

.REM \*

IDENTIFICATION

PRODUCT CODE:           MAINDEC-11-DFKTF-A-D  
PRODUCT NAME:           11/34 MEMORY MANAGEMENT ABORT TESTS  
DATE CREATED:            DECEMBER 21, 1975  
MAINTAINER:             DIAGNOSTIC ENGINEERING  
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1.0 ABSTRACT

PROGRAM DFKTF TESTS THE MEMORY MANAGEMENT ABORT LOGIC. THE PROGRAM IS WRITTEN TO CAUSE A MEMORY MANAGEMENT ABORT AT EVERY PDP11/34 MICRO STATE WHERE A MEMORY REFERENCE IS INITIATED. ABORTS ARE IN ALL CASES TRAPPED TO THE KERNEL, HOWEVER, THE INSTRUCTIONS CAUSING THE ABORT ARE EXECUTED IN BOTH MODES (KERNEL AND USER).

2.0 REQUIREMENTS

2.1 EQUIPMENT

PDP-11/34

2.2 STORAGE

PROGRAM STORAGE - THE ROUTINE USES MEMORY 0-17777

2.3 PRELIMINARY PROGRAMS

TESTS DFKTA-DFKTD

3.0 LOADING AND STARTING PROCEDURE

LOAD PROGRAM INTO MEMORY USING ABS LOADER  
LOAD ADDRESS 200  
START.  
THE PROGRAM WILL LOOP AND RING BELL ON COMPLETION.

4.0 SWITCH SETTINGS

5.0 SUBROUTINE ABSTRACTS

5.1 HLT

THE HLT (HALT) INSTRUCTION IS EXECUTED WHEN AN ERROR IS DETECTED. NOTE THAT THE HLT (HALT) INSTRUCTION TRAPS TO LOC 4 IN USER MODE. IF A HLT (HALT) INSTRUCTION IS EXECUTED IN THESE MODES THE TRAP IS TAKEN AND THE PROGRAM HALTS AT LOCATION 176 IN KERNEL MODE. PRESSING CONTINUE RESTARTS THE TEST. NOTE: THE USER STACK POINTER IS NOT AFFECTED. TO DETERMINE WHICH TEST THE PROGRAM WAS EXECUTING WHEN THE HLT OCCURRED REFER TO R1 WHOSE CONTENTS ARE THE LAST TEST SUCCESSFULLY EXECUTED AND ALSO THE KERNEL STACK THE TOP WORD OF WHICH IS THE VIRTUAL PC OF THE HLT INSTRUCTION +2.

5.2 SCOPE

THE SCOPE (EMT) SERVICE ROUTINE STORES IN R1 THE PC OF THE LAST TEST SUCCESSFULLY EXECUTED AND MAY BE USED AS AN AID IN DEBUGGING IF THE PROGRAM 'BOMBS' BECAUSE OF A HARDWARE FAILURE. A BRANCH INSTRUCTION MAY BE INSERTED AT THE SCOPE LOCATION TO THE PREVIOUS SCOPE (EMT) INSTRUCTION TO CONTINUOUSLY LOOP A TEST. ADDITIONALLY THE SCOPE ROUTINE SETS ALL STACK POINTERS TO THEIR INITIAL SETTINGS (SEE SEC 8.2) AND ENTERS EACH TEST IN KERNEL MODE, PREVIOUS KERNEL MODE.

6.0 ERRORS

THE TEST HALTS WHEN AN ERROR IS DETECTED AND DISPLAYS THE PC+2 OF THE HLT (HALT) INSTRUCTION IN THE ADDRESS LIGHTS.

6.1 ERROR RECOVERY

PRESS CONTINUE OR RESTART AT 200 OR PREVIOUS SCOPE.

6.2 ERROR LOOPING

TO LOOP ON AN ERROR REPLACE THE HLT INSTRUCTION WITH A BRANCH BACK TO THE PREVIOUS SCOPE. NOTE: IF THE ERROR IS INTERMITTENT THE TEST WILL DROP THROUGH THE HLT AND CONTINUE TO THE NEXT TEST. TO CONTINUOUSLY LOOP THE TEST REPLACE THE BEQ .+4 PRECEEDING THE HLT WITH THE BRANCH.

7.0 RESTRICTIONS

7.1 STARTING RESTRICTION

NONE

7.2 OPERATIONAL RESTRICTION

NONE

8.0 MISCELLANEOUS

IF THE PROGRAM HALTS IN THE TRAP INTERRUPT VECTOR AREA (0-1000) EXAMINE REGISTER 6 (THE KERNEL STACK PTR), REGISTER 6 CONTAINS THE ADDRESS WHERE THE PC OF THE INSTRUCTION THAT CAUSED THE TRAP IS STORED. EXAMINE ALSO R1 (R1 SPECIFIES THE LAST TEST SUCCESSFULLY COMPLETED)

8.2 STACK POINTER

THE STACK POINTERS ARE INITIALLY SET TO THE FOLLOWING VALUES

KERNEL = 1060

USER = 600

AND ARE RESET TO THESE VALUES AT THE START OF EACH SUBTEST (BY SCOPE).

8.3 PASS COUNT

1000(8) PASSES ARE REQUIRED FOR COMPLETION OF THIS PROGRAM; AT WHICH TIME THE BELL WILL RING AT THE TTY.

8.4 MEMORY MANAGEMENT MEMORY MAP

THE MAPPING OF THE MEM MGMT REGISTERS IS DONE AT THE BEGINNING OF THE PROGRAM BEFORE ANY TESTING IS STARTED. THE USER SHOULD ACQUAINT HIMSELF WITH THE MEMORY MANAGEMENT MAP BEFORE USING THIS PROGRAM.

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;COPYRIGHT 1975, DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.
;MEMORY MANAGEMENT ABORT TEST. THIS PROGRAM TESTS MEMORY MGMT ABORT ERRORS
;THIS PROGRAM IS A MODIFICATION OF THE 11/40 TEST, DBKTF. THIS
;VERSION HAS BEEN MODIFIED TO ACCOUNT FOR ANY 11/40-11/34 DIFFERENCE.
;THIS PROGRAM IS INTENDED TO BE RUN ONLY ON 11/34 PROCESSORS.

;GENERAL REGISTER ASSIGNMENTS
000000      R0=X0
000001      R1=X1
000002      R2=X2
000003      R3=X3
000004      R4=X4
000005      R5=X5
000006      SP=X6
000007      PC=X7

;STACK POINTER REGISTERS
000006      KSP=X6      ;KERNEL STACK POINTER
000006      USP=X6      ;USER STACK POINTER

;STATUS REGISTER BIT ASSIGNMENTS
000001      C=1
000002      V=2
000004      Z=4
000010      N=10
000020      T=20
000340      PRTY7=340   ;'T' BIT
000200      PRTY4=200   ;PRIORITY LEVEL 7
000000      KM=000000   ;PRIORITY LEVEL 4
140000      UM=140000   ;KERNEL MODE
000000      PKM=000000  ;USER MODE
030000      PUM=030000  ;PREVIOUS KERNEL MODE
                   ;PREVIOUS USER MODE

;VECTOR ADDRESSES
000010      ERRVEC=10    ;ADDRESS OF ERROR VECTOR
000014      TBIVVEC=14   ;ADDRESS OF 'T' BIT TRAP VECTOR
000020      IOTVEC=20    ;ADDRESS OF IOT TRAP VECTOR
000024      PFVEC=24     ;ADDRESS OF POWER FAIL TRAP VECTOR
000030      EMTVEC=30    ;ADDRESS OF EMT VECTOR
000034      TRAPVEC=34   ;ADDRESS OF TRAP VECTOR
000064      TPVEC=64     ;ADDRESS OF TTY PRINTER INTERRUPT VECTOR
000244      FPVEC=244    ;ADDRESS OF FLOATING POINT INT. VECTOR
000250      MMVEC=250    ;ADDRESS OF MEMORY MGMT ERROR TRAP VECTOR

;REGISTER ADDRESSES
177776      PSW=177776   ;ADDRESS OF STATUS REGISTER
177560      TKS=177560   ;ADDRESS OF KEYBOARD CSR
177562      TKB=177562   ;ADDRESS OF KEYBOARD BUFFER
177564      TPS=177564   ;ADDRESS OF TELEPRINTER CSR
177566      TPB=177566   ;ADDRESS OF TELEPRINTER BUFFER
177570      SWR=177570   ;ADDRESS OF CONSOL SWITCH REGISTER

;INITIAL STACK POINTER SETTINGS

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001100      KPTR=1100    ;BOTTOM OF KERNEL STACK
000600      UPTR=600     ;USER STACK SETTING

;MISCELLANEOUS BIT ASSIGNMENTS
100000      BIT15=100000
040000      BIT10=400000
020000      BIT13=200000
000400      BIT8=400
000100      BIT6=100

;MEMORY MANAGEMENT REGISTER SR0 BIT ASSIGNMENTS
000001      ENM=1       ;ENABLE MEMORY MANAGEMENT
000002      VS0=0
000002      VS1=2
000004      VS2=4
000006      VS3=6
000010      VS4=10
000012      VS5=12
000014      VS6=14
000016      VS7=16
000000      IS=00
000140      UPG=140
000000      KPG=000
000400      DM=400      ;DESTINATION MODE
020000      IVA=20000   ;ACCESS VIOLATION ABORT
040000      PLA=40000   ;PAGE LENGTH ABORT
100000      NRA=100000  ;NON-RESIDENT ABORT

;PAGE DESCRIPTOR REGISTER (PDR) BIT ASSIGNMENTS
000010      ED=10       ;EXPANSION DIRECTION BIT IN PDR
000000      UP=0        ;EXPAND UP
000010      DWN=10      ;EXPAND DOWN
000100      W=100       ;'W' BIT IN PDR

;MEMORY MANAGEMENT REGISTER ADDRESS ASSIGNMENTS
177572      SR0=177572   ;ADDRESS OF MEMORY MGMT REGISTER SR0
177574      SR1=177574   ;      "      "      "      "      SR1
177576      SR2=177576   ;      "      "      "      "      SR2

177600      UIPDR0=177600 ;ADDRESS OF USER 'I' PDR'S
177602      UIPDR1=177602
177604      UIPDR2=177604
177606      UIPDR3=177606
177610      UIPDR4=177610
177612      UIPDR5=177612
177614      UIPDR6=177614
177616      UIPDR7=177616

177640      UIPAR0=177640
177642      UIPAR1=177642
177644      UIPAR2=177644
177646      UIPAR3=177646
177650      UIPAR4=177650
177652      UIPAR5=177652

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177654          UIPAR6=177654
177656          UIPAR7=177656

172300          KIPDR0=172300
172302          KIPDR1=172302
172304          KIPDR2=172304
172306          KIPDR3=172306
172310          KIPDR4=172310
172312          KIPDR5=172312
172314          KIPDR6=172314
172316          KIPDR7=172316

172340          KIPAR0=172340
172342          KIPAR1=172342
172344          KIPAR2=172344
172346          KIPAR3=172346
172350          KIPAR4=172350
172352          KIPAR5=172352
172354          KIPAR6=172354
172356          KIPAR7=172356
  
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000000          JACCESS CONTROL FIELD DEFINITIONS (IN PDR)
000002          NR0=0          JNON-RESIDENT ABORT ALL REFS.
000004          R00=2          JREAD,ABORT ON WRITE
000006          RWT=4          JTRAP ON READ & WRITE
000006          RW=6          JREAD & WRITE
  
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000000          JINSTRUCTION EQUATES
104000          HLT=HALT
104000          SCOPE=EMT          JSCOPE IS AN EMT TRAP
  
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016700          JVIRTUAL ADDRESSES
140000          KI0=16700
120000          KI6=140000
100000          UI5=120000
040000          UI4=100000
020000          UI2=40000
000000          UI1=20000
000000          UI3=60000
  
```

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016600          JCORRESPONDING PHYSICAL ADDRESSES
016700          PKI0=16600
017200          PKI6=16700
017300          PUI5=17200
017400          PUI4=17300
017000          PUI3=17400
017100          PUI2=17000
017100          PUI1=17100
          .LIST ME
          .NLIST MC,MD
JFILL TRAP AND INTERRUPT VECTOR AREA WITH
          J,+2
          JHALT
JUNEXPECTED TRAPS/INTERRUPTS WILL HALT AT VECTOR ADDRESS *2
  
```

JAND DISPLAY VECTOR ADDRESS+4 NOTE: LISTING DOES NOT SHOW LOADING THE JVECTOR AREA.

```

000010          .NLIST MC
000010          .ERRVEC
000030          .WORD SHLT
000030          .EMTVEC
000046          .WORD SCOPEA
000046          .=46
000052          LOGIC
000052          .=52
000052          0

000176          .=176
000176          HALT
          JEXAMINE R1, THE CONTENTS OF WHICH IS THE PC OF THE PRESENT TEST
          JTHE TOP WORD ON THE KERNEL STACK CONTAINS THE VIRTUAL
          JADDRESS OF THE HLT INSTRUCTION IN THE TEST THAT FAILED.
000200          .=200
000200          JMP STANT          JGO START TEST

000400          .=400
          JUSER HLT (HALT) TRAP SERVICE ROUTINE
000400          SHLT: BIC #1,0#SR0          JTURN MEM MGMT OFF
000406          042737 140000 177776 BIC #140000,0#PSW          JRETURN TO KERNEL
000414          162716 000002 SUB #2,(KSP)          JPOINT PC TO TRAPPING INST.
000420          005776 000000 TST 0(KSP)          JWAS IT A HLT (HALT)
000424          001404 BEQ SHLTA
000426          062716 000002 ADD #2,(KSP)          JRESTORE PC TO TRAPPING INST.
000432          000137 000012 JMP 0#ERRVEC+2          JGO HALT AT 6
000436          000137 000176 SHLTA: JMP 0#176          JGO HALT AT ADDRESS 176

          JSCOPE (EMT) SERVICE ROUTINE
000442          005037 177572 SCOPEA: CLR 0#SR0          JDISABLE MEMORY MGMT
000446          011601 MOV (KSP),R1          JSAVE PC IN R1
000450          012706 001100 MOV #KPTR,KSP          JSET KERNEL STACK PTR
000454          005046 CLR -(KSP)          JSET UP FOR KERNEL MODE ON RETURN
000456          010146 MOV R1,-(KSP)          JRETURN IN LINE
000460          012746 000600 MOV #UPTR,-(KSP)          JUSER STACK PTR ON KERNEL STACK
000464          012737 030000 177776 MOV #PUM,0#PSW          JPREVIOUS USER MODE
000472          106606 MTPD USP          JSET USER STACK PTR
000474          001400 BEQ SCOPEX
000476          000006 SCOPEX: RTT          JRETURN TO NEXT TEST IN KERNEL MODE
          JWITH ALL STACK PTRS SET UP

001200          .=1200
          JTAGS
001200          ICNT: 0          JCONTAINS PASS COUNT
001202          SR0: 0          JCONTAINS SR0 CONTENTS ON ERROR
001204          TEMP=.
001212          .=,+6
  
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)START MEMORY MANAGEMENT TEST.
001212 000240          )START: NOP
001214 005067 177760  )CLR ICNT          )CLEAR PASS COUNT
001220 012706 001100  )BEGIN: MOV #KPTR,KSP )SET KERNEL STACK PTR
001224 104000          )SCOPE SCOPE          )SCOPE SETS ALL STACK PTRS
001226 005037 000252  )CLR #MMVEC+2      )KERNEL MODE ON ABORT

)ROUTINE TO CLEAR MEMORY MANAGEMENT REGISTERS.
MM0:
001232 000240          )NOP
001234 005067 176332  )CLR SR0
001240 012702 177600  )MOV #UIPDR0,R2
001244 012703 000010  )MOV #8.,R3
001250 005022          )CLR (R2)+
001252 077302          )SOB R3,.-2
001254 012702 177640  )MOV #UIPAR0,R2
001260 012703 000010  )MOV #8.,R3
001264 005022          )CLR (R2)+
001266 077302          )SOB R3,.-2
001270 012702 172300  )MOV #KIPDR0,R2
001274 012703 000010  )MOV #8.,R3
001300 005022          )CLR (R2)+
001302 077302          )SOB R3,.-2
001304 012702 172340  )MOV #KIPAR0,R2
001310 012703 000010  )MOV #8.,R3
001314 005022          )CLR (R2)+
001316 077302          )SOB R3,.-2

001320 012737 073006 172300 )MMK: MOV #73006,##KIPDR0 )RW, UP 167 BLOCKS
001326 012737 000006 172314 )MOV #6,##KIPDR6 )RW, UP 1 BLOCK
001334 012737 077406 172316 )MOV #77406,##KIPDR7 )RW, UP 200 BLOCKS
001342 012737 073006 177600 )MOV #73006,##UIPDR0 )RW, UP 167 BLOCKS
001350 012737 000006 177604 )MOV #6,##UIPDR2 )RW, UP 1 BLOCK
001356 012737 000006 177602 )MOV #6,##UIPDR1 )RW, UP 1 BLOCK
001364 012737 000006 177610 )MOV #6,##UIPDR4 )RW, UP 1 BLOCK
001372 012737 000006 177612 )MOV #6,##UIPDR5 )RW, UP 1 BLOCK

001400 005067 170734          )CLR KIPAR0          )VA=PA=0000-16677
001404 012767 000167 170742  )MOV #167,KIPAR6     )VA=140000-140077/PA=16700-16777
001412 012767 007600 170736  )MOV #7600,KIPAR7   )VA=160000-177776,PA=760000-777776
001420 005067 176214          )CLR UIPAR0          )VA=PA=0-16677
001424 012767 000170 176212  )MOV #170,UIPAR2     )VA=40000-40077/PA=17000-17077
001432 012767 000171 176202  )MOV #171,UIPAR1     )VA=20000-20077/PA=17100-17177
001440 012767 000172 176204  )MOV #172,UIPAR5     )VA=120000-120077/PA=17200-17277
001446 012767 000173 176174  )MOV #173,UIPAR4     )VA=100000-100077/PA=17300-17377

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)CHECK
)ABORTS WHEN SOURCE OPERAND IS FETCHED

)SOURCE MODE=1.
T0:
001454          )MOV #T0C,##MMVEC      )LOAD MEM MGMT ERROR VECTOR
001454 012737 001510 000250  )CLR MMVEC+2
001462 005067 176564          )MOV #K10,R3
001466 012703 016700          )MOV R3,R2
001472 010302          )CLR (R3)
001474 005013          )INC ##SR0          )ENABLE MEMORY MGMT
001476 005237 177572          )SOB R3,.-2
001502 000277          )SOB R3,.-2
001504 011302          )MOV (R3),R2          )MEM MGMT LENGTH ABORT AT SRC00
001506 000000          )HLT                  )ERROR! DID NOT ABORT
001510 022706 001074          )T0C: CMP #KPTR=4,KSP )CHECK STACK PTR
001514 001401          )BEQ .+4
001516 000000          )HLT
001520 022766 000017 000002  )CMP #17,2(KSP)      )CHECK THAT CORRECT STATUS
001526 001401          )BEQ .+4              )WAS SAVED ON THE STACK
001530 000000          )HLT                  )ERROR! INCORRECT STATUS
001532 022767 040001 176032  )CMP #PLA+1,SR0     )CHECK SR0 (ABORT CONDITIONS
001540 001401          )BEQ .+4              )& FAILING PAGE #)
001542 000000          )HLT                  )ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
001544 022767 001504 176024  )CMP #T0A,SR2       )CHECK CONTENTS OF SR2
001552 001401          )BEQ .+4              )ERROR! INCORRECT PC IN SR2
001554 000000          )HLT                  )PC OF ABORTED INSTRUCTION)
001556 020203          )CMP R2,R3          )ERROR! INCORRECT PC IN SR2
001560 001401          )BEQ .+4              )CHECK THAT INSTRUCTIONS AS ABORTED
001562 000000          )HLT
001564 104000          )SCOPE              )ERROR!
)SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

)CHECK
)ABORTS WHEN SOURCE OPERAND IS FETCHED
)SOURCE MODE=2,BYTE INSTRUCTION
T1:
001566 012737 001614 000250  )MOV #T1C,##MMVEC      )LOAD MEM MGMT ERROR VECTOR
001574 012702 016700          )MOV #K10,R2
001600 010204          )MOV R2,R4
001602 005012          )CLR (R2)
001604 005237 177572          )INC ##SR0          )ENABLE MEMORY MGMT
001610 122202          )T1A: CMPB (R2)+,R2   )SEG LENGTH ABORT AT SRC01
001612 000000          )T1B: HLT                  )ERROR! DID NOT ABORT
001614 022706 001074          )T1C: CMP #KPTR=4,KSP )CHECK STACK PTR
001620 001401          )BEQ .+4
001622 000000          )HLT
001624 022767 040001 175740  )CMP #PLA+1,SR0     )CHECK SR0 (ABORT CONDITIONS
001632 001401          )BEQ .+4              )& FAILING PAGE #)
001634 000000          )HLT                  )ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
001636 022767 001610 175732  )CMP #T1A,SR2       )CHECK CONTENTS OF SR2
001644 001401          )BEQ .+4              )PC OF ABORTED INSTRUCTION)
001646 000000          )HLT                  )ERROR! INCORRECT PC IN SR2

)CHECK THAT REGISTER INCREMENTED PROPERLY
001650 022702 016700          )CMP #K10,R2
001654 001401          )BEQ .+4

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002316 000000 HLT ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
002320 022767 002300 175250 CMP #T6A,SR2 ;CHECK CONTENTS OF SR2
002326 001401 BEQ .+4 ;(PC OF ABORTED INSTRUCTION)
002330 000000 HLT ERROR! INCORRECT PC IN SR2
002332 005202 INC R2 ;CHECK THAT R2 WAS NOT CHANGED
002334 001401 BEQ .+4
002336 000000 HLT ERROR!
002340 104000 SCOPE ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

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;CHECK
;ABORTS WHEN ADDRESS OF SOURCE OPERAND IS FETCHED
;SOURCE MODE = 7, PC
002342 012737 002364 000250 MOV #T7C,##MMVEC ;LOAD MEM MGMT ERROR VECTOR
002350 005004 CLR R4
002352 005237 177572 INC ##SR0 ;ENABLE MEMORY MGMT
002356 007404 016700 T7A: ADD #K10(R4),R4 ;SEG LEN ABORT
002362 000000 T7B: HLT ;ERROR! FAILED TO ABORT
002364 T7C:
002364 022767 040001 175200 CMP #PLA+1,SR0 ;CHECK SR0 (ABORT CONDITIONS
002372 001401 BEQ .+4 ;& FAILING PAGE #)
002374 000000 HLT ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
002376 022767 002356 175172 CMP #T7A,SR2 ;CHECK CONTENTS OF SR2
002404 001401 BEQ .+4 ;(PC OF ABORTED INSTRUCTION)
002406 000000 HLT ERROR! INCORRECT PC IN SR2
002410 005704 TST R4
002412 001401 BEQ .+4
002414 000000 HLT
002416 104000 SCOPE ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

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;CHECK
;ABORTS WHEN SOURCE OPERAND IS FETCHED
;SOURCE MODE = 3,PC
002420 012737 002442 000250 MOV #T10C,##MMVEC ;LOAD MEM MGMT ERROR VECTOR
002426 005003 CLR R3
002430 005237 177572 INC ##SR0 ;ENABLE MEMORY MGMT
002434 013703 016700 T10A: MOV #K10,R3 ;SEG LEN ABORT
002440 000000 T10B: HLT ;ERROR! FAILED TO ABORT
002442 T10C:
002442 022767 040001 175122 CMP #PLA+1,SR0 ;CHECK SR0 (ABORT CONDITIONS
002450 001401 BEQ .+4 ;& FAILING PAGE #)
002452 000000 HLT ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
002454 022767 002434 175114 CMP #T10A,SR2 ;CHECK CONTENTS OF SR2
002462 001401 BEQ .+4 ;(PC OF ABORTED INSTRUCTION)
002464 000000 HLT ERROR! INCORRECT PC IN SR2
002466 005703 TST R3
002470 001401 BEQ .+4
002472 000000 HLT
002474 104000 SCOPE ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

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;CHECK
;ABORTS WHEN TOP WORD OFF STACK (PC) IS FETCHED
002476 012737 002544 000250 MOV #T13C,##MMVEC ;LOAD MEM MGMT ERROR VECTOR
002504 012767 170000 175264 MOV #UM+PUM,PSW ;USER MODE!!! PREV USER MODE!!!

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002512 012706 040100 MOV #UI2+100,USP ;USER STACK PTR IS NON-RES
002516 012737 002542 017100 MOV #T13D,##PUI2+100 ;LOAD 'NEW' PC
002524 005037 017102 CLR ##PUI2+102
002530 005237 177572 INC ##SR0 ;ENABLE MEMORY MGMT
002534 000277 SCC
002536 000002 T13A: RTI ;NON-RES ABORT
002540 000000 T13B: HLT ;ERROR! FAILED TO ABORT
002542 000000 T13D: HLT ;ERROR! RTI FAILED & DID NOT ABORT
002544 022706 001074 T13C: CMP #KPTR-4,KSP ;CHECK STACK PTR
002550 001401 BEQ .+4
002552 000000 HLT
002554 022766 170017 000002 CMP #UM+PUM+17,2(KSP) ;CHECK THAT CORRECT STATUS
002562 001401 BEQ .+4 ;WAS SAVED ON THE STACK
002564 000000 HLT ;ERROR! INCORRECT STATUS
002566 022767 040145 174776 CMP #PLA+UPG+VS2+1,SR0 ;CHECK SR0 (ABORT CONDITIONS
002574 001401 BEQ .+4 ;& FAILING PAGE #)
002576 000000 HLT ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
002600 022767 002536 174770 CMP #T13A,SR2 ;CHECK CONTENTS OF SR2
002606 001401 BEQ .+4 ;(PC OF ABORTED INSTRUCTION)
002610 000000 HLT ;ERROR! INCORRECT PC IN SR2
002612 106506 MFPD USP ;PUSH USER STACK PTR ONTO KERNEL STACK
002614 022716 040100 CMP #UI2+100,(KSP) ;CHECK THAT USER STACK PTR WAS POPPED
002620 001401 BEQ .+4
002622 000000 HLT
002624 104000 SCOPE ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

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;CHECK
;ABORTS WHEN SECOND WORD ON STACK (STATUS) IS FETCHED
002626 012737 002672 000250 MOV #T14C,##MMVEC ;LOAD MEM MGMT ERROR VECTOR
002634 012767 170000 175134 MOV #UM+PUM,PSW ;USER MODE!!!,PREV USER MODE!!!
002642 012706 100076 MOV #UI4+76,USP
002646 012737 002670 017376 MOV #T14D,##PUI4+76 ;LOAD USER STACK (PHYS ADRS.)
002654 005037 017400 CLR ##PUI4+100 ;AND 'NEW' STATUS
002660 005237 177572 INC ##SR0 ;ENABLE MEMORY MGMT
002664 000006 T14A: RTT ;SEG LEN ABORT AFTER FIRST POP
002666 000000 T14B: HLT ;ERROR! FAILED TO ABORT
002670 000000 T14D: HLT ;ERROR!
002672 T14C:
002672 022767 040151 174672 CMP #PLA+UPG+VS4+1,SR0 ;CHECK SR0 (ABORT CONDITIONS
002700 001401 BEQ .+4 ;& FAILING PAGE #)
002702 000000 HLT ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
002704 022767 002664 174664 CMP #T14A,SR2 ;CHECK CONTENTS OF SR2
002712 001401 BEQ .+4 ;(PC OF ABORTED INSTRUCTION)
002714 000000 HLT ;ERROR! INCORRECT PC IN SR2
002716 106506 MFPD USP ;PUSH USER STACK PTR ONTO KERNEL STACK
002720 022716 100100 CMP #UI4+100,(KSP) ;CHECK THAT USER STACK PTR POPPED TWICE
002724 001401 BEQ .+4
002726 000000 HLT
002730 104000 SCOPE ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

```

```

;CHECK
;ABORTS WHEN TOP WORD ON USER STACK (RETURN PC) IS FETCHED
002732 012767 170000 175036 MOV #UM+PUM,PSW ;USER MODE!!! PREV USER MODE!!!
002740 012706 020100 MOV #UI1+100,USP

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002744 012737 002770 000250      MOV      #T16C,##MMVEC  ;LOAD MEM MGMT ERROR VECTOR
002752 012705 002766              MOV      #T16D,R5
002756 005237 177572              INC      ##SR0        ;ENABLE MEMORY MGMT
002762 000205              T16A:   RTS          5          ;ABORTS (STACK IS NON-RES)
002764 000000              T16B:   HLT          ;ERROR! RTS& ABORT FAILED
002766 000000              T16D:   HLT          ;ERROR! ABORT FAILED
002770 022706 001074              T16C:   CMP      #KPTR=4,KSP ;CHECK STACK PTR
002774 001401              BEQ     .+4
002776 000000              HLT
003000 022767 040143 174564              CMP      #PLA+UPG+VS1+1,SR0 ;CHECK SR0 (ABORT CONDITIONS)
003006 001401              BEQ     .+4          ;& FAILING PAGE #)
003010 000000              HLT          ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
003012 022767 002762 174556              CMP      #T16A,SR2    ;CHECK CONTENTS OF SR2
003020 001401              BEQ     .+4          ;(PC OF ABORTED INSTRUCTION)
003022 000000              HLT          ;ERROR! INCORRECT PC IN SR2
003024 022705 002766              CMP      #T16D,R5    ;CHECK THAT R5 DID NOT CHANGE
003030 001401              BEQ     .+4
003032 000000              HLT          ;ERROR!
003034 106506              MFPD    USP          ;PUSH USER STACK PTR ONTO KERNEL STACK
003036 022716 020100              CMP      #UI1*100,(KSP) ;CHECK THAT USER STACK WAS POPPED
003042 001401              BEQ     .+4
003044 000000              HLT          ;ERROR! INCORRECT USER STACK PTR
003046 104000              SCOPE     ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

;CHECK
;ABORTS WHEN SOURCE INDEX IS FETCHED
;SOURCE MODE = 6, PC
003050 012737 003112 000250      MOV      #T20C,##MMVEC  ;LOAD MEM MGMT ERROR VECTOR
003056 012702 177777              MOV      #-1,R2        ;PRESET DEST REG
003062 012737 016702 016676              MOV      #16702,##KI0-2 ;16702,000000 IS A MOV .+4,R2
003070 005037 016700              CLR      ##KI0        ;INSTRUCTION
003074 005037 016702              CLR      ##KI0+2
003100 005237 177572              INC      ##SR0        ;ENABLE MEMORY MGMT
003104 000277              SCC
003106 000137 016676              JMP      ##KI0-2      ;GO TO MOV INST.
003112              RETURN=.

;***** NOTE PC CHANGE *****
;KI0=2
016676 016702 000000              T20A:   MOV      .+4,R2    ;SEG LEN ABORT WHEN INDEX VALUE IS FETCHED
016702 000000              T20B:   HLT          ;ERROR! FAILED TO ABORT
;***** RETURN PC *****
;RETURN
003112 022706 001074              T20C:   CMP      #KPTR=4,KSP ;CHECK STACK PTR
003116 001401              BEQ     .+4
003120 000000              HLT
003122 022766 000017 000002              CMP      #17,2(KSP)    ;CHECK THAT CORRECT STATUS
003130 001401              BEQ     .+4          ;WAS SAVED ON THE STACK
003132 000000              HLT          ;ERROR! INCORRECT STATUS
003134 022767 040001 174430              CMP      #PLA+IS+VS0+1,SR0 ;CHECK SR0 (ABORT CONDITIONS)
003142 001401              BEQ     .+4          ;& FAILING PAGE #)
003144 000000              HLT          ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
003146 022767 016676 174422              CMP      #T20A,SR2    ;CHECK CONTENTS OF SR2
003154 001401              BEQ     .+4          ;(PC OF ABORTED INSTRUCTION)
003156 000000              HLT          ;ERROR! INCORRECT PC IN SR2
003160 005202              INC      R2
```

```
003162 001401              BEQ     .+4
003164 000000              HLT
003166 104000              SCOPE     ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

;CHECK
;ABORTS WHEN SOURCE INDEX IS FETCHED
;SOURCE MODE = 7
003170 012737 003232 000250      MOV      #T21C,##MMVEC  ;LOAD MEM MGMT ERROR VECTOR
003176 012737 177777 016700              MOV      #-1,##PKI6
003204 012702 140000              MOV      #KI6,R2      ;LOAD INDEX REGISTER
003210 012737 017202 016676              MOV      #017202,##KI0-2 ;017202,000000 IS A MOV #0(R2),R2
003216 005037 016700              CLR      ##KI0        ;INSTRUCTION
003222 005237 177572              INC      ##SR0        ;ENABLE MEMORY MGMT
003226 000137 016676              JMP      ##KI0-2
003232              RETURN=.

;***** NOTE PC CHANGE *****
;KI0=2
016676 017202 000000              T21A:   MOV      #0(R2),R2 ;SEG LEN ABORT
016702 000000              T21B:   HLT          ;ERROR! FAILED TO ABORT
;***** RETURN PC *****
;RETURN
003232              T21C:
003232 022767 040001 174332              CMP      #PLA+IS+VS0+1,SR0 ;CHECK SR0 (ABORT CONDITIONS)
003240 001401              BEQ     .+4          ;& FAILING PAGE #)
003242 000000              HLT          ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
003244 022767 016676 174324              CMP      #T21A,SR2    ;CHECK CONTENTS OF SR2
003252 001401              BEQ     .+4          ;(PC OF ABORTED INSTRUCTION)
003254 000000              HLT          ;ERROR! INCORRECT PC IN SR2
003256 022702 140000              CMP      #KI6,R2     ;CHECK THAT R2 IS UNCHANGED
003262 001401              BEQ     .+4
003264 000000              HLT          ;ERROR!
003266 104000              SCOPE     ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

;CHECK
;ABORTS WHEN INST FOLLOWING SOB IS FETCHED
003270 012703 000001              MOV      #1,X3
003274 012737 077302 016676              MOV      #077302,##KI0-2 ;077302=SOB R3,-2
003302 005037 016674              CLR      ##KI0-4      ;CLEAR INST. PRECEDING SOB (-2)
003306 005037 016700              CLR      ##KI0        ;PUT HLT FOLLOWING SOB
003312 012737 003332 000250              MOV      #T22C,##MMVEC  ;LOAD MEM MGMT ERROR VECTOR
003320 005237 177572              INC      ##SR0        ;ENABLE MEMORY MGMT
003324 000277 016676              SCC
003326 000137              JMP      ##KI0-2      ;GO TO SOB INST.

;***** RETURN PC *****
;KI0=4
016674 000000              T22:   HLT          ;ERROR! SOB BRANCHED & FAILED TO ABORT
016676 077302              T22A:   SOB      R3,-2    ;ABORTS WHEN NEXT INST. IS FETCHED
016700 000000              T22AA:  HLT          ;ERROR! FAILED TO ABORT
016702 000000              T22B:   0
003332              ;=RETURN

003332 022706 001074              T22C:   CMP      #KPTR=4,KSP ;CHECK STACK PTR
```

```

003336 001401      BEQ      ,+4
003340 000000      HLT
003342 022766 000017 000002      CMP      #17,2(KSP)      ;CHECK THAT CORRECT STATUS
003350 001401      BEQ      ,+4      ;WAS SAVED ON THE STACK
003352 000000      HLT      ;ERROR! INCORRECT STATUS
003354 022767 000001 174210      CMP      #PLA+VS0+1,SR0 ;CHECK SR0 (ABORT CONDITIONS
003362 001401      BEQ      ,+4      ;& FAILING PAGE #)
003364 000000      HLT      ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
003366 022767 016676 174202      CMP      #T22A,SR2      ;CHECK CONTENTS OF SR2
003374 001401      BEQ      ,+4      ;(PC OF ABORTED INSTRUCTION)
003376 000000      HLT      ;ERROR! INCORRECT PC IN SR2
003400 005703      TST      R3      ;CHECK THAT R3 DECREMENTD
003402 001401      BEQ      ,+4
003404 000000      HLT
003406 104000      SCOPE      ;ERROR! R3 WAS NOT DECREMENTED BY SOB
;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

```

```

;CHECK
;ABORTS WHEN DEST OPERAND IS FETCHED
003410 012767 030000 174360      MOV      #KM+PUM,PSW
003416 012737 003440 000250      MOV      #T24C,#MMVEC ;LOAD MEM MGMT ERROR VECTOR
003424 012702 040000      MOV      #UI2,R2
003430 005237 177572      INC      #SR0 ;ENABLE MEMORY MGMT
;NON-RESIDENT ABORT
T24A: HFPD
T24B: HLT
T24C: CMP      #KPTR-4,KSP ;CHECK STACK PTR
      BEQ      ,+4
      HLT
003450 022767 040143 174114      CMP      #UP6+PLA+VS1+1,SR0 ;CHECK SR0 (ABORT CONDITIONS
; & FAILING PAGE #)
003456 001401      BEQ      ,+4      ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
003460 000000      HLT      ;CHECK CONTENTS OF SR2
003462 022767 003434 174106      CMP      #T24A,SR2      ;(PC OF ABORTED INSTRUCTION)
003470 001401      BEQ      ,+4      ;ERROR! INCORRECT PC IN SR2
003472 000000      HLT      ;CHECK THAT R2 AUTO-DECREMENTED
003474 022702 037776      CMP      #UI2-2,R2
003500 001401      BEQ      ,+4
003502 000000      HLT
003504 104000      SCOPE      ;ERROR! R2 DID NOT AUTO-DECREMENT
;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

```

```

;CHECK
;ABORTS WHEN DEST OPERAND IS FETCHED
003506 012737 003536 000250      MOV      #T25C,#MMVEC ;LOAD MEM MGMT ERROR VECTOR
003514 012702 177572      MOV      #SR0,R2
003520 012767 170000 174250      MOV      #UM+PUM,PSW
003526 005237 177572      INC      #SR0 ;ENABLE MEMORY MGMT
T25A: CLR      (R2) ;ABORT
T25B: HLT      ;ERROR! FAILED TO ABORT
T25C: CMP      #KPTR-4,KSP ;CHECK STACK PTR
      BEQ      ,+4
      HLT
003546 022767 140157 174016      CMP      #NRA+PLA+UPG+VS7+1,SR0 ;CHECK SR0 (ABORT CONDITIONS
; & FAILING PAGE #)
003554 001401      BEQ      ,+4      ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
003556 000000      HLT      ;CHECK CONTENTS OF SR2
003560 022767 003532 174010      CMP      #T25A,SR2      ;(PC OF ABORTED INSTRUCTION)
003566 001401      BEQ      ,+4

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003570 000000      HLT
003572 104000      SCOPE      ;ERROR! INCORRECT PC IN SR2
;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

```

```

;CHECK
;ABORTS WHEN DEST OPERAND IS FETCHED
003574 012737 003624 000250      MOV      #T30C,#MMVEC ;LOAD MEM MGMT ERROR VECTOR
003602 012703 016677      MOV      #KI0-1,R3
003606 012737 177777 016700      MOV      #-1,#KI0
003614 005237 177572      INC      #SR0 ;ENABLE MEMORY MGMT
003620 142323      BICB    (R3)+,(R3)+ ;SEG LENGTH ABORT
003622 000000      HLT      ;ERROR! FAILED TO ABORT

```

```

T30C:
003624 022767 040001 173740      CMP      #PLA+1,SR0 ;CHECK SR0 (ABORT CONDITIONS
; & FAILING PAGE #)
003632 001401      BEQ      ,+4      ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
003634 000000      HLT      ;CHECK CONTENTS OF SR2
003636 022767 003620 173732      CMP      #T30A,SR2      ;(PC OF ABORTED INSTRUCTION)
003644 001401      BEQ      ,+4      ;ERROR! INCORRECT PC IN SR2
003646 000000      HLT      ;DISABLE MEMORY MGMT
003650 005037 177572      CLR      #SR0
003654 022703 016700      CMP      #KI0,R3 ;CHECK AUTO-INC TWICE
003660 001401      BEQ      ,+4
003662 000000      HLT      ;ERROR!
003664 005237 016700      INC      #KI0
003670 001401      BEQ      ,+4
003672 000000      HLT
003674 104000      SCOPE      ;ERROR!
;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

```

```

;CHECK
;ABORTS WHEN ADDRESS OF DEST OPERAND IS FETCHED
003676 012737 003746 000250      MOV      #T31C,#MMVEC ;LOAD MEM MGMT ERROR VECTOR
003704 012702 040000      MOV      #UI2,R2
003710 012703 017100      MOV      #PUI1,R3
003714 012713 177777      MOV      #-1,(R3)
003720 011337 017000      MOV      (R3),#PUI2
003724 012703 020002      MOV      #UI1+2,R3 ;R3= USER VIRTUAL ADDRESS
003730 012767 170000 174040      MOV      #UM+PUM,PSW
003736 005237 177572      INC      #SR0
003742 114332      MOVB    -(R3),#(R2)+ ;NON-RESIDENT ABORT
003744 000000      HLT      ;ERROR! FAILED TO ABORT

```

```

T31C:
003746 022767 140157 173616      CMP      #NRA+PLA+UPG+VS7+1,SR0 ;CHECK SR0 (ABORT CONDITIONS
; & FAILING PAGE #)
003754 001401      BEQ      ,+4      ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
003756 000000      HLT      ;CHECK CONTENTS OF SR2
003760 022767 003742 173610      CMP      #T31A,SR2      ;(PC OF ABORTED INSTRUCTION)
003766 001401      BEQ      ,+4      ;ERROR! INCORRECT PC IN SR2
003770 000000      HLT      ;CHECK AUTO-INC
003772 022702 040002      CMP      #UI2+2,R2
003776 001401      BEQ      ,+4
004000 000000      HLT      ;ERROR!
004002 022703 020001      CMP      #UI1+1,R3 ;CHECK AUTO DECREMENT OF R3
004006 001401      BEQ      ,+4
004010 000000      HLT      ;ERROR! R3 NOT AUTO-DECREMENTED

```

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004012 104000                                SCOPE                                ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

;CHECK ABORT
004014 012737 004060 000250                MOV    #T32C,0,MMHVEC    ;LOAD MEM MGMT ERROR VECTOR
004022 012767 170000 173746                MOV    #UM+PUM,PSW
004030 012706 000600                        MOV    #UPTR,USP
004034 005016                                CLR    [USP]
004036 012702 060000                        MOV    #UI3,R2
004042 012737 177777 017400                MOV    #-1,MMUI3
004050 005237 177572                        INC    #SR0
004054 006632                                T32A: MTP1                ;ENABLE MEMORY MGMT
004056 000000                                T32B: HLT                 ;NON-RESIDENT ABORT
004060                                T32C: HLT                 ;ERROR: FAILED TO ABORT

004060 022767 100147 173504                CMP    #NRA+UPG+VS3+1,SR0    ;CHECK SR0 (ABORT CONDITIONS)
004066 001401                                BEQ    .+4                 ;& FAILING PAGE #)
004070 000000                                HLT    ;ERROR: INCORRECT ABORT CONDITIONS OR PAGE IDENT
004072 022767 004054 173476                CMP    #T32A,SR2
004100 001401                                BEQ    .+4                 ;CHECK CONTENTS OF SR2
004102 000000                                HLT    ;(PC OF ABORTED INSTRUCTION)
004104 106506                                MFPD   USP                ;ERROR: INCORRECT PC IN SR2
004106 022716 000602                        CMP    #UPTR+2,(KSP)        ;PUSH USER STACK PTR ONTO KERNEL STACK
004112 001401                                BEQ    .+4                 ;CHECK THAT USER STACK PTR POPPED
004114 000000                                HLT
004116 022702 060000                        CMP    #UI3,R2 ;CHECK AUTO=INC
004122 001401                                BEQ    .+4                 ;ERROR:
004124 000000                                HLT    ;ERROR:
004126 104000                                SCOPE                                ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

;CHECK
;ABORTS WHEN ADDRESS OF DEST OPERAND IS FETCHED
004130 012737 004164 000250                MOV    #T33C,MMHVEC    ;LOAD MEM MGMT ERROR VECTOR
004136 012767 030000 173632                MOV    #KM+PUM,PSW
004144 012716 117776                        MOV    #UI5-2,(KSP)        ;NON-RES ADDRESS
004150 012746 140000                        MOV    #KI6,-(KSP)        ;ADDRESS POINTER
004154 005237 177572                        INC    #SR0
004160 106636                                T33A: MTPD                ;ENABLE MEMORY MGMT
004162 000000                                T33B: HLT                 ;NON-RESIDENT ABORT WHEN MTPD
004164                                T33C: HLT                 ;ADDRESSES FINAL ADDRESS
004164                                T33C: HLT                 ;ERROR: FAILED TO ABORT

004164 022767 040151 173400                CMP    #PLA+UPG+VS4+1,SR0    ;CHECK SR0 (ABORT CONDITIONS)
004172 001401                                BEQ    .+4                 ;& FAILING PAGE #)
004174 000000                                HLT    ;ERROR: INCORRECT ABORT CONDITIONS OR PAGE IDENT
004176 022767 004160 173372                CMP    #T33A,SR2
004204 001401                                BEQ    .+4                 ;CHECK CONTENTS OF SR2
004206 000000                                HLT    ;(PC OF ABORTED INSTRUCTION)
004210 106506                                MFPD   KSP                ;ERROR: INCORRECT PC IN SR2
004212 022716 001076                        CMP    #KPTR-2,(KSP)        ;GET KERNEL STACK PTR
004216 001401                                BEQ    .+4                 ;CHECK THAT KERNEL STACK PTR POPPED TWICE
004220 000000                                HLT
004222 104000                                SCOPE                                ;ERROR:
;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

;CHECK
;ABORTS WHEN ADDRESS OF DEST OPERAND IS FETCHED
;DM=5
    
```

```

004224 012737 004260 000250                MOV    #T35C,MMHVEC    ;LOAD MEM MGMT ERROR VECTOR
004232 012704 016702                        MOV    #KI0+2,R4
004236 012727 020000 016676                MOV    #20000,#KI0-2
004244 005237 177572                        INC    #SR0
004250 000277                                SCC
004252 112754 177777                        T35A: MOV8                ;ENABLE MEMORY MGMT
004256 000000                                T35B: HLT                 ;SEG LENGTH ABORT
004260                                T35C: HLT                 ;ERROR: FAILED TO ABORT

004260 022766 000017 000002                CMP    #17,2(KSP)        ;CHECK THAT CORRECT STATUS
004266 001401                                BEQ    .+4                 ;WAS SAVED ON THE STACK
004270 000000                                HLT    ;ERROR: INCORRECT STATUS
004272 022767 040001 173272                CMP    #PLA+VS0+1,SR0    ;CHECK SR0 (ABORT CONDITIONS)
004300 001401                                BEQ    .+4                 ;& FAILING PAGE #)
004302 000000                                HLT    ;ERROR: INCORRECT ABORT CONDITIONS OR PAGE IDENT
004304 022767 004252 173264                CMP    #T35A,SR2
004312 001401                                BEQ    .+4                 ;CHECK CONTENTS OF SR2
004314 000000                                HLT    ;(PC OF ABORTED INSTRUCTION)
004316 022704 016700                        CMP    #KI0,R4
004322 001401                                BEQ    .+4                 ;ERROR: INCORRECT PC IN SR2
004324 000000                                HLT
004326 104000                                SCOPE                                ;ERROR:
;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

;CHECK
;ABORTS WHEN DEST OPERAND IS FETCHED
;DM=4
004330 012737 004362 000250                MOV    #T36C,MMHVEC    ;LOAD MEM MGMT ERROR VECTOR
004336 012704 140002                        MOV    #KI6+2,R4
004342 012703 016702                        MOV    #KI0+2,R3
004346 012713 177777                        MOV    #-1,(R3)
004352 005237 177572                        INC    #SR0
004356 154443                                T36A: B18B                ;ENABLE MEMORY MGMT
004360 000000                                T36B: HLT                 ;SEG LENGTH ABORT
004362                                T36C: HLT                 ;ERROR: FAILED TO ABORT

004362 022767 040001 173202                CMP    #PLA+1,SR0
004370 001401                                BEQ    .+4                 ;CHECK SR0 (ABORT CONDITIONS)
004372 000000                                HLT    ;& FAILING PAGE #)
004374 022767 004356 173174                CMP    #T36A,SR2
004402 001401                                BEQ    .+4                 ;ERROR: INCORRECT ABORT CONDITIONS OR PAGE IDENT
004404 000000                                HLT    ;CHECK CONTENTS OF SR2
004406 022703 016701                        CMP    #KI0+1,R3
004412 001401                                BEQ    .+4                 ;(PC OF ABORTED INSTRUCTION)
004414 000000                                HLT    ;CHECK AUTO=DEC
004416 022704 140001                        CMP    #KI6+1,R4
004422 001401                                BEQ    .+4                 ;ERROR:
004424 000000                                HLT    ;CHECK AUTO=DEC
004426 104000                                SCOPE                                ;ERROR: AUTO=DEC FAILED
;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

;CHECK
;WHEN INSTRUCTION FETCHES DESTINATION INDEX VALUE
004430 012737 004476 000250                MOV    #T40C,MMHVEC    ;LOAD MEM MGMT ERROR VECTOR
004436 012767 170000 173332                MOV    #UM+PUM,PSW
004444 012737 113767 017074                MOV    #113767,MMUI2+74    ;113767,020001,177776
    
```



```

017200 004753 T44A: JSR 7,0-(R3)
017202 000000 T44B: HLT JERROR!
005100 005100 .=RETURN
005100 022706 001074 T44C: CMP #KPTR-4,KSP JCHECK STACK PTR
005104 001401 BEQ .+4
005106 000000 HLT JINCORRECT STACK PTR
005110 022767 140157 172454 CMP #NRA+PLA+UPG+VS7+1,SR0 JCHECK SR0 (ABORT CONDITIONS
005116 001401 BEQ .+4 J& FAILING PAGE #)
005120 000000 HLT JERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
005122 022767 120000 172446 CMP #UI5,SR2 JCHECK CONTENTS OF SR2
005130 001401 BEQ .+4 J(PC OF ABORTED INSTRUCTION)
005132 000000 HLT JERROR! INCORRECT PC IN SR2
005134 106506 MFPD USP JGET USER STACK PTR (ON KERNEL STACK)
005136 022716 000576 CMP #UPTR-2,(KSP) JCHECK THAT USER STACK DID NOT
005142 001401 BEQ .+4 JGET PUSHED
005144 000000 HLT JERROR!
005146 022703 120004 CMP #UI5+4,R3 JCHECK AUTO-DEC
005152 001401 BEQ .+4
005154 000000 HLT JERROR!
005156 104000 SCOPE JSCOPE STORES PC IN R1 & SETS ALL STACK PTRS

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```

JCHECK
WHEN INSTRUCTION FETCHES DESTINATION OPERAND (UIPDR5)
005160 012737 005232 000250 MOV #T45C,#MMVEC JLOAD MEM MGMT ERROR VECTOR
005166 012767 170000 172602 MOV #UM+PUM,PSW JUSER MODE!!!,PREV USER MODE!!
005174 012706 000600 MOV #UPTR,USP JSET USER STACK PTR
005200 005016 CLR (USP)
005202 012737 012667 017200 MOV #012667,#PUI5 J012667,057606 = MOV (USP)+,UIPDR5
005210 012737 057606 017202 MOV #57606,#PUI5+2 JINSTRUCTION
005216 005037 017204 CLR #PUI5+4
005222 005237 177572 INC #SR0 JENABLE MEMORY MGMT
005226 000137 120000 JMP #UI5
005232 017200 RETURN=.
017200 012667 057606 T45A: MOV (USP)+,UIPDR5-UIS+PUI5
017204 000000 T45B: HLT JERROR! FAILED TO ABORT
005232 .=RETURN

005232 T45C:
005232 022767 140157 172332 CMP #NRA+UPG+PLA+VS7+1,SR0 JCHECK SR0 (ABORT CONDITIONS
005240 001401 BEQ .+4 J& FAILING PAGE #)
005242 000000 HLT JERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
005244 022767 120000 172324 CMP #UI5,SR2 JCHECK CONTENTS OF SR2
005252 001401 BEQ .+4 J(PC OF ABORTED INSTRUCTION)
005254 000000 HLT JERROR! INCORRECT PC IN SR2
005256 005037 177572 CLR #SR0 JDISABLE MEMORY MGMT
005262 005737 177612 TST #UIPDR5
005266 001001 BNE .+4
005270 000000 HLT
005272 104000 SCOPE JSCOPE STORES PC IN R1 & SETS ALL STACK PTRS

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JCHECK

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JABORTS WHEN REGISTER (R5) IS PUSHED ON USER STACK
005274 012737 005344 000250 MOV #TS0C,#MMVEC JLOAD MEM MGMT ERROR VECTOR
005302 012767 170000 172466 MOV #UM+PUM,PSW JUSER MODE!!!,PREV USER MODE!!
005310 012706 100000 MOV #UI4,USP JSET USER STACK PTR
005314 005037 017276 CLR #PUI4+2
005320 005005 CLR R5
005322 012767 005342 173654 MOV #TS0D,TEMP
005330 005237 177572 INC #SR0 JENABLE MEMORY MGMT
005334 004577 173644 TS0A: JSR 5,TEMP JNON-RES ABORT
005340 000000 TS0B: HLT JJSR FAILED & DID NOT ABORT
005342 000000 TS0C: HLT JERROR! FAILED TO ABORT
005344 TS0C:

005344 022767 140147 172220 CMP #NRA+PLA+UPG+VS3+1,SR0 JCHECK SR0 (ABORT CONDITIONS
005352 001401 BEQ .+4 J& FAILING PAGE #)
005354 000000 HLT JERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
005356 022767 005334 172212 CMP #TS0A,SR2 JCHECK CONTENTS OF SR2
005364 001401 BEQ .+4 J(PC OF ABORTED INSTRUCTION)
005366 000000 HLT JERROR! INCORRECT PC IN SR2
005370 106506 MFPD USP JPUSH USER STACK PTR ONTO KERNEL STACK
005372 022716 077776 CMP #UI4-2,(KSP) JCHECK THAT USER STACK PTR DEC-
005376 001401 BEQ .+4 JREMENTED
005400 000000 HLT JERROR!
005402 005705 TST R5
005404 001401 BEQ .+4
005406 000000 HLT
005410 104000 SCOPE JSCOPE STORES PC IN R1 & SETS ALL STACK PTRS

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JCHECK
JABORTS WHEN STATUS IS PUSHED ONTO USER STACK
005412 012737 005456 000250 MOV #TS2C,#MMVEC JLOAD MEM MGMT ERROR VECTOR
005420 012767 140000 172374 MOV #UM,IOTVEC+2
005426 012767 005454 172364 MOV #TS2D,IOTVEC
005434 012767 170000 172334 MOV #UM+PUM,PSW JUSER MODE!!!,PREV USER MODE!!
005442 005006 CLR USP JSET USER STACK PTR
005444 005237 177572 INC #SR0 JENABLE MEMORY MGMT
005450 000004 TS2A: JOT JNON-RESIDENT ABORT
005452 000000 TS2B: HLT JERROR! IOT & ABORT FAILED
005454 000000 TS2D: HLT JERROR! ABORT FAILED
005456 022706 001074 TS2C: CMP #KPTR-4,KSP JCHECK STACK PTR
005462 001401 BEQ .+4
005464 000000 HLT JINCORRECT STACK PTR
005466 022766 170000 000002 CMP #UM+PUM,2(KSP) JCHECK THAT CORRECT STATUS
005474 001401 BEQ .+4 JWAS SAVED ON THE STACK
005476 000000 HLT JERROR! INCORRECT STATUS
005500 022767 140157 172064 CMP #NRA+UPG+PLA+VS7+1,SR0 JCHECK SR0 (ABORT CONDITIONS
005506 001401 BEQ .+4 J& FAILING PAGE #)
005510 000000 HLT JERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
005512 022767 005450 172056 CMP #TS2A,SR2 JCHECK CONTENTS OF SR2
005520 001401 BEQ .+4 J(PC OF ABORTED INSTRUCTION)
005522 000000 HLT JERROR! INCORRECT PC IN SR2
005524 12737 000060 177777 CMQB #60,#PSW+1 JCHECK FOR CORRECT PSW ON ABORT
005532 001401 BEQ .+4 J(KM+PUM IN HIGH BYTE)
005534 000000 HLT JERROR! INCORRECT PSW AFTER ABORT
005536 012737 030000 177776 MOV #KM+PUM,#PSW JKERNEL MODE!!!,PREV SUPER MODE!!

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005544 106506 MFPD USP ;PUSH USER STACK PTR ONTO KERNEL STACK
005546 022716 177776 CMP #0=2,(KSP) ;CHECK PUSHES
005552 001401 BEQ .+4
005554 000000 HLT ;ERROR!
005556 104000 SCOPE ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS
  
```

```

;CHECK ABORTS WHEN RETURN PC IS PUSHED ONTO USER STACK
005560 012737 005626 000250 MOV #T53C,#MMVEC ;LOAD MEM MGMT ERROR VECTOR
005566 012767 170000 172022 MOV #UM*PUM,PSW ;USER MODE, PREV. USER MODE
005574 012706 040002 MOV #UI2+2,USP ;SET USER STACK PTR
005600 012767 005624 172212 MOV #T53D,IOTVEC
005606 012767 140340 172206 MOV #UM*PRTY7,IOTVEC+2
005614 005237 177572 INC #SR0 ;ENABLE MEMORY MGMT
005620 000000 T53A: IOT ;NON-RESIDENT ABORT AT TRP14
005622 000000 T53B: HLT ;ERROR! IOT & ABORT FAILED
005624 000000 T53D: HLT ;ERROR! ABORT FAILED
005626 022706 001074 T53C: CMP #KPTR=4,KSP ;CHECK STACK PTR
005632 001401 BEQ .+4
005634 000000 HLT ;INCORRECT STACK PTR
005636 022716 005622 CMP #T53B,(KSP) ;CHECK RETURN PC
005642 001401 BEQ .+4
005644 000000 HLT
005646 022766 170340 000002 CMP #UM*PUM+PRTY7,2(KSP) ;CHECK THAT CORRECT STATUS
005654 001401 BEQ .+4 ;WAS SAVED ON THE STACK
005656 000000 HLT ;ERROR! INCORRECT STATUS
005660 022767 040143 171704 CMP #PLA+UPG+VS1+1,SR0 ;CHECK SR0 (ABORT CONDITIONS)
005666 001401 BEQ .+4 ;& FAILING PAGE #)
005670 000000 HLT ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
005672 022767 005620 171676 CMP #T53A,SR2 ;CHECK CONTENTS OF SR2
005700 001401 BEQ .+4 ;(PC OF ABORTED INSTRUCTION)
005702 000000 HLT ;ERROR! INCORRECT PC IN SR2
005704 012767 030000 172064 MOV #KM*PUM,PSW
005712 106506 MFPD USP ;PUSH USER STACK PTR ONTO KERNEL STACK
005714 022716 037776 CMP #UI2=2,(KSP) ;CHECK THAT USER STACK PTR WAS
005720 001401 BEQ .+4 ;DECREMENTED BY 4
005722 000000 HLT ;ERROR!
005724 005067 172072 CLR IOTVEC+2
005730 012767 000022 172062 MOV #IOTVEC+2,IOTVEC
005736 104000 SCOPE ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS
  
```

```

;CHECK ABORT
005740 012737 006002 000250 MOV #T56C,#MMVEC ;LOAD MEM MGMT ERROR VECTOR
005746 012767 170000 172022 MOV #UM*PUM,PSW
005754 012706 000600 MOV #UPTR,USP
005760 012766 040100 MOV #UM,-(USP)
005770 005037 017100 MOV #UI2+100,-(USP)
005774 005237 177572 CLR ##PUI2+100
006000 000002 T56B: INC #SR0 ;ENABLE MEMORY MGMT
006002 006002 RTI
006004 017100 RETURN#.#PUI2+100
017100 000000 T56A: HLT ;ERROR! FAILED TO ABORT
006002 006002 .=RETURN
  
```

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006002 022706 001074 T56C: CMP #KPTR=4,KSP ;CHECK STACK PTR
006006 001401 BEQ .+4
006010 000000 HLT
006012 022767 040145 171552 CMP #PLA+UPG+VS2+1,SR0 ;CHECK SR0 (ABORT CONDITIONS)
006020 001401 BEQ .+4 ;& FAILING PAGE #)
006022 000000 HLT ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
006024 022767 006000 171544 CMP #T56B,SR2 ;CHECK CONTENTS OF SR2
006032 001401 BEQ .+4 ;(PC OF ABORTED INSTRUCTION)
006034 000000 HLT ;ERROR! INCORRECT PC IN SR2
006036 104000 SCOPE ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS
  
```

```

;CHECK ABORT
006040 012767 170000 171730 MOV #UM*PUM,PSW
006046 012737 006100 000250 MOV #T60C,#MMVEC ;LOAD MEM MGMT ERROR VECTOR
006054 012737 000005 017076 MOV #5,#PUI2+76 ;5 IS A RESET INSTRUCTION
006062 005037 017100 CLR ##PUI2+100
006066 005005 CLR R5
006070 005237 177572 INC #SR0 ;ENABLE MEMORY MGMT
006074 000137 040076 JMP #UI2+76 ;GO EXECUTE RESET
006100 006100 RETURN#.#PUI2+76
017076 000005 T60A: RESET ;ABORTS WHEN NEXT INST. FETCHED
017100 000000 HLT ;ERROR! FAILED TO ABORT
006100 .=RETURN
  
```

```

006100 T60C:
006102 022767 040145 171464 CMP #PLA+UPG+VS2+1,SR0 ;CHECK SR0 (ABORT CONDITIONS)
006106 001401 BEQ .+4 ;& FAILING PAGE #)
006110 000000 HLT ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
006112 022767 040076 171456 CMP #UI2+76,SR2 ;CHECK CONTENTS OF SR2
006120 001401 BEQ .+4 ;(PC OF ABORTED INSTRUCTION)
006122 000000 HLT ;ERROR! INCORRECT PC IN SR2
006124 104000 SCOPE ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS
  
```

```

;CHECK ABORTS WHEN INST FOLLOWING MARK IS FETCHED
006126 012767 170000 171642 MOV #UM*PUM,PSW
006134 012737 006164 000250 MOV #T63C,#MMVEC ;LOAD MEM MGMT ERROR VECTOR
006142 012746 006164 000250 MOV (PC)+,-(USP) ;PUSH MARK INST ON USER STACK
006144 006401 MARK 1 ;PUSH THIS INST ON USER STACK
006146 012705 040100 MOV #UI2+100,R5 ;AFTER MARK EXECUTE INST AT T63A
006152 005037 017100 CLR #T63A ;WHICH IS A HALT
006156 005237 177572 INC #SR0 ;ENABLE MEMORY MGMT
006162 000116 JMP (USP) ;GO EXECUTE MARK AT SPTR=2
006164 006164 RETURN#.#PUI2+100
017100 000000 T63A: HLT ;SEG ABORT WHEN THIS INST. FETCHED AT
006164 006164 .=RETURN
006164 022706 001074 T63C: CMP #KPTR=4,KSP ;CHECK STACK PTR
006170 001401 BEQ .+4
006172 000000 HLT
006174 022767 040145 171370 CMP #PLA+UPG+VS2+1,SR0 ;CHECK SR0 (ABORT CONDITIONS)
006202 001401 BEQ .+4 ;& FAILING PAGE #)
  
```

```

006204 000000      HLT
006206 022767      CMP      #UPTR-2,SR2  ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
006214 001401      BEQ      .+4          ;CHECK CONTENTS OF SR2
006216 000000      HLT          ;(PC OF ABORTED INSTRUCTION)
006220 106506      MFPD     USP          ;ERROR! INCORRECT PC IN SR2
006222 022716      CMP      #UPTR+4,(KSP) ;PUSH USER STACK PTR ONTO KERNEL STACK
006226 001401      BEQ      .+4          ;CHECK USER STACK PTR
006230 000000      HLT          ;ERROR! INCORRECT USER STACK PTR
006232 023705      CMP      #UPTR+2,R5   ;CHECK CONTENTS OF R5
006236 001401      BEQ      .+4
006240 000000      HLT
006242 104000      SCOPE     ;ERROR!
;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

```

```

;CHECK
;ABORTS WHEN INST FOLLOWING TST IS FETCHED
006244 012737 006300 000250      MOV      #T64C,#MMVEC ;LOAD MEM MGMT ERROR VECTOR
006252 012702 177777      MOV      #=1,R2       ;R2=STATUS WORD ADDRESS (ODD BYTE)
006256 012737 105722 016676      MOV      #105722,#K10-2 ;105722=TSTB (R2)+
006264 005037 016700      CLR      #K10
006270 005237 177572      INC      #SR0        ;ENABLE MEMORY MGMT
006274 000137 016676      JMP      #K10-2      ;GO EXECUTE INSTRUCTION
;
016676 105722      T64A:   TSTB      (R2)+    ;ABORTS WHEN NEXT INST. IS FETCHED
016700 000000      T64B:   HLT          ;ERROR! FAILED TO ABORT
;
006300 000000      T64C:   .RETURN
006306 001401      CMP      #PLA+VS0+1,SR0 ;CHECK SR0 (ABORT CONDITIONS
006310 000000      BEQ      .+4          ;& FAILING PAGE #)
006312 022767 016676 171256      HLT          ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
006320 001401      CMP      #T64A,SR2    ;CHECK CONTENTS OF SR2
006322 000000      BEQ      .+4          ;(PC OF ABORTED INSTRUCTION)
006324 005702      HLT          ;ERROR! INCORRECT PC IN SR2
006326 001401      TST     R2           ;CHECK AUTO-INC
006330 000000      BEQ      .+4
006332 104000      HLT          ;ERROR! AUTO-INC FAILED
;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

```

```

;CHECK
;ABORTS WHEN INSTRUCTION FOLLOWING MOVB IS FETCHED
006334 012737 006372 000250      MOV      #T66C,#MMVEC ;LOAD MEM MGMT ERROR VECTOR
006342 012703 016700      MOV      #K10,R3
006346 005013      CLR      (3)         ;SET UP CODE (HALT)
006350 012743      MOV      (7)+,-(R3)  ;THIS INSTRUCTION IS NOT EXECUTED
006352 114203      MOVB    -(R2),R3
006354 012702 001204      MOV      #TEMP,R2
006360 012722 100000      MOV      #100000,(R2)+ ;ENABLE MEMORY MGMT
006364 005237 177572      INC      #SR0
006370 000113      JMP      (R3)        ;GO EXECUTE MOVB INSTRUCTION
;
016676 114203      T66A:   MOVB    -(R2),R3  ;ABORTS WHEN THE NEXT INST IS FETCHED
016700 000000      T66B:   HLT          ;ERROR! FAILED TO ABORT HERE
;
006372 000000      .RETURN

```

```

006372 022767 040001 171172      T66C:   CMP      #PLA+VS0+1,SR0 ;CHECK SR0 (ABORT CONDITIONS
006400 001401      BEQ      .+4          ;& FAILING PAGE #)
006402 000000      HLT          ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
006404 022767 016676 171164      CMP      #T66A,SR2    ;CHECK CONTENTS OF SR2
006412 001401      BEQ      .+4          ;(PC OF ABORTED INSTRUCTION)
006414 000000      HLT          ;ERROR! INCORRECT PC IN SR2
006416 022703 177600      CMP      #177600,R3   ;MOVB TO A REGISTER EXTENDS
006422 001401      BEQ      .+4          ;THE SIGN
006424 000000      HLT          ;ERROR! INCORRECT RESULT IN R3
006426 104000      SCOPE     ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

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```

;CHECK ACCESS VIOLATION ABORT
;ABORTS WHEN SOURCE DATA IS FETCHED USING DATIP WITH DEST ADDRESS READ ONLY
006430 012737 006462 000250      MOV      #T72C,#MMVEC ;LOAD MEM MGMT ERROR VECTOR
006436 112737 000002 172314      MOVB    #R00,#K1PDR6 ;SET KERNEL ADDRESS 140000-140077
;READ ABORT ON WRITE
006444 005037 016700      CLR      #PK16       ;CLEAR CORRESPONDING PHYSICAL ADDRESS
006450 005237 177572      INC      #SR0        ;ENABLE MEMORY MGMT
006454 000261      SEC
006456 005537 140000      T72A:   AUC      #K16   ;SET "C"
;ABORTS WHEN DATA IS FETCHED USING DATIP
;
006462 022767 020015 171102      T72C:   CMP      #AVA+VS6+1,SR0 ;CHECK SR0 (ABORT CONDITIONS
006470 001401      BEQ      .+4          ;& FAILING PAGE #)
006472 000000      HLT          ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
006474 022767 006456 171074      CMP      #T72A,SR2    ;CHECK CONTENTS OF SR2
006502 001401      BEQ      .+4          ;(PC OF ABORTED INSTRUCTION)
006504 000000      HLT          ;ERROR! INCORRECT PC IN SR2
006506 022766 000001 000002      CMP      #C,2(KSP)    ;CHECK THAT CORRECT STATUS
006514 001401      BEQ      .+4          ;WAS SAVED ON THE STACK
006516 000000      HLT          ;ERROR! INCORRECT STATUS
006520 005037 177572      CLR      #SW0        ;DISABLE MEMORY MGMT
006524 005737 016700      TST     #PK16       ;CHECK THAT ADDRESS WAS NOT WRITTEN
006530 001401      BEQ      .+4
006532 000000      HLT          ;ERROR! DATA WRITTEN INTO READ ONLY ADDRESS
006534 104000      SCOPE

```

```

;CHECK ACCESS VIOLATION ABORT
;ABORTS WHEN SOURCE DATA IS FETCHED FROM READ ONLY SPACE USING A DATIP,
006536 012737 006562 000250      MOV      #T73C,#MMVEC ;LOAD MEM MGMT ERROR VECTOR
006544 005037 016700      CLR      #PK16       ;PRESET ADDRESS
006550 005237 177572      INC      #SR0        ;ENABLE MEMORY MGMT
006554 000261      SEC
006556 100037 140001      T73A:   RORB    #K16+1  ;SET "C"
;ABORTS WHEN RESULT IS WRITTEN
;
006562 022767 020015 171002      T73C:   CMP      #AVA+VS6+1,SR0 ;CHECK SR0 (ABORT CONDITIONS
006570 001401      BEQ      .+4          ;& FAILING PAGE #)
006572 000000      HLT          ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
006574 022767 006556 170774      CMP      #T73A,SR2    ;CHECK CONTENTS OF SR2
006602 001401      BEQ      .+4          ;(PC OF ABORTED INSTRUCTION)
006604 000000      HLT          ;ERROR! INCORRECT PC IN SR2
006606 022766 000001 000002      CMP      #C,2(KSP)    ;CHECK THAT CORRECT STATUS
006614 001401      BEQ      .+4          ;WAS SAVED ON THE STACK

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006616 000000          HLT          ;ERROR! INCORRECT STATUS
006620 005037          CLR          ;DISABLE MEMORY MGMT
006624 005737 016700  TST          ;
006630 001401          BEQ          .+4
006632 000000          HLT          ;ERROR! ADDRESS WAS WRITTEN
006634 012737 000006 172314  MOV          ;SET KDPDR R/W
006642 104000          SCOPE         ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS
  
```

```

;CHECK ABORT USING 'T' BIT TRAP
;CHECK ABORT WHEN PSW IS NON-RESIDENT
006644 012737 006700 000250  MOV          ;LOAD MEM MGMT ERROR VECTOR
006652 005002          CLR          ;PRESET DESTINATION
006654 005237 177572          INC          ;ENABLE MEMORY MGMT
006660 012746 140017          MOV          ;'NEW' STATUS ON STACK
006664 012746 006672          MOV          ;RETURN PC
006670 000002          RTI          ;SET STATUS AND EXECUTE NEXT INST.
006672 213702 177776  T102A: MOV          ;PSW IS NON-RESIDENT IN USER MODE
006676 000000          HLT          ;ERROR! FAILED TO ABORT
006700          T102C:
006700 022767 140157 170664  CMP          ;NRA+PLA+UPG+VS7+1,SR0 ;CHECK SR0 (ABORT CONDITIONS
006706 001401          BEQ          .+4 ;& FAILING PAGE #)
006710 000000          HLT          ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
006712 022767 006672 170656  CMP          ;CHECK CONTENTS OF SR2
006720 001401          BEQ          .+4 ;{PC OF ABORTED INSTRUCTION)
006722 000000          HLT          ;ERROR! INCORRECT PC IN SR2
006724 022766 140017 000002  CMP          ;UM+17,2(KSP)
006732 001401          BEQ          .+4 ;WAS SAVED ON THE STACK
006734 000000          HLT          ;ERROR! INCORRECT STATUS
006736 005702          TST          R2
006740 001401          BEQ          .+4 ;CHECK THAT R2 WAS NOT LOADED
006742 000000          HLT          ;ERROR! DEST (R2) WAS CMEANGED
006744 104000          SCOPE

006746 005267 172226          END:    INC          ICNT
006752 022767 005000 172220  CMP          ;5000,ICNT
006760 001402          BEQ          DONE
006762 000167 172232          JMP          BEGIN
006766 012767 000007 170572  DONE:  MOV          ;7,TPB
006774 105767 170564          TSTB         TPS
007000          BPL          .-4
007002 013702 000042          MOV          ;#42,X2
007006 001404          BEQ          DONE1
007010 004712          LOGIC: JSR          7,(2)
007012 000240          NOP
007014 000240          NOP
007016 000240          NOP
007020 000167 172166          DONE1: JMP          START

000001          .END
  
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```

AVA = 020000          BEGIN 001220          BIT13 = 020000          BIT14 = 040000
BIT15 = 100000          BIT6 = 000100          BITS = 000400          C = 000001
DM = 000400          DONE 006766          DONE1 007020          DWN = 000010
ED = 000010          EMTVEC = 000030          END 006746          ENMM = 000001
ERRVEC = 000010          FPVEC = 000244          HLT = 000000          ICNT 001200
IOTVEC = 000020          IS = 000000          KIPAR0 = 172340          KIPAR1 = 172342
KIPAR2 = 172344          KIPAR3 = 172346          KIPAR4 = 172350          KIPAR5 = 172352
KIPAR6 = 172354          KIPAR7 = 172356          KIPDR0 = 172300          KIPDR1 = 172302
KIPDR2 = 172304          KIPDR3 = 172306          KIPDR4 = 172310          KIPDR5 = 172312
KIPDR6 = 172314          KIPDR7 = 172316          KIO = 016700          KI6 = 140000
KM = 000000          KPG = 000000          KPTR = 001100          KSP = 1000006
LOGIC 007012          MMK = 001320          MMVEC = 000250          MM0 = 001232
N = 000010          NRA = 100000          NR0 = 000000          PC = 1000007
PFVEC = 000024          PKIO = 016600          PKI6 = 016700          PKM = 000000
PLA = 040000          PRTY4 = 000200          PRTY7 = 000340          PSW = 177776
PU11 = 017100          PU12 = 017000          PU13 = 017400          PUI4 = 017300
PU15 = 017200          PUM = 030000          R00 = 000002          RETURN = 006372
RW = 000006          RWT = 000000          R0 = 10000004          R1 = 1000001
R2 = 1000002          R3 = 1000003          R4 = 10000004          R5 = 1000005
SCOPE = 104000          SCOPEA 000442          SCOPEX 000476          SHLT 000400
SHLTA 000436          SP = 1000006          SR0 = 177572          SR0T 001202
SR1 = 177574          SR2 = 177576          START 001212          SWR = 177570
T = 000020          TBITVE = 000014          TEMP = 001204          TKB = 177562
TKS = 177560          TPB = 177566          TPS = 177564          TPVEC = 000064
TRAPVE = 000034          T0 = 001454          T0A = 001504          T0B = 001506
T0C = 001510          T1A = 001610          T1B = 001612          T1C = 001614
T10A = 002434          T10B = 002440          T10C = 002442          T102A 006672
T102C 006700          T13A = 002536          T13B = 002540          T13C = 002544
T13D = 002542          T14A = 002664          T14B = 002666          T14C = 002672
T14D = 002670          T16A = 002762          T16B = 002764          T16C = 002770
T16D = 002766          T2A = 001704          T2B = 001706          T2C = 001710
T20A = 016676          T20B = 016702          T20C = 003112          T21A = 016676
T21B = 016702          T21C = 003232          T22 = 016674          T22A = 016676
T22AA = 016700          T22B = 016702          T22C = 003332          T24A = 003434
T24B = 003436          T24C = 003440          T25A = 003532          T25B = 003534
T25C = 003536          T3A = 002010          T3B = 002012          T3C = 002014
T30A = 003620          T30C = 003624          T31A = 003742          T31B = 003744
T31C = 003746          T32B = 004056          T32C = 004056          T32A = 004060
T33A = 004160          T33B = 004162          T33C = 004164          T35A = 004252
T35B = 004256          T35C = 004260          T36A = 004356          T36B = 004360
T36C = 004362          T4A = 002160          T4B = 002162          T4C = 002164
T40A = 017074          T40B = 017102          T40C = 004476          T41A = 017200
T41B = 017202          T41C = 004572          T42A = 004662          T42B = 004664
T42C = 004666          T43A = 017076          T43B = 017102          T43C = 005002
T43D = 005000          T44A = 017200          T44B = 017202          T44C = 005100
T45A = 017200          T45B = 017204          T45C = 005232          T50A = 005334
T50B = 005340          T50C = 005344          T50D = 005342          T52A = 005450
T52B = 005452          T52C = 005456          T52D = 005454          T53A = 005620
T53B = 005622          T53C = 005626          T53D = 005624          T56A = 017100
T56B = 006000          T56C = 006002          T6A = 002300          T6B = 002304
T6C = 002306          T60A = 017076          T60C = 006100          T63A = 017100
T63C = 006164          T64A = 016676          T64B = 016700          T64C = 006300
T66A = 016676          T66B = 016700          T66C = 006372          T7A = 002356
T7B = 002362          T7C = 002364          T72A = 006456          T72C = 006462
  
```

T73A	006556	T73C	006562	UIPAR0	177640	UIPAR1	177642
UIPAR2	177644	UIPAR3	177646	UIPAR4	177650	UIPAR5	177652
UIPAR6	177654	UIPAR7	177656	UIPDR0	177600	UIPDR1	177602
UIPDR2	177604	UIPDR3	177606	UIPDR4	177610	UIPDR5	177612
UIPDR6	177614	UIPDR7	177616	UI1	020000	UI2	040000
UI3	060000	UI4	100000	UI5	120000	UM	140000
UP	000000	UPG	000140	UPTR	000600	USP	X000006
V	000002	VS0	000000	VS1	000002	VS2	000004
VS3	000006	VS4	000010	VS5	000012	VS6	000014
VS7	000016	W	000100	Z	000004	.	007024

ERRORS DETECTED: 0

\*DFKTFA,DFKTFA=DFKTFA.SRC/SOL  
RUN-TIME: 5 9 0 SECONDS  
CORE USED: 5K