PDP11/34

MEM MANG EXERCISER

MD-11-DFKTF-A

EP-DFKTF-A-DL-A OCT 1976

FICHE 1 OF 1

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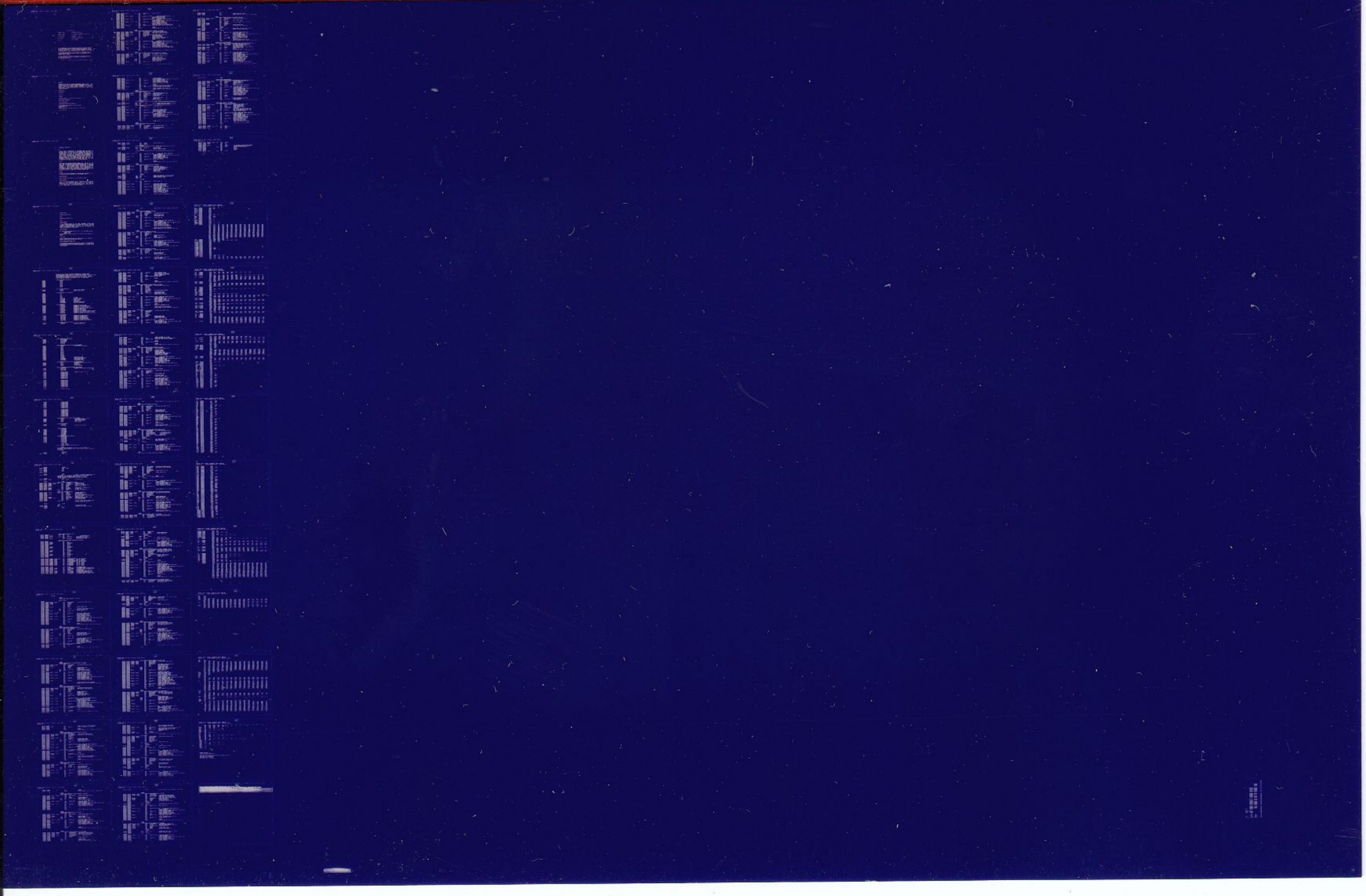

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                                        .REM    *
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IDENTIFICATION

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

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 DETRMINE WHICH TEST THE PROGRAM WAS EXECUTING WHEN THE HLT OCCURED 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 CONTINOUSLY 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 CONTINUOSLY 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 ME  RY MGMT ABORT ERRORS
                                ;THIS PROGRAM IS A MODIFICATION OF THE 11/40 TEST, DFKTF.  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=%0
000001                                  R1=%1
000002                                  R2=%2
000003                                  R3=%3
000004                                  R4=%4
000005                                  R5=%5
000006                                  SP=%6
000007                                  PC=%7

                                ;STACK POINTER REGISTERS
000006                                  KSP=%6                  ;KERNEL STACK POINTER
000006                                  USP=%6                  ;USER STACK POINTER

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

                                ;VECTOR ADDRESSES
000010                                  ERRVEC=10               ;ADDRESS OF ERROR VECTOR
000014                                  TBITVEC=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
001100                                  KPTR=1100               ;BOTTOM OF KERNEL STACK
000600                                  UPTR=600                ;USER STACK SETTING
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                                ;MISCELLANEOUS BIT ASSIGNMENTS
100000                                  BIT15=100000
040000                                  BIT14=40000
020000                                  BIT13=20000
000400                                  BIT8=400
000100                                  BIT6=100

                                ;MEMORY MANAGEMENT REGISTER SR0 BIT ASSIGNMENTS
000001                                  ENMM=1                  ;ENABLE MEMORY MANAGEMENT
000000                                  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                                  AVA=20000               ;ACCESS VIOLATION ABORT
040000                                  PLA=40000               ;PAGE LENGTH ABORT
100000                                  NRA=100000              ;NON-RESIDENT ABORT

                                ;PAGE DESCRIPTOR REGISTER (PDR) BIT ASSSIGNMENTS
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
177654                                  UIPAR6=177654
177656                                  UIPAR7=177656

172300                                  KIPDR0=172300
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                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

                                ;ACCESS CONTROL FIELD DEFINITIONS (IN PDR)
                000000                  NRD=0                   ;NON-RESIDENT ABORT ALL REFS.
                000002                  RDO=2                   ;READ,ABORT ON WRITE
                000004                  RWT=4                   ;TRAP ON READ & WRITE
                000006                  RW=6                    ;READ & WRITE

                                ;INSTRUCTION EQUATES
                000000                  HLT=HALT
                104000                  SCOPE=EMT               ;SCOPE IS AN EMT TRAP


                                ;VIRTUAL ADDRESSES
                016700                  KID=16700
                140000                  KI6=140000
                120000                  UI5=120000
                100000                  UI4=100000
                040000                  UI2=40000
                020000                  UI1=20000
                060000                  UI3=60000
                                ;CORRESPONDING PHYSICAL ADDRESSES
                016600                  PKI0=16600
                016700                  PKI6=16700
                017200                  PUI5=17200
                017300                  PUI4=17300
                017400                  PUI3=17400
                017000                  PUI2=17000
                017100                  PUI1=17100
                                        .LIST   ME
                                        .NLIST  MC,MD
                                ;FILL TRAP AND INTERRUPT VECTOR AREA WITH
                                        ;.+2
                                        ;HALT
                                ;UNEXPECTED TRAPS/INTERRUPTS WILL HALT AT VECTOR ADDRESS +2
                                ;AND DISPLAY VECTOR ADDRESS+4 NOTE: LISTING DOES NOT SHOW LOADING THE
                                ;VECTOR AREA.

                                        .NLIST  MC
                000010                  .=ERRVEC
000010          000400                  .WORD   SHLT
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                000030                          .=EMTVEC
000030          000442                          .WORD   SCOPEA
                000046                          .=46
000046          007010                          LOGIC
                000052                          .=52
000052          000000                          0

                000176                          .=176
000176          000000                          HALT                    ;ERROR!  TO IDENTIFY WHICH TEST FAILED
                                        ;EXAMINE R1, THE CONTENTS OF WHICH IS THE PC OF THE PRESENT TEST
                                        ;THE TOP WORD ON THE KERNEL STACK CONTAINS THE VIRTUAL
                                        ;ADDRESS OF THE HLT INSTRUCTION IN THE TEST THAT FAILED.
                000200                          .=200
000200          000167  001006                  JMP     START           ;GO START TEST

                000400                          .=400
                                        ;USER HLT (HALT) TRAP SERVICE ROUTINE
000400          042737  000001  177572  SHLT:   BIC     #1,@#SR0        ;TURN MEM MGMT OFF
000406          042737  140000  177776          BIC     #140000,@#PSW   ;RETURN TO KERNEL
000414          162716  000002                  SUB     #2,(KSP)        ;POINT PC TO TRAPPING INST.
000420          005776  000000                  TST     @(KSP)          ;WAS IT A HLT (HALT)
000424          001404                          BEQ     SHLTA
000426          062716  000002                  ADD     #2,(KSP)        ;RESTORE PC TO TRAPPING INST.
000432          000137  000012                  JMP     @#ERRVEC+2      ;GO HALT AT 6
000436          000137  000176          SHLTA:  JMP     @#176           ;GO HALT AT ADDRESS 176

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

                001200                          .=1200
                                        ;TAGS
001200          000000          ICNT:   0                       ;CONTAINS PASS COUNT
001202          000000          SR0T:   0                       ;CONTAINS 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 SETS ALL STACK PTRS
001226  005037  000252                  CLR     @#MMVEC+2       ;KERNEL MODE ON ABORT

                                        ;ROUTINE TO CLEAR MEMORY MANAGEMENT REGISTERS.
001232  000240                  MMO:    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=0-16677
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
001454                                  T0:
001454  012737  001510  000250                MOV     #TOC,@#MMVEC    ;LOAD MEM MGMT ERROR VECTOR
001462  005067  176564                      CLR     MMVEC+2
001466  012703  016700                      MOV     #K10,R3
001472  010302                            MOV     R3,R2
001474  005013                            CLR     (R3)
001476  005237  177572                    INC     @#SR0           ;ENABLE MEMORY MGMT
001502  000277                            SCC
001504  011302                  T0A:      MOV     (R3),R2         ;MEM MGMT LENGTH ABORT AT SRC00
001506  000000                  T0B:      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             ;(PC OF ABORTED INSTRUCTION)
001554  000000                            HLT                     ;ERROR! INCORRECT PC IN SR2
001556  020203                            CMP     R2,R3           ;CHECK THAT INSTRUCTIONS AS ABORTED
001560  001401                            BEQ     .+4
001562  000000                            HLT                     ;ERROR!
001564  104000                            SCOPE                   ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

                                        ;CHECK
                                        ;ABORTS WHEN SOURCE OPERAND IS FETCHED
                                        ;SOURCE MODE=2,BYTE INSTRUCTION
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
001656  000000                            HLT                     ;ERROR!
001660  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=3
001662  012737  001710  000250            MOV     #T2C,@#MMVEC    ;LOAD MEM MGMT ERROR VECTOR
001670  012705  016700                    MOV     #KIO,R5
001674  010504                          MOV     R5,R4
001676  005237  177572                  INC     @#SR0           ;ENABLE MEMORY MGMT
001702  000277                          SCC                     ;PRESET CC'S
001704  153504                  T2A:    BISB    @(R5)+,R4       ;NON-RES ABORT AT S13.10
001706  000000                  T2B:    HLT                     ;ERROR! FAILED TO ABORT
001710                          T2C:
001710  022766  000017  000002            CMP     #17,2(KSP)      ;CHECK THAT CORRECT STATUS
001716  001401                          BEQ     .+4             ;WAS SAVED ON THE STACK
001720  000000                          HLT                     ;ERROR! INCORRECT STATUS
001722  022767  040001  175642          CMP     #PLA+1,SR0      ;CHECK SR0 (ABORT CONDITIONS
001730  001401                          BEQ     .+4             ;& FAILING PAGE #)
001732  000000                          HLT                     ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
001734  022767  001704  175634          CMP     #T2A,SR2        ;CHECK CONTENTS OF SR2
001742  001401                          BEQ     .+4             ;(PC OF ABORTED INSTRUCTION)
001744  000000                          HLT                     ;ERROR! INCORRECT PC IN SR2
001746  022705  016700                  CMP     #KIO,R5
001752  001401                          BEQ     .+4
001754  000000                          HLT                     ;ERROR! R5 DID NOT AUTO-INCREMENT
001756  104000                          SCOPE                   ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

                                        ;CHECK
                                        ;ABORTS WHEN SOURCE OPERAND IS FETCHED
                                        ;SOURCE MODE=4,USER MODE
001760  012737  002014  000250            MOV     #T3C,@#MMVEC    ;LOAD MEM MGMT ERROR VECTOR
001766  012767  170000  176002            MOV     #UM+PUM,PSW     ;USER MODE!!!, PREV USER MODE
001774  012702  100000                    MOV     #UI4,R2
002000  010203                          MOV     R2,R3
002002  005237  177572                  INC     @#SR0           ;ENABLE MEMORY MGMT
002006  000277                          SCC                     ;PRESET CC'S
002010  064203                  T3A:    ADD     -(R2),R3        ;NON-RESIDENT ABORT
002012  000000                  T3B:    HLT                     ;ERROR! FAILED TO ABORT
002014  022706  001074          T3C:    CMP     #KPTR-4,KSP     ;CHECK STACK PTR
002020  001401                          BEQ     .+4
002022  000000                          HLT
002024  022766  170017  000002            CMP     #UM+PUM+17,2(KSP)       ;CHECK THAT CORRECT STATUS
002032  001401                          BEQ     .+4             ;WAS SAVED ON THE STACK
002034  000000                          HLT                     ;ERROR! INCORRECT STATUS
002036  022767  140147  175526          CMP     #NRA+PLA+UPG+VS3+1,SR0  ;CHECK SR0 (ABORT CONDITIONS
002044  001401                          BEQ     .+4             ;& FAILING PAGE #)
002046  000000                          HLT                     ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
002050  022767  002010  175520          CMP     #T3A,SR2        ;CHECK CONTENTS OF SR2
002056  001401                          BEQ     .+4             ;(PC OF ABORTED INSTRUCTION)
002060  000000                          HLT                     ;ERROR! INCORRECT PC IN SR2
                                        ;CHECK CONTENTS OF REFERENCED PAGE DESCRIPTOR REGISTER (UIPDR2)
002062  032767  000100  175514          BIT     #W,UIPDR2       ;CHECK CONTENTS OF REFERENCED PDR
002070  001401                          BEQ     .+4
002072  000000                          HLT                     ;ERROR!
002074  042767  000100  175502          BIC     #W,UIPDR2
002102  022702  077776                  CMP     #UI4-2,R2       ;CHECK THAT AUTO- DECREMENT TOOK PLACE
002106  001401                          BEQ     .+4
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002110  000000                          HLT                     ;ERROR! R2 FAILED TO AUTO-DECREMENT
002112  022703  100000                  CMP     #UI4,R3         ;CHECK THAT R3 WAS NOT CHANGED
002116  001401                          BEQ     .+4
002120  000000                          HLT                     ;ERROR!
002122  104000                          SCOPE                   ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

                                ;CHECK
                                ;ABORTS WHEN ADDRESS OF SOURCE OPERAND IS FETCHED
                                ;SOURCE MODE=5,USER MODE
002124  012737  002164  000250          MOV     #T4C,@#MMVEC    ;LOAD MEM MGMT ERROR VECTOR
002132  012767  170000  175636          MOV     #UM+PUM,PSW     ;USER MODE!!!,PREV USER MODE!!
002140  012704  120002                  MOV     #UI5+2,R4
002144  010405                          MOV     R4,R5
002146  012737  177777  017200          MOV     #-1,@#PUI5
002154  005237  177572                  INC     @#SR0           ;ENABLE MEMORY MGMT
002160  146405                  T4A:    BICB    @-(R4),R5       ;NON-RESIDENT ABORT
002162  000000                  T4B:    HLT                     ;ERROR! FAILED TO ABORT
002164  022706  001074          T4C:    CMP     #KPTR-4,KSP     ;CHECK STACK PTR
002170  001401                          BEQ     .+4
002172  000000                          HLT
002174  022767  140157  175370          CMP     #NRA+PLA+UPG+VS7:1,SR0  ;CHECK SR0 (ABORT CONDITIONS
002202  001401                          BEQ     .+4             ;& FAILING PAGE #)
002204  000000                          HLT                     ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
002206  022767  002160  175362          CMP     #T4A,SR2        ;CHECK CONTENTS OF SR2
002214  001401                          BEQ     .+4             ;(PC OF ABORTED INSTRUCTION)
002216  000000                          HLT                     ;ERROR! INCORRECT PC IN SR2
                                ;CHECK CONTENTS OF REFERENCED PAGE DESCRIPTOR REGISTER (UIPDR5)
002220  032767  000100  175364          BIT     #W,UIPDR5       ;CHECK CONTENTS OF REFERENCED PDR
002226  001401                          BEQ     .+4
002230  000000                          HLT                     ;ERROR!
002232  042767  000100  175352          BIC     #W,UIPDR5
002240  022704  120000                  CMP     #UI5,R4 ;CHECK AUTO-DECREMENT
002244  001401                          BEQ     .+4
002246  000000                          HLT                     ;ERROR! FAILED TO AUTO-DECREMENT R4
002250  022705  120002                  CMP     #UI5+2,R5       ;CHECK THAT R5 WAS UNCHANGED
002254  001401                          BEQ     .+4
002256  000000                          HLT                     ;ERROR!
002260  104000                          SCOPE                   ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

                                ;CHECK
                                ;ABORTS WHEN SOURCE OPERAND IS FETCHED
                                ;SOURCE MODE = 6
002262  012737  002306  000250          MOV     #T6C,@#MMVEC    ;LOAD MEM MGMT ERROR VECTOR
002270  012702  177777                  MOV     #-1,R2
002274  005237  177572                  INC     @#SR0           ;ENABLE MEMORY MGMT
002300  016702  014374          T6A:    MOV     K10,R2          ;SEG LENGTH ABORT
002304  000000                  T6B:    HLT                     ;ERROR! FAILED TO ABORT
002306                          T6C:
002306  022767  040001  175256          CMP     #PLA+1,SR0      ;CHECK SR0 (ABORT CONDITIONS
002314  001401                          BEQ     .+4             ;& FAILING PAGE #)
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
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002336  000000                          HLT                     ;ERROR!
002340  104000                          SCOPE                   ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

                                ;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  067404  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

                                ;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                     ;ERROR!
002474  104000                          SCOPE                   ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS


                                ;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!!
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 ABOPT
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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  106546                          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                             ;ERROR!
002624  104000                          SCOPE                           ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

                                ;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
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
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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  02010C                  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,@#KIO-2  ;16702,000000 IS A MOV .+4,R2
003070  005037  016700                  CLR     @#KIO           ;INSTRUCTION
003074  005037  016702                  CLR     @#KIO+2
003100  005237  177572                  INC     @#SR0           ;ENABLE MEMORY MGMT
003104  000277                          SCC                     ;PRESET CC'S
003106  000137  016676                  JMP     @#KIO-2         ;GO TO MOV INST.
        003112                  RETURN=.
                                ;************************ NOTE PC CHANGE **********************************
        016676                  .=KIO-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 ***************************************
        003112                  .=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+VSO+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,@#KIO-2 ;017202,000000 IS A MOV  @0(R2),R2
003216  005037  016700                  CLR     @#KIO           ;INSTRUCTION
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003222  005237  177572                 INC     @#SR0           ;ENABLE MEMORY MGMT
003226  000137  016676                 JMP     @#KI0-2
        003232                          RETURN=.
                                ;************************** NOTE PC CHANGE ****************************
        016676                          .=KI0-2
016676  017202  000000          T21A:   MOV     20(R2),R2       ;SEG LEN ABORT
016702  000000                  T21B:   HLT                     ;ERROR! FAILED TO ABORT
        003232                          .=RETURN
                                ;************************** RETURN PC *********************************

003232                          T21C:
003232  022767  040001  174332          CMP     #PLA+IS+VSO+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,R3
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                          SCC                     ;PRESET CC'S
003326  000137  016676                  JMP     @#KI0-2         ;GO TO SOB INST.

        003332                          RETURN=.
        016674                          .=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  040001  174210          CMP     #PLA+VSO+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                     ;ERROR! R3 WAS NOT DECREMENTED BY SOB
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003406  104000                          SCOPE                   ;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
003434  106542                  T24A:   MFPD    -(R2)           ;NON-RESIDENT ABORT
003436  000000                  T24B:   HLT
003440  022706  001074          T24C:   CMP     #KPTR-4,KSP     ;CHECK STACK PTR
003444  001401                          BEQ     .+4
003446  000000                          HLT
003450  022767  040143  174114          CMP     #UPG+PLA+VS1+1,SR0      ;CHECK SR0 (ABORT CONDITIONS
003456  001401                          BEQ     .+4             ;& FAILING PAGE #)
003460  000000                          HLT                     ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
003462  022767  003434  174106          CMP     #T24A,SR2       ;CHECK CONTENTS OF SR2
003470  001401                          BEQ     .+4             ;(PC OF ABORTED INSTRUCTION)
003472  000000                          HLT                     ;ERROR! INCORRECT PC IN SR2
003474  022702  037776                  CMP     #UI2-2,R2       ;CHECK THAT R2 AUTO-DECREMENTED
003500  001401                          BEQ     .+4
003502  000000                          HLT                     ;ERROR! R2 DID NOT AUTO-DECREMENT
003504  104000                          SCOPE                   ;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
003532  005012                  T25A:   CLR     (R2)            ;ABORT
003534  000000                  T25B:   HLT                     ;ERROR! FAILED TO ABORT
003536  022706  001074          T25C:   CMP     #KPTR-4,KSP     ;CHECK STACK PTR
003542  001401                          BEQ     .+4
003544  000000                          HLT
003546  022767  140157  174016          CMP     #NRA+PLA+UPG+VS7+1,SR0  ;CHECK SR0 (ABORT CONDITIONS
003554  001401                          BEQ     .+4             ;& FAILING PAGE #)
003556  000000                          HLT                     ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
003560  022767  003532  174010          CMP     #T25A,SR2       ;CHECK CONTENTS OF SR2
003566  001401                          BEQ     .+4             ;(PC OF ABORTED INSTRUCTION)
003570  000000                          HLT                     ;ERROR! INCORRECT PC IN SR2
003572  104000                          SCOPE                   ;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     #KIO-1,R3
003606  012737  177777  016700          MOV     #-1,@#KIO
003614  005237  177572                  INC     @#SR0           ;ENABLE MEMORY MGMT
003620  142323                  T30A:   BICB    (R3)+,(R3)+     ;SEG LENGTH ABORT
003622  000000                          HLT                     ;ERROR! FAILED TO ABORT

003624                          T30C:
003624  022767  040001  173740          CMP     #PLA+1,SR0      ;CHECK SR0 (ABORT CONDITIONS
003632  001401                          BEQ     .+4             ;& FAILING PAGE #)
003634  000000                          HLT                     ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
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003636  022767  003620  173732          CMP     #T30A,SR2       ;CHECK CONTENTS OF SR2
003644  001401                          BEQ     .+4             ;(PC OF A ABORTED INSTRUCTION)
003646  000000                          HLT                     ;ERROR! INCORRECT PC IN SR2
003650  005037  177572                  CLR     @#SR0           ;DISABLE MEMORY MGMT
003654  022703  016700                  CMP     #KI0,R3 ;CHECK AUTO-INC TWICE
003660  001401                          BEQ     .+4
003662  000000                          HLT                     ;ERROR!
003664  005037  016700                  INC     @#KI0
003670  001401                          BEQ     .+4
003672  000000                          HLT                     ;ERROR!
003674  104000                          SCOPE                   ;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           ;ENABLE MEMORY MGMT
003742  114332                  T31A:   MOVB    -(R3),@(R2)+    ;NON-RESIDENT ABORT
003744  000000                  T31B:   HLT                     ;ERROR! FAILED TO ABORT

003746                          T31C:
003746  022767  140157  173616          CMP     #NRA+PLA+UPG+VS7+1,SR0  ;CHECK SR0 (ABORT CONDITIONS
003754  001401                          BEQ     .+4             ;& FAILING PAGE #)
003756  000000                          HLT                     ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
003760  022767  003742  173610          CMP     #T31A,SR2       ;CHECK CONTENTS OF SR2
003766  001401                          BEQ     .+4             ;(PC OF ABORTED INSTRUCTION)
003770  000000                          HLT                     ;ERROR! INCORRECT PC IN SR2
003772  022702  040002                  CMP     #UI2+2,R2       ;CHECK AUTO-INC
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
004012  104000                          SCOPE                   ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

                                ;CHECK ABORT
004014  012737  004060  000250          MOV     #T32C,@#MMVEC   ;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,@#PUI3
004050  005237  177572                  INC     @#SR0           ;ENABLE MEMORY MGMT
004054  006432                  T32A:   MTPI    @(R2)+          ;NON-RESIDENT ABORT
004056  000000                  T32B:   HLT                     ;ERROR! FAILED TO ABORT
004060                          T32C:
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       ;CHECK CONTENTS OF SR2
004100  001401                          BEQ     .+4             ;(PC OF ABORTED INSTRUCTION)
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004102  000000                          HLT                     ;ERROR! INCORRECT PC IN SR2
004104  10[illegible]36                 MFPD    USP             ;PUSH USER STACK PTR ONTO KERNEL STACK
004106  C[illegible]716  000602         CMP     #UPTR+2,(KSP)   ;CHECK THAT USER STACK PTR POPPED
004112  001401                          BEQ     .+4
004114  000000                          HLT                     ;ERROR!
004116  022702  060000                  CMP     #UI3,R2 ;CHECK AUTO-INC
004122  001401                          BEQ     .+4
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,@#MMVEC   ;LOAD MEM MGMT ERROR VECTOR
004136  012767  030000  173632          MOV     #KM+PUM,PSW
004144  012716  117776                  MOV     #UIS-2,(KSP)    ;NON-RES ADDRESS
004150  012746  140000                  MOV     #KI6,-(KSP)     ;ADDRESS POINTER
004154  005237  177572                  INC     @#SR0           ;ENABLE MEMORY MGMT
004160  106636                  T33A:   MTPD    @(KSP)+         ;NON-RESIDENT ABORT WHEN MTPD
                                                                ;ADDRESSES FINAL ADDRESS
004162  000000                  T33B:   HLT                     ;ERROR! FAILED TO ABORT
004164                          T33C:
004164  022767  040151  173400          CMP     #PLA+UPG+VSH+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       ;CHECK CONTENTS OF SR2
004204  001401                          BEQ     .+4             ;(PC OF ABORTED INSTRUCTION)
004206  000000                          HLT                     ;ERROR! INCORRECT PC IN SR2
004210  106506                          MFPD    KSP             ;GET KERNEL STACK PTR
004212  022716  001076                  CMP     #KPTR-2,(KSP)   ;CHECK THAT KERNEL STACK PTR POPPED TWICE
004216  001401                          BEQ     .+4
004220  000000                          HLT                     ;ERROR!
004222  104000                          SCOPE                   ;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,@#MMVEC   ;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           ;ENABLE MEMORY MGMT
004250  000277                          SCC
004252  112754  177777          T35A:   MOVB    #-1,@-(R4)      ;SEG LENGTH ABORT
004256  000000                  T35B:   HLT                     ;ERROR! FAILED TO ABORT
004260                          T35C:
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+VSO+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       ;CHECK CONTENTS OF SR2
004312  001401                          BEQ     .+4             ;(PC OF ABORTED INSTRUCTION)
004314  000000                          HLT                     ;ERROR! INCORRECT PC IN SR2
004316  022704  016700                  CMP     #KI0,R4
004322  001401                          BEQ     .+4
004324  000000                          HLT                     ;ERROR!
```

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004326  104000                          SCOPE                   ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

                                ;CHECK
                                ;ABORTS WHEN DEST OPERAND IS FETCHED
                                ;DM=4
004330  012737  004362  000250          MOV     #T36C,@#MMVEC   ;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           ;ENABLE MEMORY MGMT
004356  154443                  T36A:   BISB    -(R4),-(R3)     ;SEG LENGTH ABORT
004360  000000                  T36B:   HLT                     ;ERROR! FAILED TO ABORT

004362                          T36C:
004362  022767  040001  173202          CMP     #PLA+1,SR0      ;CHECK SR0 (ABORT CONDITIONS
004370  001401                          BEQ     .+4             ;& FAILING PAGE #)
004372  000000                          HLT                     ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
004374  022767  004356  173174          CMP     #T36A,SR2       ;CHECK CONTENTS OF SR2
004402  001401                          BEQ     .+4             ;(PC OF ABORTED INSTRUCTION)
004404  000000                          HLT                     ;ERROR! INCORRECT PC IN SR2
004406  022703  016701                  CMP     #KI0+1,R3       ;CHECK AUTO-DEC
004412  001401                          BEQ     .+4
004414  000000                          HLT                     ;ERROR!
004416  022704  140001                  CMP     #KI6+1,R4       ;CHECK AUTO-DEC
004422  001401                          BEQ     .+4
004424  000000                          HLT                     ;ERROR! AUTO-DEC FAILED
004426  104000                          SCOPE                   ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS


                                ;CHECK
                                ;WHEN INSTRUCTION FETCHES DESTINATION INDEX VALUE
004430  012737  004476  000250          MOV     #T40C,@#MMVEC   ;LOAD MEM MGMT ERROR VECTOR
004436  012767  170000  173332          MOV     #UM+PUM,PSW
004444  012737  113767  017074          MOV     #113767,@#PUI2+74       ;113767,020001,177776
004452  012737  020001  017076          MOV     #20001,@#PUI2+76        ;IS A MOVB  @#20001,.+4
004460  012737  177776  017100          MOV     #177776,@#PUI2+100      ;INSTRUCTION
004466  005237  177572                  INC     @#SR0           ;ENABLE MEMORY MGMT
004472  000137  040074                  JMP     @#UI2+74
        004476                          RETURN=.
        017074                          .=PUI2+74
017074  113767  020001  177776  T40A:   MOVB    @#20001,.+4     ;SEG LENGTH ABORT WHEN INST. FETCHES
                                                                ;DEST INDEX WORD
017102  000000                  T40B:   HLT                     ;ERROR! FAILED TO ABORT
        004476                          .=RETURN

004476                          T40C:
004476  022767  040145  173066          CMP     #PLA+UPG+VS2+1,SR0      ;CHECK SR0 (ABORT CONDITIONS
004504  001401                          BEQ     .+4             ;& FAILING PAGE #)
004506  000000                          HLT                     ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
004510  022767  040074  173060          CMP     #UI2+74,SR2     ;CHECK CONTENTS OF SR2
004516  001401                          BEQ     .+4             ;(PC OF ABORTED INSTRUCTION)
004520  000000                          HLT                     ;ERROR! INCORRECT PC IN SR2
004522  104000                          SCOPE                   ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

                                ;CHECK
                                ;WHEN INSTRUCTION FETCHES DESTINATION OPERAND
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004524  012737  004572  000250          MOV     #T41C,@#MMVEC   ;LOAD MEM MGMT ERROR VECTOR
004532  012767  170000  173236          MOV     #UM+PUM,PSW     ;USER MODE!!!,PREV USER MODE!!
004540  012703  100000                  MOV     #UI4,R3
004544  012704  100102                  MOV     #UI4+102,R4
004550  012737  010344  017200          MOV     #010344,@#PUI5  ;012344 = MOV  R3,-(R4)
004556  005037  017202                  CLR     @#PUI5+2
004562  005237  177572                  INC     @#SR0           ;ENABLE MEMORY MGMT
004566  000137  120000                  JMP     @#UI5
        004572                          RETURN=.
        017200                          .=PUI5
017200  010344                  T41A:   MOV     R3,-(R4)        ;ABORT
017202  000000                  T41B:   HLT                     ;ERROR! FAILED TO ABORT
        004572                          .=RETURN

004572                          T41C:
004572  022767  040151  172772          CMP     #PLA+UPG+VSW+1,SR0      ;CHECK SR0 (ABORT CONDITIONS
004600  001401                          BEQ     .+4             ;& FAILING PAGE #)
004602  000000                          HLT                     ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
004604  022767  120000  172764          CMP     #UI5,SR2        ;CHECK CONTENTS OF SR2
004612  001401                          BEQ     .+4             ;(PC OF ABORTED INSTRUCTION)
004614  000000                          HLT                     ;ERROR! INCORRECT PC IN SR2
004616  022704  100100                  CMP     #UI4+100,R4
004622  001401                          BEQ     .+4
004624  000000                          HLT
004626  104000                          SCOPE                   ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

                                ;CHECK
                                ;(WHEN INSTRUCTION FETCHES ADDRESS OF DESTINATION OPERAND)
004630  012737  004666  000250          MOV     #T42C,@#MMVEC   ;LOAD MEM MGMT ERROR VECTOR
004636  012767  030000  173132          MOV     #KM+PUM,PSW
004644  012703  140102                  MOV     #KI6+102,R3
004650  012737  177777  017000          MOV     #-1,@#PKI6+100
004656  005237  177572                  INC     @#SR0           ;ENABLE MEMORY MGMT
004662  106653                  T42A:   MTPD    @-(R3)          ;SEG LENGTH ABORT
004664  000000                  T42B:   HLT                     ;ERROR! FAILED TO ABORT

004666  022706  001076          T42C:   CMP     #KPTR-2,KSP     ;CHECK STACK PTR ( 1 POP, 2 PUSHES)
004672  001401                          BEQ     .+4
004674  000000                          HLT                     ;ERROR! INCORRECT STACK PTR
004676  022767  040015  172666          CMP     #PLA+VS6+1,SR0  ;CHECK SR0 (ABORT CONDITIONS
004704  001401                          BEQ     .+4             ;& FAILING PAGE #)
004706  000000                          HLT                     ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
004710  022767  004662  172660          CMP     #T42A,SR2       ;CHECK CONTENTS OF SR2
004716  001401                          BEQ     .+4             ;(PC OF ABORTED INSTRUCTION)
004720  000000                          HLT                     ;ERROR! INCORRECT PC IN SR2
004722  022703  140100                  CMP     #KI6+100,R3     ;CHECK AUTO-DECREMENT
004726  001401                          BEQ     .+4
004730  000000                          HLT                     ;ERROR! DID NOT AUTO-DEC
004732  104000                          SCOPE                   ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

                                ;CHECK
                                ;ABORTS WHEN ADDRESS TO JUMP TO IS FETCHED
004734  012737  005002  000250          MOV     #T43C,@#MMVEC   ;LOAD MEM MGMT ERROR VECTOR
004742  012737  000137  017076          MOV     #137,@#PUI2+76  ;000137,T43D =JMP  @#T43D
004750  012737  005000  017100          MOV     #T43D,@#PUI2+100
004756  005037  017102                  CLR     @#PUI2+102
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004762  012767  170000  173006          MOV     #UM+PUM,PSW
004770  005237  177572                  INC     @#SR0           ;ENABLE MEMORY MGMT
004774  000137  040076                  JMP     @#UI2+76        ;GO DO INSTRUCTION
        005000                          RETURN=.
        017076                          .=PUI2+76
017076  000137  005000          T43A:   JMP     @#T43D
017102  000000                  T43B:   HLT                     ;ERROR! JMP FAILED
        005000                          .=RETURN
005000  000000                  T43D:   HLT                     ;ERROR! FAILED TO ABORT
005002                          T43C:
005002  022767  040145  172562          CMP     #PLA+UPG+VS2+1,SR0      ;CHECK SR0 (ABORT CONDITIONS
005010  001401                          BEQ     .+4             ;& FAILING PAGE #)
005012  000000                          HLT                     ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
005014  022767  040076  172554          CMP     #UI2+76,SR2     ;CHECK CONTENTS OF SR2
005022  001401                          BEQ     .+4             ;(PC OF ABORTED INSTRUCTION)
005024  000000                          HLT                     ;ERROR! INCORRECT PC IN SR2
005026  104000                          SCOPE                   ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

                                ;CHECK
                                ;WHEN INSTRUCTION FETCHES ADDRESS OF DEST. OPERAND. (UI5+4)
005030  012737  005100  000250          MOV     #T44C,@#MMVEC   ;LOAD MEM MGMT ERROR VECTOR
005036  012767  170000  172732          MOV     #UM+PUM,PSW     ;USER MODE!!! PREV USER MODE!!
005044  012706  000600                  MOV     #UPTR,USP       ;SET USER STACK PTR
005050  012703  120006                  MOV     #UI5+6,R3
005054  012737  177776  017204          MOV     #-2,@#PUI5+4
005062  012737  004753  017200          MOV     #4753,@#PUI5    ;004753 = JSR 7,@-(R3)
005070  005237  177572                  INC     @#SR0           ;ENABLE MEMORY MGMT
005074  000137  120000                  JMP     @#UI5           ;GO DO INST.
        005100                          RETURN=.
        017200                          .=PUI5
017200  004753                  T44A:   JSR     7,@-(R3)
017202  000000                  T44B:   HLT                     ;ERROR!
        005100                          .=RETURN
005100  022706  001074          T44C:   CMP     #KPTR-4,KSP     ;CHECK STACK PTR
005104  001401                          BEQ     .+4
005106  000000                          HLT                     ;INCORRECT STACK PTR
005110  022767  140157  172454          CMP     #NRA+PLA+UPG+VS7+1,SR0  ;CHECK SR0 (ABORT CONDITIONS
005116  001401                          BEQ     .+4             ;& FAILING PAGE #)
005120  000000                          HLT                     ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
005122  022767  120000  172446          CMP     #UI5,SR2        ;CHECK CONTENTS OF SR2
005130  001401                          BEQ     .+4             ;(PC OF ABORTED INSTRUCTION)
005132  000000                          HLT                     ;ERROR! INCORRECT PC IN SR2
005134  106506                          MFPD    USP             ;GET USER STACK PTR (ON KERNEL STACK)
005136  022716  000576                  CMP     #UPTR-2,(KSP)   ;CHECK THAT USER STACK DID NOT
005142  001401                          BEQ     .+4             ;GET PUSHED
005144  000000                          HLT                     ;ERROR!
005146  022703  120004                  CMP     #UI5+4,R3       ;CHECK AUTO-DEC
005152  001401                          BEQ     .+4
005154  000000                          HLT                     ;ERROR!
005156  104000                          SCOPE                   ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

                                ;CHECK
                                ;WHEN INSTRUCTION FETCHES DESTINATION OPERAND (UIPDR5)
005160  012737  005232  000250          MOV     #T45C,@#MMVEC   ;LOAD MEM MGMT ERROR VECTOR
005166  012767  170000  172602          MOV     #UM+PUM,PSW     ;USER MODE!!! PREV USER MODE!!
005174  012706  000600                  MOV     #UPTR,USP       ;SET USER STACK PTR
```

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005200  005016                          CLR     (USP)
005202  012737  012667  017200          MOV     #012667,@#PUIS  ;012667,057606 = MOV  (USP)+,UIPDRS
005210  012737  057606  017202          MOV     #57606,@#PUIS+2 ;INSTRUCTION
005216  005037  017204                  CLR     @#PUIS+4
005222  005237  177572                  INC     @#SR0           ;ENABLE MEMORY MGMT
005226  000137  120000                  JMP     @#UIS
        005232                          RETURN=.
        017200                          .=PUIS
017200  012667  057606          T45A:   MOV     (USP)+,UIPDRS-UIS+PUIS
017204  000000                  T45B:   HLT                     ;ERROR! FAILED TO ABORT
        005232                          .=RETURN

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


                                ;CHECK
                                ;ABORTS WHEN REGISTER (R5) IS PUSHED ON USER STACK
005274  012737  005344  000250          MOV     #T50C,@#MVEC    ;LOAD MEM MGMT ERROR VECTOR
005302  012767  170000  172466          MOV     #UM+PUM,PSW     ;USER MODE!!!, PREV USER MODE!!
005310  012706  100000                  MOV     #UI4,USP        ;SET USER STACK PTR
005314  005037  017276                  CLR     @#PUI4-2
005320  005005                          CLR     R5
005324  012767  005342  173654          MOV     #T50D,TEMP
005332  005237  177572                  INC     @#SR0           ;ENABLE MEMORY MGMT
005336  004577  173644          T50A:   JSR     5,@TEMP         ;NON-RES ABORT
005340  000000                  T50B:   HLT                     ;JSR FAILED & DID NOT ABORT
005342  000000                  T50D:   HLT                     ;ERROR! FAILED TO ABORT
005344                          T50C:
005344  022767  140147  172220          CMP     #NRA+PLA+UPG+VS3+1,SR0  ;CHECK SR0 (ABORT CONDITIONS
005352  001401                          BEQ     .+4             ;& FAILING PAGE #)
005354  000000                          HLT                     ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
005356  022767  005334  172212          CMP     #T50A,SR2       ;CHECK CONTENTS OF SR2
005364  001401                          BEQ     .+4             ;(PC OF ABORTED INSTRUCTION)
005366  000000                          HLT                     ;ERROR! INCORRECT PC IN SR2
005370  106506                          MFPD    USP             ;PUSH USER STACK PTR ONTO KERNEL STACK
005372  022716  077776                  CMP     #UI4-2,(KSP)    ;CHECK THAT USER STACK PTR DEC-
005376  001401                          BEQ     .+4             ;REMENTED
005400  000000                          HLT                     ;ERROR!
005402  005705                          TST     R5
005404  001401                          BEQ     .+4
005406  000000                          HLT
005410  104000                          SCOPE                   ;SCOPE STORES PC IN R1 & SETS ALL STACK PTRS

                                ;CHECK
```

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                                        ;ABORTS WHEN STATUS IS PUSHED ONTO USER STACK
005412  012737  005456  000250            MOV     #T52C,@#MMVEC   ;LOAD MEM MGMT ERROR VECTOR
005420  012767  140000  172374            MOV     #UM,IOTVEC+2
005426  012767  005454  172364            MOV     #T52D,IOTVEC
005434  012767  170000  172334            MOV     #UM+PUM,PSW     ;USER MODE!!!,PREV USER MODE!!
005442  005006                            CLR     USP             ;SET USER STACK PTR
005444  005237  177572                    INC     @#SR0           ;ENABLE MEMORY MGMT
005450  000004                    T52A:   IOT                     ;NON-RESIDENT ABORT
005452  000000                    T52B:   HLT                     ;ERROR! IOT & ABORT FAILED
005454  000000                    T52D:   HLT                     ;ERROR! ABORT FAILED
005456  022706  001074            T52C:   CMP     #KPTR-4,KSP     ;CHECK STACK PTR
005462  001401                            BEQ     .+4
005464  000000                            HLT                     ;INCORRECT STACK PTR
005466  022766  170000  000002            CMP     #UM+PUM,2(KSP)  ;CHECK THAT CORRECT STATUS
005474  001401                            BEQ     .+4             ;WAS SAVED ON THE STACK
005476  000000                            HLT                     ;ERROR! INCORRECT STATUS
005500  022767  140157  172064            CMP     #NRA+UPG+PLA+VS7+1,SR0  ;CHECK SR0 (ABORT CONDITIONS
005506  001401                            BEQ     .+4             ;& FAILING PAGE #)
005510  000000                            HLT                     ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
005512  022767  005450  172056            CMP     #T52A,SR2       ;CHECK CONTENTS OF SR2
005520  001401                            BEQ     .+4             ;(PC OF ABORTED INSTRUCTION)
005522  000000                            HLT                     ;ERROR! INCORRECT PC IN SR2
005524  122737  000060  177777            CMPB    #60,@#PSW+1     ;CHECK FOR CORRECT PSW ON ABORT
005532  001401                            BEQ     .+4             ;(KM+PUM IN HIGH BYTE)
005534  000000                            HLT                     ;ERROR! INCORRECT PSW AFTER ABORT
005536  012737  030000  177776            MOV     #KM+PUM,@#PSW   ;KERNEL MODE!!! PREV SUPER MODE!!
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  104003                            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  172202            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  000004                    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  012746  140000                  MOV     #UM,-(USP)
005764  012746  040100                  MOV     #UI2+100,-(USP)
005770  005037  017100                  CLR     @#PUI2+100
005774  005237  177572                  INC     @#SR0               ;ENABLE MEMORY MGMT
006000  000002                  T56B:   RTI
        006002                          RETURN=.
        017100                          .=PUI2+100
017100  000000                  T56A:   HLT                         ;ERROR! FAILED TO ABORT
        006002                          .=RETURN
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                          RETURN=.
        017076                          .=PUI2+76
017076  000005                  T60A:   RESET                       ;ABORTS WHEN NEXT INST. FETCHED
017100  000000                          HLT                         ;ERROR! FAILED TO ABORT
        006100                          .=RETURN

006100                          T60C:
006100  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                          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                          RETURN=.
        017100                          .=PUI2+100
017100  000000                  T63A:   HLT                     ;SEG ABORT WHEN THIS INST. FETCHED AT
        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                     ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
006206  022767  000576  171362          CMP     #UPTR-2,SR2     ;CHECK CONTENTS OF SR2
006214  001401                          BEQ     .+4             ;(PC OF ABORTED INSTRUCTION)
006216  000000                          HLT                     ;ERROR! INCORRECT PC IN SR2
006220  106506                          MFPD    USP             ;PUSH USER STACK PTR ONTO KERNEL STACK
006222  022716  000604                  CMP     #UPTR+4,(KSP)   ;CHECK USER STACK PTR
006226  001401                          BEQ     .+4
006230  000000                          HLT                     ;ERROR! INCORRECT USER STACK PTR
006232  023705  000602                  CMP     @#UPTR+2,R5     ;CHECK CONTENTS OF R5
006236  001401                          BEQ     .+4
006240  000000                          HLT                     ;ERROR!
006242  104000                          SCOPE                   ;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,@#KI0-2 ;105722=TSTB (R2)+
006264  005037  016700                  CLR     @#KI0
006270  005237  177572                  INC     @#SR0           ;ENABLE MEMORY MGMT
006274  000137  016676                  JMP     @#KI0-2         ;GO EXECUTE INSTRUCTION
        006300                          RETURN=.
        016676                          .=KI0-2
016676  105722                  T64A:   TSTB    (R2)+           ;ABORTS WHEN NEXT INST. IS FETCHED
016700  000000                  T64B:   HLT                     ;ERROR! FAILED TO ABORT
        006300                          .=RETURN
006300                          T64C:
006300  022767  040001  171264          CMP     #PLA+VS0+1,SR0  ;CHECK SR0 (ABORT CONDITIONS
006306  001401                          BEQ     .+4             ;& FAILING PAGE #)
006310  000000                          HLT                     ;ERROR! INCORRECT ABORT CONDITIONS OR PAGE IDENT
006312  022767  016676  171256          CMP     #T64A SR2       ;CHECK CONTENTS OF SR2
006320  001401                          BEQ     .+4             ;(PC OF ABORTED INSTRJCTION)
006322  000000                          HLT                     ;ERROR! INCORRECT PC IN SR2
006324  005702                          TST     R2              ;CHECK AUTO-INC
```

```
006326  001401                          BEQ     .+4
006330  000000                          HLT                     ;ERROR! AUTO-INC FAILED
006332  104000                          SCOPE                   ;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)
006352  114203                          MOVB    -(R2),R3        ;THIS INSTRUCTION IS NOT EXECUTED
006354  012702  001204                  MOV     #TEMP,R2
006360  012722  100000                  MOV     #100000,(R2)+
006364  005237  177572                  INC     @#SR0           ;ENABLE MEMORY MGMT
006370  000113                          JMP     (R3)            ;GO EXECUTE MOVB INSTRUCTION
        006372                  RETURN=.
        016676                  .=K10-2
016676  114203                  T66A:   MOVB    -(R2),R3        ;ABORTS WHEN THE NEXT INST IS FETCHED
016700  000000                  T66B:   HLT                     ;ERROR! FAILED TO ABORT HERE
        006372                  .=RETURN
006372                          T66C:
006372  022767  040001  171172          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

                                ;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  000000  172314          MOVB    #R00,@#KIPDR6   ;SET KERNEL ADDRESS 140000-140077
                                                                ;READ ABORT ON WRITE
006444  005037  016700                  CLR     @#PKI6          ;CLEAR CORRESPONDING PHYSICAL ADDRESS
006450  005237  177572                  INC     @#SR0           ;ENABLE MEMORY MGMT
006454  000261                          SEC                     ;SET 'C'
006456  005537  140000          T72A:   ADC     @#KI6           ;ABORTS WHEN DATA IS FETCHED USING DATIP

006462                          T72C:
006462  022767  020015  171102          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     @#SR0           ;DISABLE MEMORY MGMT
006524  005737  016700                  TST     @#PKI6          ;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     @#PKI6          ;PRESET ADDRESS
006550  005237  177572                  INC     @#SR0           ;ENABLE MEMORY MGMT
006554  000261                          SEC                     ;SET 'C'
006556  106037  140001          T73A:   RORB    @#KI6+1         ;ABORTS WHEN RESULT IS WRITTEN
006562                          T73C:
006562  022767  020015  171002          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
006616  000000                          HLT                     ;ERROR! INCORRECT STATUS
006620  005037  177572                  CLR     @#SR0           ;DISABLE MEMORY MGMT
006624  005737  016700                  TST     @#PKI6
006630  001401                          BEQ     .+4
006632  000000                          HLT                     ;ERROR! ADDRESS WAS WRITTEN
006634  012737  000006  172314          MOV     #6,@#KIPDR6     ;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     #T102C,@#MMVEC  ;LOAD MEM MGMT ERROR VECTOR
006652  005002                          CLR     R2              ;PRESET DESTINATION
006654  005237  177572                  INC     @#SR0           ;ENABLE MEMORY MGMT
006660  012746  140017                  MOV     #UM+17,-(KSP)   ;'NEW' STATUS ON STACK
006664  012746  006672                  MOV     #.+6,-(KSP)     ;RETURN PC
006670  000002                          RTI                     ;SET STATUS AND EXECUTE NEXT INST.
006672  013702  177776          T102A:  MOV     @#PSW,R2        ;PSW IS NON-RESIDENT IN USER MODE
006676  000000                          HLT                     ;ERROR! FAILED TO ABORT
006700                          T102C:
006700  022767  140157  170664          CMP     #MRA+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     #T102A,SR2      ;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)   ;CHECK THAT CORRECT STATUS
006732  001401                          BEQ     .+4             ;WAS SAVED ON THE STACK
006734  000000                          HLT                     ;ERROR! INCORRECT STATUS
006736  005702                          TST     R2              ;CHECK THAT R2 WAS NOT LOADED
006740  001401                          BEQ     .+4
006742  000000                          HLT                     ;ERROR! DEST (R2) WAS CHEANGED
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  100375                  BPL     .-4
007002  013702  000042          MOV     @#42,%2         ;GET DECTAPE MONITOR RETURN ADDRESS
007006  001404                  BEQ     DONE1           ;DO NOT RETURN TO MON IF (42)=0
007010  004712          LOGIC:  JSR     7,(2)           ;RETURN TO DECTAPE MONITOR
007012  000240                  NOP                     ;ACT11
007014  000240                  NOP                     ;OVERLAY
007016  000240                  NOP                     ;AREA
007020  000167  172166  DONE1:  JMP     START

        000001                  .END
```

E03


```
AVA    = 020000            253#   1432   1455
BEGIN    001220            393#   1500
BIT13  = 020000            335#
BIT14  = 040000            334#
BIT15  = 100000            333#
BIT6   = 000100            237#
BIT8   = 000400            236#
C      = 000001            197#   1438   1461
DM     = 000400            252#
DONE     006766           1498    1501#
DONE1    007020           1505    1510#
DWN    = 000010            260#
ED     = 000010            258#
EMTVEC= 000030             214#    343
END      006746           1497#
ENMM   = 000001            240#
ERRVEC= 000010             210#    341    366
FPVEC  = 000244            217#
HLT    = 000000            311#    451    454    457    460    463    466    478    481    484    487    491    503
                           507     510    513    516    529    532    535    538    541    545    549    552    565
                           568     571    574    578    582    585    595    599    602    605    615    619    622
                           625     635    639    642    645    659    660    663    666    669    672    676    688
                           689     693    696    700    711    712    715    718    721    724    728    745    750
                           753     756    759    762    779    786    789    792    808    810    816    819    822
                           825     828    838    841    844    847    850    860    863    866    869    879    884
                           887     891    894    908    913    916    919    922    934    938    941    945    948
                           960     964    967    971    983    987    990    993    996   1008   1013   1016   1019
                          1022    1039   1045   1048   1064   1070   1073   1076   1087   1091   1094   1097   1100
                          1115    1117   1121   1124   1140   1144   1147   1150   1154   1157   1174   1180   1183
                          1187    1202   1203   1207   1210   1214   1217   1229   1230   1233   1236   1239   1242
                          1245    1250   1262   1263   1266   1269   1272   1275   1278   1283   1299   1303   1306
                          1309    1323   1329   1332   1348   1352   1355   1358   1362   1365   1379   1384   1387
                          1390    1407   1412   1415   1418   1434   1437   1440   1444   1457   1460   1463   1467
                          1481    1485   1488   1491   1494
ICNT     001200            384#    392*  1497*  1498
IOTVEC= 000020             212#   1223*  1224*  1258*  1259*  1284*  1285*
IS     = 000000            249#    754    784
KIPAR0= 172340             295#    412    426*
KIPAR1= 172342             296#
KIPAR2= 172344             297#
KIPAR3= 172346             298#
KIPAR4= 172350             299#
KIPAR5= 172352             300#
KIPAR6= 172354             301#    427*
KIPAR7= 172356             302#    428*
KIPDR0= 172300             286#    408    417*
KIPDR1= 172302             287#
KIPDR2= 172304             288#
KIPDR3= 172306             289#
KIPDR4= 172310             290#
KIPDR5= 172312             291#
KIPDR6= 172314             292#    418*  1424*  1468*
KIPDR7= 172316             293#    419*
KIO    = 016700            316#    445    473    489    498    514    594    614    634    735*   736*   737*   740
                           743     771*   772*   774    777    798*   799*   800*   804    807    875    876*   889
                           892*    978    979*   994   1004   1017   1372*  1373*  1375   1377   1396   1405
```

F03


```
KI6     = 140000          317#  770   790   956  1003  1020  1083  1098  1429#  1453#
KM      = 000000          204#  833   954  1082  1246  1279
KPG     = 000000          251#
KPTR    = 001100          229#  372   393   452   479   530   566   661   713   748   814   839   861
                          969  1089  1142  1231  1264  1301  1350
KSP     =x000006          193#  362#  363   365#  371   372#  373#  374#  375#  393#  452   455   479
                          505   530   533   566   661   664   674   698   713   726   748   751   814
                          817   849   861   943   955#  956#  958#  968   969   985  1089  1142  1152
                         1212  1231  1234  1248  1264  1267  1270  1281  1301  1350  1360  1438  1461
                         1477#  1478#  1489
LOGIC   007010            346  1506#
MMK     001320            417#
MMVEC   = 000250          218#  395#  443#  444#  472#  497#  522#  558#  591#  611#  631#  651#  681#
                          707#  733#  768#  801#  834#  855#  874#  899#  926#  953#  977#  1002#  1028#
                         1053#  1081#  1105#  1129#  1162#  1194#  1222#  1255#  1289#  1314#  1339#  1370#  1395#
                         1423#  1449#  1474#
MMO     001232            398#
N       = 000010          2[illegible]#
NRA     = 100000          2[illegible]#  536   569   864   911   936  1145  1178  1205  1237  1483
NRD     = 000000          305#
PC      =x000007          190#  1340
PFVEC   = 000024          213#
PKIO    = 016600          324#
PKIS    = 016700          325#  769#  1084#  1426#  1442  1450#  1465
PKM     = 000000          206#
PLA     = 040000          254#  458   492   508   536   569   597   617   637   667   691   716   754
                          784   820   842   864   882   911   962   988  1011  1043  1068  1092  1119
                         1145  1178  1205  1237  1273  1304  1327  1353  1382  1410  1483
PRTY4   = 000200          203#
PRTY7   = 000340          202#  1259  1270
PSW     = 177776          221#  361#  376#  523#  559#  652#  682#  705#  833#  857#  905#  927#  954#
                         1029#  1054#  1082#  1109#  1130#  1163#  1195#  1225#  1243  1246#  1256#  1279#  1290#
                         1313#  1338#  1480
PUI1    = 017100          330#  901
PUI2    = 017000          329#  654#  655#  903#  1030#  1031#  1032#  1036  1106#  1107#  1108#  1113  1294#
                         1283  1315#  1316#  1321  1347
PUI3    = 017400          328#  931#
PUI4    = 017300          327#  684#  685#  1197#
PUI5    = 017200          326#  562#  1057#  1058#  1062  1133#  1134#  1138  1166#  1167#  1168#  1172  1173#
PUM     = 030000          207#  376   523   533   559   652   664   682   705   833   857   905   927
                          954  1029  1054  1082  1109  1130  1163  1195  1225  1234  1246  1256  1270
                         1279  1290  1313  1338
R00     = 000002          306#  1424
RETURN= 006372            741#  747   775#  780   806#  812  1035#  1040  1061#  1065  1112#  1116  1137#
                         1141  1171#  1175  1297#  1300  1320#  1324  1346#  1349  1376#  1380  1404#  1408
RW      = 000006          308#
RWT     = 000004          307#
R0      =%000000          183#
R1      =%000001          184#  371#  374
R2      =%000002          185#  400#  402#  404#  406#  408#  410#  412#  414#  446#  450#  464  473#
                          474   475#  477   489   524#  525   528   547   592#  594#  603#  734#  744#
                          760#  770#  778#  790   8[illegible]#  837   848   856#  859#  900#  907#  917  930#
                          933#  946  1371#  1378  13[illegible]  1319  1400#  1401#  1406  1475#  1480#  1492
R3      =%000003          186#  401#  403#  405#  407#  409#  411#  413#  415#  445#  446  447#  450
                          464   525#  528#  550   632#  634#  643   809#  826   875#  878#  889  901#
                          902#  903   904#  907   920  1004#  1005#  1007#  1017  1055#  1063  1083#  1086#
```

```
                            1098    1132*   1139    1155    1396*   1398*   1399*   1403    1406*   1416
R4      =%000004            187#    474*    499*    502*    560*    561     564     580     612*    614*    623     978*    982*
                            994     1003*   1007    1020    1056*   1063*   1074
R5      =%000005            188#    498*    499     502     514     561*    564*    583     708*    722     1198*   1215    1317*
                            1342*   1363
SCOPE  = 104000             312#    394     467     492     517     553     586     606     626     646     677     701     729
                            763     793     829     851     870     895     923     949     972     997     1023    1049    1077
                            1101    1125    1158    1188    1218    1251    1286    1310    1333    1366    1391    1419    1445
                            1469    1495
SCOPEA  000442              344     370#
SCOPEX  000476              378     379#
SHLT    000400              342     360#
SHLTA   000436              364     367#
SP      =%000006            189#
SR0    = 177572             264#    360*    370*    399*    448*    458     476*    482     500*    508     526*    536     563*
                            569     553*    597     613*    617     633*    637     656*    667     686*    691     709*    716
                            739*    754     773*    784     802*    820     836*    842     856     858*    864     877*    882
                            8[illegible]*   906*    911     932*    936     957*    962     980*    968     1006*   1011    1033*   1043
                            1059*   1068    1075*   1092    1110*   1119    1135*   1145    1169*   1178    1184*   1200*   1205
                            1227*   1237    1260*   1273    1295*   1304    1318*   1327    1344*   1353    1374*   1382    1402*
                            1410    1427*   1432    1441*   1451*   1455    1464*   1476*   1483
SROT    001202              385#
SR1    = 177574             265#
SR2    = 177576             266#    461     485     511     539     572     600     620     640     670     694     719     757
                            787     823     845     867     885     914     939     965     991     1014    1046    1071    1095
                            1122    1148    1181    1208    1240    1276    1307    1330    1356    1385    1413    1435    1458
                            1486
START   001212              356     391#    1510
SWR    = 177570             226#
T      = 000020             201#
TBITVE= 000014              211#
TEMP   = 001204             386#    1199*   1201    1400
TKB    = 177562             223#
TKS    = 177560             222#
TPB    = 177566             225#    1501*
TPS    = 177564             224#    1502
TPVEC  = 000064             216#
TRAPVE= 000034              215#
T0      001454              442#
T0A     001504              450#    461
T0B     001506              451#
T0C     001510              443     452#
T1A     001610              477#    485
T1B     001612              478#
T1C     001614              472     479#
T10A    002434              634#    640
T10B    002440              635#
T10C    002442              631     636#
T102A   006672              1480#   1486
T102C   006700              1474    1482#
T13A    002536              658#    670
T13B    002540              659#
T13C    002544              651     661#
T13D    002542              654     660#
T14A    002664              687#    694
T14B    002666              688#
```

```
T14C    002672          681     690#
T14D    002670          684     693#
T16A    002762          710#    719
T16B    002764          711#
T16C    002770          707     713#
T16D    002766          708     712#    722
T2A     001704          502#    511
T2B     001706          503#
T2C     001710          497     504#
T20A    016676          744#    757
T20B    016702          745#
T20C    003112          733     748#
T21A    016676          778#    787
T21B    016702          779#
T21C    003232          768     783#
T22     016674          800#
T23A    016676          809#    823
T23BA   016700          810#
T23B    016702          811#
T22C    003332          801     814#
T24A    003434          837#    845
T24B    003436          838#
T24C    003440          834     839#
T25A    003532          859#    867
T25B    003534          860#
T25C    003536          855     861#
T3A     002010          528#    539
T33     002012          529#
T3C     002014          522     530#
T30A    003620          878#    885
T30C    003624          874     881#
T31A    003742          907#    914
T31B    003744          908#
T31C    003746          899     910#
T32A    004054          933#    939
T32B    004056          934#
T32C    004060          926     935#
T33A    004160          958#    965
T33B    004162          960#
T33C    004164          953     961#
T34A    004172          993#    991
T34B    004176          993#
T34C    004200          977     984#
T35A    004206          1007#   1014
T35B    004210          1008#
T36C    004362          1002    1010#
T4A     002160          564#    572
T4B     002162          565#
T4C     002164          558     566#
T40A    017074          1037#
T40B    017102          1039#
T40C    004476          1028    1042#
T41A    017200          1063#
T41B    017202          1064#
T41C    004572          1053    1067#
T42A    004662          1086#   1095
```

DFKTFA.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

```
T42B    004664          1087#
T42C    004756          1031    1089#
T43A    017076          1114#
T43B    017102          1115#
T43C    [illegible]     1105    1118#
T43D    [illegible]     1107    1114    1117#
T44A    017[illegible]  1139#
T44B    017[illegible]  1140#
T44C    005100          1129    1142#
T45A    017200          1173#
T45B    017204          1174#
T45C    [illegible]     1162    1177#
T50A    [illegible]     1201#   1208
T50B    [illegible]     1202#
T50C    [illegible]     1194    1204#
T50D    [illegible]     1199    1203#
T52A    [illegible]     1223#   1240
T52B    [illegible]     1[illegible]#
T52C    [illegible]     1222    1231#
T52D    [illegible]     1224    1230#
T53A    [illegible]     1261#   1276
T53B    [illegible]     1252#   1267
T53C    [illegible]     1255    1264#
T53D    005624          1258    1263#
T56A    017100          1249#
T56B    006000          1296#   1307
T56C    006002          1289    1301#
T6A     002300           594#    600
T6B     002304           595#
T6C     002306           591     596#
T60A    017076          1322#
T60C    006100          1314    1326#
T63A    017100          1343*   1348#
T63C    006164          1339    1350#
T64A    016676          1378#   1385
T64B    016700          1379#
T64C    006300          1370    1381#
T66A    016676          1406#   1413
T66B    016700          1407#
T66C    006372          1395    1409#
T7A     [illegible]      614#    620
T7B     [illegible]      615#
T7C     [illegible]      611     616#
T72A    006456          1429#   1435
T72C    006462          1423    1431#
T73A    [illegible]     1453#   1458
T73C    006562          1449    1454#
UIPAR0= 177640           277#    404     429*
UIPAR1= 177642           278#    431*
UIPAR2= 177644           279#    430*
UIPAR3= 177646           280#
UIPAR4= 177650           281#    433*
UIPAR5= 177652           282#    432*
UIPAR6= 177654           283#
UIPAR7= 177656           284#
UIPDR0= 177600           268#    400     420*
```

DFKTFA.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

```
UIPOR1= 177602            269#  422#
UIPOR2= 177604            270#  421#  543  546#
UIPOR3= 177606            271#
UIPOR4= 177610            272#  423#
UIPOR5= 177612            273#  424#  576  579#  1173#  1185
UIPOR6= 177614            274#
UIPOR7= 177616            275#
UI1     = 020000          321#  706  726  904  920
UI2     = 040000          320#  653  674  835  848  900  917  1034  1046  1111  1122  1257  1281
                         1293  1319 1330 1342
UI3     = 060000          322#  930  946
UI4     = 100000          319#  524  547  550  683  698  1055  1056  1074  1196  1212
UI5     = 120000          318#  560  580  583  955  1060  1071  1132  1136  1148  1155  1170  1173#
                         1181
UM      = 140000          205#  523  533  559  652  664  682  705  857  905  927  1029  1054
                         1109  1130 1163 1195 1223 1225 1234 1256 1259 1270 1290 1292  1313
                         1339  1477 1489
UP      = 000000          238#
UPG     = 000140          250#  536  569  667  691  716  842  864  911  936  962  1043  1068
                         1119  1145 1178 1205 1237 1273 1304 1327 1353 1483
UPTR    = 000600          230#  375  928  943  1131 1152 1164 1291 1356 1360 1363
USP     =X000006          194#  377* 653* 673  683* 697  706* 725  928* 929* 942  1131* 1151
                         1164* 1165* 1173 1196* 1211 1226* 1247 1257* 1280 1291* 1292* 1293* 1340*
                         1345  1359
V       = 000002          198#
VS0     = 000000          241#  754  784  820  988  1382  1410
VS1     = 000002          242#  716  842  1273
VS2     = 000004          243#  667  1043 1119 1304 1327  1353
VS3     = 000006          244#  536  936  1205
VS4     = 000010          245#  691  962  1068
VS5     = 000012          246#
VS6     = 000014          247#  1092 1432 1455
VS7     = 000016          248#  569  864  911  1145 1178  1237  1483
W       = 000100          261#  543  546  576  579
Z       = 000004          199#
.       = 007024          340#  341#  343#  345#  347#  350#  355#  358#  382#  386  387#  403  407
                          411   415   453   456   459   462   465   480   483   486  490   506  509
                          512   515   531   534   537   540   544   548   551   567  570   573  577
                          581   584   588   601   604   618   621   624   638   641  644   662  665
                          668   671   675   692   695   699   714   717   720   723  727   741  743#
                          744   747#  749   752   755   758   761   775   777#  780# 785   788  791
                          806   807#  809   812#  815   818   821   824   827   840  843   846  849
                          862   865   868   873   876   890   893   912   915   918  921   937  940
                          944   947   963   966   970   986   989   992   995   1012 1015  1018 1021
                         1035  1036# 1037* 1040# 1044  1047  1061  1062# 1065# 1069 1072  1075 1090
                         1093  1096  1099  1112  1113# 1116# 1120  1123  1137  1138# 1141# 1143 1146
                         1149  1153  1156  1171  1172# 1175# 1179  1182  1186  1206 1209  1213 1216
                         1232  1235  1238  1241  1244  1249  1265  1268  1271  1274 1277  1282 1297
                         1298# 1300# 1302  1305  1308  1320  1321# 1324# 1328  1331 1346  1347# 1349#
                         1351  1354  1357  1361  1364  1376  1377# 1380# 1383  1386 1389  1404 1405#
                         1408# 1411  1414  1417  1433  1436  1439  1443  1456  1459 1462  1466 1478
                         1484  1487  1490  1493  1503
```

DFKTFA.P11 CROSS REFERENCE TABLE -- MACRO NAMES

DFKTFA.P11 CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

```
ADC     1429
ADD      365   528   614
BEQ      364   378   453   456   459   462   465   480   483   486   490   506   509   512   515
         531   534   537   540   544   548   551   567   570   573   577   581   584   598   601
         604   618   621   624   638   641   644   662   665   668   671   675   692   695   699
         714   717   720   723   727   749   752   755   758   761   785   788   791   815   818
         821   824   827   840   843   846   849   862   865   868   893   886   890   893   912
         915   918   921   937   940   944   947   963   966   970   976   989   992   995  1012
        1015  1018  1021  1044  1047  1069  1072  1075  1090  1093  1096  1099  1120  1123  1143
        1146  1149  1153  1156  1179  1182  1206  1209  1213  1216  1232  1235  1238  1241  1244
        1249  1265  1268  1271  1274  1277  1282  1302  1305  1308  1328  1331  1351  1354  1357
        1361  1364  1383  1386  1389  1411  1414  1417  1433  1436  1439  1443  1456  1459  1462
        1466  1484  1487  1490  1493  1499  1505
BIC      360   361   546   579
BICB     564   878
BISB     502  1007
BIT      543   576
BNE     1186
BPL     1503
CLR      370   373   392   395   399   402   406   410   414   426   429   444   447   475   612
         632   655   685   736   737   772   799   800   859   888   929  1058  1108  1165  1168
        1184  1197  1198  1226  1284  1294  1316  1317  1343  1373  1397  1426  1441  1450  1464
        1475
CMP      452   455   458   461   464   479   482   485   489   505   508   511   514   530   533
         536   539   547   550   566   569   572   590   583   597   600   617   620   637   640
         661   664   667   670   674   691   694   698   713   716   719   722   726   748   751
         754   757   784   787   790   814   817   820   823   839   842   845   848   861   864
         867   882   885   889   911   914   917   920   936   939   943   946   962   965   969
         985   988   991   994  1011  1014  1017  1020  1043  1046  1068  1071  1074  1089  1092
        1095  1098  1119  1122  1142  1145  1148  1152  1155  1178  1181  1205  1208  1212  1221
        1234  1237  1240  1248  1264  1267  1270  1273  1276  1281  1301  1304  1307  1327  1330
        1350  1353  1356  1360  1363  1382  1385  1410  1413  1416  1432  1435  1438  1455  1458
        1461  1483  1486  1489  1498
CMPB     477  1243
EMT      312
HALT     311   340   351
INC      448   476   500   526   563   593   603   613   633   656   686   709   738   760   773
         802   836   858   877   892   906   932   957   980  1006  1033  1059  1085  1110  1135
        1169  1200  1227  1260  1295  1318  1344  1374  1402  1427  1451  1476  1497
IOT     1228  1261
JMP      356   366   367   740   774   804  1034  1060  1111  1114  1136  1170  1319  1345  1375
        1403  1500  1510
JSR     1139  1201  1506
MARK    1341
MFPD     673   697   725   837   942   968  1151  1211  1247  1280  1359
MOV      371   372   374   375   376   393   400   401   404   405   408   409   412   413   417
         418   419   420   421   422   423   424   427   428   430   431   432   433   443   445
         446   450   472   473   474   497   498   499   522   523   524   525   558   559   560
         561   562   591   592   594   611   631   634   651   652   653   654   681   682   683
         684   705   706   707   708   733   734   735   744   768   769   770   771   778   797
         798   801   833   834   835   855   856   857   874   875   876   899   900   901   902
         903   904   905   926   927   928   930   931   953   954   955   956   977   978   979
        1002  1003  1004  1005  1028  1029  1030  1031  1032  1053  1054  1055  1056  1057  1063
        1081  1082  1083  1084  1105  1106  1107  1109  1129  1130  1131  1132  1133  1134  1162
        1163  1164  1166  1167  1173  1194  1195  1196  1199  1222  1223  1224  1225  1246  1255
        1256  1257  1258  1259  1279  1285  1289  1290  1291  1292  1293  1313  1314  1315  1338
```

```
DFKTFA  MACY11 27(732)  10-SEP-76  09:50  PAGE 41
DFKTFA.P11      CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

          1339    1340    1342    1370    1371    1372    1395    1396    1398    1400    1401    1423    1449    1468    1474
          1477    1478    1480    1501    1504
MOVB       907     982    1037    1399    1406    1424
MTPD       377     958    1086
MTPI       933
NOP        391     398    1507    1508    1509
RESET     1322
RORB      1453
RTI        658    1296    1479
RTS        710
RTT        379     687
SCC        449     501     527     657     739     803     981
SEC       1428    1452
SOB        403     407     411     415     809
SUB        362
TST        363     623     643     826    1185    1215    1388    1442    1465    1492
TSTB      1378    1502
.ENABL       1
.END      1512
.LIST        1     315     331     340
.MACR      315     331
.NLIST       1     315     331     332     340
.REM         1
.REPT      340
.TITLE       1
.WORD      342     344



ERRORS DETECTED:  0
DEFAULT GLOBALS GENERATED:  0

*Ur KTFA,DFKTFA.SEQ/SOL/CRF/DS:ERFZ/EN:ABS=DSKM:DFKTFA.P11
RUN-TIME:  5 10 2 SECONDS
RUN-TIME RATIO: 25/19=1.3
CORE USED:  8K  (15 PAGES)
```

N03

Spooler runtime [illegible] Seconds, [illegible], [illegible] disk reads, 2 disk writes, 3[illegible] pages [illegible]