BRANCH IF DATA IS GOOD
```

```
                                                ERROR   46              ;BAD RELOCATION 22-BIT MAPPING
052144  104046
052146  013711  001172          3$:           MOV     $TMP0,(R1)      ;RESTORE ORIGINAL DATA USING PAGE 5
052152  062702  000400                        ADD     #400,R2         ;CHANGE DATA PATTERN
052156  062737  000400  172350                ADD     #400,KIPAR4     ;GET READY TO TEST NEXT BIT
052164  062737  000400  172352                ADD     #400,KIPAR5     ;NEW PHYSICAL ADDRESS
052172  022737  167400  172352                CMP     #167400,KIPAR5  ;MAKE SURE YOU DON'T GET ON THE UNIBUS
052200  103326                                BHIS    1$              ;BRANCH IF PAR 5 IS NOT PAST LIMIT
052202  005737  001304                        TST     HOLFLG          ;SEE IF MEMORY ENDS WITH A HOLE
052206  001401                                BEQ     4$              ;BRANCH IF NO HOLE AT END OF MEMORY
052210  104126                                ERROR   126             ;HOLE AT END OF MEMORY

                                .SBTTL          TEST 'SAPN UNIBUS ADRS L' IN 22-BIT MAPPING
                                ;*
                                ;*      UNIBUS ADDRESS 000000 IS GENERATED BY CARRY PROPAGATION
                                ;*      SINCE THE MAP IS DISABLED THIS SHOULD REFERENCE PHYSICAL
                                ;*      ADDRESS 000000.
                                ;*

052212  012737  000020  172516  4$:           MOV     #BIT4,MMR3      ;ENABLE 22-BIT MAPPING
052220  012737  031670  000004                MOV     #CPUER,ERRVEC   ;RESTORE NORMAL CPU TRAP ROUTINE
052226  012737  031774  000114                MOV     #MEMER,CACHVEC  ;RESTORE NORMAL CACHE PARITY ERROR POINTER
052234  012737  000020  001224                MOV     #20,CPUEXP      ;POSSIBLE U.B. TIME OUT
052242  012737  167777  172350                MOV     #167777,KIPAR4  ;GET READY TO TEST U.B. ADDRESS 0
052250  012737  000000  172352                MOV     #0,KIPAR5       ;SHOULD GO TO PHYSICAL ADDRESS 0
052256  012702  017000                        MOV     #17000,R2       ;LOAD DATA PATTERN INTO R2
052262  012737  052274  001112                MOV     #5$,$LPERR      ;SET LOOP ON ERROR POINTER TO 6$
052270  011037  001172                        MOV     (R0),$TMP0      ;SAVE DATA IN LOCATION 0 USING PAGE 4
052274  000240                          5$:   NOP                     ;THIS A IS SYNC POINT FOR SCOPING
052276  010210                                MOV     R2,(R0)         ;LOAD DATA PATTERN INTO TEST LOCATION
052300  011103                                MOV     (R1),R3         ;READ TEST LOCATION VIA DIFFERENT V. A.
052302  013710  001172                        MOV     $TMP0,(R0)      ;RESTORE ORIGINAL DATA USING PAGE 4
052306  020203                                CMP     R2,R3           ;SEE IF DATA MATCHES
052310  001401                                BEQ     6$              ;BRANCH IF DATA IS GOOD
052312  104047                                ERROR   47              ;BAD RELOCATION, UNIBUS ADDRESS

                                .SBTTL          TEST 'SAPN NOT CACHE ADRS H' 22-BIT MAPPING
                                ;*
                                ;*      ADDRESS 000000 IS GENERATED BY CARRY PROPAGATION, THIS WILL
                                ;*      CAUSE '22BIT WRAPAROUND' TO BE ASSERTED, KNOCKING DOWN
                                ;*      'NOT CACHE ADRS'.  THEN THE SIZE REGISTER IS USED AS A PAR AND A
                                ;*      CARRY IS PROPAGATED TO CAUSE 'ADRS OVERFLOW' TO BE ASSERTED
                                ;*      WHICH SHOULD GENERATE 'NOT CACHE ADRS'.
                                ;*

052314  012737  052340  001112  6$:           MOV     #16$,$LPERR     ;SET LOOP ON ERROR POINTER TO 16$
052322  005037  001224                        CLR     CPUEXP          ;NO TRAPS THRU ERRVEC EXPECTED HERE
052326  012737  177777  172350                MOV     #177777,KIPAR4  ;LOAD PAR 4 WITH HIGHEST VALUE POSSIBLE
052334  005037  000000                        CLR     @#000000        ;CLEAR ADDRESS ZERO
052340  000240                         16$:   NOP                     ;THIS IS A SYNC POINT FOR SCOPING
052342  013701  100100                        MOV     @#100100,R1     ;THIS SHOULD READ ADDRESS ZERO INTO R1
052346  005701                                TST     R1              ;SEE IF YOU REALLY READ ADDRESS ZERO
052350  001401                                BEQ     7$              ;BRANCH IF YOU READ ADDRESS ZERO
052352  104044                                ERROR   44              ;DIDN'T READ ADDRESS ZERO
052354  012737  052412  001112  7$:           MOV     #17$,$LPERR     ;SET LOOP ON ERROR POINTER TO 17$
052362  022737  167777  177760                CMP     #167777,SIZELO  ;IS SIZE REGISTER L.E. TO 167777
052370  101421                                BLOS    8$              ;BRANCH IF MAXIMUM MEMORY IS ON SYSTEM
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```
6877  052372  012737  000040  001224          MOV     #40,CPUEXP      ;EXPECTING CACHE NON-EXISTANT MEMORY
6878  052400  005037  001260                  CLR     PCPUER          ;CLEAR TRAP THRU ERRVEC FLAG
6879  052404  013737  177760  172350          MOV     SIZELO,KIPAR4   ;GET READY TO GENERATE NON-EXIST ADDR.
6880  052412  000240                  17$:    NOP                     ;THIS IS A SYNC POINT FOR SCOPING
6881  052414  013701  100100                  MOV     @#100100,R1     ;READ FROM NON-EXISTANT ADDRESS
6882  052420  005737  001260                  TST     PCPUER          ;SEE IF TRAP THRU ERRVEC OCCURRED
6883  052424  001003                          BNE     8$              ;BRANCH TO EXIT IF TRAP HAPPENED
6884  052426  012700  100100                  MOV     #100100,R0      ;SAVE VIRTUAL ADDRESS FOR ERROR TYPE OUT
6885  052432  104045                          ERROR   45              ;NO TRAP THRU ERRVEC
6886  052434  005037  001224          8$:     CLR     CPUEXP          ;NO CPU TRAPS EXPECTED
6887  052440  012737  052006  001112          MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
6888  052446  000472                          BR      TST51           ;;BRANCH TO NEXT TEST
6889
6890
6891                          ;;**************************  TRAP TO HERE THRU ERRVEC ******************
6892
6893  052450  012637  001306          10$:    MOV     (KSP)+,OLDPC    ;SAVE RETURN ADDRESS
6894  052454  012637  001310                  MOV     (KSP)+,OLDPS    ;SAVE OLD PROCESSOR STATUS
6895  052460  013737  177766  001260          MOV     CPUERR,PCPUER   ;SAVE CPU ERROR REGISTER FOR TYPING
6896  052466  022737  000040  001260          CMP     #40,PCPUER      ;WAS TRAP NON-EXISTANT MEMORY
6897  052474  001012                          BNE     12$             ;BRANCH IF MEMORY EXISTS
6898  052476  023737  172350  177760          CMP     KIPAR4,SIZELO   ;SEE IF PAR 4 MATCHES SIZE REGISTER
6899  052504  001004                          BNE     11$             ;BRANCH IF NO MATCH, POSSIBLE ERROR
6900                                                                  ;IN COMPARE CIRCUIT
6901  052506  012737  052212  001306          MOV     #4$,OLDPC       ;CHANGE RETURN ADDRESS IF AT TOP OF MEM
6902  052514  000430                          BR      14$             ;BRANCH TO EXIT
6903  052516  104050                  11$:    ERROR   50              ;COMPARE CIRCUIT FOR SIZE JUMPERS BAD
6904  052520  000426                          BR      14$             ;BRANCH TO EXIT & CONTINUE
6905                                  ;;
6906                                  ;;********** COME HERE IF YOU DON'T GET CACHE NON-EXISTANT MEMORY ERROR
6907                                  ;;********** THERE MIGHT BE A HOLE IN MEMORY.
6908                                  ;;
6909  052522  022737  052006  001260  12$:     CMP     #20$,PCPUER     ;SEE IF ADDRESS TIMED OUT
6910  052530  001011                          BNE     13$             ;BRANCH IF NO TIME OUT, UNEXPECTED ERROR
6911  052532  005737  001304                  TST     HOLFLG          ;HAS THIS HAPPENED BEFORE?
6912  052536  001003                          BNE     15$             ;BRANCH IF NOT FIRST TIMEOUT
6913  052540  013737  172352  001174          MOV     KIPAR5,$TMP1    ;SAVE PAR WHEN HOLE FIRST DISCOVERED
6914  052546  005237  001304          15$:    INC     HOLFLG          ;KEEP COUNT OF CONSECUTIVE TIMEOUTS
6915  052552  000411                          BR      14$             ;BRANCH TO EXIT AND CONTINUE TEST
6916  052554  013737  001306  001262  13$:     MOV     OLDPC,BADPC     ;MOVE PC OF UNEXPECTED ERROR FOR TYPE OUT
6917  052562  104002                          ERROR   2               ;UNEXPECTED TRAP THRU ERRVEC
6918  052564  013737  001110  001306          MOV     $LPADR,OLDPC    ;RETURN TO START OF TEST
6919  052572  005037  001304                  CLR     HOLFLG          ;CLEAR HOLE FLAG IN CASE IT WAS SET
6920  052576  005037  177766          14$:    CLR     CPUERR          ;CLEAR THE CPU ERROR REGISTER
6921  052602  013746  001310                  MOV     OLDPS,-(KSP)    ;PUSH OLD PROCESSOR STATUS ON STACK
6922  052606  013746  001306                  MOV     OLDPC,-(KSP)    ;PUSH RETURN ADDRESS ON STACK
6923  052612  000002                          RTI                     ;RETURN TO TEST AND CONTINUE
6924
6925                                  ;;********* COME HERE IF TRAP TO 114 (SIZELO HIGHER THAN ACTUAL MEMORY)
6926                                  ;;
6927  052614  012637  001306          30$:    MOV     (KSP)+,OLDPC
6928  052620  012637  001310                  MOV     (KSP)+,OLDPS
6929  052624  012737  052212  001306          MOV     #4$,OLDPC
6930  052632  000761                          BR      14$             ;BRANCH TO EXIT
6931
6932
```

```
                                .SBTTL  ************ ENTRY POINT 5 --- STARTING ADDRESS 220 ************
                                .SBTTL  ******** MEMORY MANAGEMENT ABORTS AND TRAPS LOGIC TESTS ********
                                ;*
                                ;*      THIS GROUP OF TESTS CHECKS OUT THE MEMORY MANAGEMENT ABORT
                                ;*      AND TRAP LOGIC ON PAGES 'SAPL', 'SSRC', AND 'SSRD'.  IT WILL
                                ;*      ALSO CHECK OUT BITS <07:01> OF MMR0, AND ALL BITS OF MMR2.
                                ;*      IT THEN CHECKS THAT KERNEL MODE IS ALWAYS CLOCKED DURING
                                ;*      A TRAP SEQUENCE SO THAT THE VECTOR IS PICKED UP FROM KERNEL
                                ;*      SPACE.
                                ;
                                ;;*********************************************************************
                                ;*TEST 51       PAGE LENGTH FAULTS - UPWARD EXPANSION
                                ;*
                                ;*      THIS TEST CHECKS OUT THE PAGE LENGTH COMPARATORS ON PAGE 'SAPL'
                                ;*      AND THE LOGIC THAT GENERATES 'SAPL LENGTH FAULT'.  IT TRIES
                                ;*      EVERY PAGE LENGTH FIELD FROM 1 BLOCK TO 200(8) BLOCKS.  THE
                                ;*      TEST THEN TRIES A REFERENCE AT EVERY 100 BYTES UNTIL AN ABORT
                                ;*      OCCURS.  IF THE ABORT HAPPENS TOO SOON OR IF NO ABORT HAPPENS AT
                                ;*      THE CORRECT BLOCK NUMBER AN ERROR IS REPORTED.
                                ;*
                                ;;*********************************************************************
052634                          TST51:
                                        SCOPE
052634  000004
052636  012737  053166  001316         MOV     #TST52,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
                                                                ;TEST FOR ESCAPE ON PARITY ERRORS
052644  012737  000024  001206         MOV     #24,$TIMES      ;;DO 24 ITERATIONS
052652                          ENTPT5:
052652  012737  053012  001110         MOV     #20$,$LPADR     ;SET LOOP ADDRESS POINTER TO 20$
052660  012737  053012  001112         MOV     #20$,$LPERR     ;SET LOOP ON ERROR POINTER TO 20$
052666  012737  000051  001102         MOV     #51,$TSTNM      ;LOAD TEST NUMBER INTO MEMORY
052674  013737  001102  177570         MOV     $TSTNM,DISPLAY  ;DISPLAY TEST NUMBER FOR THIS TEST
052702  012737  077406  172300         MOV     #77406,KIPDR0   ;MAKE KERNEL I PAGE 0 200 BLOCKS, R/W
052710  012737  077406  172302         MOV     #77406,KIPDR1   ;MAKE KERNEL I PAGE 1 200 BLOCKS, R/W
052716  012737  077406  172304         MOV     #77406,KIPDR2   ;MAKE KERNEL I PAGE 2 200 BLOCKS, R/W
052724  012737  077406  172306         MOV     #77406,KIPDR3   ;MAKE KERNEL I PAGE 3 200 BLOCKS, R/W
052732  012737  077406  172316         MOV     #77406,KIPDR7   ;MAKE KERNEL I PAGE 7 200 BLOCKS, R/W
052740  012737  000000  172340         MOV     #000,KIPAR0     ;MAP KERNEL I PAGE 0 TO 0 - 4K
052746  012737  000200  172342         MOV     #200,KIPAR1     ;MAP KERNEL I PAGE 1 TO 4K - 8K
052754  012737  000400  172344         MOV     #400,KIPAR2     ;MAP KERNEL I PAGE 2 TO 8K - 12K
052762  012737  000600  172346         MOV     #600,KIPAR3     ;MAP KERNEL I PAGE 3 TO 12K - 16K
052770  012737  177600  172356         MOV     #177600,KIPAR7  ;MAP KERNEL I PAGE 7 TO THE I/O PAGE
052776  012737  000001  177572         MOV     #BIT0,MMR0      ;ENABLE 18-BIT RELOCATION IF NOT ON
053004  012737  000020  172516         MOV     #BIT4,MMR3      ;ENABLE 22-BIT RELOCATION IF NOT ON
053012  012737  000006  172310  20$:    MOV     #000006,@#KIPDR4 ;LOAD PDR4 FOR PAGE LENGTH OF 1
053020  012737  001000  172350         MOV     #1000,KIPAR4    ;MAP PAGE 4 TO 16K
053026  012700  172311                 MOV     #KIPDR4+1,R0    ;PUT ADDRESS OF PDR 4'S UPPER BYTE IN R0
053032  012737  053064  001112         MOV     #3$,$LPERR      ;SET LOOP ON ERROR POINTER TO 3$
053040  005037  001250          1$:    CLR     PMMR0           ;CLEAR LOCATION THAT HOLDS MMR0
053044  012702  100000                 MOV     #100000,R2      ;PUT VIRTUAL ADDRESS INTO R2
053050  010203                  2$:    MOV     R2,R3           ;PUT VIRTUAL ADDRESS INTO R3 TOO
053052  072327  177772                 ASH     #-6,R3          ;RIGHT SHIFT 6 BITS SO IT WILL
                                                                ;MATCH THE PLF
053056  042703  177600                 BIC     #177600,R3      ;CLEAR BITS THAT ARE SET IN UPPER BYTE
```

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 6989  053062  111001                          MOVB    (R0),R1         ;SAVE PLF IN R1 FOR LATER COMPARISON
 6990  053064  012737  040011  001226  3$:     MOV     #040011,MMEXP   ;POTENTIAL ABORT CONDITION: PAGE LENGTH
 6991                                                                  ;ERROR KERNEL, I-SPACE, PAGE 4
 6992  053072  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
 6993  053074  011204                          MOV     (R2),R4         ;READ USING V.A. IN R2
 6994  053076  005037  001226                  CLR     MMEXP           ;CLEAR EXPECTED ABORT CONDITION
 6995  053102  005737  001250                  TST     PMMR0           ;SEE IF ABORT OCCURRED YET
 6996  053106  001405                          BEQ     4$              ;BRANCH IF NO ABORT YET, CHANGE V.A.
 6997  053110  005303                          DEC     R3              ;MAKE R3 EQUAL TO PLF
 6998  053112  020103                          CMP     R1,R3           ;SEE IF PDR 4'S PLF=R3
 6999  053114  001414                          BEQ     6$              ;BRANCH IF ABORT HAPPENS AT RIGHT PLACE
 7000  053116  104051                          ERROR   51              ;ABORT WRONG PLACE
 7001  053120  000412                          BR      6$              ;BRANCH TO CHANGE PLF
 7002  053122  020103                  4$:     CMP     R1,R3           ;SEE IF PAGE LENGTH FAULT SHOULD HAVE OCCURRED
 7003  053124  103002                          BHIS    5$              ;BRANCH IF NO PAGE LENGTH FAULT CONDITION
 7004  053126  104052                          ERROR   52              ;NO ABORT, IT SHOULD HAVE HAPPENED THIS TIME
 7005  053130  000406                          BR      6$              ;BRANCH TO CHANGE PLF
 7006  053132  120327  000177          5$:     CMPB    R3,#177         ;SEE IF V.A. IS 177
 7007  053136  001403                          BEQ     6$              ;BRANCH TO CHECK PLF
 7008  053140  062702  000100                  ADD     #100,R2         ;CHANGE VIRTUAL ADDRESS
 7009  053144  000741                          BR      2$              ;GO TRY THE NEXT VIRTUAL ADDRESS
 7010  053146  122710  000177          6$:     CMPB    #177,(R0)       ;SEE IF PDR 4'S PLF IS 177
 7011  053152  001402                          BEQ     7$              ;BRANCH TO EXIT IF PLF IS 177
 7012  053154  105210                          INCB    (R0)            ;STEP PLF OF PDR 4 UP BY 1
 7013  053156  000730                          BR      1$              ;BRANCH TO START WITH V.A. OF 0
 7014  053160  012737  053012  001112  7$:     MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
 7015
 7016                                  ;;*****************************************************************
 7017                                  ;*TEST 52       PAGE LENGTH FAULTS - DOWNWARD EXPANSION
 7018                                  ;*
 7019                                  ;*      THIS TEST CHECKS OUT THE PAGE LENGTH COMPARATORS ON PAGE 'SAPL'
 7020                                  ;*      AND THE LOGIC THAT GENERATES 'SAPL LENGTH FAULT'.  IT TRIES
 7021                                  ;*      EVERY PAGE LENGTH FIELD FROM 1 BLOCK TO 200(8) BLOCKS.  THE
 7022                                  ;*      TEST THEN TRIES A REFERENCE AT EVERY 100 BYTES UNTIL AN ABORT
 7023                                  ;*      OCCURS.  IF THE ABORT HAPPENS TOO SOON OR IF NO ABORT HAPPENS AT
 7024                                  ;*      THE CORRECT BLOCK NUMBER AN ERROR IS REPORTED.
 7025                                  ;*
 7026                                  ;;*****************************************************************
 7027  053166                          TST52:
 7028  053166  000004                          SCOPE
 7029  053170  012737  053360  001316          MOV     #TST53,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
 7030                                                                  ;TEST FOR ESCAPE ON PARITY ERRORS
 7031  053176  012737  000024  001206          MOV     #24,$TIMES      ;;DO 24 ITERATIONS
 7032  053204  012737  077416  172310  20$:     MOV     #77416,@#KIPDR4 ;LOAD PDR4 FOR PAGE LENGTH OF 1
 7033  053212  012737  001000  172350          MOV     #1000,KIPAR4    ;MAP PAGE 4 TO 16K
 7034  053220  012700  172311                  MOV     #KIPDR4+1,R0    ;PUT ADDRESS OF PDR 4'S UPPER BYTE IN R0
 7035  053224  012737  053256  001112          MOV     #3$,$LPERR      ;SET LOOP ON ERROR POINTER TO 3$
 7036  053232  005037  001250          1$:     CLR     PMMR0           ;CLEAR LOCATION THAT HOLDS MMR0
 7037  053236  012702  117700                  MOV     #117700,R2      ;PUT VIRTUAL ADDRESS INTO R2
 7038  053242  010203                  2$:     MOV     R2,R3           ;PUT VIRTUAL ADDRESS INTO R3 TOO
 7039  053244  072327  177772                  ASH     #-6,R3          ;RIGHT SHIFT 6 BITS SO IT WILL
 7040                                                                  ;MATCH THE PLF
 7041  053250  042703  177600                  BIC     #177600,R3      ;CLEAR BITS THAT ARE SET IN UPPER BYTE
 7042  053254  111001                          MOVB    (R0),R1         ;SAVE PLF IN R1 FOR LATER COMPARISON
 7043  053256  012737  040011  001226  3$:     MOV     #040011,MMEXP   ;POTENTIAL ABORT CONDITION: PAGE LENGTH
 7044                                                                  ;ERROR KERNEL, I-SPACE, PAGE 4
```

```
7045  053264  000240                        NOP                     ;THIS IS A SYNC POINT FOR SCOPING
7046  053266  011204                        MOV     (R2),R4         ;READ USING V.A. IN R2
7047  053270  005037  001226                CLR     MMEXP           ;CLEAR EXPECTED ABORT CONDITION
7048  053274  005737  001250                TST     PMMR0           ;SEE IF ABORT OCCURRED YET
7049  053300  001405                        BEQ     4$              ;BRANCH IF NO ABORT YET, CHANGE V.A.
7050  053302  005203                        INC     R3              ;MAKE R3 EQUAL TO PLF
7051  053304  020103                        CMP     R1,R3           ;SEE IF PDR 4'S PLF=R3
7052  053306  001414                        BEQ     6$              ;BRANCH IF ABORT HAPPENS AT RIGHT PLACE
7053  053310  104051                        ERROR   51              ;ABORT WRONG PLACE
7054  053312  000412                        BR      6$              ;BRANCH TO CHANGE PLF
7055  053314  020103              4$:       CMP     R1,R3           ;SEE IF PAGE LENGTH FAULT SHOULD HAVE OCCURRED
7056  053316  101402                        BLOS    5$              ;BRANCH IF NO PAGE LENGTH FAULT CONDITION
7057  053320  104052                        ERROR   52              ;NO ABORT, IT SHOULD HAVE HAPPENED THIS TIME
7058  053322  000406                        BR      6$              ;BRANCH TO CHANGE PLF
7059  053324  120327  000000        5$:     CMPB    R3,#000         ;SEE IF V.A. IS 000
7060  053330  001403                        BEQ     6$              ;BRANCH TO CHECK PLF
7061  053332  162702  000100                SUB     #100,R2         ;CHANGE VIRTUAL ADDRESS
7062  053336  000741                        BR      2$              ;GO TRY THE NEXT VIRTUAL ADDRESS
7063  053340  122710  000000        6$:     CMPB    #000,(R0)       ;SEE IF PDR 4'S PLF IS 000
7064  053344  001402                        BEQ     7$              ;BRANCH TO EXIT IF PLF IS 000
7065  053346  105310                        DECB    (R0)            ;STEP PLF OF PDR 4 UP BY 1
7066  053350  000730                        BR      1$              ;BRANCH TO START WITH V.A. OF 0
7067  053352  012737  053204  001112  7$:   MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
7068
7069
7070                                  ;;*****************************************************************
7071                                  ;*TEST 53       ACCESS CONTROL FIELD = 0, 3, OR 7 (ABORT ALL ACCESSES)
7072                                  ;*
7073                                  ;*      THESE A.C.F.'S ARE ALL NON-RESIDENT, ANY REFERENCE (READ
7074                                  ;*      OR WRITE) TO A NON-RESIDENT PAGE SHOULD SET BIT 15 IN MMR0.
7075                                  ;*      BITS <06:01> IN MMR0 WILL LOCK UP ALL AVAILABLE INFORMATION
7076                                  ;*      ON THAT PAGE.  IN THIS CASE THE PAGE THAT CAUSES THE ABORT
7077                                  ;*      IS KERNEL I-SPACE PAGE 5.  THE EXPECTED ERROR CODE IS 100013.
7078                                  ;*
7079                                  ;;*****************************************************************
7080  053360                          TST53:
7081  053360  000004                        SCOPE
7082  053362  012737  053644  001316        MOV     #TST54,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
7083                                                                 ;TEST FOR ESCAPE ON PARITY ERRORS
7084  053370  012737  077406  172310  20$:   MOV     #77406,@#KIPDR4 ;LOAD ACF 6 INTO PDR 4
7085  053376  012737  077400  172312        MOV     #77400,@#KIPDR5 ;LOAD ACF 0 INTO PDR5
7086
7087  053404  012737  001000  172350        MOV     #1000,@#KIPAR4  ;LOAD 16K INTO PAR4
7088  053412  012737  001000  172352        MOV     #1000,@#KIPAR5  ;LOAD 16K INTO PAR5
7089  053420  012700  100000                MOV     #100000,R0      ;LOAD VIRTUAL ADDRESS FOR PAR4 INTO R0
7090  053424  012701  120000                MOV     #120000,R1      ;LOAD VIRTUAL ADDRESS FOR PAR5 INTO R1
7091  053430  012702  161457                MOV     #161457,R2      ;LOAD DATA PATTERN INTO R2
7092  053434  012737  053444  001112  11$:   MOV     #1$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
7093  053442  005010                        CLR     (R0)            ;CLEAR MEMORY LOCATION 100000
7094  053444  012737  100013  001226  1$:    MOV     #100013,MMEXP   ;LOAD EXPECTED ABORT CONDITION: NON-RESIDENT,
7095                                                                 ;KERNEL, I-SPACE, PAGE 5, FULL RELOCATION
7096  053452  000240                        NOP                     ;THIS IS A SYNC POINT FOR SCOPING
7097  053454  010211                8$:     MOV     R2,(R1)         ;WRITE TO NON-RESIDENT OR UNUSED ACF
7098                                                                 ;SHOULD CAUSE ABORT
7099  053456  005037  001226                CLR     MMEXP           ;CLEAR EXPECTED ABORT CONDITION
7100
```

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7101  053462  005710                          TST     (R0)            ;SEE IF (100000) IS STILL ZERO
7102  053464  001401                          BEQ     2$              ;BRANCH IF (100000) IS ZERO
7103  053466  104053                          ERROR   53              ;ABORT DID NOT HAPPEN
7104  053470  012737  053502  001112  2$:     MOV     #4$,$LPERR      ;SET LOOP ON ERROR POINTER TO 4$
7105  053476  010210                          MOV     R2,(R0)         ;LOAD DATA PATTERN INTO 100000
7106  053500  005004                          CLR     R4              ;CLEAR REGISTER TO RECEIVE DATA
7107  053502  012737  100013  001226  4$:     MOV     #100013,MMEXP   ;LOAD EXPECTED ABORT CONDITION: NON-RESIDENT,
7108                                                                  ;KERNEL, I-SPACE, PAGE 5, FULL RELOCATION
7109  053510  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
7110  053512  011104                  9$:     MOV     (R1),R4         ;TRY TO READ (100000) INTO R4
7111                                                                  ;THIS SHOULD ABORT
7112  053514  005037  001226                  CLR     MMEXP           ;EXPECTED ABORT CONDITION
7113
7114  053520  005704                          TST     R4              ;MAKE SURE R4 IS STILL 0
7115  053522  001401                          BEQ     5$              ;BRANCH IF R4 IS 0
7116  053524  104053                          ERROR   53              ;ABORT DID NOT HAPPEN
7117  053526  023727  172312  077407  5$:     CMP     KIPDR5,#77407   ;SEE IF PDR 5'S ACF=7
7118  053534  001414                          BEQ     12$             ;TEST OVER IF ACF=7
7119  053536  023727  172312  077403          CMP     KIPDR5,#77403   ;SEE IF PDR 5'S ACF=3
7120  053544  001004                          BNE     10$             ;BRANCH TO MAKE ACF=3 IF NOT 3
7121  053546  012737  077407  172312          MOV     #77407,KIPDR5   ;MAKE ACF=7 IF ALREADY 3
7122  053554  000727                          BR      11$             ;REPEAT TEST WITH ACF=7
7123  053556  012737  077403  172312  10$:     MOV     #77403,KIPDR5   ;MAKE PDR 5'S ACF=3
7124  053564  000723                          BR      11$             ;REPEAT TEST WITH ACF=3
7125                                  ;;
7126                                  ;;      THIS SECTION OF CODE VERIFIES THAT YOU WON'T MODIFY A MEMORY
7127                                  ;;      MANAGEMENT REGISTER ON A M.M. ABORT REFERENCE.
7128                                  ;;
7129  053566  012737  053614  001112  12$:     MOV     #13$,$LPERR     ;SET LOOP ON ERROR POINTER TO 13$
7130  053574  012737  177600  172352          MOV     #177600,KIPAR5  ;MAP PAGE 5 TO I/O PAGE
7131  053602  012701  132350                  MOV     #132350,R1      ;LOAD VIRTUAL ADDRESS TO REFERENCE
7132                                                                  ;KIPAR4
7133  053606  012737  100013  001226          MOV     #100013,MMEXP   ;EXPECTING NON-RESIDENT ABORT
7134                                                                  ;KERNEL I PAGE 5
7135  053614  000240                  13$:     NOP                     ;THIS IS A SYNC POINT FOR SCOPING
7136  053616  005011                          CLR     (R1)            ;THIS INSTRUCTION SHOULD ABORT
7137                                                                  ;DURING THE ABORT 'SSRC INH T3' IS
7138                                                                  ;ASSERTED TO STOP THE CLOCKING OF THE
7139                                                                  ;FLIP/FLOPS ON SCCX
7140  053620  022737  001000  172350          CMP     #1000,KIPAR4    ;KIPAR4 SHOULD STILL BE 1000
7141  053626  001401                          BEQ     14$             ;BRANCH IF KIPAR4 IS STILL 1000
7142  053630  104127                          ERROR   127             ;ABORT DID NOT STOP CLRING OF KIPAR4
7143  053632  012737  053370  001112  14$:     MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
7144  053640  005037  001226                  CLR     MMEXP           ;NOT EXPECTING ANY TRAPS
7145
7146
7147                                  ;;*************************************************************
7148                                  ;*TEST 54        ACCESS CONTROL FIELD = 2  (ABORT ON WRITE)
7149                                  ;*
7150                                  ;*      THIS IS A READ ONLY A.C.F., ANY WRITE ATTEMPT TO THIS PAGE
7151                                  ;*      WILL ABORT AND SET BIT 13 OF MMR0.
7152                                  ;*      BITS <06:01> IN MMR0 WILL LOCK UP ALL AVAILABLE INFORMATION
7153                                  ;*      ON THAT PAGE.  IN THIS CASE THE WRITE ATTEMPT WILL BE TO
7154                                  ;*      KERNEL I-SPACE PAGE 4.  THE EXPECTED ERROR CODE IS 020011.
7155                                  ;*
7156                                  ;;*************************************************************
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7157  053644                          TST54:
7158  053644  000004                          SCOPE
7159  053646  012737  053774  001316          MOV     #TST55,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
7160                                                                  ;TEST FOR ESCAPE ON PARITY ERRORS
7161  053654                          20$:
7162  053654  012737  001000  172352          MOV     #1000,KIPAR5    ;MAP PAGE 5 TO 16K
7163  053662  012737  001000  172350          MOV     #1000,KIPAR4    ;MAP PAGE 4 TO 16K
7164  053670  012737  077406  172312          MOV     #77406,KIPDR5   ;PAGE 5 IS 200 BLOCKS LONG,
7165                                                                  ;EXPANDS UPWARD, AND IS READ/WRITE
7166                                                                  ;WITH NO TRAPPING
7167  053676  012737  077402  172310          MOV     #77402,KIPDR4   ;LOAD ACF 2 INTO PDR 4
7168  053704  005037  001226                  CLR     MMEXP           ;NOT EXPECTING ANY TRAPS OR ABORTS YET
7169  053710  012737  002222  120000          MOV     #2222,@#120000  ;LOAD DATA INTO 16K
7170  053716  013700  100000                  MOV     @#100000,R0     ;READ DATA THRU PAGE 4
7171  053722  012737  053734  001112  1$:     MOV     #11$,$LPERR     ;SET LOOP ON ERROR POINTER TO 11$
7172  053730  005037  120000                  CLR     @#120000        ;CLEAR TEST LOCATION THRU PAGE 5
7173  053734  012737  020011  001226  11$:    MOV     #20011,MMEXP    ;EXPECTING READ ONLY FAULT, PAGE 4
7174  053742  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
7175  053744  012737  017777  100000          MOV     #17777,@#100000 ;TRY TO WRITE THRU PAGE 4
7176  053752  005037  001226                  CLR     MMEXP           ;NO MORE TRAPS EXPECTED
7177  053756  005737  120000                  TST     @#120000        ;SEE IF TEST LOCATION IS STILL ZERO
7178  053762  001401                          BEQ     2$              ;BRANCH IF WORD IS STILL ZERO
7179  053764  104054                          ERROR   54              ;NO ABORT ON PAGE 4
7180  053766  012737  053654  001112  2$:     MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
7181
7182
7183                                  ;;*****************************************************************
7184                                  ;*TEST 55       ACCESS CONTROL FIELD = 1  (ABORT ON WRITE, TRAP ON READ)
7185                                  ;*
7186                                  ;*      THIS IS ANOTHER READ ONLY A.C.F., ALL WRITES TO THIS PAGE WILL
7187                                  ;*      ABORT AND SET BIT 13 OF MMR0.
7188                                  ;*      BITS <06:01> IN MMR0 WILL LOCK UP ALL AVAILABLE INFORMATION
7189                                  ;*      ON THAT PAGE.  IN THIS CASE THE PAGE THAT CAUSES THE ABORT
7190                                  ;*      IS KERNEL I-SPACE PAGE 4.  THE EXPECTED ERROR CODE IS 020011.
7191                                  ;*
7192                                  ;*      IF BIT 09 OF MMR0 (ENABLE MEMORY MANAGEMENT TRAPS) IS SET
7193                                  ;*      THEN ALL READS TO THIS PAGE WILL TRAP, AFTER THE INSTRUCTION
7194                                  ;*      IS COMPLETED, SETTING BIT 12 OF MMR0.
7195                                  ;*
7196                                  ;*      AFTER THE ABORT ON WRITE IS TESTED, A READ FROM THIS PAGE
7197                                  ;*      WITH BIT 9 CLEAR WILL BE DONE TO ENSURE THAT TRAPPING DOESN'T
7198                                  ;*      TAKE PLACE WHEN NOT ENABLED.  THEN BIT 09 IS SET AND ANOTHER
7199                                  ;*      READ IS DONE (THIS TIME IT SHOULD TRAP TO PAGE 1 KERNEL MODE).
7200                                  ;*
7201                                  ;;*****************************************************************
7202  053774                          TST55:
7203  053774  000004                          SCOPE
7204  053776  012737  054240  001316          MOV     #TST56,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
7205                                                                  ;TEST FOR ESCAPE ON PARITY ERRORS
7206  054004                          20$:
7207  054004  012737  001000  172352          MOV     #1000,KIPAR5    ;MAP PAGE 5 TO 16K
7208  054012  012737  001000  172350          MOV     #1000,KIPAR4    ;MAP PAGE 4 TO 16K
7209  054020  012737  077406  172312          MOV     #77406,KIPDR5   ;PAGE 5 IS 200 BLOCKS LONG,
7210                                                                  ;EXPANDS UPWARD, AND IS READ/WRITE
7211                                                                  ;WITH NO TRAPPING
7212  054026  012737  077401  172310          MOV     #77401,KIPDR4   ;SET ACF = 1 FOR PAGE 4
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 7213  054034  012737  054046  001112          MOV     #10$,$LPERR     ;SET LOOP ON ERROR POINTER TO 10$
 7214  054042  005037  001250                  CLR     PMMR0           ;CLEAR M.M. ABORT FLAG
 7215  054046  012737  020011  001226  10$:     MOV     #20011,MMEXP    ;READ ONLY ABORT, PAGE 4
 7216  054054  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
 7217  054056  012737  017777  100000          MOV     #17777,@#100000 ;TRY TO WRITE THRU PAGE 4
 7218  054064  005037  001226                  CLR     MMEXP           ;NO MORE TRAPS EXPECTED
 7219  054070  005737  001250                  TST     PMMR0           ;SEE IF M.M. ABORT HAPPENED
 7220  054074  001001                          BNE     1$              ;BRANCH IF ABORT HAPPENED
 7221  054076  104054                          ERROR   54              ;NO ABORT ON PAGE 4 A.C.F.=1
 7222  054100  012737  054116  001112  1$:     MOV     #11$,$LPERR     ;SET LOOP ON ERROR POINTER TO 11$
 7223  054106  012700  012547                  MOV     #12547,R0       ;PUT DATA PATTERN INTO R0
 7224  054112  010037  120000                  MOV     R0,@#120000     ;LOAD DATA PATTERN THRU PAGE 5
 7225  054116  000240          11$:            NOP                     ;THIS IS A SYNC POINT FOR SCOPING
 7226  054120  013701  100000                  MOV     @#100000,R1     ;READ TEST LOCATION THRU PAGE 4
 7227  054124  020100                          CMP     R1,R0           ;SEE IF DATA READ TOOK PLACE
 7228  054126  001401                          BEQ     2$              ;BRANCH IF READ CORRECT
 7229  054130  104055                          ERROR   55              ;INCORRECT READ, BIT09 (MMR0) IS CLEAR
 7230  054132  013737  177572  001250  2$:     MOV     MMR0,PMMR0      ;SAVE MMR0 IN CASE OF ERROR
 7231  054140  032737  010000  001250          BIT     #BIT12,PMMR0    ;BIT 12 SHOULD SET EVEN IF YOU DON'T
 7232                                                                  ;TAKE THE TRAP DUE TO BIT09 BEING CLR
 7233  054146  001001                          BNE     3$              ;BRANCH IF BIT12 IS SET
 7234  054150  104066                          ERROR   66              ;BIT 12 WAS NOT SET
 7235  054152  012737  054162  001112  3$:     MOV     #12$,$LPERR     ;SET LOOP ON ERROR POINTER TO 12$
 7236  054160  005001                          CLR     R1              ;CLEAR REG 1, RECEIVES DATA ON FETCH
 7237  054162  005037  001250          12$:    CLR     PMMR0           ;CLEAR M.M. TRAP FLAG
 7238  054166  012737  001001  177572          MOV     #1001,MMR0      ;ENABLE TRAPS, FULL RELOCATION, CLR BIT 12
 7239  054174  012737  011003  001226          MOV     #11003,MMEXP    ;EXPECTED TRAP CONDITION
 7240                                                                  ;TRAP, TRAPS ENABLED, RELOCATION
 7241  054202  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
 7242  054204  013701  100000                  MOV     @#100000,R1     ;READ THRU PAGE 4
 7243  054210  005037  001226                  CLR     MMEXP           ;NO MORE TRAPS EXPECTED
 7244  054214  005737  001250                  TST     PMMR0           ;SEE IF TRAP OCCURED
 7245  054220  001001                          BNE     4$              ;BRANCH IF TRAP OCCURRED
 7246  054222  104056                          ERROR   56              ;NO TRAP
 7247  054224  020001                  4$:     CMP     R0,R1           ;SEE IF DATA READ WAS CORRECT
 7248  054226  001401                          BEQ     5$              ;BRANCH IF READ CORRECT
 7249  054230  104057                          ERROR   57              ;INCORRECT READ, BIT09 (MMR0) WAS SET
 7250  054232  012737  054004  001112  5$:     MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
 7251
 7252
 7253                                  ;;*****************************************************************
 7254                                  ;*TEST 56       ACCESS CONTROL FIELD = 4  (TRAP ON READ OR WRITE)
 7255                                  ;*
 7256                                  ;*      THIS A.C.F. IS READ/WRITE BUT ALL REFERENCES TO THIS PAGE
 7257                                  ;*      WILL TRAP TO VECTOR 250 SETTING BIT 12 OF MMR0 IF BIT 9
 7258                                  ;*      (ENABLE MEMORY MANAGEMENT TRAPS) IS SET.
 7259                                  ;*
 7260                                  ;*      SINCE I HAVE ALREADY TESTED THE FACT THAT BIT 9 OF MMR0 DOES
 7261                                  ;*      INDEED ENABLE M.M. TRAPS I WILL JUST SET BIT 9 AND VERIFY THAT
 7262                                  ;*      BOTH A READ AND A WRITE TO PAGE 4 A.C.F. = 4 TRAP CORRECTLY
 7263                                  ;*
 7264                                  ;;*****************************************************************
 7265  054240                          TST56:
 7266  054240  000004                          SCOPE
 7267  054242  012737  054460  001316          MOV     #TST57,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
 7268                                                                  ;TEST FOR ESCAPE ON PARITY ERRORS
```

```
7269  054250                                  20$:
7270  054250  012737  001000  172352            MOV     #1000,KIPAR5    ;MAP PAGE 5 TO 16K
7271  054256  012737  001000  172350            MOV     #1000,KIPAR4    ;MAP PAGE 4 TO 16K
7272  054264  012737  077406  172312            MOV     #77406,KIPDR5   ;PAGE 5 IS 200 BLOCKS LONG,
7273                                                                    ;EXPANDS UPWARD, AND IS READ/WRITE
7274                                                                    ;WITH NO TRAPPING
7275  054272  012737  077404  172310            MOV     #77404,KIPDR4   ;SET ACF = 4 IN PDR 4
7276  054300  012700  013451                    MOV     #13451,R0       ;LOAD DATA PATTERN INTO R0
7277  054304  010037  120000                    MOV     R0,@#120000     ;LOAD DATA INTO TEST LOCATION
7278  054310  005001                            CLR     R1              ;WHAT DO YOU THINK
7279  054312  012737  054320  001112            MOV     #10$,$LPERR     ;SET LOOP ON ERROR POINTER TO 10$
7280  054320  005037  001250            10$:    CLR     PMMR0           ;CLEAR FLAG LOCATION
7281  054324  012737  011003  001226            MOV     #11003,MMEXP    ;EXPECTING TRAP WITH TRAPS ENABLED
7282                                                                    ;KERNEL I PAGE 1, FULL RELOCATION
7283  054332  012737  001001  177572            MOV     #1001,MMR0      ;ENABLE M. M. TRAPS
7284  054340  000240                            NOP                     ;THIS IS A SYNC POINT FOR SCOPING
7285  054342  013701  100000                    MOV     @#100000,R1     ;TRY TO READ THRU PAGE 4
7286  054346  005037  001226                    CLR     MMEXP           ;NO MORE TRAPS EXPECTED
7287  054352  005737  001250                    TST     PMMR0           ;SEE IF TRAP OCCURRED
7288  054356  001001                            BNE     1$              ;BRANCH IF TRAP
7289  054360  104056                            ERROR   56              ;NO TRAP
7290  054362  020001                    1$:     CMP     R0,R1           ;SEE IF READ WAS CORRECT
7291  054364  001401                            BEQ     2$              ;BRANCH IF CORRECT
7292  054366  104057                            ERROR   57              ;INCORRECT READ, BIT09 (MMR0) WAS SET
7293  054370  012737  054376  001112    2$:     MOV     #12$,$LPERR     ;SET LOOP ON ERROR POINTER TO 12$
7294  054376  005037  001250            12$:    CLR     PMMR0           ;CLEAR FLAG LOCATION
7295  054402  012737  001001  177572            MOV     #1001,MMR0      ;ENABLE TRAPPING
7296  054410  012737  011003  001226            MOV     #11003,MMEXP    ;EXPECTING TRAP WITH TRAPS ENABLED
7297                                                                    ;KERNEL I PAGE 1, FULL RELOCATON
7298  054416  000240                            NOP                     ;THIS IS A SYNC POINT FOR SCOPING
7299  054420  012737  000000  100000            MOV     #0,@#100000     ;TRY TO WRITE INTO PAGE 4
7300  054426  005037  001226                    CLR     MMEXP           ;NOT EXPECTING ANY TRAPS
7301  054432  005737  001250                    TST     PMMR0           ;SEE IF TRAP OCCURRED
7302  054436  001001                            BNE     3$              ;BRANCH IF TRAP
7303  054440  104056                            ERROR   56              ;NO TRAP
7304  054442  005737  120000            3$:     TST     @#120000        ;SEE IF WRITE OCCURED
7305  054446  001401                            BEQ     4$              ;BRANCH IF WRITE HAPPENED
7306  054450  104060                            ERROR   60              ;NO WRITE, BIT09 (MMR0) WAS SET
7307  054452  012737  054250  001112    4$:     MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
7308
7309
7310                                    ;;**********************************************************************
7311                                    ;*TEST 57       ACCESS CONTROL FIELD = 5  (TRAP ON WRITE)
7312                                    ;*
7313                                    ;*      THIS TEST IS RUN WITH THE ENABLE M.M. TRAPS BIT (BIT09) SET.
7314                                    ;*      THE A.C.F. FOR PAGE 4 IS SET TO 5 (TRAP ON WRITE).
7315                                    ;*      A READ FROM PAGE 4 IS TRIED EXPECTING NO TRAP AND THEN A WRITE
7316                                    ;*      TO PAGE 4 IS TRIED EXPECTING A M.M. TRAP.  THE TRAP IS VERIFIED
7317                                    ;*      BY THE USE OF A TRAP FLAG WHICH IS SET IN THE TRAP ROUTINE.
7318                                    ;*
7319                                    ;;**********************************************************************
7320  054460                            TST57:
7321  054460  000004                            SCOPE
7322  054462  012737  054656  001316            MOV     #TST60,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
7323                                                                    ;TEST FOR ESCAPE ON PARITY ERRORS
7324  054470                            20$:
```

```
7325  054470  012737  001000  172352          MOV     #1000,KIPAR5    ;MAP PAGE 5 TO 16K
7326  054476  012737  001000  172350          MOV     #1000,KIPAR4    ;MAP PAGE 4 TO 16K
7327  054504  012737  077406  172312          MOV     #77406,KIPDR5   ;PAGE 5 IS 200 BLOCKS LONG,
7328                                                                  ;EXPANDS UPWARD, AND IS READ/WRITE
7329                                                                  ;WITH NO TRAPPING
7330  054512  012737  077405  172310          MOV     #77405,KIPDR4   ;SET ACF = 5 IN PDR 4
7331  054520  012700  012345                  MOV     #12345,R0       ;SET DATA PATTERN INTO R0
7332  054524  010037  120000                  MOV     R0,@#120000     ;LOAD TEST LOCATION WITH DATA
7333  054530  005037  001226                  CLR     MMEXP           ;NO TRAP EXPECTED
7334  054534  005001                          CLR     R1              ;CLEAR REGISTER 1
7335  054536  012737  054544  001112          MOV     #10$,$LPERR     ;SET LOOP ON ERROR POINTER TO 10$
7336  054544  012737  001001  177572  10$:     MOV     #1001,MMR0      ;ENABLE M M TRAPS
7337  054552  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
7338  054554  013701  100000                  MOV     @#100000,R1     ;READ TEST LOCATION THRU PAGE 4
7339  054560  020001                          CMP     R0,R1           ;SEE IF READ WAS CORRECT
7340  054562  001401                          BEQ     1$              ;BRANCH IF READ CORRECT
7341  054564  104057                          ERROR   57              ;INCORRECT READ, BIT09 (MMR0) WAS SET
7342  054566  012737  054574  001112  1$:     MOV     #11$,$LPERR     ;SET LOOP ON ERROR POINTER TO 11$
7343  054574  005037  001250          11$:    CLR     PMMR0           ;CLEAR FLAG LOCATION
7344  054600  012737  001001  177572          MOV     #1001,MMR0      ;ENABLE TRAPS
7345  054606  012737  011003  001226          MOV     #11003,MMEXP    ;EXPECTING M.M. TRAP
7346
7347  054614  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
7348  054616  012737  000000  100000          MOV     #0,@#100000     ;TRY TO WRITE INTO PAGE 4
7349  054624  005037  001226                  CLR     MMEXP           ;NO MORE TRAPS EXPECTED
7350  054630  005737  001250                  TST     PMMR0           ;SEE IF TRAP OCCURRED
7351  054634  001001                          BNE     2$              ;BRANCH IF TRAP
7352  054636  104056                          ERROR   56              ;NO TRAP
7353  054640  005737  120000          2$:     TST     @#120000        ;SEE IF WRITE OCCURRED
7354  054644  001401                          BEQ     3$              ;BRANCH IF WRITE HAPPENED
7355  054646  104060                          ERROR   60              ;NO WRITE, BIT09 (MMR0) WAS SET
7356  054650  012737  054470  001112  3$:     MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
7357
7358
7359                                          ;;*****************************************************************
7360                                          ;*TEST 60       NO TRAP WHEN TRAP BIT IS SET
7361                                          ;*
7362                                          ;*      THIS TEST VERIFIES THE LOGIC (ON 'SSRD') THAT PREVENTS A M.M.
7363                                          ;*      TRAP AS LONG AS BIT12 OF MMR0 (M.M. TRAP BIT) IS SET.  THE
7364                                          ;*      TEST SETS BITS 12, 09, & 00 OF MMR0 AND TRIES A REFERENCE TO
7365                                          ;*      PAGE 4 WHOSE A.C.F.= 4 (TRAP ON ALL REFERENCES).  NO TRAP IS
7366                                          ;*      EXPECTED, SO IF THE LOGIC FAILS AN UNEXPECTED M.M. TRAP WILL
7367                                          ;*      OCCUR.
7368                                          ;;*****************************************************************
7369  054656                                  TST60:
7370  054656  000004                          SCOPE
7371  054660  012737  055000  001316          MOV     #TST61,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
7372                                                                  ;TEST FOR ESCAPE ON PARITY ERRORS
7373  054666                                  20$:
7374  054666  012737  001000  172352          MOV     #1000,KIPAR5    ;MAP PAGE 5 TO 16K
7375  054674  012737  001000  172350          MOV     #1000,KIPAR4    ;MAP PAGE 4 TO 16K
7376  054702  012737  077406  172312          MOV     #77406,KIPDR5   ;PAGE 5 IS 200 BLOCKS LONG,
7377                                                                  ;EXPANDS UPWARD, AND IS READ/WRITE
7378                                                                  ;WITH NO TRAPPING
7379  054710  012737  077404  172310          MOV     #77404,KIPDR4   ;SET ACF = 4 IN PDR 4
7380  054716  005037  001226                  CLR     MMEXP           ;NO TRAPS EXPECTED
```

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 7381  054722  012737  017777  120000          MOV     #17777,@#120000 ;LOAD DATA INTO TEST LOCATION
 7382  054730  012737  054736  001112          MOV     #10$,$LPERR     ;SET LOOP ON ERROR POINTER TO 10$
 7383  054736  012737  011001  177572  10$:    MOV     #11001,MMR0     ;ENABLE TRAPS AND SET TRAP BIT (12)
 7384  054744  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
 7385  054746  012737  000000  100000          MOV     #0,@#100000     ;TRY TO WRITE THRU PAGE 4
 7386  054754  012737  000001  177572          MOV     #1,MMR0         ;CLEAR BITS 9 & 12 OF MMR0
 7387  054762  005737  120000                  TST     @#120000        ;SEE IF WORD WAS CHANGED
 7388  054766  001401                          BEQ     1$              ;BRANCH IF LOCATION IS CLEAR
 7389  054770  104060                          ERROR   60              ;NO WRITE, BIT09 (MMR0) WAS SET
 7390  054772  012737  054666  001112  1$:     MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
 7391
 7392
 7393                                  ;;*****************************************************************
 7394                                  ;*TEST 61       NO TRAPPING WHEN REFERENCING A MEMORY MANAGEMENT REG
 7395                                  ;*
 7396                                  ;*      THIS VERIFIES THE LOGIC THAT PREVENTS A M.M. TRAP WHEN
 7397                                  ;*      REFERENCING A M.M. REGISTER.  PAGE 7 IS MAPPED TO THE I/O
 7398                                  ;*      PAGE AND ITS A.C.F.= 4 (TRAP ON ALL REFERENCES).  EACH STATUS
 7399                                  ;*      REGISTER AND EACH PAR7 AND PDR7 IS READ THRU PAGE 7.  IF ANY
 7400                                  ;*      TRAPS OCCUR AN UNEXPECTED M.M. TRAP IS REPORTED.  THEN A MAP
 7401                                  ;*      REGISTER (170200) IS REFERENCED AND THE CORRECT TRAP IS VERIFIED
 7402                                  ;*      TO INSURE THAT A TRAP CAN OCCUR ON PAGE 7.
 7403                                  ;*      THE SIGNAL UNDER TEST IS 'SCCC INT REG B L'.
 7404                                  ;*
 7405                                  ;;*****************************************************************
 7406  055000                          TST61:
 7407  055000  000004                          SCOPE
 7408  055002  012737  055230  001316          MOV     #TST62,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
 7409                                                                  ;TEST FOR ESCAPE ON PARITY ERRORS
 7410  055010                          20$:
 7411  055010  012700  012754                  MOV     #12754,R0       ;LOAD DATA PATTERN INTO R0
 7412  055014  010037  170200                  MOV     R0,MAPL0        ;LOAD MAP REGISTER 0
 7413  055020  005037  001226                  CLR     MMEXP           ;NOT EXPECTING ANY TRAPS
 7414  055024  012737  077404  172316          MOV     #77404,KIPDR7   ;SET ACF = 4 IN PAGE 7
 7415  055032  012737  001001  177572          MOV     #1001,MMR0      ;ENABLE MEMORY MANAGEMENT TRAPS
 7416  055040  013701  172356                  MOV     KIPAR7,R1       ;READ KERNEL PAR 7
 7417  055044  013701  172256                  MOV     SIPAR7,R1       ;READ SUPERVISOR PAR 7
 7418  055050  013701  177656                  MOV     UIPAR7,R1       ;READ USER PAR 7
 7419  055054  013701  172316                  MOV     KIPDR7,R1       ;READ KERNEL PDR 7
 7420  055060  013701  172216                  MOV     SIPDR7,R1       ;READ SUPERVISOR PDR 7
 7421  055064  013701  177616                  MOV     UIPDR7,R1       ;READ USER PDR 7
 7422  055070  013701  177572                  MOV     MMR0,R1         ;READ MMR0
 7423  055074  013701  177574                  MOV     MMR1,R1         ;READ MMR1
 7424  055100  013701  177576                  MOV     MMR2,R1         ;READ MMR2
 7425  055104  013701  172516                  MOV     MMR3,R1         ;READ MMR3
 7426  055110  012737  001001  177572          MOV     #1001,MMR0      ;MAKE SURE TRAPS ARE ENABLED
 7427  055116  005037  001250                  CLR     PMMR0           ;CLEAR M.M. TRAP FLAG
 7428  055122  012737  011003  001226          MOV     #11003,MMEXP    ;EXPECTING M.M. TRAP ON NEXT REFERENCE
 7429  055130  013701  170200                  MOV     MAPL0,R1        ;TRY TO READ MAP REGISTER 0
 7430  055134  005037  001226                  CLR     MMEXP           ;NOT EXPECTING ANY M.M. TRAPS
 7431  055140  005737  001250                  TST     PMMR0           ;SEE IF TRAP OCCURRED
 7432  055144  001001                          BNE     1$              ;BRANCH IF TRAP OCCURED
 7433  055146  104061                          ERROR   61              ;NO TRAP
 7434  055150  020001                  1$:     CMP     R0,R1           ;SEE IF DATA WAS READ CORRECTLY
 7435  055152  001401                          BEQ     2$              ;BRANCH IF DATA IS RIGHT
 7436  055154  104062                          ERROR   62              ;INCORRECT READ ON I/O PAGE
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 7437  055156  012737  001000  177572  2$:     MOV     #BIT9,MMR0      ;ENABLE TRAPS, NO RELOCATION
 7438  055164  005037  001250                  CLR     PMMR0           ;CLEAR M.M. TRAPS FLAG
 7439  055170  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
 7440  055172  013701  170200                  MOV     MAPL0,R1        ;READ MAP REGISTER 0
 7441                                                                  ;THIS READ SHOULD NOT TRAP SINCE
 7442                                                                  ;THERE IS NO RELOCATION ENABLED.
 7443  055176  005737  001250                  TST     PMMR0           ;SEE IF TRAP OCCURRED
 7444  055202  001401                          BEQ     3$              ;BRANCH IF NO TRAP
 7445  055204  104063                          ERROR   63              ;TRAPPED WHEN NO RELOCATION ENABLED
 7446  055206  012737  000001  177572  3$:     MOV     #BIT0,MMR0      ;ENABLE FULL RELOCATION
 7447  055214  012737  077406  172316          MOV     #77406,KIPDR7   ;SET PDR 7 TO NO TRAPPING ACF
 7448  055222  012737  055010  001112          MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
 7449
 7450
 7451                                  ;;*****************************************************************
 7452                                  ;*TEST 62       ONLY ONE VECTOR TAKEN IF TRAP AND ABORT
 7453                                  ;*
 7454                                  ;*      IF THERE IS A M.M. TRAP CONDITION AND A M.M. ABORT ON THE
 7455                                  ;*      SAME INSTRUCTION ONLY ONE VECTOR TO 000250 SHOULD BE TAKEN.
 7456                                  ;*      'SSRC KT ABORT FLG L' AND 'SSRC ABT FLG (0) H' WILL KNOCK
 7457                                  ;*      DOWN 'SSRD MEM MGMT TRAP L' SO THAT ONLY THE ABORT VECTOR WILL
 7458                                  ;*      BE TAKEN.
 7459                                  ;*      THIS TEST SETS THE VECTOR TO THE CODE AT 10$ AND, IF TWO VECTORS
 7460                                  ;*      ARE TAKEN ERROR 64 IS CALLED.  MMR0 SHOULD REPORT BOTH THE TRAP
 7461                                  ;*      AND THE ABORT CONDITIONS WHICH ARE: PAGE LENGTH, KERNEL I-SPACE
 7462                                  ;*      PAGE 5, AND BIT12 OF MMR0.  (051013)
 7463                                  ;*
 7464                                  ;;*****************************************************************
 7465  055230                          TST62:
 7466  055230  000004                          SCOPE
 7467  055232  012737  055426  001316          MOV     #TST63,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
 7468                                                                  ;TEST FOR ESCAPE ON PARITY ERRORS
 7469  055240  012737  055304  001112  20$:     MOV     #1$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
 7470  055246  012737  055326  000250          MOV     #10$,MMVEC      ;SET M.M. VECTOR TO 10$
 7471  055254  012737  001000  172350          MOV     #1000,KIPAR4    ;MAP PAGE 4 TO 16K - 20K
 7472  055262  012737  001000  172352          MOV     #1000,KIPAR5    ;MAP PAGE 5 TO 16K- 20K
 7473  055270  012737  000006  172312          MOV     #000006,KIPDR5  ;SET PAGE LENGTH TO ONE FOR PAGE 5
 7474  055276  012737  077404  172310          MOV     #77404,KIPDR4   ;SET TRAP ON READ OR WRITE FOR PAGE 4
 7475  055304  012706  001100          1$:     MOV     #KERSTK,KSP     ;MAKE SURE KERN STK PTR IS SETUP IN
 7476                                                                  ;CASE YOU LOOP ON ERROR
 7477  055310  012737  001001  177572          MOV     #1001,MMR0       ;ENABLE M.M. TRAPS
 7478  055316  000240                          NOP                      ;THIS IS A SYNC POINT FOR SCOPING
 7479  055320  013737  100000  120100          MOV     @#100000,@#120100  ;TRY TO READ THRU PAGE 4 AND
 7480                                                                    ;WRITE THRU PAGE 5 (PAGE 4 TRAP &
 7481                                                                   ;PAGE 5 ABORT PAGE LENGTH)
 7482  055326  020627  001074          10$:    CMP     KSP,#1074       ;HAS THE KERNEL STACK ONLY BEEN
 7483                                                                  ;PUSHED ONCE BY THE PREVIOUS INSTRUCTION
 7484  055332  001404                          BEQ     12$             ;BRANCH IF IT HAS BEEN PUSHED
 7485                                                                  ;ONLY ONE TIME
 7486  055334  010637  001172                  MOV     KSP,$TMP0       ;SAVE THE KERNEL STACK POINTER FOR TYPE OUT
 7487  055340  104064                          ERROR   64              ;TWO PUSHES WHEN ONLY ONE SHOULD HAPPEN
 7488  055342  000413                          BR      15$             ;BRANCH TO EXIT TEST
 7489  055344  013737  177572  001250  12$:     MOV     MMR0,PMMR0      ;SAVE MMR0 FOR CHECK
 7490  055352  012737  051013  001226          MOV     #51013,MMEXP    ;MMR0 SHOULD HAVE PAGE LENGTH,
 7491                                                                  ;TRAP, ENABLE TRAP, PAGE 5, RELOCATING
 7492  055360  023737  001250  001226          CMP     PMMR0,MMEXP     ;SEE IF ABORT CONDITION IS CORRECT
```

```
                                BEQ     15$             ;BRANCH TO EXIT IF CORRECT
                                ERROR   65              ;INCORRECT ABORT CONDITION
                        15$:    MOV     #16$,(KSP)      ;CHANGE RETURN ADDRESS TO 16$
                                RTT                     ;RETURN TO 16$ AND CONTINUE PROGRAM
                        16$:    MOV     #MMTRAP,MMVEC   ;RESTORE TRAP HANDLER
                                MOV     #BIT0,MMR0      ;CLEAR OUT MMR0, BUT LEAVE RELOC ON
                                CLR     MMEXP           ;NOT EXPECTING ANY M.M. TRAPS
                                MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST


                ;;*******************************************************************
                ;*TEST 63        PROPER TIMING OF MEMORY MANAGEMENT TRAPS
                ;*
                ;*      IF THE INSTRUCTION SETTING BIT09 OF MMR0 SATISFIES A M.M. TRAP
                ;*      CONDITION, NO TRAP SHOULD OCCUR SINCE BIT09 WILL NOT BE SET
                ;*      WHEN THE TRAP CONDITION IS SATISFIED.
                ;*      THE SECOND HALF OF THIS TEST VERIFIES THAT IF THE M.M. TRAP
                ;*      CONDITION IS MET DURING THE INSTRUCTION WHICH CLEARS BIT 09
                ;*      OF MMR0 THE TRAP WILL OCCUR ANYWAY.
                ;*
                ;;*******************************************************************
                TST63:
                                SCOPE
                                MOV     #TST64,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
                                                        ;TEST FOR ESCAPE ON PARITY ERRORS
                        20$:    MOV     #000,KIPAR4     ;MAP PAGE 4 TO 0 - 4K
                                MOV     #77404,KIPDR4   ;TRAP ALL REFERENCES
                                MOV     #1$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
                                MOV     #ENMMTR,R0      ;PUT ADDRESS OF ENABLE M.M. TRAPS
                                                        ;WORD INTO R0
                                BIS     #BIT15,R0       ;MAKE ADDRESS IN R0 USE PAGE 4
                                CLR     MMEXP           ;NOT EXPECTING ANY TRAPS ON THIS REF.
                        1$:     NOP                     ;THIS IS A SYNC POINT FOR SCOPING
                        11$:    BIS     (R0),MMR0       ;SET ENABLE TRAPS BIT IN MMR0 USING
                                                        ;PAGE THAT COULD CAUSE TRAP IF BIT09
                                                        ;WERE ON DURING SOURCE MODE
                                MOV     MMR0,PMMR0      ;READ MMR0 FOR CHECK ON BIT 12
                                BIT     #BIT12,PMMR0    ;SEE IF BIT12 IS SET BY INST. AT 11$
                                BNE     2$              ;BRANCH IF IT IS SET
                                ERROR   66              ;BIT 12 NOT SET IN MMR0
                        2$:     MOV     #3$,$LPERR      ;SET LOOP ON ERROR POINTER TO 3$
                                MOV     #10003,MMEXP    ;EXPECTING TRAP, BUT ENABLE TRAPS BIT
                                                        ;SHOULD BE CLEAR BEFORE END OF INST.
                                                        ;THAT CAUSES THE TRAP
                        3$:     MOV     #1001,MMR0      ;ENABLE M.M. TRAPS, FULL RELOCATION
                                CLR     PMMR0           ;CLEAR M.M. TRAP FLAG
                                NOP                     ;THIS IS A SYNC POINT FOR SCOPING
                                BIC     (R0),MMR0       ;CLEAR ENABLE M.M. TRAP BIT AT END
                                                        ;OF INSTRUCTION, TRAP FLIP/FLOP SHOULD
                                                        ;BE SET DURING SOURCE MODE FETCH
                                TST     PMMR0           ;SEE IF TRAP REALLY OCCURRED ON LAST INS
                                BNE     4$              ;BRANCH IF TRAP OCCURRED
                                ERROR   67              ;NO TRAP, WHEN CLEARING BIT09 (MMR0)
                        4$:     CLR     MMEXP           ;NO M.M. TRAPS EXPECTED
                                MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
```

```
                                ;;*****************************************************************
                                ;*TEST 64        ABORT ON ILLEGAL MODE
                                ;*
                                ;*      IF THE MODE SET IN BITS <15:14> OF THE PROCESSOR STATUS IS
                                ;*      <10> THE MODE IS ILLEGAL AND THE NEXT INSTRUCTION FETCH WILL
                                ;*      SELECT NO PAR/PDR PAIR TO CONTROL THE REFERENCE.  THE PDR
                                ;*      LINES WILL ALL BE READ AS ONES.  THE A.C.F. = 7 (NON-RESIDENT),
                                ;*      THE EXPANSION DIRECTION = DOWN, THE P.L.F. = 177 OR 1 BLOCK.
                                ;*      THE M.M. ABORT WILL BE NON-RESIDENT, PAGE LENGTH (IF THE
                                ;*      VIRTUAL ADDRESS HAS A BLOCK NUMBER OF 176 OR LESS), MODE <10>,
                                ;*      PAGE 2 (SINCE THE CODE IS ON PAGE 2).
                                ;*
                                ;;*****************************************************************
055600                          TST64:
055600  000004                          SCOPE
055602  012737  055712  001316          MOV     #TST65,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
                                                                ;TEST FOR ESCAPE ON PARITY ERRORS
055610  012737  055636  000250  20$:    MOV     #10$,MMVEC      ;SET M.M. VECTOR TO 10$
055616  012737  055624  001112          MOV     #1$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
055624  000240                  1$:     NOP                     ;THIS IS A SYNC POINT FOR SCOPING
055626  052737  100000  177776          BIS     #BIT15,PSW      ;SET ILLEGAL MODE IN PROCESSOR STATUS
055634  104071                          ERROR   71              ;INSTRUCTION FETCH DIDN'T ABORT
                                                                ;THIS INSTRUCTION FETCH SHOULD ABORT,
                                                                ;NON-RESIDENT & PAGE LENGTH FAULT,
                                                                ;ILLEGAL MODE, PAGE 1.


055636  013737  177572  001250  10$:    MOV     MMR0,PMMR0      ;READ MMR0 FOR COMPARE
055644  012716  055660                  MOV     #16$,(KSP)      ;CHANGE RETURN ADDRESS TO 16$
055650  042766  100000  000002          BIC     #BIT15,2(KSP)   ;CLEAR ILLEGAL MODE BIT IN PSW ON STACK
055656  000006                          RTT                     ;RETURN TO 16$ AND CONTINUE PROGRAM
055660  012701  140105          16$:    MOV     #140105,R1      ;LOAD EXPECTED ABORT CONDITION IN R1:
                                                                ;NON-RESIDENT, PAGE FAULT, MODE=<10>,
                                                                ;PAGE 2.
055664  020137  001250                  CMP     R1,PMMR0        ;DID YOU GET THE EXPECTED CONDITION
055670  001401                          BEQ     11$             ;BRANCH IF CONDITION IS CORRECT
055672  104072                          ERROR   72              ;WRONG ERROR CONDITION
055674  000237                  11$:    SPL     7               ;MAKE THE PRIORITY LEVEL 7
055676  042737  177776  177572          BIC     #177776,MMR0    ;CLEAR ALL ERROR CONDITIONS
055704  012737  055610  001112          MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST


                                ;;*****************************************************************
                                ;*TEST 65        MEMORY MANAGEMENT REGISTERS ONLY CLOCKED ONCE IF MMR0 NOT CLEARED
                                ;*
                                ;*      AS LONG AS 'SSRC NO ERROR (1) H' IS NOT ASSERTED (THAT IS AFTER
                                ;*      AN ABORT AND UNTIL MMR0 BITS <15:13> ARE CLEARED) MMR0, MMR1,
                                ;*      AND MMR2 SHOULD NOT BE CLOCKED.  THIS TEST CAUSES A NON-RESIDENT
                                ;*      ABORT, SAVES THE STATUS REGISTERS, CHANGES THE VECTOR TO 10$,
                                ;*      AND THEN CAUSES A PAGE LENGTH ABORT.  AT THE SECOND ABORT THE
                                ;*      STATUS REGISTERS ARE COMPARED WITH THEIR FIRST CONDITIONS. IF ANY
                                ;*      OF THEM CHANGE, THE OLD AND THE NEW CONDITIONS WILL BE REPORTED.
                                ;*
                                ;;*****************************************************************
```

```
7605  055712                                TST65:
7606  055712  000004                        SCOPE
7607  055714  012737  056154  001316        MOV     #TST66,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
7608                                                                ;TEST FOR ESCAPE ON PARITY ERRORS
7609  055722  012737  000000  172310  20$:  MOV     #000000,KIPDR4  ;MAP PAGE 4 NON-RESIDENT, AND PAGE
7610                                                                ;LENGTH OF 1 BLOCK
7611  055730  012737  055772  000250        MOV     #5$,MMVEC       ;SET M.M. TRAP VECTOR TO 5$
7612  055736  012737  000340  000252        MOV     #340,MMVEC+2    ;SET PRIORITY TO 7 GOTO KERNEL MODE
7613  055744  012737  055752  001112        MOV     #1$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
7614  055752  013700  100000          1$:   MOV     @#100000,R0     ;TRY TO READ THRU PAGE 4
7615                                                                ;THIS PAGE NON-RESIDENT SHOULD CAUSE
```

```
7616
7617  055756  012737  056022  000250  2$:     MOV     #10$,MMVEC      ;SET M.M. TRAP VECTOR TO 10$
7618  055764  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
7619  055766  013700  100100                  MOV     @#100100,R0     ;TRY TO READ FROM BLOCK 2 OF PAGE 4
7620                                                                  ;THIS SHOULD ABORT AGAIN BUT NONE
7621                                                                  ;OF THE MEMORY MANAGEMENT STATUS
7622                                                                  ;REGISTERS SHOULD BE CLOCKED THIS TIME.
7623
```

7624

```
 7625  055772  013737  177572  001250  5$:     MOV     MMR0,PMMR0      ;READ MEMORY MANAGEMENT REGISTER 0
 7626  056000  013737  177574  001252          MOV     MMR1,PMMR1      ;READ MEMORY MANAGEMENT REGISTER 1
 7627  056006  013737  177576  001254          MOV     MMR2,PMMR2      ;READ MEMORY MANAGEMENT REGISTER 2
 7628  056014  012716  055756                  MOV     #2$,(KSP)       ;CHANGE RETURN ADDRESS TO 2$
 7629  056020  000006                          RTT                     ;GO BACK TO 2$ AND CAUSE PAGE FAULT
 7630
 7631
 7632  056022  012716  056030          10$:    MOV     #16$,(KSP)      ;CHANGE RETURN ADDRESS TO 16$
 7633  056026  000006                          RTT                     ;RETURN TO 16$ AND CONTINUE PROGRAM
 7634  056030  005037  001200          16$:    CLR     $TMP3           ;ERROR COUNTER, 3 POSSIBLE CMP FAILURES
```

```
7635  056034  013737  177572  001172          MOV     MMR0,$TMP0      ;READ MEMORY MANAGEMENT REGISTER 0
7636  056042  013737  177574  001174          MOV     MMR1,$TMP1      ;READ MEMORY MANAGEMENT REGISTER 1
7637  056050  013737  177576  001176          MOV     MMR2,$TMP2      ;READ MEMORY MANAGEMENT REGISTER 2
7638  056056  023737  001176  001254          CMP     $TMP2,PMMR2     ;SEE IF MMR2 CHANGED
7639  056064  001402                          BEQ     11$             ;BRANCH IF MMR2 DIDN'T CHANGE
7640  056066  005237  001200                  INC     $TMP3           ;ONE COMPARE FAILURE
7641  056072  023737  001174  001252  11$:    CMP     $TMP1,PMMR1     ;SEE IN MMR1 CHANGED
7642  056100  001402                          BEQ     12$             ;BRANCH IF MMR1 DIDN'T CHANGE
7643  056102  005237  001200                  INC     $TMP3           ;ANOTHER COMPARE FAILURE
7644  056106  023737  001172  001250  12$:    CMP     $TMP0,PMMR0     ;SEE IF MMR0 CHANGED
7645  056114  001402                          BEQ     13$             ;BRANCH IF MMR0 DIDN'T CHANGE
7646  056116  005237  001200                  INC     $TMP3           ;ANOTHER COMPARE FAILURE
7647  056122  005737  001200          13$:    TST     $TMP3           ;WERE THERE ANY ERRORS ON THIS TEST
7648  056126  001401                          BEQ     19$             ;BRANCH IF NO ERRORS
7649  056130  104073                          ERROR   73              ;AT LEAST ONE M.M. REG CHANGED
7650  056132  042737  177776  177572  19$:    BIC     #177776,MMR0    ;CLEAR ALL ERROR BITS IN MMR0
7651  056140  012737  032226  000250          MOV     #MMTRAP,MMVEC   ;PUT BACK REGULAR M.M. TRAP ROUTINE
7652  056146  012737  055722  001112          MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
7653
7654
7655                                  ;;*****************************************************************
7656                                  ;*TEST 66       SUPERVISOR MODE, ABORT VECTOR FROM KERNEL SPACE
7657                                  ;*
7658                                  ;*      THIS TEST DOES AN ABORT FROM SUPERVISOR MODE.  THE VECTOR
7659                                  ;*      SHOULD BE PICKED UP FROM KERNEL I-SPACE DUE TO 'ROM OUT06'
7660                                  ;*      FORCING KERNEL MODE ON 'SSRB' DURING THE ABORT SEQUENCE.
7661                                  ;*
7662                                  ;*      THE 'HALTS' IN THIS TEST ARE SPACE FILLERS AND SHOULD NEVER BE
7663                                  ;*      REACHED, IF SUPERVISOR MODE IS ENABLED PROPERLY ON 'SSRB',
7664                                  ;*      'SAPE', AND 'SAPB'.
7665                                  ;*
7666                                  ;;*****************************************************************
7667  056154                          TST66:
7668  056154  000004                          SCOPE
7669  056156  012737  056560  001316          MOV     #TST67,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
7670                                                                  ;TEST FOR ESCAPE ON PARITY ERRORS
7671  056164  104416                          TBITO                   ;MAKE SURE T-BIT IS OFF FOR THIS TEST
7672                                                                  ;AND THE NEXT THREE (3) TESTS.
7673  056166  005037  001226          20$:    CLR     MMEXP           ;NOT EXPECTING ANY M.M. TRAPS YET
7674  056172  012737  077400  177602          MOV     #77400,UIPDR1   ;LOAD USER PAGE 1 NON-RESIDENT
7675  056200  012737  077400  177604          MOV     #77400,UIPDR2   ;LOAD USER PAGE 2 NON-RESIDENT
7676  056206  012737  077400  177606          MOV     #77400,UIPDR3   ;LOAD USER PAGE 3 NON-RESIDENT
7677  056214  012737  077400  177616          MOV     #77400,UIPDR7   ;LOAD USER PAGE 7 NON-RESIDENT
7678  056222  012700  077406                  MOV     #77406,R0       ;PAGE LENGTH-200 BLOCKS EXPAND UP
7679                                                                  ;RESIDENT READ/WRITE
7680  056226  010037  177600                  MOV     R0,UIPDR0       ;LOAD USER PAGE 0
7681  056232  010037  172200                  MOV     R0,SIPDR0       ;LOAD SUPERVISOR PAGE 0
7682  056236  010037  172202                  MOV     R0,SIPDR1       ;LOAD SUPERVISOR PAGE 1
7683  056242  010037  172204                  MOV     R0,SIPDR2       ;LOAD SUPERVISOR PAGE 2
7684  056246  010037  172206                  MOV     R0,SIPDR3       ;LOAD SUPERVISOR PAGE 3
7685  056252  010037  172216                  MOV     R0,SIPDR7       ;LOAD SUPERVISOR PAGE 7
7686  056256  012737  000002  177640          MOV     #2,UIPAR0       ;MAP USER PAGE 0 TO 00200
7687  056264  012737  177600  177656          MOV     #177600,UIPAR7  ;MAP USER PAGE 7 TO I/O PAGE
7688  056272  012737  000001  172240          MOV     #1,SIPAR0       ;MAP SUPERVISOR PAGE 0 TO 000100
7689  056300  012737  000201  172242          MOV     #201,SIPAR1     ;MAP SUPERVISOR PAGE 1 TO 020100
7690  056306  012737  000401  172244          MOV     #401,SIPAR2     ;MAP SUPERVISOR PAGE 2 TO 040100
```

```
7691  056314  012737  000601  172246          MOV     #601,SIPAR3     ;MAP SUPERVISOR PAGE 3 TO 060100
7692  056322  012737  177600  172256          MOV     #177600,SIPAR7  ;MAP SUPERVISOR PAGE 7 TO I/O PAGE
7693  056330  012737  077403  172210          MOV     #77403,SIPDR4   ;MAKE SUPERVISOR PAGE 4 NON-RESIDENT
7694  056336  012737  001000  172250          MOV     #1000,SIPAR4    ;MAP SUPERVISOR PAGE 4 TO 16K
7695  056344  012737  032506  000350          MOV     #SUPVEC,350     ;SUPERVISOR SPACE VECTOR
7696  056352  012737  000140  000352          MOV     #140,352        ;SUPERVISOR SPACE PSW = 140
7697  056360  012737  032530  000450          MOV     #USEVEC,450     ;USER SPACE VECTOR
7698  056366  012737  000000  000452          MOV     #000,452        ;USER SPACE PSW = 000
7699  056374  012737  056402  001112          MOV     #5$,$LPERR      ;SET LOOP ON ERROR POINTER TO 5$
7700  056402  012737  040000  177776  5$:     MOV     #40000,PSW      ;GO TO SUPERVISOR MODE.
7701                                                                  ;THE NEXT INSTRUCTION EXECUTED IS AT
7702                                                                  ;3$.  THE ADDRESS IS 100 OCTAL BYTES
7703                                                                  ;GREATER THAN THE ADDRESS AT 1$.
7704  056410  104074                  1$:     ERROR   74              ;DIDN'T GO TO SUPERVISOR MODE
7705  056412  005037  177776                  CLR     PSW             ;GO BACK INTO KERNEL MODE
7706  056416  000137  056460                  JMP     2$              ;GO TO EXIT OF TEST
7707  056422  000000                          HALT                    ;THE NEXT 'SEVERAL' HALTS SHOULDN'T
7708  056424  000000                          HALT                    ;EVER BE REACHED
7709  056426  000000                          HALT                    ;EVER BE REACHED
7710  056430  000000                          HALT                    ;EVER BE REACHED
7711  056432  000000                          HALT                    ;EVER BE REACHED
7712  056434  000000                          HALT                    ;EVER BE REACHED
7713  056436  000000                          HALT                    ;EVER BE REACHED
7714  056440  000000                          HALT                    ;EVER BE REACHED
7715  056442  000000                          HALT                    ;EVER BE REACHED
7716  056444  000000                          HALT                    ;EVER BE REACHED
7717  056446  000000                          HALT                    ;EVER BE REACHED
7718  056450  000000                          HALT                    ;EVER BE REACHED
7719  056452  000000                          HALT                    ;EVER BE REACHED
7720  056454  000000                          HALT                    ;EVER BE REACHED
7721  056456  000000                          HALT                    ;EVER BE REACHED
7722  056460  012737  032226  000250  2$:     MOV     #MMTRAP,MMVEC   ;RESTORE NORMAL M.M. TRAP ROUTINE
7723  056466  012737  056166  001112          MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
7724  056474  000431                          BR      TST67           ;;BRANCH TO NEXT TEST
7725  056476  000000                          HALT                    ;THE NEXT 'SEVERAL' HALTS SHOULDN'T
7726  056500  000000                          HALT                    ;EVER BE REACHED
7727  056502  000000                          HALT                    ;EVER BE REACHED
7728  056504  000000                          HALT                    ;EVER BE REACHED
7729  056506  000000                          HALT                    ;EVER BE REACHED
7730  056510  012737  032456  000150  3$:     MOV     #KERVEC,<MMVEC-100>     ;SET UP KERNEL SPACE VECTOR
7731  056516  012737  000340  000152          MOV     #340,<MMVEC+2-100>      ;KERNEL SPACE PSW = 340
7732  056524  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
7733  056526  013700  100000                  MOV     @#100000,R0             ;READ FROM PAGE 4, SUPERVISOR
7734  056532  022737  100051  001150          CMP     #100051,<PMMR0-100>     ;EXPECTING NON-RESIDENT PAGE 4
7735                                                                  ;ABORT IN SUPERVISOR MODE
7736  056540  001401                          BEQ     10$             ;BRANCH IF CORRECT COND
7737  056542  104075                          ERROR   75              ;ABORT CONDITION INCORRECT
7738  056544  042737  177776  177572  10$:    BIC     #177776,MMR0           ;CLEAR MMR0 FOR NEXT ABORT
7739  056552  012737  000340  177776          MOV     #340,PSW        ;GO BACK INTO KERNEL MODE NOW
7740                                                                  ;THE NEXT INSTRUCTION TO BE EXECUTED
7741                                                                  ;IS AT LABEL 2$
7742
7743
7744
7745                                  ;;*****************************************************************
7746                                  ;*TEST.67        M.M. ABORT DURING AN ODD ADDRESS ABORT SEQUENCE
```

```
                                ;*
                                ;*      THIS TEST VERIFIES BIT07 OF MMR0 (INSTRUCTION COMPLETE) AND
                                ;*      'SSRA PS RESTORE (1) H'.
                                ;*      THE TEST CAUSES AN 'ODD ADDRESS' ABORT THRU 'ERRVEC' WHICH
                                ;*      PUTS THE PROCESSOR INTO SUPERVISOR MODE.  THE SUPERVISOR
                                ;*      STACK POINTER IS AT 1104 AND ITS PAGE 0 IS 11 BLOCKS LONG,
                                ;*      SO WHEN THE OLD PS AND PC ARE PUSHED ON THE STACK A M.M.
                                ;*      PAGE LENGTH ABORT OCCURS.  THE OLD PS SHOULD BE RESTORED SO
                                ;*      THAT THE PROPER RECOVERY CAN BE MADE, AND THE M.M. ABORT
                                ;*      HAPPENS.
                                ;*      MMR0  HAS PAGE LENGTH FAULT, SUPERVISOR I-SPACE, PAGE 0
                                ;*      MMR1  HAS R6 DECREMENTED BY 2 TWICE
                                ;*      MMR2  HAS 000004 (ADDRESS OF 'ERRVEC' WHERE M.M. ABORT OCCURRED)
                                ;*
                                ;;**********************************************************************
056560                          TST67:
056560  000004                          SCOPE
056562  012737  057144  001316          MOV     #TST70,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
                                                                ;TEST FOR ESCAPE ON PARITY ERRORS
                                        .EQUIV  BIT4,TBIT       ;BIT 4 OF P.S. IS T-BIT TRAPPING BIT
056570  012737  040340  000006  20$:    MOV     #40340,ERRVEC+2 ;SET PRIORITY OF ERRVEC TO 7
                                                                ;AND MAKE NEW MODE SUPERVISOR
056576  012737  000000  172240          MOV     #000,SIPAR0     ;MAP SUPERVISOR PAGE 0 TO PHYS. 0
056604  012737  000200  172242          MOV     #200,SIPAR1     ;MAP SUPERVISOR PAGE 1 TO 4K -8K
056612  012737  000400  172244          MOV     #400,SIPAR2     ;MAP SUPERVISOR PAGE 2 TO 8K - 12K
056620  012737  000600  172246          MOV     #600,SIPAR3     ;MAP SUPERVISOR PAGE 3 TO 12K - 16K
056626  012737  177600  172256          MOV     #177600,SIPAR7  ;MAP SUPERVISOR PAGE 7 TO I/O PAGE
056634  012737  077406  172202          MOV     #77406,SIPDR1   ;MAKE SUPER PAGE 1 200 BLCKS, R/W
056642  012737  077406  172204          MOV     #77406,SIPDR2   ;MAKE SUPER PAGE 2 200 BLCKS, R/W
056650  012737  077406  172206          MOV     #77406,SIPDR3   ;MAKE SUPER PAGE 3 200 BLCKS, R/W
056656  012737  077406  172216          MOV     #77406,SIPDR7   ;MAKE SUPER PAGE 7 200 BLOCKS, R/W
056664  012737  056706  001112          MOV     #1$,$LPERR      ;SET LOOP ON ERROR POINTER TO 1$
056672  012737  056740  000250          MOV     #10$,MMVEC      ;SET M.M. VECTOR TO 10$
056700  012737  004006  172200          MOV     #04006,SIPDR0   ;SUPERVISOR PAGE 0 EXPANDS UPWARD
                                                                ;AND IS 11 BLOCKS LONG.
                                                                ;ANY ADDRESS ABOVE 1076 WILL CAUSE A
                                                                ;PAGE LENGTH FAULT.  THIS MEANS THAT
                                                                ;WHEN THE ODD ADDRESS TRAP TRIES TO
                                                                ;PUSH THE OLD PS ON THE SUPERVISOR STACK
                                                                ;IT WILL GET A MEMORY MANAGEMENT ABORT.
056706  052737  040000  177776  1$:     BIS     #BIT14,PSW      ;GO TO SUPERVISOR MODE TO SET STK PTR.
056714  012706  001104                  MOV     #1104,SSP       ;SET THE STACK POINTER OUT OF LIMITS
056720  042737  040000  177776          BIC     #BIT14,PSW      ;GO BACK TO KERNEL MODE AND SET UP
                                                                ;FOR ODD ADDRESS INSTRUCTION
056726  000230                          SPL     0               ;SET PRIORITY LEVEL TO 0
056730  000277                          SCC                     ;SET ALL CONDITION CODES
056732  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
056734  013701  000001                  MOV     @#000001,R1     ;TRY TO READ ADDRESS 1 INTO R1
                                                                ;THIS WILL ABORT TO 4, AND THE PS
                                                                ;AT ADDRESS 6 WILL FORCE SUPERVISOR.
                                                                ;THEN WHILE PUSHING THE PS ON THE STACK
                                                                ;YOU SHOULD GET A MEMORY MANAGEMENT
                                                                ;ABORT AND GO TO 10$.  THE PS SHOULD
                                                                ;HAVE BEEN RESTORED AND WILL NOW BE ON
                                                                ;THE KERNEL STACK.
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 7803  056740  016601  000002          10$:  MOV     2(KSP),R1       ;COPY PS ON STACK INTO R1
 7804  056744  012716  056752                MOV     #16$,(KSP)      ;SET RETURN PC TO 16$
 7805  056750  000006                        RTT                     ;RETURN TO 16$ WITH T-BIT INTACT
 7806  056752  042701  000020          16$:  BIC     #TBIT,R1        ;CLEAR T BIT IN R1 IF ON THIS PASS
 7807  056756  005037  001200                CLR     $TMP3           ;THIS IS THE ERROR COUNTER FLAG
 7808  056762  122701  000017                CMPB    #17,R1          ;THE PROCESSOR STATUS THAT SHOULD
 7809                                                                ;BE ON THE STACK IS THE ONE WITH ALL
 7810                                                                ;OF THE CONDITION CODES SET.
 7811  056766  001402                        BEQ     11$             ;BRANCH IF PS IS CORRECT
 7812  056770  005237  001200                INC     $TMP3           ;WRONG PS IS ON STACK
 7813  056774  013737  177572  001250  11$:  MOV     MMR0,PMMR0      ;SAVE MMR0 FOR COMPARE
 7814  057002  013737  177574  001252        MOV     MMR1,PMMR1      ;SAVE MMR1, IT SHOULD BE 173366
 7815  057010  013737  177576  001254        MOV     MMR2,PMMR2      ;SAVE MMR2, IT SHOULD EQUAL #10
 7816  057016  022737  040241  001250        CMP     #040241,PMMR0   ;SHOULD HAVE PAGE LENGTH FAULT,
 7817                                                                ;COMPLETED, PAGE 0, SUPERVISOR I-SPACE.
 7818  057024  001402                        BEQ     12$             ;BRANCH IF CORRECT CONDITION
 7819  057026  005237  001200                INC     $TMP3           ;WRONG ABORT CONDITION
 7820  057032  022737  173366  001252  12$:  CMP     #173366,PMMR1   ;R6 DECREMENTED TWICE, DURING ABORTED
 7821                                                                ;PUSHES TO SUPERVISOR STACK
 7822  057040  001402                        BEQ     13$             ;BRANCH IF MMR1 IS CORRECT
 7823  057042  005237  001200                INC     $TMP3           ;MMR1 IS NOT CORRECT
 7824  057046  022737  000004  001254  13$:  CMP     #4,PMMR2        ;SEE IF MMR2 EQUALS ADDRS.000004
 7825  057054  001402                        BEQ     14$             ;BRANCH IF ADDRESS IS CORRECT
 7826  057056  005237  001200                INC     $TMP3           ;MMR2 HAS THE WRONG ADDRESS
 7827  057062  005737  001200          14$:  TST     $TMP3           ;DID ANY OF THE COMPARES FAIL?
 7828  057066  001401                        BEQ     15$             ;BRANCH IF ALL COMPARES SUCCEEDED
 7829  057070  104070                        ERROR   70              ;AT LEAST ONE COMPARE FAILED
 7830  057072  000237          15$:  SPL     7               ;NORMAL PRIORITY IS 7
 7831  057074  052737  040000  177776        BIS     #BIT14,PSW      ;GO TO SUPERVISOR MODE TO RESET PTR
 7832  057102  012706  000700                MOV     #700,SSP        ;RESTORE SUPER STK PTR TO 700
 7833  057106  042737  040000  177776        BIC     #BIT14,PSW      ;RETURN TO KERNEL MODE
 7834  057114  012737  000340  000006        MOV     #340,ERRVEC+2   ;RESTORE CORRECT PS TO ERROR VECTOR
 7835  057122  012737  056570  001112        MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
 7836  057130  042737  177776  177572        BIC     #177776,MMR0    ;CLEAR ERROR CONDITION IN MMR0
 7837  057136  012737  032226  000250        MOV     #MMTRAP,MMVEC   ;RESTORE NORMAL M.M. VECTOR
 7838
 7839
 7840                                ;;*****************************************************************
 7841                                ;*TEST 70       USER MODE, ABORT VECTOR FROM KERNEL SPACE
 7842                                ;*
 7843                                ;*      THIS TEST DOES AN ABORT FROM USER MODE.  THE VECTOR
 7844                                ;*      SHOULD BE PICKED UP FROM KERNEL I-SPACE DUE TO 'ROM OUT06'
 7845                                ;*      FORCING KERNEL MODE ON 'SSRB' DURING THE ABORT SEQUENCE.
 7846                                ;*
 7847                                ;*      THE 'HALTS' IN THIS TEST ARE SPACE FILLERS AND SHOULD NEVER BE
 7848                                ;*      REACHED, IF USER MODE IS ENABLED PROPERLY ON 'SSRB', 'SAPE',
 7849                                ;*      'SAPB', 'SAPC', AND 'SAPF'.
 7850                                ;*
 7851                                ;*      IT SHOULD BE NOTED THAT IF THIS TEST CODE IS EXECUTED IN SINGLE
 7852                                ;*      INSTRUCTION, THE ABORT WILL PUSH THE PS & PC ONTO THE SUPERVISOR
 7853                                ;*      STACK INSTEAD OF THE KERNEL STACK.  THIS IS DUE TO A FLAW IN
 7854                                ;*      THE CPU ROM AND IS A CARRY OVER FROM THE PDP-11/45.  IF YOU NEED
 7855                                ;*      TO SINGLE INSTRUCTION THIS TEST, SINGLE BUS CYCLE THRU THE ABORT
 7856                                ;*      SEQUENCE FOR PROPER OPERATION OF THE STACKS.
 7857                                ;*
 7858                                ;;*****************************************************************
```

```
                                        TST70:
                                        SCOPE
057146  012737  057546  001316        MOV     #TST71,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
                                                              ;TEST FOR ESCAPE ON PARITY ERRORS
057154  005037  001226        20$:    CLR     MMEXP           ;NOT EXPECTING ANY M.M. TRAPS YET
057160  012737  077400  172202        MOV     #77400,SIPDR1   ;LOAD SUPERVISOR PAGE 1 NON-RESIDENT
057166  012737  077400  172204        MOV     #77400,SIPDR2   ;LOAD SUPERVISOR PAGE 2 NON-RESIDENT
057174  012737  077400  172206        MOV     #77400,SIPDR3   ;LOAD SUPERVISOR PAGE 3 NON-RESIDENT
057202  012737  077400  172216        MOV     #77400,SIPDR7   ;LOAD SUPERVISOR PAGE 7 NON-RESIDENT
057210  012700  077406                MOV     #77406,R0       ;PAGE LENGTH-200 BLOCKS EXPAND UP
                                                              ;RESIDENT READ/WRITE
057214  010037  172200                MOV     R0,SIPDR0       ;LOAD SUPERVISOR PAGE 0
057220  010037  177600                MOV     R0,UIPDR0       ;LOAD USER PAGE 0
057224  010037  177602                MOV     R0,UIPDR1       ;LOAD USER PAGE 1
057230  010037  177604                MOV     R0,UIPDR2       ;LOAD USER PAGE 2
057234  010037  177606                MOV     R0,UIPDR3       ;LOAD USER PAGE 3
057240  010037  177616                MOV     R0,UIPDR7       ;LOAD USER PAGE 7
057244  012737  000002  172240        MOV     #2,SIPAR0       ;MAP SUPERVISOR PAGE 0 TO 00200
057252  012737  177600  172256        MOV     #177600,SIPAR7  ;MAP SUPERVISOR PAGE 7 TO I/O PAGE
057260  012737  000001  177640        MOV     #1,UIPAR0       ;MAP USER PAGE 0 TO 00100
057266  012737  000201  177642        MOV     #201,UIPAR1     ;MAP USER PAGE 1 TO 20100
057274  012737  000401  177644        MOV     #401,UIPAR2     ;MAP USER PAGE 2 TO 40100
057302  012737  000601  177646        MOV     #601,UIPAR3     ;MAP USER PAGE 3 TO 60100
057310  012737  177600  177656        MOV     #177600,UIPAR7  ;MAP USER PAGE 7 TO I/O PAGE
057316  012737  077400  177612        MOV     #77400,UIPDR5   ;MAKE USER PAGE 5 NON-RESIDENT
057324  012737  001000  177652        MOV     #1000,UIPAR5    ;MAP USER PAGE 5 TO 16K
057332  012737  032506  000450        MOV     #SUPVEC,450     ;SUPERVISOR SPACE VECTOR
057340  012737  000140  000452        MOV     #140,452        ;SUPERVISOR SPACE PSW = 140
057346  012737  032530  000350        MOV     #USEVEC,350     ;USER SPACE VECTOR
057354  012737  000000  000352        MOV     #000,352        ;USER SPACE PSW = 000
057362  012737  057370  001112        MOV     #5$,$LPERR      ;SET LOOP ON ERROR POINTER TO 5$
057370  012737  140000  177776  5$:   MOV     #140000,PSW     ;GO TO USER MODE.
                                                              ;THE NEXT INSTRUCTION EXECUTED IS AT
                                                              ;3$.  THE ADDRESS IS 100 OCTAL BYTES
                                                              ;GREATER THAN THE ADDRESS AT 1$.
057376  104076                1$:     ERROR   76              ;DIDN'T GO TO USER MODE
057400  005037  177776                CLR     PSW             ;GO BACK INTO KERNEL MODE
057404  000137  057446                JMP     2$              ;GO TO EXIT OF TEST
057410  000000                        HALT                    ;THE NEXT 'SEVERAL' HALTS SHOULDN'T
057412  000000                        HALT                    ;EVER BE REACHED
057414  000000                        HALT                    ;EVER BE REACHED
057416  000000                        HALT                    ;EVER BE REACHED
057420  000000                        HALT                    ;EVER BE REACHED
057422  000000                        HALT                    ;EVER BE REACHED
057424  000000                        HALT                    ;EVER BE REACHED
057426  000000                        HALT                    ;EVER BE REACHED
057430  000000                        HALT                    ;EVER BE REACHED
057432  000000                        HALT                    ;EVER BE REACHED
057434  000000                        HALT                    ;EVER BE REACHED
057436  000000                        HALT                    ;EVER BE REACHED
057440  000000                        HALT                    ;EVER BE REACHED
057442  000000                        HALT                    ;EVER BE REACHED
057444  000000                        HALT                    ;EVER BE REACHED
057446  012737  032226  000250  2$:   MOV     #MMTRAP,MMVEC   ;RESTORE NORMAL M.M. TRAP ROUTINE
057454  012737  057154  001112        MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
057462  000431                        BR      TST71           ;;BRANCH TO NEXT TEST
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7915  057464  000000                          HALT                    ;THE NEXT 'SEVERAL' HALTS SHOULDN'T
7916  057466  000000                          HALT                    ;EVER BE REACHED
7917  057470  000000                          HALT                    ;EVER BE REACHED
7918  057472  000000                          HALT                    ;EVER BE REACHED
7919  057474  000000                          HALT                    ;EVER BE REACHED
7920  057476  012737  032456  000150  3$:     MOV     #KERVEC,<MMVEC-100>     ;SET UP KERNEL SPACE VECTOR
7921  057504  012737  000340  000152          MOV     #340,<MMVEC+2-100>      ;KERNEL SPACE PSW = 340
7922  057512  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
7923  057514  013700  120000                  MOV     @#120000,R0             ;READ FROM PAGE 5, USER SPACE
7924  057520  022737  100153  001150          CMP     #100153,<PMMR0-100>     ;EXPECTING NON-RESIDENT PAGE 5
7925                                                                          ;ABORT IN USER MODE I-SPACE
7926  057526  001401                          BEQ     10$                     ;BRANCH IF CORRECT COND
7927  057530  104077                          ERROR   77                      ;ABORT CONDITION INCORRECT
7928  057532  042737  177776  177572  10$:    BIC     #177776,MMR0           ;CLEAR MMR0 FOR NEXT TEST
7929  057540  012737  000340  177776          MOV     #340,PSW        ;GO BACK INTO KERNEL MODE NOW
7930                                                                  ;THE NEXT INSTRUCTION TO BE EXECUTED
7931                                                                  ;IS AT LABEL 2$
7932
7933
7934                                  ;;*****************************************************************
7935                                  ;*TEST 71       COUNT PATTERN THRU MMR2, TO TEST ALL BITS
7936                                  ;*
7937                                  ;*      THIS TEST SETS UP ALL USER I-SPACE PAGES TO BE NON-RESIDENT
7938                                  ;*      AND THEN TRIES ALL POSSIBLE VIRTUAL ADDRESSES AS A PROCESSOR
7939                                  ;*      COUNTER IN USER MODE.  EVERY INSTRUCTION FETCH WILL ABORT,
7940                                  ;*      NON RESIDENT AND THE CONTENTS OF MMR2 IS TESTED ALONG
7941                                  ;*      WITH BITS <06:01> OF MMR0.
7942                                  ;*
7943                                  ;;*****************************************************************
7944  057546                          TST71:
7945  057546  000004                          SCOPE
7946  057550  012737  060012  001316          MOV     #TST72,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
7947                                                                  ;TEST FOR ESCAPE ON PARITY ERRORS
7948  057556  012737  000002  001206          MOV     #2,$TIMES       ;;DO 2 ITERATIONS
7949  057564  012737  077400  177600  20$:     MOV     #77400,UIPDR0   ;MAP USER PAGE 0 NON-RESIDENT
7950  057572  012737  077400  177602          MOV     #77400,UIPDR1   ;MAP USER PAGE 1 NON-RESIDENT
7951  057600  012737  077400  177604          MOV     #77400,UIPDR2   ;MAP USER PAGE 2 NON-RESIDENT
7952  057606  012737  077400  177606          MOV     #77400,UIPDR3   ;MAP USER PAGE 3 NON-RESIDENT
7953  057614  012737  077400  177610          MOV     #77400,UIPDR4   ;MAP USER PAGE 4 NON-RESIDENT
7954  057622  012737  077400  177612          MOV     #77400,UIPDR5   ;MAP USER PAGE 5 NON-RESIDENT
7955  057630  012737  077400  177614          MOV     #77400,UIPDR6   ;MAP USER PAGE 6 NON-RESIDENT
7956  057636  012737  077400  177616          MOV     #77400,UIPDR7   ;MAP USER PAGE 7 NON-RESIDENT
7957  057644  012737  057674  001112          MOV     #2$,$LPERR      ;SET LOOP ON ERROR POINTER TO 2$
7958  057652  012700  140000                  MOV     #140000,R0      ;THIS WILL FORCE USER MODE WHEN USED
7959                                                                  ;AS A PROCESSOR STATUS
7960  057656  005001                          CLR     R1              ;R1 HOLDS USER VIRTUAL PC
7961  057660  012737  057704  000250          MOV     #10$,MMVEC      ;SET M.M. TRAP VECTOR TO 10$
7962  057666  012737  000340  000252          MOV     #340,MMVEC+2    ;MAKE SURE TRAP TAKES YOU TO KERNEL
7963  057674  010046                  2$:     MOV     R0,-(KSP)       ;PUSH USER PS ON STACK
7964  057676  010146                          MOV     R1,-(KSP)       ;PUSH USER'S VIRTUAL PC ON STACK
7965  057700  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
7966  057702  000002                          RTI                     ;RETURN TO USER MODE
7967                                                                  ;THE FIRST INSTRUCTION FETCH WILL
7968                                                                  ;CAUSE A NON-RESIDENT ABORT AND LOCK
7969                                                                  ;MMR2 SO THAT ALL BITS CAN BE CHECKED.
7970
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7971
7972
7973  057704  062706  000004          10$:    ADD     #4,KSP          ;CLEAN UP STACK FOR NEXT TIME
7974  057710  013737  177576  001254          MOV     MMR2,PMMR2      ;READ MMR2 TO TEMP LOCATION
7975  057716  013737  177572  001250          MOV     MMR0,PMMR0      ;READ MMR0 TO TEMP LOCATION
7976  057724  020137  001254                  CMP     R1,PMMR2        ;SEE IF MMR2 LOCKED CORRECT V. A.
7977  057730  001401                          BEQ     11$             ;BRANCH IF MMR2 HAS RIGHT V.A.
7978  057732  104100                          ERROR   100             ;WRONG V.A.
7979  057734  005002                  11$:    CLR     R2              ;R2 WILL GET THE VIRTUAL PAGE NO.
7980  057736  010103                          MOV     R1,R3           ;COPY VIRTUAL ADDRESS INTO R3
7981  057740  073227  000003                  ASHC    #3,R2           ;COMBINED LEFT SHIFT <R2,R3> 3 BITS
7982  057744  006102                          ROL     R2              ;ADJUST PAGE NUMBER
7983  057746  052702  100141                  BIS     #100141,R2      ;SET OTHER EXPECTED BITS IN MMR0
7984  057752  020237  001250                  CMP     R2,PMMR0        ;SEE IF MMR0 RECORDED CORRECT PAGE NO.
7985  057756  001401                          BEQ     12$             ;BRANCH IF PAGE NUMBER WAS CORRECT
7986  057760  104101                          ERROR   101             ;WRONG PAGE NO. IN MMR0
7987  057762  042737  177776  177572  12$:    BIC     #177776,MMR0    ;CLEAR ALL ERROR BITS IN MMR0
7988  057770  062701  000002                  ADD     #2,R1           ;TRY NEXT VIRTUAL ADDRESS
7989  057774  001337                          BNE     2$              ;BRANCH IF NOT ALL DONE
7990  057776  012737  032226  000250          MOV     #MMTRAP,MMVEC   ;PUT BACK REGULAR M.M. TRAP ROUTINE
7991  060004  012737  057564  001112          MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
7992
7993
7994                                  .SBTTL  ************ ENTRY POINT 6 --- STARTING ADDRESS 224 ************
7995                                  .SBTTL  ********* D-SPACE TESTS, CORRECT TIMING OF I & D SPACE *********
7996                                  ;*
7997                                  ;*      THIS GROUP OF TESTS CHECKS THE PROPER ENABLING OF D-SPACE.
7998                                  ;*      IT TESTS THAT I-SPACE IS FORCED DURING INSTRUCTION FETCHES AND
7999                                  ;*      ADDRESS, INDEX, OR OPERAND FETCHES IF THE REGISTER FIELD IS 7.
8000                                  ;*      IT ALSO CHECKS THAT TRAPS PICK UP THE VECTOR FROM D-SPACE, IF
8001                                  ;*      IT IS ENABLED.
8002                                  ;*
8003                                  ;*      THROUGHOUT THIS AREA OF TESTING D-SPACE PAGES 2 & 3
8004                                  ;*      ARE MAPPED NON-RESIDENT, AND I-SPACE PAGE 4 IS ALSO MAPPED
8005                                  ;*      NON-RESIDENT.  ALL OTHER PAGES IN BOTH I & D SPACE ARE
8006                                  ;*      MAPPED RESIDENT, 4K, READ/WRITE.  IF ANY ABORTS SHOULD OCCUR
8007                                  ;*      DURING THESE TESTS THEY WILL VECTOR TO 'NODSPAC'.  IF THE
8008                                  ;*      OFFENDING PAGE IS 2 OR 3 THEN THE FAULT IS THAT I-SPACE WASN'T
8009                                  ;*      FORCED WHEN IT SHOULD HAVE BEEN, BUT IF THE PAGE IS 4 THEN
8010                                  ;*      THE FAULT IS THAT I-SPACE WAS FORCED WHEN IT SHOULD NOT HAVE BEEN.
8011                                  ;*
8012
8013
8014                                  ;;*********************************************************************
8015                                  ;*TEST 72       ENABLE KERNEL D-SPACE AND SEE THAT I-SPACE IS FORCED
8016                                  ;*
8017                                  ;*      THIS TEST SHOWS THAT I-SPACE IS FORCED BY EITHER 'SSRB I
8018                                  ;*      SPACEA L' OR SSRB I SPACEB L' DURING THE PROPER TIMES
8019                                  ;*
8020                                  ;*      ALL ERRORS FOUND IN THIS TEST ARE REPORTED WHEN THE C.P.U.
8021                                  ;*      ABORTS THRU 'MMVEC' TO SUBROUTINE 'NODSPAC'.  THIS SUBROUTINE
8022                                  ;*      WILL REPORT THAT D-SPACE WAS NOT ENABLED PROPERLY.
8023                                  ;*
8024                                  ;;*********************************************************************
8025  060012                          TST72:
8026  060012  000004                         SCOPE
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8027  060014  012737  060606  001316          MOV     #TST73,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
8028                                                                  ;TEST FOR ESCAPE ON PARITY ERRORS
8029  060022  104420                          TBITR                   ;RESTORE THE T-BIT TO ITS CONDITION
8030                                                                  ;BEFORE THE LAST FOUR TESTS.
8031  060024                          ENTPT6:
8032  060024  012737  060164  001110          MOV     #20$,$LPADR     ;SET LOOP ADDRESS POINTER TO 20$
8033  060032  012737  060164  001112          MOV     #20$,$LPERR     ;SET LOOP ON ERROR POINTER TO 20$
8034  060040  012737  000072  001102          MOV     #72,$TSTNM      ;LOAD TEST NUMBER INTO MEMORY
8035  060046  013737  001102  177570          MOV     $TSTNM,DISPLAY  ;DISPLAY TEST NUMBER FOR THIS TEST
8036  060054  012737  077406  172300          MOV     #77406,KIPDR0   ;MAKE KERNEL I PAGE 0 200 BLOCKS, R/W
8037  060062  012737  077406  172302          MOV     #77406,KIPDR1   ;MAKE KERNEL I PAGE 1 200 BLOCKS, R/W
8038  060070  012737  077406  172304          MOV     #77406,KIPDR2   ;MAKE KERNEL I PAGE 2 200 BLOCKS, R/W
8039  060076  012737  077406  172306          MOV     #77406,KIPDR3   ;MAKE KERNEL I PAGE 3 200 BLOCKS, R/W
8040  060104  012737  077406  172316          MOV     #77406,KIPDR7   ;MAKE KERNEL I PAGE 7 200 BLOCKS, R/W
8041  060112  012737  000000  172340          MOV     #000,KIPAR0     ;MAP KERNEL I PAGE 0 TO 0 - 4K
8042  060120  012737  000200  172342          MOV     #200,KIPAR1     ;MAP KERNEL I PAGE 1 TO 4K - 8K
8043  060126  012737  000400  172344          MOV     #400,KIPAR2     ;MAP KERNEL I PAGE 2 TO 8K - 12K
8044  060134  012737  000600  172346          MOV     #600,KIPAR3     ;MAP KERNEL I PAGE 3 TO 12K - 16K
8045  060142  012737  177600  172356          MOV     #177600,KIPAR7  ;MAP KERNEL I PAGE 7 TO THE I/O PAGE
8046  060150  012737  000001  177572          MOV     #BIT0,MMR0      ;ENABLE 18-BIT RELOCATION IF NOT ON
8047  060156  012737  000020  172516          MOV     #BIT4,MMR3      ;ENABLE 22-BIT RELOCATION IF NOT ON
8048  060164  012737  077400  172310  20$:    MOV     #77400,KIPDR4   ;MAKE KERNEL I PAGE 4 NON-RESIDENT
8049  060172  012737  077406  172320          MOV     #77406,KDPDR0   ;MAKE KERNEL D PAGE 0 200 BLOCKS R/W
8050  060200  012737  077406  172322          MOV     #77406,KDPDR1   ;MAKE KERNEL D PAGE 1 200 BLOCKS R/W
8051  060206  012737  077406  172330          MOV     #77406,KDPDR4   ;MAKE KERNEL D PAGE 4 200 BLOCKS R/W
8052  060214  012737  077400  172324          MOV     #77400,KDPDR2   ;MAKE KERNEL D PAGE 2 NON-RESIDENT
8053  060222  012737  077400  172326          MOV     #77400,KDPDR3   ;MAKE KERNEL D PAGE 3 NON-RESIDENT
8054  060230  012737  000000  172360          MOV     #000,KDPAR0     ;MAP KERNEL D PAGE 0 TO PHYSICAL 0
8055  060236  012737  000200  172362          MOV     #200,KDPAR1     ;MAP KERNEL D PAGE 1 TO 4K - 8K
8056  060244  012737  001000  172370          MOV     #1000,KDPAR4    ;MAP KERNEL D PAGE 4 TO 16K
8057  060252  012737  077406  172336          MOV     #77406,KDPDR7   ;MAP KERNEL D PAGE 7 TO 200 BLOCKS R/W
8058  060260  012737  177600  172376          MOV     #177600,KDPAR7  ;MAP KERNEL D PAGE 7 TO I/O PAGE
8059  060266  012704  172516                  MOV     #MMR3,R4        ;PUT ADDRS OF MMR3 IN R4
8060  060272  012705  000004                  MOV     #BIT2,R5        ;PUT KERNEL D-SPACE ENABLE BIT INTO R5
8061  060276  012700  000002                  MOV     #2,R0           ;LOAD A TWO INTO R0
8062  060302  012737  032346  000250          MOV     #NODSPAC,MMVEC  ;SET M.M. VECTOR TO D-SPACE SERVICE ROUTINE
8063  060310  012737  060320  001112          MOV     #10$,$LPERR     ;SET LOOP ON ERROR POINTER TO 10$
8064  060316  050514                          BIS     R5,(R4)         ;ENABLE D-SPACE MAPPING IN KERNEL MODE
8065                                  ;;
8066                                  ;*      TEST THAT 'ROM OUT09'' COMES UP ON INSTRUCTION FETCHES,
8067                                  ;*      FORCING I-SPACE.
8068                                  ;;
8069  060320  000400                  10$:    BR      1$              ;BRANCH, USE FET.00
8070  060322  000244                  1$:     CLZ                     ;CLEAR ZERO BIT IN PROCESSOR STATUS
8071  060324  001776                          BEQ     1$              ;NO BRANCH, USE FET.13
8072  060326  000264                  2$:     SEZ                     ;SET ZERO BIT IN PROC. STATUS
8073  060330  001376                          BNE     2$              ;NO BRANCH, USE FET.12
8074  060332  000270                  3$:     SEN                     ;SET NEGATIVE BIT IN PROC. STATUS
8075  060334  100376                          BPL     3$              ;NO BRANCH, USE FET.11
8076  060336  000237                  4$:     SPL     7               ;SET PRIOR TO 7: USE SPL.10, GOTO FET.10
8077  060340  005700                          TST     R0              ;USE TST.10, GOTO FET.10
8078  060342  077003                          SOB     R0,4$           ;BRANCH UNTIL R0 IS ZERO:
8079                                                                  ;USE SOB.20, GOTO FET.10
8080  060344  073002                          ASHC    R2,R0           ;COMBINED SHIFT, SHIFT COUNT ZERO
8081                                                                  ;USE ASC.80, GOTO FET.10
8082  060346  005200                          INC     R0              ;MAKE R0 POSITIVE ONE
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8083  060350  073002                          ASHC    R2,R0           ;LEFT COMBINED SHIFT ONE PLACE
8084                                                                  ;USE ASC.61, GOTO FET.10
8085  060352  005300                          DEC     R0              ;MAKE R0 EQUAL ZERO
8086  060354  005300                          DEC     R0              ;MAKE R0 NEGATIVE ONE
8087  060356  073002                          ASHC    R2,R0           ;RIGHT COMBINED SHIFT ONE PLACE
8088                                                                  ;USE ASC.60, GOTO FET.10
8089  060360  072001                          ASH     R1,R0           ;RIGHT SHIFT ONE PLACE
8090                                                                  ;GOTO FET.07
8091  060362  005200                          INC     R0              ;MAKE R0 EQUAL ZERO
8092  060364  005200                          INC     R0              ;MAKE R0 POSITIVE ONE
8093  060366  072001                          ASH     R1,R0           ;LEFT SHIFT ONE PLACE
8094                                                                  ;GO TO FET.05
8095  060370  070001                          MUL     R1,R0           ;MULTIPLY R1 X R0
8096                                                                  ;USE MUL.60, GOTO FET.10
8097  060372  005000                          CLR     R0              ;MAKE SURE R0 IS ZERO
8098  060374  071001                          DIV     R1,R0           ;DIVISOR IS ZERO, GO TO FET.04
8099  060376  040514                          BIC     R5,(R4)         ;DISABLE KERNEL D-SPACE MAPPING
8100                                  ;:
8101                                  ;*      TEST THAT 'ROM OUT13'' COMES UP WHEN SRCM = 1, 2, OR 3.
8102                                  ;*      THIS IS ANDED WITH SRCF = 7
8103                                  ;:
8104  060400  012737  060410  001112          MOV     #11$,$LPERR     ;SET LOOP ON ERROR POINTER TO 11$
8105  060406  050514                          BIS     R5,(R4)         ;ENABLE D-SPACE MAPPING IN KERNEL MODE
8106  060410  011700                  11$:    MOV     (PC),R0         ;USE S13.00, SOURCE MODE IS 1
8107  060412  012700  000000                  MOV     #0,R0           ;USE S13.01, SOURCE MODE IS 2
8108  060416  013700  100000                  MOV     @#100000,R0     ;USE S13.01, SOURCE MODE IS 3
8109  060422  040514                          BIC     R5,(R4)         ;DISABLE KERNEL D-SPACE MAPPING
8110                                  ;:
8111                                  ;*      TEST THAT 'ROM OUT14'' COMES UP WHEN DSTM = 1, OR 2.
8112                                  ;*      THIS IS ANDED WITH DSTF = 7 AND NOT(MTP + MFP).
8113                                  ;:
8114  060424  012737  060434  001112          MOV     #12$,$LPERR     ;SET LOOP ON ERROR POINTER TO 12$
8115  060432  050514                          BIS     R5,(R4)         ;ENABLE D-SPACE MAPPING IN KERNEL MODE
8116  060434  005717                  12$:    TST     (PC)            ;USE D12.00, GOTO D12.10
8117                                                                  ;(INST. IS DAC * DM1)
8118  060436  005727  000000                  TST     #0              ;USE D12.01, GOTO D12.10
8119                                                                  ;(INST IS DAC * DM2)
8120  060442  022717  000240                  CMP     #240,(PC)       ;USE D12.80, GOTO D12.60
8121                                                                  ;(INST IS BIN * DM1)
8122  060446  000240                          NOP                     ;THIS SHOULD BE COMPARED WITH IMMEDIATE
8123                                                                  ;DATA IN ABOVE COMPARE INSTRUCTION
8124  060450  040514                          BIC     R5,(R4)         ;DISABLE KERNEL D-SPACE MAPPING
8125                                  ;:
8126                                  ;*      TEST THAT 'ROM OUT15'' COMES UP WHEN DSTM = 3.
8127                                  ;*      THIS IS ANDED WITH DSTF = 7.
8128                                  ;:
8129  060452  012737  060462  001112          MOV     #13$,$LPERR     ;SET LOOP ON ERROR POINTER TO 13$
8130  060460  050514                          BIS     R5,(R4)         ;ENABLE D-SPACE MAPPING IN KERNEL MODE
8131  060462  005037  100000          13$:    CLR     @#100000        ;CLEAR LOCATION 100000
8132                                                                  ;USE D30.00, GOTO D30.10
8133  060466  012737  000000  100000          MOV     #0,@#100000     ;LOAD ZERO TO LOCATION 100000
8134                                                                  ;USE D30.80, GOTO D30.10
8135  060474  112737  000000  100001          MOVB    #0,@#100001     ;LOAD ZERO INTO UPPER BYTE OF 100000
8136                                                                  ;USE D30.90, GOTO D30.10
8137  060502  040514                          BIC     R5,(R4)         ;DISABLE KERNEL D-SPACE MAPPING
8138                                  ;:
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                                        ;*      TEST THAT 'ROM OUT09'' FORCES I-SPACE DURING INDEX WORD
                                        ;*      FETCHES.
                                        ;:
060504  012737  060514  001112          MOV     #14$,$LPERR     ;SET LOOP ON ERROR POINTER TO 14$
060512  050514                          BIS     R5,(R4)         ;ENABLE D-SPACE MAPPING IN KERNEL MODE
060514  012700  000000          14$:    MOV     #0,R0           ;BIN * DM0, USE D00.90, GOTO FET.10
060520  010001                          MOV     R0,R1           ;BIN * DM0 * SM0, USE EXC.80, GOTO FET.10
060522  012767  000001  017250          MOV     #1,<77772-.>(PC)        ;LOAD 1 INTO ADR 100000
                                                                ;DSTM = 6, DSTF = 7
                                                                ;USE D67.80, AND D67.00
060530  112777  000000  017242          MOVB    #0,@100000      ;LOAD ZERO INTO ADR 000001
                                                                ;DSTM = 7, DSTF = 7
                                                                ;USE D67.90 AND D67.01
060536  016700  017236                  MOV     <77774-.>(PC),R0        ;READ FROM ADRS 100000
                                                                ;SRCM = 6, SRCF = 7
                                                                ;USE S67.00
060542  040514                          BIC     R5,(R4)         ;DISABLE KERNEL D-SPACE MAPPING
                                        ;:
                                        ;*      TEST 'ROM OUT11'' ANDED WITH (PREV=I)
                                        ;:
060544  012737  060554  001112          MOV     #15$,$LPERR     ;SET LOOP ON ERROR POINTER TO 15$
060552  050514                          BIS     R5,(R4)         ;ENABLE D-SPACE MAPPING IN KERNEL MODE
060554  012737  000000  100000  15$:    MOV     #0,@#100000     ;CLEAR LOCATION 100000
060562  005437  100000                  NEG     @#100000        ;NEGATE ZERO, USE NEG.20, GOTO EXC.10
060566  105437  100001                  NEGB    @#100001        ;NEGATE UPPER BYTE OF 100000
                                                                ;USE SHR.10, GOTO EXC.10
060572  005537  100000                  ADC     @#100000        ;ADD CARRY BIT TO ADRS 100000
                                                                ;USE EXC.00, GOTO EXC.10
060576  040514                  19$:    BIC     R5,(R4)         ;DISABLE KERNEL D-SPACE MAPPING
060600  012737  060164  001112          MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST


                                        ;;**************************************************************************
                                        ;*TEST 73       ENABLE KERNEL D-SPACE AND SEE THAT I-SPACE IS NOT FORCED
                                        ;*
                                        ;*      THIS TEST SHOWS THAT I-SPACE IS NOT FORCED IF THE REGISTER
                                        ;*      FIELD IS NOT 7 BUT THE OTHER CONDITIONS ARE STILL MET.
                                        ;*
                                        ;*      ALL ERRORS FOUND IN THIS TEST ARE REPORTED WHEN THE C.P.U.
                                        ;*      ABORTS THRU 'MMVEC' TO SUBROUTINE 'NODSPAC''.  THIS SUBROUTINE
                                        ;*      WILL REPORT THAT D-SPACE WAS NOT ENABLED PROPERLY.
                                        ;*
                                        ;;**************************************************************************
060606                          TST73:
                                        SCOPE
060606  000004
060610  012737  061110  001316          MOV     #TST74,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
                                                                ;TEST FOR ESCAPE ON PARITY ERRORS
060616  012737  077406  172310  20$:    MOV     #77406,KIPDR4   ;MAKE KERNEL I PAGE 4 200 BLOCKS, R/W
060624  012737  001000  172350          MOV     #1000,KIPAR4    ;MAP KERNEL I PAGE 4 TO 16K
060632  012737  077406  172320          MOV     #77406,KDPDR0   ;MAKE KERNEL D PAGE 0 200 BLOCKS R/W
060640  012737  077406  172322          MOV     #77406,KDPDR1   ;MAKE KERNEL D PAGE 1 200 BLOCKS R/W
060646  012737  077406  172330          MOV     #77406,KDPDR4   ;MAKE KERNEL D PAGE 4 200 BLOCKS R/W
060654  012737  077400  172324          MOV     #77400,KDPDR2   ;MAKE KERNEL D PAGE 2 NON-RESIDENT
060662  012737  077400  172326          MOV     #77400,KDPDR3   ;MAKE KERNEL D PAGE 3 NON-RESIDENT
060670  012737  000000  172360          MOV     #000,KDPAR0     ;MAP KERNEL D PAGE 0 TO PHYSICAL 0
060676  012737  001000  172370          MOV     #1000,KDPAR4    ;MAP KERNEL D PAGE 4 TO 16K
```

```
8195  060704  012737  077406  172336          MOV     #77406,KDPDR7   ;MAP KERNEL D PAGE 7 TO 200 BLOCKS R/W
8196  060712  012737  177600  172376          MOV     #177600,KDPAR7  ;MAP KERNEL D PAGE 7 TO I/O PAGE
8197  060720  012704  172516                  MOV     #MMR3,R4        ;PUT ADDRS OF MMR3 IN R4
8198  060724  012705  000004                  MOV     #BIT2,R5        ;PUT KERNEL D-SPACE ENABLE BIT INTO R5
8199  060730  012700  100000                  MOV     #100000,R0      ;LOAD ADDRESS 100000 INTO R0
8200  060734  012737  100000  100000          MOV     #100000,@#100000 ;LOAD ADDRESS 100000 WITH 100000
8201  060742  012737  100000  100002          MOV     #100000,@#100002 ;LOAD ADDRESS 100002 WITH 100000
8202  060750  105037  172310                  CLRB    KIPDR4          ;MAKE KERNEL I PAGE 4 NON-RESIDENT
8203  060754  012737  060762  001112          MOV     #11$,$LPERR     ;SET LOOP ON ERROR POINTER TO 11$
8204                                  ;;
8205                                  ;*      TEST THAT 'ROM OUT13'' COMES UP WHEN SRCM = 1, 2, OR 3.
8206                                  ;*      IN THIS CASE SRCF = -7.
8207                                  ;;
8208  060762  012700  100000          11$:    MOV     #100000,R0      ;LOAD ADDRESS 100000 INTO R0
8209  060766  050514                          BIS     R5,(R4)         ;ENABLE D-SPACE MAPPING IN KERNEL MODE
8210  060770  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
8211  060772  011001                          MOV     (R0),R1         ;USE S13.00, SOURCE MODE IS 1
8212  060774  012001                          MOV     (R0)+,R1        ;USE S13.01, SOURCE MODE IS 2
8213  060776  013001                          MOV     @(R0)+,R1       ;USE S13.01, SOURCE MODE IS 3
8214  061000  040514                          BIC     R5,(R4)         ;DISABLE KERNEL D-SPACE MAPPING
8215                                  ;;
8216                                  ;*      TEST THAT 'ROM OUT14'' COMES UP WHEN DSTM = 1, OR 2.
8217                                  ;*      THIS IS ANDED WITH DSTF = -7 AND NOT(MTP + MFP).
8218                                  ;;
8219  061002  012737  061010  001112          MOV     #12$,$LPERR     ;SET LOOP ON ERROR POINTER TO 12$
8220  061010  012700  100000          12$:    MOV     #100000,R0      ;LOAD ADDRESS 100000 INTO R0
8221  061014  050514                          BIS     R5,(R4)         ;ENABLE D-SPACE MAPPING IN KERNEL MODE
8222  061016  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
8223  061020  005710                          TST     (R0)            ;USE D12.00, GOTO D12.10
8224                                                                  ;(INST. IS DAC * DM1)
8225  061022  005720                          TST     (R0)+           ;USE D12.01, GOTO D12.10
8226                                                                  ;(INST IS DAC * DM2)
8227  061024  021010                          CMP     (R0),(R0)       ;USE D12.80, GOTO D12.60
8228                                                                  ;(INST IS BIN * DM1)
8229  061026  122020                          CMPB    (R0)+,(R0)+     ;USE D12.90, GOTO D12.60
8230                                                                  ;(INST IS BIN * DM2)
8231  061030  040514                          BIC     R5,(R4)         ;DISABLE KERNEL D-SPACE MAPPING
8232                                  ;;
8233                                  ;*      TEST THAT 'ROM OUT15'' COMES UP WHEN DSTM = 3.
8234                                  ;*      THIS IS ANDED WITH DSTF = -7.
8235                                  ;;
8236  061032  012737  061040  001112          MOV     #13$,$LPERR     ;SET LOOP ON ERROR POINTER TO 13$
8237  061040  112737  000006  172310  13$:    MOVB    #006,KIPDR4     ;MAKE KERNEL I-SPACE PAGE 4 RESIDENT
8238  061046  012700  100000                  MOV     #100000,R0      ;LOAD ADDRESS 100000 INTO R0
8239  061052  105037  172310                  CLRB    KIPDR4          ;MAKE KERNEL I PAGE 4 NON-RESIDENT
8240  061056  050514                          BIS     R5,(R4)         ;ENABLE D-SPACE MAPPING IN KERNEL MODE
8241  061060  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
8242  061062  005030                          CLR     @(R0)+          ;USE D30.00, GOTO D30.10
8243  061064  012730  100000                  MOV     #100000,@(R0)+  ;USE D30.80, GOTO D30.10
8244  061070  012710  100001                  MOV     #100001,(R0)    ;LOAD ODD ADDRESS INTO LOCATION OF R0
8245  061074  112730  000200                  MOVB    #200,@(R0)+     ;USE D30.90, GOTO D30.10
8246  061100  040514                  19$:    BIC     R5,(R4)         ;DISABLE KERNEL D-SPACE MAPPING
8247  061102  012737  060616  001112          MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
8248
8249
8250
```

```
                                ;;*****************************************************************
                                ;*TEST 74       PROPER ENABLING OF SUPERVISOR D-SPACE
                                ;*
                                ;*      THIS TEST SHOWS THE PROPER FUNCTIONING OF SUPERVISOR D-SPACE.
                                ;*      BOTH 'SSRB I SPACEA L' AND 'SSRB I SPACEB L' ARE ASSERTED
                                ;*      DURING THIS TEST FORCING I-SPACE.
                                ;*
                                ;*      ALL ERRORS FOUND IN THIS TEST ARE REPORTED WHEN THE C.P.U.
                                ;*      ABORTS THRU 'MMVEC' TO SUBROUTINE 'NODSPAC'.  THIS SUBROUTINE
                                ;*      WILL REPORT THAT D-SPACE WAS NOT ENABLED PROPERLY.
                                ;*
                                ;;*****************************************************************
061110                          TST74:
061110  000004                        SCOPE
061112  012737  061562  001316        MOV     #TST75,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
                                                                ;TEST FOR ESCAPE ON PARITY ERRORS
061120  012700  077406          20$:  MOV     #77406,R0       ;MAKE THE NEXT FEW PAGES 4K, R/W, UP
061124  010037  172200                MOV     R0,SIPDR0       ;SUPERVISOR I-SPACE PAGE 0
061130  010037  172202                MOV     R0,SIPDR1       ;SUPERVISOR I-SPACE PAGE 1
061134  010037  172204                MOV     R0,SIPDR2       ;SUPERVISOR I-SPACE PAGE 2
061140  010037  172206                MOV     R0,SIPDR3       ;SUPERVISOR I-SPACE PAGE 3
061144  010037  172210                MOV     R0,SIPDR4       ;SUPERVISOR I-SPACE PAGE 4
061150  010037  172216                MOV     R0,SIPDR7       ;SUPERVISOR I-SPACE PAGE 7
061154  010037  172220                MOV     R0,SDPDR0       ;SUPERVISOR D-SPACE PAGE 0
061160  010037  172222                MOV     R0,SDPDR1       ;SUPERVISOR D-SPACE PAGE 1
061164  010037  172230                MOV     R0,SDPDR4       ;SUPERVISOR D-SPACE PAGE 4
061170  010037  172236                MOV     R0,SDPDR7       ;SUPERVISOR D-SPACE PAGE 7
061174  105000                        CLRB    R0              ;MAKE THE NEXT TWO PAGES NON-RESIDENT
061176  010037  172224                MOV     R0,SDPDR2       ;SUPERVISOR D-SPACE PAGE 2
061202  010037  172226                MOV     R0,SDPDR3       ;SUPERVISOR D-SPACE PAGE 3
061206  012737  000000  172240        MOV     #000,SIPAR0     ;MAP SUPER I-SPACE PAGE 0 TO PHY 0
061214  012737  000200  172242        MOV     #200,SIPAR1     ;MAP SUPER I-SPACE PAGE 1 TO 4K - 8K
061222  012737  000400  172244        MOV     #400,SIPAR2     ;MAP SUPER I-SPACE PAGE 2 TO 8K - 12K
061230  012737  000600  172246        MOV     #600,SIPAR3     ;MAP SUPER I-SPACE PAGE 3 TO 12K - 16K
061236  012737  001000  172250        MOV     #1000,SIPAR4    ;MAP SUPER I-SPACE PAGE 4 TO 16K - 20K
061244  012737  177600  172256        MOV     #177600,SIPAR7  ;MAP SUPER I-SPACE PAGE 7 TO I/O PAGE
061252  012737  000000  172260        MOV     #000,SDPAR0     ;MAP SUPER D-SPACE PAGE 0 TO PHY 0
061260  012737  000200  172262        MOV     #200,SDPAR1     ;MAP SUPER D-SPACE PAGE 1 TO 4K - 8K
061266  012737  177600  172276        MOV     #177600,SDPAR7  ;MAP SUPER D-SPACE PAGE 7 TO I/O PAGE
061274  012704  172516                MOV     #MMR3,R4        ;PUT ADDRESS OF MMR3 IN R4
061300  012705  000002                MOV     #BIT1,R5        ;PUT ENABLE SUPERVISOR D-SPACE BIT IN R5
061304  052737  040000  177776        BIS     #40000,PSW      ;GO INTO SUPERVISOR MODE HERE
061312  105037  172210                CLRB    SIPDR4          ;MAKE I-SPACE PAGE 4 NON-RESIDENT
061316  012737  061324  001112        MOV     #10$,$LPERR     ;SET LOOP ON ERROR POINTER TO 10$
                                ;;
                                ;;      THIS SECTION CHECKS SIGNAL SPACEA FOR DISABLING D-SPACE
                                ;;
061324  050514                  10$:  BIS     R5,(R4)         ;ENABLE SUPER D-SPACE
061326  000240                        NOP                     ;THIS IS A SYNC POINT FOR SCOPING
061330  000400                        BR      1$              ;THIS INST FETCH SHOULD USE ROM OUT09
061332  040514                  1$:   BIC     R5,(R4)         ;DISABLE SUPER D-SPACE
061334  012737  061342  001112        MOV     #11$,$LPERR     ;SET LOOP ON ERROR POINTER TO 11$
061342  050514                  11$:  BIS     R5,(R4)         ;ENABLE SUPER D-SPACE
061344  000240                        NOP                     ;THIS IS A SYNC POINT FOR SCOPING
061346  017777  016426  016424        MOV     @100000,@100000 ;THIS INST USES ROM OUT09
061354  040514                        BIC     R5,(R4)         ;DISABLE SUPER D-SPACE
```

```
                                                ;THIS SECTION CHECKS SIGNAL SPACEB FOR DISABLING D-SPACE
                                                ;
                                                ;THE FOLLOWING SECTION VERIFIES THAT I-SPACE IS NOT
                                                ;FORCED DURING THE ADDRESSING CYCLES OF THE INSTRUCTIONS.
                                                ;
                                                ;**********************************************************************
                                                ;*TEST 75       PROPER ENABLING OF USER D-SPACE
                                                ;*
                                                ;*      THIS TEST SHOWS THE PROPER FUNCTIONING OF USER D-SPACE.
                                                ;*      BOTH 'SSRB I SPACEA L' AND 'SSRB I SPACEB L' ARE ASSERTED
                                                ;*      DURING THIS TEST FORCING I-SPACE.
                                                ;*
                                                ;*      ALL ERRORS FOUND IN THIS TEST ARE REPORTED WHEN THE C.P.U.
                                                ;*      ABORTS THRU 'MMVEC' TO SUBROUTINE 'NODSPAC'.  THIS SUBROUTINE
```

```
8307  061356  012737  061364  001112          MOV     #12$,$LPERR     ;SET LOOP ON ERROR POINTER TO 12$
8308  061364  050514                  12$:    BIS     R5,(R4)         ;ENABLE SUPER D-SPACE
8309  061366  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
8310  061370  005037  100000                  CLR     @#100000        ;THIS INST USES ROM OUT15 & DSTF7
8311  061374  040514                          BIC     R5,(R4)         ;DISABLE SUPER D-SPACE
8312                                  ;;
8313                                  ;;      THIS SECTION CHECKS SIGNAL SPACEB FOR DISABLING D-SPACE
8314                                  ;;
8315  061376  012737  061404  001112          MOV     #13$,$LPERR     ;SET LOOP ON ERROR POINTER TO 13$
8316  061404  050514                  13$:    BIS     R5,(R4)         ;ENABLE SUPER D-SPACE
8317  061406  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
8318  061410  013700  100000                  MOV     @#100000,R0     ;THIS INST USES ROM OUT13 & SRCF7
8319  061414  040514                          BIC     R5,(R4)         ;DISABLE SUPER D-SPACE
8320  061416  012737  061424  001112          MOV     #14$,$LPERR     ;SET LOOP ON ERROR POINTER TO 14$
8321  061424  050514                  14$:    BIS     R5,(R4)         ;ENABLE SUPER D-SPACE
8322  061426  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
8323  061430  005727  000000                  TST     #0              ;THIS INST USES ROM OUT14 & DSTF7
8324  061434  040514                          BIC     R5,(R4)         ;DISABLE SUPER D-SPACE
8325                                  ;;
8326                                  ;;      THE FOLLOWING SECTION VERIFIES THAT I-SPACE IS NOT
8327                                  ;;      FORCED DURING THE ADDRESSING CYCLES OF THE INSTRUCTIONS.
8328                                  ;;
8329  061436  012737  061444  001112          MOV     #16$,$LPERR     ;SET LOOP ON ERROR POINTER TO 16$
8330  061444  112737  000006  172210  16$:    MOVB    #006,SIPDR4     ;MAKE I-SPACE PAGE 4 RESIDENT
8331  061452  012700  100000                  MOV     #100000,R0      ;LOAD ADDRESS 100000 INTO R0
8332  061456  012737  100000  100000          MOV     #100000,@#100000 ;LOAD NO. 100000 INTO ADDRESS 100000
8333  061464  105037  172210                  CLRB    SIPDR4          ;MAKE I-SPACE PAGE 4 NON-RESIDENT
8334  061470  050514                          BIS     R5,(R4)         ;ENABLE SUPER D-SPACE
8335  061472  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
8336  061474  012730  100000                  MOV     #100000,@(R0)+  ;THIS INST USES ROM OUT15 & -DSTF7
8337  061500  040514                          BIC     R5,(R4)         ;DISABLE SUPER D-SPACE
8338  061502  012737  061510  001112          MOV     #17$,$LPERR     ;SET LOOP ON ERROR POINTER TO 17$
8339  061510  012700  100000          17$:    MOV     #100000,R0      ;LOAD ADDRESS 100000 INTO R0
8340  061514  050514                          BIS     R5,(R4)         ;ENABLE SUPER D-SPACE
8341  061516  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
8342  061520  011001                          MOV     (R0),R1         ;THIS INST USES ROM OUT13 & -SRCF7
8343  061522  040514                          BIC     R5,(R4)         ;DISABLE SUPER D-SPACE
8344  061524  012737  061532  001112          MOV     #18$,$LPERR     ;SET LOOP ON ERROR POINTER TO 18$
8345  061532  012700  100000          18$:    MOV     #100000,R0      ;LOAD ADDRESS 100000 INTO R0
8346  061536  050514                          BIS     R5,(R4)         ;ENABLE SUPER D-SPACE
8347  061540  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
8348  061542  005720                          TST     (R0)+           ;THIS INST USES ROM OUT14 & -DSTF7
8349  061544  040514                          BIC     R5,(R4)         ;DISABLE SUPER D-SPACE
8350  061546  042737  040000  177776          BIC     #40000,PSW      ;GO BACK TO KERNEL MODE
8351  061554  012737  061120  001112          MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
8352
8353
8354
8355
8356
8357
8358
8359
8360
8361
8362
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8363                                    ;*      WILL REPORT THAT D-SPACE WAS NOT ENABLED PROPERLY.
8364                                    ;*
8365                                    ;;**********************************************************************
8366  061562                            TST75:
8367  061562  000004                            SCOPE
8368  061564  012737  062234  001316            MOV     #TST76,NXTTST   ;SAVE STARTING ADDRESS OF NEXT
8369                                                                    ;TEST FOR ESCAPE ON PARITY ERRORS
8370  061572  012700  077406           20$:     MOV     #77406,R0       ;MAKE THE NEXT FEW PAGES 4K, R/W, UP
8371  061576  010037  177600                    MOV     R0,UIPDR0       ;USER I-SPACE PAGE 0
8372  061602  010037  177602                    MOV     R0,UIPDR1       ;USER I-SPACE PAGE 1
8373  061606  010037  177604                    MOV     R0,UIPDR2       ;USER I-SPACE PAGE 2
8374  061612  010037  177606                    MOV     R0,UIPDR3       ;USER I-SPACE PAGE 3
8375  061616  010037  177610                    MOV     R0,UIPDR4       ;USER I-SPACE PAGE 4
8376  061622  010037  177616                    MOV     R0,UIPDR7       ;USER I-SPACE PAGE 7
8377  061626  010037  177620                    MOV     R0,UDPDR0       ;USER D-SPACE PAGE 0
8378  061632  010037  177622                    MOV     R0,UDPDR1       ;USER D-SPACE PAGE 1
8379  061636  010037  177630                    MOV     R0,UDPDR4       ;USER D-SPACE PAGE 4
8380  061642  010037  177636                    MOV     R0,UDPDR7       ;USER D-SPACE PAGE 7
8381  061646  105000                            CLRB    R0              ;MAKE THE NEXT TWO PAGES NON-RESIDENT
8382  061650  010037  177624                    MOV     R0,UDPDR2       ;USER D-SPACE PAGE 2
8383  061654  010037  177626                    MOV     R0,UDPDR3       ;USER D-SPACE PAGE 3
8384  061660  012737  000000  177640            MOV     #000,UIPAR0     ;MAP USER I-SPACE PAGE 0 TO PHY 0
8385  061666  012737  000200  177642            MOV     #200,UIPAR1     ;MAP USER I-SPACE PAGE 1 TO 4K - 8K
8386  061674  012737  000400  177644            MOV     #400,UIPAR2     ;MAP USER I-SPACE PAGE 2 TO 8K - 12K
8387  061702  012737  000600  177646            MOV     #600,UIPAR3     ;MAP USER I-SPACE PAGE 3 TO 12K - 16K
8388  061710  012737  001000  177650            MOV     #1000,UIPAR4    ;MAP USER I-SPACE PAGE 4 TO 16K - 20K
8389  061716  012737  177600  177656            MOV     #177600,UIPAR7  ;MAP USER I-SPACE PAGE 7 TO I/O PAGE
8390  061724  012737  000000  177660            MOV     #000,UDPAR0     ;MAP USER D-SPACE PAGE 0 TO PHY 0
8391  061732  012737  000200  177662            MOV     #200,UDPAR1     ;MAP USER D-SPACE PAGE 1 TO 4K - 8K
8392  061740  012737  177600  177676            MOV     #177600,UDPAR7  ;MAP USER D-SPACE PAGE 7 TO I/O PAGE
8393  061746  012704  172516                    MOV     #MMR3,R4        ;PUT ADDRESS OF MMR3 IN R4
8394  061752  012705  000001                    MOV     #BIT0,R5        ;PUT ENABLE USER D-SPACE BIT IN R5
8395  061756  052737  140000  177776            BIS     #140000,PSW     ;GO INTO USER MODE HERE
8396  061764  105037  177610                    CLRB    UIPDR4          ;MAKE I-SPACE PAGE 4 NON-RESIDENT
8397  061770  012737  061776  001112            MOV     #10$,$LPERR     ;SET LOOP ON ERROR POINTER TO 10$
8398  061776  050514                 10$:       BIS     R5,(R4)         ;ENABLE USER D-SPACE
8399  062000  000240                            NOP                     ;THIS IS A SYNC POINT FOR SCOPING
8400  062002  000400                            BR      1$              ;THIS INST FETCH SHOULD USE ROM OUT09
8401  062004  040514                 1$:        BIC     R5,(R4)         ;DISABLE USER D-SPACE
8402  062006  012737  062014  001112            MOV     #11$,$LPERR     ;SET LOOP ON ERROR POINTER TO 11$
8403  062014  050514                 11$:       BIS     R5,(R4)         ;ENABLE USER D-SPACE
8404  062016  000240                            NOP                     ;THIS IS A SYNC POINT FOR SCOPING
8405  062020  017777  015754  015752            MOV     @100000,@100000 ;THIS INST USES ROM OUT09
8406  062026  040514                            BIC     R5,(R4)         ;DISABLE USER D-SPACE
8407  062030  012737  062036  001112            MOV     #12$,$LPERR     ;SET LOOP ON ERROR POINTER TO 12$
8408  062036  050514                 12$:       BIS     R5,(R4)         ;ENABLE USER D-SPACE
8409  062040  000240                            NOP                     ;THIS IS A SYNC POINT FOR SCOPING
8410  062042  005037  100000                    CLR     @#100000        ;THIS INST USES ROM OUT15 & DSTF7
8411  062046  040514                            BIC     R5,(R4)         ;DISABLE USER D-SPACE
8412                                  ;;
8413                                  ;;      THIS SECTION CHECKS SIGNAL SPACEA FOR DISABLING D-SPACE
8414                                  ;;
8415  062050  012737  062056  001112            MOV     #13$,$LPERR     ;SET LOOP ON ERROR POINTER TO 13$
8416  062056  050514                 13$:       BIS     R5,(R4)         ;ENABLE USER D-SPACE
8417  062060  000240                            NOP                     ;THIS IS A SYNC POINT FOR SCOPING
8418  062062  013700  100000                    MOV     @#100000,R0     ;THIS INST USES ROM OUT13 & SRCF7
```

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8419  062066  040514                          BIC     R5,(R4)          ;DISABLE USER D-SPACE
8420  062070  012737  062076  001112          MOV     #14$,$LPERR      ;SET LOOP ON ERROR POINTER TO 14$
8421  062076  050514                  14$:    BIS     R5,(R4)          ;ENABLE USER D-SPACE
8422  062100  000240                          NOP                      ;THIS IS A SYNC POINT FOR SCOPING
8423  062102  005727  000000                  TST     #0               ;THIS INST USES ROM OUT14 & DSTF7
8424  062106  040514                          BIC     R5,(R4)          ;DISABLE USER D-SPACE
8425                                  ;;
8426                                  ;;      THIS SECTION OF CODE CHECKS TO BE SURE THAT I-SPACE IS NOT
8427                                  ;;      FORCED DURING ADDRESSING CYCLES OF INSTRUCTIONS
8428                                  ;;
8429  062110  012737  062116  001112          MOV     #16$,$LPERR      ;SET LOOP ON ERROR POINTER TO 16$
8430  062116  112737  000006  177610  16$:    MOVB    #006,UIPDR4      ;MAKE I-SPACE PAGE 4 RESIDENT
8431  062124  012700  100000                  MOV     #100000,R0       ;LOAD ADDRESS 100000 INTO R0
8432  062130  012737  100000  100000          MOV     #100000,@#100000 ;LOAD NO. 100000 INTO ADDRESS 100000
8433  062136  105037  177610                  CLRB    UIPDR4           ;MAKE I-SPACE PAGE 4 NON-RESIDENT
8434  062142  050514                          BIS     R5,(R4)          ;ENABLE USER D-SPACE
8435  062144  000240                          NOP                      ;THIS IS A SYNC POINT FOR SCOPING
8436  062146  012730  100000                  MOV     #100000,@(R0)+   ;THIS INST USES ROM OUT15 & -DSTF7
8437  062152  040514                          BIC     R5,(R4)          ;DISABLE USER D-SPACE
8438  062154  012737  062162  001112          MOV     #17$,$LPERR      ;SET LOOP ON ERROR POINTER TO 17$
8439  062162  012700  100000          17$:    MOV     #100000,R0       ;LOAD ADDRESS 100000 INTO R0
8440  062166  050514                          BIS     R5,(R4)          ;ENABLE USER D-SPACE
8441  062170  000240                          NOP                      ;THIS IS A SYNC POINT FOR SCOPING
8442  062172  011001                          MOV     (R0),R1          ;THIS INST USES ROM OUT13 & -SRCF7
8443  062174  040514                          BIC     R5,(R4)          ;DISABLE USER D-SPACE
8444  062176  012737  062204  001112          MOV     #18$,$LPERR      ;SET LOOP ON ERROR POINTER TO 18$
8445  062204  012700  100000          18$:    MOV     #100000,R0       ;LOAD ADDRESS 100000 INTO R0
8446  062210  050514                          BIS     R5,(R4)          ;ENABLE USER D-SPACE
8447  062212  000240                          NOP                      ;THIS IS A SYNC POINT FOR SCOPING
8448  062214  005720                          TST     (R0)+            ;THIS INST USES ROM OUT14 & -DSTF7
8449  062216  040514                          BIC     R5,(R4)          ;DISABLE USER D-SPACE
8450  062220  042737  140000  177776          BIC     #140000,PSW      ;GO BACK TO KERNEL MODE
8451  062226  012737  061572  001112          MOV     #20$,$LPERR      ;SET LOOP POINTER TO START OF TEST
8452
8453
8454                                  ;;**********************************************************************
8455                                  ;*TEST 76        TRAPPING IN D-SPACE KERNEL MODE
8456                                  ;*
8457                                  ;*      THIS TEST VERIFIES THAT THE ABORT VECTOR IS TAKEN FROM D-SPACE
8458                                  ;*      AND NOT I-SPACE.  THE I-SPACE VECTOR POINTS TO 10$, AND
8459                                  ;*      THE D-SPACE VECTOR POINTS TO 15$.  EACH PSW IN VIRTUAL 252 IS
8460                                  ;*      DIFFERENT SO THE PROGRAM CAN TELL WHICH AREA IT IS PICKED
8461                                  ;*      UP FROM.
8462                                  ;;**********************************************************************
8463  062234                          TST76:
8464  062234  000004                          SCOPE
8465  062236  012737  062502  001316          MOV     #TST77,NXTTST    ;SAVE STARTING ADDRESS OF NEXT
8466                                                                   ;TEST FOR ESCAPE ON PARITY ERRORS
8467  062244  104416                          TBITO                    ;MAKE SURE T-BIT IS OFF FOR THIS TEST
8468  062246  012737  062304  001112  20$:    MOV     #1$,$LPERR       ;SET LOOP ON ERROR POINTER TO 1$
8469  062254  012737  062356  000250          MOV     #10$,@#250       ;SET M.M.VEC TO HOLD BAD VECTOR
8470  062262  012737  000000  000252          MOV     #000,@#252       ;PROC. STAT. IN 252 HAS PRIORITY OF ZERO
8471  062270  012737  062364  000350          MOV     #15$,@#350       ;D-SPACE M.M.VECTOR IS AT 350
8472  062276  012737  000340  000352          MOV     #340,@#352       ;PRIORITY FOR D-SPACE VECTOR IS 7
8473  062304  012706  001000          1$:     MOV     #1000,KSP        ;SET UP KERNEL VECTOR
8474  062310  042737  177776  177572          BIC     #177776,MMR0     ;CLEAR ALL ERROR BITS IN MMR0
```

```
8475                                        ;       NOW SET UP FOR AN ABORT IN KERNEL MODE D-SPACE ENABLED
8476                                        ;
8477  062316  012737  077402  172330        MOV     #77402,KDPDR4   ;KERNEL D-SPACE PAGE 4 IS READ ONLY
8478  062324  012737  001000  172370        MOV     #1000,KDPAR4    ;MAP D-SPACE PAGE 4 TO 16K
8479  062332  052737  000004  172516        BIS     #BIT2,MMR3      ;ENABLE KERNEL D-SPACE MAPPING
8480  062340  012737  000001  172360        MOV     #1,KDPAR0       ;MAP KERNEL D PAGE 0 TO 000100
8481  062346  000240                        NOP                     ;THIS IS A SYNC POINT FOR SCOPING
8482  062350  012737  177777  100000        MOV     #-1,@#100000    ;TRY TO WRITE TO PAGE 4
8483  062356  013700  177776        10$:    MOV     PSW,R0          ;SAVE PROC. STAT. FOR COMPARE
8484  062362  000402                        BR      16$             ;BRANCH TO D-SPACE READ CODE
8485  062364  013700  177776        15$:    MOV     PSW,R0          ;SAVE PROC. STAT FOR COMPARE
8486  062370  005037  172360        16$:    CLR     KDPAR0          ;RE-MAP KERNEL D PAGE 0 TO PHYSICAL 0
8487  062374  012706  001100                MOV     #KERSTK,KSP     ;RE-SET STACK POINTER AFTER D-SPACE
8488                                                                ;ABORT.
8489  062400  013737  177572  001250        MOV     MMR0,PMMR0      ;SAVE MMR0 FOR COMPARE
8490  062406  013737  177574  001252        MOV     MMR1,PMMR1      ;SAVE MMR1 FOR COMPARE
8491  062414  013737  177576  001254        MOV     MMR2,PMMR2      ;SAVE MMR2 FOR COMPARE
8492  062422  122700  000340                CMPB    #340,R0         ;DID YOU PICK UP THE CORRECT PSW
8493  062426  001401                        BEQ     2$              ;BRANCH IF PSW IS 340
8494  062430  104130                        ERROR   130             ;WRONG PSW PICKED UP IN ABORT SEQUENCE
8495  062432  022737  020031  001250  2$:   CMP     #020031,PMMR0   ;EXPECTING READ ONLY ABORT
8496                                                                ;KERNEL MODE, D-SPACE, PAGE 4
8497  062440  001401                        BEQ     3$              ;BRANCH IF CONDITION IS CORRECT
8498  062442  104131                        ERROR   131             ;WRONG M.M. ABORT CONDITION
8499  062444  042737  177776  177572  3$:   BIC     #177776,MMR0    ;CLEAR MMR0 FOR EXIT OF TEST
8500  062452  042737  000004  172516        BIC     #BIT2,MMR3      ;TURN OFF KERNEL D-SPACE ENABLE
8501  062460  012737  032226  000250        MOV     #MMTRAP,MMVEC   ;RESTORE NORMAL M.M. TRAP VECTOR
8502  062466  012737  000340  000252        MOV     #340,MMVEC+2    ;PRIORITY EQUALS 7
8503  062474  012737  062246  001112        MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
8504
8505
8506                                        .SBTTL  ************ ENTRY POINT 7 --- STARTING ADDRESS 230 ************
8507                                        .SBTTL  ********** A & W BIT LOGIC TEST AND DUAL MAPPING TESTS *********
8508                                        ;*
8509                                        ;*      THIS GROUP OF TESTS CHECKS OUT THE A-BIT AND W-BIT LOGIC ON
8510                                        ;*      'SAPD' AND THEN USES THAT LOGIC TO VERIFY THAT THERE IS NO
8511                                        ;*      DUAL MAPPING OF PAR/PDR PAIRS BETWEEN GROUPS OR INSIDE A GROUP.
8512                                        ;*      ALL A-BITS AND W-BITS ARE SET TO ENSURE THAT THERE ISN'T A BAD
8513                                        ;*      CHIP IN THE PDR'S.
8514                                        ;*
8515
8516
8517                                        ;;*********************************************************************
8518                                        ;*TEST 77       TEST A-BIT AND W-BIT LOGIC
8519                                        ;*
8520                                        ;*      THIS TEST CHECKS ALL THE LOGIC FOR THE A-BIT AND W-BIT ON
8521                                        ;*      'SAPD'.  THE BITS ARE SET ONE AT A TIME THEN A REFERENCE
8522                                        ;*      TO THAT PAGE CAUSING AN ABORT IS MADE TO SEE IF THE BIT REMAINS
8523                                        ;*      SET.  LAST EITHER THE PAR OR PDR IS WRITTEN TO SEE THAT THE
8524                                        ;*      BITS ARE CLEARED DURING A PAR OR PDR LOAD.
8525                                        ;*
8526                                        ;;*********************************************************************
8527  062502                                TST77:
8528  062502  000004                                SCOPE
8529  062504  012737  063314  001316                MOV     #TST100,NXTTST  ;SAVE STARTING ADDRESS OF NEXT
8530                                                                        ;TEST FOR ESCAPE ON PARITY ERRORS
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8531  062512  104420                          TBITR                   ;RESTORE THE T-BIT TO ITS CONDITION
8532                                                                  ;BEFORE THE LAST TEST.
8533  062514                          ENTPT7:
8534  062514  012737  062654  001110          MOV     #20$,$LPADR     ;SET LOOP ADDRESS POINTER TO 20$
8535  062522  012737  062654  001112          MOV     #20$,$LPERR     ;SET LOOP ON ERROR POINTER TO 20$
8536  062530  012737  000077  001102          MOV     #77,$TSTNM      ;LOAD TEST NUMBER INTO MEMORY
8537  062536  013737  001102  177570          MOV     $TSTNM,DISPLAY  ;DISPLAY TEST NUMBER FOR THIS TEST
8538  062544  012737  077406  172300          MOV     #77406,KIPDR0   ;MAKE KERNEL I PAGE 0 200 BLOCKS, R/W
8539  062552  012737  077406  172302          MOV     #77406,KIPDR1   ;MAKE KERNEL I PAGE 1 200 BLOCKS, R/W
8540  062560  012737  077406  172304          MOV     #77406,KIPDR2   ;MAKE KERNEL I PAGE 2 200 BLOCKS, R/W
8541  062566  012737  077406  172306          MOV     #77406,KIPDR3   ;MAKE KERNEL I PAGE 3 200 BLOCKS, R/W
8542  062574  012737  077406  172316          MOV     #77406,KIPDR7   ;MAKE KERNEL I PAGE 7 200 BLOCKS, R/W
8543  062602  012737  000000  172340          MOV     #000,KIPAR0     ;MAP KERNEL I PAGE 0 TO 0 - 4K
8544  062610  012737  000200  172342          MOV     #200,KIPAR1     ;MAP KERNEL I PAGE 1 TO 4K - 8K
8545  062616  012737  000400  172344          MOV     #400,KIPAR2     ;MAP KERNEL I PAGE 2 TO 8K - 12K
8546  062624  012737  000600  172346          MOV     #600,KIPAR3     ;MAP KERNEL I PAGE 3 TO 12K - 16K
8547  062632  012737  177600  172356          MOV     #177600,KIPAR7  ;MAP KERNEL I PAGE 7 TO THE I/O PAGE
8548  062640  012737  000001  177572          MOV     #BIT0,MMR0      ;ENABLE 18-BIT RELOCATION IF NOT ON
8549  062646  012737  000020  172516          MOV     #BIT4,MMR3      ;ENABLE 22-BIT RELOCATION IF NOT ON
8550                                          .EQUIV  BIT6,WBIT       ;LABEL 'WBIT' IS EQUIVALENT TO BIT 6
8551                                          .EQUIV  BIT7,ABIT       ;LABEL 'ABIT' IS EQUIVALENT TO BIT 7
8552  062654  012737  000006  172310  20$:    MOV     #00006,KIPDR4   ;PAGE 4 HAS A PAGE LENGTH OF 1
8553  062662  012737  001000  172350          MOV     #1000,KIPAR4    ;MAP PAGE 4 TO 16K
8554  062670  012737  063304  000250          MOV     #10$,MMVEC      ;SET M.M. TRAP VECTOR TO 10$
8555  062676  012737  062704  001112          MOV     #11$,$LPERR     ;SET LOOP ON ERROR POINTER TO 11$
8556  062704  000240                  11$:    NOP                     ;THIS IS A SYNC POINT FOR SCOPING
8557  062706  012737  012345  100000  1$:     MOV     #12345,@#100000 ;WRITE INTO PAGE 4
8558  062714  013737  172310  001172          MOV     KIPDR4,$TMP0    ;READ PDR 4 TO CHECK W-BIT
8559  062722  032737  000100  001172          BIT     #WBIT,$TMP0     ;SEE IF W-BIT IS SET
8560  062730  001001                          BNE     2$              ;BRANCH IF W-BIT IS SET
8561  062732  104102                          ERROR   102             ;W-BIT NOT SET
8562  062734  012737  062742  001112  2$:     MOV     #12$,$LPERR     ;SET LOOP ON ERROR POINTER TO 12$
8563  062742  000240                  12$:    NOP                     ;THIS IS A SYNC POINT FOR SCOPING
8564  062744  012737  012345  100100          MOV     #12345,@#100100 ;WRITE INTO PAGE 4, BLOCK 2
8565  062752  013737  172310  001172          MOV     KIPDR4,$TMP0    ;READ PDR 4TO SEE IF W-BIT REMAINED SET
8566  062760  032737  000100  001172          BIT     #WBIT,$TMP0     ;SEE IF W-BIT REMAINED SET
8567  062766  001001                          BNE     3$              ;BRANCH IF W-BIT IS SET
8568  062770  104103                          ERROR   103             ;W-BIT DID NOT REMAIN SET
8569  062772  012737  063000  001112  3$:     MOV     #13$,$LPERR     ;SET LOOP ON ERROR POINTER TO 13$
8570  063000  000240                  13$:    NOP                     ;THIS IS A SYNC POINT FOR SCOPING
8571  063002  112737  000004  172310          MOVB    #004,KIPDR4     ;CHANGE PAGE 4'S ACCESS CONTROL FIELD
8572  063010  013737  172310  001172          MOV     KIPDR4,$TMP0    ;READ PDR 4 TO CHECK W-BIT CLEARING
8573  063016  022737  000004  001172          CMP     #00004,$TMP0    ;SEE IF W-BIT GOT CLEARED ON PDR WRITE
8574  063024  001401                          BEQ     4$              ;BRANCH IF W-BIT GOT CLEARED
8575  063026  104104                          ERROR   104             ;W-BIT DIDN'T GET CLEARED ON PDR WRITE
8576  063030  012737  063036  001112  4$:     MOV     #14$,$LPERR     ;SET LOOP ON ERROR POINTER TO 14$
8577  063036  052737  001000  177572  14$:    BIS     #BIT9,MMR0      ;ENABLE M.M. TRAPS
8578  063044  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
8579  063046  013700  100000                  MOV     @#100000,R0     ;READ FROM PAGE 4, BLOCK 1
8580  063052  013737  172310  001172          MOV     KIPDR4,$TMP0    ;READ PDR 4 TO CHECK A-BIT
8581  063060  032737  000200  001172          BIT     #ABIT,$TMP0     ;SEE IF A-BIT WAS SET DURING READ
8582  063066  001001                          BNE     5$              ;BRANCH IF A-BIT WAS SET
8583  063070  104105                          ERROR   105             ;A-BIT DIDN'T GET SET
8584  063072  012737  063100  001112  5$:     MOV     #15$,$LPERR     ;SET LOOP ON ERROR POINTER TO 15$
8585  063100  052737  001000  177572  15$:    BIS     #BIT9,MMR0      ;ENABLE M.M. TRAPS
8586  063106  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
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8587  063110  013700  100100                  MOV     @#100100,R0     ;READ FROM PAGE 4, BLOCK 2
8588  063114  013737  172310  001172          MOV     KIPDR4,$TMP0    ;READ PDR 4 TO SEE IF A-BIT REMAINED SET
8589  063122  032737  000200  001172          BIT     #ABIT,$TMP0     ;SEE IF A-BIT IS STILL SET
8590  063130  001001                          BNE     6$              ;BRANCH IF A-BIT IS STILL SET
8591  063132  104106                          ERROR   106             ;A-BIT DIDN'T REMAIN SET
8592  063134  012737  063142  001112  6$:     MOV     #16$,$LPERR     ;SET LOOP ON ERROR POINTER TO 16$
8593  063142  000240                  16$:    NOP                     ;THIS IS A SYNC POINT FOR SCOPING
8594  063144  012737  001000  172350          MOV     #1000,KIPAR4    ;WRITE PAR 4 TO SEE IF A-BIT CLEARS
8595  063152  013737  172310  001172          MOV     KIPDR4,$TMP0    ;READ PDR 4 TO CHECK A-BIT
8596  063160  022737  000004  001172          CMP     #00004,$TMP0    ;SEE IF A-BIT IS CLEAR
8597  063166  001401                          BEQ     7$              ;BRANCH IF A-BIT IS CLEAR
8598  063170  104107                          ERROR   107             ;A-BIT DIDN'T CLEAR ON PAR WRITE
8599  063172  012737  063200  001112  7$:     MOV     #17$,$LPERR     ;SET LOOP ON ERROR POINTER TO 17$
8600  063200  000240                  17$:    NOP                     ;THIS IS A SYNC POINT FOR SCOPING
8601  063202  012737  123456  170200          MOV     #123456,MAPL0   ;LOAD A MAP REGISTER TO CHECK 'INT REG'
8602  063210  013737  172316  001172          MOV     KIPDR7,$TMP0    ;READ PDR 7 TO CHECK W-BIT
8603  063216  032737  000100  001172          BIT     #WBIT,$TMP0     ;SEE IF W-BIT SET ON MAP REGISTER WRITE
8604  063224  001001                          BNE     8$              ;BRANCH IF W-BIT WAS SET
8605  063226  104110                          ERROR   110             ;W-BIT DID NOT GET SET
8606  063230  012737  063236  001112  8$:     MOV     #18$,$LPERR     ;SET LOOP ON ERROR POINTER TO 18$
8607  063236  000240                  18$:    NOP                     ;THIS IS A SYNC POINT FOR SCOPING
8608  063240  012737  077406  172310          MOV     #77406,KIPDR4   ;LOAD AN INTERNAL REGISTER, SHOULDN'T
8609                                                                  ;AFFECT PAGE 7'S W-BIT
8610  063246  013737  172316  001172          MOV     KIPDR7,$TMP0    ;READ PDR 7 TO CHECK W-BIT AGAIN
8611  063254  032737  000100  001172          BIT     #WBIT,$TMP0     ;SEE IF W-BIT IS STILL SET
8612  063262  001001                          BNE     9$              ;BRANCH IF W-BIT IS STILL SET
8613  063264  104111                          ERROR   111             ;W-BIT NOT SET AFTER WRITING PDR 4
8614  063266  012737  062654  001112  9$:     MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
8615  063274  012737  032226  000250          MOV     #MMTRAP,MMVEC   ;RESTORE NORMAL M.M. TRAP ROUTINE
8616  063302  000404                          BR      TST100          ;;BRANCH TO NEXT TEST
8617
8618  063304  042737  177776  177572  10$:    BIC     #177776,MMR0    ;CLEAR MMR0 FOR NEXT READ OR WRITE
8619  063312  000002                          RTI                     ;RETURN TO TEST AND CHECK A OR W BIT
8620
8621
8622                                  ;*
8623                                  ;*      THESE NEXT SIX (6) TESTS USE A.C.F. = 5 (TRAP ON WRITE) TO
8624                                  ;*      TEST ALL A & W BITS.  THE TESTS ALSO CHECK FOR DUAL MAPPING
8625                                  ;*      AMONG GROUPS OR INSIDE A GROUP OF PAR/PDR'S.  THIS IS DONE BY
8626                                  ;*      WRITING ONLY ONE PAGE IN A MODE OF OPERATION THEN CHECKING ALL
8627                                  ;*      PDR'S TO SEE THAT ONLY THE ONE UNDER TEST HAS BOTH ITS A & W
8628                                  ;*      BITS SET.  THIS TEST IS RUN IN ALL MODES, WITH D-SPACE DISABLED
8629                                  ;*      AND THEN AGAIN WITH D-SPACE ENABLED, SO THAT ALL THE REGISTER
8630                                  ;*      PAIRS ARE TESTED.
8631                                  ;*
8632                                  ;;*****************************************************************
8633                                  ;*TEST 100      DUAL MAPPING KERNEL MODE I-SPACE
8634                                  ;*
8635                                  ;*      THIS TEST STARTS BY LOADING ALL THE P.D.R.'S WITH 77405
8636                                  ;*      (4K PAGE,TRAP ON WRITE).  THEN THE VIRTUAL ADDRESS IS SET TO
8637                                  ;*      010200 AND THAT WORD IS WRITTEN INTO ITSELF.  THIS WRITE WILL
8638                                  ;*      SATISFY THE TRAP CONDITION OF THE A.C.F. (BUT IT WILL NOT TRAP
8639                                  ;*      SINCE BIT09 OF MMR0 IS CLEAR) AND SET BOTH THE A & W BITS IN
8640                                  ;*      THE KERNEL I-SPACE P.D.R. UNDER TEST.  NOW ALL OF THE
8641                                  ;*      P.D.R.'S ARE COMPARED WITH 77705 AND ANY THAT MATCH, EXCEPT THE
8642                                  ;*      ONE THAT IS UNDER TEST, ARE REPORTED AS DUAL MAPPING ERRORS.
```

```
                                        ;*      WHEN THE I/O PAGE IS REACHED THE VIRTUAL ADDRESS GENERATES THE
                                        ;*      ADDRESS OF 'MAPL00'' (17770200) WHICH SHOULD ALWAYS EXIST.
                                        ;*
                                        ;**************************************************************************
063314                                  TST100:
063314  000004                                SCOPE
063316  012737  064540  001316                MOV     #TST101,NXTTST  ;SAVE STARTING ADDRESS OF NEXT
                                                                        ;TEST FOR ESCAPE ON PARITY ERRORS
                                        ;       THE FOLLOWING  CODE IS USED TO INITIALIZE THE PAR'S FOR
                                        ;       THE NEXT TESTS, SO THAT THE CODE WILL RUN WITH MEMORY
                                        ;       MANAGEMENT FULLY ENABLED.
                                        ;
063324  012737  000000  172340                MOV     #0,KIPAR0       ;
063332  012737  000200  172342                MOV     #200,KIPAR1     ;
063340  012737  000400  172344                MOV     #400,KIPAR2     ;
063346  012737  000600  172346                MOV     #600,KIPAR3     ;
063354  012737  001000  172350                MOV     #1000,KIPAR4    ;
063362  012737  001000  172352                MOV     #1000,KIPAR5    ;
063370  012737  001000  172354                MOV     #1000,KIPAR6    ;
063376  012737  177600  172356                MOV     #177600,KIPAR7  ;
063404  012737  000000  172360                MOV     #0,KDPAR0       ;
063412  012737  000200  172362                MOV     #200,KDPAR1     ;
063420  012737  000400  172364                MOV     #400,KDPAR2     ;
063426  012737  000600  172366                MOV     #600,KDPAR3     ;
063434  012737  001000  172370                MOV     #1000,KDPAR4    ;
063442  012737  001000  172372                MOV     #1000,KDPAR5    ;
063450  012737  001000  172374                MOV     #1000,KDPAR6    ;
063456  012737  177600  172376                MOV     #177600,KDPAR7  ;
063464  012737  000000  172240                MOV     #0,SIPAR0       ;
063472  012737  000200  172242                MOV     #200,SIPAR1     ;
063500  012737  000400  172244                MOV     #400,SIPAR2     ;
063506  012737  000600  172246                MOV     #600,SIPAR3     ;
063514  012737  001000  172250                MOV     #1000,SIPAR4    ;
063522  012737  001000  172252                MOV     #1000,SIPAR5    ;
063530  012737  001000  172254                MOV     #1000,SIPAR6    ;
063536  012737  177600  172256                MOV     #177600,SIPAR7  ;
063544  012737  000000  172260                MOV     #0,SDPAR0       ;
063552  012737  000200  172262                MOV     #200,SDPAR1     ;
063560  012737  000400  172264                MOV     #400,SDPAR2     ;
063566  012737  000600  172266                MOV     #600,SDPAR3     ;
063574  012737  001000  172270                MOV     #1000,SDPAR4    ;
063602  012737  001000  172272                MOV     #1000,SDPAR5    ;
063610  012737  001000  172274                MOV     #1000,SDPAR6    ;
063616  012737  177600  172276                MOV     #177600,SDPAR7  ;
063624  012737  000000  177640                MOV     #0,UIPAR0       ;
063632  012737  000200  177642                MOV     #200,UIPAR1     ;
063640  012737  000400  177644                MOV     #400,UIPAR2     ;
063646  012737  000600  177646                MOV     #600,UIPAR3     ;
063654  012737  001000  177650                MOV     #1000,UIPAR4    ;
063662  012737  001000  177652                MOV     #1000,UIPAR5    ;
063670  012737  001000  177654                MOV     #1000,UIPAR6    ;
063676  012737  177600  177656                MOV     #177600,UIPAR7  ;
063704  012737  000000  177660                MOV     #0,UDPAR0       ;
063712  012737  000200  177662                MOV     #200,UDPAR1     ;
063720  012737  000400  177664                MOV     #400,UDPAR2     ;
063726  012737  000600  177666                MOV     #600,UDPAR3     ;
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 8699  063734  012737  001000  177670          MOV     #1000,UDPAR4    ;
 8700  063742  012737  001000  177672          MOV     #1000,UDPAR5    ;
 8701  063750  012737  001000  177674          MOV     #1000,UDPAR6    ;
 8702  063756  012737  177600  177676          MOV     #177600,UDPAR7  ;
 8703  063764  012737  064002  001110          MOV     #20$,$LPADR     ;SET LOOP ON TEST POINTER TO 20$
 8704  063772  012737  064002  001112          MOV     #20$,$LPERR     ;SET LOOP ON ERROR POINTER TO 20$
 8705  064000  104416                          TBITO                   ;MAKE SURE THAT T-BIT IS OFF FOR
 8706                                                                  ;THE SIX DUAL MAPPING TESTS
 8707  064002  012737  064152  001112  20$:    MOV     #21$,$LPERR     ;SET LOOP ON ERROR POINTER TO 21$
 8708  064010  012737  000000  177776          MOV     #00000,PSW      ;GO TO KERNEL MODE
 8709  064016  012703  172300                  MOV     #KIPDR0,R3      ;LOAD FIRST ADDRESS OF KERNEL PDR'S
 8710                                                                  ;THAT WILL BE TESTED IN THIS TEST
 8711  064022  012704  000010                  MOV     #10,R4          ;TEST THE NEXT EIGHT PDR'S
 8712  064026  012705  010200                  MOV     #10200,R5       ;LOAD STARTING VIRTUAL ADDRESS INTO R5
 8713  064032  012700  077405          19$:    MOV     #77405,R0       ;ALL PAGES WILL BE TRAP ON WRITE
 8714  064036  005037  001172                  CLR     $TMP0           ;CLEAR CORRECT PDR SET INDICATOR
 8715  064042  012702  000010                  MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
 8716  064046  012701  177620                  MOV     #UDPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
 8717  064052  010021                  1$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
 8718  064054  077202                          SOB     R2,1$           ;BRANCH BACK TO 1$ IF R2 IS NOT ZERO
 8719  064056  012702  000010                  MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
 8720  064062  012701  177600                  MOV     #UIPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
 8721  064066  010021                  2$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
 8722  064070  077202                          SOB     R2,2$           ;BRANCH BACK TO 2$ IF R2 IS NOT ZERO
 8723  064072  012702  000010                  MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
 8724  064076  012701  172220                  MOV     #SDPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
 8725  064102  010021                  3$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
 8726  064104  077202                          SOB     R2,3$           ;BRANCH BACK TO 3$ IF R2 IS NOT ZERO
 8727  064106  012702  000010                  MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
 8728  064112  012701  172200                  MOV     #SIPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
 8729  064116  010021                  4$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
 8730  064120  077202                          SOB     R2,4$           ;BRANCH BACK TO 4$ IF R2 IS NOT ZERO
 8731  064122  012702  000010                  MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
 8732  064126  012701  172320                  MOV     #KDPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
 8733  064132  010021                  5$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
 8734  064134  077202                          SOB     R2,5$           ;BRANCH BACK TO 5$ IF R2 IS NOT ZERO
 8735  064136  012702  000010                  MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
 8736  064142  012701  172300                  MOV     #KIPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
 8737  064146  010021                  6$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
 8738  064150  077202                          SOB     R2,6$           ;BRANCH BACK TO 6$ IF R2 IS NOT ZERO
 8739  064152  012700  077405          21$:    MOV     #77405,R0       ;MUST RE-INIT THESE PDRS IF ERROR
 8740  064156  010037  172300                  MOV     R0,KIPDR0       ;LOAD KERNEL PDR0
 8741  064162  010037  172302                  MOV     R0,KIPDR1       ;LOAD KERNEL PDR1
 8742  064166  010037  172316                  MOV     R0,KIPDR7       ;LOAD KERNEL PDR7
 8743  064172  010037  172300                  MOV     R0,KIPDR0       ;LOAD PDR0 OF PRESENT SPACE
 8744  064176  010037  172316                  MOV     R0,KIPDR7       ;LOAD PDR7 OF PRESENT SPACE
 8745  064202  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
 8746  064204  011515                          MOV     (R5),(R5)       ;WRITE INTO PAGE UNDER TEST
 8747  064206  012702  000020                  MOV     #20,R2          ;SET COUNTER TO READ NEXT 20 REGISTERS
 8748  064212  012701  172300                  MOV     #KIPDR0,R1      ;LOAD ADDRESS OF BEGINNING PDR
 8749  064216  011100                  7$:     MOV     (R1),R0         ;READ PDR INTO R0
 8750  064220  022700  077705                  CMP     #77705,R0       ;SEE IF THIS WAS THE PDR WITH A&W BITS ON
 8751  064224  001023                          BNE     9$              ;BRANCH IF THIS IS NOT THE ONE
 8752  064226  020103                          CMP     R1,R3           ;SEE IF THE ADDRESS MATCHES PDR UNDER TEST
 8753  064230  001417                          BEQ     8$              ;BRANCH IF ADDRESS IS CORRECT
 8754  064232  104112                          ERROR   112             ;A & W BITS GOT SET IN WRONG PDR
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 8755  064234  012700  077405                MOV     #77405,R0       ;RE-SET PAGES MODIFIED BY ERROR
 8756  064240  010037  172300                MOV     R0,KIPDR0       ;RELOAD KERNEL PDR0
 8757  064244  010037  172302                MOV     R0,KIPDR1       ;RELOAD KERNEL PDR1
 8758  064250  010037  172316                MOV     R0,KIPDR7       ;RELOAD KERNEL PDR7
 8759  064254  010037  172300                MOV     R0,KIPDR0       ;RELOAD PAGE 0 OF PRESENT SPACE
 8760  064260  010037  172316                MOV     R0,KIPDR7       ;RE-LOAD I/O PAGE PDR IF ERROR
 8761  064264  011515                        MOV     (R5),(R5)       ;TRY WRITE AGAIN, IN CASE YOU
 8762                                                                  ;WERE TESTING PAGE SEVEN
 8763  064266  000402                        BR      9$              ;GO UPDATE R1 FOR NEXT READ
 8764  064270  005237  001172        8$:     INC     $TMP0           ;SET FLAG SINCE ADDRESSES MATCHED
 8765  064274  062701  000002        9$:     ADD     #2,R1           ;POINT TO NEXT PDR TO BE READ
 8766  064300  077232                        SOB     R2,7$           ;BRANCH TO 7$ IF ALL PDR'S NOT READ
 8767  064302  012702  000020                MOV     #20,R2          ;SET COUNTER TO READ NEXT 20 REGISTERS
 8768  064306  012701  172200                MOV     #SIPDR0,R1      ;LOAD ADDRESS OF BEGINNING PDR
 8769  064312  011100                10$:    MOV     (R1),R0         ;READ PDR INTO R0
 8770  064314  022700  077705                CMP     #77705,R0       ;SEE IF THIS WAS THE PDR WITH A&W BITS ON
 8771  064320  001023                        BNE     12$             ;BRANCH IF THIS IS NOT THE ONE
 8772  064322  020103                        CMP     R1,R3           ;SEE IF THE ADDRESS MATCHES PDR UNDER TEST
 8773  064324  001417                        BEQ     11$             ;BRANCH IF ADDRESS IS CORRECT
 8774  064326  104112                        ERROR   112             ;A & W BITS GOT SET IN WRONG PDR
 8775  064330  012700  077405                MOV     #77405,R0       ;RE-SET PAGES MODIFIED BY ERROR
 8776  064334  010037  172300                MOV     R0,KIPDR0       ;RELOAD KERNEL PDR0
 8777  064340  010037  172302                MOV     R0,KIPDR1       ;RELOAD KERNEL PDR1
 8778  064344  010037  172316                MOV     R0,KIPDR7       ;RELOAD KERNEL PDR7
 8779  064350  010037  172300                MOV     R0,KIPDR0       ;RELOAD PAGE 0 OF PRESENT SPACE
 8780  064354  010037  172316                MOV     R0,KIPDR7       ;RE-LOAD I/O PAGE PDR IF ERROR
 8781  064360  011515                        MOV     (R5),(R5)       ;TRY WRITE AGAIN, IN CASE YOU
 8782                                                                  ;WERE TESTING PAGE SEVEN
 8783  064362  000402                        BR      12$             ;GO UPDATE R1 FOR NEXT READ
 8784  064364  005237  001172        11$:    INC     $TMP0           ;SET FLAG SINCE ADDRESSES MATCHED
 8785  064370  062701  000002        12$:    ADD     #2,R1           ;POINT TO NEXT PDR TO BE READ
 8786  064374  077232                        SOB     R2,10$          ;BRANCH TO 10$ IF ALL PDR'S NOT READ
 8787  064376  012702  000020                MOV     #20,R2          ;SET COUNTER TO READ NEXT 20 REGISTERS
 8788  064402  012701  177600                MOV     #UIPDR0,R1      ;LOAD ADDRESS OF BEGINNING PDR
 8789  064406  011100                13$:    MOV     (R1),R0         ;READ PDR INTO R0
 8790  064410  022700  077705                CMP     #77705,R0       ;SEE IF THIS WAS THE PDR WITH A&W BITS ON
 8791  064414  001023                        BNE     15$             ;BRANCH IF THIS IS NOT THE ONE
 8792  064416  020103                        CMP     R1,R3           ;SEE IF THE ADDRESS MATCHES PDR UNDER TEST
 8793  064420  001417                        BEQ     14$             ;BRANCH IF ADDRESS IS CORRECT
 8794  064422  104112                        ERROR   112             ;A & W BITS GOT SET IN WRONG PDR
 8795  064424  012700  077405                MOV     #77405,R0       ;RE-SET PAGES MODIFIED BY ERROR
 8796  064430  010037  172300                MOV     R0,KIPDR0       ;RELOAD KERNEL PDR0
 8797  064434  010037  172302                MOV     R0,KIPDR1       ;RELOAD KERNEL PDR1
 8798  064440  010037  172316                MOV     R0,KIPDR7       ;RELOAD KERNEL PDR7
 8799  064444  010037  172300                MOV     R0,KIPDR0       ;RELOAD PAGE 0 OF PRESENT SPACE
 8800  064450  010037  172316                MOV     R0,KIPDR7       ;RE-LOAD I/O PAGE PDR IF ERROR
 8801  064454  011515                        MOV     (R5),(R5)       ;TRY WRITE AGAIN, IN CASE YOU
 8802                                                                  ;WERE TESTING PAGE SEVEN
 8803  064456  000402                        BR      15$             ;GO UPDATE R1 FOR NEXT READ
 8804  064460  005237  001172        14$:    INC     $TMP0           ;SET FLAG SINCE ADDRESSES MATCHED
 8805  064464  062701  000002        15$:    ADD     #2,R1           ;POINT TO NEXT PDR TO BE READ
 8806  064470  077232                        SOB     R2,13$          ;BRANCH TO 13$ IF ALL PDR'S NOT READ
 8807  064472  005737  001172                TST     $TMP0           ;SEE IF THERE WAS A CORRECT PDR
 8808  064476  001002                        BNE     16$             ;BRANCH IF THERE WAS
 8809  064500  011300                        MOV     (R3),R0         ;SAVE CONTENTS OF PDR UNDER TEST
 8810  064502  104113                        ERROR   113             ;NO PDR ADDRESSES MATCHED
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 8811  064504  062703  000002          16$:    ADD     #2,R3           ;POINT TO NEXT PDR UNDER TEST
 8812  064510  062705  020000                  ADD     #20000,R5       ;CHANGE PAGE NUMBER IN VIRT. ADDR.
 8813  064514  005304                          DEC     R4              ;DECREMENT COUNTER
 8814  064516  001402                          BEQ     17$             ;BRANCH IF COUNTER IS ZERO
 8815  064520  000137  064032                  JMP     19$             ;JUMP TO LOAD PDR'S AGAIN
 8816  064524                          17$:
 8817  064524  012737  000340  177776          MOV     #340,PSW        ;RETURN TO KERNEL MODE, PRIORITY 7
 8818  064532  012737  064002  001112          MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
 8819
 8820
 8821                                  ;;**************************************************************
 8822                                  ;*TEST 101      DUAL MAPPING SUPERVISOR MODE I-SPACE
 8823                                  ;;
 8824                                  ;;      THIS TEST STARTS BY LOADING ALL THE P.D.R.'S WITH 77405
 8825                                  ;;      (4K PAGE,TRAP ON WRITE).  THEN THE VIRTUAL ADDRESS IS SET TO
 8826                                  ;;      010200 AND THAT WORD IS WRITTEN INTO ITSELF.  THIS WRITE WILL
 8827                                  ;;      SATISFY THE TRAP CONDITION OF THE A.C.F. (BUT IT WILL NOT TRAP
 8828                                  ;;      SINCE BIT09 OF MMR0 IS CLEAR) AND SET BOTH THE A & W BITS IN
 8829                                  ;;      THE SUPERVISOR I-SPACE P.D.R. UNDER TEST.  NOW ALL OF THE
 8830                                  ;;      P.D.R.'S ARE COMPARED WITH 77705 AND ANY THAT MATCH, EXCEPT THE
 8831                                  ;;      ONE THAT IS UNDER TEST, ARE REPORTED AS DUAL MAPPING ERRORS.
 8832                                  ;;      WHEN THE I/O PAGE IS REACHED THE VIRTUAL ADDRESS GENERATES THE
 8833                                  ;;      ADDRESS OF 'MAPL00'' (17770200) WHICH SHOULD ALWAYS EXIST.
 8834                                  ;;
 8835                                  ;;**************************************************************
 8836  064540                          TST101:
 8837  064540  000004                          SCOPE
 8838  064542  012737  065306  001316          MOV     #TST102,NXTTST  ;SAVE STARTING ADDRESS OF NEXT
 8839                                                                  ;TEST FOR ESCAPE ON PARITY ERRORS
 8840  064550  012737  064720  001112  20$:    MOV     #21$,$LPERR     ;SET LOOP ON ERROR POINTER TO 21$
 8841  064556  012737  040000  177776          MOV     #40000,PSW      ;GO TO SUPERVISOR MODE
 8842  064564  012703  172200                  MOV     #SIPDR0,R3      ;LOAD FIRST ADDRESS OF SUPERVISOR PDR'S
 8843                                                                  ;THAT WILL BE TESTED IN THIS TEST
 8844  064570  012704  000010                  MOV     #10,R4          ;TEST THE NEXT EIGHT PDR'S
 8845  064574  012705  010200                  MOV     #10200,R5       ;LOAD STARTING VIRTUAL ADDRESS INTO R5
 8846  064600  012700  077405          19$:    MOV     #77405,R0       ;ALL PAGES WILL BE TRAP ON WRITE
 8847  064604  005037  001172                  CLR     $TMP0           ;CLEAR CORRECT PDR SET INDICATOR
 8848  064610  012702  000010                  MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
 8849  064614  012701  172320                  MOV     #KDPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
 8850  064620  010021                  1$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
 8851  064622  077202                          SOB     R2,1$           ;BRANCH BACK TO 1$ IF R2 IS NOT ZERO
 8852  064624  012702  000010                  MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
 8853  064630  012701  172300                  MOV     #KIPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
 8854  064634  010021                  2$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
 8855  064636  077202                          SOB     R2,2$           ;BRANCH BACK TO 2$ IF R2 IS NOT ZERO
 8856  064640  012702  000010                  MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
 8857  064644  012701  177620                  MOV     #UDPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
 8858  064650  010021                  3$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
 8859  064652  077202                          SOB     R2,3$           ;BRANCH BACK TO 3$ IF R2 IS NOT ZERO
 8860  064654  012702  000010                  MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
 8861  064660  012701  177600                  MOV     #UIPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
 8862  064664  010021                  4$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
 8863  064666  077202                          SOB     R2,4$           ;BRANCH BACK TO 4$ IF R2 IS NOT ZERO
 8864  064670  012702  000010                  MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
 8865  064674  012701  172220                  MOV     #SDPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
 8866  064700  010021                  5$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
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8867  064702  077202                        SOB     R2,5$           ;BRANCH BACK TO 5$ IF R2 IS NOT ZERO
8868  064704  012702  000010                MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
8869  064710  012701  172200                MOV     #SIPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
8870  064714  010021                6$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
8871  064716  077202                        SOB     R2,6$           ;BRANCH BACK TO 6$ IF R2 IS NOT ZERO
8872  064720  012700  077405        21$:    MOV     #77405,R0       ;MUST RE-INIT THESE PDRS IF ERROR
8873  064724  010037  172300                MOV     R0,KIPDR0       ;LOAD KERNEL PDR0
8874  064730  010037  172302                MOV     R0,KIPDR1       ;LOAD KERNEL PDR1
8875  064734  010037  172316                MOV     R0,KIPDR7       ;LOAD KERNEL PDR7
8876  064740  010037  172200                MOV     R0,SIPDR0       ;LOAD PDR0 OF PRESENT SPACE
8877  064744  010037  172216                MOV     R0,SIPDR7       ;LOAD PDR7 OF PRESENT SPACE
8878  064750  000240                        NOP                     ;THIS IS A SYNC POINT FOR SCOPING
8879  064752  011515                        MOV     (R5),(R5)       ;WRITE INTO PAGE UNDER TEST
8880  064754  012702  000020                MOV     #20,R2          ;SET COUNTER TO READ NEXT 20 REGISTERS
8881  064760  012701  172300                MOV     #KIPDR0,R1      ;LOAD ADDRESS OF BEGINNING PDR
8882  064764  011100                7$:     MOV     (R1),R0         ;READ PDR INTO R0
8883  064766  022700  077705                CMP     #77705,R0       ;SEE IF THIS WAS THE PDR WITH A&W BITS ON
8884  064772  001023                        BNE     9$              ;BRANCH IF THIS IS NOT THE ONE
8885  064774  020103                        CMP     R1,R3           ;SEE IF THE ADDRESS MATCHES PDR UNDER TEST
8886  064776  001417                        BEQ     8$              ;BRANCH IF ADDRESS IS CORRECT
8887  065000  104112                        ERROR   112             ;A & W BITS GOT SET IN WRONG PDR
8888  065002  012700  077405                MOV     #77405,R0       ;RE-SET PAGES MODIFIED BY ERROR
8889  065006  010037  172300                MOV     R0,KIPDR0       ;RELOAD KERNEL PDR0
8890  065012  010037  172302                MOV     R0,KIPDR1       ;RELOAD KERNEL PDR1
8891  065016  010037  172316                MOV     R0,KIPDR7       ;RELOAD KERNEL PDR7
8892  065022  010037  172200                MOV     R0,SIPDR0       ;RELOAD PAGE 0 OF PRESENT SPACE
8893  065026  010037  172216                MOV     R0,SIPDR7       ;RE-LOAD I/O PAGE PDR IF ERROR
8894  065032  011515                        MOV     (R5),(R5)       ;TRY WRITE AGAIN, IN CASE YOU
8895                                                                ;WERE TESTING PAGE SEVEN
8896  065034  000402                        BR      9$              ;GO UPDATE R1 FOR NEXT READ
8897  065036  005237  001172        8$:     INC     $TMP0           ;SET FLAG SINCE ADDRESSES MATCHED
8898  065042  062701  000002        9$:     ADD     #2,R1           ;POINT TO NEXT PDR TO BE READ
8899  065046  077232                        SOB     R2,7$           ;BRANCH TO 7$ IF ALL PDR'S NOT READ
8900  065050  012702  000020                MOV     #20,R2          ;SET COUNTER TO READ NEXT 20 REGISTERS
8901  065054  012701  172200                MOV     #SIPDR0,R1      ;LOAD ADDRESS OF BEGINNING PDR
8902  065060  011100                10$:    MOV     (R1),R0         ;READ PDR INTO R0
8903  065062  022700  077705                CMP     #77705,R0       ;SEE IF THIS WAS THE PDR WITH A&W BITS ON
8904  065066  001023                        BNE     12$             ;BRANCH IF THIS IS NOT THE ONE
8905  065070  020103                        CMP     R1,R3           ;SEE IF THE ADDRESS MATCHES PDR UNDER TEST
8906  065072  001417                        BEQ     11$             ;BRANCH IF ADDRESS IS CORRECT
8907  065074  104112                        ERROR   112             ;A & W BITS GOT SET IN WRONG PDR
8908  065076  012700  077405                MOV     #77405,R0       ;RE-SET PAGES MODIFIED BY ERROR
8909  065102  010037  172300                MOV     R0,KIPDR0       ;RELOAD KERNEL PDR0
8910  065106  010037  172302                MOV     R0,KIPDR1       ;RELOAD KERNEL PDR1
8911  065112  010037  172316                MOV     R0,KIPDR7       ;RELOAD KERNEL PDR7
8912  065116  010037  172200                MOV     R0,SIPDR0       ;RELOAD PAGE 0 OF PRESENT SPACE
8913  065122  010037  172216                MOV     R0,SIPDR7       ;RE-LOAD I/O PAGE PDR IF ERROR
8914  065126  011515                        MOV     (R5),(R5)       ;TRY WRITE AGAIN, IN CASE YOU
8915                                                                ;WERE TESTING PAGE SEVEN
8916  065130  000402                        BR      12$             ;GO UPDATE R1 FOR NEXT READ
8917  065132  005237  001172        11$:    INC     $TMP0           ;SET FLAG SINCE ADDRESSES MATCHED
8918  065136  062701  000002        12$:    ADD     #2,R1           ;POINT TO NEXT PDR TO BE READ
8919  065142  077232                        SOB     R2,10$          ;BRANCH TO 10$ IF ALL PDR'S NOT READ
8920  065144  012702  000020                MOV     #20,R2          ;SET COUNTER TO READ NEXT 20 REGISTERS
8921  065150  012701  177600                MOV     #UIPDR0,R1      ;LOAD ADDRESS OF BEGINNING PDR
8922  065154  011100                13$:    MOV     (R1),R0         ;READ PDR INTO R0
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 8923  065156  022700  077705              CMP     #77705,R0       ;SEE IF THIS WAS THE PDR WITH A&W BITS ON
 8924  065162  001023                      BNE     15$             ;BRANCH IF THIS IS NOT THE ONE
 8925  065164  020103                      CMP     R1,R3           ;SEE IF THE ADDRESS MATCHES PDR UNDER TEST
 8926  065166  001417                      BEQ     14$             ;BRANCH IF ADDRESS IS CORRECT
 8927  065170  104112                      ERROR   112             ;A & W BITS GOT SET IN WRONG PDR
 8928  065172  012700  077405              MOV     #77405,R0       ;RE-SET PAGES MODIFIED BY ERROR
 8929  065176  010037  172300              MOV     R0,KIPDR0       ;RELOAD KERNEL PDR0
 8930  065202  010037  172302              MOV     R0,KIPDR1       ;RELOAD KERNEL PDR1
 8931  065206  010037  172316              MOV     R0,KIPDR7       ;RELOAD KERNEL PDR7
 8932  065212  010037  172200              MOV     R0,SIPDR0       ;RELOAD PAGE 0 OF PRESENT SPACE
 8933  065216  010037  172216              MOV     R0,SIPDR7       ;RE-LOAD I/O PAGE PDR IF ERROR
 8934  065222  011515                      MOV     (R5),(R5)       ;TRY WRITE AGAIN, IN CASE YOU
 8935                                                              ;WERE TESTING PAGE SEVEN
 8936  065224  000402                      BR      15$             ;GO UPDATE R1 FOR NEXT READ
 8937  065226  005237  001172      14$:    INC     $TMP0           ;SET FLAG SINCE ADDRESSES MATCHED
 8938  065232  062701  000002      15$:    ADD     #2,R1           ;POINT TO NEXT PDR TO BE READ
 8939  065236  077232                      SOB     R2,13$          ;BRANCH TO 13$ IF ALL PDR'S NOT READ
 8940  065240  005737  001172              TST     $TMP0           ;SEE IF THERE WAS A CORRECT PDR
 8941  065244  001002                      BNE     16$             ;BRANCH IF THERE WAS
 8942  065246  011300                      MOV     (R3),R0         ;SAVE CONTENTS OF PDR UNDER TEST
 8943  065250  104113                      ERROR   113             ;NO PDR ADDRESSES MATCHED
 8944  065252  062703  000002      16$:    ADD     #2,R3           ;POINT TO NEXT PDR UNDER TEST
 8945  065256  062705  020000              ADD     #20000,R5       ;CHANGE PAGE NUMBER IN VIRT. ADDR.
 8946  065262  005304                      DEC     R4              ;DECREMENT COUNTER
 8947  065264  001402                      BEQ     17$             ;BRANCH IF COUNTER IS ZERO
 8948  065266  000137  064600              JMP     19$             ;JUMP TO LOAD PDR'S AGAIN
 8949  065272                      17$:
 8950  065272  012737  000340  177776      MOV     #340,PSW        ;RETURN TO KERNEL MODE, PRIORITY 7
 8951  065300  012737  064550  001112      MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
 8952
 8953
 8954                              ;;*****************************************************************
 8955                              ;*TEST 102      DUAL MAPPING USER MODE I-SPACE
 8956                              ;;
 8957                              ;;      THIS TEST STARTS BY LOADING ALL THE P.D.R.'S WITH 77405
 8958                              ;;      (4K PAGE,TRAP ON WRITE).  THEN THE VIRTUAL ADDRESS IS SET TO
 8959                              ;;      010200 AND THAT WORD IS WRITTEN INTO ITSELF.  THIS WRITE WILL
 8960                              ;;      SATISFY THE TRAP CONDITION OF THE A.C.F. (BUT IT WILL NOT TRAP
 8961                              ;;      SINCE BIT09 OF MMR0 IS CLEAR) AND SET BOTH THE A & W BITS IN
 8962                              ;;      THE USER I-SPACE P.D.R. UNDER TEST.  NOW ALL OF THE
 8963                              ;;      P.D.R.'S ARE COMPARED WITH 77705 AND ANY THAT MATCH, EXCEPT THE
 8964                              ;;      ONE THAT IS UNDER TEST, ARE REPORTED AS DUAL MAPPING ERRORS.
 8965                              ;;      WHEN THE I/O PAGE IS REACHED THE VIRTUAL ADDRESS GENERATES THE
 8966                              ;;      ADDRESS OF 'MAPL00'' (17770200) WHICH SHOULD ALWAYS EXIST.
 8967                              ;;
 8968                              ;;*****************************************************************
 8969  065306                      TST102:
 8970  065306  000004                      SCOPE
 8971  065310  012737  066054  001316      MOV     #TST103,NXTTST  ;SAVE STARTING ADDRESS OF NEXT
 8972                                                              ;TEST FOR ESCAPE ON PARITY ERRORS
 8973  065316  012737  065466  001112  20$:  MOV     #21$,$LPERR     ;SET LOOP ON ERROR POINTER TO 21$
 8974  065324  012737  140000  177776      MOV     #140000,PSW     ;GO TO USER MODE
 8975  065332  012703  177600              MOV     #UIPDR0,R3      ;LOAD FIRST ADDRESS OF USER PDR'S
 8976                                                              ;THAT WILL BE TESTED IN THIS TEST
 8977  065336  012704  000010              MOV     #10,R4          ;TEST THE NEXT EIGHT PDR'S
 8978  065342  012705  010200              MOV     #10200,R5       ;LOAD STARTING VIRTUAL ADDRESS INTO R5
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 8979  065346  012700  077405          19$:  MOV   #77405,R0      ;ALL PAGES WILL BE TRAP ON WRITE
 8980  065352  005037  001172                CLR   $TMP0         ;CLEAR CORRECT PDR SET INDICATOR
 8981  065356  012702  000010                MOV   #10,R2        ;SET COUNT TO LOAD 8 ADDRESSES
 8982  065362  012701  172220                MOV   #SDPDR0,R1    ;PUT ADDRESS OF FIRST PDR IN R1
 8983  065366  010021                   1$:  MOV   R0,(R1)+      ;LOAD R0 INTO PDR ADDRESSED BY R1
 8984  065370  077202                        SOB   R2,1$         ;BRANCH BACK TO 1$ IF R2 IS NOT ZERO
 8985  065372  012702  000010                MOV   #10,R2        ;SET COUNT TO LOAD 8 ADDRESSES
 8986  065376  012701  172200                MOV   #SIPDR0,R1    ;PUT ADDRESS OF FIRST PDR IN R1
 8987  065402  010021                   2$:  MOV   R0,(R1)+      ;LOAD R0 INTO PDR ADDRESSED BY R1
 8988  065404  077202                        SOB   R2,2$         ;BRANCH BACK TO 2$ IF R2 IS NOT ZERO
 8989  065406  012702  000010                MOV   #10,R2        ;SET COUNT TO LOAD 8 ADDRESSES
 8990  065412  012701  172320                MOV   #KDPDR0,R1    ;PUT ADDRESS OF FIRST PDR IN R1
 8991  065416  010021                   3$:  MOV   R0,(R1)+      ;LOAD R0 INTO PDR ADDRESSED BY R1
 8992  065420  077202                        SOB   R2,3$         ;BRANCH BACK TO 3$ IF R2 IS NOT ZERO
 8993  065422  012702  000010                MOV   #10,R2        ;SET COUNT TO LOAD 8 ADDRESSES
 8994  065426  012701  172300                MOV   #KIPDR0,R1    ;PUT ADDRESS OF FIRST PDR IN R1
 8995  065432  010021                   4$:  MOV   R0,(R1)+      ;LOAD R0 INTO PDR ADDRESSED BY R1
 8996  065434  077202                        SOB   R2,4$         ;BRANCH BACK TO 4$ IF R2 IS NOT ZERO
 8997  065436  012702  000010                MOV   #10,R2        ;SET COUNT TO LOAD 8 ADDRESSES
 8998  065442  012701  177620                MOV   #UDPDR0,R1    ;PUT ADDRESS OF FIRST PDR IN R1
 8999  065446  010021                   5$:  MOV   R0,(R1)+      ;LOAD R0 INTO PDR ADDRESSED BY R1
 9000  065450  077202                        SOB   R2,5$         ;BRANCH BACK TO 5$ IF R2 IS NOT ZERO
 9001  065452  012702  000010                MOV   #10,R2        ;SET COUNT TO LOAD 8 ADDRESSES
 9002  065456  012701  177600                MOV   #UIPDR0,R1    ;PUT ADDRESS OF FIRST PDR IN R1
 9003  065462  010021                   6$:  MOV   R0,(R1)+      ;LOAD R0 INTO PDR ADDRESSED BY R1
 9004  065464  077202                        SOB   R2,6$         ;BRANCH BACK TO 6$ IF R2 IS NOT ZERO
 9005  065466  012700  077405          21$:  MOV   #77405,R0     ;MUST RE-INIT THESE PDRS IF ERROR
 9006  065472  010037  172300                MOV   R0,KIPDR0     ;LOAD KERNEL PDR0
 9007  065476  010037  172302                MOV   R0,KIPDR1     ;LOAD KERNEL PDR1
 9008  065502  010037  172316                MOV   R0,KIPDR7     ;LOAD KERNEL PDR7
 9009  065506  010037  177600                MOV   R0,UIPDR0     ;LOAD PDR0 OF PRESENT SPACE
 9010  065512  010037  177616                MOV   R0,UIPDR7     ;LOAD PDR7 OF PRESENT SPACE
 9011  065516  000240                        NOP                 ;THIS IS A SYNC POINT FOR SCOPING
 9012  065520  011515                        MOV   (R5),(R5)     ;WRITE INTO PAGE UNDER TEST
 9013  065522  012702  000020                MOV   #20,R2        ;SET COUNTER TO READ NEXT 20 REGISTERS
 9014  065526  012701  172300                MOV   #KIPDR0,R1    ;LOAD ADDRESS OF BEGINNING PDR
 9015  065532  011100                   7$:  MOV   (R1),R0       ;READ PDR INTO R0
 9016  065534  022700  077705                CMP   #77705,R0     ;SEE IF THIS WAS THE PDR WITH A&W BITS ON
 9017  065540  001023                        BNE   9$            ;BRANCH IF THIS IS NOT THE ONE
 9018  065542  020103                        CMP   R1,R3         ;SEE IF THE ADDRESS MATCHES PDR UNDER TEST
 9019  065544  001417                        BEQ   8$            ;BRANCH IF ADDRESS IS CORRECT
 9020  065546  104112                        ERROR 112           ;A & W BITS GOT SET IN WRONG PDR
 9021  065550  012700  077405                MOV   #77405,R0     ;RE-SET PAGES MODIFIED BY ERROR
 9022  065554  010037  172300                MOV   R0,KIPDR0     ;RELOAD KERNEL PDR0
 9023  065560  010037  172302                MOV   R0,KIPDR1     ;RELOAD KERNEL PDR1
 9024  065564  010037  172316                MOV   R0,KIPDR7     ;RELOAD KERNEL PDR7
 9025  065570  010037  177600                MOV   R0,UIPDR0     ;RELOAD PAGE 0 OF PRESENT SPACE
 9026  065574  010037  177616                MOV   R0,UIPDR7     ;RE-LOAD I/O PAGE PDR IF ERROR
 9027  065600  011515                        MOV   (R5),(R5)     ;TRY WRITE AGAIN, IN CASE YOU
 9028                                                            ;WERE TESTING PAGE SEVEN
 9029  065602  000402                        BR    9$            ;GO UPDATE R1 FOR NEXT READ
 9030  065604  005237  001172          8$:   INC   $TMP0         ;SET FLAG SINCE ADDRESSES MATCHED
 9031  065610  062701  000002          9$:   ADD   #2,R1         ;POINT TO NEXT PDR TO BE READ
 9032  065614  077232                        SOB   R2,7$         ;BRANCH TO 7$ IF ALL PDR'S NOT READ
 9033  065616  012702  000020                MOV   #20,R2        ;SET COUNTER TO READ NEXT 20 REGISTERS
 9034  065622  012701  172200                MOV   #SIPDR0,R1    ;LOAD ADDRESS OF BEGINNING PDR
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 9035  065626  011100                  10$:    MOV     (R1),R0         ;READ PDR INTO R0
 9036  065630  022700  077705                  CMP     #77705,R0       ;SEE IF THIS WAS THE PDR WITH A&W BITS ON
 9037  065634  001023                          BNE     12$             ;BRANCH IF THIS IS NOT THE ONE
 9038  065636  020103                          CMP     R1,R3           ;SEE IF THE ADDRESS MATCHES PDR UNDER TEST
 9039  065640  001417                          BEQ     11$             ;BRANCH IF ADDRESS IS CORRECT
 9040  065642  104112                          ERROR   112             ;A & W BITS GOT SET IN WRONG PDR
 9041  065644  012700  077405                  MOV     #77405,R0       ;RE-SET PAGES MODIFIED BY ERROR
 9042  065650  010037  172300                  MOV     R0,KIPDR0       ;RELOAD KERNEL PDR0
 9043  065654  010037  172302                  MOV     R0,KIPDR1       ;RELOAD KERNEL PDR1
 9044  065660  010037  172316                  MOV     R0,KIPDR7       ;RELOAD KERNEL PDR7
 9045  065664  010037  177600                  MOV     R0,UIPDR0       ;RELOAD PAGE 0 OF PRESENT SPACE
 9046  065670  010037  177616                  MOV     R0,UIPDR7       ;RE-LOAD I/O PAGE PDR IF ERROR
 9047  065674  011515                          MOV     (R5),(R5)       ;TRY WRITE AGAIN, IN CASE YOU
 9048                                                                  ;WERE TESTING PAGE SEVEN
 9049  065676  000402                          BR      12$             ;GO UPDATE R1 FOR NEXT READ
 9050  065700  005237  001172          11$:    INC     $TMP0           ;SET FLAG SINCE ADDRESSES MATCHED
 9051  065704  062701  000002          12$:    ADD     #2,R1           ;POINT TO NEXT PDR TO BE READ
 9052  065710  077232                          SOB     R2,10$          ;BRANCH TO 10$ IF ALL PDR'S NOT READ
 9053  065712  012702  000020                  MOV     #20,R2          ;SET COUNTER TO READ NEXT 20 REGISTERS
 9054  065716  012701  177600                  MOV     #UIPDR0,R1      ;LOAD ADDRESS OF BEGINNING PDR
 9055  065722  011100                  13$:    MOV     (R1),R0         ;READ PDR INTO R0
 9056  065724  022700  077705                  CMP     #77705,R0       ;SEE IF THIS WAS THE PDR WITH A&W BITS ON
 9057  065730  001023                          BNE     15$             ;BRANCH IF THIS IS NOT THE ONE
 9058  065732  020103                          CMP     R1,R3           ;SEE IF THE ADDRESS MATCHES PDR UNDER TEST
 9059  065734  001417                          BEQ     14$             ;BRANCH IF ADDRESS IS CORRECT
 9060  065736  104112                          ERROR   112             ;A & W BITS GOT SET IN WRONG PDR
 9061  065740  012700  077405                  MOV     #77405,R0       ;RE-SET PAGES MODIFIED BY ERROR
 9062  065744  010037  172300                  MOV     R0,KIPDR0       ;RELOAD KERNEL PDR0
 9063  065750  010037  172302                  MOV     R0,KIPDR1       ;RELOAD KERNEL PDR1
 9064  065754  010037  172316                  MOV     R0,KIPDR7       ;RELOAD KERNEL PDR7
 9065  065760  010037  177600                  MOV     R0,UIPDR0       ;RELOAD PAGE 0 OF PRESENT SPACE
 9066  065764  010037  177616                  MOV     R0,UIPDR7       ;RE-LOAD I/O PAGE PDR IF ERROR
 9067  065770  011515                          MOV     (R5),(R5)       ;TRY WRITE AGAIN, IN CASE YOU
 9068                                                                  ;WERE TESTING PAGE SEVEN
 9069  065772  000402                          BR      15$             ;GO UPDATE R1 FOR NEXT READ
 9070  065774  005237  001172          14$:    INC     $TMP0           ;SET FLAG SINCE ADDRESSES MATCHED
 9071  066000  062701  000002          15$:    ADD     #2,R1           ;POINT TO NEXT PDR TO BE READ
 9072  066004  077232                          SOB     R2,13$          ;BRANCH TO 13$ IF ALL PDR'S NOT READ
 9073  066006  005737  001172                  TST     $TMP0           ;SEE IF THERE WAS A CORRECT PDR
 9074  066012  001002                          BNE     16$             ;BRANCH IF THERE WAS
 9075  066014  011300                          MOV     (R3),R0         ;SAVE CONTENTS OF PDR UNDER TEST
 9076  066016  104113                          ERROR   113             ;NO PDR ADDRESSES MATCHED
 9077  066020  062703  000002          16$:    ADD     #2,R3           ;POINT TO NEXT PDR UNDER TEST
 9078  066024  062705  020000                  ADD     #20000,R5       ;CHANGE PAGE NUMBER IN VIRT. ADDR.
 9079  066030  005304                          DEC     R4              ;DECREMENT COUNTER
 9080  066032  001402                          BEQ     17$             ;BRANCH IF COUNTER IS ZERO
 9081  066034  000137  065346                  JMP     19$             ;JUMP TO LOAD PDR'S AGAIN
 9082  066040                          17$:
 9083  066040  012737  000340  177776          MOV     #340,PSW        ;RETURN TO KERNEL MODE, PRIORITY 7
 9084  066046  012737  065316  001112          MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
 9085
 9086
 9087                                  ;;*****************************************************************
 9088                                  ;*TEST 103       DUAL MAPPING KERNEL MODE D-SPACE
 9089                                  ;;
 9090                                  ;;      THIS TEST STARTS BY LOADING ALL THE P.D.R.'S WITH 77405
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                                ;;      (4K PAGE,TRAP ON WRITE).  THEN THE VIRTUAL ADDRESS IS SET TO
                                ;;      010200 AND THAT WORD IS WRITTEN INTO ITSELF.  THIS WRITE WILL
                                ;;      SATISFY THE TRAP CONDITION OF THE A.C.F. (BUT IT WILL NOT TRAP
                                ;;      SINCE BIT09 OF MMR0 IS CLEAR) AND SET BOTH THE A & W BITS IN
                                ;;      THE KERNEL D-SPACE P.D.R. UNDER TEST.  NOW ALL OF THE
                                ;;      P.D.R.'S ARE COMPARED WITH 77705 AND ANY THAT MATCH, EXCEPT THE
                                ;;      ONE THAT IS UNDER TEST, ARE REPORTED AS DUAL MAPPING ERRORS.
                                ;;      WHEN THE I/O PAGE IS REACHED THE VIRTUAL ADDRESS GENERATES THE
                                ;;      ADDRESS OF 'MAPL00'' (17770200) WHICH SHOULD ALWAYS EXIST.
                                ;;
                                ;;*****************************************************************
066054                          TST103:
066054  000004                          SCOPE
066056  012737  066636  001316          MOV     #TST104,NXTTST  ;SAVE STARTING ADDRESS OF NEXT
                                                                ;TEST FOR ESCAPE ON PARITY ERRORS
066064  012737  066242  001112  20$:     MOV     #21$,$LPERR     ;SET LOOP ON ERROR POINTER TO 21$
066072  012737  000000  177776          MOV     #00000,PSW      ;GO TO KERNEL MODE
066100  052737  000007  172516          BIS     #7,MMR3         ;ENABLE ALL D-SPACE MAPPING
066106  012703  172320                  MOV     #KDPDR0,R3      ;LOAD FIRST ADDRESS OF KERNEL PDR'S
                                                                ;THAT WILL BE TESTED IN THIS TEST
066112  012704  000010                  MOV     #10,R4          ;TEST THE NEXT EIGHT PDR'S
066116  012705  010200                  MOV     #10200,R5       ;LOAD STARTING VIRTUAL ADDRESS INTO R5
066122  012700  077405          19$:    MOV     #77405,R0       ;ALL PAGES WILL BE TRAP ON WRITE
066126  005037  001172                  CLR     $TMP0           ;CLEAR CORRECT PDR SET INDICATOR
066132  012702  000010                  MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
066136  012701  177600                  MOV     #UIPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
066142  010021                  1$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
066144  077202                          SOB     R2,1$           ;BRANCH BACK TO 1$ IF R2 IS NOT ZERO
066146  012702  000010                  MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
066152  012701  177620                  MOV     #UDPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
066156  010021                  2$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
066160  077202                          SOB     R2,2$           ;BRANCH BACK TO 2$ IF R2 IS NOT ZERO
066162  012702  000010                  MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
066166  012701  172200                  MOV     #SIPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
066172  010021                  3$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
066174  077202                          SOB     R2,3$           ;BRANCH BACK TO 3$ IF R2 IS NOT ZERO
066176  012702  000010                  MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
066202  012701  172220                  MOV     #SDPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
066206  010021                  4$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
066210  077202                          SOB     R2,4$           ;BRANCH BACK TO 4$ IF R2 IS NOT ZERO
066212  012702  000010                  MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
066216  012701  172300                  MOV     #KIPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
066222  010021                  5$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
066224  077202                          SOB     R2,5$           ;BRANCH BACK TO 5$ IF R2 IS NOT ZERO
066226  012702  000010                  MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
066232  012701  172320                  MOV     #KDPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
066236  010021                  6$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
066240  077202                          SOB     R2,6$           ;BRANCH BACK TO 6$ IF R2 IS NOT ZERO
066242  012700  077405          21$:    MOV     #77405,R0       ;MUST RE-INIT THESE PDRS IF ERROR
066246  010037  172320                  MOV     R0,KDPDR0       ;LOAD KERNEL PDR0
066252  010037  172322                  MOV     R0,KDPDR1       ;LOAD KERNEL PDR1
066256  010037  172336                  MOV     R0,KDPDR7       ;LOAD KERNEL PDR7
066262  010037  172320                  MOV     R0,KDPDR0       ;LOAD PDR0 OF PRESENT SPACE
066266  010037  172336                  MOV     R0,KDPDR7       ;LOAD PDR7 OF PRESENT SPACE
066272  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
066274  011515                          MOV     (R5),(R5)       ;WRITE INTO PAGE UNDER TEST
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9147  066276  012702  000020                    MOV     #20,R2          ;SET COUNTER TO READ NEXT 20 REGISTERS
9148  066302  012701  172300                    MOV     #KIPDR0,R1      ;LOAD ADDRESS OF BEGINNING PDR
9149  066306  011100                    7$:     MOV     (R1),R0         ;READ PDR INTO R0
9150  066310  022700  077705                    CMP     #77705,R0       ;SEE IF THIS WAS THE PDR WITH A&W BITS ON
9151  066314  001023                            BNE     9$              ;BRANCH IF THIS IS NOT THE ONE
9152  066316  020103                            CMP     R1,R3           ;SEE IF THE ADDRESS MATCHES PDR UNDER TEST
9153  066320  001417                            BEQ     8$              ;BRANCH IF ADDRESS IS CORRECT
9154  066322  104112                            ERROR   112             ;A & W BITS GOT SET IN WRONG PDR
9155  066324  012700  077405                    MOV     #77405,R0       ;RE-SET PAGES MODIFIED BY ERROR
9156  066330  010037  172320                    MOV     R0,KDPDR0       ;RELOAD KERNEL PDR0
9157  066334  010037  172322                    MOV     R0,KDPDR1       ;RELOAD KERNEL PDR1
9158  066340  010037  172336                    MOV     R0,KDPDR7       ;RELOAD KERNEL PDR7
9159  066344  010037  172320                    MOV     R0,KDPDR0       ;RELOAD PAGE 0 OF PRESENT SPACE
9160  066350  010037  172336                    MOV     R0,KDPDR7       ;RE-LOAD I/O PAGE PDR IF ERROR
9161  066354  011515                            MOV     (R5),(R5)       ;TRY WRITE AGAIN, IN CASE YOU
9162                                                                    ;WERE TESTING PAGE SEVEN
9163  066356  000402                            BR      9$              ;GO UPDATE R1 FOR NEXT READ
9164  066360  005237  001172            8$:     INC     $TMP0           ;SET FLAG SINCE ADDRESSES MATCHED
9165  066364  062701  000002            9$:     ADD     #2,R1           ;POINT TO NEXT PDR TO BE READ
9166  066370  077232                            SOB     R2,7$           ;BRANCH TO 7$ IF ALL PDR'S NOT READ
9167  066372  012702  000020                    MOV     #20,R2          ;SET COUNTER TO READ NEXT 20 REGISTERS
9168  066376  012701  172200                    MOV     #SIPDR0,R1      ;LOAD ADDRESS OF BEGINNING PDR
9169  066402  011100                    10$:    MOV     (R1),R0         ;READ PDR INTO R0
9170  066404  022700  077705                    CMP     #77705,R0       ;SEE IF THIS WAS THE PDR WITH A&W BITS ON
9171  066410  001023                            BNE     12$             ;BRANCH IF THIS IS NOT THE ONE
9172  066412  020103                            CMP     R1,R3           ;SEE IF THE ADDRESS MATCHES PDR UNDER TEST
9173  066414  001417                            BEQ     11$             ;BRANCH IF ADDRESS IS CORRECT
9174  066416  104112                            ERROR   112             ;A & W BITS GOT SET IN WRONG PDR
9175  066420  012700  077405                    MOV     #77405,R0       ;RE-SET PAGES MODIFIED BY ERROR
9176  066424  010037  172320                    MOV     R0,KDPDR0       ;RELOAD KERNEL PDR0
9177  066430  010037  172322                    MOV     R0,KDPDR1       ;RELOAD KERNEL PDR1
9178  066434  010037  172336                    MOV     R0,KDPDR7       ;RELOAD KERNEL PDR7
9179  066440  010037  172320                    MOV     R0,KDPDR0       ;RELOAD PAGE 0 OF PRESENT SPACE
9180  066444  010037  172336                    MOV     R0,KDPDR7       ;RE-LOAD I/O PAGE PDR IF ERROR
9181  066450  011515                            MOV     (R5),(R5)       ;TRY WRITE AGAIN, IN CASE YOU
9182                                                                    ;WERE TESTING PAGE SEVEN
9183  066452  000402                            BR      12$             ;GO UPDATE R1 FOR NEXT READ
9184  066454  005237  001172            11$:    INC     $TMP0           ;SET FLAG SINCE ADDRESSES MATCHED
9185  066460  062701  000002            12$:    ADD     #2,R1           ;POINT TO NEXT PDR TO BE READ
9186  066464  077232                            SOB     R2,10$          ;BRANCH TO 10$ IF ALL PDR'S NOT READ
9187  066466  012702  000020                    MOV     #20,R2          ;SET COUNTER TO READ NEXT 20 REGISTERS
9188  066472  012701  177600                    MOV     #UIPDR0,R1      ;LOAD ADDRESS OF BEGINNING PDR
9189  066476  011100                    13$:    MOV     (R1),R0         ;READ PDR INTO R0
9190  066500  022700  077705                    CMP     #77705,R0       ;SEE IF THIS WAS THE PDR WITH A&W BITS ON
9191  066504  001023                            BNE     15$             ;BRANCH IF THIS IS NOT THE ONE
9192  066506  020103                            CMP     R1,R3           ;SEE IF THE ADDRESS MATCHES PDR UNDER TEST
9193  066510  001417                            BEQ     14$             ;BRANCH IF ADDRESS IS CORRECT
9194  066512  104112                            ERROR   112             ;A & W BITS GOT SET IN WRONG PDR
9195  066514  012700  077405                    MOV     #77405,R0       ;RE-SET PAGES MODIFIED BY ERROR
9196  066520  010037  172320                    MOV     R0,KDPDR0       ;RELOAD KERNEL PDR0
9197  066524  010037  172322                    MOV     R0,KDPDR1       ;RELOAD KERNEL PDR1
9198  066530  010037  172336                    MOV     R0,KDPDR7       ;RELOAD KERNEL PDR7
9199  066534  010037  172320                    MOV     R0,KDPDR0       ;RELOAD PAGE 0 OF PRESENT SPACE
9200  066540  010037  172336                    MOV     R0,KDPDR7       ;RE-LOAD I/O PAGE PDR IF ERROR
9201  066544  011515                            MOV     (R5),(R5)       ;TRY WRITE AGAIN, IN CASE YOU
9202                                                                    ;WERE TESTING PAGE SEVEN
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 9203  066546  000402                          BR      15$             ;GO UPDATE R1 FOR NEXT READ
 9204  066550  005237  001172          14$:    INC     $TMP0           ;SET FLAG SINCE ADDRESSES MATCHED
 9205  066554  062701  000002          15$:    ADD     #2,R1           ;POINT TO NEXT PDR TO BE READ
 9206  066560  077232                          SOB     R2,13$          ;BRANCH TO 13$ IF ALL PDR'S NOT READ
 9207  066562  005737  001172                  TST     $TMP0           ;SEE IF THERE WAS A CORRECT PDR
 9208  066566  001002                          BNE     16$             ;BRANCH IF THERE WAS
 9209  066570  011300                          MOV     (R3),R0         ;SAVE CONTENTS OF PDR UNDER TEST
 9210  066572  104113                          ERROR   113             ;NO PDR ADDRESSES MATCHED
 9211  066574  062703  000002          16$:    ADD     #2,R3           ;POINT TO NEXT PDR UNDER TEST
 9212  066600  062705  020000                  ADD     #20000,R5       ;CHANGE PAGE NUMBER IN VIRT. ADDR.
 9213  066604  005304                          DEC     R4              ;DECREMENT COUNTER
 9214  066606  001402                          BEQ     17$             ;BRANCH IF COUNTER IS ZERO
 9215  066610  000137  066122                  JMP     19$             ;JUMP TO LOAD PDR'S AGAIN
 9216  066614                          17$:
 9217  066614  042737  000007  172516          BIC     #7,MMR3         ;DISABLE ALL D-SPACE MAPPING
 9218  066622  012737  000340  177776          MOV     #340,PSW        ;RETURN TO KERNEL MODE, PRIORITY 7
 9219  066630  012737  066064  001112          MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
 9220
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                                ;;*****************************************************************
                                ;*TEST 104      DUAL MAPPING SUPERVISOR MODE D-SPACE
                                ;;
                                ;;      THIS TEST STARTS BY LOADING ALL THE P.D.R.'S WITH 77405
                                ;;      (4K PAGE,TRAP ON WRITE).  THEN THE VIRTUAL ADDRESS IS SET TO
                                ;;      010200 AND THAT WORD IS WRITTEN INTO ITSELF.  THIS WRITE WILL
                                ;;      SATISFY THE TRAP CONDITION OF THE A.C.F. (BUT IT WILL NOT TRAP
                                ;;      SINCE BIT09 OF MMR0 IS CLEAR) AND SET BOTH THE A & W BITS IN
                                ;;      THE SUPERVISOR D-SPACE P.D.R. UNDER TEST.  NOW ALL OF THE
                                ;;      P.D.R.'S ARE COMPARED WITH 77705 AND ANY THAT MATCH, EXCEPT THE
                                ;;      ONE THAT IS UNDER TEST, ARE REPORTED AS DUAL MAPPING ERRORS.
                                ;;      WHEN THE I/O PAGE IS REACHED THE VIRTUAL ADDRESS GENERATES THE
                                ;;      ADDRESS OF 'MAPL00' (17770200) WHICH SHOULD ALWAYS EXIST.
                                ;;
                                ;;*****************************************************************
066636                          TST104:
                                        SCOPE
066636  000004
066640  012737  067420  001316        MOV     #TST105,NXTTST  ;SAVE STARTING ADDRESS OF NEXT
                                                                ;TEST FOR ESCAPE ON PARITY ERRORS
066646  012737  067024  001112  20$:   MOV     #21$,$LPERR     ;SET LOOP ON ERROR POINTER TO 21$
066654  012737  040000  177776        MOV     #40000,PSW      ;GO TO SUPERVISOR MODE
066662  052737  000007  172516        BIS     #7,MMR3         ;ENABLE ALL D-SPACE MAPPING
066670  012703  172220                MOV     #SDPDR0,R3      ;LOAD FIRST ADDRESS OF SUPERVISOR PDR'S
                                                                ;THAT WILL BE TESTED IN THIS TEST
066674  012704  000010                MOV     #10,R4          ;TEST THE NEXT EIGHT PDR'S
066700  012705  010200                MOV     #10200,R5       ;LOAD STARTING VIRTUAL ADDRESS INTO R5
066704  012700  077405        19$:    MOV     #77405,R0       ;ALL PAGES WILL BE TRAP ON WRITE
066710  005037  001172                CLR     $TMP0           ;CLEAR CORRECT PDR SET INDICATOR
066714  012702  000010                MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
066720  012701  172300                MOV     #KIPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
066724  010021                1$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
066726  077202                        SOB     R2,1$           ;BRANCH BACK TO 1$ IF R2 IS NOT ZERO
066730  012702  000010                MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
066734  012701  172320                MOV     #KDPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
066740  010021                2$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
066742  077202                        SOB     R2,2$           ;BRANCH BACK TO 2$ IF R2 IS NOT ZERO
066744  012702  000010                MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
066750  012701  177600                MOV     #UIPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
066754  010021                3$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
066756  077202                        SOB     R2,3$           ;BRANCH BACK TO 3$ IF R2 IS NOT ZERO
066760  012702  000010                MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
066764  012701  177620                MOV     #UDPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
066770  010021                4$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
066772  077202                        SOB     R2,4$           ;BRANCH BACK TO 4$ IF R2 IS NOT ZERO
066774  012702  000010                MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
067000  012701  172200                MOV     #SIPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
067004  010021                5$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
067006  077202                        SOB     R2,5$           ;BRANCH BACK TO 5$ IF R2 IS NOT ZERO
067010  012702  000010                MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
067014  012701  172220                MOV     #SDPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
067020  010021                6$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
067022  077202                        SOB     R2,6$           ;BRANCH BACK TO 6$ IF R2 IS NOT ZERO
067024  012700  077405        21$:    MOV     #77405,R0       ;MUST RE-INIT THESE PDRS IF ERROR
067030  010037  172320                MOV     R0,KDPDR0       ;LOAD KERNEL PDR0
067034  010037  172322                MOV     R0,KDPDR1       ;LOAD KERNEL PDR1
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 9277  067040  010037  172336            MOV     R0,KDPDR7       ;LOAD KERNEL PDR7
 9278  067044  010037  172220            MOV     R0,SDPDR0       ;LOAD PDR0 OF PRESENT SPACE
 9279  067050  010037  172236            MOV     R0,SDPDR7       ;LOAD PDR7 OF PRESENT SPACE
 9280  067054  000240                    NOP                     ;THIS IS A SYNC POINT FOR SCOPING
 9281  067056  011515                    MOV     (R5),(R5)       ;WRITE INTO PAGE UNDER TEST
 9282  067060  012702  000020            MOV     #20,R2          ;SET COUNTER TO READ NEXT 20 REGISTERS
 9283  067064  012701  172300            MOV     #KIPDR0,R1      ;LOAD ADDRESS OF BEGINNING PDR
 9284  067070  011100            7$:     MOV     (R1),R0         ;READ PDR INTO R0
 9285  067072  022700  077705            CMP     #77705,R0       ;SEE IF THIS WAS THE PDR WITH A&W BITS ON
 9286  067076  001023                    BNE     9$              ;BRANCH IF THIS IS NOT THE ONE
 9287  067100  020103                    CMP     R1,R3           ;SEE IF THE ADDRESS MATCHES PDR UNDER TEST
 9288  067102  001417                    BEQ     8$              ;BRANCH IF ADDRESS IS CORRECT
 9289  067104  104112                    ERROR   112             ;A & W BITS GOT SET IN WRONG PDR
 9290  067106  012700  077405            MOV     #77405,R0       ;RE-SET PAGES MODIFIED BY ERROR
 9291  067112  010037  172320            MOV     R0,KDPDR0       ;RELOAD KERNEL PDR0
 9292  067116  010037  172322            MOV     R0,KDPDR1       ;RELOAD KERNEL PDR1
 9293  067122  010037  172336            MOV     R0,KDPDR7       ;RELOAD KERNEL PDR7
 9294  067126  010037  172220            MOV     R0,SDPDR0       ;RELOAD PAGE 0 OF PRESENT SPACE
 9295  067132  010037  172236            MOV     R0,SDPDR7       ;RE-LOAD I/O PAGE PDR IF ERROR
 9296  067136  011515                    MOV     (R5),(R5)       ;TRY WRITE AGAIN, IN CASE YOU
 9297                                                            ;WERE TESTING PAGE SEVEN
 9298  067140  000402                    BR      9$              ;GO UPDATE R1 FOR NEXT READ
 9299  067142  005237  001172    8$:     INC     $TMP0           ;SET FLAG SINCE ADDRESSES MATCHED
 9300  067146  062701  000002    9$:     ADD     #2,R1           ;POINT TO NEXT PDR TO BE READ
 9301  067152  077232                    SOB     R2,7$           ;BRANCH TO 7$ IF ALL PDR'S NOT READ
 9302  067154  012702  000020            MOV     #20,R2          ;SET COUNTER TO READ NEXT 20 REGISTERS
 9303  067160  012701  172200            MOV     #SIPDR0,R1      ;LOAD ADDRESS OF BEGINNING PDR
 9304  067164  011100            10$:    MOV     (R1),R0         ;READ PDR INTO R0
 9305  067166  022700  077705            CMP     #77705,R0       ;SEE IF THIS WAS THE PDR WITH A&W BITS ON
 9306  067172  001023                    BNE     12$             ;BRANCH IF THIS IS NOT THE ONE
 9307  067174  020103                    CMP     R1,R3           ;SEE IF THE ADDRESS MATCHES PDR UNDER TEST
 9308  067176  001417                    BEQ     11$             ;BRANCH IF ADDRESS IS CORRECT
 9309  067200  104112                    ERROR   112             ;A & W BITS GOT SET IN WRONG PDR
 9310  067202  012700  077405            MOV     #77405,R0       ;RE-SET PAGES MODIFIED BY ERROR
 9311  067206  010037  172320            MOV     R0,KDPDR0       ;RELOAD KERNEL PDR0
 9312  067212  010037  172322            MOV     R0,KDPDR1       ;RELOAD KERNEL PDR1
 9313  067216  010037  172336            MOV     R0,KDPDR7       ;RELOAD KERNEL PDR7
 9314  067222  010037  172220            MOV     R0,SDPDR0       ;RELOAD PAGE 0 OF PRESENT SPACE
 9315  067226  010037  172236            MOV     R0,SDPDR7       ;RE-LOAD I/O PAGE PDR IF ERROR
 9316  067232  011515                    MOV     (R5),(R5)       ;TRY WRITE AGAIN, IN CASE YOU
 9317                                                            ;WERE TESTING PAGE SEVEN
 9318  067234  000402                    BR      12$             ;GO UPDATE R1 FOR NEXT READ
 9319  067236  005237  001172    11$:    INC     $TMP0           ;SET FLAG SINCE ADDRESSES MATCHED
 9320  067242  062701  000002    12$:    ADD     #2,R1           ;POINT TO NEXT PDR TO BE READ
 9321  067246  077232                    SOB     R2,10$          ;BRANCH TO 10$ IF ALL PDR'S NOT READ
 9322  067250  012702  000020            MOV     #20,R2          ;SET COUNTER TO READ NEXT 20 REGISTERS
 9323  067254  012701  177600            MOV     #UIPDR0,R1      ;LOAD ADDRESS OF BEGINNING PDR
 9324  067260  011100            13$:    MOV     (R1),R0         ;READ PDR INTO R0
 9325  067262  022700  077705            CMP     #77705,R0       ;SEE IF THIS WAS THE PDR WITH A&W BITS ON
 9326  067266  001023                    BNE     15$             ;BRANCH IF THIS IS NOT THE ONE
 9327  067270  020103                    CMP     R1,R3           ;SEE IF THE ADDRESS MATCHES PDR UNDER TEST
 9328  067272  001417                    BEQ     14$             ;BRANCH IF ADDRESS IS CORRECT
 9329  067274  104112                    ERROR   112             ;A & W BITS GOT SET IN WRONG PDR
 9330  067276  012700  077405            MOV     #77405,R0       ;RE-SET PAGES MODIFIED BY ERROR
 9331  067302  010037  172320            MOV     R0,KDPDR0       ;RELOAD KERNEL PDR0
 9332  067306  010037  172322            MOV     R0,KDPDR1       ;RELOAD KERNEL PDR1
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 9333  067312  010037  172336              MOV     R0,KDPDR7       ;RELOAD KERNEL PDR7
 9334  067316  010037  172220              MOV     R0,SDPDR0       ;RELOAD PAGE 0 OF PRESENT SPACE
 9335  067322  010037  172236              MOV     R0,SDPDR7       ;RE-LOAD I/O PAGE PDR IF ERROR
 9336  067326  011515                      MOV     (R5),(R5)       ;TRY WRITE AGAIN, IN CASE YOU
 9337                                                              ;WERE TESTING PAGE SEVEN
 9338  067330  000402                      BR      15$             ;GO UPDATE R1 FOR NEXT READ
 9339  067332  005237  001172        14$:  INC     $TMP0           ;SET FLAG SINCE ADDRESSES MATCHED
 9340  067336  062701  000002        15$:  ADD     #2,R1           ;POINT TO NEXT PDR TO BE READ
 9341  067342  077232                      SOB     R2,13$          ;BRANCH TO 13$ IF ALL PDR'S NOT READ
 9342  067344  005737  001172              TST     $TMP0           ;SEE IF THERE WAS A CORRECT PDR
 9343  067350  001002                      BNE     16$             ;BRANCH IF THERE WAS
 9344  067352  011300                      MOV     (R3),R0         ;SAVE CONTENTS OF PDR UNDER TEST
 9345  067354  104113                      ERROR   113             ;NO PDR ADDRESSES MATCHED
 9346  067356  062703  000002        16$:  ADD     #2,R3           ;POINT TO NEXT PDR UNDER TEST
 9347  067362  062705  020000              ADD     #20000,R5       ;CHANGE PAGE NUMBER IN VIRT. ADDR.
 9348  067366  005304                      DEC     R4              ;DECREMENT COUNTER
 9349  067370  001402                      BEQ     17$             ;BRANCH IF COUNTER IS ZERO
 9350  067372  000137  066704              JMP     19$             ;JUMP TO LOAD PDR'S AGAIN
 9351  067376                      17$:
 9352  067376  042737  000007  172516      BIC     #7,MMR3         ;DISABLE ALL D-SPACE MAPPING
 9353  067404  012737  000340  177776      MOV     #340,PSW        ;RETURN TO KERNEL MODE, PRIORITY 7
 9354  067412  012737  066646  001112      MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
 9355
 9356
 9357                          ;;*****************************************************************
 9358                          ;*TEST 105      DUAL MAPPING USER MODE D-SPACE
 9359                          ;:
 9360                          ;:      THIS TEST STARTS BY LOADING ALL THE P.D.R.'S WITH 77405
 9361                          ;:      (4K PAGE,TRAP ON WRITE).  THEN THE VIRTUAL ADDRESS IS SET TO
 9362                          ;:      010200 AND THAT WORD IS WRITTEN INTO ITSELF.  THIS WRITE WILL
 9363                          ;:      SATISFY THE TRAP CONDITION OF THE A.C.F. (BUT IT WILL NOT TRAP
 9364                          ;:      SINCE BIT09 OF MMR0 IS CLEAR) AND SET BOTH THE A & W BITS IN
 9365                          ;:      THE USER D-SPACE P.D.R. UNDER TEST.  NOW ALL OF THE
 9366                          ;:      P.D.R.'S ARE COMPARED WITH 77705 AND ANY THAT MATCH, EXCEPT THE
 9367                          ;:      ONE THAT IS UNDER TEST, ARE REPORTED AS DUAL MAPPING ERRORS.
 9368                          ;:      WHEN THE I/O PAGE IS REACHED THE VIRTUAL ADDRESS GENERATES THE
 9369                          ;:      ADDRESS OF 'MAPL00'' (17770200) WHICH SHOULD ALWAYS EXIST.
 9370                          ;:
 9371                          ;;*****************************************************************
 9372  067420                  TST105:
 9373  067420  000004                      SCOPE
 9374  067422  012737  070202  001316      MOV     #TST106,NXTTST  ;SAVE STARTING ADDRESS OF NEXT
 9375                                                              ;TEST FOR ESCAPE ON PARITY ERRORS
 9376  067430  012737  067606  001112  20$:  MOV     #21$,$LPERR     ;SET LOOP ON ERROR POINTER TO 21$
 9377  067436  012737  140000  177776      MOV     #140000,PSW     ;GO TO USER MODE
 9378  067444  052737  000007  172516      BIS     #7,MMR3         ;ENABLE ALL D-SPACE MAPPING
 9379  067452  012703  177620              MOV     #UDPDR0,R3      ;LOAD FIRST ADDRESS OF USER PDR'S
 9380                                                              ;THAT WILL BE TESTED IN THIS TEST
 9381  067456  012704  000010              MOV     #10,R4          ;TEST THE NEXT EIGHT PDR'S
 9382  067462  012705  010200              MOV     #10200,R5       ;LOAD STARTING VIRTUAL ADDRESS INTO R5
 9383  067466  012700  077405  19$:  MOV     #77405,R0       ;ALL PAGES WILL BE TRAP ON WRITE
 9384  067472  005037  001172              CLR     $TMP0           ;CLEAR CORRECT PDR SET INDICATOR
 9385  067476  012702  000010              MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
 9386  067502  012701  172200              MOV     #SIPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
 9387  067506  010021              1$:  MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
 9388  067510  077202                      SOB     R2,1$           ;BRANCH BACK TO 1$ IF R2 IS NOT ZERO
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9389  067512  012702  000010                MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
9390  067516  012701  172220                MOV     #SDPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
9391  067522  010021                2$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
9392  067524  077202                        SOB     R2,2$           ;BRANCH BACK TO 2$ IF R2 IS NOT ZERO
9393  067526  012702  000010                MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
9394  067532  012701  172300                MOV     #KIPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
9395  067536  010021                3$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
9396  067540  077202                        SOB     R2,3$           ;BRANCH BACK TO 3$ IF R2 IS NOT ZERO
9397  067542  012702  000010                MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
9398  067546  012701  172320                MOV     #KDPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
9399  067552  010021                4$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
9400  067554  077202                        SOB     R2,4$           ;BRANCH BACK TO 4$ IF R2 IS NOT ZERO
9401  067556  012702  000010                MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
9402  067562  012701  177600                MOV     #UIPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
9403  067566  010021                5$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
9404  067570  077202                        SOB     R2,5$           ;BRANCH BACK TO 5$ IF R2 IS NOT ZERO
9405  067572  012702  000010                MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
9406  067576  012701  177620                MOV     #UDPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
9407  067602  010021                6$:     MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
9408  067604  077202                        SOB     R2,6$           ;BRANCH BACK TO 6$ IF R2 IS NOT ZERO
9409  067606  012700  077405        21$:    MOV     #77405,R0       ;MUST RE-INIT THESE PDRS IF ERROR
9410  067612  010037  172320                MOV     R0,KDPDR0       ;LOAD KERNEL PDR0
9411  067616  010037  172322                MOV     R0,KDPDR1       ;LOAD KERNEL PDR1
9412  067622  010037  172336                MOV     R0,KDPDR7       ;LOAD KERNEL PDR7
9413  067626  010037  177620                MOV     R0,UDPDR0       ;LOAD PDR0 OF PRESENT SPACE
9414  067632  010037  177636                MOV     R0,UDPDR7       ;LOAD PDR7 OF PRESENT SPACE
9415  067636  000240                        NOP                     ;THIS IS A SYNC POINT FOR SCOPING
9416  067640  011515                        MOV     (R5),(R5)       ;WRITE INTO PAGE UNDER TEST
9417  067642  012702  000020                MOV     #20,R2          ;SET COUNTER TO READ NEXT 20 REGISTERS
9418  067646  012701  172300                MOV     #KIPDR0,R1      ;LOAD ADDRESS OF BEGINNING PDR
9419  067652  011100                7$:     MOV     (R1),R0         ;READ PDR INTO R0
9420  067654  022700  077705                CMP     #77705,R0       ;SEE IF THIS WAS THE PDR WITH A&W BITS ON
9421  067660  001023                        BNE     9$              ;BRANCH IF THIS IS NOT THE ONE
9422  067662  020103                        CMP     R1,R3           ;SEE IF THE ADDRESS MATCHES PDR UNDER TEST
9423  067664  001417                        BEQ     8$              ;BRANCH IF ADDRESS IS CORRECT
9424  067666  104112                        ERROR   112             ;A & W BITS GOT SET IN WRONG PDR
9425  067670  012700  077405                MOV     #77405,R0       ;RE-SET PAGES MODIFIED BY ERROR
9426  067674  010037  172320                MOV     R0,KDPDR0       ;RELOAD KERNEL PDR0
9427  067700  010037  172322                MOV     R0,KDPDR1       ;RELOAD KERNEL PDR1
9428  067704  010037  172336                MOV     R0,KDPDR7       ;RELOAD KERNEL PDR7
9429  067710  010037  177620                MOV     R0,UDPDR0       ;RELOAD PAGE 0 OF PRESENT SPACE
9430  067714  010037  177636                MOV     R0,UDPDR7       ;RE-LOAD I/O PAGE PDR IF ERROR
9431  067720  011515                        MOV     (R5),(R5)       ;TRY WRITE AGAIN, IN CASE YOU
9432                                                                ;WERE TESTING PAGE SEVEN
9433  067722  000402                        BR      9$              ;GO UPDATE R1 FOR NEXT READ
9434  067724  005237  001172        8$:     INC     $TMP0           ;SET FLAG SINCE ADDRESSES MATCHED
9435  067730  062701  000002        9$:     ADD     #2,R1           ;POINT TO NEXT PDR TO BE READ
9436  067734  077232                        SOB     R2,7$           ;BRANCH TO 7$ IF ALL PDR'S NOT READ
9437  067736  012702  000020                MOV     #20,R2          ;SET COUNTER TO READ NEXT 20 REGISTERS
9438  067742  012701  172200                MOV     #SIPDR0,R1      ;LOAD ADDRESS OF BEGINNING PDR
9439  067746  011100                10$:    MOV     (R1),R0         ;READ PDR INTO R0
9440  067750  022700  077705                CMP     #77705,R0       ;SEE IF THIS WAS THE PDR WITH A&W BITS ON
9441  067754  001023                        BNE     12$             ;BRANCH IF THIS IS NOT THE ONE
9442  067756  020103                        CMP     R1,R3           ;SEE IF THE ADDRESS MATCHES PDR UNDER TEST
9443  067760  001417                        BEQ     11$             ;BRANCH IF ADDRESS IS CORRECT
9444  067762  104112                        ERROR   112             ;A & W BITS GOT SET IN WRONG PDR
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 9445  067764  012700  077405                    MOV     #77405,R0       ;RE-SET PAGES MODIFIED BY ERROR
 9446  067770  010037  172320                    MOV     R0,KDPDR0       ;RELOAD KERNEL PDR0
 9447  067774  010037  172322                    MOV     R0,KDPDR1       ;RELOAD KERNEL PDR1
 9448  070000  010037  172336                    MOV     R0,KDPDR7       ;RELOAD KERNEL PDR7
 9449  070004  010037  177620                    MOV     R0,UDPDR0       ;RELOAD PAGE 0 OF PRESENT SPACE
 9450  070010  010037  177636                    MOV     R0,UDPDR7       ;RE-LOAD I/O PAGE PDR IF ERROR
 9451  070014  011515                            MOV     (R5),(R5)       ;TRY WRITE AGAIN, IN CASE YOU
 9452                                                                    ;WERE TESTING PAGE SEVEN
 9453  070016  000402                            BR      12$             ;GO UPDATE R1 FOR NEXT READ
 9454  070020  005237  001172          11$:      INC     $TMP0           ;SET FLAG SINCE ADDRESSES MATCHED
 9455  070024  062701  000002          12$:      ADD     #2,R1           ;POINT TO NEXT PDR TO BE READ
 9456  070030  077232                            SOB     R2,10$          ;BRANCH TO 10$ IF ALL PDR'S NOT READ
 9457  070032  012702  000020                    MOV     #20,R2          ;SET COUNTER TO READ NEXT 20 REGISTERS
 9458  070036  012701  177600                    MOV     #UIPDR0,R1      ;LOAD ADDRESS OF BEGINNING PDR
 9459  070042  011100          13$:      MOV     (R1),R0         ;READ PDR INTO R0
 9460  070044  022700  077705                    CMP     #77705,R0       ;SEE IF THIS WAS THE PDR WITH A&W BITS ON
 9461  070050  001023                            BNE     15$             ;BRANCH IF THIS IS NOT THE ONE
 9462  070052  020103                            CMP     R1,R3           ;SEE IF THE ADDRESS MATCHES PDR UNDER TEST
 9463  070054  001417                            BEQ     14$             ;BRANCH IF ADDRESS IS CORRECT
 9464  070056  104112                            ERROR   112             ;A & W BITS GOT SET IN WRONG PDR
 9465  070060  012700  077405                    MOV     #77405,R0       ;RE-SET PAGES MODIFIED BY ERROR
 9466  070064  010037  172320                    MOV     R0,KDPDR0       ;RELOAD KERNEL PDR0
 9467  070070  010037  172322                    MOV     R0,KDPDR1       ;RELOAD KERNEL PDR1
 9468  070074  010037  172336                    MOV     R0,KDPDR7       ;RELOAD KERNEL PDR7
 9469  070100  010037  177620                    MOV     R0,UDPDR0       ;RELOAD PAGE 0 OF PRESENT SPACE
 9470  070104  010037  177636                    MOV     R0,UDPDR7       ;RE-LOAD I/O PAGE PDR IF ERROR
 9471  070110  011515                            MOV     (R5),(R5)       ;TRY WRITE AGAIN, IN CASE YOU
 9472                                                                    ;WERE TESTING PAGE SEVEN
 9473  070112  000402                            BR      15$             ;GO UPDATE R1 FOR NEXT READ
 9474  070114  005237  001172          14$:      INC     $TMP0           ;SET FLAG SINCE ADDRESSES MATCHED
 9475  070120  062701  000002          15$:      ADD     #2,R1           ;POINT TO NEXT PDR TO BE READ
 9476  070124  077232                            SOB     R2,13$          ;BRANCH TO 13$ IF ALL PDR'S NOT READ
 9477  070126  005737  001172                    TST     $TMP0           ;SEE IF THERE WAS A CORRECT PDR
 9478  070132  001002                            BNE     16$             ;BRANCH IF THERE WAS
 9479  070134  011300                            MOV     (R3),R0         ;SAVE CONTENTS OF PDR UNDER TEST
 9480  070136  104113                            ERROR   113             ;NO PDR ADDRESSES MATCHED
 9481  070140  062703  000002          16$:      ADD     #2,R3           ;POINT TO NEXT PDR UNDER TEST
 9482  070144  062705  020000                    ADD     #20000,R5       ;CHANGE PAGE NUMBER IN VIRT. ADDR.
 9483  070150  005304                            DEC     R4              ;DECREMENT COUNTER
 9484  070152  001402                            BEQ     17$             ;BRANCH IF COUNTER IS ZERO
 9485  070154  000137  067466                    JMP     19$             ;JUMP TO LOAD PDR'S AGAIN
 9486  070160                          17$:
 9487  070160  042737  000007  172516            BIC     #7,MMR3         ;DISABLE ALL D-SPACE MAPPING
 9488  070166  012737  000340  177776            MOV     #340,PSW        ;RETURN TO KERNEL MODE, PRIORITY 7
 9489  070174  012737  067430  001112            MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
 9490
 9491
 9492                                  .SBTTL  ************ ENTRY POINT 8 --- STARTING ADDRESS 234 ************
 9493                                  .SBTTL  ***** MOVE FROM AND MOVE TO PREVIOUS MODE INSTRUCTION TEST *****
 9494                                  ;*
 9495                                  ;*      THIS GROUP OF TESTS WILL TEST ALL THE LOGIC ASSOCIATED WITH
 9496                                  ;*      THE 'MOVE FROM PREVIOUS'' AND MOVE TO PREVIOUS'' INSTRUCTIONS.
 9497                                  ;*      THE LOGIC IS PRIMARILY ON ''SSRB'', THE 'ROM OUTXX'' SIGNALS ARE
 9498                                  ;*      GENERATED BY THE ROMS ON ''SSRA''.
 9499                                  ;*
 9500
```

```
                                        ;;*****************************************************************
                                        ;*TEST 106      MOVE FROM PREVIOUS (SUPERVISOR) I-SPACE
                                        ;*
                                        ;*      THIS TEST USES THE 'MFPI' INSTRUCTION TO ENSURE THAT THE
                                        ;*      PREVIOUS MODE IS CLOCKED CORRECTLY BY 'ROM OUT05'.
                                        ;*      THERE IS A DESCRIPTION BEFORE EACH DESTINATION MODE TESTED,
                                        ;*      WHICH LISTS THE ROM STATES THAT SHOULD COME UP (ALONG WITH
                                        ;*      THEIR ADDRESSES).
                                        ;*      IF THE CORRECT MODE IS NOT ENABLED A NON-RESIDENT ABORT
                                        ;*      WILL OCCUR AND TRAP TO 10$, WHERE THE ERRORS ARE REPORTED.
                                        ;*
                                        ;;*****************************************************************
070202                                  TST106:
                                                SCOPE
070202  000004
070204  012737  071004  001316                MOV     #TST107,NXTTST  ;SAVE STARTING ADDRESS OF NEXT
                                                                        ;TEST FOR ESCAPE ON PARITY ERRORS
070212  104420                                TBITR                   ;RESTORE T-BIT TO ITS STATUS BEFORE
                                                                        ;THE SIX DUAL MAPPING TESTS
070214                                  ENTPT8:
070214  012737  070416  001110                MOV     #20$,$LPADR     ;SET LOOP ADDRESS POINTER TO 20$
070222  012737  070416  001112                MOV     #20$,$LPERR     ;SET LOOP ON ERROR POINTER TO 20$
070230  012737  000106  001102                MOV     #106,$TSTNM     ;LOAD TEST NUMBER INTO MEMORY
070236  013737  001102  177570                MOV     $TSTNM,DISPLAY  ;DISPLAY TEST NUMBER FOR THIS TEST
070244  012737  077406  172300                MOV     #77406,KIPDR0   ;MAKE KERNEL I PAGE 0 200 BLOCKS, R/W
070252  012737  077406  172302                MOV     #77406,KIPDR1   ;MAKE KERNEL I PAGE 1 200 BLOCKS, R/W
070260  012737  077406  172304                MOV     #77406,KIPDR2   ;MAKE KERNEL I PAGE 2 200 BLOCKS, R/W
070266  012737  077406  172306                MOV     #77406,KIPDR3   ;MAKE KERNEL I PAGE 3 200 BLOCKS, R/W
070274  012737  077406  172316                MOV     #77406,KIPDR7   ;MAKE KERNEL I PAGE 7 200 BLOCKS, R/W
070302  012737  000000  172340                MOV     #000,KIPAR0     ;MAP KERNEL I PAGE 0 TO 0 - 4K
070310  012737  000200  172342                MOV     #200,KIPAR1     ;MAP KERNEL I PAGE 1 TO 4K - 8K
070316  012737  000400  172344                MOV     #400,KIPAR2     ;MAP KERNEL I PAGE 2 TO 8K - 12K
070324  012737  000600  172346                MOV     #600,KIPAR3     ;MAP KERNEL I PAGE 3 TO 12K - 16K
070332  012737  177600  172356                MOV     #177600,KIPAR7  ;MAP KERNEL I PAGE 7 TO THE I/O PAGE
070340  012737  000001  177572                MOV     #BIT0,MMR0      ;ENABLE 18-BIT RELOCATION IF NOT ON
070346  012737  000020  172516                MOV     #BIT4,MMR3      ;ENABLE 22-BIT RELOCATION IF NOT ON
070354  042737  000007  172516                BIC     #7,MMR3         ;MAKE SURE THAT ALL D-SPACE IS DISABLED
070362  012700  077406                        MOV     #77406,R0       ;MAKE ALL KERNEL I-SPACE PAGES RESIDENT
                                                                        ;READ/WRITE, LENGTH 200 BLOCKS
070366  012702  000010                        MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
070372  012701  172300                        MOV     #KIPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
070376  010021                  19$:          MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
070400  077202                                SOB     R2,19$          ;BRANCH BACK TO 19$ IF R2 IS NOT ZERO
070402  012737  070416  001110                MOV     #20$,$LPADR     ;SET LOOP POINTER TO 20$
070410  012737  070416  001112                MOV     #20$,$LPERR     ;SET LOOP ON ERROR TO 20$
070416  012700  077400                  20$:  MOV     #77400,R0       ;MAKE PAGE 4 IN ALL BUT SUPERVISOR I
                                                                        ;AND KERNEL I NON-RESIDENT
070422  010037  172330                        MOV     R0,KDPDR4       ;KERNEL D-SPACE PAGE 4
070426  010037  172230                        MOV     R0,SDPDR4       ;SUPERVISOR D-SPACE PAGE 4
070432  010037  177630                        MOV     R0,UDPDR4       ;USER D-SPACE PAGE 4
070436  010037  177610                        MOV     R0,UIPDR4       ;USER I-SPACE PAGE 4
070442  012737  077406  172310                MOV     #77406,KIPDR4   ;KERNEL I-SPACE PAGE 4 READ/WRITE
070450  012737  077406  172210                MOV     #77406,SIPDR4   ;SUPER I-SPACE PAGE 4 READ/WRITE
070456  012737  001000  172350                MOV     #1000,KIPAR4    ;MAP KERNEL I PAGE 4 TO 16K
070464  012737  001000  172250                MOV     #1000,SIPAR4    ;MAP SUPER I PAGE 4 TO 16K
070472  012700  036514                        MOV     #36514,R0       ;LOAD DATA PATTERN INTO R0
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 9557  070476  010037  100000                    MOV     R0,@#100000     ;LOAD DATA PATTERN INTO PHY 100000
 9558  070502  012737  070756  000250            MOV     #10$,MMVEC      ;SET M.M. VECTOR TO 10$
 9559  070510  105037  172310                    CLRB    KIPDR4          ;MAKE KERNEL I-SPACE PAGE 4 NON-RESIDENT
 9560  070514  012737  070522  001112            MOV     #11$,$LPERR     ;SET LOOP ON ERROR POINTER TO 11$
 9561  070522  012737  010340  177776  11$:      MOV     #010340,PSW     ;MAKE PREVIOUS MODE SUPERVISOR
 9562  070530  000240                            NOP                     ;THIS IS A SYNC POINT FOR SCOPING
 9563  070532  006506                    1$:     MFPI    SSP             ;PUT SUPERVISOR STACK POINTER ON KERNEL
 9564                                                                    ;STACK
 9565  070534  022706  001100                    CMP     #KERSTK,KSP     ;WAS SOMETHING PUSHED ON STACK AT 1$
 9566  070540  001407                            BEQ     3$              ;BRANCH IF NOTHING WAS PUSHED
 9567  070542  012601                            MOV     (KSP)+,R1       ;POP KERNEL STACK INTO R1
 9568  070544  012702  000700                    MOV     #SUPSTK,R2      ;EXPECTING TO GET 700 AS SSP
 9569  070550  020201                            CMP     R2,R1           ;DID YOU GET THE RIGHT POINTER?
 9570  070552  001403                            BEQ     2$              ;BRANCH IF YOU DID
 9571  070554  104114                            ERROR   114             ;WRONG THING WAS PUSHED ON STACK
 9572  070556  000401                            BR      2$              ;BRANCH TO NEXT TRY
 9573  070560  104115                    3$:     ERROR   115             ;NOTHING PUSHED ON STACK
 9574  070562                            2$:     ;THE FOLLOWING WILL TEST DSTM=1 MFPI.  BELOW ARE THE
 9575                                            ;ROM STATE NAMES AND ADDRESSES, FROM THE A-FORK.
 9576                                            ;THE * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
 9577                                            ;INTO THE F/F'S ON SSRB.
 9578                                            ;   *  D12.00    (001)
 9579                                            ;   *  D12.10    (175)
 9580                                            ;   *  MFP.00    (066)
 9581                                            ;      MFP.10    (250)
 9582                                            ;      SVC.80    (222)
 9583                                            ;      SVC.90    (300)
 9584                                            ;      FET.00    (217)
 9585  070562  012737  070570  001112            MOV     #12$,$LPERR     ;SET LOOP ON ERROR POINTER TO 12$
 9586  070570  012737  010340  177776  12$:      MOV     #010340,PSW     ;MAKE PREVIOUS MODE SUPERVISOR
 9587  070576  012702  100000                    MOV     #100000,R2      ;LOAD VIRTUAL ADDRESS INTO R2
 9588  070602  000240                            NOP                     ;THIS IS A SYNC POINT FOR SCOPING
 9589  070604  006512                            MFPI    (R2)            ;READ FROM PHYSICAL 100000
 9590  070606  012601                            MOV     (KSP)+,R1       ;POP KERNEL STACK INTO R1
 9591  070610  020001                            CMP     R0,R1           ;WAS DATA FETCHED SAME AS STORED
 9592  070612  001401                            BEQ     4$              ;BRANCH IF CORRECT DATA WAS FETCHED
 9593  070614  104116                            ERROR   116             ;WRONG DATA WAS FETCHED
 9594  070616                            4$:     ;THE FOLLOWING WILL TEST DSTM=2 MFPI.  BELOW ARE THE
 9595                                            ;ROM STATE NAMES AND ADDRESSES, FROM THE A-FORK.
 9596                                            ;THE * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
 9597                                            ;INTO THE F/F'S ON SSRB.
 9598                                            ;   *  D12.01    (002)
 9599                                            ;   *  D12.10    (175)
 9600                                            ;   *  MFP.00    (066)
 9601                                            ;      MFP.10    (250)
 9602                                            ;      SVC.80    (222)
 9603                                            ;      SVC.90    (300)
 9604                                            ;      FET.00    (217)
 9605  070616  012737  070624  001112            MOV     #14$,$LPERR     ;SET LOOP ON ERROR POINTER TO 14$
 9606  070624  012737  010340  177776  14$:      MOV     #010340,PSW     ;MAKE PREVIOUS MODE SUPERVISOR
 9607  070632  012702  100000                    MOV     #100000,R2      ;LOAD VIRTUAL ADDRESS INTO R2
 9608  070636  000240                            NOP                     ;THIS IS A SYNC POINT FOR SCOPING
 9609  070640  006522                            MFPI    (R2)+           ;READ FROM PHYSICAL 100000
 9610  070642  012601                            MOV     (KSP)+,R1       ;POP KERNEL STACK INTO R1
 9611  070644  020001                            CMP     R0,R1           ;WAS DATA FETCHED SAME AS STORED
 9612  070646  001401                            BEQ     5$              ;BRANCH IF CORRECT DATA WAS FETCHED
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 9613  070650  104116                          ERROR   116             ;WRONG DATA WAS FETCHED
 9614  070652                          5$:     ;THE FOLLOWING WILL TEST DSTM=3 MFPI.  BELOW ARE THE
 9615                                          ;ROM STATE NAMES AND ADDRESSES, FROM THE A-FORK.
 9616                                          ;THE * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
 9617                                          ;INTO THE F/F'S ON SSRB.
 9618                                          ;       D30.00    (003)
 9619                                          ;       D30.10    (221)
 9620                                          ;       D10.20    (233)
 9621                                          ;   *   D10.50    (311)
 9622                                          ;   *   D10.60    (177)
 9623                                          ;   *   MFP.00    (066)
 9624                                          ;       MFP.10    (250)
 9625                                          ;       SVC.80    (222)
 9626                                          ;       SVC.90    (300)
 9627                                          ;       FET.00    (217)
 9628  070652  012737  070660  001112          MOV     #15$,$LPERR     ;SET LOOP ON ERROR POINTER TO 15$
 9629  070660  012737  010340  177776  15$:    MOV     #010340,PSW     ;MAKE PREVIOUS MODE SUPERVISOR
 9630  070666  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
 9631  070670  006537  100000                  MFPI    @#100000        ;READ FROM PHYSICAL 100000
 9632  070674  012601                          MOV     (KSP)+,R1       ;POP KERNEL STACK INTO R1
 9633  070676  020001                          CMP     R0,R1           ;WAS DATA FETCHED SAME AS STORED
 9634  070700  001401                          BEQ     6$              ;BRANCH IF CORRECT DATA WAS FETCHED
 9635  070702  104116                          ERROR   116             ;WRONG DATA WAS FETCHED
 9636  070704                          6$:     ;THE FOLLOWING WILL TEST DSTM=4 MFPI.  BELOW ARE THE
 9637                                          ;ROM STATE NAMES AND ADDRESSES, FROM THE A-FORK.
 9638                                          ;THE * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
 9639                                          ;INTO THE F/F'S ON SSRB.
 9640                                          ;       D45.00    (004)
 9641                                          ;   *   D10.30    (122)
 9642                                          ;   *   D10.60    (177)
 9643                                          ;   *   MFP.00    (066)
 9644                                          ;       MFP.10    (250)
 9645                                          ;       SVC.80    (222)
 9646                                          ;       SVC.90    (300)
 9647                                          ;       FET.00    (217)
 9648  070704  012737  070712  001112          MOV     #16$,$LPERR     ;SET LOOP ON ERROR POINTER TO 16$
 9649  070712  012737  010340  177776  16$:    MOV     #010340,PSW     ;MAKE PREVIOUS MODE SUPERVISOR
 9650  070720  012702  100002                  MOV     #100002,R2      ;LOAD VIRTUAL ADDRESS INTO R2
 9651  070724  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
 9652  070726  006542                          MFPI    -(R2)           ;READ FROM PHYSICAL 100000
 9653  070730  012601                          MOV     (KSP)+,R1       ;POP KERNEL STACK INTO R1
 9654  070732  020001                          CMP     R0,R1           ;WAS DATA FETCHED SAME AS STORED
 9655  070734  001401                          BEQ     7$              ;BRANCH IF CORRECT DATA WAS FETCHED
 9656  070736  104116                          ERROR   116             ;WRONG DATA WAS FETCHED
 9657  070740  012737  032226  000250  7$:     MOV     #MMTRAP,MMVEC   ;SET M.M.VECTOR TO NORMAL ROUTINE
 9658  070746  012737  070416  001112          MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
 9659  070754  000413                          BR      TST107          ;;BRANCH TO NEXT TEST
 9660
 9661
 9662  070756  013737  177572  001250  10$:    MOV     MMR0,PMMR0      ;SAVE MMR0 FOR ERROR TYPEOUT
 9663  070764  013737  177574  001252          MOV     MMR1,PMMR1      ;SAVE MMR1 FOR ERROR TYPEOUT
 9664  070772  013737  177576  001254          MOV     MMR2,PMMR2      ;SAVE MMR2 FOR ERROR TYPEOUT
 9665  071000  104117                          ERROR   117             ;TRIED TO READ NON-RESIDENT PAGE
 9666  071002  000002                          RTI
 9667
 9668
```

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                                ;;*****************************************************************
                                ;*TEST 107      MOVE TO PREVIOUS (SUPERVISOR) I-SPACE
                                ;*
                                ;*      THIS TEST USES THE 'MTPI' INSTRUCTION TO ENSURE THAT THE
                                ;*      PREVIOUS MODE IS CLOCKED CORRECTLY BY 'ROM OUT05'.
                                ;*      THERE IS A DESCRIPTION BEFORE EACH DESTINATION MODE TESTED,
                                ;*      WHICH LISTS THE ROM STATES THAT SHOULD COME UP (ALONG WITH
                                ;*      THEIR ADDRESSES).
                                ;*      IF THE CORRECT MODE IS NOT ENABLED A NON-RESIDENT ABORT
                                ;*      WILL OCCUR AND TRAP TO 10$, WHERE THE ERRORS ARE REPORTED.
                                ;*
                                ;;*****************************************************************
071004                          TST107:
071004  000004                          SCOPE
071006  012737  071464  001316          MOV     #TST110,NXTTST  ;SAVE STARTING ADDRESS OF NEXT
                                                                ;TEST FOR ESCAPE ON PARITY ERRORS
071014  012700  077400          20$:    MOV     #77400,R0       ;MAKE PAGE 4 IN ALL BUT SUPERVISOR I
                                                                ;AND KERNEL I NON-RESIDENT
071020  010037  172330                  MOV     R0,KDPDR4       ;KERNEL D-SPACE PAGE 4
071024  010037  172230                  MOV     R0,SDPDR4       ;SUPERVISOR D-SPACE PAGE 4
071030  010037  177630                  MOV     R0,UDPDR4       ;USER D-SPACE PAGE 4
071034  010037  177610                  MOV     R0,UIPDR4       ;USER I-SPACE PAGE 4
071040  012737  077406  172310          MOV     #77406,KIPDR4   ;KERNEL I-SPACE PAGE 4 READ/WRITE
071046  012737  077406  172210          MOV     #77406,SIPDR4   ;SUPER I-SPACE PAGE 4 READ/WRITE
071054  012737  001000  172350          MOV     #1000,KIPAR4    ;MAP KERNEL I PAGE 4 TO 16K
071062  012737  001000  172250          MOV     #1000,SIPAR4    ;MAP SUPER I PAGE 4 TO 16K
071070  012737  071436  000250          MOV     #10$,MMVEC      ;SET M.M. VECTOR TO 10$
071076  012737  010340  177776  1$:     MOV     #010340,PSW     ;MAKE PREVIOUS MODE SUPERVISOR
071104  012746  007777                  MOV     #7777,-(KSP)    ;PUSH DATA ON KERNEL STACK
071110  006606                          MTPI    SSP             ;LOAD SUPERVISOR STACK POINTER
071112  006506                          MFPI    SSP             ;READ SUPERVISOR STACK POINTER
071114  012601                          MOV     (KSP)+,R1       ;POP KERNEL STACK INTO R1
071116  022701  007777                  CMP     #7777,R1        ;WAS SUPERVISOR STACK POINTER CHANGED
071122  001401                          BEQ     2$              ;BRANCH IF IT WAS
071124  104120                          ERROR   120             ;SUPER STACK POINTER NOT CHANGED
071126  012737  010340  177776  2$:     MOV     #010340,PSW     ;MAKE PREVIOUS MODE SUPERVISOR
071134  012746  000700                  MOV     #SUPSTK,-(KSP)  ;GET READY TO RESTORE SUPERVISOR S. POINT
071140  006606                          MTPI    SSP             ;RESTORE SUPERVISOR STACK POINTER
071142                          3$:     ;THIS WILL TEST DSTM = 1 MTPI. BELOW ARE THE
                                        ;ROM STATE NAMES AND ADDRESSES, FROM THE C-FORK
                                        ;THE  * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
                                        ;INTO THE FLIP/FLOPS ON SSRB.
                                        ;   *  D12.80     (111)
                                        ;   *  D12.60     (155)
                                        ;      D12.20     (312)
                                        ;      FET.10     (260)
071142  012737  071160  001112          MOV     #13$,$LPERR     ;SET LOOP ON ERROR POINTER TO 13$
071150  012702  100000                  MOV     #100000,R2      ;LOAD VIRTUAL ADDRESS INTO R2
071154  012700  125252                  MOV     #125252,R0      ;LOAD TEST DATA INTO R0
071160  010046                  13$:    MOV     R0,-(KSP)       ;PUSH TEST DATA ON KERNEL STACK
071162  105037  172310                  CLRB    KIPDR4          ;MAKE KERNEL I PAGE 4 NON-RESIDENT
071166  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
071170  006612                          MTPI    (R2)            ;LOAD TEST DATA INTO PHYSICAL 100000
071172  112737  000006  172310          MOVB    #006,KIPDR4     ;MAKE KERNEL PAGE 4 RESIDENT
071200  011201                          MOV     (R2),R1         ;READ FROM ADDRESS 100000
071202  020001                          CMP     R0,R1           ;SEE IF DATA WAS STORED AT CORRECT PLACE
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 9725  071204  001401                          BEQ     4$              ;BRANCH IF STORE WAS CORRECT
 9726  071206  104121                          ERROR   121             ;INCORRECT STORE
 9727  071210                          4$:     ;THIS WILL TEST DSTM = 3 MTPI. BELOW ARE THE
 9728                                          ;ROM STATE NAMES AND ADDRESSES, FROM THE C-FORK
 9729                                          ;THE  * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
 9730                                          ;INTO THE FLIP/FLOPS ON SSRB.
 9731                                          ;       D30.80  113)
 9732                                          ;       D30.10  (221)
 9733                                          ;       D10.20  (233)
 9734                                          ;   *   D10.50  (311)
 9735                                          ;   *   D10.40  (157)
 9736                                          ;       FET.01  (331)
 9737  071210  012737  071230  001112          MOV     #14$,$LPERR     ;SET LOOP ON ERROR POINTER TO 14$
 9738  071216  012737  010340  177776          MOV     #010340,PSW     ;MAKE PREVIOUS MODE SUPERVISOR
 9739  071224  012700  052525                  MOV     #52525,R0       ;LOAD TEST DATA INTO R0
 9740  071230  010046                  14$:    MOV     R0,-(KSP)       ;PUSH TEST DATA ON KERNEL STACK
 9741  071232  105037  172310                  CLRB    KIPDR4          ;MAKE KERNEL I PAGE 4 NON-RESIDENT
 9742  071236  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
 9743  071240  006637  100000                  MTPI    @#100000        ;LOAD TEST DATA INTO PHYSICAL 100000
 9744  071244  112737  000006  172310          MOVB    #006,KIPDR4     ;MAKE KERNEL PAGE 4 RESIDENT
 9745  071252  013701  100000                  MOV     @#100000,R1     ;READ FROM ADDRESS 100000
 9746  071256  020001                          CMP     R0,R1           ;SEE IF DATA WAS STORED CORRECTLY
 9747  071260  001401                          BEQ     5$              ;BRANCH IF STORE WAS CORRECT
 9748  071262  104121                          ERROR   121             ;INCORRECT STORE
 9749  071264                          5$:     ;THIS WILL TEST DSTM = 4 MTPI. BELOW ARE THE
 9750                                          ;ROM STATE NAMES AND ADDRESSES, FROM THE C-FORK
 9751                                          ;THE  * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
 9752                                          ;INTO THE FLIP/FLOPS ON SSRB.
 9753                                          ;       D45.80  (115)
 9754                                          ;   *   D40.20  (121)
 9755                                          ;   *   D10.40  (157)
 9756                                          ;       FET.01  (331)
 9757  071264  012737  071304  001112          MOV     #15$,$LPERR     ;SET LOOP ON ERROR POINTER TO 15$
 9758  071272  012737  010340  177776          MOV     #010340,PSW     ;MAKE PREVIOUS MODE SUPERVISOR
 9759  071300  012700  125252                  MOV     #125252,R0      ;LOAD TEST DATA INTO R0
 9760  071304  010046                  15$:    MOV     R0,-(KSP)       ;PUSH TEST DATA ON KERNEL STACK
 9761  071306  012702  100002                  MOV     #100002,R2      ;LOAD VIRTUAL ADDRESS INTO R2
 9762  071312  105037  172310                  CLRB    KIPDR4          ;MAKE KERNEL I PAGE 4 NON-RESIDENT
 9763  071316  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
 9764  071320  006642                          MTPI    -(R2)           ;LOAD TEST DATA INTO PHYSICAL 100000
 9765  071322  112737  000006  172310          MOVB    #006,KIPDR4     ;MAKE KERNEL PAGE 4 RESIDENT
 9766  071330  013701  100000                  MOV     @#100000,R1     ;READ FROM ADDRESS 100000
 9767  071334  020001                          CMP     R0,R1           ;SEE IF DATA WAS STORED CORRECTLY
 9768  071336  001401                          BEQ     6$              ;BRANCH IF STORE WAS CORRECT
 9769  071340  104121                          ERROR   121             ;INCORRECT STORE
 9770  071342                          6$:     ;THIS WILL TEST DSTM = 6 MTPI. BELOW ARE THE
 9771                                          ;ROM STATE NAMES AND ADDRESSES, FROM THE C-FORK
 9772                                          ;THE  * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
 9773                                          ;INTO THE FLIP/FLOPS ON SSRB.
 9774                                          ;       D67.80  (117)
 9775                                          ;       D67.00  (006)
 9776                                          ;       D67.10  (251)
 9777                                          ;   *   D10.30  (122)
 9778                                          ;   *   D10.40  (157)
 9779                                          ;       FET.01  (331)
 9780  071342  012737  071364  001112          MOV     #16$,$LPERR     ;SET LOOP ON ERROR POINTER TO 16$
```

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 9781  071350  012737  010340  177776          MOV     #010340,PSW     ;MAKE PREVIOUS MODE SUPERVISOR
 9782  071356  012700  052525                  MOV     #52525,R0       ;LOAD TEST DATA INTO R0
 9783  071362  005002                          CLR     R2              ;MAKE REGISTER 2 ZERO
 9784  071364  010046                  16$:    MOV     R0,-(KSP)       ;PUSH TEST DATA ON KERNEL STACK
 9785  071366  105037  172310                  CLRB    KIPDR4          ;MAKE KERNEL I PAGE 4 NON-RESIDENT
 9786  071372  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
 9787  071374  006662  100000                  MTPI    100000(R2)      ;LOAD TEST DATA INTO PHYSICAL 100000
 9788  071400  112737  000006  172310          MOVB    #006,KIPDR4     ;MAKE KERNEL PAGE 4 RESIDENT
 9789  071406  013701  100000                  MOV     @#100000,R1     ;READ FROM ADDRESS 100000
 9790  071412  020001                          CMP     R0,R1           ;SEE IF DATA WAS STORED CORRECTLY
 9791  071414  001401                          BEQ     7$              ;BRANCH IF STORE WAS CORRECT
 9792  071416  104121                          ERROR   121             ;INCORRECT STORE
 9793  071420  012737  071014  001112  7$:     MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
 9794  071426  012737  032226  000250          MOV     #MMTRAP,MMVEC   ;RESTORE M.M. VECTOR TO NORMAL ROUTINE
 9795  071434  000413                          BR      TST110          ;;BRANCH TO NEXT TEST
 9796
 9797
 9798  071436  013737  177572  001250  10$:    MOV     MMR0,PMMR0      ;SAVE MMR0 FOR ERROR TYPEOUT
 9799  071444  013737  177574  001252          MOV     MMR1,PMMR1      ;SAVE MMR1 FOR ERROR TYPEOUT
 9800  071452  013737  177576  001254          MOV     MMR2,PMMR2      ;SAVE MMR2 FOR ERROR TYPEOUT
 9801  071460  104117                          ERROR   117             ;TRIED TO LOAD A N.R. PAGE 4
 9802  071462  000002                          RTI                     ;RETURN TO TEST
 9803
 9804
 9805                                  ;;*****************************************************************
 9806                                  ;*TEST 110      MFPI (SUPERVISOR) WITH SUPERVISOR D-SPACE ENABLED
 9807                                  ;*
 9808                                  ;*      THIS TEST USES THE 'MFPI' INSTRUCTION TO ENSURE THAT THE
 9809                                  ;*      PREVIOUS MODE IS CLOCKED CORRECTLY BY 'ROM OUT05', AND THAT
 9810                                  ;*      D-SPACE IS NOT ENABLED.  THIS IS DONE BY 'ROM OUT08 H' AND
 9811                                  ;*      'SSRB IR15 L' NOT ASSERTED GENERATING 'SSRB I SPACEB L'.
 9812                                  ;*      THERE IS A DESCRIPTION BEFORE EACH DESTINATION MODE TESTED,
 9813                                  ;*      WHICH LISTS THE ROM STATES THAT SHOULD COME UP (ALONG WITH
 9814                                  ;*      THEIR ADDRESSES).
 9815                                  ;*      IF THE CORRECT MODE IS NOT ENABLED A NON-RESIDENT ABORT
 9816                                  ;*      WILL OCCUR AND TRAP TO 10$, WHERE THE ERRORS ARE REPORTED.
 9817                                  ;*
 9818                                  ;;*****************************************************************
 9819  071464                          TST110:
 9820  071464  000004                          SCOPE
 9821  071466  012737  072064  001316          MOV     #TST111,NXTTST  ;SAVE STARTING ADDRESS OF NEXT
 9822                                                                  ;TEST FOR ESCAPE ON PARITY ERRORS
 9823  071474  012700  077406                  MOV     #77406,R0       ;MAKE ALL KERNEL I-SPACE PAGES RESIDENT
 9824                                                                  ;READ/WRITE, LENGTH 200 BLOCKS
 9825  071500  012702  000010                  MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
 9826  071504  012701  172300                  MOV     #KIPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
 9827  071510  010021                  19$:    MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
 9828  071512  077202                          SOB     R2,19$          ;BRANCH BACK TO 19$ IF R2 IS NOT ZERO
 9829  071514  012737  071530  001110          MOV     #20$,$LPADR     ;SET LOOP POINTER TO 20$
 9830  071522  012737  071530  001112          MOV     #20$,$LPERR     ;SET LOOP ON ERROR TO 20$
 9831  071530  012700  077400          20$:    MOV     #77400,R0       ;MAKE PAGE 4 IN ALL BUT SUPERVISOR I
 9832                                                                  ;AND KERNEL I NON-RESIDENT
 9833  071534  010037  172330                  MOV     R0,KDPDR4       ;KERNEL D-SPACE PAGE 4
 9834  071540  010037  172230                  MOV     R0,SDPDR4       ;SUPERVISOR D-SPACE PAGE 4
 9835  071544  010037  177630                  MOV     R0,UDPDR4       ;USER D-SPACE PAGE 4
 9836  071550  010037  177610                  MOV     R0,UIPDR4       ;USER I-SPACE PAGE 4
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 9837  071554  012737  077406  172310          MOV     #77406,KIPDR4   ;KERNEL I-SPACE PAGE 4 READ/WRITE
 9838  071562  012737  077406  172210          MOV     #77406,SIPDR4   ;SUPER I-SPACE PAGE 4 READ/WRITE
 9839  071570  012737  001000  172350          MOV     #1000,KIPAR4    ;MAP KERNEL I PAGE 4 TO 16K
 9840  071576  012737  001000  172250          MOV     #1000,SIPAR4    ;MAP SUPER I PAGE 4 TO 16K
 9841  071604  012700  036514                  MOV     #36514,R0       ;LOAD DATA PATTERN INTO R0
 9842  071610  010037  100000                  MOV     R0,@#100000     ;LOAD DATA PATTERN INTO PHY 100000
 9843  071614  012737  072036  000250          MOV     #10$,MMVEC      ;SET M.M. VECTOR TO 10$
 9844  071622  052737  000002  172516          BIS     #BIT1,MMR3      ;ENABLE SUPERVISOR D-SPACE
 9845  071630  105037  172310                  CLRB    KIPDR4          ;MAKE KERNEL I-SPACE PAGE 4 NON-RESIDENT
 9846                                          ;THE FOLLOWING WILL TEST DSTM=1 MFPI.  BELOW ARE THE
 9847                                          ;ROM STATE NAMES AND ADDRESSES, FROM THE A-FORK.
 9848                                          ;THE * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
 9849                                          ;INTO THE F/F'S ON SSRB.
 9850                                          ;   *  D12.00    (001)
 9851                                          ;   *  D12.10    (175)
 9852                                          ;   *  MFP.00    (066)
 9853                                          ;      MFP.10    (250)
 9854                                          ;      SVC.80    (222)
 9855                                          ;      SVC.90    (300)
 9856                                          ;      FET.00    (217)
 9857  071634  012737  071642  001112          MOV     #12$,$LPERR     ;SET LOOP ON ERROR POINTER TO 12$
 9858  071642  012737  010340  177776  12$:    MOV     #010340,PSW     ;MAKE PREVIOUS MODE SUPERVISOR
 9859  071650  012702  100000                  MOV     #100000,R2      ;LOAD VIRTUAL ADDRESS INTO R2
 9860  071654  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
 9861  071656  006512                          MFPI    (R2)            ;READ FROM PHYSICAL 100000
 9862  071660  012601                          MOV     (KSP)+,R1       ;POP KERNEL STACK INTO R1
 9863  071662  020001                          CMP     R0,R1           ;WAS DATA FETCHED SAME AS STORED
 9864  071664  001401                          BEQ     4$              ;BRANCH IF CORRECT DATA WAS FETCHED
 9865  071666  104116                          ERROR   116             ;WRONG DATA WAS FETCHED
 9866  071670                          4$:     ;THE FOLLOWING WILL TEST DSTM=2 MFPI.  BELOW ARE THE
 9867                                          ;ROM STATE NAMES AND ADDRESSES, FROM THE A-FORK.
 9868                                          ;THE * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
 9869                                          ;INTO THE F/F'S ON SSRB.
 9870                                          ;   *  D12.01    (002)
 9871                                          ;   *  D12.10    (175)
 9872                                          ;   *  MFP.00    (066)
 9873                                          ;      MFP.10    (250)
 9874                                          ;      SVC.80    (222)
 9875                                          ;      SVC.90    (300)
 9876                                          ;      FET.00    (217)
 9877  071670  012737  071676  001112          MOV     #14$,$LPERR     ;SET LOOP ON ERROR POINTER TO 14$
 9878  071676  012737  010340  177776  14$:    MOV     #010340,PSW     ;MAKE PREVIOUS MODE SUPERVISOR
 9879  071704  012702  100000                  MOV     #100000,R2      ;LOAD VIRTUAL ADDRESS INTO R2
 9880  071710  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
 9881  071712  006522                          MFPI    (R2)+           ;READ FROM PHYSICAL 100000
 9882  071714  012601                          MOV     (KSP)+,R1       ;POP KERNEL STACK INTO R1
 9883  071716  020001                          CMP     R0,R1           ;WAS DATA FETCHED SAME AS STORED
 9884  071720  001401                          BEQ     5$              ;BRANCH IF CORRECT DATA WAS FETCHED
 9885  071722  104116                          ERROR   116             ;WRONG DATA WAS FETCHED
 9886  071724                          5$:     ;THE FOLLOWING WILL TEST DSTM=3 MFPI.  BELOW ARE THE
 9887                                          ;ROM STATE NAMES AND ADDRESSES, FROM THE A-FORK.
 9888                                          ;THE * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
 9889                                          ;INTO THE F/F'S ON SSRB.
 9890                                          ;      D30.00    (003)
 9891                                          ;      D30.10    (221)
 9892                                          ;      D10.20    (233)
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                                        ;  *  D10.50    (311)
                                        ;  *  D10.60    (177)
                                        ;  *  MFP.00    (066)
                                        ;     MFP.10    (250)
                                        ;     SVC.80    (222)
                                        ;     SVC.90    (300)
                                        ;     FET.00    (217)
071724  012737  071732  001112        MOV     #15$,$LPERR     ;SET LOOP ON ERROR POINTER TO 15$
071732  012737  010340  177776  15$:   MOV     #010340,PSW     ;MAKE PREVIOUS MODE SUPERVISOR
071740  000240                        NOP                     ;THIS IS A SYNC POINT FOR SCOPING
071742  006537  100000                MFPI    @#100000        ;READ FROM PHYSICAL 100000
071746  012601                        MOV     (KSP)+,R1       ;POP KERNEL STACK INTO R1
071750  020001                        CMP     R0,R1           ;WAS DATA FETCHED SAME AS STORED
071752  001401                        BEQ     6$              ;BRANCH IF CORRECT DATA WAS FETCHED
071754  104116                        ERROR   116             ;WRONG DATA WAS FETCHED
071756                          6$:   ;THE FOLLOWING WILL TEST DSTM=4 MFPI.  BELOW ARE THE
                                      ;ROM STATE NAMES AND ADDRESSES, FROM THE A-FORK.
                                      ;THE * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
                                      ;INTO THE F/F'S ON SSRB.
                                      ;     D45.00    (004)
                                      ;  *  D10.30    (122)
                                      ;  *  D10.60    (177)
                                      ;  *  MFP.00    (066)
                                      ;     MFP.10    (250)
                                      ;     SVC.80    (222)
                                      ;     SVC.90    (300)
                                      ;     FET.00    (217)
071756  012737  071764  001112        MOV     #16$,$LPERR     ;SET LOOP ON ERROR POINTER TO 16$
071764  012737  010340  177776  16$:   MOV     #010340,PSW     ;MAKE PREVIOUS MODE SUPERVISOR
071772  012702  100002                MOV     #100002,R2      ;LOAD VIRTUAL ADDRESS INTO R2
071776  000240                        NOP                     ;THIS IS A SYNC POINT FOR SCOPING
072000  006542                        MFPI    -(R2)           ;READ FROM PHYSICAL 100000
072002  012601                        MOV     (KSP)+,R1       ;POP KERNEL STACK INTO R1
072004  020001                        CMP     R0,R1           ;WAS DATA FETCHED SAME AS STORED
072006  001401                        BEQ     7$              ;BRANCH IF CORRECT DATA WAS FETCHED
072010  104116                        ERROR   116             ;WRONG DATA WAS FETCHED
072012  012737  032226  000250  7$:   MOV     #MMTRAP,MMVEC   ;SET M.M.VECTOR TO NORMAL ROUTINE
072020  012737  071530  001112        MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
072026  042737  000002  172516        BIC     #BIT1,MMR3      ;DISABLE SUPERVISOR D-SPACE
072034  000413                        BR      TST111          ;;BRANCH TO NEXT TEST

072036  013737  177572  001250  10$:   MOV     MMR0,PMMR0      ;SAVE MMR0 FOR ERROR TYPEOUT
072044  013737  177574  001252        MOV     MMR1,PMMR1      ;SAVE MMR1 FOR ERROR TYPEOUT
072052  013737  177576  001254        MOV     MMR2,PMMR2      ;SAVE MMR2 FOR ERROR TYPEOUT
072060  104117                        ERROR   117             ;TRIED TO READ NON-RESIDENT PAGE
072062  000002                        RTI                     ;RETURN TO TEST


                                ;;******************************************************************
                                ;*TEST 111      MTPI (SUPERVISOR) WITH SUPERVISOR D-SPACE ENABLED
                                ;*
                                ;*      THIS TEST USES THE 'MTPI' INSTBUCTION TO ENSURE(TIQ(TIE
                                ;*      PREVIOUS MODE IS CLOCKED CORRECTLY BY 'ROM OUT05', AND THAT
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                                        ;*      D-SPACE IS NOT ENABLED.  THIS IS DONE BY 'ROM OUT08 H' AND
                                        ;*      'SSRB IR15 L' NOT ASSERTED GENERATING 'SSRB I SPACEB L'.
                                        ;*      THERE IS A DESCRIPTION BEFORE EACH DESTINATION MODE TESTED,
                                        ;*      WHICH LISTS THE ROM STATES THAT SHOULD COME UP (ALONG WITH
                                        ;*      THEIR ADDRESSES).
                                        ;*      IF THE CORRECT MODE IS NOT ENABLED A NON-RESIDENT ABORT
                                        ;*      WILL OCCUR AND TRAP TO 10$, WHERE THE ERRORS ARE REPORTED.
                                        ;*
                                        ;;*****************************************************************
072064                                  TST111:
072064  000004                                  SCOPE
072066  012737  072514  001316                  MOV     #TST112,NXTTST  ;SAVE STARTING ADDRESS OF NEXT
                                                                        ;TEST FOR ESCAPE ON PARITY ERRORS
072074  012700  077400          20$:    MOV     #77400,R0       ;MAKE PAGE 4 IN ALL BUT SUPERVISOR I
                                                                ;AND KERNEL I NON-RESIDENT
072100  010037  172330                  MOV     R0,KDPDR4       ;KERNEL D-SPACE PAGE 4
072104  010037  172230                  MOV     R0,SDPDR4       ;SUPERVISOR D-SPACE PAGE 4
072110  010037  177630                  MOV     R0,UDPDR4       ;USER D-SPACE PAGE 4
072114  010037  177610                  MOV     R0,UIPDR4       ;USER I-SPACE PAGE 4
072120  012737  077406  172310          MOV     #77406,KIPDR4   ;KERNEL I-SPACE PAGE 4 READ/WRITE
072126  012737  077406  172210          MOV     #77406,SIPDR4   ;SUPER I-SPACE PAGE 4 READ/WRITE
072134  012737  001000  172350          MOV     #1000,KIPAR4    ;MAP KERNEL I PAGE 4 TO 16K
072142  012737  001000  172250          MOV     #1000,SIPAR4    ;MAP SUPER I PAGE 4 TO 16K
072150  012737  072466  000250          MOV     #10$,MMVEC      ;SET M.M. VECTOR TO 10$
072156  052737  000002  172516          BIS     #BIT1,MMR3      ;ENABLE SUPERVISOR D-SPACE
                                        ;THIS WILL TEST DSTM = 1 MTPI. BELOW ARE THE
                                        ;ROM STATE NAMES AND ADDRESSES, FROM THE C-FORK
                                        ;THE  * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
                                        ;INTO THE FLIP/FLOPS ON SSRB.
                                        ;   *   D12.80      (111)
                                        ;   *   D12.60      (155)
                                        ;       D12.20      (312)
                                        ;       FET.10      (260)
072164  012737  072202  001112          MOV     #13$,$LPERR     ;SET LOOP ON ERROR POINTER TO 13$
072172  012702  100000                  MOV     #100000,R2      ;LOAD VIRTUAL ADDRESS INTO R2
072176  012700  125252                  MOV     #125252,R0      ;LOAD TEST DATA INTO R0
072202  010046                  13$:    MOV     R0,-(KSP)       ;PUSH TEST DATA ON KERNEL STACK
072204  105037  172310                  CLRB    KIPDR4          ;MAKE KERNEL I PAGE 4 NON-RESIDENT
072210  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
072212  006612                          MTPI    (R2)            ;LOAD TEST DATA INTO PHYSICAL 100000
072214  112737  000006  172310          MOVB    #006,KIPDR4     ;MAKE KERNEL PAGE 4 RESIDENT
072222  011201                          MOV     (R2),R1         ;READ FROM ADDRESS 100000
072224  020001                          CMP     R0,R1           ;SEE IF DATA WAS STORED AT CORRECT PLACE
072226  001401                          BEQ     4$              ;BRANCH IF STORE WAS CORRECT
072230  104121                          ERROR   121             ;INCORRECT STORE
072232                          4$:     ;THIS WILL TEST DSTM = 3 MTPI. BELOW ARE THE
                                        ;ROM STATE NAMES AND ADDRESSES, FROM THE C-FORK
                                        ;THE  * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
                                        ;INTO THE FLIP/FLOPS ON SSRB.
                                        ;       D30.80      (113)
                                        ;       D30.10      (221)
                                        ;       D10.20      (233)
                                        ;   *   D10.50      (311)
                                        ;   *   D10.40      (157)
                                        ;       FET.01      (331)
072232  012737  072252  001112          MOV     #14$,$LPERR     ;SET LOOP ON ERROR POINTER TO 14$
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10005  072240  012737  010340  177776          MOV     #010340,PSW     ;MAKE PREVIOUS MODE SUPERVISOR
10006  072246  012700  052525                  MOV     #52525,R0       ;LOAD TEST DATA INTO R0
10007  072252  010046                  14$:    MOV     R0,-(KSP)       ;PUSH TEST DATA ON KERNEL STACK
10008  072254  105037  172310                  CLRB    KIPDR4          ;MAKE KERNEL I PAGE 4 NON-RESIDENT
10009  072260  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
10010  072262  006637  100000                  MTPI    @#100000        ;LOAD TEST DATA INTO PHYSICAL 100000
10011  072266  112737  000006  172310          MOVB    #006,KIPDR4     ;MAKE KERNEL PAGE 4 RESIDENT
10012  072274  013701  100000                  MOV     @#100000,R1     ;READ FROM ADDRESS 100000
10013  072300  020001                          CMP     R0,R1           ;SEE IF DATA WAS STORED CORRECTLY
10014  072302  001401                          BEQ     5$              ;BRANCH IF STORE WAS CORRECT
10015  072304  104121                          ERROR   121             ;INCORRECT STORE
10016  072306                          5$:     ;THIS WILL TEST DSTM = 4 MTPI. BELOW ARE THE
10017                                          ;ROM STATE NAMES AND ADDRESSES, FROM THE C-FORK
10018                                          ;THE  * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
10019                                          ;INTO THE FLIP/FLOPS ON SSRB.
10020                                          ;       D45.80    (115)
10021                                          ;   *   D40.20    (121)
10022                                          ;   *   D10.40    (157)
10023                                          ;       FET.01    (331)
10024  072306  012737  072326  001112          MOV     #15$,$LPERR     ;SET LOOP ON ERROR POINTER TO 15$
10025  072314  012737  010340  177776          MOV     #010340,PSW     ;MAKE PREVIOUS MODE SUPERVISOR
10026  072322  012700  125252                  MOV     #125252,R0      ;LOAD TEST DATA INTO R0
10027  072326  010046                  15$:    MOV     R0,-(KSP)       ;PUSH TEST DATA ON KERNEL STACK
10028  072330  012702  100002                  MOV     #100002,R2      ;LOAD VIRTUAL ADDRESS INTO R2
10029  072334  105037  172310                  CLRB    KIPDR4          ;MAKE KERNEL I PAGE 4 NON-RESIDENT
10030  072340  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
10031  072342  006642                          MTPI    -(R2)           ;LOAD TEST DATA INTO PHYSICAL 100000
10032  072344  112737  000006  172310          MOVB    #006,KIPDR4     ;MAKE KERNEL PAGE 4 RESIDENT
10033  072352  013701  100000                  MOV     @#100000,R1     ;READ FROM ADDRESS 100000
10034  072356  020001                          CMP     R0,R1           ;SEE IF DATA WAS STORED CORRECTLY
10035  072360  001401                          BEQ     6$              ;BRANCH IF STORE WAS CORRECT
10036  072362  104121                          ERROR   121             ;INCORRECT STORE
10037  072364                          6$:     ;THIS WILL TEST DSTM = 6 MTPI. BELOW ARE THE
10038                                          ;ROM STATE NAMES AND ADDRESSES, FROM THE C-FORK
10039                                          ;THE  * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
10040                                          ;INTO THE FLIP/FLOPS ON SSRB.
10041                                          ;       D67.80    (117)
10042                                          ;       D67.00    (006)
10043                                          ;       D67.10    (251)
10044                                          ;   *   D10.30    (122)
10045                                          ;   *   D10.40    (157)
10046                                          ;       FET.01    (331)
10047  072364  012737  072406  001112          MOV     #16$,$LPERR     ;SET LOOP ON ERROR POINTER TO 16$
10048  072372  012737  010340  177776          MOV     #010340,PSW     ;MAKE PREVIOUS MODE SUPERVISOR
10049  072400  012700  052525                  MOV     #52525,R0       ;LOAD TEST DATA INTO R0
10050  072404  005002                          CLR     R2              ;MAKE REGISTER 2 ZERO
10051  072406  010046                  16$:    MOV     R0,-(KSP)       ;PUSH TEST DATA ON KERNEL STACK
10052  072410  105037  172310                  CLRB    KIPDR4          ;MAKE KERNEL I PAGE 4 NON-RESIDENT
10053  072414  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
10054  072416  006662  100000                  MTPI    100000(R2)      ;LOAD TEST DATA INTO PHYSICAL 100000
10055  072422  112737  000006  172310          MOVB    #006,KIPDR4     ;MAKE KERNEL PAGE 4 RESIDENT
10056  072430  013701  100000                  MOV     @#100000,R1     ;READ FROM ADDRESS 100000
10057  072434  020001                          CMP     R0,R1           ;SEE IF DATA WAS STORED CORRECTLY
10058  072436  001401                          BEQ     7$              ;BRANCH IF STORE WAS CORRECT
10059  072440  104121                          ERROR   121             ;INCORRECT STORE
10060  072442  012737  072074  001112  7$:     MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
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10061  072450  012737  032226  000250          MOV     #MMTRAP,MMVEC   ;RESTORE M.M. VECTOR TO NORMAL ROUTINE
10062  072456  042737  000002  172516          BIC     #BIT1,MMR3      ;DISABLE SUPERVISOR D-SPACE
10063  072464  000413                          BR      TST112          ;;BRANCH TO NEXT TEST
10064
10065
10066  072466  013737  177572  001250  10$:    MOV     MMR0,PMMR0      ;SAVE MMR0 FOR ERROR TYPEOUT
10067  072474  013737  177574  001252          MOV     MMR1,PMMR1      ;SAVE MMR1 FOR ERROR TYPEOUT
10068  072502  013737  177576  001254          MOV     MMR2,PMMR2      ;SAVE MMR2 FOR ERROR TYPEOUT
10069  072510  104117                          ERROR   117             ;TRIED TO LOAD A N.R. PAGE 4
10070  072512  000002                          RTI                     ;RETURN TO TEST
10071
10072
10073
10074                                  ;;*****************************************************************
10075                                  ;*TEST 112      MOVE FROM PREVIOUS (USER) I-SPACE
10076                                  ;*
10077                                  ;*      THIS TEST CHECKS THAT IF THE PREVIOUS MODE IS USER THE
10078                                  ;*      'USER SPACE (1) L'' FLIP-FLOP IS SET AND THE FETCH IS FROM
10079                                  ;*      USER MODE.
10080                                  ;*      THERE IS A DESCRIPTION BEFORE EACH DESTINATION MODE TESTED,
10081                                  ;*      WHICH LISTS THE ROM STATES THAT SHOULD COME UP (ALONG WITH
10082                                  ;*      THEIR ADDRESSES).
10083                                  ;*      IF THE CORRECT MODE IS NOT ENABLED A NON-RESIDENT ABORT
10084                                  ;*      WILL OCCUR AND TRAP TO 10$, WHERE THE ERRORS ARE REPORTED.
10085                                  ;*
10086                                  ;;*****************************************************************
10087  072514                          TST112:
10088  072514  000004                          SCOPE
10089  072516  012737  073106  001316          MOV     #TST113,NXTTST  ;SAVE STARTING ADDRESS OF NEXT
10090                                                                  ;TEST FOR ESCAPE ON PARITY ERRORS
10091  072524  012700  077400          20$:    MOV     #77400,R0       ;MAKE PAGE 4 NON-RESIDENT IN ALL MODES
10092                                                                  ;EXCEPT KERNEL I-SPACE & USER I-SPACE
10093  072530  010037  172330                  MOV     R0,KDPDR4       ;KERNEL D-SPACE PAGE 4
10094  072534  010037  177630                  MOV     R0,UDPDR4       ;USER D-SPACE PAGE 4
10095  072540  010037  172230                  MOV     R0,SDPDR4       ;SUPERVISOR D-SPACE PAGE 4
10096  072544  010037  172210                  MOV     R0,SIPDR4       ;SUPERVISOR I-SPACE PAGE 4
10097  072550  012737  077406  172310          MOV     #77406,KIPDR4   ;KERNEL I-SPACE PAGE 4 READ/WRITE
10098  072556  012737  077406  177610          MOV     #77406,UIPDR4   ;USER I-SPACE PAGE 4 READ/WRITE
10099  072564  012737  001000  172350          MOV     #1000,KIPAR4    ;MAP KERNEL I PAGE 4 TO 16K
10100  072572  012737  001000  177650          MOV     #1000,UIPAR4    ;MAP USER I PAGE 4 TO 16K
10101  072600  012700  036514                  MOV     #36514,R0       ;LOAD DATA PATTERN INTO R0
10102  072604  010037  100000                  MOV     R0,@#100000     ;LOAD DATA PATTERN INTO PHY 100000
10103  072610  012702  100000                  MOV     #100000,R2      ;LOAD VIRTUAL ADDRESS INTO R2
10104  072614  012737  073060  000250          MOV     #10$,MMVEC      ;SET M.M. VECTOR TO 10$
10105  072622  105037  172310                  CLRB    KIPDR4          ;MAKE KERNEL I-SPACE PAGE 4 NON-RESIDENT
10106  072626  012737  030340  177776          MOV     #030340,PSW     ;MAKE PREVIOUS MODE USER
10107  072634  006506                  1$:     MFPI    USP             ;PUT USER STACK POINTER ON KERNEL STACK
10108  072636  022706  001100                  CMP     #KERSTK,KSP     ;WAS SOMETHING PUSHED ON STACK AT 1$
10109  072642  001407                          BEQ     3$              ;BRANCH IF NOTHING WAS PUSHED
10110  072644  012601                          MOV     (KSP)+,R1       ;POP KERNEL STACK INTO R1
10111  072646  012702  000600                  MOV     #USESTK,R2      ;EXPECTING 600 AS USP
10112  072652  020201                          CMP     R2,R1           ;DID YOU GET THE RIGHT POINTER?
10113  072654  001403                          BEQ     2$              ;BRANCH IF YOU DID
10114  072656  104114                          ERROR   114             ;WRONG THING WAS PUSHED ON STACK
10115  072660  000401                          BR      2$              ;BRANCH TO NEXT TRY
10116  072662  104115                  3$:     ERROR   115             ;NOTHING WAS PUSHED ON THE STACK
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10117  072664                          2$:     ;THE FOLLOWING WILL TEST DSTM=1 MFPI.  BELOW ARE THE
10118                                          ;ROM STATE NAMES AND ADDRESSES, FROM THE A-FORK.
10119                                          ;THE * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
10120                                          ;INTO THE F/F'S ON SSRB.
10121                                          ;   *  D12.00    (001)
10122                                          ;   *  D12.10    (175)
10123                                          ;   *  MFP.00    (066)
10124                                          ;      MFP.10    (250)
10125                                          ;      SVC.80    (222)
10126                                          ;      SVC.90    (300)
10127                                          ;      FET.00    (217)
10128  072664  012737  072672  001112          MOV     #12$,$LPERR     ;SET LOOP ON ERROR POINTER TO 12$
10129  072672  012737  030340  177776  12$:    MOV     #030340,PSW     ;MAKE PREVIOUS MODE USER
10130  072700  012702  100000                  MOV     #100000,R2      ;PUT VIRTUAL ADDRESS IN R2
10131  072704  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
10132  072706  006512                          MFPI    (R2)            ;READ FROM PHYSICAL 100000
10133  072710  012601                          MOV     (KSP)+,R1       ;POP KERNEL STACK INTO R1
10134  072712  020001                          CMP     R0,R1           ;WAS DATA FETCHED SAME AS STORED
10135  072714  001401                          BEQ     4$              ;BRANCH IF CORRECT DATA WAS FETCHED
10136  072716  104116                          ERROR   116             ;WRONG DATA WAS FETCHED
10137  072720                          4$:     ;THE FOLLOWING WILL TEST DSTM=2 MFPI.  BELOW ARE THE
10138                                          ;ROM STATE NAMES AND ADDRESSES, FROM THE A-FORK.
10139                                          ;THE * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
10140                                          ;INTO THE F/F'S ON SSRB.
10141                                          ;   *  D12.01    (002)
10142                                          ;   *  D12.10    (175)
10143                                          ;   *  MFP.00    (066)
10144                                          ;      MFP.10    (250)
10145                                          ;      SVC.80    (222)
10146                                          ;      SVC.90    (300)
10147                                          ;      FET.00    (217)
10148  072720  012737  072726  001112          MOV     #14$,$LPERR     ;SET LOOP ON ERROR POINTER TO 14$
10149  072726  012737  030340  177776  14$:    MOV     #030340,PSW     ;MAKE PREVIOUS MODE USER
10150  072734  012702  100000                  MOV     #100000,R2      ;PUT VIRTUAL ADDRESS IN R2
10151  072740  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
10152  072742  006522                          MFPI    (R2)+           ;READ FROM PHYSICAL 100000
10153  072744  012601                          MOV     (KSP)+,R1       ;POP KERNEL STACK INTO R1
10154  072746  020001                          CMP     R0,R1           ;WAS DATA FETCHED SAME AS STORED
10155  072750  001401                          BEQ     5$              ;BRANCH IF CORRECT DATA WAS FETCHED
10156  072752  104116                          ERROR   116             ;WRONG DATA WAS FETCHED
10157  072754                          5$:     ;THE FOLLOWING WILL TEST DSTM=3 MFPI.  BELOW ARE THE
10158                                          ;ROM STATE NAMES AND ADDRESSES, FROM THE A-FORK.
10159                                          ;THE * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
10160                                          ;INTO THE F/F'S ON SSRB.
10161                                          ;      D30.00    (003)
10162                                          ;      D30.10    (221)
10163                                          ;      D10.20    (233)
10164                                          ;   *  D10.50    (311)
10165                                          ;   *  D10.60    (177)
10166                                          ;   *  MFP.00    (066)
10167                                          ;      MFP.10    (250)
10168                                          ;      SVC.80    (222)
10169                                          ;      SVC.90    (300)
10170                                          ;      FET.00    (217)
10171  072754  012737  072762  001112          MOV     #15$,$LPERR     ;SET LOOP ON ERROR POINTER TO 15$
10172  072762  012737  030340  177776  15$:    MOV     #030340,PSW     ;MAKE PREVIOUS MODE USER
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10173  072770  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
10174  072772  006537  100000                  MFPI    @#100000        ;READ FROM PHYSICAL 100000
10175  072776  012601                          MOV     (KSP)+,R1       ;POP KERNEL STACK INTO R1
10176  073000  020001                          CMP     R0,R1           ;WAS DATA FETCHED SAME AS STORED
10177  073002  001401                          BEQ     6$              ;BRANCH IF CORRECT DATA WAS FETCHED
10178  073004  104116                          ERROR   116             ;WRONG DATA WAS FETCHED
10179  073006                          6$:     ;THE FOLLOWING WILL TEST DSTM=4 MFPI.  BELOW ARE THE
10180                                          ;ROM STATE NAMES AND ADDRESSES, FROM THE A-FORK.
10181                                          ;THE * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
10182                                          ;INTO THE F/F'S ON SSRB.
10183                                          ;       D45.00  (004)
10184                                          ;   *   D10.30  (122)
10185                                          ;   *   D10.60  (177)
10186                                          ;   *   MFP.00  (066)
10187                                          ;       MFP.10  (250)
10188                                          ;       SVC.80  (222)
10189                                          ;       SVC.90  (300)
10190                                          ;       FET.00  (217)
10191  073006  012737  073014  001112          MOV     #16$,$LPERR     ;SET LOOP ON ERROR POINTER TO 16$
10192  073014  012737  030340  177776  16$:    MOV     #030340,PSW     ;MAKE PREVIOUS MODE USER
10193  073022  012702  100002                  MOV     #100002,R2      ;LOAD VIRTUAL ADDRESS INTO R2
10194  073026  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
10195  073030  006542                          MFPI    -(R2)           ;READ FROM PHYSICAL 100000
10196  073032  012601                          MOV     (KSP)+,R1       ;POP KERNEL STACK INTO R1
10197  073034  020001                          CMP     R0,R1           ;WAS DATA FETCHED SAME AS STORED
10198  073036  001401                          BEQ     7$              ;BRANCH IF CORRECT DATA WAS FETCHED
10199  073040  104116                          ERROR   116             ;WRONG DATA WAS FETCHED
10200  073042  012737  032226  000250  7$:     MOV     #MMTRAP,MMVEC   ;SET M.M.VECTOR TO NORMAL ROUTINE
10201  073050  012737  072524  001112          MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
10202  073056  000413                          BR      TST113          ;;BRANCH TO NEXT TEST
10203
10204
10205  073060  013737  177572  001250  10$:    MOV     MMR0,PMMR0      ;SAVE MMR0 FOR ERROR TYPEOUT
10206  073066  013737  177574  001252          MOV     MMR1,PMMR1      ;SAVE MMR1 FOR ERROR TYPEOUT
10207  073074  013737  177576  001254          MOV     MMR2,PMMR2      ;SAVE MMR2 FOR ERROR TYPEOUT
10208  073102  104117                          ERROR   117             ;TRIED TO READ NON-RESIDENT PAGE
10209  073104  000002                          RTI                     ;RETURN TO TEST
10210
10211                                  ;;******************************************************************
10212                                  ;*TEST 113      MOVE FROM PREVIOUS (KERNEL) I-SPACE TO SUPERVISOR MODE
10213                                  ;*
10214                                  ;*      THIS TEST CHECKS THAT IF THE PREVIOUS MODE IS KERNEL THE
10215                                  ;*      'KERNEL SPACE (1) L'' FLIP-FLOP IS SET AND THE FETCH IS FROM
10216                                  ;*      KERNEL MODE.
10217                                  ;*      THERE IS A DESCRIPTION BEFORE EACH DESTINATION MODE TESTED,
10218                                  ;*      WHICH LISTS THE ROM STATES THAT SHOULD COME UP (ALONG WITH
10219                                  ;*      THEIR ADDRESSES).
10220                                  ;*      IF THE CORRECT MODE IS NOT ENABLED A NON-RESIDENT ABORT
10221                                  ;*      WILL OCCUR AND TRAP TO 10$, WHERE THE ERRORS ARE REPORTED.
10222                                  ;*
10223                                  ;;******************************************************************
10224  073106                          TST113:
10225  073106  000004                          SCOPE
10226  073110  012737  073552  001316          MOV     #TST114,NXTTST  ;SAVE STARTING ADDRESS OF NEXT
10227                                                                  ;TEST FOR ESCAPE ON PARITY ERRORS
10228  073116  012700  077406                  MOV     #77406,R0       ;MAKE ALL SUPER I-SPACE PAGES RESIDENT
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10229                                                                   ;READ/WRITE, LENGTH 200 BLOCKS
10230  073122  012702  000010                        MOV     #10,R2      ;SET COUNT TO LOAD 8 ADDRESSES
10231  073126  012701  172200                        MOV     #SIPDR0,R1  ;PUT ADDRESS OF FIRST PDR IN R1
10232  073132  010021                      19$:      MOV     R0,(R1)+    ;LOAD R0 INTO PDR ADDRESSED BY R1
10233  073134  077202                                SOB     R2,19$      ;BRANCH BACK TO 19$ IF R2 IS NOT ZERO
10234  073136  012737  073152  001110                MOV     #20$,$LPADR ;SET LOOP POINTER TO 20$
10235  073144  012737  073152  001112                MOV     #20$,$LPERR ;SET LOOP ON ERROR TO 20$
10236  073152  012737  040340  177776  20$:         MOV     #040340,PSW ;GO TO SUPERVISOR MODE FOR THIS TEST
10237  073160  012700  077400                        MOV     #77400,R0   ;MAKE PAGE 4 NON-RESIDENT IN ALL MODES
10238                                                                   ;EXCEPT SUPER I-SPACE & KERNEL I-SPACE
10239  073164  010037  172330                        MOV     R0,KDPDR4   ;KERNEL D-SPACE PAGE 4
10240  073170  010037  172230                        MOV     R0,SDPDR4   ;SUPERVISOR D-SPACE PAGE 4
10241  073174  010037  177630                        MOV     R0,UDPDR4   ;USER D-SPACE PAGE 4
10242  073200  010037  177610                        MOV     R0,UIPDR4   ;USER I-SPACE PAGE 4
10243  073204  012737  077406  172310                MOV     #77406,KIPDR4 ;KERNEL I-SPACE PAGE 4 READ/WRITE
10244  073212  012737  077406  172210                MOV     #77406,SIPDR4 ;SUPER I-SPACE PAGE 4 READ/WRITE
10245  073220  012737  001000  172350                MOV     #1000,KIPAR4 ;MAP KERNEL I PAGE 4 TO 16K
10246  073226  012737  001000  172250                MOV     #1000,SIPAR4 ;MAP SUPER I PAGE 4 TO 16K
10247  073234  012700  036514                        MOV     #36514,R0   ;LOAD DATA PATTERN INTO R0
10248  073240  010037  100000                        MOV     R0,@#100000 ;LOAD DATA PATTERN INTO PHY 100000
10249  073244  012702  100000                        MOV     #100000,R2  ;LOAD VIRTUAL ADDRESS INTO R2
10250  073250  012737  073524  000250                MOV     #10$,MMVEC  ;SET M.M. VECTOR TO 10$
10251  073256  105037  172210                        CLRB    SIPDR4      ;MAKE SUPER I-SPACE PAGE 4 NON-RESIDENT
10252  073262  012737  040340  177776                MOV     #040340,PSW ;MAKE PREVIOUS MODE KERNEL PRESENT SUPER
10253  073270  000240                                NOP                 ;THIS IS A SYNC POINT FOR SCOPING
10254  073272  006506                      1$:       MFPI    KSP         ;PUT KERNEL STACK POINTER ON SUPER STACK
10255  073274  022706  000700                        CMP     #SUPSTK,SSP ;WAS SOMETHING PUSHED ON STACK AT 1$
10256  073300  001407                                BEQ     3$          ;BRANCH IF NOTHING WAS PUSHED
10257  073302  012601                                MOV     (SSP)+,R1   ;POP SUPERVISOR STACK INTO R1
10258  073304  012702  001100                        MOV     #KERSTK,R2  ;EXPECTING 1100 AS KSP
10259  073310  020201                                CMP     R2,R1       ;DID YOU GET THE RIGHT POINTER?
10260  073312  001403                                BEQ     2$          ;BRANCH IF YOU DID
10261  073314  104114                                ERROR   114         ;WRONG THING WAS PUSHED ON STACK
10262  073316  000401                                BR      2$          ;BRANCH TO NEXT TRY
10263  073320  104115                      3$:       ERROR   115         ;NOTHING PUSHED ON STACK
10264  073322                               2$:       ;THE FOLLOWING WILL TEST DSTM=1 MFPI.  BELOW ARE THE
10265                                                 ;ROM STATE NAMES AND ADDRESSES, FROM THE A-FORK.
10266                                                 ;THE * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
10267                                                 ;INTO THE F/F'S ON SSRB.
10268                                                 ;   *  D12.00    (001)
10269                                                 ;   *  D12.10    (175)
10270                                                 ;   *  MFP.00    (066)
10271                                                 ;      MFP.10    (250)
10272                                                 ;      SVC.80    (222)
10273                                                 ;      SVC.90    (300)
10274                                                 ;      FET.00    (217)
10275  073322  012737  073330  001112                MOV     #12$,$LPERR ;SET LOOP ON ERROR POINTER TO 12$
10276  073330  012737  040340  177776  12$:         MOV     #040340,PSW ;MAKE PREVIOUS MODE KERNEL PRESENT SUPER
10277  073336  012702  100000                        MOV     #100000,R2  ;LOAD VIRTUAL ADDRESS INTO R2
10278  073342  000240                                NOP                 ;THIS IS A SYNC POINT FOR SCOPING
10279  073344  006512                                MFPI    (R2)        ;READ FROM PHYSICAL 100000
10280  073346  012601                                MOV     (SSP)+,R1   ;POP SUPER STACK INTO R1
10281  073350  020001                                CMP     R0,R1       ;WAS DATA FETCHED SAME AS STORED
10282  073352  001401                                BEQ     4$          ;BRANCH IF CORRECT DATA WAS FETCHED
10283  073354  104116                                ERROR   116         ;WRONG DATA WAS FETCHED
10284  073356                               4$:       ;THE FOLLOWING WILL TEST DSTM=2 MFPI.  BELOW ARE THE
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10285                                          ;ROM STATE NAMES AND ADDRESSES, FROM THE A-FORK.
10286                                          ;THE * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
10287                                          ;INTO THE F/F'S ON SSRB.
10288                                          ;   *  D12.01    (002)
10289                                          ;   *  D12.10    (175)
10290                                          ;   *  MFP.00    (066)
10291                                          ;      MFP.10    (250)
10292                                          ;      SVC.80    (222)
10293                                          ;      SVC.90    (300)
10294                                          ;      FET.00    (217)
10295  073356  012737  073364  001112         MOV     #14$,$LPERR     ;SET LOOP ON ERROR POINTER TO 14$
10296  073364  012737  040340  177776  14$:   MOV     #040340,PSW     ;MAKE PREVIOUS MODE KERNEL PRESENT SUPER
10297  073372  012702  100000                 MOV     #100000,R2      ;LOAD VIRTUAL ADDRESS INTO R2
10298  073376  000240                         NOP                     ;THIS IS A SYNC POINT FOR SCOPING
10299  073400  006522                         MFPI    (R2)+           ;READ FROM PHYSICAL 100000
10300  073402  012601                         MOV     (SSP)+,R1       ;POP SUPER STACK INTO R1
10301  073404  020001                         CMP     R0,R1           ;WAS DATA FETCHED SAME AS STORED
10302  073406  001401                         BEQ     5$              ;BRANCH IF CORRECT DATA WAS FETCHED
10303  073410  104116                         ERROR   116             ;WRONG DATA WAS FETCHED
10304  073412                          5$:    ;THE FOLLOWING WILL TEST DSTM=3 MFPI.  BELOW ARE THE
10305                                         ;ROM STATE NAMES AND ADDRESSES, FROM THE A-FORK.
10306                                         ;THE * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
10307                                         ;INTO THE F/F'S ON SSRB.
10308                                         ;      D30.00    (003)
10309                                         ;      D30.10    (221)
10310                                         ;      D10.20    (233)
10311                                         ;   *  D10.50    (311)
10312                                         ;   *  D10.60    (177)
10313                                         ;   *  MFP.00    (066)
10314                                         ;      MFP.10    (250)
10315                                         ;      SVC.80    (222)
10316                                         ;      SVC.90    (300)
10317                                         ;      FET.00    (217)
10318  073412  012737  073420  001112         MOV     #15$,$LPERR     ;SET LOOP ON ERROR POINTER TO 15$
10319  073420  012737  040340  177776  15$:   MOV     #040340,PSW     ;MAKE PREVIOUS MODE KERNEL PRESENT SUPER
10320  073426  000240                         NOP                     ;THIS IS A SYNC POINT FOR SCOPING
10321  073430  006537  100000                 MFPI    @#100000        ;READ FROM PHYSICAL 100000
10322  073434  012601                         MOV     (SSP)+,R1       ;POP SUPERVISOR STACK INTO R1
10323  073436  020001                         CMP     R0,R1           ;WAS DATA FETCHED SAME AS STORED
10324  073440  001401                         BEQ     6$              ;BRANCH IF CORRECT DATA WAS FETCHED
10325  073442  104116                         ERROR   116             ;WRONG DATA WAS FETCHED
10326  073444                          6$:    ;THE FOLLOWING WILL TEST DSTM=4 MFPI.  BELOW ARE THE
10327                                         ;ROM STATE NAMES AND ADDRESSES, FROM THE A-FORK.
10328                                         ;THE * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
10329                                         ;INTO THE F/F'S ON SSRB.
10330                                         ;      D45.00    (004)
10331                                         ;   *  D10.30    (122)
10332                                         ;   *  D10.60    (177)
10333                                         ;   *  MFP.00    (066)
10334                                         ;      MFP.10    (250)
10335                                         ;      SVC.80    (222)
10336                                         ;      SVC.90    (300)
10337                                         ;      FET.00    (217)
10338  073444  012737  073452  001112         MOV     #16$,$LPERR     ;SET LOOP ON ERROR POINTER TO 16$
10339  073452  012737  040340  177776  16$:   MOV     #040340,PSW     ;MAKE PREVIOUS MODE KERNEL PRESENT SUPER
10340  073460  012702  100002                 MOV     #100002,R2      ;LOAD VIRTUAL ADDRESS INTO R2
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10341  073464  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
10342  073466  006542                          MFPI    -(R2)           ;READ FROM PHYSICAL 100000
10343  073470  012601                          MOV     (SSP)+,R1       ;POP SUPERVISOR STACK INTO R1
10344  073472  020001                          CMP     R0,R1           ;WAS DATA FETCHED SAME AS STORED
10345  073474  001401                          BEQ     7$              ;BRANCH IF CORRECT DATA WAS FETCHED
10346  073476  104116                          ERROR   116             ;WRONG DATA WAS FETCHED
10347  073500  012737  032226  000250  7$:     MOV     #MMTRAP,MMVEC   ;SET M.M.VECTOR TO NORMAL ROUTINE
10348  073506  012737  000340  177776          MOV     #00340,PSW      ;GO BACK TO KERNEL MODE, PREVIOUS KERNEL
10349  073514  012737  073152  001112          MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
10350  073522  000413                          BR      TST114          ;;BRANCH TO NEXT TEST
10351
10352
10353  073524  013737  177572  001250  10$:    MOV     MMR0,PMMR0      ;SAVE MMR0 FOR ERROR TYPEOUT
10354  073532  013737  177574  001252          MOV     MMR1,PMMR1      ;SAVE MMR1 FOR ERROR TYPEOUT
10355  073540  013737  177576  001254          MOV     MMR2,PMMR2      ;SAVE MMR2 FOR ERROR TYPEOUT
10356  073546  104117                          ERROR   117             ;TRIED TO READ NON-RESIDENT PAGE
10357  073550  000002                          RTI                     ;RETURN TO TEST
10358
10359
10360
10361                                  ;;*****************************************************************
10362                                  ;*TEST 114      MFPD (SUPERVISOR) WITH SUPERVISOR D-SPACE ENABLED
10363                                  ;*
10364                                  ;*      THIS TEST CHECKS THAT ''SSRB IR15 L'' CAN INHIBIT THE ASSERTING
10365                                  ;*      OF ''SSRB I SPACEB L'' SO THAT THE REFERENCE IS TO D-SPACE IF
10366                                  ;*      THE INSTRUCTION IS MFPD (OR MTPD).  [THESE INSTRUCTIONS HAVE
10367                                  ;*      BIT 15 SET IN THE I.R.]
10368                                  ;*      THERE IS A DESCRIPTION BEFORE EACH DESTINATION MODE TESTED,
10369                                  ;*      WHICH LISTS THE ROM STATES THAT SHOULD COME UP (ALONG WITH
10370                                  ;*      THEIR ADDRESSES).
10371                                  ;*      IF THE CORRECT MODE IS NOT ENABLED A NON-RESIDENT ABORT
10372                                  ;*      WILL OCCUR AND TRAP TO 10$, WHERE THE ERRORS ARE REPORTED.
10373                                  ;*
10374                                  ;;*****************************************************************
10375  073552                          TST114:
10376  073552  000004                          SCOPE
10377  073554  012737  074152  001316          MOV     #TST115,NXTTST  ;SAVE STARTING ADDRESS OF NEXT
10378                                                                  ;TEST FOR ESCAPE ON PARITY ERRORS
10379  073562  012700  077406                  MOV     #77406,R0       ;MAKE ALL KERNEL I-SPACE PAGES RESIDENT
10380                                                                  ;READ/WRITE, LENGTH 200 BLOCKS
10381  073566  012702  000010                  MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
10382  073572  012701  172300                  MOV     #KIPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
10383  073576  010021                  19$:    MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
10384  073600  077202                          SOB     R2,19$          ;BRANCH BACK TO 19$ IF R2 IS NOT ZERO
10385  073602  012737  073616  001110          MOV     #20$,$LPADR     ;SET LOOP POINTER TO 20$
10386  073610  012737  073616  001112          MOV     #20$,$LPERR     ;SET LOOP ON ERROR TO 20$
10387  073616  012700  077400          20$:    MOV     #77400,R0       ;MAKE PAGE 4 IN ALL BUT SUPERVISOR D
10388                                                                  ;AND KERNEL I NON-RESIDENT
10389  073622  010037  172330                  MOV     R0,KDPDR4       ;KERNEL D-SPACE PAGE 4
10390  073626  010037  172210                  MOV     R0,SIPDR4       ;SUPERVISOR I-SPACE PAGE 4
10391  073632  010037  177630                  MOV     R0,UDPDR4       ;USER D-SPACE PAGE 4
10392  073636  010037  177610                  MOV     R0,UIPDR4       ;USER I-SPACE PAGE 4
10393  073642  012737  077406  172310          MOV     #77406,KIPDR4   ;KERNEL I-SPACE PAGE 4 READ/WRITE
10394  073650  012737  077406  172230          MOV     #77406,SDPDR4   ;SUPER D-SPACE PAGE 4 READ/WRITE
10395  073656  012737  001000  172350          MOV     #1000,KIPAR4    ;MAP KERNEL I PAGE 4 TO 16K
10396  073664  012737  001000  172270          MOV     #1000,SDPAR4    ;MAP SUPER D PAGE 4 TO 16K
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10397  073672  012700  036514                    MOV     #36514,R0       ;LOAD DATA PATTERN INTO R0
10398  073676  010037  100000                    MOV     R0,@#100000     ;LOAD DATA PATTERN INTO PHY 100000
10399  073702  012737  074124  000250            MOV     #10$,MMVEC      ;SET M.M. VECTOR TO 10$
10400  073710  052737  000002  172516            BIS     #BIT1,MMR3      ;ENABLE SUPERVISOR D-SPACE
10401  073716  105037  172310                    CLRB    KIPDR4          ;MAKE KERNEL I-SPACE PAGE 4 NON-RESIDENT
10402  073722                            2$:     ;THE FOLLOWING WILL TEST DSTM=1 MFPD.  BELOW ARE THE
10403                                            ;ROM STATE NAMES AND ADDRESSES, FROM THE A-FORK.
10404                                            ;THE * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
10405                                            ;INTO THE F/F'S ON SSRB.
10406                                            ;   *  D12.00    (001)
10407                                            ;   *  D12.10    (175)
10408                                            ;   *  MFP.00    (066)
10409                                            ;      MFP.10    (250)
10410                                            ;      SVC.80    (222)
10411                                            ;      SVC.90    (300)
10412                                            ;      FET.00    (217)
10413  073722  012737  073730  001112            MOV     #12$,$LPERR     ;SET LOOP ON ERROR POINTER TO 12$
10414  073730  012737  010340  177776  12$:      MOV     #010340,PSW     ;MAKE PREVIOUS MODE SUPERVISOR
10415  073736  012702  100000                    MOV     #100000,R2      ;LOAD VIRTUAL ADDRESS INTO R2
10416  073742  000240                            NOP                     ;THIS IS A SYNC POINT FOR SCOPING
10417  073744  106512                            MFPD    (R2)            ;READ FROM PHYSICAL 100000
10418  073746  012601                            MOV     (KSP)+,R1       ;POP KERNEL STACK INTO R1
10419  073750  020001                            CMP     R0,R1           ;WAS DATA FETCHED SAME AS STORED
10420  073752  001401                            BEQ     4$              ;BRANCH IF CORRECT DATA WAS FETCHED
10421  073754  104116                            ERROR   116             ;WRONG DATA WAS FETCHED
10422  073756                            4$:     ;THE FOLLOWING WILL TEST DSTM=2 MFPD.  BELOW ARE THE
10423                                            ;ROM STATE NAMES AND ADDRESSES, FROM THE A-FORK.
10424                                            ;THE * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
10425                                            ;INTO THE F/F'S ON SSRB.
10426                                            ;   *  D12.01    (002)
10427                                            ;   *  D12.10    (175)
10428                                            ;   *  MFP.00    (066)
10429                                            ;      MFP.10    (250)
10430                                            ;      SVC.80    (222)
10431                                            ;      SVC.90    (300)
10432                                            ;      FET.00    (217)
10433  073756  012737  073764  001112            MOV     #14$,$LPERR     ;SET LOOP ON ERROR POINTER TO 14$
10434  073764  012737  010340  177776  14$:      MOV     #010340,PSW     ;MAKE PREVIOUS MODE SUPERVISOR
10435  073772  012702  100000                    MOV     #100000,R2      ;LOAD VIRTUAL ADDRESS INTO R2
10436  073776  000240                            NOP                     ;THIS IS A SYNC POINT FOR SCOPING
10437  074000  106522                            MFPD    (R2)+           ;READ FROM PHYSICAL 100000
10438  074002  012601                            MOV     (KSP)+,R1       ;POP KERNEL STACK INTO R1
10439  074004  020001                            CMP     R0,R1           ;WAS DATA FETCHED SAME AS STORED
10440  074006  001401                            BEQ     5$              ;BRANCH IF CORRECT DATA WAS FETCHED
10441  074010  104116                            ERROR   116             ;WRONG DATA WAS FETCHED
10442  074012                            5$:     ;THE FOLLOWING WILL TEST DSTM=3 MFPD.  BELOW ARE THE
10443                                            ;ROM STATE NAMES AND ADDRESSES, FROM THE A-FORK.
10444                                            ;THE * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
10445                                            ;INTO THE F/F'S ON SSRB.
10446                                            ;      D30.00    (003)
10447                                            ;      D30.10    (221)
10448                                            ;      D10.20    (233)
10449                                            ;   *  D10.50    (311)
10450                                            ;   *  D10.60    (177)
10451                                            ;   *  MFP.00    (066)
10452                                            ;      MFP.10    (250)
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10453                                          ;       SVC.80    (222)
10454                                          ;       SVC.90    (300)
10455                                          ;       FET.00    (217)
10456  074012  012737  074020  001112          MOV     #15$,$LPERR     ;SET LOOP ON ERROR POINTER TO 15$
10457  074020  012737  010340  177776  15$:    MOV     #010340,PSW     ;MAKE PREVIOUS MODE SUPERVISOR
10458  074026  000240                         NOP                     ;THIS IS A SYNC POINT FOR SCOPING
10459  074030  106537  100000                 MFPD    @#100000        ;READ FROM PHYSICAL 100000
10460  074034  012601                         MOV     (KSP)+,R1       ;POP KERNEL STACK INTO R1
10461  074036  020001                         CMP     R0,R1           ;WAS DATA FETCHED SAME AS STORED
10462  074040  001401                         BEQ     6$              ;BRANCH IF CORRECT DATA WAS FETCHED
10463  074042  104116                         ERROR   116             ;WRONG DATA WAS FETCHED
10464  074044                          6$:    ;THE FOLLOWING WILL TEST DSTM=4 MFPD.  BELOW ARE THE
10465                                         ;ROM STATE NAMES AND ADDRESSES, FROM THE A-FORK.
10466                                         ;THE * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
10467                                         ;INTO THE F/F'S ON SSRB.
10468                                          ;       D45.00    (004)
10469                                          ;   *   D10.30    (122)
10470                                          ;   *   D10.60    (177)
10471                                          ;   *   MFP.00    (066)
10472                                          ;       MFP.10    (250)
10473                                          ;       SVC.80    (222)
10474                                          ;       SVC.90    (300)
10475                                          ;       FET.00    (217)
10476  074044  012737  074052  001112          MOV     #16$,$LPERR     ;SET LOOP ON ERROR POINTER TO 16$
10477  074052  012737  010340  177776  16$:    MOV     #010340,PSW     ;MAKE PREVIOUS MODE SUPERVISOR
10478  074060  012702  100002                 MOV     #100002,R2      ;LOAD VIRTUAL ADDRESS INTO R2
10479  074064  000240                         NOP                     ;THIS IS A SYNC POINT FOR SCOPING
10480  074066  106542                         MFPD    -(R2)           ;READ FROM PHYSICAL 100000
10481  074070  012601                         MOV     (KSP)+,R1       ;POP KERNEL STACK INTO R1
10482  074072  020001                         CMP     R0,R1           ;WAS DATA FETCHED SAME AS STORED
10483  074074  001401                         BEQ     7$              ;BRANCH IF CORRECT DATA WAS FETCHED
10484  074076  104116                         ERROR   116             ;WRONG DATA WAS FETCHED
10485  074100  012737  032226  000250  7$:    MOV     #MMTRAP,MMVEC   ;SET M.M.VECTOR TO NORMAL ROUTINE
10486  074106  012737  073616  001112          MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
10487  074114  042737  000002  172516          BIC     #BIT1,MMR3      ;DISABLE SUPERVISOR D-SPACE
10488  074122  000413                         BR      TST115          ;;BRANCH TO NEXT TEST
10489
10490
10491  074124  013737  177572  001250  10$:    MOV     MMR0,PMMR0      ;SAVE MMR0 FOR ERROR TYPEOUT
10492  074132  013737  177574  001252          MOV     MMR1,PMMR1      ;SAVE MMR1 FOR ERROR TYPEOUT
10493  074140  013737  177576  001254          MOV     MMR2,PMMR2      ;SAVE MMR2 FOR ERROR TYPEOUT
10494  074146  104117                         ERROR   117             ;TRIED TO READ NON-RESIDENT PAGE
10495  074150  000002                         RTI                     ;RETURN TO TEST
10496
10497
10498                                         ;;******************************************************************
10499                                         ;*TEST 115      MFPI (USER/PREV.USER) WITH USER D-SPACE ENABLED
10500                                         ;*
10501                                         ;*      THIS TEST CHECKS THAT, IF THE INSTRUCTION IS EITHER MFPI OR
10502                                         ;*      MTPI AND BOTH THE PRESENT AND PREVIOUS MODES ARE USER
10503                                         ;*      (PS=17XXXX), THEN ''SSRB I SPACEB L'' IS NOT ASSERTED AND
10504                                         ;*      D-SPACE IS USED IF IT WAS ENABLED.  [IN THIS WAY AN OPERATING
10505                                         ;*      SYSTEM CAN MAKE SOME PROPRIETARY CODE 'EXECUTE ONLY'' FOR
10506                                         ;*      THE USER.]
10507                                         ;*      THERE IS A DESCRIPTION BEFORE EACH DESTINATION MODE TESTED,
10508                                         ;*      WHICH LISTS THE ROM STATES THAT SHOULD COME UP (ALONG WITH
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10509                                   ;*      THEIR ADDRESSES).
10510                                   ;*      IF THE CORRECT MODE IS NOT ENABLED A NON-RESIDENT ABORT
10511                                   ;*      WILL OCCUR AND TRAP TO 10$, WHERE THE ERRORS ARE REPORTED.
10512                                   ;*
10513                                   ;;*****************************************************************
10514  074152  000004                   TST115: SCOPE
10515  074154  012737  074576  001316           MOV     #TST116,NXTTST  ;SET ESCAPE POINTER TO EOP ROUTINE
10516  074162  012700  077406                   MOV     #77406,R0       ;MAKE ALL USER I-SPACE PAGES RESIDENT
10517                                                                    ;READ/WRITE, LENGTH 200 BLOCKS
10518  074166  012702  000010                   MOV     #10,R2          ;SET COUNT TO LOAD 8 ADDRESSES
10519  074172  012701  177600                   MOV     #UIPDR0,R1      ;PUT ADDRESS OF FIRST PDR IN R1
10520  074176  010021                   19$:    MOV     R0,(R1)+        ;LOAD R0 INTO PDR ADDRESSED BY R1
10521  074200  077202                           SOB     R2,19$          ;BRANCH BACK TO 19$ IF R2 IS NOT ZERO
10522  074202  012737  074216  001110           MOV     #20$,$LPADR     ;SET LOOP POINTER TO 20$
10523  074210  012737  074216  001112           MOV     #20$,$LPERR     ;SET LOOP ON ERROR TO 20$
10524  074216  012737  077406  172310   20$:    MOV     #77406,KIPDR4   ;MAKE KERNEL I PAGE 4 R/W, 200 BLOCKS
10525  074224  012700  077400                   MOV     #77400,R0       ;MAKE PAGE 4 IN ALL BUT USER D
10526                                                                    ;AND USER I NON-RESIDENT
10527  074230  010037  172330                   MOV     R0,KDPDR4       ;KERNEL D-SPACE PAGE 4
10528  074234  010037  172210                   MOV     R0,SIPDR4       ;SUPERVISOR I-SPACE PAGE 4
10529  074240  010037  172230                   MOV     R0,SDPDR4       ;SUPERVISOR D-SPACE PAGE 4
10530  074244  012737  077406  177630           MOV     #77406,UDPDR4   ;USER D-SPACE PAGE 4 READ/WRITE
10531  074252  012737  001000  172350           MOV     #1000,KIPAR4    ;MAP KERNEL I PAGE 4 TO 16K
10532  074260  012737  001000  177650           MOV     #1000,UIPAR4    ;MAP USER I PAGE 4 TO 16K
10533  074266  012737  001000  177670           MOV     #1000,UDPAR4    ;MAP USER D PAGE 4 TO 16K
10534  074274  012700  036514                   MOV     #36514,R0       ;LOAD DATA PATTERN INTO R0
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10535  074300  010037  100000                    MOV     R0,@#100000     ;LOAD DATA PATTERN INTO PHY 100000
10536  074304  012737  074540  000250            MOV     #10$,MMVEC      ;SET M.M. VECTOR TO 10$
10537  074312  052737  000001  172516            BIS     #BIT0,MMR3      ;ENABLE USER D-SPACE
10538  074320  105037  172310                    CLRB    KIPDR4          ;MAKE KERNEL I-SPACE PAGE 4 NON-RESIDENT
10539  074324  105037  177610                    CLRB    UIPDR4          ;MAKE USER I-SPACE PAGE 4 NON-RESIDENT
10540  074330                            2$:     ;THE FOLLOWING WILL TEST DSTM=1 MFPI.  BELOW ARE THE
10541                                            ;ROM STATE NAMES AND ADDRESSES, FROM THE A-FORK.
10542                                            ;THE * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
10543                                            ;INTO THE F/F'S ON SSRB.
10544                                            ;   *  D12.00    (001)
10545                                            ;   *  D12.10    (175)
10546                                            ;   *  MFP.00    (066)
10547                                            ;      MFP.10    (250)
10548                                            ;      SVC.80    (222)
10549                                            ;      SVC.90    (300)
10550                                            ;      FET.00    (217)
10551  074330  012737  074336  001112            MOV     #12$,$LPERR     ;SET LOOP ON ERROR POINTER TO 12$
10552  074336  012737  170340  177776  12$:      MOV     #170340,PSW     ;MAKE PREVIOUS MODE USER
10553  074344  012702  100000                    MOV     #100000,R2      ;LOAD VIRTUAL ADDRESS INTO R2
10554  074350  000240                            NOP                     ;THIS IS A SYNC POINT FOR SCOPING
10555  074352  006512                            MFPI    (R2)            ;READ FROM PHYSICAL 100000
10556  074354  012601                            MOV     (USP)+,R1       ;POP USER STACK INTO R1
10557  074356  020001                            CMP     R0,R1           ;WAS DATA FETCHED SAME AS STORED
10558  074360  001401                            BEQ     4$              ;BRANCH IF CORRECT DATA WAS FETCHED
10559  074362  104116                            ERROR   116             ;WRONG DATA WAS FETCHED
10560  074364                            4$:     ;THE FOLLOWING WILL TEST DSTM=2 MFPI.  BELOW ARE THE
10561                                            ;ROM STATE NAMES AND ADDRESSES, FROM THE A-FORK.
10562                                            ;THE * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
10563                                            ;INTO THE F/F'S ON SSRB.
10564                                            ;   *  D12.01    (002)
10565                                            ;   *  D12.10    (175)
10566                                            ;   *  MFP.00    (066)
10567                                            ;      MFP.10    (250)
10568                                            ;      SVC.80    (222)
10569                                            ;      SVC.90    (300)
10570                                            ;      FET.00    (217)
10571  074364  012737  074372  001112            MOV     #14$,$LPERR     ;SET LOOP ON ERROR POINTER TO 14$
10572  074372  012737  170340  177776  14$:      MOV     #170340,PSW     ;MAKE PREVIOUS MODE USER
10573  074400  012702  100000                    MOV     #100000,R2      ;LOAD VIRTUAL ADDRESS INTO R2
10574  074404  000240                            NOP                     ;THIS IS A SYNC POINT FOR SCOPING
10575  074406  006522                            MFPI    (R2)+           ;READ FROM PHYSICAL 100000
10576  074410  012601                            MOV     (USP)+,R1       ;POP USER STACK INTO R1
10577  074412  020001                            CMP     R0,R1           ;WAS DATA FETCHED SAME AS STORED
10578  074414  001401                            BEQ     5$              ;BRANCH IF CORRECT DATA WAS FETCHED
10579  074416  104116                            ERROR   116             ;WRONG DATA WAS FETCHED
10580  074420                            5$:     ;THE FOLLOWING WILL TEST DSTM=3 MFPI.  BELOW ARE THE
10581                                            ;ROM STATE NAMES AND ADDRESSES, FROM THE A-FORK.
10582                                            ;THE * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
10583                                            ;INTO THE F/F'S ON SSRB.
10584                                            ;      D30.00    (003)
10585                                            ;      D30.10    (221)
10586                                            ;      D10.20    (233)
10587                                            ;   *  D10.50    (311)
10588                                            ;   *  D10.60    (177)
10589                                            ;   *  MFP.00    (066)
10590                                            ;      MFP.10    (250)
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10591                                          ;       SVC.80    (222)
10592                                          ;       SVC.90    (300)
10593                                          ;       FET.00    (217)
10594  074420  012737  074426  001112          MOV     #15$,$LPERR     ;SET LOOP ON ERROR POINTER TO 15$
10595  074426  012737  170340  177776  15$:    MOV     #170340,PSW     ;MAKE PREVIOUS MODE USER
10596  074434  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
10597  074436  006537  100000                  MFPI    @#100000        ;READ FROM PHYSICAL 100000
10598  074442  012601                          MOV     (USP)+,R1       ;POP USER STACK INTO R1
10599  074444  020001                          CMP     R0,R1           ;WAS DATA FETCHED SAME AS STORED
10600  074446  001401                          BEQ     6$              ;BRANCH IF CORRECT DATA WAS FETCHED
10601  074450  104116                          ERROR   116             ;WRONG DATA WAS FETCHED
10602  074452                          6$:     ;THE FOLLOWING WILL TEST DSTM=4 MFPI.  BELOW ARE THE
10603                                         ;ROM STATE NAMES AND ADDRESSES, FROM THE A-FORK.
10604                                         ;THE * INDICATES WHEN THE PREVIOUS MODE GETS CLOCKED
10605                                         ;INTO THE F/F'S ON SSRB.
10606                                         ;       D45.00    (004)
10607                                         ;   *   D10.30    (122)
10608                                         ;   *   D10.60    (177)
10609                                         ;   *   MFP.00    (066)
10610                                         ;       MFP.10    (250)
10611                                         ;       SVC.80    (222)
10612                                         ;       SVC.90    (300)
10613                                         ;       FET.00    (217)
10614  074452  012737  074460  001112          MOV     #16$,$LPERR     ;SET LOOP ON ERROR POINTER TO 16$
10615  074460  012737  170340  177776  16$:    MOV     #170340,PSW     ;MAKE PREVIOUS MODE USER
10616  074466  012702  100002                  MOV     #100002,R2      ;LOAD VIRTUAL ADDRESS INTO R2
10617  074472  000240                          NOP                     ;THIS IS A SYNC POINT FOR SCOPING
10618  074474  006542                          MFPI    -(R2)           ;READ FROM PHYSICAL 100000
10619  074476  012601                          MOV     (USP)+,R1       ;POP USER STACK INTO R1
10620  074500  020001                          CMP     R0,R1           ;WAS DATA FETCHED SAME AS STORED
10621  074502  001401                          BEQ     7$              ;BRANCH IF CORRECT DATA WAS FETCHED
10622  074504  104116                          ERROR   116             ;WRONG DATA WAS FETCHED
10623  074506  012737  032226  000250  7$:     MOV     #MMTRAP,MMVEC   ;SET M.M.VECTOR TO NORMAL ROUTINE
10624  074514  012737  074216  001112          MOV     #20$,$LPERR     ;SET LOOP POINTER TO START OF TEST
10625  074522  042737  000001  172516          BIC     #BIT0,MMR3      ;DISABLE USER D-SPACE
10626  074530  012737  000340  177776          MOV     #340,PSW        ;MAKE PRESENT MODE KERNEL
10627  074536  000413                          BR      21$             ;BRANCH TO EXIT
10628
10629
10630  074540  013737  177572  001250  10$:    MOV     MMR0,PMMR0      ;SAVE MMR0 FOR ERROR TYPEOUT
10631  074546  013737  177574  001252          MOV     MMR1,PMMR1      ;SAVE MMR1 FOR ERROR TYPEOUT
10632  074554  013737  177576  001254          MOV     MMR2,PMMR2      ;SAVE MMR2 FOR ERROR TYPEOUT
10633  074562  104117                          ERROR   117             ;TRIED TO READ NON-RESIDENT PAGE
10634  074564  000002                          RTI                     ;RETURN TO TEST
10635
10636  074566  005037  177572          21$:    CLR     @#MMR0          ;DISABLE KT
10637  074572  005037  172516                  CLR     @#MMR3
10638
10639
10640
10641                                          ;;*****************************************************************
10642                                          ;*TEST 116      CHECK DPARS READ BACK CORRECTLY
10643                                          ;*
10644                                          ;*      DATA ERRORS MAY OCCUR WHEN A PAR,PDR, OR MEMORY MANAGEMENT
10645                                          ;*      REGISTER TO BE READ IS ADDRESSED USING MEMORY MANAGEMENT.
10646                                          ;*      DATA FROM AN INTERNAL REGISTER (SYS SIZE-LO, SYS SIZE-HI, SYS
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10647                                   ;*      ID, OR CPU ERROR) MAY BE ENABLED ONTO THE INTERNAL DATA BUS AT
10648                                   ;*      THE SAME TIME AS DATA FROM THE ADDRESSED PAR, PDR, OR
10649                                   ;*      MEMORY MANAGEMENT REGISTER. SYMPTOM:  INCORRECT DATA READ
10650                                   ;*      FROM A PAR, PDR, OR MEMORY MANAGEMENT REGISTER WHEN
10651                                   ;*      ADDRESSED USING MEMORY MANAGEMENT.  CORRECTION: INSTALL
10652                                   ;*      ECO M8140-00002.
10653                                   ;*
10654                                   ;;**********************************************************************
10655  074576  000004                  TST116: SCOPE
10656  074600  013746  177776                  MOV     @#PS,   -(SP)
10657  074604  042716  000020                  BIC     #20,    (SP)
10658  074610  012746  074616                  MOV     #8$,    -(SP)
10659  074614  000002                          RTI
10660  074616                          8$:
10661  074616  012737  075354  001316          MOV     #DONE,  NXTTST          ;POINT TO NEXT TEST
10662  074624                          20$:
10663  074624  005037  177572                  CLR     MMR0                    ;SET CONDITIONS FOR THIS TEST
10664  074630  005037  172516                  CLR     MMR3                    ;MEM MAN OFF
10665  074634  005037  177776                  CLR     PS                      ;KERNAL MODE
10666  074640  012737  001014  177746          MOV     #1014,  @#CONTRL        ;DISABLE CACHE
10667  074646  005037  172340                  CLR     KIPAR0                  ;KI VIRTUAL=PHYSICAL
10668  074652  012737  177406  172300          MOV     #177406,        KIPDR0
10669  074660  012737  000200  172342          MOV     #200,   KIPAR1
10670  074666  012737  177406  172302          MOV     #177406,        KIPDR1
10671  074674  012737  000400  172344          MOV     #400,   KIPAR2
10672  074702  012737  177406  172304          MOV     #177406,        KIPDR2
10673  074710  012737  000600  172346          MOV     #600,   KIPAR3
10674  074716  012737  177406  172306          MOV     #177406,        KIPDR3
10675  074724  012737  001000  172350          MOV     #1000,  KIPAR4
10676  074732  012737  177406  172310          MOV     #177406,        KIPDR4
10677  074740  012737  001200  172352          MOV     #1200,  KIPAR5
10678  074746  012737  177406  172312          MOV     #177406,        KIPDR5
10679  074754  012737  001400  172354          MOV     #1400,  KIPAR6
10680  074762  012737  177406  172314          MOV     #177406,        KIPDR6
10681  074770  012737  007600  172356          MOV     #7600,  KIPAR7
10682  074776  012737  177406  172316          MOV     #177406,        KIPDR7
10683  075004  005037  172360                  CLR     KDPAR0                  ;KD VIRTUAL=PHYSICAL
10684  075010  012737  177406  172320          MOV     #177406,KDPDR0
10685  075016  012737  000200  172362          MOV     #200,KDPAR1
10686  075024  012737  177406  172322          MOV     #177406,KDPDR1
10687  075032  012737  000400  172364          MOV     #400,KDPAR2
10688  075040  012737  177406  172324          MOV     #177406,KDPDR2
10689  075046  012737  000600  172366          MOV     #600,KDPAR3
10690  075054  012737  177406  172326          MOV     #177406,KDPDR3
10691  075062  012737  001000  172370          MOV     #1000,KDPAR4
10692  075070  012737  177406  172330          MOV     #177406,KDPDR4
10693  075076  012737  001200  172372          MOV     #1200,KDPAR5
10694  075104  012737  177406  172332          MOV     #177406,KDPDR5
10695  075112  012737  001400  172374          MOV     #1400,KDPAR6
10696  075120  012737  177406  172334          MOV     #177406,KDPDR6
10697  075126  012737  007600  172376          MOV     #7600,  KDPAR7
10698  075134  012737  177406  172336          MOV     #177406,        KDPDR7
10699  075142  012737  000014  172516          MOV     #14,    MMR3            ;ENABLE DPARS
10700  075150  012737  075336  075352          MOV     #MAGIC, WORK            ;BEGIN WITH USER DPARS
10701  075156  022737  075352  075352  1$:     CMP     #WORK,  WORK            ;TESTED ALL THE DPARS?
10702  075164  101461                          BLOS    7$                      ;BRANCH IF YES
```

```
10703  075166  012737  000001  177572          MOV     #1,     MMR0            ;TURN ON MEM MAN
10704  075174  017703  000152                  MOV     @WORK,  R3              ;GET ADDRESS OF FIRST DPAR
10705  075200  017700  000146                  MOV     @WORK,  R0
10706  075204  017701  000142                  MOV     @WORK,  R1
10707  075210  062701  000016                  ADD     #16,    R1              ;POINT TO LAST DPAR
10708  075214  062737  000002  075352          ADD     #2,     WORK            ;POINT TO MAGIC NUMBER
10709  075222  017702  000124                  MOV     @WORK,  R2              ;GET THE MAGIC NUMBER
10710  075226  020103                  2$:     CMP     R1,     R3              ;ARE ALL DPARS LOADED?
10711  075230  101402                          BLOS    3$                      ;BRANCH IF YES
10712  075232  010223                          MOV     R2,     (R3)+           ;LOAD DPAR USING KDPAR7
10713  075234  000774                          BR      2$                      ;DO DPAR0 THRU DPAR6
10714  075236  010003                  3$:     MOV     R0,     R3              ;POINT BACK TO DPAR0
10715  075240  020103                  4$:     CMP     R1,     R3              ;ARE ALL DPARS READ?
10716  075242  101421                          BLOS    5$                      ;BRANCH IF YES
10717  075244  020213                          CMP     R2,     (R3)            ;READ THE MAGIC NUMBER BACK
10718  075246  001425                          BEQ     6$                      ;BRANCH IF OK
10719  075250  011301                          MOV     (R3),   R1              ;GET THE RECEIVED DATA
10720  075252  005037  177572                  CLR     MMR0                    ;TURN OFF MEM MAN
10721  075256  010137  001176                  MOV     R1,     $TMP2           ;GET THE RECEIVED DATA
10722  075262  010337  001172                  MOV     R3,     $TMP0           ;GET THE DPAR ADDRESS
10723  075266  010237  001174                  MOV     R2,     $TMP1           ;GET THE MAGIC NUMBER
10724  075272  005037  172516                  CLR     MMR3                    ;DISABLE DPAR
10725  075276  104145                          ERROR   145                     ;DPAR DID NOT READ CORRECTLY
10726  075300  104400  014365                  TYPE    ,ECO                    ;TYPE ECO MESSAGE
10727  075304  000423                          BR      DONE                    ;REPORT ONLY FIRST ERROR
10728  075306  005037  177572          5$:     CLR     MMR0                    ;TURN OFF MEM MAN
10729  075312  062737  000002  075352          ADD     #2,     WORK            ;POINT TO NEXT PAR0
10730  075320  000716                          BR      1$
10731  075322  062703  000002          6$:     ADD     #2,     R3              ;POINT TO NEXT DPAR
10732  075326  000744                          BR      4$
10733  075330  005037  172516          7$:     CLR     MMR3                    ;DISABLE DPARS
10734  075334  000407                          BR      DONE
10735
10736  075336  177660                  MAGIC:  .WORD   UDPAR0                  ;DPARS AND MAGIC NUMBER TABLE
10737  075340  007601                          .WORD   7601
10738  075342  172260                          .WORD   SDPAR0
10739  075344  007655                          .WORD   7655
10740  075346  172360                          .WORD   KDPAR0
10741  075350  007654                          .WORD   7654
10742  075352  000000                  WORK:   .WORD   0                       ;WORK LOCATION
10743
10744  075354                          DONE:
10745                                  ;
10746                                  ;
10747                                  .SBTTL  MEMORY MANAGEMENT SETUP
10748                                  ;*
10749                                  ;*      THIS ROUTINE SETS UP THE KERNEL AND SUPERVISOR PAR'S AND
10750                                  ;*      PDR'S TO  MAP VIRTUAL ADDRESSES TO THE SAME PHYSICAL ADDRESSES.
10751
10752  075354                          MMSET:
10753  075354  012703  172340          MOV     #KIPAR0,R3      ;GET ADDRESS OF KIPAR0
10754  075360  012704  172300                  MOV     #KIPDR0,R4
10755  075364  005005                          CLR     R5
10756  075366  010300                  4$:     MOV     R3,R0           ;GET ADDRESS OF KIPAR0 OR SIPAR0
10757  075370  012720  000000                  MOV     #0,(R0)+        ;SETUP
10758  075374  012720  000200                  MOV     #200,(R0)+      ;THE
```

```
10759  075400  012720  000400              MOV     #400,(R0)+      ;KERNEL OR SUPERVISOR
10760  075404  012720  000600              MOV     #600,(R0)+      ;PAR'S
10761  075410  012720  001000              MOV     #1000,(R0)+     ;TO MAP
10762  075414  012720  001200              MOV     #1200,(R0)+     ;THE PROGRAM
10763  075420  012720  001400              MOV     #1400,(R0)+     ;TO
10764  075424  012710  177600              MOV     #177600,(R0)    ;ITSELF
10765  075430  010400                      MOV     R4,R0           ;GET ADDRESS OF KIPDR0 OR SIPDR0
10766  075432  012701  077406              MOV     #77406,R1       ;GET PDR DATA
10767  075436  012702  000010              MOV     #10,R2          ;SETUP SOB COUNT
10768  075442  010120              2$:     MOV     R1,(R0)+        ;INSTRUCTION TO SETUP PDR'S
10769  075444  077202                      SOB     R2,2$           ;EXECUTE EIGHT TIMES
10770  075446  005705                      TST     R5              ;IS SETUP COMPLETE?
10771  075450  001006                      BNE     TST117          ;;BRANCH IF YES
10772  075452  012703  172240              MOV     #SIPAR0,R3      ;GET ADDRESS OF SUPER PAR0
10773  075456  012704  172200              MOV     #SIPDR0,R4      ;GET ADDRESS OF SUPER PDR0
10774  075462  005205                      INC     R5              ;SET PASS COUNT
10775  075464  000740                      BR      4$              ;GO SETUP SUPER PAR'S AND PDR'S
10776                          ;;**************************************************************
10777                          ;*TEST 117      MEMORY MANAGEMENT ABORT
10778                          ;*
10779                          ;*      THIS TEST SETS UP PDR6 TO CAUSE A MEMORY MANAGEMENT ABORT.
10780                          ;*      IF TMCC AERF(1) DOES NOT GO HIGH IT WILL LOOK LIKE THE TRAP FAILED.
10781                          ;*
10782                          ;*      IF TMCC ABORT DOES NOT GO HIGH THE TEST WILL NOT TRAP AT ALL.
10783                          ;*      IF TMCB SEGT DOES NOT GO LOW A TRAP TO 4 WILL OCCUR.
10784                          ;*
10785                          ;*      IF TMCE CACHE BEND DOES NOT GO HIGH A TRAP TO 350 WILL OCCUR.
10786                          ;;**************************************************************
10787  075466  000004          TST117: SCOPE
10788  075470  012737  075662  001210  MOV     #TST120,$ESCAPE ;SAVE START ADDRESS OF NEXT TEST
10789  075476  012737  075662  001316  MOV     #TST120,NXTTST  ;SAVE START ADDRESS OF NEXT TEST
10790  075504  012737  075620  000004  MOV     #3$,@#ERRVEC    ;SETUP LOCATION 4
10791  075512  012737  000340  000006  MOV     #PR7,@#ERRVEC+2 ;RESTOR ERROR VEC PSW
10792  075520  012737  075650  000250  MOV     #4$,@#MMVEC     ;SETUP ABORT VECTOR
10793  075526  012737  075626  000010  MOV     #5$,@#RESVEC    ;SETUP LOCATION 10
10794  075534  012737  000340  000012  MOV     #PR7,@#RESVEC+2 ;RESTORE RESVEC PSW
10795  075542  012737  075634  000240  MOV     #6$,@#240       ;SETUP LOCATION 240
10796  075550  012737  075642  000350  MOV     #7$,@#350       ;SETUP LOCATION 350
10797  075556  012737  075572  001112  MOV     #1$,$LPERR      ;SETUP ERROR LOOP
10798  075564  012737  077401  172314  MOV     #77401,@#KIPDR6 ;MAKE PAGE 6 CAUSE ABORT
10799  075572  012706  001100  1$:     MOV     #STACK,SP       ;SETUP THE SP
10800  075576  012737  000001  177572  MOV     #BIT0,@#MMR0    ;TURN RELOCATION ON
10801  075604  012737  177777  140000  MOV     #-1,@#140000    ;EXECUTE ABORT INSTRUCTION
10802                          ;ABORT FAILED
10803  075612  005037  177572          CLR     @#MMR0          ;TURN RELOCATION OFF
10804  075616  104146                  ERROR   146             ;NO KT ABORT
10805                          ;TRAPPED TO LOCATION 4
10806  075620  005037  177572  3$:     CLR     @#MMR0          ;TURN OFF MM
10807  075624  104150                  ERROR   150     ;TRAPPED TO 4
10808  075626  005037  177572  5$:     CLR     @#MMR0          ;TURN OFF MM
10809  075632  104151                  ERROR   151             ;TRAPPED TO 10
10810  075634  005037  177572  6$:     CLR     @#MMR0          ;TURN OFF MM
10811  075640  104152                  ERROR   152             ;TRAPPED TO 240
10812  075642  005037  177572  7$:     CLR     @#MMR0          ;TURN RELOCATION OFF
10813  075646  104166                  ERROR   166
10814  075650  005037  177572  4$:     CLR     @#MMR0          ;TURN MM OFF
```

```
10815  075654  012737  000012  000010          MOV     #12,@#RESVEC
10816                                                   ;CONTINUE
10817                                   ;;**************************************************************
10818                                   ;*TEST 120       MEMORY MANAGEMENT TRAP
10819                                   ;*
10820                                   ;*      THIS TEST ENSURES THAT THE MEMORY MANAGEMENT TRAP LOGIC WORKS.
10821                                   ;*      IF TMCA HONOR SEGTF DOES NOT GO LOW OR DOES NOT GET THRU
10822                                   ;*      TO TMCB BRQ TRUE THE TRAP WILL NOT OCCUR.
10823                                   ;*
10824                                   ;*      IF TMCB SEGT DOES NOT GO LOW BEN13 WILL FAIL TO BRK.20.
10825                                   ;*      THE FLOW WILL THEN GO TO RTI.60 WHICH MEANS AN ACKNOWLEDGE
10826                                   ;*      IS NEVER GIVEN AND THE PROCESSOR WILL HANG UP.
10827                                   ;*
10828                                   ;*      AN INSTRUCTION IS THEN EXECUTED THAT CAUSES A MEMORY MANAGEMENT
10829                                   ;*      TRAP ON THE SOURCE OPERAND BUT NOT ON THE DESTINATION.
10830                                   ;;**************************************************************
10831  075662  000004                  TST120: SCOPE
10832  075664  012737  076022  001210          MOV     #TST121,$ESCAPE ;SAVE START ADDRESS OF NEXT TEST
10833  075672  012737  076022  001316          MOV     #TST121,NXTTST  ;SAVE START ADDRESS OF NEXT TEST
10834  075700  012737  026252  000004          MOV     #CPUSPUR,@#ERRVEC ;RESTORE LOCATION 4
10835  075706  012737  075754  000250          MOV     #2$,@#MMVEC     ;SETUP LOCATION 250
10836  075714  012737  075730  001112          MOV     #3$,$LPERR      ;SETUP ERROR LOOP
10837  075722  012737  077404  172314          MOV     #77404,@#KIPDR6 ;SET ACF 4 IN PDR6
10838  075730  012706  001100          3$:     MOV     #STACK,SP       ;INITIALIZE THE SP
10839  075734  012737  001001  177572          MOV     #1001,@#MMR0    ;TURN RELOCATION ON
10840  075742  005037  140000                  CLR     @#140000        ;EXECUTE TRAP TYPE INSTRUCTION
10841                                  ;NO TRAP
10842  075746  005037  177572                  CLR     @#MMR0          ;TURN RELOCATION OFF
10843  075752  104153                          ERROR   153             ;NO KT TRAP
10844                                  ;TRAP OK, NOW TRY TRAP ON SOURCE NO TRAP ON DESTINATION
10845  075754  012737  076016  000250  2$:     MOV     #4$,@#MMVEC     ;SETUP VECTOR
10846  075762  012737  075770  001112          MOV     #5$,$LPERR      ;SETUP ERROR LOOP
10847  075770  012706  001100          5$:     MOV     #STACK,SP       ;INITIALIZE THE SP
10848  075774  012737  001001  177572          MOV     #1001,@#MMR0    ;INITIALIZE MMR0
10849  076002  013737  140000  001172          MOV     @#140000,$TMP0  ;EXECUTE TRAP ON SOURCE
10850                                  ;NO TRAP
10851  076010  005037  177572                  CLR     @#MMR0          ;TURN RELOCATION OFF
10852  076014  104155                          ERROR   155             ;NO TRAP ON SOURCE
10853                                  ;TRAP OK
10854  076016  005037  177572          4$:     CLR     @#MMR0          ;TURN RELOCATION OFF
10855                                                   ;CONTINUE
10856                                   ;;**************************************************************
10857                                   ;*TEST 121       NON EXTISTANT MEMORY ABORT
10858                                   ;*
10859                                   ;*      THIS TEST ENSURES THAT A NON EXISTANT MEMORY
10860                                   ;*      REFERENCE FUNCTIONS PROPERLY.
10861                                   ;*
10862                                   ;*      IF TMCC AERF(1) DOES NOT GO HIGH IT WILL LOOK LIKE THE ABORT FAILED.
10863                                   ;*      IF TMCC ABORT DOES NOT GO HIGH THE ABORT WILL STILL OCCUR,
10864                                   ;*      BUT THE ERROR REGISTER WILL NOT BE LOADED.
10865                                   ;;**************************************************************
10866  076022  000004                  TST121: SCOPE
10867  076024  012737  076202  001316          MOV     #TST122,NXTTST  ;SAVE ADDRESS OF NEXT TEST
10868  076032  005037  177766                  CLR     @#CPUERR        ;CLEAR ERROR REG
10869  076036  022737  167777  177760          CMP     #167777,@#SIZELO;2 MILLION WORDS ON SYSTEM?
10870  076044  003456                          BLE     TST122          ;BRANCH IF YES
```

```
10871  076046  012737  076076  001112          MOV     #1$,$LPERR      ;SETUP ERROR LOOP
10872  076054  012737  076130  000004          MOV     #3$,@#ERRVEC    ;SETUP LOCATION 4
10873  076062  013737  177760  172354          MOV     @#SIZELO,@#KIPAR6 ;SETUP PAR6
10874  076070  012737  077406  172314          MOV     #77406,@#KIPDR6 ;PUT 6 IN PDR6 ACF FIELD
10875  076076  012706  001100          1$:     MOV     #STACK,SP       ;SETUP THE SP
10876  076102  012737  000020  172516          MOV     #20,@#MMR3      ;SETUP FOR 22 BIT MODE
10877  076110  012737  000001  177572          MOV     #BIT0,@#MMR0    ;TURN RELOCATION ON
10878  076116  005037  140100                  CLR     @#140100        ;MAKE REFERENCE TO NEXM
10879                          ;NO ABORT
10880  076122  005037  177572                  CLR     @#MMR0          ;TURN RELOCATION OFF
10881  076126  104156                          ERROR   156             ;NO ABORT ON NEXM
10882                          ;ABORT OK
10883  076130  005037  177572          3$:     CLR     @#MMR0          ;TURN RELOCATION OFF
10884  076134  022737  000040  177766          CMP     #BIT5,@#CPUERR  ;IS ERROR REGISTER OK?
10885  076142  001411                          BEQ     4$              ;BRANCH IF YES
10886  076144  013737  177766  001174          MOV     @#CPUERR,$TMP1  ;SAVE ERROR REG FOR TYPEOUT
10887  076152  012737  000040  001172          MOV     #BIT5,$TMP0     ;SAVE EXPECTED VALUE
10888  076160  005037  177766                  CLR     @#CPUERR        ;CLEAR ERROR REG
10889  076164  104160                          ERROR   160     ;NEXM BIT DID NOT SET IN CPU ERROR
10890  076166  005037  177766          4$:     CLR     @#CPUERR        ;CLEAR ERROR REG
```

```
10891  076172  005737  177766          TST     @#CPUERR        ;DID REGISTER CLEAR?
10892  076176  001401                  BEQ     TST122          ;;BRANCH IF YES
10893  076200  104161                  ERROR   161             ;NEXM BIT DID NOT CLEAR
10894                          ;;*****************************************************************
10895                          ;*TEST 122      KT BEND
10896                          ;*
10897                          ;*      THIS TEST ENSURES THAT TMCE KT BEND GOES LOW ON AN ODD
10898                          ;*      ADDRESS ERROR, SL RED, AND NEXM. THIS IS DONE BY EXECUTING
10899                          ;*      AN INSTRUCTION FOR EACH OF THESE THREE CASES THAT ALSO
10900                          ;*      CAUSES A KT ABORT. THE ABORT SHOULD NOT BE HONORED.
10901                          ;*
10902                          ;*      NOTE: ON A KB11-E OR KB11-EM THE KT ABORT SHOULD BE HONORED OVER A
10903                          ;*      NEXM TRAP.  IF THIS IS A KB11-E/EM THEN THIS FEATURE IS TESTED.
10904                          ;;*****************************************************************
10905  076202  000004          TST122: SCOPE
10906  076204  012737  076524  001316          MOV     #TST123,NXTTST  ;SAVE ADDRESS OF NEXT TEST
10907  076212  022737  167777  177760          CMP     #167777,@#SIZELO;2 MILLION WORDS ON SYSTEM?
10908  076220  003446                  BLE     3$              ;BRANCH IF YES
10909  076222  012737  076302  001112          MOV     #1$,$LPERR      ;SETUP ERROR LOOP
10910  076230  012737  076320  000250          MOV     #2$,@#MMVEC     ;SETUP MEMORY VECTOR
10911  076236  012737  076336  000004          MOV     #3$,@#ERRVEC    ;SETUP LOCATION 4
10912  076244  005737  001360                  TST     @#KB11E         ;IS THIS A KB11-E OR KB11-EM?
10913  076250  001406                  BEQ     20$             ;BR IF NOT
10914  076252  012737  076336  000250          MOV     #3$,@#MMVEC     ;SETUP MEMORY VECTOR
10915  076260  012737  076330  000004          MOV     #21$,ERRVEC     ;SETUP LOCATION 4
10916  076266  052737  000007  172314  20$:     BIS     #7,@#KIPDR6     ;SET ACF FIELD TO 7 IN PDR6
10917  076274  012737  000060  172516          MOV     #60,@#MMR3      ;SETUP MMR3
10918  076302  012706  001100          1$:     MOV     #STACK,SP       ;INITIALIZE THE SP
10919  076306  012737  000001  177572          MOV     #BIT0,@#MMR0    ;TURN RELOCATION ON
10920  076314  005037  140100                  CLR     @#140100        ;MAKE A REFERENCE TO NEXM
10921                          ;FAILURE, KT ABORT CAME IN (KB11-B/C)
10922  076320  005037  177572          2$:     CLR     @#MMR0          ;TURN RELOCATION OFF
10923  076324  104162                  ERROR   162             ;KT ABORT OCCURRED ON NEXM
10924  076326  000403                  BR      3$              ;SKIP KB11-E ERROR MESSAGE
10925                          ;FAILURE, KT ABORT OVER-RIDDEN BY NEXM (KB11-E/EM ONLY)
10926  076330  005037  177572          21$:    CLR     @#MMR0          ;TURN RELOCATION OFF
10927  076334  104165                  ERROR   165
10928                          ;NEXM OK, TRY SL RED
10929  076336  005037  172516          3$:     CLR     @#MMR3          ;GO BACK TO 18 BIT MODE
10930  076342  052737  000007  172314          BIS     #7,@#KIPDR6     ;MAKE KERNEL PAGE 6 NON RESIDENT
10931  076350  012737  076414  000250          MOV     #5$,@#MMVEC     ;SETUP MEM VECTOR
10932  076356  012737  076414  000004          MOV     #5$,@#ERRVEC    ;SETUP LOCATION 4
10933  076364  012737  076372  001112          MOV     #6$,$LPERR      ;SETUP ERROR LOOP
10934  076372  012737  000001  177572  6$:     MOV     #BIT0,@#MMR0    ;TURN RELOCATION ON
10935  076400  012706  140336                  MOV     #140336,KSP     ;PUT SP IN RED ZONE PAGE 6
10936  076404  012737  140000  177774          MOV     #140000,@#STKLMT ;SET STACK BOUNDARY AT 24K + 400
10937  076412  005016                  CLR     (SP)            ;EXECUT INSTRUCTION TO RED ZONE NON-RESIDENT
10938  076414  032737  100000  177572  5$:     BIT     #BIT15,@#MMR0   ;DID KT ABORT FLAG COME ON?
10939  076422  001407                  BEQ     10$             ;BRANCH IF NO
10940  076424  005037  177572                  CLR     @#MMR0          ;TURN RELOCATION OFF
10941  076430  005037  177774                  CLR     @#STKLMT        ;
10942  076434  012706  001100                  MOV     #STACK,SP       ;RESTORE THE SP
10943  076440  104163                  ERROR   163
10944                          ;SL RED OK, TRY ODD ADDRESS
10945  076442  005037  177774          10$:    CLR     @#STKLMT        ;CLEAR THE SL REG
10946  076446  012737  076506  000250          MOV     #7$,@#MMVEC     ;SETUP MM VECTOR
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10947  076454  012737  076514  000004          MOV     #8$,@#ERRVEC    ;SETUP LOCATION 4
10948  076462  012737  076470  001112          MOV     #9$,$LPERR      ;SETUP ERROR LOOP
10949  076470  012737  000001  177572  9$:     MOV     #BIT0,@#MMR0    ;TURN RELOCATION ON
10950  076476  012706  001100                  MOV     #STACK,SP       ;INITIALIZE THE SP
10951  076502  005037  140001                  CLR     @#140001        ;EXECUTE ODD ADDRESS AND KT ABORT
10952                                  ;FAILURE, KT ABORT CAME IN
10953  076506  005037  177572          7$:     CLR     @#MMR0          ;TURN RELOCATION OFF
10954  076512  104164                  ERROR   164                     ;KT ABORT OCCURRED ON ODD ADDRESS
10955                                  ;ODD ADDRESS OK
10956  076514  005037  177572          8$:     CLR     @#MMR0          ;TURN RELOCATION OFF
10957  076520  005037  177766                  CLR     @#CPUERR                ;ENSURE ERROR REG CLEAR
10958                                                                  ;CONTINUE
10959                                  ;;*****************************************************************
10960                                  ;*TEST 123       SL REGISTER COMPARATOR TEST 2
10961                                  ;*
10962                                  ;*      THIS TEST IS THE SAME AS TEST 153 EXCEPT IT TESTS THE ADDRESSES
10963                                  ;*      ON EVERY PAGE. THIS IS DONE BY MAPPING I/O PAGE ADDRESSES TO
10964                                  ;*      MEMORY IN KERNEL MODE. THIS MAKES THE I/O PAGE INACCESSABLE
10965                                  ;*      IN KERNEL MODE SO AN IOT INSTRUCTION IS USED TO RETURN TO
10966                                  ;*      SUPERVISOR MODE WHEN THE I/O PAGE IS NEEDED.
10967                                  ;;*****************************************************************
10968  076524  000004                  TST123: SCOPE
10969  076526  012737  077266  001316          MOV     #TST124,NXTTST  ;SAVE ADDRESS OF NEXT TEST
10970  076534  005037  001176                  CLR     $TMP2           ;CLEAR BUFFER OVERFLOW FLAG
10971  076540  012737  003706  001106          MOV     #^D1990,$ICNT   ;SETUP ITTERATION COUNT
10972  076546  012737  076554  001110          MOV     #23$,$LPADR     ;SETUP LOOP ADDRESS
10973  076554  012737  077240  001210  23$:     MOV     #22$,$ESCAPE    ;SETUP ESCAPE
10974  076562  012737  077234  000020          MOV     #12$,@#IOTVEC   ;SETUP THE IOT VECTOR
10975  076570  012737  040340  000022          MOV     #40340,@#IOTVEC+2 ;SETUP THE IOT VEC PSW
10976  076576  012737  077406  172314          MOV     #77406,@#KIPDR6 ;ENSURE PDR6 OK
10977  076604  012737  001400  172354          MOV     #1400,@#KIPAR6  ;ENSURE PAR6 OK
10978  076612  012737  076736  000004          MOV     #1$,@#ERRVEC    ;SETUP ERROR VECTOR
10979  076620  012737  040340  000006          MOV     #40340,@#ERRVEC+2 ;SETUP ERRVEC PSW
10980  076626  012737  001600  172356          MOV     #1600,@#KIPAR7  ;MAP KERNEL PAGE 7 TO 28K
10981  076634  052737  040000  177776          BIS     #BIT14,@#PSW    ;GO TO SUPER MODE
10982  076642  012737  000001  177572          MOV     #BIT0,@#MMR0    ;TURN RELOCATION ON
10983  076650  012706  001100                  MOV     #STACK,SSP      ;INITIALIZE THE SSP
10984  076654  105037  177777                  CLRB    @#PSW+1         ;GO BACK TO KERNEL
10985  076660  012703  000400                  MOV     #400,R3         ;SET SOB COUNT FOR SL REGISTER
10986  076664  012700  120000                  MOV     #120000,R0      ;INITIALIZE ERROR DATA POINTER
10987  076670  005060  000002                  CLR     2(R0)           ;INITIALIZE ERROR DATA BUFFER
10988  076674  012701  000340                  MOV     #340,R1         ;INITIALIZE YELLOW ZONE ADDRESS
10989  076700  012702  000400          2$:     MOV     #400,R2         ;SET SOB COUNT FOR SP
10990  076704  012705  000340                  MOV     #340,R5         ;INITIALIZE SECONDARY STORAGE FOR SP
10991  076710  010506                  3$:     MOV     R5,KSP          ;SET THE SSP
10992  076712  011616                          MOV     (KSP),(KSP)     ;EXECUTE TEST INSTRUCTION
10993                                  ;NO TRAP. DETERMINE IF THIS IS CORRECT.
10994  076714  020601                          CMP     KSP,R1          ;IS ADDRESS > YELL ZONE BOUNDRY?
10995  076716  101075                          BHI     5$              ;BRANCH IF YES
10996  076720  001403                          BEQ     6$              ;BRANCH IF ADDRESS = YELL ZONE BOUNDRY
10997                                  ;NO TRAP ADDRESS IS LESS THAN YELLOW ZONE BOUNDRY
10998  076722  052710  000010                  BIS     #BIT3,(R0)      ;SET ERROR TYPE IN DATA BUFFER
10999  076726  000443                          BR      10$             ;GO RECORD DATA
11000                                  ;NO TRAP EQUALS YELLOW ZONE BOUNDRY
11001  076730  052710  000012          6$:     BIS     #12,(R0)        ;SET ERROR TYPE IN DATA BUFFER
11002  076734  000440                          BR      10$             ;GO RECORD DATA
```

```
11003                                           ;
11004                                           ;GOT A TRAP.  NOW DETERMINE IF IT IS CORRECT.
11005                                           ;   NOW IN SUPER MODE
11006  076736  032737  000004  177766  1$:      BIT     #BIT2,@#CPUERR  ;WAS IT A RED ZONE?
11007  076744  001406                          BEQ     8$              ;BRANCH IF NO
11008  076746  020105                          CMP     R1,R5           ;IS ADDRESS < YELL ZONE BOUNDRY?
11009  076750  101060                          BHI     5$              ;BRANCH IF YES
11010  076752  001431                          BEQ     10$             ;BRANCH IF ADDRESS = YELL ZONE BOUNDRY
11011                                   ;RED ZONE TRAP ON LEGAL ADDRESS
11012  076754  052710  000002                  BIS     #BIT1,(R0)      ;SET ERROR TYPE IN DATA BUFFER
11013  076760  000426                          BR      10$             ;GO RECORD DATA
11014                                   ;NOT A RED ZONE.  IS IT A YELLOW ZONE?
11015  076762  032737  000010  177766  8$:      BIT     #BIT3,@#CPUERR  ;IS THIS A YELLOW ZONE TRAP?
11016  076770  001011                          BNE     31$             ;BRANCH IF YES
11017  076772  012737  177600  172356          MOV     #177600,@#KIPAR7 ;REMAP KERNEL I/O PAGE
11018  077000  005037  177777                  CLR     @#PSW+1         ;GO BACK TO KERNEL
11019  077004  005037  177572                  CLR     @#MMR0          ;TURN RELOCATION OFF
11020  077010  000137  026252                  JMP     CPUSPUR
11021  077014  020105                  31$:    CMP     R1,R5           ;IS ADDRESS = YELL ZONE BOUNDRY?
11022  077016  001435                          BEQ     5$              ;BRANCH IF YES
11023  077020  101003                          BHI     9$              ;BRANCH IF ADDRESS IS < YELL ZONE BOUNDRY
11024                                   ;YELLOW ZONE TRAP ON LEGAL ADDRESS
11025  077022  052710  000006                  BIS     #6,(R0)         ;SET ERROR TYPE IN DATA BUFFER
11026  077026  000403                          BR      10$             ;GO RECORD DATA
11027                                   ;YELLOW ZONE TRAP ON RED ZONE ADDRESS
11028  077030  052710  000004          9$:     BIS     #BIT2,(R0)      ;SET ERROR TYPE IN DATA BUFFER
11029  077034  000400                          BR      10$             ;GO RECORD DATA
11030                                           ;
11031                                   ;RECORD ERROR DATA
11032  077036  000004                  10$:    IOT                     ;GO TO SUPER
11033  077040  032737  001000  177570          BIT     #SW9,@#SWR      ;IS LOOP ON ERROR ENABLED?
11034  077046  001405                          BEQ     20$             ;BRANCH IF NO
11035  077050  012706  001100                  MOV     #STACK,SSP      ;INITIALIZE THE SSP
11036  077054  105037  177777                  CLRB    @#PSW+1         ;GO BACK TO KERNEL
11037  077060  000713                          BR      3$              ;LOOP
11038  077062  005737  001176          20$:    TST     $TMP2           ;HAS BUFFER OVERFLOWED?
11039  077066  001011                          BNE     5$              ;BRANCH IF YES
11040  077070  005200                          INC     R0              ;SET POINTER TO HIGH BYTE
11041  077072  113720  177775                  MOVB    @#STKLMT+1,(R0)+  ;SAVE ERROR STACK LIMIT
11042  077076  010520                          MOV     R5,(R0)+        ;SAVE ERROR SP
11043  077100  020027  157774                  CMP     R0,#157774      ;HAS BUFFER REACHED PAGE 7?
11044  077104  001002                          BNE     5$              ;BRANCH IF NO
11045  077106  005237  001176                  INC     $TMP2           ;SET BUFFER OVERFLOW FLAG
11046                                           ;
11047                                   ;CONTINUE TEST
11048  077112  062705  000400          5$:     ADD     #400,R5         ;GO TO NEXT STACK ADDRESS
11049  077116  000004                  21$:    IOT                     ;GO TO SUPERVISOR MODE
11050  077120  012706  001100                  MOV     #STACK,SSP      ;RESET THE SSP
11051  077124  005037  177766                  CLR     @#CPUERR        ;CLEAR ERROR REGISTER
11052  077130  105037  177777                  CLRB    @#PSW+1         ;GO BACK TO KERNEL
11053  077134  005302                          DEC     R2              ;REPLACES A
11054  077136  001264                          BNE     3$              ;SOB
11055  077140  000004                          IOT                     ;GO TO SUPERVISOR MODE
11056  077142  062701  000400          16$:    ADD     #400,R1         ;SET NEXT YELLOW ZONE ADDRESS
11057  077146  062737  000400  177774          ADD     #400,@#STKLMT   ;GO TO NEXT SL ADDRESS
11058  077154  105037  177777                  CLRB    @#PSW+1         ;GO BACK TO KERNEL
```

```
11059  077160  005303                          DEC     R3              ;THIS REPLACES
11060  077162  001246                          BNE     2$              ;A SOB
11061                                  ;
11062                                  ;DONE WITH TEST.  WAS THERE AN ERROR?
11063  077164  000004                          IOT                     ;GO TO SUPERVISOR MODE
11064  077166  012737  177600  172356          MOV     #177600,@#KIPAR7 ;RESTORE KERNEL I/O PAGE
11065  077174  105037  177777                  CLRB    @#PSW+1         ;GO TO KERNEL MODE
11066  077200  005037  177774          18$:    CLR     @#STKLMT        ;RESET THE SL REG
11067  077204  012706  001100                  MOV     #STACK,SP       ;AND SP
11068  077210  012737  026252  000004          MOV     #CPUSPUR,@#ERRVEC  ;RESTORE ERRVEC
11069  077216  005737  120002                  TST     @#120002        ;WAS THERE AN ERROR?
11070  077222  001406                          BEQ     22$             ;BRANCH IF NO
11071  077224  010037  001156                  MOV     R0,$REG0        ;SAVE ERROR DATA POINTER
11072  077230  104167                          ERROR   167             ;STACK LIMIT COMPARATORS FAILED
11073  077232  000402                          BR      22$
11074                                  ;IOT ROUTINE
11075  077234  000176  000000          12$:    JMP     @(SSP)          ;RETURN IN SUPER MODE
11076                                  ;
11077                                  ;TEST FINISHED, CLEAN UP VECTORS
11078  077240  005037  177572          22$:    CLR     @#MMR0                  ;TURN RELOCATION OFF
11079  077244  012737  025474  000020          MOV     #$SCOPE,@#IOTVEC        ;RESTORE IOT VECTOR
11080  077252  012737  000340  000022          MOV     #PR7,@#IOTVEC+2
11081  077260  012737  000340  000006          MOV     #PR7,@#ERRVEC+2
11082                                                  ;CONTINUE
11083                                  ;;*****************************************************************
11084                                  ;*TEST 124      PS RESTORE
11085                                  ;*
11086                                  ;*      THIS TEST ENSURES THAT BEN6 WORKS ON A PS RESTORE.
11087                                  ;*      THIS IS DONE BY SETTING THE STACK TO A NON RESIDENT PAGE
11088                                  ;*      AND DOING A TRAP INSTRUCTION. WHEN THE PROCESSOR TRYS TO
11089                                  ;*      PUSH THE OLD PSW ON THE STACK A KT ABORT WILL OCCUR.
11090                                  ;*      SINCE IT WAS A KERNEL R6 OPERATION THIS WILL CAUSE BEN13
11091                                  ;*      TO GO TO STATE SER.00 WHICH WILL PUSH THE PSW AND PC INTO
11092                                  ;*      LOCATIONS 2 AND 0, AND THEN TRAP TO LOCATION 4.
11093                                  ;*      THE PSW IN LOCATION 2 SHOULD BE THE PSW BEFORE THE
11094                                  ;*      TRAP INSTRUCTION AND NOT THE PSW IN THE TRAP VECTOR.
11095                                  ;;*****************************************************************
11096  077266  000004                  TST124: SCOPE
11097  077270  012737  077372  001316          MOV     #CACHE,NXTTST
11098  077276  012737  077350  000004          MOV     #1$,@#ERRVEC    ;SETUP ERROR VECTOR
11099  077304  012737  000340  000036          MOV     #PR7,@#TRAPVEC+2 ;ENSURE PR7 IN LOCATION 36
11100  077312  042737  000007  172314          BIC     #7,@#KIPDR6     ;MAKE PAGE 6 NON-RESIDENT
11101  077320  012737  077326  001112          MOV     #2$,$LPERR      ;SETUP ERROR LOOP
11102  077326  005037  000002          2$:     CLR     @#2             ;ENSURE LOCATION 2 CLEAR
11103  077332  012737  000001  177572          MOV     #BIT0,@#MMR0    ;TURN RELOCATION ON
11104  077340  012706  150004                  MOV     #150004,SP      ;SETUP THE SP
11105  077344  000236                          SPL     6               ;SET CPU PRIORITY AT 6
11106  077346  104400                          TRAP                    ;EXECUTE TRAP INSTRUCTION
11107  077350  005037  177572          1$:     CLR     @#MMR0          ;TURN RELOCATION OFF
11108  077354  012706  001100                  MOV     #STACK,SP       ;RETSORE SP
11109  077360  022737  000310  000002          CMP     #310,@#2        ;DID CORRECT PSW GET STACKED?
11110  077366  001401                          BEQ     CACHE           ;;BRANCH IF YES
11111  077370  104170                          ERROR   170             ;BEN6 FAILED ON PS RESTORE
11112  077372                          CACHE:
11113                                  ;
11114                                  ;;*****************************************************************
```

```
11115  077372  000004                    END:    SCOPE                   ;LOOP BACK FOR LAST TEST
11116  077374  000240                            NOP                     ;THIS CAN BE ANYTHING YOU WANT
11117                                                                   ;(AS LONG AS IT IS ONLY ONE WORD)
11118  077376  000137  025204                    JMP     $EOP            ;JUMP TO END-OF-PASS ROUTINE
11119
11120          077402                    TSLOC=.                 ;GET PC TO AN EVEN WORD BOUNDARY
11121          077400                    TSLOC=-4&TSLOC
11122          077404                    TSLOC=TSLOC+4
11123          077404                    .=TSLOC
11124
11125  077404  001000                    TSTDAT: .BLKW   512.
11126          000001                    .END
```

```
ABIT   = 000200   8551#  8581  8589
ADDROR   001276    576#  2951  2955  2958  4136*  4169*  4195*  4225*
ADRAND   001300    577#  2951  2955  2958  4140*  4171*  4197*  4227*
BADPC    001262    570#  2930  2932  2935  2937   4272*  4319*  4369*  4413*  6757*  6916*
BIT0   = 000001    133#   431  4010  4503  4504   4511   6977   7446   7498   8046   8394   8548   9535
                  10537 10625 10800 10877 10919  10934  10949  10982  11103
BIT00  = 000001    123#   133
BIT01  = 000002    122#   132
BIT02  = 000004    121#   131
BIT03  = 000010    120#   130
BIT04  = 000020    119#   129
BIT05  = 000040    118#   128
BIT06  = 000100    117#   127
BIT07  = 000200    116#   126  4549
BIT08  = 000400    115#   125  3252
BIT09  = 001000    114#   124  3262  3335
BIT1   = 000002    132#   430  4328*  8291  9844  9931  9973  10062  10400  10487  11012
BIT10  = 002000    113#   423  3318
BIT11  = 004000    112#   422  3269  4506  4507  4509
BIT12  = 010000    111#   421  3206  7231  7530
BIT13  = 020000    110#   420  3325  3364  3392  5060
BIT14  = 040000    109#   419  4498  4499  4501  5079  7787  7789  7831  7833  10981
BIT15  = 100000    108#   418   433  4013  4512  4513  4515  4517  4518  4520  5022  5063  7523
                  7571  7580 10938
BIT2   = 000004    131#   429   435   436   437  8060  8198  8479  8500  11006  11028
BIT3   = 000010    130#   428   435   436   437  5233 10998 11015
BIT4   = 000020    129#   427   436  4075  6796  6839  6978  7766  8047  8549  9536
BIT5   = 000040    128#   426   435 10884 10887
BIT6   = 000100    127#  8550
BIT7   = 000200    126#  8551
BIT8   = 000400    125#   425  4533  6449  6463  6477  6491  6505  6519  6533  6547  6561  6575
                  6589  6603
BIT9   = 001000    124#   424   616  3449  7437  8577  8585
BPTVEC = 000014    140#
BYP    = 100000    433#
CACHE    077372  11097 11110 11112#
CACHSP   026456   3386#
CACHVE = 000114    147#  4309*  4322*  4331*  4657*  4658*  6631*  6683*  6798*  6841*
CISP     001363    620#
CLEANU   031346   4134#  4661  5292  5324  5356  5388  5420  5452  5496  5559  5621  5683  5745
                   5807  5879  5922  5965  6007  6056  6104
CLRREG   031330   4117#  5499  5516  5562  5579  5624  5641  5686  5703  5748  5765  5810  5827
                   6423  6425  6427  6429  6431  6433
CONTRL = 177746    157#   439#  4316  4495  4525*  4526  4618*  10666*
CPFLAG   031672   3348*  4262#  4281*  4647*
CPUER    031670   4261#  4655  4738  5302  5334  5366  5398  5430  5462  6682  6840
CPUERR = 177766    170#  3344*  3370  3383*  4163  4164*  4271  4280*  4652*  6736  6761*  6895  6920*
                  10868* 10884 10886 10888* 10890* 10891 10957* 11006 11015 11051*
CPUEXP   001224    553#  2929  4165  4273  4275  4653*  6687*  6708*  6719*  6728*  6842*  6866*  6877*
                   6886*
CPUSPU   026252   3358#  10834 11020 11068
CR     = 000015     45#  2262  2281  2286  2298  2305  2311  2324  2339  2355  2367  2374  2382
                   2390  2399  2408  2417  2425  2440  2451  2895  2903  3692  3702
CRLF   = 000200     46#  1412  1418  1420  1422  1427  1450  1464  1844  1888  2492  2508  2521
                   2579  2633  2662  2729  2735  2751  2910  3666  3702  4670
DATAND   001270    573#  2955  2958  4139*  4201*  4235*
```

```
DATAOR  001266   572#  2955  2958  4135*  4199*  4233*
DF1     024650   647   3051#
DF100   025115  1039   3119#
DF101   025121  1045   3121#
DF102   025125  1051   1057  1063  1069   1075   1081   1087  1093  3123#
DF11    024700   699   3060#
DF112   025130  1099   1327  3124#
DF113   025134  1105   3126#
DF114   025140  1111   3128#
DF116   025144  1123   1141  3130#
DF117   025150  1129   3132#
DF12    024704   705    723  3062#
DF120   025155  1135   3134#
DF122   025160  1147   1153  1159  1183   3135#
DF127   025163  1177   1267  1273  1279   1285   1291   1297  1309  1315  1333  1339  1345  1351
                1357   1363  1375  3136#
DF13    024707   711    717  3063#
DF131   025165  1189   3137#
DF15    024716  3066#
DF16    024713   729   3065#
DF17    024722   735   3068#
DF2     024651   653   1201  1206  1231   1237   1243   1249  3052#
DF20    024726   741   3070#
DF201   025172  1390   3142#
DF202   025174  1399   3143#
DF203   025177  1407   3144#
DF21    024732   748   3072#
DF22    024740   754   3074#
DF23    024750   760   3077#
DF24    024755   766   3079#
DF25    024760   772    778   784   790    3080#
DF3     024654   660    667  3053#
DF31    024764   796    802   808  814    1255   1261   3082#
DF35    024771   820   3084#
DF36    024774   827   3085#
DF37    025001   833   3087#
DF40    025006   839   1165  3089#
DF41    025012   845   1171  3091#
DF42    025015   852    877   884  3092#
DF43    025022   858   3094#
DF44    025024   864   3095#
DF45    025027   870   3096#
DF5     024662   674   1196  3055#
DF50    025032   890   3097#
DF51    025036   896    902  3099#
DF53    025042   908    914   938  956    981    996    1015  1027  1117  3101#
DF55    025044   920    932   950  3102#
DF56    025050   926    944  3104#
DF6     024667   681   1212  1219  1226   3057#
DF64    025054   963   3106#
DF65    025057   969   3107#
DF66    025063   975   3109#
DF7     024675   687    693  3059#
DF70    025066   990   3110#
DF72    025074  1002   3112#
DF73    025100  1009   3114#
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DF75    025110            1021    1033    3117#
DH1     017003             645    2485#
DH100   022047            1037    2774#
DH101   022107            1043    2780#
DH102   022147            1049    1055    1061    1067    1073    1079    2786#
DH11    017457             697    2541#
DH110   022177            1085    1091    2791#
DH112   022227            1097    2796#
DH113   022267            1103    2802#
DH114   022327            1109    2808#
DH116   022367            1121    2814#
DH117   022427            1127    2820#
DH12    017527             703    2549#
DH120   022477            1133    2827#
DH121   022527            1139    2832#
DH122   022567            1145    1181    2838#
DH123   022640            1151    1157    2845#
DH127   022670            1175    2849#
DH13    017517             709    2547#
DH131   022707            1187    2852#
DH133   023000            1199    1204    2862#
DH135   023027            1210    1217    1224    2866#
DH14    017557             715    2554#
DH140   023116            1229    1235    2876#
DH142   023145            1241    1247    2880#
DH145   023174            1259    2884#
DH146   023243            1265    1271    1277    1283    1289    1295    1307    1313    1331    1337    1343    1349    1355
                          1361    1373    2891#
DH147   023267            1325    2895#
DH15    017627             721    2562#
DH150   023342            1367    2903#
DH16    017617             727    2560#
DH17    017657             733    2567#
DH2     017013             651    2487#
DH20    017717             739    2573#
DH201   023370            1386    2907#
DH202   023407            1394    2910#
DH203   023457            1403    2918#
DH21    017757             745    2579#
DH22    020077             752    2594#
DH23    020176             758    2605#
DH24    020246             764    2612#
DH25    020276             770     776     782     788    2616#
DH3     017047             657     664    2492#
DH31    020336             794     800     806     812    1253    2622#
DH35    020406             818    2629#
DH36    020436             824    2633#
DH37    020536             831    2644#
DH40    020606             837    1163    2651#
DH41    020652             843    1169    2657#
DH42    020704             849     874     881    2662#
DH43    021006             856    2673#
DH44    021026             862    2676#
DH45    021056             868    2680#
DH5     017177             671    1193    2508#
DH50    021111             888    2685#
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DH51    021155              894     900    2692#
DH53    021215              906     912     936     954     979     994    1013    1025    1115    2698#
DH55    021235              918     930     948    2701#
DH56    021275              924     942    2707#
DH6     017303              678    2521#
DH64    021335              961    2713#
DH65    021365              967    2718#
DH66    021425              973    2724#
DH7     017427              685     691    2536#
DH70    021455              986    2729#
DH72    021606             1000    2745#
DH73    021646             1006    2751#
DH75    021777             1019    1031    2767#
DISPLA= 177570               40#    3283*   3314*   4726*   5000*   5291*   6421*   6966*   8035*   8537*   9524*
DMMA  = 004000              422#
DONE    075354            10661   10727   10734   10744#
DT    = 000001              431#
DT1     023532              646    2929#
DT100   024352             1038    3011#
DT101   024364             1044    3013#
DT102   024376             1050    1056    1062    1068    1074    1080    1086    1092    3015#
DT11    023624              698    2942#
DT112   024406             1098    3017#
DT113   024420             1104    3019#
DT114   024432             1110    3021#
DT116   024444             1122    1140    3023#
DT117   024456             1128    3025#
DT12    023636              704     722    2944#
DT120   024472             1134    3027#
DT122   024502             1146    1152    1158    1182    3029#
DT127   024512             1176    3031#
DT13    023646              710     716    2946#
DT131   024520             1188    3032#
DT133   024534             1200    1205    1230    1236    1242    1248    3034#
DT135   024544             1211    1218    1225    3036#
DT145   024562             1260    3039#
DT146   024576             1266    1272    1278    1284    1290    1296    1308    1314    1332    1338    1344    1350    1356
                           1362    1374    3041#
DT147   024604             1326    3042#
DT15    023662             2949#
DT16    023660              728    2948#
DT17    023672              734    2951#
DT2     023534              652    2930#
DT20    023704              740    2953#
DT201   024616             1389    3044#
DT202   024624             1398    3045#
DT203   024634             1406    3047#
DT21    023716              747    2955#
DT22    023734              753    2958#
DT23    023756              759    2961#
DT24    023772              765    2963#
DT25    024002              771     777     783     789    2965#
DT3     023544              659     666    2932#
DT31    024014              795     801     807     813    1254    2967#
DT35    024030              819    2969#
DT36    024040              826    2971#
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DT37     024054              832    2973#
DT40     024070              838    1164    2975#
DT41     024102              844    1170    2977#
DT42     024112              851     876     883    2979#
DT43     024126              857    2981#
DT44     024134              863    2982#
DT45     024144              869    2984#
DT5      023562              673    1195    2935#
DT50     024154              889    2986#
DT51     024166              895     901    2988#
DT53     024200              907     913     937     955     980     995    1014    1026    1116    2990#
DT55     024206              919     931     949    2991#
DT56     024220              925     943    2993#
DT6      023576              680    2937#
DT64     024232              962    2995#
DT65     024242              968    2997#
DT66     024254              974    2999#
DT7      023614              686     692    2940#
DT70     024264              989    3001#
DT72     024302             1001    3004#
DT73     024314             1008    3006#
DT75     024336             1020    1032    3009#
DUALAD   031524             4193#   5526    5589    5651    5713    5775    5837
DUT    = 000002              430#
ECO      014365             2251#  10726
EMTVEC= 000030              143#   4625*   4626*
EM1      003447              644    1431#
EM10     004300              690    1506#
EM100    011233             1036    1957#
EM101    011304             1042    1964#
EM102    011351             1048    1971#
EM103    011412             1054    1977#
EM104    011473             1060    1986#
EM105    011542             1066    1993#
EM106    011617             1072    2001#
EM107    011700             1078    2010#
EM11     004331              696    1511#
EM110    011747             1084    2017#
EM111    012016             1090    2024#
EM112    012105             1096    2034#
EM113    012140             1102    2039#
EM114    012204             1108    2045#
EM115    012252             1114    2052#
EM116    012333             1120    2061#
EM117    012401             1126    2068#
EM12     004373              702    1517#
EM120    012446             1132    2075#
EM121    012523             1138    2083#
EM122    012566             1144    2089#
EM123    012650             1150    2098#
EM124    012740             1156    2108#
EM125    013014             1162    2116#
EM126    013075             1168    2125#
EM127    013157             1174    2134#
EM13     004447              708    1525#
EM130    013247             1180    2144#
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EM131	013335	1186	2155#
EM132	013416	1192	2164#
EM133	013462	1198	2170#
EM134	013530	1203	2177#
EM135	013572	1209	2183#
EM136	013632	1215	2189#
EM137	013763	1222	2204#
EM14	004503	714	1530#
EM140	014112	1228	2220#
EM141	014160	1234	2227#
EM142	014222	1240	2233#
EM143	014270	1246	2240#
EM145	014332	1258	2246#
EM146	014461	1264	2262#
EM147	014637	1270	2281#
EM15	004537	720	1535#
EM150	014671	1276	2286#
EM151	014775	1282	2298#
EM152	015044	1288	2305#
EM153	015110	1294	2311#
EM155	015217	1306	2324#
EM156	015337	1312	2339#
EM16	004613	726	1543#
EM160	015472	1324	2355#
EM161	015600	1330	2367#
EM162	015651	1336	2374#
EM163	015730	1342	2382#
EM164	016005	1348	2390#
EM165	016070	1354	2399#
EM166	016154	1360	2408#
EM167	016231	1366	2417#
EM17	004646	732	1548#
EM170	016425	1372	2440#
EM171	016521	1378	2451#
EM2	003537	650	1441#
EM20	004714	738	1555#
EM201	016546	1385	2455#
EM202	016623	1393	2463#
EM203	016714	1402	2473#
EM21	004755	744	1561#
EM22	005017	751	1567#
EM23	005061	757	1573#
EM24	005125	763	1580#
EM25	005164	769	1586#
EM26	005242	775	1594#
EM27	005310	781	1601#
EM3	003620	656	1450#
EM30	005347	787	1607#
EM31	005436	793	1617#
EM32	005477	799	1623#
EM32M	005606	1252	1635#
EM33	005711	805	1647#
EM34	005770	811	1655#
EM35	006054	817	1664#
EM36	006142	823	1673#
EM37	006211	830	1680#

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EM4     003736            663    1464#
EM40    006270            836    1688#
EM41    006351            842    1697#
EM42    006433            848    1706#
EM43    006504            855    1713#
EM44    006562            861    1721#
EM45    006631            867    1728#
EM46    006706            873    1736#
EM47    006767            880    1745#
EM5     004061            670    1480#
EM50    007022            887    1750#
EM51    007070            893    1757#
EM52    007143            899    1765#
EM53    007220            905    1773#
EM54    007272            911    1780#
EM55    007341            917    1787#
EM56    007424            923    1796#
EM57    007503            929    1804#
EM6     004134            677    1488#
EM60    007565            935    1813#
EM61    007646            941    1822#
EM62    007725            947    1830#
EM63    010007            953    1839#
EM64    010037            959    1844#
EM65    010202            966    1861#
EM66    010252            972    1868#
EM67    010333            978    1877#
EM7     004224            684    1498#
EM70    010434            984    1888#
EM71    010517            993    1897#
EM72    010604            999    1906#
EM73    010665           1005    1915#
EM74    010767           1012    1927#
EM75    011041           1018    1935#
EM76    011114           1024    1943#
EM77    011160           1030    1949#
END     077372          11115#
ENDKB   033056           4541#
ENMMTR  001356            616#   7521
ENTPT2  041636            609    4996#
ENTPT3  043014            610    5287#
ENTPT4  047524            611    6417#
ENTPT5  052652            612    6962#
ENTPT6  060024            613    8031#
ENTPT7  062514            614    8533#
ENTPT8  070214            615    9520#
EREXIT  026250           3343    3351#
ERRCNT  001302            578#   2951   2955   2958   3237*  3305*  5303   5305   5335   5337   5367   5369   5399
                         5401   5431   5433   5463   5465   5535   5537   5598   5600   5660   5662   5722   5724
                         5784   5786   5846   5848   5898   5900   5941   5943   5984   5986   6032   6034   6081
                         6083   6129   6131
ERRVEC= 000004             136#  3243   3244*  3246*  3249*  3955   3956   3960*  3965*  3979*  3989*  4001*  4002*
                         4655*  4656*  4730*  4738*  5293*  5302*  5325*  5334*  5357*  5366*  5389*  5398*  5421*
                         5430*  5453*  5462*  6630*  6682*  6797*  6840*  7767*  7834*  10790*  10791*  10834*  10872*
                        10911*  10915*  10932*  10947*  10978*  10979*  11068*  11081*  11098*
ERTYPE  026666           3327    3439#
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ER200   003274          1382#   3459    3462
FCAC  = 000400           425#
FSTTST  001222           551#   4598*   4600*   4602*   4604*   4606*   4608*   4610*   4612*   4692
FVPE  = 002000           423#
GNS   = ****** U         451    3175    3182    3362    3368    3390    3396    3873    3874    3875    3876    3877    3878
                        3879    3880    3881    4556    4560    4564    4573    4581    4669
HIADRS= 177742           155#   4314
HITMIS= 177752           159#    440#   4318
HOLFLG  001304           579#   6629*   6647    6652*   6665    6752    6755*   6760*   6799*   6810    6815*   6828    6911
                        6914*   6919*
HT    = 000011            43#   3664    3702
IOTVEC= 000020           141#   4623*   4624*  10974*  10975*  11079*  11080*
IVSS  = 040000           419#
KBTST   032602          4487#   4644
KB11CM  001362           619#   4487*   4535*   4677    6015    6064    6112
KB11E   001360           617#   4488*   4492*   4531    4533*   4675    4683    4842    4851    6017    6066    6114   10912
KB11EM  001361           618#
KDPAR0= 172360           313#   8054*   8193*   8480*   8486*   8663*  10683*  10740
KDPAR1= 172362           314#   8055*   8664*  10685*
KDPAR2= 172364           315#   8665*  10687*
KDPAR3= 172366           316#   8666*  10689*
KDPAR4= 172370           317#   8056*   8194*   8478*   8667*  10691*
KDPAR5= 172372           318#   8668*  10693*
KDPAR6= 172374           319#   8669*  10695*
KDPAR7= 172376           320#   5299    5517    5532    5891    8058*   8196*   8670*  10697*
KDPDR0= 172320           291#   8049*   8188*   8732    8849    8990    9109    9136    9140*   9143*   9156*   9159*   9176*
                        9179*   9196*   9199*   9255    9275*   9291*   9311*   9331*   9398    9410*   9426*   9446*   9466*
                       10684*
KDPDR1= 172322           292#   8050*   8189*   9141*   9157*   9177*   9197*   9276*   9292*   9312*   9332*   9411*   9427*
                        9447*   9467*  10686*
KDPDR2= 172324           293#   8052*   8191*  10688*
KDPDR3= 172326           294#   8053*   8192*  10690*
KDPDR4= 172330           295#   8051*   8190*   8477*   9548*   9687*   9833*   9964*  10093*  10239*  10389*  10527*  10692*
KDPDR5= 172332           296#  10694*
KDPDR6= 172334           297#  10696*
KDPDR7= 172336           298#   5395    5704    5719    6025    8057*   8195*   9142*   9144*   9158*   9160*   9178*   9180*
                        9198*   9200*   9277*   9293*   9313*   9333*   9412*   9428*   9448*   9468*  10698*
KERSTK= 001100            30#   4617    4662    4957    4964    7475    8487    9565   10108   10258
KERVEC  032456          4446#   7730    7920
KIPAR0= 172340           302#   3564    3935    3969    5295    5498    5500    5514    5515    5529    5882    6158    6159*
                        6162    6167    6171    6424   6439*   6972*   8041*   8543*   8655*   9530*  10667*  10753
KIPAR1= 172342           303#   6440*   6973*   8042*   8544*   8656*   9531*  10669*
KIPAR2= 172344           304#   6441*   6974*   8043*   8545*   8657*   9532*  10671*
KIPAR3= 172346           305#   6442*   6975*   8044*   8546*   8658*   9533*  10673*
KIPAR4= 172350           306#   2986    6446*   6460*   6474*   6488*   6502*   6516*   6530*   6544*   6558*   6572*   6586*
                        6600*   6632*   6660*   6685*   6709*   6721*   6739    6802*   6824*   6843*   6867*   6879*   6898
                        6980*   7033*   7087*   7140    7163*   7208*   7271*   7326*   7375*   7471*   7518*   8187*   8553*
                        8594*   8659*   9554*   9693*   9839*   9970*  10099*  10245*  10395*  10531*  10675*
KIPAR5= 172352           307#   6633*   6649    6661*   6663    6754    6803*   6812    6825*   6826    6844*   6913    7088*
                        7130*   7162*   7207*   7270*   7325*   7374*   7472*   8660*  10677*
KIPAR6= 172354           308#   8661*  10679*  10873*  10977*
KIPAR7= 172356           309#   3983    6443*   6976*   7416    8045*   8547*   8662*   9534*  10681*  10980*  11017*  11064*
KIPDR0= 172300           280#   4512*   4513    4515*   5391    5685    5687    5701    5702    5716    6010    6263    6264*
                        6267    6272    6276    6422    6436    6967*   8036*   8538*   8709    8736    8740*   8743*   8748
                        8756*   8759*   8776*   8779*   8796*   8799*   8853    8873*   8881    8889*   8909*   8929*   8994
                        9006*   9014    9022*   9042*   9062*   9132    9148    9251    9283    9394    9418    9525*   9541
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                    9826   10382   10668*  10754
KIPDR1= 172302       281#   6968*   8037*   8539*   8741*   8757*   8777*   8797*   8874*   8890*   8910*   8930*   9007*
                    9023*   9043*   9063*   9526*  10670*
KIPDR2= 172304       282#   6969*   8038*   8540*   9527*  10672*
KIPDR3= 172306       283#   6970*   8039*   8541*   9528*  10674*
KIPDR4= 172310       284#   2993    6979*   6981    7032*   7034    7084*   7167*   7212*   7275*   7330*   7379*   7474*
                    7519*   7609*   8048*   8186*   8202*   8237*   8239*   8552*   8558    8565    8571*   8572    8580
                    8588    8595    8608*   9552*   9559*   9691*   9719*   9722*   9741*   9744*   9762*   9765*   9785*
                    9788*   9837*   9845*   9968*   9986*   9989*  10008*  10011*  10029*  10032*  10052*  10055*  10097*
                   10105*  10243*  10393*  10401*  10524*  10538*  10676*
KIPDR5= 172312       285#   7085*   7117    7119    7121*   7123*   7164*   7209*   7272*   7327*   7376*   7473*  10678*
KIPDR6= 172314       286#  10680*  10798*  10837*  10874*  10916*  10930*  10976*  11100*
KIPDR7= 172316       287#   6971*   7414*   7419    7447*   8040*   8542*   8602    8610    8742*   8744*   8758*   8760*
                    8778*   8780*   8798*   8800*   8875*   8891*   8911*   8931*   9008*   9024*   9044*   9064*   9529*
                   10682*
LF     = 000012      44#   2262    2281    2286    2298    2305    2311    2324    2339    2355    2367    2374    2382
                    2390    2399    2408    2417    2425    2440    2451    2895    2903    3696    3702
LGADRS= 177740       154#   4313
LOOP    040272      3216    4642#
MAGIC   075336     10700   10736#
MAINT  = 177750      158#   4317    4493*   4496
MAPH0  = 170202      397#
MAPH00= 170202       333#    397    4497
MAPH01= 170206       335#    399
MAPH02= 170212       337#    401
MAPH03= 170216       339#    403
MAPH04= 170222       341#    405
MAPH05= 170226       343#    407
MAPH06= 170232       345#    409
MAPH07= 170236       347#    411
MAPH1  = 170206      399#
MAPH10= 170242       349#
MAPH11= 170246       351#
MAPH12= 170252       353#
MAPH13= 170256       355#
MAPH14= 170262       357#
MAPH15= 170266       359#
MAPH16= 170272       361#
MAPH17= 170276       363#
MAPH2  = 170212      401#
MAPH20= 170302       365#
MAPH21= 170306       367#
MAPH22= 170312       369#
MAPH23= 170316       371#
MAPH24= 170320       373#
MAPH25= 170326       375#
MAPH26= 170332       377#
MAPH27= 170336       379#
MAPH3  = 170216      403#
MAPH30= 170342       381#
MAPH31= 170346       383#
MAPH32= 170352       385#
MAPH33= 170356       387#
MAPH34= 170362       389#
MAPH35= 170366       391#
MAPH36= 170372       393#
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MAPH37= 170376            395#
MAPH4  = 170222           405#
MAPH5  = 170226           407#
MAPH6  = 170232           409#
MAPH7  = 170236           411#
MAPL0  = 170200           396#   7412*   7429    7440    8601*
MAPL00= 170200            332#    396
MAPL01= 170204            334#    398
MAPL02= 170210            336#    400
MAPL03= 170214            338#    402
MAPL04= 170220            340#    404
MAPL05= 170224            342#    406
MAPL06= 170230            344#    408
MAPL07= 170234            346#    410
MAPL1  = 170204           398#
MAPL10= 170240            348#
MAPL11= 170244            350#
MAPL12= 170250            352#
MAPL13= 170254            354#
MAPL14= 170260            356#
MAPL15= 170264            358#
MAPL16= 170270            360#
MAPL17= 170274            362#
MAPL2  = 170210           400#
MAPL20= 170300            364#
MAPL21= 170304            366#
MAPL22= 170310            368#
MAPL23= 170314            370#
MAPL24= 170320            372#
MAPL25= 170324            374#
MAPL26= 170330            376#
MAPL27= 170334            378#
MAPL3  = 170214           402#
MAPL30= 170340            380#
MAPL31= 170344            382#
MAPL32= 170350            384#
MAPL33= 170354            386#
MAPL34= 170360            388#
MAPL35= 170364            390#
MAPL36= 170370            392#
MAPL37= 170374            394#
MAPL4  = 170220           404#
MAPL5  = 170224           406#
MAPL6  = 170230           408#
MAPL7  = 170234           410#
MEMER    031774          4301#   4322    4331    4657    6683    6841
MEMERR= 177744            156#   3345*   3398    3411*   4010    4013    4016*   4315    4340*   4651*
MFPT   = 000007           623#   4490
MFPTTR   033050          4489    4538#
MMEXP    001226           554#   2937    2997    4375    4379    4654*   6990*   6994*   7043*   7047*   7094*   7099*   7107*
                         7112*   7133*   7144*   7168*   7173*   7176*   7215*   7218*   7239*   7243*   7281*   7286*   7296*
                         7300*   7333*   7345*   7349*   7380*   7413*   7428*   7430*   7490*   7492    7499*   7524*   7534*
                         7546*   7673*   7863*
MMFLAG   032230          3350*   4362#   4383*   4649*
MMR0   = 177572           181#    185    2993    3346*   4372    4382*   4416    4424*   4466    4642*   5001    5063*   5077
                         5086*   5088    5099    5111    5127    5141    5152*   5172    5175*   6449*   6463*   6477*   6491*
```

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                        6505*  6519*  6533*  6547*  6561*  6575*  6589*  6603*  6638*  6977*  7230   7238*  7283*
                        7295*  7336*  7344*  7383*  7386*  7415*  7422   7426*  7437*  7446*  7477*  7489   7498*
                        7526*  7529   7537*  7540*  7578   7589*  7625   7635   7650*  7738*  7813   7836*  7928*
                        7975   7987*  8046*  8474*  8489   8499*  8548*  8577*  8585*  8618*  9535*  9662   9798
                        9935   10066  10205  10353  10491  10630  10636* 10663* 10703* 10720* 10728* 10800* 10803*
                        10806* 10808* 10810* 10812* 10814* 10839* 10842* 10848* 10851* 10854* 10877* 10880* 10883*
                        10919* 10922* 10926* 10934* 10938  10940* 10949* 10953* 10956* 10982* 11019* 11078* 11103*
                        11107*
MMR1    = 177574         182#   186    4373   4417   4467   5059   7423   7626   7636   7814   8490   9663   9799
                        9936   10067  10206  10354  10492  10631
MMR2    = 177576         183#   187    4374   4418   4468   5173   5184   7424   7627   7637   7815   7974   8491
                        9664   9800   9937   10068  10207  10355  10493  10632
MMR3    = 172516         184#   188    4645*  5220   6796*  6839*  6978*  7425   8047*  8059   8197   8290   8393
                        8479*  8500*  8549*  9108*  9217*  9243*  9352*  9378*  9487*  9536*  9537*  9844*  9931*
                        9973*  10062* 10400* 10487* 10537* 10625* 10637* 10664* 10699* 10724* 10733* 10876* 10917*
                        10929*
MMSET   075354          10752#
MMTRAP  032226   4361#  4659   7497   7651   7722   7837   7912   7990   8501   8615   9657   9794   9929
                        10061  10200  10347  10485  10623
MMVEC   = 000250         149#   4659*  4660*  7470*  7497*  7568*  7611*  7612*  7617*  7651*  7722*  7730*  7731*
                        7779*  7837*  7912*  7920*  7921*  7961*  7962*  7990*  8062*  8501*  8502*  8554*  8615*
                        9558*  9657*  9695*  9794*  9843*  9929*  9972*  10061* 10104* 10200* 10250* 10347* 10399*
                        10485* 10536* 10623* 10792* 10835* 10845* 10910* 10914* 10931* 10946*
MSER    = 177744         441#
MSG1    003324          1412#  4674
MSG2    003363          1418#  4687
MSG3    003374          1420#  4679
MSG4    003406          1422#  4681
MSG5    003437          1427#  4685
MO      = 000004         429#
MOM1    = 000014         437#
M1      = 000010         428#
NDFLAG  032350          4406#  4425*  4650*
NODSPA  032346          4404#  8062
NXTTST  001316           589#  3384   3412   4338   4727*  4758*  4800*  4828*  4872*  4900*  4926*  4954*  4994*
                        5057*  5170*  5218*  5285*  5322*  5354*  5386*  5418*  5450*  5494*  5557*  5619*  5681*
                        5743*  5805*  5876*  5919*  5962*  6004*  6053*  6101*  6154*  6189*  6224*  6259*  6294*
                        6329*  6369*  6410*  6627*  6788*  6959*  7029*  7082*  7159*  7204*  7267*  7322*  7371*
                        7408*  7467*  7516*  7566*  7607*  7669*  7764*  7861*  7946*  8027*  8184*  8265*  8368*
                        8465*  8529*  8649*  8838*  8971*  9104*  9239*  9374*  9516*  9683*  9821*  9960*  10089*
                        10226* 10377* 10515* 10661* 10789* 10833* 10867* 10906* 10969* 11097*
OKSIZ   033426           4553   4588#
OLDPC   001306           581#  4161*  4180   4194*  4208   4224*  4242   4269*  4272   4283   4311*  4319   4336*
                        4338*  4343   4370*  4385   4414*  4427   4447*  4454*  4460*  4470   6734*  6742*  6757
                        6759*  6763   6768*  6770*  6893*  6901*  6916   6918*  6922   6927*  6929*
OLDPS   001310           583#  4162*  4179   4270*  4282   4312*  4342   4371*  4384   4415*  4426   4448*  4455*
                        4461*  4469   6735*  6762   6769*  6894*  6921   6928*
OLDPSW  001312           585#  4079*  4094   4095*
PADRSH  001232           557#  3523*  3570*
PADRSL  001230           555#  3524*  3525   3571*  3572
PAFLAG  031776          3349*  4302#  4341*  4648*
PARCOU  031600          4223#  5889   5932   5975   6023   6072   6120
PARTAB  001322           598#  6375*  6381   6384
PATAND  001274           575#  2958   4141*  4231*
PATTOR  001272           574#  2958   4137*  4229*
PCONTR  001242           562#  2932   4316*
```

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PCPUER  001260          569#  2930  4163*  4164  4165  4271*  4275  6643*  6645  6688*  6693  6720*  6724
                       6736*  6737  6750  6806*  6808  6878*  6882  6895*  6896  6909
PHIADR  001236          560#  4314*
PHITMI  001246          564#  4318*
PIRQ  = 177772           38#
PIRQVE= 000240          148#
PLOADR  001234          559#  2932  4313*  4326
PMAINT  001244          563#  2932  4317*
PMMR0   001250          565#  2935  2937  2997  2999  3001  3004  3006  3009  3013  3025  3032  4372*
                       4379  4416*  4419  4466*  6983*  6995  7036*  7048  7214*  7219  7230*  7231  7237*
                       7244  7280*  7287  7294*  7301  7343*  7350  7427*  7431  7438*  7443  7489*  7492
                       7529*  7530  7538*  7543  7578*  7585  7625*  7644  7734  7813*  7816  7924  7975*
                       7984  8489*  8495  9662*  9798*  9935*  10066*  10205*  10353*  10491*  10630*
PMMR1   001252          566#  2935  2937  3001  3006  3009  3025  3032  4373*  4417*  4467*  7626*  7641
                       7814*  7820  8490*  9663*  9799*  9936*  10067*  10206*  10354*  10492*  10631*
PMMR2   001254          567#  2935  2937  3001  3006  3009  3011  3025  3032  4374*  4418*  4468*  7627*
                       7638  7815*  7824  7974*  7976  8491*  9664*  9800*  9937*  10068*  10207*  10355*  10493*
                      10632*
PMMR3   001256          568#
PPARER  001240          561#  2932  4315*  4320  4340
PR0   = 000000           70#
PR1   = 000040           71#
PR2   = 000100           72#
PR3   = 000140           73#
PR4   = 000200           74#
PR5   = 000240           75#
PR6   = 000300           76#
PR7   = 000340           77#  10791  10794  11080  11081  11099
PS    = 177776           35#     36  3204  3960  10656  10665*
PSW   = 177776           36#  4446  4456  4462  4694*  4696*  4698*  4956*  4958*  4960*  4962*  5125*  5139*
                       5151*  7571*  7700*  7705*  7739*  7727*  7789*  7831*  7833*  7890*  7895*  7929*  8292*
                       8350*  8395*  8450*  8483  8485  8708*  8817*  8841*  8950*  8974*  9083*  9107*  9218*
                       9242*  9353*  9377*  9488*  9561*  9586*  9606*  9629*  9649*  9696*  9704*  9738*  9758*
                       9781*  9858*  9878*  9901*  9921*  10005*  10025*  10048*  10106*  10129*  10149*  10172*  10192*
                      10236*  10252*  10276*  10296*  10319*  10339*  10348*  10414*  10434*  10457*  10477*  10552*  10572*
                      10595*  10615*  10626*  10981*  10984*  11018*  11036*  11052*  11058*  11065*
PWRMSG  030524          3915  3922#
PWRVEC= 000024          142#  3888*  3889*  3897*  3912*  3913*  4629*  4630*
RDMMR0  032546         4452  4458  4466#
READON  001320          595#  5100  5113
RESREG= 104414         3579  3879#  4049
RESVEC= 000010          137#  4489*  10793*  10794*  10815*
RETRY   001314          587#  3236*  4333  4335*
SAVREG= 104412         3556  3878#  4034
SDPAR0= 172260          269#  8287*  8679*  10738
SDPAR1= 172262          270#  8288*  8680*
SDPAR2= 172264          271#  8681*
SDPAR3= 172266          272#  8682*
SDPAR4= 172270          273#  8683*  10396*
SDPAR5= 172272          274#  8684*
SDPAR6= 172274          275#  8685*
SDPAR7= 172276          276#  5331  5580  5595  5934  8289*  8686*
SDPDR0= 172220          247#  8274*  8724  8865  8982  9128  9244  9271  9278*  9294*  9314*  9334*  9390
SDPDR1= 172222          248#  8275*
SDPDR2= 172224          249#  8279*
SDPDR3= 172226          250#  8280*
```

```
SDPDR4= 172230   251#  8276*  9549*  9688*  9834*  9965*  10095*  10240*  10394*  10529*
SDPDR5= 172232   252#
SDPDR6= 172234   253#
SDPDR7= 172236   254#  5427   5766   5781   6074   8277*  9279*   9295*   9315*   9335*
SIPAR0= 172240   258#  5327   5561   5563   5577   5578   5592    5925    6193    6194*   6197    6202    6206
                6428   7688*  7769*  7876*  8281*  8671*  10772
SIPAR1= 172242   259#  7689*  7770*  8282*  8672*
SIPAR2= 172244   260#  7690*  7771*  8283*  8673*
SIPAR3= 172246   261#  7691*  7772*  8284*  8674*
SIPAR4= 172250   262#  7694*  8285*  8675*  9555*  9694*  9840*   9971*   10246*
SIPAR5= 172252   263#  8676*
SIPAR6= 172254   264#  8677*
SIPAR7= 172256   265#  7417   7692*  7773*  7877*  8286*  8678*
SIPDR0= 172200   236#  5423   5747   5749   5763   5764   5778    6059    6298    6299*   6302    6307    6311
                6426   7681*  7780*  7870*  8268*  8728   8768    8842    8869    8876*   8892*   8901    8912*
                8932*  8986   9034   9124   9168   9267   9303    9386    9438    10231   10773
SIPDR1= 172202   237#  7682*  7774*  7864*  8269*
SIPDR2= 172204   238#  7683*  7775*  7865*  8270*
SIPDR3= 172206   239#  7684*  7776*  7866*  8271*
SIPDR4= 172210   240#  7693*  8272*  8293*  8330*  8333*  9553*   9692*   9838*   9969*   10096*  10244*  10251*
                10390*  10528*
SIPDR5= 172212   241#
SIPDR6= 172214   242#
SIPDR7= 172216   243#  7420   7685*  7777*  7867*  8273*  8877*   8893*   8913*   8933*
SIZEHI= 177762   167#  4567
SIZELO= 177760   165#  2986   4552   4575   6721   6739   6794    6875    6879    6898    10869   10873   10907
SIZMEM  033056  4549#  4691
SR0    = 177572   185#  3966   3978*  3986*
SR1    = 177574   186#
SR2    = 177576   187#
SR3    = 172516   188#  3977*
STACK  = 001100    29#    30     31     32   3359   3387   10799   10838   10847   10875   10918   10942   10950
                10983  11035  11050  11067  11108
START    040076  3917   4599   4601   4603   4605   4607   4609    4611    4617#
STKLMT= 177774    37#  10936* 10941* 10945* 11041  11057* 11066*
STRTAB  001336   608#  4699
STRT1   040000   455   4598#
STRT2   040010   457   4600#
STRT3   040020   459   4602#
STRT4   040030   461   4604#
STRT5   040040   463   4606#
STRT6   040050   465   4608#
STRT7   040060   467   4610#
STRT8   040070   469   4612#
SUPSTK= 000700    31#  4695   4959   9568   9705   10255
SUPVEC  032506  4454#  7695   7885
SWR    = 177570    39#    40   3206   3238*  3252   3254    3262    3269    3315    3318    3325    3329    3335
                3342   3364   3392   3452   11033
SW0    = 000001   105#
SW00   = 000001    95#   105
SW01   = 000002    94#   104
SW02   = 000004    93#   103
SW03   = 000010    92#   102
SW04   = 000020    91#   101
SW05   = 000040    90#   100
SW06   = 000100    89#    99
```

```
SW07  = 000200            88#     98
SW08  = 000400            87#     97
SW09  = 001000            86#     96
SW1   = 000002           104#
SW10  = 002000            85#
SW11  = 004000            84#
SW12  = 010000            83#
SW13  = 020000            82#
SW14  = 040000            81#
SW15  = 100000            80#
SW2   = 000004           103#
SW3   = 000010           102#
SW4   = 000020           101#
SW5   = 000040           100#
SW6   = 000100            99#
SW7   = 000200            98#   3452
SW8   = 000400            97#
SW9   = 001000            96#   3342   11033
SYSTID= 177764           169#
S0    = 000020           427#
S0MOM1= 000034           436#
S1    = 000040           426#
S1MOM1= 000054           435#
TAPE1 = ****** U        4593
TAPE2 = ****** U           1   4593
TBIT  = 000020          4075#  4077   4080   4095   4935   7766#  7806
TBITO = 104416          3880#  7671   8467   8705
TBITOF  031264          3880   4076#
TBITR = 104420          3881#  8029   8531   9518
TBITRE  031312          3881   4093#
TBITVE= 000014           138#  4635*  4636*
TESTNO  001264           571#  2930   2932   2935   2937   2940   2942   2944   2946   2949   2951   2953   2955
                        2958   2961   2963   2965   2967   2969   2971   2973   2975   2977   2979   2981   2982
                        2984   2986   2988   2990   2991   2993   2995   2997   2999   3001   3004   3006   3009
                        3011   3013   3015   3017   3019   3021   3023   3025   3027   3029   3031   3032   3039
                        3041   3042   3044   3045   3047   3304*
TIMEOU  031404          4152#  5293   5325   5357   5389   5421   5453
TKVEC = 000060           145#
TOFLAG  031406          4154#  4178*
TPVEC = 000064           146#
TRAPVE= 000034           144#  4627*  4628*  11099*
TRTVEC= 000014           139#
TSLOC = 077404         11120#  11121#  11122#  11123
TSTDAT  077404         11125#
TST1    040670           608   4693   4722#
TST10   041544          4926   4952#
TST100  063314          8529   8616   8647#
TST101  064540          8649   8836#
TST102  065306          8838   8969#
TST103  066054          8971   9102#
TST104  066636          9104   9237#
TST105  067420          9239   9372#
TST106  070202          9374   9514#
TST107  071004          9516   9659   9681#
TST11   041626          4954   4965   4992#
TST110  071464          9683   9795   9819#
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TST111	072064	9821	9932	9958#
TST112	072514	9960	10063	10087#
TST113	073106	10089	10202	10224#
TST114	073552	10226	10350	10375#
TST115	074152	10377	10488	10514#
TST116	074576	10515	10655#	
TST117	075466	10771	10787#	
TST12	042032	4994	5055#	
TST120	075662	10788	10789	10831#
TST121	076022	10832	10833	10866#
TST122	076202	10867	10870	10892 10905#
TST123	076524	10906	10968#	
TST124	077266	10969	11096#	
TST13	042464	5057	5168#	
TST14	042640	5170	5203	5216#
TST15	043004	5218	5283#	
TST16	043140	5285	5304	5320#
TST17	043244	5322	5336	5352#
TST2	041012	4727	4739	4756#
TST20	043350	5354	5368	5384#
TST21	043454	5386	5400	5416#
TST22	043560	5418	5432	5448#
TST23	043664	5450	5464	5492#
TST24	044074	5494	5536	5555#
TST25	044304	5557	5599	5617#
TST26	044514	5619	5661	5679#
TST27	044724	5681	5723	5741#
TST3	041146	4758	4798#	
TST30	045134	5743	5785	5803#
TST31	045344	5805	5847	5874#
TST32	045474	5876	5899	5917#
TST33	045624	5919	5942	5960#
TST34	045754	5962	5985	6002#
TST35	046132	6004	6033	6051#
TST36	046310	6053	6082	6099#
TST37	046466	6101	6130	6152#
TST4	041212	4800	4826#	
TST40	046604	6154	6187#	
TST41	046722	6189	6222#	
TST42	047040	6224	6257#	
TST43	047156	6259	6292#	
TST44	047274	6294	6327#	
TST45	047412	6329	6367#	
TST46	047514	6369	6408#	
TST47	051130	6410	6625#	
TST5	041334	4828	4870#	
TST50	051760	6627	6730	6786#
TST51	052634	6788	6888	6957#
TST52	053166	6959	7027#	
TST53	053360	7029	7080#	
TST54	053644	7082	7157#	
TST55	053774	7159	7202#	
TST56	054240	7204	7265#	
TST57	054460	7267	7320#	
TST6	041412	4872	4898#	
TST60	054656	7322	7369#	

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TST61    055000          7371    7406#
TST62    055230          7408    7465#
TST63    055426          7467    7514#
TST64    055600          7516    7564#
TST65    055712          7566    7605#
TST66    056154          7607    7667#
TST67    056560          7669    7724    7762#
TST7     041466          4900    4924#
TST70    057144          7764    7859#
TST71    057546          7861    7914    7944#
TST72    060012          7946    8025#
TST73    060606          8027    8182#
TST74    061110          8184    8263#
TST75    061562          8265    8366#
TST76    062234          8368    8463#
TST77    062502          8465    8527#
TWOSP    023526          2925#   3375    3379    3403    3407
TYPDS  = 104410          3179    3186    3497    3877#
TYPE   = 104400          3173    3180    3187    3320    3328    3360    3366    3375    3379    3388    3394    3403    3407
                         3469    3471    3476    3478    3506    3529    3535    3576    3669    3763    3839    3873#   3914
                         4554    4558    4562    4566    4571    4579    4587    4667    4674    4679    4681    4685    4687
                        10726
TYPOC  = 104402          3374    3378    3382    3402    3406    3410    3444    3491    3874#
TYPON  = 104406          3876#
TYPOS  = 104404          3875#   4568    4576    4584
TYPVAD   027242          3514    3556#
T.END    032776          4519    4522#
T1       032630          4493#   4539
T2       032672          4500    4503#
T3       032724          4505    4508    4511#
T4       032756          4514    4517#
UCB    = 001000           424#
UDPAR0 = 177660           225#   8390*   8695*   10736
UDPAR1 = 177662           226#   8391*   8696*
UDPAR2 = 177664           227#   8697*
UDPAR3 = 177666           228#   8698*
UDPAR4 = 177670           229#   8699*   10533*
UDPAR5 = 177672           230#   8700*
UDPAR6 = 177674           231#   8701*
UDPAR7 = 177676           232#   5363    5642    5657    5977    8392*   8702*
UDPDR0 = 177620           203#   8377*   8716    8857    8998    9120    9263    9379    9406    9413*   9429*   9449*   9469*
UDPDR1 = 177622           204#   8378*
UDPDR2 = 177624           205#   8382*
UDPDR3 = 177626           206#   8383*
UDPDR4 = 177630           207#   8379*   9550*   9689*   9835*   9966*   10094*  10241*  10391*  10530*
UDPDR5 = 177632           208#
UDPDR6 = 177634           209#
UDPDR7 = 177636           210#   5459    5828    5843    6122    8380*   9414*   9430*   9450*   9470*
UIPAR0 = 177640           214#   5359    5623    5625    5639    5640    5654    5968    6228    6229*   6232    6237    6241
                         6432   7686*   7878*   8384*   8687*
UIPAR1 = 177642           215#   7879*   8385*   8688*
UIPAR2 = 177644           216#   7880*   8386*   8689*
UIPAR3 = 177646           217#   7881*   8387*   8690*
UIPAR4 = 177650           218#   8388*   8691*   10100*  10532*
UIPAR5 = 177652           219#   7884*   8692*
UIPAR6 = 177654           220#   8693*
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UIPAR7= 177656           221#  7418   7687*  7882*  8389*  8694*
UIPDR0= 177600           192#  5455   5809   5811   5825   5826   5840   6107   6333   6334*  6337   6342   6346
                        6430   7680*  7871*  7949*  8371*  8720   8788   8861   8921   8975   9002   9009*  9025*
                        9045*  9054   9065*  9116   9188   9259   9323   9402   9458   10519
UIPDR1= 177602           193#  7674*  7872*  7950*  8372*
UIPDR2= 177604           194#  7675*  7873*  7951*  8373*
UIPDR3= 177606           195#  7676*  7874*  7952*  8374*
UIPDR4= 177610           196#  7953*  8375*  8396*  8430*  8433*  9551*  9690*  9836*  9967*  10098*  10242*  10392*
                       10539*
UIPDR5= 177612           197#  7883*  7954*
UIPDR6= 177614           198#  7955*
UIPDR7= 177616           199#  7421   7677*  7875*  7956*  8376*  9010*  9026*  9046*  9066*
USESTK= 000600            32#  4697   4961   10111
USEVEC  032530          4460#  7697   7887
VCIP   = 010000          421#
VSIU   = 020000          420#
VSPE   = 100000          418#
WBIT   = 000100          8550#  8559   8566   8603   8611
WORK     075352         10700*  10701  10704  10705  10706  10708*  10709  10729*  10742#
$BDADR  001124           519#
$BDDAT  001130           521#
$BELL   001212           547#  3320   3352
$CHARC  027650          3685   3694*  3699#
$CLR.T  025402          3192   3195#
$CMTAG  001100           506#  4619
$CM1   = 000006          533#   534#   535#   536#   537#   538#   539#
$CM2   = 000014          533#   534#   535#   536#   537#   538#   539#
$CM3   = 000006          531#   533
$CM4   = 000006          539#   540#   541#   542#   543#   544#   545#
$CORE   031002          3964   3989#
$CRLF   001217           549#  3187   3328   3352   3471   3478   3669   3702   4566   4587
$CROUT  031032          3989   3996#
$DBLK   030316          3805   3839   3847#
$DB20   031144          3503   3526   3573   4034#
$DOAGN  025422          3169   3190   3197   3203#
$DTBL   030306          3808   3843#
$ENDAD  025412           493   3199#  3332   4665
$ENDCT  025240          3171#  4631
$ENULL  025470          3218#
$EOP    025204          3161#  11118
$EOPCT  025232          3168#  3172   4631*
$ERFLG  001103           509#  3226   3258   3260   3266*  3287   3312*  3352   4173   4203   4237
$ERMAX  001117           516#  3260   3282*  3287   4634*
$ERROR  025760          3021   3303#  4625
$ERRPC  001120           517#  2940   2942   2944   2946   2949   2953   2961   2963   2965   2967   2969   2971
                        2973   2975   2977   2979   2981   2982   2984   2986   2988   2990   2991   2993   2995
                        2997   2999   3001   3004   3006   3009   3011   3013   3015   3017   3019   3023   3025
                        3027   3029   3031   3032   3034   3036   3039   3041   3042   3322*  3323*  3324   3352
                        3358*  3372   3386*  3400   3443
$ERRTB  001364           640#  3462   3466
$ERTTL  001114           514#  3184   3188*  3321*  3352
$ESCAP  001210           546#  3281*  3338   3340   3352   3384*  3412*  4633*  10788*  10832*  10973*
$FILLC  001152           529#  3672   3702
$FILLS  001151           528#  3702
$GDADR  001122           518#
$GDDAT  001126           520#
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$GET42  025364          3189#
$HD     = 000000          11
$ICNT   001106           511#  3273*  3274   3276*  3286  10971*
$ILLUP  030516          3888   3919#
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$LPERR  001112           513#  3264   3280*  3286   3337   4640*  4724*  4729*  4737*  4760*  4767*  4774*  4780*
                        4787*  4802*  4809*  4830*  4857*  4874*  4886*  4902*  4912*  4928*  4940*  4998*  5008*
                        5015*  5021*  5035*  5061*  5070*  5076*  5087*  5098*  5110*  5124*  5138*  5153*  5174*
                        5182*  5189*  5197*  5227*  5239*  5247*  5253*  5289*  5294*  5301*  5326*  5333*  5358*
                        5365*  5390*  5397*  5422*  5429*  5454*  5461*  5497*  5513*  5534*  5560*  5576*  5597*
                        5622*  5638*  5659*  5684*  5700*  5721*  5746*  5762*  5783*  5808*  5824*  5845*  5880*
                        5897*  5923*  5940*  5966*  5983*  6008*  6031*  6057*  6080*  6105*  6128*  6156*  6166*
                        6175*  6191*  6201*  6210*  6226*  6236*  6245*  6261*  6271*  6280*  6296*  6306*  6315*
                        6331*  6341*  6350*  6371*  6379*  6387*  6419*  6444*  6458*  6472*  6486*  6500*  6514*
                        6528*  6542*  6556*  6570*  6584*  6598*  6612*  6637*  6642*  6650*  6684*  6707*  6716*
                        6729*  6805*  6813*  6846*  6865*  6874*  6887*  6964*  6982*  7014*  7035*  7067*  7092*
                        7104*  7129*  7143*  7171*  7180*  7213*  7222*  7235*  7250*  7279*  7293*  7307*  7335*
                        7342*  7356*  7382*  7390*  7448*  7469*  7500*  7520*  7533*  7547*  7569*  7590*  7613*
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                        8129*  8142*  8159*  8168*  8203*  8219*  8236*  8247*  8294*  8302*  8307*  8315*  8320*
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                        10191* 10201* 10235* 10275* 10295* 10318* 10338* 10349* 10386* 10413* 10433* 10456* 10476*
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                        10948* 11101*
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                        5308#  5310   5340#  5342   5372#  5374   5404#  5406   5436#  5438   5477#  5479   5540#
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                        5946#  5948   5989#  5991   6038#  6040   6086#  6088   6143#  6145   6178#  6180   6213#
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                        7255   7310#  7312   7359#  7361   7393#  7395   7451#  7453   7503#  7505   7551#  7553
                        7593#  7595   7655#  7657   7745#  7747   7840#  7842   7934#  7936   8014#  8016   8171#
                        8173   8251#  8253   8354#  8356   8454#  8456   8517#  8519   8632#  8634   8821#  8823
                        8954#  8956   9087#  9089   9222#  9224   9357#  9359   9502#  9504   9669#  9671   9805#
                        9807   9944#  9946   10074# 10076  10211# 10213  10361# 10363  10498# 10500  10641# 10643
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$OCNT   030076          3735*  3764*  3777#
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$PWRMG  030506          3915#
$PWRUP  030436          3897    3902#
$QUES   001216           548#   3352
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$RDLIN= ****** U        3878
$RDOCT= ****** U        3878
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$REG0   001156           533#   2953    2961    2963    2965    2967    2969    2971    2973    2979    2984    2991    3019
                3023    3029    3034    3036    3044    3045    3047    3306*  11071*
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                3004    3011    3017    3021    3023    3027    3034    3036    3045    3047    3307*
$REG2   001162           535#   2942    2944    2946    2949    2953    2961    2967    2971    2973    2979    3013    3021
                3036    3047    3308*
$REG3   001164           536#   2946    2979    2988    3017    3019    3036    3309*
$REG4   001166           537#   3036    3047    3310*
$REG5   001170           538#   3311*
$RESRE  027406          3618#   3879
$RTRN   025460          3193    3212#   4635    4637*
$SAVRE  027350          3602#   3878
$SAVR6  030522          3896*   3902    3903*   3904*   3921#
$SCOPE  025474          3235#   4623   11079
$SETUP= 000037           444#   3163    3329    4665
$SIZE   030570          3951#   4550
$SIZEX  031036          3987    3997#
$STUP = 177777           444#
$SVLAD  025714          3247    3278#
$SVPC = 000240           491#    496
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                3157    3164    3191    3204    3217    3227    3228    3229    3230    3231    3238    3250    3252
                3253    3258    3259    3260    3267    3268    3269    3280    3283    3286    3294    3295    3296
                3297    3298    3299    3315    3318    3325    3329    3335    3352    4727    4760    4802    4830
                4874    4902    4928    4956    4996    5059    5172    5220    5287    5324    5356    5388    5420
                5452    5496    5559    5621    5683    5745    5807    5878    5921    5964    6006    6055    6103
                6156    6191    6226    6261    6296    6331    6371    6412    6629    6790    6961    7031    7084
                7161    7206    7269    7324    7373    7410    7469    7518    7568    7609    7671    7766    7863
                7948    8029    8186    8267    8370    8467    8531    8651    8840    8973    9106    9241    9376
                9518    9685    9823    9962   10091   10228   10379   10515   10656   10788   10832   10867   10906
               10969   11097
$SWRMK= 000200             1#      23      24    3231    3232    3254    3255
$TBIT   025466          3208*   3217#   4638*
$TIMES  001206           545#   3164*   3267*   3274    3277*   3286    4632*   5878*   5921*   5964*   6006*   6055*   6103*
                6961*   7031*   7948*
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$TMPO   001172           539#   2995    3006    3015    3039    3042    3370*   3380    3398*   3408    5126*   5136    5140*
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                6807*   6822    6847*   6851    7486*   7635*   7644    8558*   8559    8565*   8566    8572*   8573
                8580*   8581    8588*   8589    8595*   8596    8602*   8603    8610*   8611    8714*   8764*   8784*
                8804*   8807    8847*   8897*   8917*   8937*   8940    8980*   9030*   9050*   9070*   9073    9114*
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                    9477   10722* 10849* 10887*
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$TMP4   001202       543#
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                    5680   5683#  5723   5727   5742   5745#  5785   5789   5804   5807#  5847   5860   5875
                    5878#  5899   5903   5918   5921#  5942   5946   5961   5964#  5985   5989   6003   6006#
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                    6188   6191#  6213   6223   6226#  6248   6258   6261#  6283   6293   6296#  6318   6328
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                    7568#  7593   7606   7609#  7655   7668   7671#  7724   7745   7763   7766#  7840   7860
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                    9523*  9524
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$TYPON  027714      3732   3735#  3876
$TYPOS  027654      3728#  3875
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BYTEMG    6178#    6180    6215    6250    6285    6320
CMPPDR       1#    8747    8767    8787    8880    8900    8920    9013    9033    9053    9147    9167    9187    9282    9302
          9322     9417    9437    9457
COMMEN       1#     415#
COUNT1       1#    5879    5922    5965    6007    6056    6104
DUAL         1#    5496    5559    5621    5683    5745    5807
DUALMA       1#    8707    8840    8973    9106    9241    9376
DUALMG    5540#    5542    5605    5667    5729    5791
ENDCOM       1#     415#
ENTRY        1#    4722    4996    5287    6417    6962    8031    8533    9520
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          5181     5188    5196    5204    5225    5235    5245    5252    5306    5338    5370    5402    5434    5466    5505
          5538     5568    5601    5630    5663    5692    5725    5754    5787    5816    5849    5901    5944    5987    6035
          6084     6132    6165    6174    6200    6209    6235    6244    6270    6279    6305    6314    6340    6349    6385
          6456     6470    6484    6498    6512    6526    6540    6554    6568    6582    6596    6610    6651    6658    6667
          6695     6715    6727    6744    6758    6814    6821    6830    6854    6873    6885    6903    6917    7000    7004
          7053     7057    7103    7116    7142    7179    7221    7229    7234    7246    7249    7289    7292    7303    7306
          7341     7352    7355    7389    7433    7436    7445    7487    7494    7532    7545    7572    7587    7649    7704
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          9194     9210    9289    9309    9329    9345    9424    9444    9464    9480    9571    9573    9593    9613    9635
          9656     9665    9703    9726    9748    9769    9792    9801    9865    9885    9907    9928    9938    9993   10015
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         10346    10356   10421   10441   10463   10484   10494   10559   10579   10601   10622   10633   10725   10804   10807
         10809    10811   10813   10843   10852   10881   10889   10893   10923   10927   10943   10954   11072   11111
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          9266     9270    9385    9389    9393    9397    9401    9405    9540    9825   10230   10381   10518
MGDUAL    8632#    8634    8823    8956    9089    9224    9359
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MSG10     4943#    4945
MSG100    8632#    8634
MSG101    8821#    8823
MSG102    8954#    8956
MSG103    9087#    9089
MSG104    9222#    9224
MSG105    9357#    9359
MSG106    9502#    9504
MSG107    9669#    9671
MSG11     4980#    4982
MSG110    9805#    9807
MSG111    9944#    9946
MSG112   10074#   10076
MSG113   10211#   10213
MSG114   10361#   10363
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MSG13     5156#    5158
MSC14     5206#    5208
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MSG23	5477#	5479	
MSG24	5540#	5542	
MSG25	5603#	5605	
MSG26	5665#	5667	
MSG27	5727#	5729	
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MSG30	5789#	5791	
MSG31	5860#	5862	
MSG32	5903#	5905	
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MSG42	6248#	6250	
MSG43	6283#	6285	
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MSG53	7070#	7072	
MSG54	7147#	7149	
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MSG76     8454#  8456
MSG77     8517#  8519
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NEWTST       1#   415#  4711  4747  4790  4813  4860  4889  4916  4943  4980  5038  5156  5206  5271
          5308   5340  5372  5404  5436  5477  5540  5603  5665  5727  5789  5860  5903  5946  5989
          6038   6086  6143  6178  6213  6248  6283  6318  6354  6399  6614  6775  6946  7016  7070
          7147   7183  7253  7310  7359  7393  7451  7503  7551  7593  7655  7745  7840  7934  8014
          8171   8251  8354  8454  8517  8632  8821  8954  9087  9222  9357  9502  9669  9805  9944
         10074  10211 10361 10498 10641 10776 10817 10856 10894 10959 11083
PAGEF        1#   6979  7032
PARMSG    5903#  5905  5948
PDRMSG    6038#  6040  6088
POP          1#   415#  3623  3834  3906
PUSH         1#   415#  3603  3793  3890
RESPMG    5308#  5310  5342  5374  5406  5438
RESPON       1#   5292  5324  5356  5388  5420  5452
SAVEAD       1#  10788 10832
SAVTST       1#   3304
SCOPE       34#   4757  4799  4827  4871  4899  4925  4953  4993  5056  5169  5217  5284  5321  5353
          5385   5417  5449  5493  5556  5618  5680  5742  5804  5875  5918  5961  6003  6052  6100
          6153   6188  6223  6258  6293  6328  6368  6409  6626  6787  6958  7028  7081  7158  7203
          7266   7321  7370  7407  7466  7515  7565  7606  7668  7763  7860  7945  8026  8183  8264
          8367   8464  8528  8648  8837  8970  9103  9238  9373  9515  9682  9820  9959 10088 10225
         10376  10514 10655 10787 10831 10866 10905 10968 11096 11115
SETACF       1#   7161  7206  7269  7324  7373
SETTRA    3864#  3874  3875  3876  3877  3878  3879  3880  3881
SETUP        1#   415#
SKIP         1#   415#  4693  4739  4965  5203  5304  5336  5368  5400  5432  5464  5536  5599  5661
          5723   5785  5847  5899  5942  5985  6033  6082  6130  6730  6888  7724  7914  8616  9659
          9795   9932 10063 10202 10350 10488 10771 10892 11110
SLASH        1#   415#
SPACE     415#
SSCOPE       1#  3236
STARS        1#   415#   443   471   497   624  3149  3220  3287  3357  3584  3630  3702  3780  3848
          3883   3928  4022  4542  4547  4711  4721  4747  4755  4790  4797  4813  4825  4860  4869
          4889   4897  4916  4923  4943  4951  4980  4991  5038  5054  5156  5167  5206  5215  5271
          5282   5308  5319  5340  5351  5372  5383  5404  5415  5436  5447  5477  5491  5540  5554
          5603   5616  5665  5678  5727  5740  5789  5802  5860  5873  5903  5916  5946  5959  5989
          6001   6038  6050  6086  6098  6143  6151  6178  6186  6213  6221  6248  6256  6283  6291
          6318   6326  6354  6366  6399  6407  6614  6624  6775  6785  6946  6956  7016  7026  7070
          7079   7147  7156  7183  7201  7253  7264  7310  7319  7359  7368  7393  7405  7451  7464
          7503   7513  7551  7563  7593  7604  7655  7666  7745  7761  7840  7858  7934  7943  8014
          8024   8171  8181  8251  8262  8354  8365  8454  8462  8517  8526  8632  8646  8821  8835
          8954   8968  9087  9101  9222  9236  9357  9371  9502  9513  9669  9680  9805  9818  9944
          9957  10074 10086 10211 10223 10361 10374 10498 10513 10641 10654 10776 10786 10817 10830
         10856  10865 10894 10904 10959 10967 11083 11095 11114
TRACK        1#   4756  4798  4826  4870  4898  4924  4952  4992  5055  5168  5216  5283  5320  5352
          5384   5416  5448  5492  5555  5617  5679  5741  5803  5874  5917  5960  6002  6051  6099
          6152   6187  6222  6257  6292  6327  6367  6408  6625  6786  6957  7027  7080  7157  7202
          7265   7320  7369  7406  7465  7514  7564  7605  7667  7762  7859  7944  8025  8182  8263
          8366   8463  8527  8647  8836  8969  9102  9237  9372  9514  9681  9819  9958 10087 10224
```

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                10375
TRACK1            1#    4757    4799    4827    4871    4899    4925    4953    4993    5056    5169    5217    5284    5321    5353
                5385    5417    5449    5493    5556    5618    5680    5742    5804    5875    5918    5961    6003    6052    6100
                6153    6188    6223    6258    6293    6328    6368    6409    6626    6787    6958    7028    7081    7158    7203
                7266    7321    7370    7407    7466    7515    7565    7606    7668    7763    7860    7945    8026    8183    8264
                8367    8464    8528    8648    8837    8970    9103    9238    9373    9515    9682    9820    9959   10088   10225
                10376
TRMTRP          3864#
TYPBIN             1#    415#
TYPDEC             1#    415#    3177    3184
TYPNAM             1#    415#    4663
TYPNUM             1#    415#
TYPOCS             1#    415#    4567    4575    4583
TYPOCT             1#    415#    3372    3376    3380    3400    3404    3408
TYPTXT             1#    415#    3173    3180    3360    3366    3388    3394    4554    4558    4562    4571    4579
USER               1#    551
ZEROER             1#    3342
$SAVEA             1#    10867   10906   10969
$$CMRE           497#    533     534     535     536     537     538
$$CMTM           497#    539     540     541     542     543     544
$$ESCA             1#    415#
$$NEWT             1#    415#    4711    4747    4790    4813    4860    4889    4916    4943    4980    5038    5156    5206    5271
                5308    5340    5372    5404    5436    5477    5540    5603    5665    5727    5789    5860    5903    5946    5989
                6038    6086    6143    6178    6213    6248    6283    6318    6354    6399    6614    6775    6946    7016    7070
                7147    7183    7253    7310    7359    7393    7451    7503    7551    7593    7655    7745    7840    7934    8014
                8171    8251    8354    8454    8517    8632    8821    8954    9087    9222    9357    9502    9669    9805    9944
                10074   10211   10361   10498   10641   10776   10817   10856   10894   10959   11083
$$SET           3864#   3874    3875    3876    3877    3878    3879    3880    3881
$$SKIP             1#    415#    4693    4739    4965    5203    5304    5336    5368    5400    5432    5464    5536    5599    5661
                5723    5785    5847    5899    5942    5985    6033    6082    6130    6730    6888    7724    7914    8616    9659
                9795    9932   10063   10202   10350   10488   10771   10892
.EQUAT             1#
.HEADE             1#
.KT11              1#
.SETUP             1#     444
.SWRHI             1#      11
.SWRLO            24#
.$ACT1             1#     471
.$CATC             1#     444
.$CMTA             1#     497
.$DB2D             1#
.$DB2O             1#    4022
.$DIV              1#
.$EOP              1#    3149
.$ERRO             1#    3287
.$ERRT             1#
.$MULT             1#
.$POWE             1#    3883
.$RAND             1#
.$RDDE             1#
.$RDOC             1#
.$READ             1#
.$SAVE             1#    3584
.$SB2D             1#
.$SB2O             1#
.$SCOP             1#    3220
```

```
.$SIZE      1#   3928
.$SUPR      1#
.$TRAP      1#   3848
.$TYPB      1#
.$TYPD      1#   3780
.$TYPE      1#   3630
.$TYPO      1#   3702
.1170       1#     25


. ABS.  101404     000


 ERRORS DETECTED:  0

 CEKBED,CEKBED/CRF/SOL=CEKBED.SML,CEKBED.P11
 RUN-TIME: 86 128 10 SECONDS
 RUN-TIME RATIO: 566/225=2.5
 CORE USED:  41K  (81 PAGES)
```