

# KT11-C

KEYS  
MD-11-DCKTC-A

EP-DCKTC-A-DL-A  
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IDENTIFICATION

PRODUCT CODE:	MAINDEC-11-DCKTC-A
PRODUCT NAME:	KT11-C ACCESS KEYS TEST
DATE CREATED:	15 APRIL 1972
MAINTAINER:	DIAGNOSTIC GROUP
AUTHOR:	RICK FADDEN

## 1.0 ABSTRACT

THIS PROGRAM CHECKS THE OPERATION OF EACH ACCESS KEY FOR EACH OF THE FOUR UNIBUS CYCLES (OR COMBINATION OF CYCLES) WHICH MAY REFERENCE AN ADDRESS THRU SEGMENTATION. THESE CYCLES ARE DATI, DATO (NO DATIP), DATIP-DATO, AND DATIP-DATOB. EACH OF THESE CASES IS TESTED WITH AND WITHOUT MEMORY MANAGEMENT ENABLE SET. THUS EIGHT CASES ARE TESTED FOR EACH KEY. SR0, SR1, SR2, THE CORRESPONDING PDR'S, AND THE PROPER EXECUTION OR PREVENTION OF EXECUTION OF THE INSTRUCTION ARE CHECKED IN EACH CASE.

## 2.0 REQUIREMENTS

## 2.1 EQUIPMENT

PDP 11/45 WITH KT11-C OPTION

## 2.2 STORAGE

THE PROGRAM REQUIRES 5K OF MEMORY, STARTING AT LOCATION 0.

## 3.0 LOADING PROCEDURE

LOAD PROGRAM INTO MEMORY USING AFS LOADER.

## 4.0 STARTING PROCEDURE

## 4.1 NORMAL DIAGNOSTIC OPERATION

LOAD ADDRESS 200.  
SET DESIRED SWITCH REGISTER SETTINGS (ALL DOWN FOR WORST CASE).  
PRESS START.  
THE PROGRAM WILL DISPLAY THE NUMBER OF THE CURRENT SUBTEST IN THE DISPLAY REGISTER, AND WILL RING THE BELL ON COMPLETION OF A PASS.

## 4.2 SINGLE SUBTEST LOOP (TESTX)

LOAD ADDRESS 210.  
PRESS START.  
AT THE FIRST HALT, LOAD THE ADDRESS OF THE DESIRED SUBTEST (THE ADDRESS OF THE TESTXX TAG) INTO THE SWITCH REGISTER.  
THEN PRESS "CONTINUE".  
AT THE SECOND HALT, SET THE OPERATIONAL SWITCH SETTINGS DESIRED (SW11 MUST BE SET TO ZERO). THEN PRESS CONTINUE.

## 5.0 OPERATING PROCEDURE

## 5.1 OPERATIONAL SWITCH SETTINGS

SW15=1 OR UP-- HALT ON ERROR  
 SW14=1 OR UP-- SCOPE LOOP  
 SW13=1 OR UP-- INHIBIT PRINTOUT  
 SW11=1 OR UP-- INHIBIT ITERATIONS  
 SW08=1 OR UP-- LOAD MICROBREAK REGISTER WITH VALUE IN  
 SW00-SW07(AT START OF TEST ONLY).

## 5.2 SUBROUTINE ABSTRACTS

## 5.2.1 SCOPE

THIS SUBROUTINE CALL IS PLACED BETWEEN EACH SUBTEST. IT RECORDS THE STARTING ADDRESS OF EACH SUB-TEST AS IT IS BEING ENTERED. IF A SCOPE LOOP IS REQUESTED, IT WILL JUMP TO THE START OF THE SUBTEST THAT THE SCOPE LOOP IS REQUESTED FOR. IF SCOPE LOOP IS NOT REQUESTED, THERE WILL BE 1024 ITERATIONS ON THAT SUBTEST BEFORE THE NEXT SUBTEST IS ENTERED. SWITCH 11 ON A 1 INHIBITS ITERATION OF SUBTESTS.

## 5.2.2 HLT

THIS EMT CALLS THE SUBROUTINE PRINT, WHICH PRINTS OUT THE LOCATION COUNTER AT THE TIME OF FAILURE AND THE CONTENTS OF THE PROCESSOR STATUS REGISTER. NOTE THAT THE LOCATION COUNTER WILL BE THE ADDRESS OF THE HLT PLUS TWO.

## 5.2.3 TRAPCATCHER

THIS IS A SERIES OF INSTRUCTIONS STARTING AT LOCATION 0 DESIGNED TO DETECT AND ISOLATE UNEXPECTED TRAPS AND INTERRUPTS TO THE TRAP AND INTERRUPT VECTOR AREA OF MEMORY.

EACH VECTOR ENTRANCE ADDRESS IS LOADED WITH THE ADDRESS OF THE NEXT LOCATION. THE NEXT LOCATION IS LOADED WITH A HALT (000000). THUS AN ILLEGAL TRAP OR INTERRUPT WILL CAUSE A HALT AT THE TRAP LOCATION PLUS TWO.

IF A HALT OCCURS IN THE TRAP OR INTERRUPT AREA, EXAMINE REGISTER SIX. IT WILL CONTAIN THE CURRENT STACK ADDRESS. THE CONTENTS OF THE CURRENT STACK ADDRESS IS THE VALUE OF THE LOCATION COUNTER WHEN THE TRAP OR INTERRUPT OCCURRED.

## 5.2.4 TESTX (SINGLE SUBTEST LOOP)

THIS ROUTINE ALLOWS A SINGLE SUBTEST TO BE RUN CONTINUOUSLY FOR SCOPE LOOP PURPOSES. WHILE A SCOPE LOOP SWITCH OPTION EXISTS, IT REQUIRES THAT YOU ARE WITHIN THE TEST IN WHICH YOU WISH TO LOOP. IN SOME CASES (SUCH AS WITH INTERMITTENT FAILURES) THAT'S

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NOT EASY TO DO. THIS SUBROUTINE ALLOWS YOU TO LOAD THE ADDRESS  
OF ANY SUBTEST AT THE HALT AND THEN GO DIRECTLY TO THAT TEST.

## 5.2.5 EMTSRV (EMT DECODER)

THIS ROUTINE DECODES ALL EMT CALLS, INCLUDING PATCHES AND THE HLT CALL WHICH PASSES CONTROL TO THE PRINT ROUTINE.

## 5.2.6 CLRALL

THIS ROUTINE CLEARS ALL THE PAR'S AND PDR'S OF THE KT11-C, AS WELL AS SRD.

## 5.2.7 RWALL

THIS ROUTINE MAPS ALL PAGES TO BANK 0 BY CLEARING ALL THE PAR'S. ALL PAGES ARE MADE 4K READ-WRITE BY LOADING ALL THE PDR'S WITH THE VALUE 77406.

## 5.2.8 SETUP

THIS ROUTINE FIRST CALLS RWALL TO MAP ALL THE PAGES 4K, RW, BANK 0. IT THEN SETS THE KEY FOR KERNEL PAGE 1 TO WHATEVER VALUE WAS STORED ON THE STACK BEFORE THE ROUTINE WAS CALLED. THIS ALLOWS A REFERENCE TO PAGE 1 TO TEST THE DESIRED ACCESS KEY. FINALLY, KERNEL PAGE 7 IS MAPPED TO THE EXTERNAL BANK.

## 5.3 PROGRAM AND/OR OPERATOR ACTION

## 5.3.1 SA 200 (NORMAL DIAGNOSTIC OPERATION)

THE PROGRAM EXECUTES 8 TESTS OF EACH KEY, DISPLAYING THE SUBTEST NUMBER IN THE LIGHTS. TESTS 21 THRU 30 ARE CYCLED THRU 3 TIMES, ONCE FOR EACH OF THE KEYS WHICH GIVES A NON-RESIDENT ABORT. AT THE END OF EACH PASS THRU THE DIAGNOSTIC THE BELL IS RUNG.

## 5.3.2 SA 210 (SINGLE SUBTEST LOOP)

THIS STARTING ADDRESS ALLOWS THE USER TO RUN A SINGLE SUBTEST REPEATEDLY BY GIVING THE ADDRESS OF THE DESIRED SUBTEST AT THE FIRST HALT. IF SW11 IS SET TO A ONE, NORMAL TEST EXECUTION WILL BE RESUMED.

## 6.0 ERRORS

## 6.1 ERROR PRINTOUT

PRINTOUTS ARE IN A STANDARD TWO-WORD FORMAT. THE FIRST WORD IS THE OCTAL VALUE OF THE PC+2 OF THE DETECTED ERROR. THE SECOND IS THE CONTENTS OF THE PROCESSOR STATUS REGISTER WHEN THE ERROR WAS DETECTED.

## 6.2 ERROR RECOVERY

IN GENERAL, TEST FAILURES WILL PRINTOUT AN ERROR MESSAGE AND CONTINUE. IF THE "HALT ON ERROR" SWITCH IS SET, HITTING CONTINUE WILL RECOVER. IF THE PROGRAM HANGS UP IN A LOOP, THE ERROR IS LIKELY TO BE A SIGNAL WHICH WAS NEVER RECEIVED. IF A HALT OCCURS IN THE TRAP AND VECTOR AREA THE PROGRAM MUST BE RESTARTED. IF THE PROGRAM HALTS IN THE MAIN FLOW, CONSULT THE LISTING IF NO MESSAGE IS TYPED OUT.

## 7.0 RESTRICTIONS

PROGRAM MUST BE LOADED INTO LOWER 5K OF MEMORY.

## 8.0 MISCELLANEOUS

## 8.1 EXECUTION TIME

EACH PASS TAKES APPROXIMATELY 1 MINUTE WITH CORE MEMORY.

## 8.2 DISPLAY REGISTER

THE NUMBER OF THE CURRENT SUBTEST IS DISPLAYED.

## 9.0 PROGRAM DESCRIPTION

THE PROGRAM RUNS EIGHT SEPARATE TESTS OF EACH ACCESS KEY. DATI, DATO (NO DATIP), DATIP-DATO, AND DATIP-DATOB ARE CHECKED FOR EACH KEY, WITH AND WITHOUT MEMORY MANAGEMENT ENABLE SET. THE SUBTEST NUMBER IS DISPLAYED IN THE DISPLAY REGISTER, AND THE BELL IS RUNG AT THE END OF EACH PASS.

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;COPYRIGHT 1972, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754  
;TEST OF THE KTI1-C ACCESS KEYS

;OPERATING INSTRUCTIONS

1. LOAD TEST USING THE ABSOLUTE LOADER
2. LOAD SA 200
3. SET SR TO INITIAL SETTINGS
4. PRESS START

;DYNAMIC SWITCH REGISTER SETTINGS ARE:

;SW15=1 CAUSES HALT ON ERROR  
;SW14=1 CAUSES SCOPE LOOPING  
;SW13=1 INHIBITS ERROR PRINTOUT  
;SW11=1 INHIBITS ITERATIONS  
;SW08=1 LOAD MICROBREAK REGISTER WITH LOW BYTE OF SR

;DEFINITIONS

104400	SCOPE=TRAP
000240	NOP=240
000000	R0=%0
000001	R1=%1
000002	R2=%2
000003	R3=%3
000004	R4=%4
000005	R5=%5
000006	R6=%6
000007	R7=%7
000006	SP=%6
000007	PC=%7
177570	SR=177570
177776	PS=177776
177776	STATUS=PS
104006	HLT=104006

;LOAD TRAP CATCHER IN LOCATIONS 0 THRU 377  
;EACH VECTOR ADDRESS IS LOADED WITH THE ADDRESS  
;OF THE NEXT LOCATION, AND THE NEXT LOCATION IS LOADED  
;WITH A HALT INSTRUCTION (000000)

;LOAD VECTOR AREA

000030	000030	.=30
000030	023224	EMTSRV
000032	000340	340
	000034	.=34
000034	022472	SCOPEC
000036	000000	0

;LOAD STARTING AREA

000200	000200	.=200
000200	000167	JMP START
	000210	.=210
000210	000167	JMP TESTX

;LOAD DATA AREA

001000	001000	.=1000
001000	000000	KSTACK: 0

002000	002000		SSTACK: 0	.=.+776	
003000	000000		USTACK: 0	.=.+776	
003002	000000	000000 000000		.WORD 0,0,0,0	
003010	000000		TCSR: 177564		; TELETYPE PRINTER CSR
003012	177564		TDBR: 177566		
003014	177566		TEMPX: 0		; TEMPORARY STORAGE
003016	000000		TEMP1: 0		
003020	000000		TEMP2: 0		
003022	000000		SRO: 177572		; KT11-C STATUS REGISTER ADDRESSES
003024	177572		SR1: 177574		
003026	177574		SR2: 177576		
003030	177576		SR3: 172516		
003032	172516		KTVEC: 250		; KT11-C INTERRUPT VECTOR
003034	000250		KTSTA: 252		
003036	000252		ADRTAB:		
003040			UIPDR0: 177600		; USER I-SPACE PAGE DESCRIPTOR REGISTER ADDRESSES
003040	177600		UIPDR1: 177602		
003042	177602		UIPDR2: 177604		
003044	177604		UIPDR3: 177606		
003046	177606		UIPDR4: 177610		
003050	177610		UIPDR5: 177612		
003052	177612		UIPDR6: 177614		
003054	177614		UIPDR7: 177616		
003056	177616		UDPDR0: 177620		; USER D-SPACE PAGE DESCRIPTOR REGISTER ADDRESSES
003060	177620		UDPDR1: 177622		
003062	177622		UDPDR2: 177624		
003064	177624		UDPDR3: 177626		
003066	177626		UDPDR4: 177630		
003070	177630		UDPDR5: 177632		
003072	177632		UDPDR6: 177634		
003074	177634		UDPDR7: 177636		
003076	177636		UIPAR0: 177640		; USER I-SPACE PAGE ADDRESS REGISTER ADDRESSES
003100	177640		UIPAR1: 177642		
003102	177642		UIPAR2: 177644		
003104	177644		UIPAR3: 177646		
003106	177646		UIPAR4: 177650		
003110	177650		UIPAR5: 177652		
003112	177652		UIPAR6: 177654		
003114	177654		UIPAR7: 177656		
003116	177656		UDPAR0: 177660		; USER D-SPACE PAGE ADDRESS REGISTER ADDRESSES
003120	177660		UDPAR1: 177662		
003122	177662		UDPAR2: 177664		
003124	177664		UDPAR3: 177666		
003126	177666		UDPAR4: 177670		
003130	177670		UDPAR5: 177672		
003132	177672		UDPAR6: 177674		
003134	177674		UDPAR7: 177676		
003136	177676		SIPDR0: 172200		; SUPERVISOR I-SPACE PAGE DESCRIPTOR REGISTER ADDRESSES
003140	172200		SIPDR1: 172202		
003142	172202		SIPDR2: 172204		
003144	172204		SIPDR3: 172206		
003146	172206		SIPDR4: 172210		
003150	172210		SIPDR5: 172212		
003152	172212				

003154 172214  
 003156 172216  
 003160 172220  
 003162 172222  
 003164 172224  
 003166 172226  
 003170 172230  
 003172 172232  
 003174 172234  
 003176 172236  
 003200 172240  
 003202 172242  
 003204 172244  
 003206 172246  
 003210 172250  
 003212 172252  
 003214 172254  
 003216 172256  
 003220 172260  
 003222 172262  
 003224 172264  
 003226 172266  
 003230 172270  
 003232 172272  
 003234 172274  
 003236 172276  
 003240 172300  
 003242 172302  
 003244 172304  
 003246 172306  
 003250 172310  
 003252 172312  
 003254 172314  
 003256 172316  
 003260 172320  
 003262 172322  
 003264 172324  
 003266 172326  
 003270 172330  
 003272 172332  
 003274 172334  
 003276 172336  
 003300 172340  
 003302 172342  
 003304 172344  
 003306 172346  
 003310 172350  
 003312 172352  
 003314 172354  
 003316 172356  
 003320 172360  
 003322 172362  
 003324 172364  
 003326 172366  
 003330 172370  
 003332 172372

SIPDR6: 172214  
 SIPDR7: 172216  
 SDPDR0: 172220  
 SDPDR1: 172222  
 SDPDR2: 172224  
 SDPDR3: 172226  
 SDPDR4: 172230  
 SDPDR5: 172232  
 SDPDR6: 172234  
 SDPDR7: 172236  
 SIPAR0: 172240  
 SIPAR1: 172242  
 SIPAR2: 172244  
 SIPAR3: 172246  
 SIPAR4: 172250  
 SIPAR5: 172252  
 SIPAR6: 172254  
 SIPAR7: 172256  
 SDPAR0: 172260  
 SDPAR1: 172262  
 SDPAR2: 172264  
 SDPAR3: 172266  
 SDPAR4: 172270  
 SDPAR5: 172272  
 SDPAR6: 172274  
 SDPAR7: 172276  
 KIPDR0: 172300  
 KIPDR1: 172302  
 KIPDR2: 172304  
 KIPDR3: 172306  
 KIPDR4: 172310  
 KIPDR5: 172312  
 KIPDR6: 172314  
 KIPDR7: 172316  
 KDPDR0: 172320  
 KDPDR1: 172322  
 KDPDR2: 172324  
 KDPDR3: 172326  
 KDPDR4: 172330  
 KDPDR5: 172332  
 KDPDR6: 172334  
 KDPDR7: 172336  
 KIPAR0: 172340  
 KIPAR1: 172342  
 KIPAR2: 172344  
 KIPAR3: 172346  
 KIPAR4: 172350  
 KIPAR5: 172352  
 KIPAR6: 172354  
 KIPAR7: 172356  
 KDPAR0: 172360  
 KDPAR1: 172362  
 KDPAR2: 172364  
 KDPAR3: 172366  
 KDPAR4: 172370  
 KDPAR5: 172372

;SUPERVISOR D-SPACE PAGE DESCRIPTOR REGISTER ADDRESSES

;SUPERVISOR I-SPACE PAGE ADDRESS REGISTER ADDRESSES

;SUPERVISOR D-SPACE PAGE ADDRESS REGISTER ADDRESSES

;KERNEL I-SPACE PAGE DESCRIPTOR REGISTER ADDRESSES

;KERNEL D-SPACE PAGE DESCRIPTOR REGISTER ADDRESSES

;KERNEL I-SPACE PAGE ADDRESS REGISTER ADDRESSES

;KERNEL D-SPACE PAGE ADDRESS REGISTER ADDRESSES

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003334	172374			KDPAR6:	172374	
003336	172376			KDPAR7:	172376	
	003336			ADREND=	.-2	
003340	177600			PDRTAB:	177600	; TABLE OF ADDRESSES OF 1ST PDR OF EACH SET
003342	172200				172200	
003344	172300				172300	
003346	177640			PARTAB:	177640	; TABLE OF ADDRESSES OF 1ST PAR OF EACH SET
003350	172240				172240	
003352	172340				172340	
003354	003240			STATAB:	KIPDR0	; KERNEL TABLE OF PDR'S AND PAR'S
003356	000000				0	
003360	003140				SIPDR0	; SUPERVISOR TABLE OF PDR'S AND PAR'S
003362	040000				40000	
003364	003040				UIPDR0	; USER TABLE OF PDR'S AND PAR'S
003366	140000			STAEND:	140000	
003370	000000			STAPNT:	0	
003372	177573			SROH:	177573	; KT11-C STATUS REGISTER HIGH BYTE ADDRESSES
003374	177575			SR1H:	177575	
003376	177577			SR2H:	177577	
003400	177770			UBRK:	177770	; MICROBREAK REGISTER ADDRESS
003402	000000			NRCNT:	0	; COUNTER FOR TEST OF THE 3 NR KEYS
003404	000000	000003	000007	NRKEYS:	0,3,7	; VALUES OF THE 3 NON RESIDENT KEYS
003412	125252			DESTAD:	125252	; LOCATION USED FOR READS AND WRITES TO CHECK ; EXECUTION OR ABORTING AT CORRECT POINT

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;SET UP FOR START OF TESTS
START: CLR      0#PS
        MOV      #KSTACK,SP           ;SETUP KERNEL STACK
        MOV      #40000,0#PS         ;SETUP SUPERVISOR STACK POINTER
        MOV      #SSTACK,SP
        MOV      #140000,0#PS       ;SETUP USER STACK POINTER
        CLR      0#PS
        MOV      #2000,ICOUNT        ;INITIALIZE ITERATION COUNT
        MOV      #TEST1+2,RETURN     ;SETUP SCOPE AND ITERATION LOOP RETURN
        CLR      NRCNT              ;INITIALIZE FOR NR TEST
        MOV      #7,0SR3            ;ENABLE ALL D-SPACES
  
```

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;SHOW THAT DAT1 TO A RROT PAGE (ACF=1) WITHOUT MEMORY
;MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT
;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
TEST1: SCOPE
        MOV      #1,0#SR             ;LOAD TEST NUMBER INTO THE DISPLAY
        CLR      0#PS               ;INITIALIZE PROCESSOR STATUS
        MOV      #KSTACK,SP         ;INITIALIZE KERNEL STACK POINTER
        CLR      0SR0               ;INITIALIZE SRO
        MOV      #1,-(SP)           ;PUSH RROT KEY ON STACK
        JSR      %7,SETUP           ;MAKE KERNEL PAGE 1 RROT, BANK 0
        ;MAKE KERNEL PAGE 7 RW, EXTERNAL
        ;MAKE ALL OTHER PAGES RW, BANK 0
        TST      (SP)+              ;RESTORE STACK
        MOV      #RET1,0KTVEC       ;SETUP ABORT RETURN IN CASE
        CLR      0KTSTA
  
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003552 012767 125252 177632      MOV      #125252,DESTAD ;SETUP LOCATION TO BE REFERENCED
003560 012701 023412      MOV      #DESTAD+20000,R1 ;R1 CONTAINS VIRTUAL ADDRESS OF LOCATION TO
                                ;BE REFERENCED THRU KERNEL PAGE 1
003564 005277 177234      INC      @SRO ;TURN ON KT11-C
003570 022721 125252      CMP      #125252,(R1)+ ;DATI TO RROT PAGE
003574 001404      BEQ     CMPOK1 ;BRANCH IF CORRECT VALUE WAS READ
003576 005377 177222      DEC     @SRO ;ON ERROR, TURN OFF KT11-C
003602 104006      HLT     ;RELOCATION FAILED THRU KERNEL PAGE 1
003604 000441      BR      DONE1
003606 017702 177212      CMPOK1: MOV    @SRO,R2 ;SAVE CONTENTS OF SRO
003612 105377 177206      DEC     @SRO ;TURN OFF KT11-C
003616 022702 010021      CMP     #10021,R2 ;CHECK SAVED CONTENTS OF SRO
003622 001401      BEQ     .+4
003624 104006      HLT     ;SRO INCORRECT-SHOULD HAVE
                                ;TRACKED REFERENCE TO DATA SPACE,
                                ;PAGE 0, WHICH GOT THE ADDRESS
                                ;OF SRO, AND MMGT TRAP SHOULD BE SET
                                ;CHECK SR1
003626 022777 000027 177172      CMP     #27,@SR1
003634 001401      BEQ     .+4
003636 104006      HLT     ;SR1 INCORRECT-SHOULD KEEP
                                ;TRACKING EVEN WITH KT11-C OFF
                                ;CHECK SR2
003640 022777 003640 177162      CMP     #,@SR2
003646 001401      BEQ     .+4
003650 104006      HLT     ;SR2 INCORRECT-SHOULD TRACK EVEN
                                ;WHEN KT11-C IS OFF
003652 022777 077401 177362      CMP     #77401,@KIPDR1 ;CHECK INSTRUCTION SPACE PDR FOR
003660 001401      BEQ     .+4 ;THE RROT PAGE REFERENCED
003662 104006      HLT     ;KIPDR1 INCORRECT-SHOULD NOT
                                ;HAVE BEEN CHANGED SINCE THE
                                ;RROT REFERENCE WAS TO DATA SPACE
003664 022777 077601 177370      CMP     #77601,@KDPDR1 ;CHECK DATA SPACE PDR CORRESPONDING
003672 001401      BEQ     .+4 ;TO THE RROT REFERENCE
003674 104006      HLT     ;KDPDR1 INCORRECT-"A" BIT SHOULD
                                ;BE SET SINCE DATA SPACE WAS READ
                                ;AND WAS RROT
003676 000404      BR      DONE1
003700 042777 000001 177116      RET1:  BIC    #1,@SRO ;TURN OFF KT11-C
003706 104006      HLT     ;DATI TO RROT PAGE CAUSED
                                ;A TRAP OR ABORT ALTHOUGH MEMORY
                                ;MANAGEMENT TRAP ENABLE WAS NOT SET
003710 016777 177122 177116      DONE1: MOV    KTSTA,@KTVEC ;RESTORE TRAP RETURN TO CAUSE HALT
003716 005077 177114      CLR    @KTSTA ;ON AN UNEXPECTED TRAP
003722 005077 177076      CLR    @SRO ;INITIALIZE SRO
003726 005037 177776      CLR    @#PS ;INITIALIZE PROCESSOR STATUS

;SHOW THAT A DATI TO A RROT PAGE (ACF=1) WITH MEMORY MANAGEMENT
;TRAP ENABLE SET CAUSES A TRAP AT THE END OF THE INSTRUCTION
;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT THE
;PDR'S FOR THE PAGE REFERENCED ARE CORRECT
TEST2: SCOPE
003732 104400      MOV     #2,@#SR ;LOAD TEST NUMBER INTO THE DISPLAY
003734 012737 000002 177570      CLR    @#PS ;INITIALIZE PROCESSOR STATUS
003742 005037 177776      MOV    #KSTACK,SP ;INITIALIZE KERNEL STACK POINTER
003746 012706 001000      CLR    @SRO ;INITIALIZE SRO
003752 005077 177046      MOV    #1,-(SP) ;PUSH RROT KEY ON STACK
003756 012746 000001      JSR    %7,SETUP ;MAKE KERNEL PAGE 1 RROT, BANK 0
003762 004767 016322

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003766	005726				TST	(SP)+		; MAKE KERNEL PAGE 7 RW, EXTERNAL
003770	012777	004036	177036		MOV	#RET2, @KTVEC		; MAKE ALL OTHER PAGES RW, BANK 0
003776	005077	177034			CLR	@KTSTA		; RESTORE STACK POINTER
004002	012767	125252	177402		MOV	#125252, DESTAD		; SETUP TRAP RETURN
004010	005003				CLR	R3		; INITIALIZE LOCATION TO BE READ
								; CLEAR REGISTER TO SAVE WHAT WAS READ
								; ALLOWS CHECKING TO SEE THAT THE
								; INSTRUCTION COMPLETED BEFORE
								; TRAPPING
004012	012701	023412			MOV	#DESTAD+20000, R1		; R1 CONTAINS VIRTUAL ADDRESS OF LOCATION
								; TO BE REFERENCED THRU KERNEL PAGE 1
004016	012777	001001	177000		MOV	#1001, @SRO		; TURN ON KT11-C, SET MMGT TRAP ENABLE
004024	012103				MOV	(R1)+, R3		; DATI TO RROT PAGE
004026	105077	176772			CLRB	@SRO		; IF NO TRAP, TURN OFF KT11-C
004032	104006				HLT			; DATI TO RROT PAGE WITH MEMORY
004034	000440				BR	DONE2		; MANAGEMENT TRAP ENABLE SET DIDN'T
								; CAUSE A TRAP
004036	017702	176762		RET2:	MOV	@SRO, R2		; SAVE CONTENTS OF SRO
004042	005377	176756			DEC	@SRO		; TURN OFF KT11-C
004046	022702	011021			CMP	#11021, R2		; CHECK SAVED CONTENTS OF SRO
004052	001401				BEQ	.+4		
004054	104006				HLT			; SRO INCORRECT-SHOULD HAVE TRACKED
								; THE REFERENCE TO DATA SPACE, PAGE
								; 0, WHICH GOT THE ADDRESS OF SRO,
								; AND MMGT TRAP SHOULD BE SET
								; CHECK SR1
004056	022777	000027	176742		CMP	#27, @SR1		
004064	001401				BEQ	.+4		
004066	104006				HLT			; SR1 INCORRECT-SHOULD CONTINUE
								; TRACKING WITH KT11-C OFF
								; CHECK SR2
004070	022777	004070	176732		CMP	#., @SR2		
004076	001401				BEQ	.+4		
004100	104006				HLT			; SR2 INCORRECT-SHOULD STILL BE
								; TRACKING EVEN WITH KT11-C OFF
								; CHECK INSTRUCTION SPACE PDR
004102	022777	077401	177132		CMP	#77401, @KIPDR1		
004110	001401				BEQ	.+4		
004112	104006				HLT			; KIPDR1 INCORRECT-SHOULD NOT
								; HAVE BEEN CHANGED SINCE THE RROT
								; REFERENCE WAS TO DATA SPACE
								; CHECK DATA SPACE PDR
004114	022777	077601	177140		CMP	#77601, @KDPDR1		
004122	001401				BEQ	.+4		
004124	104006				HLT			; KDPDR1 INCORRECT-"A" BIT SHOULD
								; BE SET SINCE DATA SPACE WAS RROT
								; AND WAS READ
								; CHECK LOCATION WRITTEN INTO
004126	022703	125252			CMP	#125252, R3		
004132	001401				BEQ	.+4		
004134	104006				HLT			; THE INSTRUCTION REFERENCING THE RROT
								; PAGE TRAPPED BEFORE COMPLETING
								; OR RELOCATION FAILED SINCE THE
								; MOVE DID NOT CORRECTLY LOAD R3
004136	016777	176674	176670	DONE2:	MOV	KTSTA, @KTVEC		; CHANGE KT11-C FAULT RETURN TO
004144	005077	176666			CLR	@KTSTA		; CAUSE A HALT ON AN UNEXPECTED TRAP
004150	005077	176650			CLR	@SRO		
004154	005037	177776			CLR	@#PS		

; SHOW THAT A DATO (NO DATIP) TO A RROT PAGE (ACF=1) WITHOUT

# NO1

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DCKTCA

;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS WITHOUT COMPLETING THE DATO  
;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR  
;CORRESPONDING TO THE REFERENCE IS CORRECT

004160	104400								
004162	012737	000003	177570	TEST3:	SCOPE				
004170	005037	177776			MOV	#3, @#SR			;LOAD TEST NUMBER INTO THE DISPLAY
004174	012706	001000			CLR	@#PS			;INITIALIZE PROCESSOR STATUS
004200	005077	176620			MOV	#KSTACK, SP			;INITIALIZE KERNEL STACK POINTER
004204	012746	000001			CLR	@SRO			;INITIALIZE SRO
004210	004767	016074			MOV	#1, -(SP)			;PUSH RROT KEY ON STACK
					JSR	%7, SETUP			;MAKE KERNEL PAGE 1 RROT, BANK 0
									;MAKE KERNEL PAGE 7 RW, EXTERNAL
									;MAKE ALL OTHER PAGES RW, BANK 0
004214	005726				TST	(SP)+			;RESTORE STACK POINTER
004216	012777	004264	176610		MOV	#RET3, @KTVEC			;SETUP ABORT RETURN
004224	005077	176606			CLR	@KTSTA			
004230	005067	177156			CLR	DESTAD			;INITIALIZE LOCATION TO BE ADDRESSED
004234	012701	023412			MOV	#DESTAD+20000, R1			;BY DATO TO RROT PAGE
									;R1 CONTAINS VIRTUAL ADDRESS OF LOCATION
004240	112777	000001	176556		MOV	#1, @SRO			;TO BE REFERENCED THRU KERNEL PAGE 1
004246	012721	125252		AD3:	MOV	#125252, (R1)+			;TURN ON KT11-C
004252	042777	000001	176544		BIC	#1, @SRO			;DATO TO RROT PAGE-SHOULD ABORT
004260	104006				HLT				;TURN OFF KT11-C
004262	000440				BR	DONE3			;DATO TO RROT PAGE FAILED TO ABORT
004264	017702	176534		RET3:	MOV	@SRO, R2			;SAVE CONTENTS OF SRO
004270	005377	176530			DEC	@SRO			;TURN OFF KT11-C
004274	022702	020023			CMP	#20023, R2			;CHECK SAVED CONTENTS OF SRO
004300	001401				BEQ	.+4			
004302	104006				HLT				;SRO INCORRECT-SHOULD HAVE LOCKED
									;ON DATO TO KERNEL DATA SPACE PAGE 1(RROT)
									;AND MMGT TRAP SHOULD BE SET
004304	022777	010427	176514		CMP	#10427, @SR1			;CHECK SR1
004312	001401				BEQ	.+4			
004314	104006				HLT				;SR1 INCORRECT-SHOULD HAVE LOCKED
									;ON THE ABORTED REFERENCE, WHICH
									;AUTOINCREMENTED R7, AND THEN R1
004316	022777	004246	176504		CMP	#AD3, @SR2			;CHECK SR2
004324	001401				BEQ	.+4			
004326	104006				HLT				;SR2 INCORRECT-SHOULD HAVE LOCKED
									;ON THE ABORTED REFERENCE, WITH THE
									;VIRTUAL ADDRESS OF THE INSTRUCTION
004330	022777	077401	176704		CMP	#77401, @KIPDR1			;CHECK INSTRUCTION SPACE PDR
004336	001401				BEQ	.+4			
004340	104006				HLT				;KIPDR1 INCORRECT-SHOULD NOT HAVE
									;BEEN CHANGED SINCE THE RROT REFERENCE
									;WAS TO DATA SPACE
004342	022777	077401	176712		CMP	#77401, @KDPDR1			;CHECK DATA SPACE PDR
004350	001401				BEQ	.+4			
004352	104006				HLT				;KDPDR1 INCORRECT-SHOULD NOT
									;HAVE BEEN CHANGED SINCE DATO
									;DIDN'T WRITE AND WAS NOT A READ
004354	005767	177032			TST	DESTAD			;MAKE CERTAIN THAT DESTINATION
004360	001401				BEQ	.+4			;LOCATION WAS NOT WRITTEN
004362	104006				HLT				;DATO TO RROT PAGE WROTE
									;INTO THE DESTINATION LOCATION
004364	016777	176446	176442	DONE3:	MOV	KTSTA, @KTVEC			;CHANGE KT11-C FAULT RETURN

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004372 005077 176440 CLR 0KTSTA ;TO CAUSE A HALT ON AN UNEXPECTED TRAP
004376 005077 176422 CLR 0SR0
004402 005037 177776 CLR 00PS

;SHOW THAT A DATO (NO DATIP) TO A RROT PAGE (ACF=1) WITH
;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS
;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
;CORRESPONDING TO THE REFERENCE IS CORRECT
TEST4: SCOPE
004406 104400 MOV 04,00SR ;LOAD TEST NUMBER INTO THE DISPLAY
004410 012737 000004 177570 CLR 00PS ;INITIALIZE PROCESSOR STATUS
004416 005037 177776 MOV 0KSTACK,SP ;INITIALIZE KERNEL STACK POINTER
004422 012706 001000 CLR 0SR0 ;INITIALIZE SRO
004426 005077 176372 MOV 01,-(SP) ;PUSH RROT KEY ON STACK
004432 012746 000001 JSR 07,SETUP ;MAKE KERNEL PAGE 1 RROT, BANK 0
004436 004767 015546 ;MAKE KERNEL PAGE 7 RW, EXTERNAL
;MAKE ALL OTHER PAGES RW, BANK 0
;RESTORE STACK POINTER
;SETUP ABORT RETURN
004442 005726 TST (SP)+
004444 012777 004510 176362 MOV 0RET4,0KTVEC
004452 005077 176360 CLR 0KTSTA
004456 005067 176730 CLR DESTAD ;INITIALIZE LOCATION TO BE ADDRESSED
;BY DATO TO RROT PAGE
004462 012702 023412 MOV 0DESTAD+20000,R2 ;R2 CONTAINS ADDRESS OF LOCATION
;TO BE REFERENCED THRU KERNEL PAGE 1
004466 012777 001001 176330 MOV 01001,0SR0 ;TURN ON KT11-C, SET MMGT TRAP ENABLE
004474 012722 125252 AD4: MOV 0125252,(R2)+ ;DATO TO RROT PAGE-SHOULD ABORT
004500 005377 176320 DEC 0SR0 ;TURN OFF KT11-C
004504 104006 HLT ;DATO TO RROT PAGE FAILED TO ABORT
004506 000440 BR DONE4
004510 017701 176310 RET4: MOV 0SR0,R1 ;SAVE CONTENTS OF SRO
004514 005377 176304 DEC 0SR0 ;TURN OFF KT11-C
004520 022701 021023 CMP 021023,R1 ;CHECK SAVED CONTENTS OF SRO
004524 001401 BEQ .+4
004526 104006 HLT ;SRO INCORRECT-SHOULD HAVE LOCKED
;ON DATO TO KERNEL DATA SPACE PAGE 1(RROT)
;AND ACCESS FAULT SHOULD BE SET
;CHECK SR1
004530 022777 011027 176270 CMP 011027,0SR1
004536 001401 BEQ .+4
004540 104006 HLT ;SR1 INCORRECT-SHOULD HAVE LOCKED
;ON THE ABORTED REFERENCE, WHICH AUTO-
;INCREMENTED R7, AND THEN R2
;CHECK SR2
004542 022777 004474 176260 CMP 0AD4,0SR2
004550 001401 BEQ .+4
004552 104006 HLT ;SR2 INCORRECT-SHOULD HAVE LOCKED
;ON THE ABORTED REFERENCE, WITH THE
;VIRTUAL ADDRESS OF THE INSTRUCTION
;CHECK INSTRUCTION SPACE PDR
004554 022777 077401 176460 CMP 077401,0KIPDR1
004562 001401 BEQ .+4
004564 104006 HLT ;KIPDR1 INCORRECT-SHOULD NOT
;HAVE BEEN CHANGED SINCE THE RROT
;REFERENCE WAS TO DATA SPACE
;CHECK DATA SPACE PDR
004566 022777 077401 176466 CMP 077401,0KDPDR1
004574 001401 BEQ .+4
004576 104006 HLT ;KDPDR1 INCORRECT-SHOULD NOT
;HAVE BEEN CHANGED SINCE DATO
;DIDN'T WRITE AND REFERENCE WAS

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005014 022777 077401 176240      CMP      #77401,@KDPDR1
005022 001401      BEQ      .+4
005024 104006      HLT

;BEEN CHANGED SINCE THE RROT
;REFERENCE WAS TO DATA SPACE
;CHECK DATA SPACE PDR

005026 005767 176360      TST      DESTAD
005032 001401      BEQ      .+1
005034 104006      HLT

;KDPDR1 INCORRECT - SHOULD NOT HAVE
;BEEN CHANGED, SINCE DATIP IS ABORTED
;SINCE IT WILL BE FOLLOWED BY A DATC OR DATOB
;MAKE CERTAIN THAT DESTINATION
;LOCATION WAS NOT WRITTEN
;DATO TO RROT PAGE WROTE INTO
;THE DESTINATION LOCATION
;CHANGE PAGE FAULT RETURN
;TO CAUSE A HALT ON AN UNEXPECTED
;TRAP

005036 016777 175774 175770  DONE5:  MOV      KTSTA,@KTVEC
005044 005077 175766      CLR      @KTSTA
005050 005077 175750      CLR      @SRO
005054 005037 177776      CLR      @#PS

;SHOW THAT A DATIP, DATO SEQUENCE TO A RROT PAGE (ACF=1) WITH
;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS
;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
;CORRESPONDING TO THE REFERENCE IS CORRECT
TEST6:  SCOPE
005060 104400      MOV      #6,@#SR
005062 012737 000006 177570      CLR      @#PS
005070 005037 177776      MOV      @KSTACK,SP
005074 012706 001000      CLR      @SRO
005100 005077 175720      MOV      #1,-(SP)
005104 012746 000001      JSR      %7,SETUP
005110 004767 015174

;LOAD TEST NUMBER INTO THE DISPLAY
;INITIALIZE PROCESSOR STATUS
;INITIALIZE KERNEL STACK POINTER
;INITIALIZE SRO
;PUSH RROT KEY ON STACK
;MAKE KERNEL PAGE 1 RROT, BANK 0
;MAKE KERNEL PAGE 7 RW, EXTERNAL
;MAKE ALL OTHER PAGES RW, BANK 0
;RESTORE STACK POINTER
;SETUP ABORT RETURN

005114 005726      TST      (SP)+
005116 012777 005162 175710      MOV      @RET6,@KTVEC
005124 005077 175706      CLR      @KTSTA
005130 005067 176256      CLR      DESTAD

;INITIALIZE LOCATION TO BE ADDRESSED
;BY DATIP, DATO TO RROT PAGE
;R3 CONTAINS VIRTUAL ADDRESS+2 OF LOCATION
;TO BE REFERENCED THRU KERNEL PAGE 1

005134 012703 023414      MOV      @DESTAD+20002,R3

;TURN ON KT11-C
;DATIP, DATO TO RROT PAGE
;TURN OFF KT11-C
;DATIP, DATO TO RROT PAGE FAILED TO
;ABORT
;SAVE CONTENTS OF SRO
;TURN OFF KT11-C
;CHECK SAVED CONTENTS OF SRO

005140 052777 001001 175656      BIS      #1001,@SRO
005146 005243      INC      -(R3)
005150 042777 000001 175646      BIC      #1,@SRO
005156 104006      HLT
005160 000441      BR
005162 017701 175636      MOV      @SRO,R1
005166 042777 000001 175630      BIC      #1,@SRO
005174 022701 021023      CMP      #21023,R1
005200 001401      BEQ      .+4
005202 104006      HLT

;SRO INCORRECT-SHOULD HAVE LOCKED
;ON DATO TO KERNEL DATA PAGE 1(RROT) AND
;ACCESS FAULT SHOULD BE SET
;CHECK SR1

005204 022777 000363 175614      CMP      #363,@SR1
005212 001401      BEQ      .+4
005214 104006      HLT

;SR1 INCORRECT-SHOULD HAVE LOCKED
;ON THE ABORTED REFERENCE, WHICH
;AUTODECREMENTED R3
;CHECK SR2

005216 022777 005146 175604      CMP      @AD6,@SR2
005224 001401      BEQ      .+4
005226 104006      HLT

;SR2 INCORRECT-SHOULD HAVE LOCKED

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005230 022777 077401 176004      CMP      #77401, @KIPDR1
005236 001401                      BEQ      .+4
005240 104006                      HLT

; ON THE ABORTED REFERENCE, WITH THE
; VIRTUAL ADDRESS OF THE INSTRUCTION
; CHECK INSTRUCTION SPACE PDR

; KIPDR1 INCORRECT-SHOULD NOT HAVE
; BEEN CHANGED SINCE THE RRC1
; REFERENCE WAS TO DATA SPACE
; CHECK DATA SPACE PDR

005242 022777 077401 176012      CMP      #77401, @KOPDR1
005250 001401                      BEQ      .+4
005252 104006                      HLT

; KOPDR1 INCORRECT - SHOULD NOT HAVE
; BEEN CHANGED, SINCE DATIP IS ABORTED
; SINCE IT WILL BE FOLLOWED BY A DATO OR DATOB
; MAKE CERTAIN THAT DESTINATION
; LOCATION WAS NOT WRITTEN
; DATO TO RROT PAGE WROTE INTO
; THE DESTINATION LOCATION
; CHANGE PAGE FAULT RETURN
; TO CAUSE A HALT ON AN UNEXPECTED
; TRAP

005254 005767 176132      TST      DESTAD
005260 001401                      BEQ      .+4
005262 104006                      HLT

005264 016777 175546 175542  DONE6:  MOV      KTSTA, @KTVEC
005272 005077 175540          CLR      @KTSTA
005276 005077 175522          CLR      @SRO
005302 005037 177776          CLR      @#PS

; SHOW THAT A DATIP, DATOB SEQUENCE TO A RROT PAGE (ACF=1) WITHOUT
; MEMORY MANAGEMENT TRAP ENABLE SET ABORTS
; SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
; CORRESPONDING TO THE REFERENCE IS CORRECT
TEST7:  SCOPE

005306 104400
005310 012737 000007 177570      MOV      #7, @#SR
005316 005037 177776          CLR      @#PS
005322 012706 001000          MOV      @KSTACK, SP
005326 005077 175472          CLR      @SRO
005332 012746 000001          MOV      #1, -(SP)
005336 004767 014746          JSR      %7, SETUP

; LOAD TEST NUMBER INTO THE DISPLAY
; INITIALIZE PROCESSOR STATUS
; INITIALIZE KERNEL STACK POINTER
; INITIALIZE SRO
; PUSH RROT KEY ON STACK
; MAKE KERNEL PAGE 1 RROT, BANK 0
; MAKE KERNEL PAGE 7 RW, EXTERNAL
; MAKE ALL OTHER PAGES RW, BANK 0
; RESTORE STACK POINTER
; SETUP ABORT RETURN

005342 005726
005344 012777 005406 175462      TST      (SP)+
005352 005077 175460          MOV      @RET7, @KTVEC
005356 005067 176030          CLR      @KTSTA
                                CLR      DESTAD

; INITIALIZE LOCATION TO BE ADDRESSED
; BY DATIP, DATOB TO RROT PAGE
; R4 CONTAINS VIRTUAL ADDRESS OF LOCATION
; TO BE REFERENCED THRU KERNEL PAGE 1
; TURN ON KT11-C
; DATIP, DATOB TO RROT PAGE
; TURN OFF KT11-C
; DATIP, DATO TO RROT PAGE FAILED TO ABORT

005362 012704 023412      MOV      #DESTAD+20000, R4

005366 052777 000001 175430      BIS      #0001, @SRO
005374 105224                      INCB    (R4)+
005376 005377 175422          DEC     @SRO
005402 104006                      HLT
005404 000440                      BR     DONE7
005406 017701 175412      RET7:  MOV     @SRO, R1
005412 005377 175406          DEC     @SRO
005416 022701 020023          CMP     #20023, R1
005422 001401                      BEQ     .+4
005424 104006                      HLT

; SRO INCORRECT-SHOULD HAVE LOCKED ON
; DATOB TO KERNEL DATA PAGE 1 (RROT)
; ACCESS FAULT SHOULD BE SET
; CHECK SRI

005426 022777 000014 175372      CMP     #14, @SRI
005434 001401                      BEQ     .+4

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005436 104006 HLT ;SR1 INCORRECT-SHOULD HAVE LOCKED
;ON THE ABORTED REFERENCE, WHICH AUTO-
;INCREMENTED R4
;CHECK SR2

005440 022777 005374 175362 CMP #AD7,@SR2
005446 001401 BEQ .+4
005450 104006 HLT ;SR2 INCORRECT-SHOULD HAVE LOCKED
;ON THE ABORTED REFERENCE, WITH THE
;VIRTUAL ADDRESS OF THE INSTRUCTION
;CHECK INSTRUCTION SPACE PDR

005452 022777 077401 175562 CMP #77401,@KIPDR1
005460 001401 BEQ .+4
005462 104006 HLT ;KIPDR1 INCORRECT-SHOULD NOT HAVE
;BEEN CHANGED
;CHECK DATA SPACE PDR

005464 022777 077401 175570 CMP #77401,@KDPDR1
005472 001401 BEQ .+4
005474 104006 HLT ;KDPDR1 INCORRECT - SHOULD NOT HAVE
;BEEN CHANGED-DATIP IS ABORTED
;SINCE IT MUST BE FOLLOWED BY A DATO
;MAKE CERTAIN THAT DESTINATION
;LOCATION WAS NOT WRITTEN
;DATOB TO RROT PAGE WROTE INTO
;THE DESTINATION LOCATION
;CHANGE KT11-C FAULT
;RETURN TO CAUSE A HALT ON AN
;UNEXPECTED TRAP

005476 005767 175710 TST DESTAD
005502 001401 BEQ .+4
005504 104006 HLT

005506 016777 175324 175320 DONE7: MOV KTSTA,@KTVEC
005514 005077 175316 CLR @KTSTA
005520 005077 175300 CLR @SRO
005524 005037 177776 CLR @#PS

;SHOW THAT A DATIP,DATOB SEQUENCE TO A RROT PAGE (ACF=1) WITH
;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS
;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
;CORRESPONDING TO THE REFERENCE IS CORRECT
TEST10: SCOPE
005530 104400 MOV #10,@#SR ;LOAD TEST NUMBER INTO THE DISPLAY
005532 012737 000010 177570 CLR @#PS ;INITIALIZE PROCESSOR STATUS
005540 005037 177776 MOV #KSTACK,SP ;INITIALIZE KERNEL STACK POINTER
005544 012706 001000 CLR @SRO ;INITIALIZE SRO
005550 005077 175250 MOV #1,-(SP) ;PUSH RROT KEY ON STACK
005554 012746 000001 JSR %7,SETUP ;MAKE KERNEL PAGE 1 RROT, BANK 0
005560 004767 014524 ;MAKE KERNEL PAGE 7 RW, EXTERNAL
;MAKE ALL OTHER PAGES RW, BANK 0
;RESTORE STACK POINTER
;SETUP ABORT RETURN

005564 005726 TST (SP)+
005566 012777 005630 175240 MOV #RET10,@KTVEC
005574 005077 175236 CLR @KTSTA
005600 005067 175606 CLR DESTAD ;INITIALIZE LOCATION TO BE ADDRESSED
;BY DATIP,DATOB TO RROT PAGE
;R4 CONTAINS VIRTUAL ADDRESS OF LOCATION
;TO BE REFERENCED THRU KERNEL PAGE 1

005604 012704 023412 MOV #DESTAD+20000,R4

005610 052777 001001 175206 AD10: BIS #1001,@SRO ;TURN ON KT11-C
005616 105224 INCB (R4)+ ;DATIP, DATOB TO RROT PAGE
005620 005377 175200 DEC @SRO ;TURN OFF KT11-C
005624 104006 HLT ;DATIP,DATO TO RROT PAGE FAILED TO ABORT
005626 000440 BR DONE10
005630 017701 175170 RET10: MOV @SRO,R1 ;SAVE CONTENTS OF SRO
005634 005377 175164 DEC @SRO ;TURN OFF KT11-C
005640 022701 021023 CMP #21023,R1 ;CHECK SAVED CONTENTS OF SRO
005644 001401 BEQ .+4
005646 104006 HLT ;SRO INCORRECT-SHOULD HAVE LOCKED ON

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; DATOB TO KERNEL DATA PAGE 1 (PROT)
; ACCESS FAULT SHOULD BE SET
; CHECK SR1
005650 022777 000014 175150      CMP      #14, @SR1
005656 001401      BEQ      .+4
005660 104006      HLT

; SR1 INCORRECT-SHOULD HAVE LOCKED
; ON THE ABORTED REFERENCE, WHICH AUTO-
; INCREMENTED R4
; CHECK SR2
005662 022777 005616 175140      CMP      #AD10, @SR2
005670 001401      BEQ      .+4
005672 104006      HLT

; SR2 INCORRECT-SHOULD HAVE LOCKED
; ON THE ABORTED REFERENCE, WITH THE
; VIRTUAL ADDRESS OF THE INSTRUCTION
; CHECK INSTRUCTION SPACE PDR
005674 022777 077401 175340      CMP      #77401, @KIPDR1
005702 001401      BEQ      .+4
005704 104006      HLT

; KIPDR1 INCORRECT-SHOULD NOT HAVE
; BEEN CHANGED
; CHECK DATA SPACE PDR
005706 022777 077401 175346      CMP      #77401, @KDPDR1
005714 001401      BEQ      .+4
005716 104006      HLT

; KDPDR1 INCORRECT - SHOULD NOT HAVE
; BEEN CHANGED-DATIP IS ABORTED
; SINCE IT MUST BE FOLLOWED BY A DATO
; MAKE CERTAIN THAT DESTINATION
; LOCATION WAS NOT WRITTEN
; DATOB TO RROT PAGE WROTE INTO
; THE DESTINATION LOCATION
; CHANGE KT11-C FAULT
; RETURN TO CAUSE A HALT ON AN
; UNEXPECTED TRAP
005720 005767 175466      TST      DESTAD
005724 001401      BEQ      .+4
005726 104006      HLT

005730 016777 175102 175076  DONE10: MOV      KTSTA, @KTVEC
005736 005077 175074      CLR      @KTSTA
005742 005077 175056      CLR      @SR0
005746 005037 177776      CLR      @#PS

; SHOW THAT DATI TO A RRO PAGE (ACF=2) WITHOUT MEMORY
; MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
; SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT
; THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
TEST11: SCOPE
005752 104400
005754 012737 000011 177570      MOV      #11, @#SR
005762 005037 177776      CLR      @#PS
005766 012706 001000      MOV      #KSTACK, SP
005772 005077 175026      CLR      @SR0
005776 012746 000002      MOV      #2, -(SP)
006002 004767 014302      JSR      %7, SETUP

; LOAD TEST NUMBER INTO THE DISPLAY
; INITIALIZE PROCESSOR STATUS
; INITIALIZE KERNEL STACK POINTER
; INITIALIZE SR0
; PUSH RRO KEY ON STACK
; MAKE KERNEL PAGE 1 RRO, BANK 0
; MAKE KERNEL PAGE 7 RW, EXTERNAL
; MAKE ALL OTHER PAGES RW, BANK 0
; RESTORE STACK POINTER
; SETUP ABORT RETURN IN CASE
006006 005726
006010 012777 006150 175016      TST      (SP)+
006016 005077 175014      MOV      #RET11, @KTVEC
006022 012767 125252 175362      CLR      @KTSTA
006030 012701 023412      MOV      #125252, DESTAD
; INITIALIZE LOCATION TO BE REFERENCED
; R1 CONTAINS VIRTUAL ADDRESS OF
; LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
006034 005277 174764      INC      @SR0
006040 022721 125252      CMP      #125252, (R1)+
; TURN ON KT11-C
; DATI TO RRO PAGE
006044 001404      BEQ      OK11
006046 005377 174752      DEC      @SR0
; ON ERROR, TURN OFF KT11-C
; RELOCATION FAILED THRU KERNEL PAGE 1
006052 104006      HLT
006054 000441      BR
006056 017702 174742      OK11: MOV      @SR0, R2
; SAVE CONTENTS OF SR0

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006062	105377	174736		DECB	JSRO		;TURN OFF KT11-C
006066	022702	000021		CMP	#21,R2		;CHECK SAVED CONTENTS OF SRO
006072	001401			BEQ	+.4		
006074	104006			HLT			;SRO INCORRECT-SHOULD HAVE
							;TRACKED REFERENCE TO DATA SPACE,
							;PAGE 0, WHICH GOT THE ADDRESS OF SRO
							;CHECK SR1
006076	022777	000027	174722	CMP	#27,JSR1		
006104	001401			BEQ	+.4		
006106	104006			HLT			;SR1 INCORRECT-SHOULD KEEP
							;TRACKING EVEN WITH KT11-C OFF
							;CHECK SR2
006110	022777	006110	174712	CMP	#.,JSR2		
006116	001401			BEQ	+.4		
006120	104006			HLT			;SR2 INCORRECT-SHOULD TRACK EVEN
							;WHEN KT11-C IS OFF
							;CHECK INSTRUCTION SPACE PDR FOR
							;THE RRO PAGE REFERENCED
							;KIPDR1 INCORRECT-SHOULD NOT
							;HAVE BEEN CHANGED
							;CHECK DATA SPACE PDR CORRESPONDING
							;TO THE RRO REFERENCE
							;KDPDR1 INCORRECT-SHOULD NOT HAVE
							;CHANGED SINCE PAGE WAS NOT WRITTEN
							;TURN OFF KT11-C
							;DATI TO RRO PAGE CAUSED
							;A TRAP OR ABORT
							;RESTORE TRAP RETURN TO CAUSE HALT
							;ON AN UNEXPECTED TRAP
							;INITIALIZE SRO
							;INITIALIZE PROCESSOR STATUS
							;SHOW THAT A DATI TO A RRO PAGE (ACF=2) WITH MEMORY MANAGEMENT
							;TRAP ENABLE SET DOESN'T TRAP OR ABORT
							;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT THE
							;PDR'S FOR THE PAGE REFERENCED ARE CORRECT
							TEST12: SCOPE
006202	104400						
006204	012737	000012	177570	MOV	#12,#SR		;LOAD TEST NUMBER INTO THE DISPLAY
006212	005037	177776		CLR	#PS		;INITIALIZE PROCESSOR STATUS
006216	012706	001000		MOV	#KSTACK,SP		;INITIALIZE KERNEL STACK POINTER
006222	005077	174576		CLR	JSRO		;INITIALIZE SRO
006226	012746	000002		MOV	#2,-(SP)		;PUSH RRO KEY ON STACK
006232	004767	014052		JSR	%7,SETUP		;MAKE KERNEL PAGE 1 RRO, BANK 0
							;MAKE KERNEL PAGE 7 RW, EXTERNAL
							;MAKE ALL OTHER PAGES RW, BANK 0
							;RESTORE STACK POINTER
							;SETUP TRAP RETURN
006236	005726			TST	(SP)+		
006240	012777	006402	174566	MOV	#RET12,#KTVEC		
006246	005077	174564		CLR	#KTSTA		
006252	012767	125252	175132	MOV	#125252,DESTAD		;INITIALIZE LOCATION TO BE READ
006260	012701	023412		MOV	#DESTAD+2000,R1		;R1 CONTAINS VIRTUAL ADDRESS OF LOCATION TO BE
							;REFERENCED THRU KERNEL PAGE 1
							;TURN ON KT11-C, SET MMGT TRAP ENABLE
							;DATI TO RRO PAGE
006264	012777	001001	174532	MOV	#1001,JSRO		
006272	022721	125252		CMP	#125252,(R1)+		
006276	001404			BEQ	OK12		
006300	005377	174520		DEC	JSRO		;ON ERROR, TURN OFF KT11-C
006304	104006			HLT			;RELOCATION FAILED THRU KERNEL PAGE 1
006306	000441			BR	DONE12		
006310	017702	174510	OK12:	MOV	JSRO,R2		;SAVE CONTENTS OF SRO

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006314	005377	174504		DEC	SR0		;TURN OFF KT11-C
006320	022702	001021		CMP	#1021,R2		;CHECK SAVED CONTENTS OF SR0
006324	001401			BEQ	.+4		
006326	104006			HLT			;SR0 INCORRECT-SHOULD HAVE TRACKED
							;THE REFERENCE TO DATA SPACE, PAGE
							;0 WHICH GOT THE ADDRESS OF SR0
							;CHECK SR1
006330	022777	000027	174470	CMP	#27,SR1		
006336	001401			BEQ	.+4		
006340	104006			HLT			;SR1 INCORRECT-SHOULD CONTINUE
							;TRACKING WITH KT11-C OFF
							;CHECK SR2
006342	022777	006342	174460	CMP	#,SR2		
006350	001401			BEQ	.+4		
006352	104006			HLT			;SR2 INCORRECT-SHOULD STILL BE
							;TRACKING WITH KT11-C OFF
							;CHECK INSTRUCTION SPACE PDR
006354	022777	077402	174660	CMP	#77402,AKIPDR1		
006362	001401			BEQ	.+4		
006364	104006			HLT			;KIPDR1 INCORRECT-SHOULD NOT HAVE CHANGED
006366	022777	077402	174666	CMP	#77402,AKDPDR1		;CHECK DATA SPACE PDR
006374	001401			BEQ	.+4		
006376	104006			HLT			;KDPDR1 INCORRECT-SHOULD NOT HAVE CHANGED
006400	000404			BR	DONE12		
006402	042777	000001	174414	RET12:	BIC	#1,SR0	;TURN OFF KT11-C
006410	104006			HLT			;DATO TO RRO PAGE CAUSED A TRAP OR ABORT
006412	016777	174420	174414	DONE12:	MOV	KTSTA,AKTVEC	;CHANGE KT11-C FAULT RETURN TO
006420	005077	174412		CLR	AKTSTA		;CAUSE A HALT ON AN UNEXPECTED TRAP
006424	005077	174374		CLR	SR0		
006430	005037	177776		CLR	PS		
							;SHOW THAT A DATO (NO DATIP) TO A RRO PAGE (ACF=2) WITHOUT
							;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS WITHOUT COMPLETING THE DATO
							;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
							;CORRESPONDING TO THE REFERENCE IS CORRECT
006434	104400						TEST13: SCOPE
006436	012737	000013	177570	MOV	#13,SR		;LOAD TEST NUMBER INTO THE DISPLAY
006444	005037	177776		CLR	PS		;INITIALIZE PROCESSOR STATUS
006450	012706	001000		MOV	#KSTACK,SP		;INITIALIZE KERNEL STACK POINTER
006454	005077	174344		CLR	SR0		;INITIALIZE SR0
006460	012746	000002		MOV	#2,-(SP)		;PUSH RRO KEY ON STACK
006464	004767	013620		JSR	%7,SETUP		;MAKE KERNEL PAGE 1 RRO, BANK 0
							;MAKE KERNEL PAGE 7 RW, EXTERNAL
							;MAKE ALL OTHER PAGES RW, BANK 0
							;RESTORE STACK
006470	005726			TST	(SP)+		;SETUP ABORT RETURN
006472	012777	006540	174334	MOV	#RET13,AKTVEC		
006500	005077	174332		CLR	AKTSTA		
006504	005067	174702		CLR	DESTAD		;INITIALIZE LOCATION TO BE ADDRESSED
							;BY DATO TO RRO PAGE
006510	012701	023412		MOV	#DESTAD+20000,R1		;R1 CONTAINS VIRTUAL ADDRESS OF LOCATION
							;TO BE REFERENCED THRU KERNEL PAGE 1
006514	112777	000001	174302	MOVB	#1,SR0		;TURN ON KT11-C
006522	012721	125252		MOV	#125252,(R1)+		;DATO TO RRO PAGE-SHOULD ABORT
006526	042777	000001	174270	BIC	#1,SR0		;TURN OFF KT11-C
006534	104006			HLT			;DATO TO RRO PAGE FAILED TO ABORT
006536	000440			BR	DONE13		
006540	017702	174260		RET13:	MOV	SR0,R2	;SAVE CONTENTS OF SR0
006544	005377	174254		DEC	SR0		;TURN OFF KT11-C
006550	022702	020023		CMP	#20023,R2		;CHECK SAVED CONTENTS OF SR0

006554	001401				BEQ	.+4			
006556	104006				HLT				;SRO INCORRECT-SHOULD HAVE LOCKED
									;ON DATO TO KERNEL DATA PAGE 1(RRO)
									;AND ACCESS VIOLATION SHOULD BE SET
									;CHECK SR1
006560	022777	010427	174240		CMP	#10427, @SR1			
006566	001401				BEQ	.+4			
006570	104006				HLT				;SR1 INCORRECT-SHOULD HAVE LOCKED
									;ON THE ABORTED REFERENCE, WHICH
									;AUTOINCREMENTED R7, AND THEN R1
									;CHECK SR2
006572	022777	006522	174230		CMP	#AD13, @SR2			
006600	001401				BEQ	.+4			
006602	104006				HLT				;SR2 INCORRECT-SHOULD HAVE LOCKED
									;ON THE ABORTED REFERENCE, WITH THE
									;VIRTUAL ADDRESS OF THE INSTRUCTION
									;CHECK INSTRUCTION SPACE PDR
006604	022777	077402	174430		CMP	#77402, @KIPDR1			
006612	001401				BEQ	.+4			
006614	104006				HLT				;KIPDR1 INCORRECT-SHOULD NOT HAVE
									;BEEN CHANGED
									;CHECK DATA SPACE PDR
006616	022777	077402	174436		CMP	#77402, @KDPDR1			
006624	001401				BEQ	.+4			
006626	104006				HLT				;KDPDR1 INCORRECT-SHOULD NOT
									;HAVE BEEN CHANGED
									;MAKE CERTAIN THAT DESTINATION
									;LOCATION WAS NOT WRITTEN
									;DATO TO RRO PAGE WROTE
									;INTO THE DESTINATION LOCATION
									;CHANGE KT11-C FAULT RETURN
									;TO CAUSE A HALT ON AN UNEXPECTED TRAP
006640	016777	174172	174166	DONE13:	MOV	KTSTA, @KTVEC			
006646	005077	174164			CLR	@KTSTA			
006652	005077	174146			CLR	@SRO			
006656	005037	177776			CLR	@#PS			
									;SHOW THAT A DATO (NO DATIP) TO A RRO PAGE (ACF=2) WITH
									;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS
									;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
									;CORRESPONDING TO THE REFERENCE IS CORRECT
									TEST14: SCOPE
006662	104400								
006664	012737	000014	177570		MOV	#14, @#SR			;LOAD TEST NUMBER INTO THE DISPLAY
006672	005037	177776			CLR	@#PS			;INITIALIZE PROCESSOR STATUS
006676	012706	001000			MOV	#KSTACK, SP			;INITIALIZE KERNEL STACK POINTER
006702	005077	174116			CLR	@SRO			;INITIALIZE SRO
006706	012746	000002			MOV	#2, -(SP)			;PUSH RRO KEY ON STACK
006712	004767	013372			JSR	%7, SETUP			;MAKE KERNEL PAGE 1 RRO, BANK 0
									;MAKE KERNEL PAGE 7 RW, EXTERNAL
									;MAKE ALL OTHER PAGES RW, BANK 0
									;RESTORE STACK
									;SETUP ABORT RETURN
006716	005726				TST	(SP)+			
006720	012777	006764	174106		MOV	#RET14, @KTVEC			
006726	005077	174104			CLR	@KTSTA			
006732	005067	174454			CLR	DESTAD			;INITIALIZE LOCATION TO BE ADDRESSED
									;BY DATO TO RRO PAGE
006736	012702	023412			MOV	#DESTAD+20000, R2			;R2 CONTAINS VIRTUAL ADDRESS OF LOCATION
									;TO BE REFERENCED THRU KERNEL PAGE 1
									;TURN ON KT11-C, SET MMGT TRAP ENABLE
									;DATO TO RRO PAGE-SHOULD ABORT
									;TURN OFF KT11-C
									;DATO TO RRO PAGE FAILED TO ABORT
006742	012777	001001	174054		MOV	#1001, @SRO			
006750	012722	125252		AD14:	MOV	#125252, (R2)+			
006754	105377	174044			DEC	@SRO			
006760	104006				HLT				
006762	000440				BR	DONE14			

006764	017701	174034		RET14:	MOV	2SR0,R1	;SAVE CONTENTS OF SR0
006770	005377	174030			DEC	2SR0	;TURN OFF KT11-C
006774	022701	021023			CMP	#21023,R1	;CHECK SAVED CONTENTS OF SRC
007000	001401				BEG	.+4	
007002	104006				HLT		;SR0 INCORRECT-SHOULD HAVE LOCKED ;ON DATO TO KERNEL DATA PAGE 1(RR0) ;AND ACCESS FAULT SHOULD BE SET
007004	022777	011027	174014		CMP	#11027,2SR1	;CHECK SR1
007012	001401				BEG	.+4	
007014	104006				HLT		;SR1 INCORRECT-SHOULD HAVE LOCKED ;ON THE ABORTED REFERENCE, WHICH AUTO- ;INCREMENTED R7, AND THEN R2
007016	022777	006750	174004		CMP	#AD14,2SR2	;CHECK SR2
007024	001401				BEG	.+4	
007026	104006				HLT		;SR2 INCORRECT-SHOULD HAVE LOCKED ;ON THE ABORTED REFERENCE, WITH THE ;VIRTUAL ADDRESS OF THE INSTRUCTION
007030	022777	077402	174204		CMP	#77402,2KIPDR1	;CHECK INSTRUCTION SPACE PDR
007036	001401				BEG	.+4	
007040	104006				HLT		;KIPDR1 INCORRECT-SHOULD NOT ;HAVE BEEN CHANGED
007042	022777	077402	174212		CMP	#77402,2KDPDR1	;CHECK DATA SPACE PDR
007050	001401				BEG	.+4	
007052	104006				HLT		;KDPDR1 INCORRECT-SHOULD NOT ;HAVE BEEN CHANGED
007054	005767	174332			TST	DESTAD	;MAKE CERTAIN THAT DESTINATION
007060	001401				BEG	.+4	;LOCATION WAS NOT WRITTEN
007062	104006				HLT		;DATO TO RRO PAGE WROTE ;INTO THE DESTINATION LOCATION
007064	016777	173746	173742	DONE14:	MOV	KTSTA,2KTVEC	;CHANGE KT11-C FAULT RETURN
007072	005077	173740			CLR	2KTSTA	;TO CAUSE A HALT ON AN UNEXPECTED TRAP
007076	005077	173722			CLR	2SR0	
007102	005037	177776			CLR	2#PS	

;SHOW THAT A DATIP, DATO SEQUENCE TO A RRO PAGE (ACF=2) WITHOUT  
;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS  
;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR  
;CORRESPONDING TO THE REFERENCE IS CORRECT

007106	104400			TEST15:	SCOPE		
007110	012737	000015	177570		MOV	#15,2#SR	;LOAD TEST NUMBER INTO THE DISPLAY
007116	005037	177776			CLR	2#PS	;INITIALIZE PROCESSOR STATUS
007122	012706	001000			MOV	#KSTACK,SP	;INITIALIZE KERNEL STACK POINTER
007126	005077	173672			CLR	2SR0	;INITIALIZE SR0
007132	012746	000002			MOV	#2,-(SP)	;PUSH RRO KEY ON STACK
007136	004767	013146			JSR	%7, SETUP	;MAKE KERNEL PAGE 1 RRO, BANK 0 ;MAKE KERNEL PAGE 7 RW, EXTERNAL ;MAKE ALL OTHER PAGES RW, BANK 0
007142	005726				TST	(SP)+	;RESTORE STACK POINTER
007144	012777	007210	173662		MOV	#RET15,2KTVEC	;SETUP ABORT RETURN
007152	005077	173660			CLR	2KTSTA	
007156	005067	174230			CLR	DESTAD	;INITIALIZE LOCATION TO BE ADDRESSED ;BY DATIP, DATO TO RRO PAGE
007162	012703	023414			MOV	#DESTAD+20002,R3	;R3 CONTAINS ADDRESS+2 OF LOCATION ;TO BE REFERENCED THRU KERNEL PAGE 1
007166	052777	000001	173630		BIS	#1,2SR0	;TURN ON KT11-C

007174	005243			AD15:	INC	-(R3)	:DATIP, DATO TO RRO PAGE - SHOULD ABORT
007176	042777	000001	173620		BIC	#1,SR0	:TURN OFF KT11-C
007204	104006				HLT		:DATIP, DATO TO RRO PAGE FAILED TO
007206	000441				BR	DONE15	:ABORT
007210	017701	173610		RET15:	MOV	SR0,R1	:SAVE CONTENTS OF SR0
007214	042777	000001	173602		BIC	#1,SR0	:TURN OFF KT11-C
007222	022701	020023			CMP	#20023,R1	:CHECK SAVED CONTENTS OF SR0
007226	001401				BEQ	.+4	
007230	104006				HLT		:SR0 INCORRECT-SHOULD HAVE LOCKED
							:ON DATIP, DATO TO KERNEL DATA PAGE 1(RRO)
							:ACCESS FAULT SHOULD BE SET
007232	022777	000363	173566		CMP	#363,SR1	:CHECK SR1
007240	001401				BEQ	.+4	
007242	104006				HLT		:SR1 INCORRECT-SHOULD HAVE LOCKED
							:ON THE ABORTED REFERENCE, WHICH
							:AUTODECREMENTED R3
007244	022777	007174	173556		CMP	#AD15,SR2	:CHECK SR2
007252	001401				BEQ	.+4	
007254	104006				HLT		:SR2 INCORRECT-SHOULD HAVE LOCKED
							:ON THE ABORTED REFERENCE, CONTAINING THE
							:VIRTUAL ADDRESS OF THE INSTRUCTION
007256	022777	077402	173756		CMP	#77402,@KIPDR1	:CHECK INSTRUCTION SPACE PDR
007264	001401				BEQ	.+4	
007266	104006				HLT		:KIPDR1 INCORRECT-SHOULD NOT HAVE
							:BEEN CHANGED
007270	022777	077402	173764		CMP	#77402,@KDPDR1	:CHECK DATA SPACE PDR
007276	001401				BEQ	.+4	
007300	104006				HLT		:KDPDR1 INCORRECT - SHOULD NOT HAVE
							:BEEN CHANGED, SINCE THE INSTRUCTION WAS
							:ABORTED BEFORE THE WRITE OCCURRED
007302	005767	174104			TST	DESTAD	:MAKE CERTAIN THAT DESTINATION
007306	001401				BEQ	.+4	:LOCATION WAS NOT WRITTEN
007310	104006				HLT		:DATO TO RRO PAGE WROTE INTO
							:THE DESTINATION LOCATION
007312	016777	173520	173514	DONE15:	MOV	KTSTA,@KTVEC	:CHANGE PAGE FAULT RETURN
007320	005077	173512			CLR	@KTSTA	:TO CAUSE A HALT ON AN UNEXPECTED
007324	005077	173474			CLR	SR0	:TRAP
007330	005037	177776			CLR	@PS	
							:SHOW THAT A DATIP, DATO SEQUENCE TO A RRO PAGE (ACF=2) WITH
							:MEMORY MANAGEMENT TRAP ENABLE SET ABORTS
							:SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
							:CORRESPONDING TO THE REFERENCE IS CORRECT
007334	104400			TEST16:	SCOPE		
007336	012737	000016	177570		MOV	#16,@SR	:LOAD TEST NUMBER INTO THE DISPLAY
007344	005037	177776			CLR	@PS	:INITIALIZE PROCESSOR STATUS
007350	012706	001000			MOV	#KSTACK,SP	:INITIALIZE KERNEL STACK POINTER
007354	005077	173444			CLR	SR0	:INITIALIZE SR0
007360	012746	000002			MOV	#2,-(SP)	:PUSH RRO KEY ON STACK
007364	004767	012720			JSR	%7, SETUP	:MAKE KERNEL PAGE 1 RRO, BANK 0
							:MAKE KERNEL PAGE 7 RW, EXTERNAL
							:MAKE ALL OTHER PAGES RW, BANK 0
007370	005726				TST	(SP)+	:RESTORE STACK POINTER
007372	012777	007436	173434		MOV	#RET16,@KTVEC	:SETUP ABORT RETURN
007400	005077	173432			CLR	@KTSTA	
007404	005067	174002			CLR	DESTAD	:INITIALIZE LOCATION TO BE ADDRESSED

007410	012703	023414		MOV	#DESTAD+20002,R3	;BY DATIP, DATO TO RRO PAGE ;R3 CONTAINS ADDRESS+2 OF LOCATION
007414	052777	001001	173402	BIS	#1001, @SRO	;TO BE REFERENCED THRU KERNEL PAGE 1
007422	005243			AD16: INC	-(R3)	;TURN ON KT11-C
007424	042777	000001	173372	BIC	#1, @SRO	;DATIP, DATO TO RRO PAGE - SHOULD ABORT
007432	104006			HLT		;TURN OFF KT11-C
007434	000441			BR	DONE16	;DATIP, DATO TO RRO PAGE FAILED TO
007436	017701	173362		RET16: MOV	@SRO, R1	;ABORT
007442	042777	000001	173354	BIC	#1, @SRO	;SAVE CONTENTS OF SRO
007450	022701	021023		CMP	#21023, R1	;TURN OFF KT11-C
007454	001401			BEQ	.+4	;CHECK SAVED CONTENTS OF SRO
007456	104006			HLT		;SRO INCORRECT-SHOULD HAVE LOCKED
						;ON DATIP, DATO TO KERNEL DATA PAGE 1(RRO)
						;ACCESS FAULT SHOULD BE SET
007460	022777	000363	173340	CMP	#363, @SR1	;CHECK SR1
007466	001401			BEQ	.+4	
007470	104006			HLT		;SR1 INCORRECT-SHOULD HAVE LOCKED
						;ON THE ABORTED REFERENCE, WHICH
						;AUTODECREMENTED R3
007472	022777	007422	173330	CMP	#AD16, @SR2	;CHECK SR2
007500	001401			BEQ	.+4	
007502	104006			HLT		;SR2 INCORRECT-SHOULD HAVE LOCKED
						;ON THE ABORTED REFERENCE, CONTAINING THE
						;VIRTUAL ADDRESS OF THE INSTRUCTION
007504	022777	077402	173530	CMP	#77402, @KIPDR1	;CHECK INSTRUCTION SPACE PDR
007512	001401			BEQ	.+4	
007514	104006			HLT		;KIPDR1 INCORRECT-SHOULD NOT HAVE
						;BEEN CHANGED
007516	022777	077402	173536	CMP	#77402, @KDPDR1	;CHECK DATA SPACE PDR
007524	001401			BEQ	.+4	
007526	104006			HLT		;KDPDR1 INCORRECT - SHOULD NOT HAVE
						;BEEN CHANGED, SINCE THE INSTRUCTION WAS
						;ABORTED BEFORE THE WRITE OCCURRED
007530	005767	173656		TST	DESTAD	;MAKE CERTAIN THAT DESTINATION
007534	001401			BEQ	.+4	;LOCATION WAS NOT WRITTEN
007536	104006			HLT		;DATO TO RRO PAGE WROTE INTO
						;THE DESTINATION LOCATION
007540	016777	173272	173266	DONE16: MOV	KTSTA, @KTVEC	;CHANGE PAGE FAULT RETURN
007546	005077	173264		CLR	@KTSTA	;TO CAUSE A HALT ON AN UNEXPECTED
007552	005077	173246		CLR	@SRO	;TRAP
007556	005037	177776		CLR	@#PS	

;SHOW THAT A DATIP, DATOB SEQUENCE TO A RRO PAGE (ACF=2) WITHOUT  
;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS  
;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR  
;CORRESPONDING TO THE REFERENCE IS CORRECT

007562	104400			TEST17: SCOPE		
007564	012737	000017	177570	MOV	#17, @#SR	;LOAD TEST NUMBER INTO THE DISPLAY
007572	005037	177776		CLR	@#PS	;INITIALIZE PROCESSOR STATUS
007576	012706	001000		MOV	#KSTACK, SP	;INITIALIZE KERNEL STACK POINTER
007602	005077	173216		CLR	@SRO	;INITIALIZE SRO
007606	012746	000002		MOV	#2, -(SP)	;PUSH RRO KEY ON STACK
007612	004767	012472		JSR	%7, SETUP	;MAKE KERNEL PAGE 1 RRO, BANK 0
						;MAKE KERNEL PAGE 7 RW, EXTERNAL

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007616 005726          TST      (SP)+          ;MAKE ALL OTHER PAGES RW, BANK 0
007620 012777 007662 173206  MOV      #RET17,@KTVEC ;RESTORE STACK POINTER
007626 005077 173204          CLR      @KTSTA        ;SETUP ABORT RETURN
007632 005067 173554          CLR      DESTAD        ;INITIALIZE LOCATION TO BE ADDRESSED
                                ;BY DATIP, DATOB TO RRO PAGE
007636 012704 023412          MOV      #DESTAD+20000,R4 ;R4 CONTAINS ADDRESS OF LOCATION
                                ;TO BE REFERENCED THRU KERNEL PAGE 1
007642 052777 000001 173154  AD17:  BIS      #1,@SR0 ;TURN ON KT11-C
007650 105224          INCB     (R4)+          ;DATIP, DATOB TO RRO PAGE - SHOULD ABORT
007652 005377 173146          DEC      @SR0          ;TURN OFF KT11-C
007656 104006          HLT                     ;DATIP, DATO TO RRO PAGE FAILED
007660 000440          BR       DONE17        ;TO ABORT
007662 017701 173136          RET17: MOV      @SR0,R1 ;SAVE CONTENTS OF SR0
007666 005377 173132          DEC      @SR0          ;TURN OFF KT11-C
007672 022701 020023          CMP      #20023,R1    ;CHECK SAVED CONTENTS OF SR0
007676 001401          BEQ     .+4
007700 104006          HLT                     ;SR0 INCORRECT-SHOULD HAVE LOCKED ON
                                ;THE DATIP, DATOB TO KERNEL DATA PAGE 1 (RRO)
                                ;ACCESS FAULT SHOULD BE SET
007702 022777 000014 173116  CMP      #14,@SR1     ;CHECK SR1
007710 001401          BEQ     .+4
007712 104006          HLT                     ;SR1 INCORRECT-SHOULD HAVE LOCKED
                                ;ON THE ABORTED REFERENCE, WHICH AUTO-
                                ;INCREMENTED R4 BY ONE
007714 022777 007650 173106  CMP      #AD17,@SR2   ;CHECK SR2
007722 001401          BEQ     .+4
007724 104006          HLT                     ;SR2 INCORRECT-SHOULD HAVE LOCKED
                                ;ON THE ABORTED REFERENCE, CONTAINING THE
                                ;VIRTUAL ADDRESS OF THE INSTRUCTION
007726 022777 077402 173306  CMP      #77402,@KIPDR1 ;CHECK INSTRUCTION SPACE PDR
007734 001401          BEQ     ..+4
007736 104006          HLT                     ;KIPDR1 INCORRECT-SHOULD NOT HAVE
                                ;BEEN CHANGED
007740 022777 077402 173314  CMP      #77402,@KDPDR1 ;CHECK DATA SPACE PDR
007746 001401          BEQ     .+4
007750 104006          HLT                     ;KDPDR1 INCORRECT-SHOULD NOT HAVE
                                ;BEEN CHANGED, SINCE THE INSTRUCTION WAS
                                ;ABORTED BEFORE THE WRITE OCCURRED
007752 005767 173434          TST      DESTAD        ;MAKE CERTAIN THAT DESTINATION
007756 001401          BEQ     .+4          ;LOCATION WAS NOT WRITTEN
007760 104006          HLT                     ;DATOB TO RRO PAGE WROTE INTO
                                ;THE DESTINATION LOCATION
007762 016777 173050 173044  DONE17: MOV      KTSTA,@KTVEC ;CHANGE KT11-C FAULT
007770 005077 173042          CLR      @KTSTA        ;RETURN TO CAUSE A HALT ON AN
007774 005077 173024          CLR      @SR0          ;UNEXPECTED TRAP
010000 005037 177776          CLR      @#PS

;SHOW THAT A DATIP, DATOB SEQUENCE TO A RRO PAGE (ACF=2) WITH
;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS
;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
;CORRESPONDING TO THE REFERENCE IS CORRECT
010004 104400          TEST20: SCOPE
010006 012737 000020 177570  MOV      #20,@#SR     ;LOAD TEST NUMBER INTO THE DISPLAY
010014 005037 177776          CLR      @#PS        ;INITIALIZE PROCESSOR STATUS
010020 012706 001000          MOV      #KSTACK,SP  ;INITIALIZE KERNEL STACK POINTER

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010024	005077	172774		CLR	2SR0	: INITIALIZE SRO
010030	012746	000002		MOV	2, -(SP)	: PUSH RRO KEY ON STACK
010034	004767	012250		JSR	7, SETUP	: MAKE KERNEL PAGE 1 RRO, BANK 0
						: MAKE KERNEL PAGE 7 RW, EXTERNAL
						: MAKE ALL OTHER PAGES RW, BANK 0
010040	005726			TST	(SP)+	: RESTORE STACK POINTER
010042	012777	010104	172764	MOV	2RET20, 2KTVEC	: SETUP ABORT RETURN
010050	005077	172762		CLR	2KTSTA	
010054	005067	173332		CLR	DESTAD	: INITIALIZE LOCATION TO BE ADDRESSED
						: BY DATIP, DATOB TO RRO PAGE
010060	012704	023412		MOV	2DESTAD+20000, R4	: R4 CONTAINS ADDRESS OF LOCATION
						: TO BE REFERENCED THRU KERNEL PAGE 1
010064	052777	001001	172732	BIS	1001, 2SR0	: TURN ON KT11-C
010072	105224			INCB	(R4)+	: DATIP, DATOB TO RRO PAGE - SHOULD ABORT
010074	005377	172724		DEC	2SR0	: TURN OFF KT11-C
010100	104006			HLT		: DATIP, DATOB TO RRO PAGE FAILED
010102	000440			BR	DONE20	: TO ABORT
010104	017701	172714		MOV	2SR0, R1	: SAVE CONTENTS OF SRO
010110	005377	172710		DEC	2SR0	: TURN OFF KT11-C
010114	022701	021023		CMP	21023, R1	: CHECK SAVED CONTENTS OF SRO
010120	001401			BEQ	.+4	
010122	104006			HLT		: SRO INCORRECT-SHOULD HAVE LOCKED ON
						: THE DATIP, DATOB TO KERNEL DATA PAGE (RRO)
						: ACCESS FAULT SHOULD BE SET
010124	022777	000014	172674	CMP	14, 2SR1	: CHECK SR1
010132	001401			BEQ	.+4	
010134	104006			HLT		: SR1 INCORRECT-SHOULD HAVE LOCKED
						: ON THE ABORTED REFERENCE, WHICH AUTO-
						: INCREMENTED R4 BY ONE
010136	022777	010072	172664	CMP	2AD20, 2SR2	: CHECK SR2
010144	001401			BEQ	.+4	
010146	104006			HLT		: SR2 INCORRECT-SHOULD HAVE LOCKED
						: ON THE ABORTED REFERENCE, CONTAINING THE
						: VIRTUAL ADDRESS OF THE INSTRUCTION
010150	022777	077402	173064	CMP	277402, 2KIPDR1	: CHECK INSTRUCTION SPACE PDR
010156	001401			BEQ	.+4	
010160	104006			HLT		: KIPDR1 INCORRECT-SHOULD NOT HAVE
						: BEEN CHANGED
010162	022777	077402	173072	CMP	277402, 2KDPDR1	: CHECK DATA SPACE PDR
010170	001401			BEQ	.+4	
010172	104006			HLT		: KDPDR1 INCORRECT-SHOULD NOT HAVE
						: BEEN CHANGED, SINCE THE INSTRUCTION WAS
						: ABORTED BEFORE THE WRITE OCCURRED
010174	005767	173212		TST	DESTAD	: MAKE CERTAIN THAT DESTINATION
010200	001401			BEQ	.+4	: LOCATION WAS NOT WRITTEN
010202	104006			HLT		: DATOB TO RRO PAGE WROTE INTO
						: THE DESTINATION LOCATION
010204	016777	172626	172622	MOV	KTSTA, 2KTVEC	: CHANGE KT11-C FAULT
010212	005077	172620		CLR	2KTSTA	: RETURN TO CAUSE A HALT ON AN
010216	005077	172602		CLR	2SR0	: UNEXPECTED TRAP
010222	005037	177776		CLR	2#PS	

: THE FOLLOWING TESTS (21-30) ARE RUN FOR EACH OF THE NON-RESIDENT  
: KEYS - A PASS IS MADE FOR KEY 0, THEN A PASS IS MADE FOR KEY 3,  
: AND FINALLY A PASS IS MADE FOR KEY 7  
: THE CURRENT KEY IS STORED ON THE STACK

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;SHOW THAT DATI TO A NR PAGE WITHOUT MEMORY
;MANAGEMENT TRAP ENABLE SET ABORTS WITHOUT COMPLETING
;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT
;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
010226 104400
010230 005037 001000          CLR      0KSTACK          ;PUT 0 ON STACK AS FIRST NR KEY TO BE TESTED
                                ;THIS INSTRUCTION IS SKIPPED WHEN TESTING THE
                                ;OTHER 2 KEYS, WHICH ARE SETUP AFTER TEST30
                                ;LOAD TEST NUMBER INTO THE DISPLAY
010234 012737 000021 177570  MOV      #21,0SR          ;INITIALIZE PROCESSOR STATUS
010242 005037 177776          CLR      0PS              ;INITIALIZE KERNEL STACK POINTER
010246 012706 001000          MOV      0KSTACK,SP      ;INITIALIZE SRO
010252 005077 172546          CLR      0SRO            ;MAKE KERNEL PAGE 1 NR, BANK 0
010256 004767 012026          JSR      %7,SETUP        ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                ;MAKE ALL OTHER PAGES RW, BANK 0
                                ;SETUP ABORT RETURN
010262 012777 010326 172544  MOV      0RET21,0KTVEC
010270 005077 172542          CLR      0KTSTA
010274 005003                  CLR      R3              ;INITIALIZE DESTINATION LOCATION
010276 012767 125252 173106  MOV      #125252,DESTAD ;INITIALIZE SOURCE LOCATION
010304 012701 023412          MOV      0DESTAD+20000,R1 ;R1 CONTAINS VIRTUAL ADDRESS OF LOCATION
                                ;TO BE REFERENCED THRU KERNEL PAGE 1
010310 005277 172510          INC      0SRO            ;TURN ON KT11-C
010314 012103 AD21:  MOV      (R1)+,R3      ;DATI TO NR PAGE - SHOULD ABORT
010316 005377 172502          DEC      0SRO            ;ON ERROR, TURN OFF KT11-C
010322 104006          HLT
                                ;NO ABORT ON DATI TO A NON-RESIDENT PAGE
010324 000445          BR
010326 017702 172472 RET21: MOV      0SRO,R2      ;SAVE CONTENTS OF SRO
010332 105377 172466          DEC8    0SRO            ;TURN OFF KT11-C
010336 022702 100023          CMP      #100023,R2     ;CHECK SAVED CONTENTS OF SRO
010342 001401          BEQ
010344 104006          HLT
                                ;SRO INCORRECT-SHOULD HAVE
                                ;LOCKED ON REFERENCE TO DATA SPACE,
                                ;KERNEL PAGE 1 WHICH WAS NON-RESIDENT
                                ;CHECK SR1
010346 022777 000021 172452  CMP      #21,0SR1
010354 001401          BEQ
010356 104006          HLT
                                ;SR1 INCORRECT-SHOULD HAVE
                                ;LOCKED UP AFTER NR
                                ;ACCESS AUTO INCREMENTED
                                ;REGISTER 1 BY TWO
                                ;CHECK SR2
010360 022777 010314 172442  CMP      0AD21,0SR2
010366 001401          BEQ
010370 104006          HLT
                                ;SR2 INCORRECT-SHOULD HAVE LOCKED ON
                                ;NR REFERENCE
                                ;MOVE CONTENTS OF KIPDR1 TO R5
010372 017705 172644          MOV      0KIPDR1,R5
010376 042705 000007          BIC      #7,R5          ;TO MASK OFF ACCESS KEY
010402 022705 077400          CMP      #77400,R5     ;CHECK INSTRUCTION SPACE PDR FOR
010406 001401          BEQ      .+4           ;THE NR PAGE REFERENCED (BITS 0-2 MASKED OUT)
010410 104006          HLT                    ;KIPDR1 INCORRECT-SHOULD NOT
                                ;HAVE BEEN CHANGED
                                ;MOVE CONTENTS OF KDPDR1 TO R5
010412 017704 172644          MOV      0KDPDR1,R4
010416 042704 000007          BIC      #7,R4          ;TO MASK OFF ACCESS KEY
010422 022704 077400          CMP      #77400,R4     ;CHECK DATA SPACE PDR CORRESPONDING
010426 001401          BEQ      .+4           ;TO THE RROT REFERENCE
010430 104006          HLT                    ;KDPDR1 INCORRECT- SHOULD NOT
                                ;HAVE BEEN CHANGED

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010432	005703			TST	R3		:CHECK DESTINATION LOCATION TO SEE
010434	001401			BEQ	.+4		:IF INSTRUCTION ALTERED IT BEFORE ABORTING
010436	104006			HLT			:INSTRUCTION COMPLETED BEFORE ABORT OCCURRED
010440	016777	172372	172366	DONE21: MOV	KTSTA,KTVEC		:RESTORE TRAP RETURN TO CAUSE HALT
010446	005077	172364		CLR	KTSTA		:ON AN UNEXPECTED TRAP
010452	005077	172346		CLR	SR0		:INITIALIZE SR0
010456	005037	177776		CLR	PS		:INITIALIZE PROCESSOR STATUS
:SHOW THAT A DATI TO A NR PAGE WITH MEMORY MANAGEMENT							
:TRAP ENABLE SET ABORTS WITHOUT COMPLETING							
:SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE							
:PDR'S FOR THE PAGE REFERENCED ARE CORRECT							
010462	104400			TEST22: SCOPE			
010464	012737	000022	177570	MOV	#22,SR		:LOAD TEST NUMBER INTO THE DISPLAY
010472	005037	177776		CLR	PS		:INITIALIZE PROCESSOR STATUS
010476	012706	001000		MOV	KTSTACK,SP		:INITIALIZE KERNEL STACK POINTER
010502	005077	172316		CLR	SR0		:INITIALIZE SR0
010506	004767	011576		JSR	%7,SETUP		:MAKE KERNEL PAGE 1 NR, BANK 0
							:MAKE KERNEL PAGE 7 RW, EXTERNAL
							:MAKE ALL OTHER PAGES RW, BANK 0
							:SETUP ABORT RETURN
010512	012777	010560	172314	MOV	RET22,KTVEC		
010520	005077	172312		CLR	KTSTA		
010524	012767	125252	172660	MOV	#125252,DESTAD		:INITIALIZE LOCATION TO BE READ
010532	005003			CLR	R3		:CLEAR REGISTER TO SAVE WHAT WAS READ
							:ALLOWS CHECKING TO SEE THAT THE
							:INSTRUCTION DIDN'T COMPLETE
010534	012701	023412		MOV	DESTAD+20000,R1		:R1 CONTAINS VIRTUAL ADDRESS OF LOCATION
							:TO BE REFERENCED THRU KERNEL PAGE 1
010540	012777	001001	172256	MOV	#1001,SR0		:TURN ON KT11-C, SET MGMT TRAP ENABLE
010546	012103			AD22: MOV	(R1)+,R3		:DATI TO NR PAGE - SHOULD ABORT
010550	105077	172250		CLRB	SR0		:IF NO ABORT, TURN OFF KT11-C
010554	104006			HLT			:DATI TO NR PAGE WITH MEMORY
010556	000445			BR	DONE22		:MANAGEMENT TRAP ENABLE SET DIDN'T
							:CAUSE AN ABORT
010560	017702	172240		RET22: MOV	SR0,R2		:SAVE CONTENTS OF SR0
010564	005377	172234		DEC	SR0		:TURN OFF KT11-C
010570	022702	101023		CMP	#101023,R2		:CHECK SAVED CONTENTS OF SR0
010574	001401			BEQ	.+4		
010576	104006			HLT			:SR0 INCORRECT-SHOULD HAVE LOCKED ON NR
							:REFERENCE TO DATA SPACE, KERNEL PAGE 1
010600	022777	000021	172220	CMP	#21,SR1		:CHECK SR1
010605	001401			BEQ	.+4		
010610	104006			HLT			:SR1 INCORRECT-SHOULD HAVE LOCKED ON THE
							:NR REFERENCE WHICH AUTO INCREMENTED R1 BY ONE
010612	022777	010546	172210	CMP	AD22,SR2		:CHECK SR2
010620	001401			BEQ	.+4		
010622	104006			HLT			:SR2 INCORRECT-SHOULD HAVE LOCKED
							:ON THE NR REFERENCE
010624	017704	172412		MOV	KTIPDR1,R4		:MOVE CONTENTS OF KIPDR1 TO R4
010630	042704	000007		BIC	#7,R4		:TO MASK OFF THE ACCESS KEY
010634	022704	077400		CMP	#77400,R4		:CHECK INSTRUCTION SPACE PDR
010640	001401			BEQ	.+4		: (BITS 0-2 MASKED OUT)
010642	104006			HLT			:KIPDR1 INCORRECT-SHOULD NOT
							:HAVE BEEN CHANGED
010644	017705	172412		MOV	KTDPDR1,R5		:MOVE CONTENTS OF KDPDR1 TO R5
010650	042705	000007		BIC	#7,R5		:TO MASK OFF THE ACCESS KEY

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010654 022705 077400      CMP      #77400,R5      ;CHECK DATA SPACE PDR
010660 001401              BEQ      .+4          ;(BITS 0-2 MASKED OUT)
010662 104006              HLT                      ;KIPDR1 INCORRECT- SHOULD NOT
                                ;HAVE BEEN CHANGED
                                ;MAKE SURE INSTRUCTION DIDN'T COMPLETE

010664 005703              TST      R3
010666 001401              BEQ      .+4
010670 104006              HLT                      ;THE INSTRUCTION REFERENCING THE NR
                                ;PAGE DIDN'T ABORT BEFORE COMPLETING
010672 016777 172140 172134 DONE22: MOV      KTSTA,KTVEC      ;CHANGE KT11-C FAULT RETURN TO
010700 005077 172132      CLR      KTSTA        ;CAUSE A HALT ON AN UNEXPECTED TRAP
010704 005077 172114      CLR      JSRO
010710 005037 177776      CLR      JPS

;SHOW THAT A DATO (NO DATIP) TO A NR PAGE WITHOUT
;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS WITHOUT COMPLETING THE DATO
;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
;CORRESPONDING TO THE REFERENCE IS CORRECT
010714 104400              TEST23: SCOPE
010716 012737 000023 177570      MOV      #23,JPSR      ;LOAD TEST NUMBER INTO THE DISPLAY
010724 005037 177776      CLR      JPS          ;INITIALIZE PROCESSOR STATUS
010730 012706 001000      MOV      #KSTACK,SP   ;INITIALIZE KERNEL STACK POINTER
010734 005077 172064      CLR      JSRO         ;INITIALIZE SRO
010740 004767 011344      JSR      %7,SETUP      ;MAKE KERNEL PAGE 1 NR, BANK 0
                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                ;MAKE ALL OTHER PAGES RW, BANK 0
                                ;SETUP ABORT RETURN

010744 012777 011012 172062      MOV      #RET23,KTVEC
010752 005077 172060      CLR      KTSTA
010756 005067 172430      CLR      DESTAD      ;INITIALIZE LOCATION TO BE ADDRESSED
                                ;BY DATO TO NR PAGE
010762 012701 023412      MOV      #DESTAD+20000,R1 ;R1 CONTAINS ADDRESS OF LOCATION
                                ;TO BE REFERENCED THRU KERNEL PAGE 1
010766 112777 000001 172030      MOV8     #1,JSRO      ;TURN ON KT11-C
010774 012721 125252      MOV      #125252,(R1)+ ;DATO TO NR PAGE-SHOULD ABORT
011000 042777 000001 172016      BIC      #1,JSRO      ;TURN OFF KT11-C
                                ;DATO TO NR PAGE FAILED TO ABORT
011010 000446              BR
011012 017702 172006      RET23: MOV      JSRO,R2 ;SAVE CONTENTS OF SRO
011016 005377 172002      DEC      JSRO         ;TURN OFF KT11-C
011022 022702 100023      CMP      #100023,R2   ;CHECK SAVED CONTENTS OF SRO
011026 001401              BEQ      .+4
011030 104006              HLT                      ;SRO INCORRECT-SHOULD HAVE LOCKED
                                ;ON DATO TO KERNEL DATA PAGE 1(NR)
                                ;NR FAULT SHOULD BE SET

011032 022777 010427 171766      CMP      #10427,JSR1
011040 001401              BEQ      .+4          ;CHECK SR1
011042 104006              HLT                      ;SR1 INCORRECT-SHOULD HAVE LOCKED
                                ;ON THE ABORTED REFERENCE, WHICH
                                ;AUTOINCREMENTED R7 AND THEN R1
                                ;CHECK SR2

011044 022777 010774 171756      CMP      #AD23,JSR2
011052 001401              BEQ      .+4
011054 104006              HLT                      ;SR2 INCORRECT-SHOULD HAVE LOCKED
                                ;ON THE ABORTED REFERENCE, CONTAINING THE
                                ;VIRTUAL ADDRESS OF THE INSTRUCTION
011056 017703 172160      MOV      #KIPDR1,R3   ;MOVE CONTENTS OF KIPDR1 TO R3
011062 042703 000007      BIC      #7,R3        ;TO MASK OFF THE ACCESS KEY
011066 022703 077400      CMP      #77400,R3    ;CHECK INSTRUCTION SPACE PDR

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011072 001401      BEQ      .+4      ;(BITS 0-2 MASKED OUT)
011074 104006      HLT
;KIPDR1 INCORRECT-SHOULD NOT HAVE
;BEEN CHANGED
011076 017704 172160  MOV      2KDPDR1,R4  ;MOVE CONTENTS OF KDPDR1 TO R4
011102 042704 000007  BIC      #7,R4      ;TO MASK OFF THE ACCESS KEY
011106 022704 077400  CMP      #77400,R4  ;CHECK DATA SPACE PDR
011112 001401      BEQ      .+4      ;(BITS 0-2 MASKED OUT)
011114 104006      HLT
;KDPDR1 INCORRECT-SHOULD NOT
;HAVE BEEN CHANGED
011116 005767 172270  TST      DESTAD     ;MAKE CERTAIN THAT DESTINATION
011122 001401      BEQ      .+4      ;LOCATION WAS NOT WRITTEN
011124 104006      HLT
;DATO TO NR PAGE WROTE
;INTO THE DESTINATION LOCATION
011126 016777 171704 171700  DONE23: MOV      KTSTA,2KTVEC ;CHANGE KT11-C FAULT RETURN
011134 005077 171676  CLR      2KTSTA     ;TO CAUSE A HALT ON AN UNEXPECTED TRAP
011140 005077 171660  CLR      2SRO
011144 005037 177776  CLR      2#PS

;SHOW THAT A DATO (NO DATIP) TO A NR PAGE WITH
;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS
;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
;CORRESPONDING TO THE REFERENCE IS CORRECT
011150 104400      TEST24: SCOPE
011152 012737 000024 177570  MOV      #24,2#SR   ;LOAD TEST NUMBER INTO THE DISPLAY
011160 005037 177776  CLR      2#PS      ;INITIALIZE PROCESSOR STATUS
011164 012706 001000  MOV      #KSTACK,SP ;INITIALIZE KERNEL STACK POINTER
011170 005077 171630  CLR      2SRO      ;INITIALIZE SRO
011174 004767 011110  JSR      %7,SETUP  ;MAKE KERNEL PAGE 1 NR, BANK 0
;MAKE KERNEL PAGE 7 RW, EXTERNAL
;MAKE ALL OTHER PAGES RW, BANK 0
;SETUP ABORT RETURN
011200 012777 011244 171626  MOV      #RET24,2KTVEC
011206 005077 171624  CLR      2KTSTA
011212 005067 172174  CLR      DESTAD    ;INITIALIZE LOCATION TO BE ADDRESSED
;BY DATO TO NR PAGE
011216 012702 023412  MOV      #DESTAD+20000,R2 ;R2 CONTAINS ADDRESS OF LOCATION
;TO BE REFERENCED THRU KERNEL PAGE 1
011222 012777 001001 171574  MOV      #1001,2SRO ;TURN ON KT11-C, MGMT TRAP ENABLE
011230 012722 125252  AD24:  MOV      #125252,(R2)+ ;DATO TO NR PAGE-SHOULD ABORT
011234 105377 171564  JSR      2SRO      ;TURN OFF KT11-C
;DATO TO NR PAGE FAILED TO ABORT
011240 104006  HLT
011242 000446  PR
011244 017701 171554  RET24: MOV      2SRO,R1 ;SAVE CONTENTS OF SRO
011250 005377 171550  DEC      2SRO      ;TURN OFF KT11-C
011254 022701 101023  CMP      #101023,R1 ;CHECK SAVED CONTENTS OF SRO
011260 001401      BEQ      .+4
011262 104006  HLT
;SRO INCORRECT-SHOULD HAVE LOCKED
;ON DATO TO KERNEL DATA PAGE 1(NR)
;AND NR FAULT SHOULD BE SET
;CHECK SR1
011264 022777 011027 171534  CMP      #11027,2SR1
011272 001401      BEQ      .+4
011274 104006  HLT
;SR1 INCORRECT-SHOULD HAVE LOCKED
;ON THE ABORTED REFERENCE, WHICH AUTO-
;INCREMENTED R7 AND THEN R2
;CHECK SR2
011276 022777 011230 171524  CMP      #AD24,2SR2
011304 001401      BEQ      .+4
011306 104006  HLT
;SR2 INCORRECT-SHOULD HAVE LOCKED

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011310 017703 171726      MOV      2KIPDR1,R3
011314 042703 000007      BIC      #7,R3
011320 022703 077400      CMP      #77400,P3
011324 001401      BEQ      .+4
011326 104006      HLT

011330 017704 171726      MOV      2KDPDR1,R4
011334 042704 000007      BIC      #7,R4
011340 022704 077400      CMP      #77400,R4
011344 001401      BEQ      .+4
011346 104006      HLT

011350 005767 172036      TST      DESTAD
011354 001401      BEQ      .+4
011356 104006      HLT

011360 016777 171452 171446 DONE24: MOV      2KTSTA,2KTVEC
011366 005077 171444      CLR      2KTSTA
011372 005077 171426      CLR      2SRO
011376 005037 177776      CLR      2#PS

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;ON THE ABORTED REFERENCE, CONTAINING THE
;VIRTUAL ADDRESS OF THE INSTRUCTION
;MOVE CONTENTS OF I-SPACE PDR TO R3
;TO MASK OFF THE ACCESS KEY
;CHECK INSTRUCTION SPACE PDR
;WITH BITS 0-2 MASKED OUT
;KIPDR1 INCORRECT-SHOULD NOT
;HAVE BEEN CHANGED
;MOVE CONTENTS OF D-SPACE PDR TO R4
;TO MASK OFF ACCESS KEY
;CHECK DATA SPACE PDR
;WITH BITS 0-2 MASKED OFF
;KDPDR1 INCORRECT-SHOULD NOT
;HAVE BEEN CHANGED
;MAKE CERTAIN THAT DESTINATION
;LOCATION WAS NOT WRITTEN
;DATO TO NR PAGE WROTE
;INTO THE DESTINATION LOCATION
;CHANGE KT11-C FAULT RETURN
;TO CAUSE A HALT ON AN UNEXPECTED TRAP

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;SHOW THAT A DATIP, DATO SEQUENCE TO A NR PAGE WITHOUT
;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS
;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
;CORRESPONDING TO THE REFERENCE IS CORRECT
TEST25: SCOPE
011402 104400
011404 012737 000025 177570      MOV      #25,2#SR
011412 005037 177776      CLR      2#PS
011416 012706 001000      MOV      #KSTACK,SP
011422 005077 171376      CLR      2SRO
011426 004767 010656      JSR      %7,SETUP
;LOAD TEST NUMBER INTO THE DISPLAY
;INITIALIZE PROCESSOR STATUS
;INITIALIZE KERNEL STACK POINTER
;INITIALIZE SRO
;MAKE KERNEL PAGE 1 NR, BANK 0
;MAKE KERNEL PAGE 7 RW, EXTERNAL
;MAKE ALL OTHER PAGES RW, BANK 0
;SETUP ABORT RETURN

011432 012777 011476 171374      MOV      #RET25,2KTVEC
011440 005077 171372      CLR      2KTSTA
011444 005067 171742      CLR      DESTAD
;INITIALIZE LOCATION TO BE ADDRESSED
;BY DATIP, DATO TO NR PAGE
;R3 CONTAINS ADDRESS+2 OF LOCATION
;TO BE REFERENCED THRU KERNEL PAGE 1

011450 012703 023414      MOV      #DESTAD+20002,R3
;TURN ON KT11-C
;DATIP, DATO TO NR PAGE-SHOULD ABORT
;TURN OFF KT11-C
;DATIP, DATO TO NR PAGE FAILED TO
;ABORT

011454 052777 000001 171342      BIS      #1,2SRO
011462 005243 171332 AD25: INC      -(R3)
011464 042777 000001 171332      BIC      #1,2SRO
011472 104006      HLT
011474 000447      BR      DONE25
011476 017701 171322 RET25: MOV      2SRO,R1
011502 042777 000001 171314      BIC      #1,2SRO
011510 022701 100023      CMP      #100023,R1
011514 001401      BEQ      .+4
;SAVE CONTENTS OF SRO
;TURN OFF KT11-C
;CHECK SAVED CONTENTS OF SRO

011520 022777 000363 171300      CMP      #363,2SR1
011526 001401      BEQ      .+4
;SRO INCORRECT-SHOULD HAVE LOCKED
;ON DATO TO KERNEL DATA PAGE 1(NR)
;NR FAULT SHOULD BE SET
;CHECK SR1

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012160 104006          HLT           ;DATIP, DATO TO NR PAGE FAILED
012162 000446          BR           ;TO ABORT
012164 017701 170634  RET27: MOV        2SR0,R1  ;SAVE CONTENTS OF SR0
012170 005377 170630  DEC        2SR0  ;TURN OFF KT11-C
012174 022701 100023  CMP        #100023,R1 ;CHECK SAVED CONTENTS OF SR0
012200 001401          BEQ        .+4
012202 104006          HLT           ;SR0 INCORRECT-SHOULD HAVE LOCKED ON
;DATIP, DATOB TO KERNEL DATA PAGE 1 (NR)
;NR FAULT SHOULD BE SET
;CHECK SR1

012204 022777 000014 170614  CMP        #14,2SR1
012212 001401          BEQ        .+4
012214 104006          HLT           ;SR1 INCORRECT-SHOULD HAVE LOCKED
;ON THE ABORTED REFERENCE, WHICH AUTO-
;INCREMENTED R4 BY ONE
;CHECK SR2

012216 022777 012152 170604  CMP        #A027,2SR2
012224 001401          BEQ        .+4
012226 104006          HLT           ;SR2 INCORRECT SHOULD HAVE LOCKED
;ON THE ABORTED REFERENCE, CONTAINING THE
;VIRTUAL ADDRESS OF THE INSTRUCTION
;MOVE CONTENTS OF I-SPACE PDR 1 TO R2
;TO MASK OFF THE ACCESS KEY
;CHECK INSTRUCTION SPACE PDR
;WITH BITS 0-2 MASKED OFF
;KIPDR1 INCORRECT-SHOULD NOT HAVE
;BEEN CHANGED

012230 017702 171006  MOV        2KIPDR1,R2
012234 042702 000007  BIC        #7,R2
012240 022702 077400  CMP        #77400,R2
012244 001401          BEQ        .+4
012246 104006          HLT           ;KIPDR1 INCORRECT-SHOULD NOT HAVE
;BEEN CHANGED

012250 017703 171006  MOV        2KDPDR1,R3
012254 042703 000007  BIC        #7,R3
012260 022703 077400  CMP        #77400,R3
012264 001401          BEQ        .+4
012266 104006          HLT           ;KDPDR1 INCORRECT- SHOULD NOT
;HAVE BEEN CHANGED

012270 005767 171116  TST        DESTAD
012274 001401          BEQ        .+4
012276 104006          HLT           ;MAKE CERTAIN THAT DESTINATION
;LOCATION WAS NOT WRITTEN
;DATOB TO NR PAGE WROTE INTO
;THE DESTINATION LOCATION
;CHANGE KT11-C FAULT
;RETURN TO CAUSE A HALT ON AN
;UNEXPECTED TRAP

012300 016777 170532 170526  DONE27: MOV        KTSTA,2KTVEC
012306 005077 170524  CLR        2KTSTA
012312 005077 170506  CLR        2SR0
012316 005037 177776  CLR        2#PS

;SHOW THAT A DATIP, DATOB SEQUENCE TO A NR PAGE WITH
;MEMORY MANAGEMENT TRAP ENABLE SET ABORTS
;SHOW THAT THE KT11-C STATUS REGISTERS LOCK UP, AND THAT THE PDR
;CORRESPONDING TO THE REFERENCE IS CORRECT
TEST30: SCOPE

012322 104400          MOV        #30,2#SR
012324 012737 000030 177570  CLR        2#PS
012332 005037 177776  MOV        #KSTACK,SP
012336 012706 001000  CLR        2SR0
012342 005077 170456  JSR        %7,SETUP
012346 004767 007736  ;LOAD TEST NUMBER INTO THE DISPLAY
;INITIALIZE PROCESSOR STATUS
;INITIALIZE KERNEL STACK POINTER
;INITIALIZE SR0
;MAKE KERNEL PAGE 1 NR, BANK 0
;MAKE KERNEL PAGE 7 RW, EXTERNAL
;MAKE ALL OTHER PAGES RW, BANK 0
;SETUP ABORT RETURN

012352 012777 012414 170454  MOV        #RET30,2KTVEC
012360 005077 170452  CLR        2KTSTA
012364 005067 171022  CLR        DESTAD
;INITIALIZE LOCATION TO BE ADDRESSED
;BY DATIP, DATOB TO NR PAGE

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012370	012704	023412		MUV	#DESTAD+20000,R4	.R4 CONTAINS ADDRESS OF LOCATION ; TO BE REFERENCED THRU KERNEL PAGE 1
012374	052777	001001	170422	BIS	#1001,SR0	; TURN ON KT11-C
012402	105224			AD30: INCB	(R4)+	; DATIP, DATOB TO NR PAGE-SHOULD ABORT
012404	005377	170414		DEC	SR0	; TURN OFF KT11-C
012410	104006			HLT		; DATIP, DATO TO NR PAGE FAILED
012412	000446			BR	DONE30	; TO ABORT
012414	017701	170404		RE*30: MOV	SR0,R1	; SAVE CONTENTS OF SR0
012420	005377	170400		DEC	SR0	; TURN OFF KT11-C
012424	022701	101023		CMP	#101023,R1	; CHECK SAVED CONTENTS OF SR0
012430	001401			BEQ	.+4	
012432	104006			HLT		; SR0 INCORRECT-SHOULD HAVE LOCKED ON ; DATIP, DATOB TO KERNEL DATA PAGE 1 (NR) ; NR FAULT SHOULD BE SET
012434	022777	000014	170364	CMP	#14,SR1	; CHECK SR1
012442	001401			BEQ	.+4	
012444	104006			HLT		; SR1 INCORRECT-SHOULD HAVE LOCKED ; ON THE ABORTED REFERENCE, WHICH AUTO- ; INCREMENTED R4 BY ONE
012446	022777	012402	170354	CMP	#AD30,SR2	; CHECK SR2
012454	001401			BEQ	.+4	
012456	104006			HLT		; SR2 INCORRECT SHOULD HAVE LOCKED ; ON THE ABORTED REFERENCE, CONTAINING THE ; VIRTUAL ADDRESS OF THE INSTRUCTION
012460	017702	170556		MOV	#KIPDR1,R2	; MOVE CONTENTS OF I-SPACE PDR 1 TO R2
012464	042702	000007		BIC	#7,R2	; TO MASK OFF THE ACCESS KEY
012470	022702	077400		CMP	#77400,R2	; CHECK INSTRUCTION SPACE PDR
012474	001401			BEQ	.+4	; WITH BITS 0-2 MASKED OFF
012476	104006			HLT		; KIPDR1 INCORRECT-SHOULD NOT HAVE ; BEEN CHANGED
012500	017703	170556		MOV	#KDPDR1,R3	; MOVE CONTENTS OF D-SPACE PDR TO R3
012504	042703	000007		BIC	#7,R3	; TO MASK OFF THE ACCESS KEY
012510	022703	077400		CMP	#77400,R3	; CHECK DATA SPACE PDR
012514	001401			BEQ	.+4	; WITH BITS 0-2 MASKED OFF
012516	104006			HLT		; KDPDR1 INCORRECT- SHOULD NOT ; HAVE BEEN CHANGED
012520	005767	170666		TST	DESTAD	; MAKE CERTAIN THAT DESTINATION
012524	001401			BEQ	.+4	; LOCATION WAS NOT WRITTEN
012526	104006			HLT		; DATOB TO NR PAGE WROTE INTO ; THE DESTINATION LOCATION
012530	016777	170302	170276	DONE30: MOV	KTSTA,#KTVEC	; CHANGE KT11-C FAULT
012536	005077	170274		CLR	KTSTA	; RETURN TO CAUSE A HALT ON AN
012542	005077	170256		CLR	SR0	; UNEXPECTED TRAP
012546	005037	177776		CLR	#PS	
012552	104400			SCOPE		
012554	005267	170622		INC	NRcnt	; COUNT HOW MANY NR KEYS HAVE BEEN TESTED
012560	022767	000003	170614	CMP	#3,NRcnt	
012566	001413			BEQ	NXTST	; IF ALL 3 HAVE BEEN TESTED, BRANCH
012570	016701	170606		MOV	NRcnt,R1	; OTHERWISE, CALCULATE OFFSET TO GET NEXT KEY
012574	006301			ASL	R1	
012576	016137	003404	001000	MOV	NRKEYS(R1),#KSTACK	; PUT NEXT NR KEY ON STACK
012604	012767	010234	010006	MOV	#TEST21+6,RETURN	; PUT NEW SCOPE LOOP ADDRESS IN RETURN
012612	000167	175416		JMP	TEST21+6	; JUMP TO EXECUTE TESTS WITH NEXT NR KEY
012616	005067	170560		CLR	NRcnt	
012622	012767	012632	007770	NXTST: MOV	#TEST31+2,RETURN	

: SHOW THAT DATI TO A RW PAGE (ACF=6) WITHOUT MEMORY  
: MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS  
: SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT  
: THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT

012630	104400			TEST31: SCOPE		
012632	012737	000031	177570	MOV	#31, @SR	: LOAD TEST NUMBER INTO THE DISPLAY
012640	005037	177776		CLR	@PS	: INITIALIZE PROCESSOR STATUS
012644	012706	001000		MOV	#KSTACK, SP	: INITIALIZE KERNEL STACK POINTER
012650	005077	170150		CLR	@SRO	: INITIALIZE SRO
012654	012746	000006		MOV	#6, -(SP)	: PUSH RW KEY ON STACK
012660	004767	007424		JSR	%7, SETUP	: MAKE KERNEL PAGE 1 RW, BANK 0
						: MAKE KERNEL PAGE 7 RW, EXTERNAL
						: MAKE ALL OTHER PAGES RW, BANK 0
						: RESTORE STACK POINTER
012664	005726			TST	(SP)+	: SETUP ABORT RETURN IN CASE
012666	012777	013026	170140	MOV	#RET31, @KTVEC	
012674	005077	170136		CLR	@KTSTA	
012700	012767	125252	170504	MOV	#125252, DESTAD	: INITIALIZE LOCATION TO BE READ
012706	012701	023412		MOV	#DESTAD+20000, R1	: R1 CONTAINS VIRTUAL ADDRESS OF
						: LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
012712	005277	170106		INC	@SRO	: TURN ON KT11-C
012716	022721	125252		CMP	#125252, (R1)+	: DATI TO RW PAGE-SHOULDN'T TRAP OR ABORT
012722	001404			BEQ	OK31	
012724	005377	170074		DEC	@SRO	: ON ERROR, TURN OFF KT11-C
012730	104006			HLT		: RELOCATION FAILED THRU KERNEL PAGE 1
012732	000441			BR	DONE31	
012734	017702	170064		MOV	@SRO, R2	: SAVE CONTENTS OF SRO
012740	105377	170060		DEC	@SRO	: TURN OFF KT11-C
012744	022702	000021		CMP	#21, R2	: CHECK SAVED CONTENTS OF SRO
012750	001401			BEQ	+.4	
012752	104006			HLT		: SRO INCORRECT-SHOULD HAVE
						: TRACKED REFERENCE TO DATA SPACE,
						: PAGE 0, WHICH GOT THE ADDRESS
						: OF SRO TO TURN OFF KT11-C
						: CHECK SRI
012754	022777	000027	170044	CMP	#27, @SR1	
012762	001401			BEQ	+.4	
012764	104006			HLT		: SR1 INCORRECT-SHOULD KEEP
						: TRACKING EVEN WITH KT11-C OFF
012766	022777	012766	170034	CMP	#., @SR2	: CHECK SR2
012774	001401			BEQ	+.4	
012776	104006			HLT		: SR2 INCORRECT-SHOULD TRACK EVEN
						: WHEN KT11-C IS OFF
013000	022777	077406	170234	CMP	#77406, @KIPDR1	: CHECK INSTRUCTION SPACE PDR FOR
013006	001401			BEQ	+.4	: THE RW PAGE REFERENCED
013010	104006			HLT		: KIPDR1 INCORRECT-SHOULD NOT
						: HAVE BEEN CHANGED
013012	022777	077406	170242	CMP	#77406, @KDPDR1	: CHECK DATA SPACE PDR CORRESPONDING
013020	001401			BEQ	+.4	: TO THE RW REFERENCE
013022	104006			HLT		: KDPDR1 INCORRECT - SHOULD NOT
						: HAVE BEEN CHANGED
013024	000404			BR	DONE31	
013026	042777	000001	167770	RET31: BIC	#1, @SRO	: TURN OFF KT11-C
013034	104006			HLT		: DATI TO RW PAGE CAUSED
						: A TRAP OR ABORT
013036	016777	167774	167770	DONE31: MOV	KTSTA, @KTVEC	: RESTORE TRAP RETURN TO CAUSE HALT
013044	005077	167766		CLR	@KTSTA	: G. AN UNEXPECTED TRAP

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013050 005077 167750 CLR QSR0 ;INITIALIZE SRO
013054 005037 177776 CLR Q#PS ;INITIALIZE PROCESSOR STATUS

;SHOW THAT A DATI TO A RW PAGE (ACF=6) WITH MEMORY
;MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT
;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
TEST32: SCOPE
013060 104400
013062 012737 000032 177570 MOV #32,Q#SR ;LOAD TEST NUMBER INTO THE DISPLAY
013070 005037 177776 CLR Q#PS ;INITIALIZE PROCESSOR STATUS
013074 012706 001000 MOV #KSTACK,SP ;INITIALIZE KERNEL STACK POINTER
013100 005077 167720 CLR QSR0 ;INITIALIZE SRO
013104 012746 000006 MOV #6,-(SP) ;PUSH RW KEY ON STACK
013110 004767 007174 JSR %7,SETUP ;MAKE KERNEL PAGE 1 RW, BANK 0
;MAKE KERNEL PAGE 7 RW, EXTERNAL
;MAKE ALL OTHER PAGES RW, BANK 0
013114 005726
013116 012777 013260 167710 TST (SP)+
013124 005077 167706 MOV #RET32,QKTVEC ;RESTORE STACK POINTER
013130 012767 125252 170254 CLR QKTSTA ;SETUP ABORT RETURN IN CASE
013136 012701 023412 MOV #125252,DESTAD ;INITIALIZE LOCATION TO BE READ
MOV #DESTAD+20000,R1 ;R1 CONTAINS VIRTUAL ADDRESS OF
;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
013142 052777 001001 167654 BIS #1001,QSR0 ;TURN ON KT11-C, SET MMGT TRAP ENABLE
013150 022721 125252 CMP #125252,(R1)+ ;DATI TO RW PAGE-SHOULDN'T TRAP OR ABORT
013154 001404 BEQ OK32
013156 005377 167642 DEC QSR0 ;ON ERROR, TURN OFF KT11-C
013162 104006 HLT ;RELOCATION FAILED THRU KERNEL PAGE 1
013164 000441 BR
013166 017702 167632 OK32: MOV QSR0,R2 ;SAVE CONTENTS OF SRG
013172 105377 167626 DECB QSR0 ;TURN OFF KT11-C
013176 022702 001021 CMP #1021,R2 ;CHECK SAVED CONTENTS OF SRO
013202 001401 BEQ .+4
013204 104006 HLT ;SRO INCORRECT-SHOULD HAVE
;TRACKED REFERENCE TO KERNEL DATA SPACE,
;PAGE 0, WHICH GOT THE ADDRESS
;OF SRO AND MMGT TRAP ENABLE SHOULD BE SET
;CHECK SR1
013206 022777 000027 167612 CMP #27,QSR1
013214 001401 BEQ .+4
013216 104006 HLT ;SR1 INCORRECT-SHOULD KEEP
;TRACKING EVEN WITH KT11-C
;CHECK SR2
013220 022777 013220 167602 CMP #.,QSR2
013226 001401 BEQ .+4
013230 104006 HLT ;SR2 INCORRECT-SHOULD TRACK EVEN
;WHEN KT11-C IS OFF
;CHECK INSTRUCTION SPACE PDR FOR
;THE RW PAGE REFERENCED
;KIPDR1 INCORRECT-SHOULD NOT
;HAVE BEEN CHANGED
013232 022777 077406 170002 CMP #77406,QKIPDR1
013240 001401 BEQ .+4
013242 104006 HLT ;CHECK DATA SPACE PDR CORRESPONDING
;TO THE RW REFERENCE
;KOPDR1 INCORRECT - SHOULD NOT
;HAVE BEEN CHANGED
013244 022777 077406 170010 CMP #77406,QKOPDR1
013252 001401 BEQ .+4
013254 104006 HLT
013256 000404 BR DONE32
013260 042777 000001 167536 RET32: BIC #1,QSR0 ;TURN OFF KT11-C
013266 104006 HLT ;DATI TO RW PAGE CAUSED
;A TRAP OR ABORT

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013270 016777 167542 167536 DONE32: MOV      KTSTA, @KTVEC      ;RESTORE TRAP RETURN TO CAUSE HALT
013276 005077 167534                CLR      @KTSTA        ;ON AN UNEXPECTED TRAP
013302 005077 167516                CLR      @SRO         ;INITIALIZE SRO
013306 005037 177776                CLR      @#PS        ;INITIALIZE PROCESSOR STATUS

;SHOW THAT A DATC (NO DATIP) TO A RW PAGE (ACF=6) WITHOUT MEMORY
;MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT
;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
013312 104400                TEST33: SCOPE
013314 012737 000033 177570        MOV      #33, @#SR     ;LOAD TEST NUMBER INTO THE DISPLAY
013322 005037 177776                CLR      @#PS        ;INITIALIZE PROCESSOR STATUS
013326 012706 001000                MOV      #KSTACK, SP  ;INITIALIZE KERNEL STACK POINTER
013332 005077 167466                CLR      @SRO         ;INITIALIZE SRO
013336 012746 000006                MOV      #6, -(SP)    ;PUSH RW KEY ON THE STACK
013342 004767 006742                JSR      %7, SETUP    ;MAKE KERNEL PAGE 1 RW, BANK 0
                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                ;MAKE ALL OTHER PAGES RW, BANK 0
013346 005726                TST      (SP)+        ;RESTORE STACK POINTER
013350 012777 013506 167456        MOV      #RET33, @KTVEC ;SETUP ABORT RETURN IN CASE
013356 005077 167454                CLR      @KTSTA
013362 005067 170024                CLR      DESTAD
013366 012701 023412                MOV      #DESTAD+20000, R1 ;INITIALIZE LOCATION TO BE REFERENCED
                                ;R1 CONTAINS VIRTUAL ADDRESS OF
                                ;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
013372 005277 167426                INC      @SRO         ;TURN ON KT11-C
013376 012721 125252                MOV      #125252, (R1)+ ;DATO TO RW PAGE-SHOULDN'T TRAP OR ABORT
013402 017702 167416                MOV      @SRO, R2    ;SAVE CONTENTS OF SRO
013406 105377 167412                DECB    @SRO         ;TURN OFF KT11-C
013412 022702 000021                CMP      #21, R2     ;CHECK SAVED CONTENTS OF SRO
013416 001401                BEQ     .+4
013420 104006                HLT

;SRO INCORRECT-SHOULD HAVE
;TRACKED REFERENCE TO DATA SPACE,
;PAGE 0, WHICH GOT THE ADDRESS
;OF SRO TO TURN OFF KT11-C
;CHECK SRI
013422 022777 000027 167376        CMP      #27, @SRI
013430 001401                BEQ     .+4
013432 104006                HLT

;SRI INCORRECT-SHOULD KEEP
;TRACKING EVEN WITH KT11-C OFF
;CHECK SR2
013434 022777 013434 167366        CMP      #., @SR2
013442 001401                BEQ     .+4
013444 104006                HLT

;SR2 INCORRECT-SHOULD TRACK EVEN
;WHEN KT11-C IS OFF
;CHECK INSTRUCTION SPACE PDR FOR
;THE RW PAGE REFERENCED
;KIPDR1 INCORRECT-SHOULD NOT
;HAVE BEEN CHANGED
013446 022777 077406 167566        CMP      #77406, @KIPDR1
013454 001401                BEQ     .+4
013456 104006                HLT

;CHECK DATA SPACE PDR CORRESPONDING
;TO THE RW REFERENCE
;KOPDR1 INCORRECT - "W" BIT SHOULD
;BE SET SINCE PAGE WAS WRITTEN INTO
;MAKE SURE THAT THE WRITE ACTUALLY OCCURRED
013460 022777 077506 167574        CMP      #77506, @KOPDR1
013466 001401                BEQ     .+4
013470 104006                HLT

;DATO TO RW PAGE FAILED TO WRITE CORRECT LOCATION
013472 022767 125252 167712        CMP      #125252, DESTAD
013500 001401                BEQ     .+4
013502 104006                HLT
013504 000404                BR      DONE33
013506 042777 000001 167310 RET33: BIC      #1, @SRO    ;TURN OFF KT11-C
013514 104006                HLT                ;DATO TO RW PAGE CAUSED

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013516 016777 167314 167310 DONE33: MOV      KTSTA,KTVEEC ;A TRAP OR ABORT
013524 005077 167306          CLR      *KTSTA  ;RESTORE TRAP RETURN TO CAUSE HALT
013530 005077 167270          CLR      *SRO    ;ON AN UNEXPECTED TRAP
013534 005037 177776          CLR      *PS     ;INITIALIZE SRO
                                ;INITIALIZE PROCESSOR STATUS

;SHOW THAT A DATO (NO DATIP) TO A RW PAGE (ACF=6) WITH MEMORY
;MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
;SHOW THAT THE K11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT
;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
TEST34: SCOPE
013540 104400          MOV      #34,*SR   ;LOAD TEST NUMBER INTO THE DISPLAY
013542 012737 000034 177570  CLR      *PS     ;INITIALIZE PROCESSOR STATUS
013550 005037 177776          MOV      *KSTACK,SP ;INITIALIZE KERNEL STACK POINTER
013554 012706 001000          CLR      *SRO    ;INITIALIZE SRO
013560 005077 167240          MOV      #6,-(SP)  ;PUSH RW KEY ON STACK
013564 012746 000006          JSR      %7,SETUP ;MAKE KERNEL PAGE 1 RW, BANK 0
013570 004767 006514          ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                ;MAKE ALL OTHER PAGES RW, BANK 0
                                ;RESTORE STACK POINTER
                                ;SETUP ABORT RETURN IN CASE
013574 005726          TST      (SP)+
013576 012777 013736 167230  MOV      *RET34,*KTVEEC
013604 005077 167226          CLR      *KTSTA
013610 005067 167576          CLR      DESTAD
013614 012701 023412          MOV      *DESTAD+20000,R1 ;INITIALIZE LOCATION TO BE WRITTEN INTO
                                ;R1 CONTAINS VIRTUAL ADDRESS OF
                                ;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
013620 012777 001001 167176  MOV      #1001,*SRO ;TURN ON K11-C, MGMT TRAP ENABLE SET
013626 012721 125252          MOV      #125252,(R1)+ ;DATO TO RW PAGE-SHOULD NOT TRAP OR ABORT
013632 017702 167166          MOV      *SRO,R2   ;SAVE CONTENTS OF SRO
013636 105377 167162          DECB   *SRO        ;TURN OFF K11-C
013642 022702 001021          CMP      #1021,R2  ;CHECK SAVED CONTENTS OF SRO
013646 001401          BEQ
013650 104006          HLT
                                ;SRO INCORRECT-SHOULD HAVE
                                ;TRACKED REFERENCE TO DATA SPACE,
                                ;PAGE 0, WHICH GOT THE ADDRESS
                                ;OF SRO, AND MGMT TRAP ENABLE SHOULD BE SET
                                ;CHECK SR1
013652 022777 000027 167146  CMP      #27,*SR1
013660 001401          BEQ
013662 104006          HLT
                                ;SR1 INCORRECT-SHOULD KEEP
                                ;TRACKING EVEN WITH K11-C OFF
                                ;CHECK SR2
013664 022777 013664 167136  CMP      #,*SR2
013672 001401          BEQ
013674 104006          HLT
                                ;SR2 INCORRECT-SHOULD TRACK EVEN
                                ;WHEN K11-C IS OFF
                                ;CHECK INSTRUCTION SPACE PDR FOR
                                ;THE RW PAGE REFERENCED
                                ;KIPDR1 INCORRECT-SHOULD NOT
                                ;HAVE BEEN CHANGED
013676 022777 077406 167336  CMP      #77406,*KIPDR1
013704 001401          BEQ
013706 104006          HLT
                                ;CHECK DATA SPACE PDR CORRESPONDING
                                ;TO THE RW REFERENCE
                                ;KOPDR1 INCORRECT - "W" BIT SHOULD
                                ;HAVE SET
013710 022777 077506 167344  CMP      #77506,*KOPDR1
013716 001401          BEQ
013720 104006          HLT
                                ;MAKE SURE THAT THE WRITE ACTUALLY OCCURRED
013722 022767 125252 167462  CMP      #125252,DESTAD
013730 001401          BEQ
013732 104006          HLT
013734 000404          BR      DONE34 ;DATO TO RW PAGE FAILED TO WRITE CORRECT LOCATION

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013736 042777 000001 167060 RET34: B1C      #1,JSRO      ;TURN OFF KT11-C
013744 104006                HLT                ;DATO TO RW PAGE CAUSED
                                ;A TRAP OR ABORT
013746 016777 167064 167060 DONE34: MOV      KTSTA,KTVEC ;RESTORE TRAP RETURN TO CAUSE HALT
013754 005077 167056                CLR      KTSTA  ;ON AN UNEXPECTED TRAP
013760 005077 167040                CLR      JSRO   ;INITIALIZE SRO
013764 005037 177776                CLR      JPS    ;INITIALIZE PROCESSOR STATUS

;SHOW THAT A DATIP, DATO SEQUENCE TO A RW PAGE (ACF=6) WITHOUT MEMORY
;MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT
;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
013770 104400                ;TEST35: SCOPE
013772 012737 000035 177570      MOV      #35,JSR ;LOAD TEST NUMBER INTO THE DISPLAY
014000 005037 177776                CLR      JPS    ;INITIALIZE PROCESSOR STATUS
014004 012706 001000                MOV      #KSTACK,SP ;INITIALIZE KERNEL STACK POINTER
014010 005077 167010                CLR      JSRO   ;INITIALIZE SRO
014014 012746 000006                MOV      #6,-(SP) ;PUSH RW KEY ON THE STACK
014020 004767 006264                JSR      %7,SETUP ;MAKE KERNEL PAGE 1 RW, BANK 0
                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                ;MAKE ALL OTHER PAGES RW, BANK 0
014024 005726                TST      (SP)+    ;RESTORE STACK POINTER
014026 012777 014162 167000      MOV      #RET35,KTVEC ;SETUP ABORT RETURN IN CASE
014034 005077 166776                CLR      KTSTA
014040 005067 167346                CLR      DESTAD ;INITIALIZE LOCATION TO BE REFERENCED
014044 012704 023414                MOV      #DESTAD+20002,R4 ;R4 CONTAINS VIRTUAL ADDRESS+2 OF
                                ;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
014050 005277 166750                INC      JSRO   ;TURN ON KT11-C
014054 005244                INC      -(R4)  ;DATIP, DATO TO RW PAGE-SHOULDN'T TRAP OR ABORT
014056 017702 166742                MOV      JSRO,R2 ;SAVE CONTENTS OF SRO
014062 105077 166736                CLR      JSRO   ;TURN OFF KT11-C
014066 022702 000021                CMP      #21,R2 ;CHECK SAVED CONTENTS OF SRO
014072 001401                BEQ     .+4
014074 104006                HLT
                                ;SRO INCORRECT-SHOULD HAVE
                                ;TRACKED REFERENCE TO DATA SPACE,
                                ;PAGE 0, WHICH GOT THE ADDRESS
                                ;OF SRO TO TURN OFF KT11-C
014076 022777 000027 166722      CMP      #27,JSR1 ;CHECK SR1
014104 001401                BEQ     .+4
014106 104006                HLT
                                ;SR1 INCORRECT-SHOULD KEEP
                                ;TRACKING EVEN WITH KT11-C OFF
014110 022777 014110 166712      CMP      #,JSR2 ;CHECK SR2
014116 001401                BEQ     .+4
014120 104006                HLT
                                ;SR2 INCORRECT-SHOULD TRACK EVEN
                                ;WHEN KT11-C IS OFF
014122 022777 077406 167112      CMP      #77406,JKIPDR1 ;CHECK INSTRUCTION SPACE PDR FOR
014130 001401                BEQ     .+4      ;THE RW PAGE REFERENCED
014132 104006                HLT      ;KIPDR1 INCORRECT-SHOULD NOT
                                ;HAVE BEEN CHANGED
014134 022777 077506 167120      CMP      #77506,JKDPDR1 ;CHECK DATA SPACE PDR CORRESPONDING
014142 001401                BEQ     .+4      ;TO THE RW REFERENCE
014144 104006                HLT      ;KDPDR1 INCORRECT - "W" BIT SHOULD
                                ;HAVE BEEN SET
014146 022767 000001 167236      CMP      #1,DESTAD ;MAKE CERTAIN THAT THE INSTRUCTION WAS EXECUTED
014154 001401                BEQ     .+4

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014156 104006 HLT ;DATIP, DATO TO RW PAGE DIDN'T EXECUTE CORPECTLY
014160 000404 BR DONE35
014162 042777 000001 166634 RET35: BIC #1, SRO ;TURN OFF KT11-C
014170 104006 HLT ;DATIP, DATO TO RW PAGE CALSED
;A TRAP OR ABORT
014172 016777 166640 166634 DONE35: MOV KTSTA, KSTVEC ;RESTORE TRAP RETURN TO CALSE HALT
014200 005077 166632 CLR KSTSTA ;ON AN UNEXPECTED TRAP
014204 005077 166614 CLR SRO ;INITIALIZE SRO
014210 005037 177776 CLR SPS ;INITIALIZE PROCESSOR STATUS

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;SHOW THAT DATIP, DATO SEQUENCE TO A RW PAGE (ACF=6) WITH MEMORY
;MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT
;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT

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014214 104400 TEST36: SCOPE
014216 012737 000036 177570 MOV #36, SRO ;LOAD TEST NUMBER INTO THE DISPLAY
014224 005037 177776 CLR SPS ;INITIALIZE PROCESSOR STATUS
014230 012706 001000 MOV #KSTACK, SP ;INITIALIZE KERNEL STACK POINTER
014234 005077 166564 CLR SRO ;INITIALIZE SRO
014240 012746 000006 MOV #6, -(SP) ;PUSH RW KEY ON THE STACK
014244 004767 006040 JSR %7, SETUP ;MAKE KERNEL PAGE 1 RW, BANK 0
;MAKE KERNEL PAGE 7 RW, EXTERNAL
;MAKE ALL OTHER PAGES RW, BANK 0
;RESTORE STACK POINTER
;SETUP ABORT RETURN IN CASE

014250 005726 TST (SP)+
014252 012777 014412 166554 MOV #RET36, KSTVEC
014260 005077 166552 CLR KSTSTA
014264 005067 167122 CLR DESTAD ;INITIALIZE LOCATION TO BE REFERENCED
014270 012705 023414 MOV #DESTAD+20002, R5 ;R5 CONTAINS VIRTUAL ADDRESS+2 OF
;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1

014274 012777 001001 166522 MOV #1001, SRO ;TURN ON KT11-C, MNGT TRAP ENABLE SET
014302 005245 INC -(R5) ;DATIP, DATO TO RW PAGE-SHOULDN'T TRAP OR ABORT
014304 017702 166514 MOV SRO, R2 ;SAVE CONTENTS OF SRO
014310 042777 000001 166506 BIC #1, SRO ;TURN OFF KT11-C
014316 022702 001021 CMP #1021, R2 ;CHECK SAVED CONTENTS OF SRO
014322 001401 BEQ .+4
014324 104006 HLT ;SRO INCORRECT-SHOULD HAVE
;TRACKED REFERENCE TO DATA SPACE,
;PAGE 0, WHICH GOT THE ADDRESS
;OF SRO, AND MNGT TRAP ENABLE SHOULD BE SET

014326 022777 000027 166472 CMP #27, SRO1 ;CHECK SR1
014334 001401 BEQ .+4
014336 104006 HLT ;SR1 INCORRECT-SHOULD KEEP
;TRACKING EVEN WITH KT11-C OFF

014340 022777 014340 166462 CMP #, SRO2 ;CHECK SR2
014346 001401 BEQ .+4
014350 104006 HLT ;SR2 INCORRECT-SHOULD TRACK EVEN
;WHEN KT11-C IS OFF

014352 022777 077406 166662 CMP #77406, KIPDR1 ;CHECK INSTRUCTION SPACE PDR FOR
014360 001401 BEQ .+4 ;THE RW PAGE REFERENCED
014362 104006 HLT ;KIPDR1 INCORRECT-SHOULD NOT
;HAVE BEEN CHANGED

014364 022777 077506 166670 CMP #77506, KDOPDR1 ;CHECK DATA SPACE PDR CORRESPONDING
014372 001401 BEQ .+4 ;TO THE RW REFERENCE
014374 104006 HLT ;KDOPDR1 INCORRECT - "W" BIT SHOULD
;HAVE BEEN SET

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## E04

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014376 022767 000001 167006      CMP      #1,DESTAD      ;MAKE CERTAIN THAT THE INSTRUCTION WAS EXECUTED
014404 001401                      BEQ      .+4
014406 104006                      HLT
014410 000404                      BR       DONE36
014412 042777 000001 166404 RET36: BIC      #1,@SRO      ;TURN OFF KT11-C
014420 104006                      HLT      ;DATIP, DATO TO RW PAGE DIDN'T EXECUTE CORRECTLY
                                ;DATIP, DATO TO RW PAGE CAUSED
                                ;A TRAP OR ABORT
014422 016777 166410 166404 DONE36: MOV     KTSTA,@KTVEC ;RESTORE TRAP RETURN TO CAUSE HALT
014430 005077 166402                      CLR     @KTSTA      ;ON AN UNEXPECTED TRAP
014434 005077 166364                      CLR     @SRO        ;INITIALIZE SRO
014440 005037 177776                      CLR     @PS        ;INITIALIZE PROCESSOR STATUS

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;SHOW THAT A DATIP, DATOB SEQUENCE TO A RW PAGE (ACF=6) WITHOUT MEMORY  
;MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS  
;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT  
;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT

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014444 104400
014446 012737 000037 177570      MOV     #37,@#SR    ;LOAD TEST NUMBER INTO THE DISPLAY
014454 005037 177776                      CLR     @PS        ;INITIALIZE PROCESSOR STATUS
014460 012706 001000                      MOV     #KSTACK,SP ;INITIALIZE KERNEL STACK POINTER
014464 005077 166334                      CLR     @SRO        ;INITIALIZE SRO
014470 012746 000006                      MOV     #6,-(SP)    ;PUSH RW KEY ON THE STACK
014474 004767 005610                      JSR     %7,SETUP    ;MAKE KERNEL PAGE 1 RW, BANK 0
                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                ;MAKE ALL OTHER PAGES RW, BANK 0
                                ;RESTORE STACK POINTER
014500 005726
014502 012777 014636 166324      MOV     #RET37,@KTVEC ;SETUP ABORT RETURN IN CASE
014510 005077 166322                      CLR     @KTSTA
014514 005067 166672                      CLR     DESTAD
014520 012703 023413                      MOV     #DESTAD+20001,R3 ;INITIALIZE LOCATION TO BE REFERENCED
                                ;R3 CONTAINS VIRTUAL ADDRESS+1 OF
                                ;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
014524 005277 166274                      INC     @SRO        ;TURN ON KT11-C
014530 105343                      DECB   -(R3)        ;DATIP, DATOB TO RW PAGE-SHOULDN'T TRAP OR ABORT
014532 017702 166266                      MOV     @SRO,R2    ;SAVE CONTENTS OF SRO
014536 105377 166262                      DECB   @SRO        ;TURN OFF KT11-C
014542 022702 000021                      CMP     #21,R2     ;CHECK SAVED CONTENTS OF SRO
014546 001401                      BEQ     .+4
014550 104006                      HLT
                                ;SRO INCORRECT-SHOULD HAVE
                                ;TRACKED REFERENCE TO DATA SPACE,
                                ;PAGE 0, WHICH GOT THE ADDRESS
                                ;OF SRO TO TURN OFF KT11-C
                                ;CHECK SR1
014552 022777 000027 166246      CMP     #27,@SR1
014560 001401                      BEQ     .+4
014562 104006                      HLT
                                ;SR1 INCORRECT-SHOULD KEEP
                                ;TRACKING EVEN WITH KT11-C OFF
                                ;CHECK SR2
014564 022777 014564 166236      CMP     #,@SR2
014572 001401                      BEQ     .+4
014574 104006                      HLT
                                ;SR2 INCORRECT-SHOULD TRACK EVEN
                                ;WHEN KT11-C IS OFF
014576 022777 077406 166436      CMP     #77406,@KIPDR1 ;CHECK INSTRUCTION SPACE PDR FOR
014604 001401                      BEQ     .+4        ;THE RW PAGE REFERENCED
014606 104006                      HLT        ;KIPDR1 INCORRECT-SHOULD NOT
                                ;HAVE BEEN CHANGED
014610 022777 077506 166444      CMP     #77506,@KDPDR1 ;CHECK DATA SPACE PDR CORRESPONDING
014616 001401                      BEQ     .+4        ;TO THE RW REFERENCE

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014620 104006          HLT          ;KDPDR1 INCORRECT - "W" BIT SHOULD
;HAVE BEEN SET
014622 022767 000377 166562    CMP      #377,DESTAD ;MAKE CERTAIN THAT THE INSTRUCTION WAS EXECUTED
014630 001401          BEQ      .+4
014632 104006          HLT          ;DATIP, DATOB TO RW PAGE DIDN'T EXECUTE CORRECTLY
014634 000404          BR       DONE37
014636 042777 000001 166160  RET37:  BIC      #1,DSRO ;TURN OFF KT11-C
014644 104006          HLT          ;DATIP, DATOB TO RW PAGE CAUSED
;A TRAP OR ABORT
014646 016777 166164 166160  DONE37:  MOV      KTSTA,DKTVEC ;RESTORE TRAP RETURN TO CAUSE HALT
014654 005077 166156          CLR      DKTSTA ;ON AN UNEXPECTED TRAP
014660 005077 166140          CLR      DSRO ;INITIALIZE SRO
014664 005037 177776          CLR      D#PS ;INITIALIZE PROCESSOR STATUS

;SHOW THAT A DATIP, DATOB SEQUENCE TO A RW PAGE (ACF=6) WITH MEMORY
;MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT
;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
014670 104400          TEST40: SCOPE
014672 012737 000040 177570    MOV      #40,D#SR ;LOAD TEST NUMBER INTO THE DISPLAY
014700 005037 177776          CLR      D#PS ;INITIALIZE PROCESSOR STATUS
014704 012706 001000          MOV      #KSTACK,SP ;INITIALIZE KERNEL STACK POINTER
014710 005077 166110          CLR      DSRO ;INITIALIZE SRO
014714 012746 000006          MOV      #6,-(SP) ;PUSH RW KEY ON THE STACK
014720 004767 005364          JSR      %7,SETUP ;MAKE KERNEL PAGE 1 RW, BANK 0
;MAKE KERNEL PAGE 7 RW, EXTERNAL
;MAKE ALL OTHER PAGES RW, BANK 0
;RESTORE STACK POINTER
;SETUP ABORT RETURN IN CASE
014724 005726          TST      (SP)+
014726 012777 015064 166100    MOV      #RET40,DKTVEC
014734 005077 166076          CLR      DKTSTA
014740 005067 166446          CLR      DESTAD ;INITIALIZE LOCATION TO BE REFERENCED
014744 012700 023413          MOV      #DESTAD+20001,R0 ;R0 CONTAINS VIRTUAL ADDRESS OF
;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
014750 012777 001001 166046    MOV      #1001,DSRO ;TURN ON KT11-C, SET MMGT TRAP ENABLE
014756 105310          DECB   DSRO ;DATIP, DATOB TO RW PAGE-SHOULDN'T TRAP OR ABORT
014760 017702 166040          MOV      DSRO,R2 ;SAVE CONTENTS OF SRO
014764 105377 166034          DECB   DSRO ;TURN OFF KT11-C
014770 022702 001021          CMP      #1021,R2 ;CHECK SAVED CONTENTS OF SRO
014774 001401          BEQ      .+4
014776 104006          HLT          ;SRO INCORRECT-SHOULD HAVE
;TRACKED REFERENCE TO DATA SPACE,
;PAGE 0, WHICH GOT THE ADDRESS
;OF SRO, AND MMGT TRAP ENABLE SHOULD BE SET
;CHECK SR1
015000 022777 000027 166020    CMP      #27,DSR1
015006 001401          BEQ      .+4
015010 104006          HLT          ;SR1 INCORRECT-SHOULD KEEP
;TRACKING EVEN WITH KT11-C OFF
;CHECK SR2
015012 022777 015012 166010    CMP      #.,DSR2
015020 001401          BEQ      .+4
015022 104006          HLT          ;SR2 INCORRECT-SHOULD TRACK EVEN
;WHEN KT11-C IS OFF
015024 022777 077406 166210    CMP      #77406,DKIPDR1 ;CHECK INSTRUCTION SPACE PDR FOR
015032 001401          BEQ      .+4 ;THE RW PAGE REFERENCED
015034 104006          HLT          ;KIPDR1 INCORRECT-SHOULD NOT
;HAVE BEEN CHANGED

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015036 022777 077506 166216      CMP      #77506, @KDPDR1 ;CHECK DATA SPACE PDR CORRESPONDING
015044 001401                      BEQ      .+4          ;TO THE RW REFERENCE
015046 104006                      HLT                               ;KDPDR1 INCORRECT - "W" BIT SHOULD
                                        ;HAVE BEEN SET
015050 022767 177400 166334      CMP      #177400, DESTAD ;MAKE CERTAIN THAT THE INSTRUCTION WAS EXECUTED
015056 001401                      BEQ      .+4          ;
015060 104006                      HLT                               ;DATIP, DATOB TO RW PAGE FAILED TO EXECUTE CORRECTLY
015062 000404                      BR       DONE40
015064 042777 000001 165732  RET40: BIC      #1, @SRO ;TURN OFF KT11-C
015072 104006                      HLT                               ;DATIP, DATOB TO RW PAGE CAUSED
                                        ;A TRAP OR ABORT
015074 016777 165736 165732  DONE40: MOV    KTSTA, @KTVEC ;RESTORE TRAP RETURN TO CAUSE HALT
015102 005077 165730                      CLR      @KTSTA ;ON AN UNEXPECTED TRAP
015106 005077 165712                      CLR      @SRO ;INITIALIZE SRO
015112 005037 177776                      CLR      @#PS ;INITIALIZE PROCESSOR STATUS

;SHOW THAT DATI TO A RRWT PAGE (ACF=4) WITHOUT MEMORY
;MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT
;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
015116 104400
015120 012737 000041 177570      MOV      #41, @#SR ;LOAD TEST NUMBER INTO THE DISPLAY
015126 005037 177776                      CLR      @#PS ;INITIALIZE PROCESSOR STATUS
015132 012706 001000                      MOV      #KSTACK, SP ;INITIALIZE KERNEL STACK POINTER
015136 005077 165662                      CLR      @SRO ;INITIALIZE SRO
015142 012746 000004                      MOV      #4, -(SP) ;PUSH RRWT KEY ON STACK
015146 004767 005136                      JSR      %7, SETUP ;MAKE KERNEL PAGE 1 RRWT, BANK 0
                                        ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                        ;MAKE ALL OTHER PAGES RW, BANK 0
015152 005726                      TST      (SP)+ ;RESTORE STACK POINTER
015154 012777 015314 165652      MOV      #RET41, @KTVEC ;SETUP ABORT RETURN IN CASE
015162 005077 165650                      CLR      @KTSTA
015166 012767 125252 166216      MOV      #125252, DESTAD ;INITIALIZE LOCATION TO BE READ
015174 012701 023412                      MOV      #DESTAD+20000, R1 ;R1 CONTAINS VIRTUAL ADDRESS OF
                                        ;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
015200 005277 165620                      INC      @SRO ;TURN ON KT11-C
015204 022721 125252                      CMP      #125252, (R1)+ ;DATI TO RRWT PAGE-SHOULDN'T TRAP SINCE
                                        ;TRAP ENABLE ISN'T SET
015210 001404                      BEQ      OK41
015212 005377 165606                      DEC      @SRO ;ON ERROR, TURN OFF KT11-C
015216 104006                      HLT                               ;RELOCATION FAILED THRU KERNEL PAGE 1
015220 000441                      BR       DONE41
015222 017702 165576      OK41: MOV    @SRO, R2 ;SAVE CONTENTS OF SRO
015226 105377 165572                      DECB    @SRO ;TURN OFF KT11-C
015232 022702 010021                      CMP      #10021, R2 ;CHECK SAVED CONTENTS OF SRO
015236 001401                      BEQ      .+4
015240 104006                      HLT                               ;SRO INCORRECT-SHOULD HAVE
                                        ;TRACKED REFERENCE TO DATA SPACE,
                                        ;PAGE 0, WHICH GOT THE ADDRESS
                                        ;OF SRO, AND MNGT TRAP SHOULD BE SET
015242 022777 000027 165556      CMP      #27, @SR1 ;CHECK SR1
015250 001401                      BEQ      .+4
015252 104006                      HLT                               ;SR1 INCORRECT-SHOULD KEEP
                                        ;TRACKING EVEN WITH KT11-C OFF
015254 022777 015254 165546      CMP      #, @SR2 ;CHECK SR2
015262 001401                      BEQ      .+4

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015264 104006                HLT                ;SR2 INCORRECT-SHOULD TRACK EVEN
;WHEN KT11-C IS OFF
015266 022777 077404 165746  CMP      #77404, @KIPDR1 ;CHECK INSTRUCTION SPACE PDR FOR
015274 001401                BEQ      .+4         ;THE RRWT PAGE REFERENCED
015276 104006                HLT                ;KIPDR1 INCORRECT-SHOULD NOT
;HAVE BEEN CHANGED SINCE THE
;RRWT REFERENCE WAS TO DATA SPACE
015300 022777 077604 165754  CMP      #77604, @KDPDR1 ;CHECK DATA SPACE PDR CORRESPONDING
015306 001401                BEQ      .+4         ;TO THE RRWT REFERENCE
015310 104006                HLT                ;KDPDR1 INCORRECT-"A" BIT SHOULD
;BE SET SINCE DATA SPACE WAS READ
;AND WAS RRWT
015312 000404                BR        DONE41
015314 042777 000001 165502  RET41:  BIC      #1, @SR0 ;TURN OFF KT11-C
015322 104006                HLT                ;DATI TO RRWT PAGE CAUSED
;A TRAP OR ABORT ALTHOUGH MEMORY
;MANAGEMENT TRAP ENABLE WAS NOT SET
015324 016777 165506 165502  DONE41: MOV     KTSTA, @KTVEC ;RESTORE TRAP RETURN TO CAUSE HALT
015332 005077 165500                CLR     @KTSTA ;ON AN UNEXPECTED TRAP
015336 005077 165462                CLR     @SR0 ;INITIALIZE SR0
015342 005037 177776                CLR     @#PS ;INITIALIZE PROCESSOR STATUS

;SHOW THAT A DATI TO A RRWT PAGE (ACF=4) WITH MEMORY MANAGEMENT
;TRAP ENABLE SET CAUSES A TRAP AT THE END OF THE INSTRUCTION
;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT THE
;PDR'S FOR THE PAGE REFERENCED ARE CORRECT
015346 104400                TEST42: SCOPE
015350 012737 000042 177570  MOV     #42, @#SR ;LOAD TEST NUMBER INTO THE DISPLAY
015356 005037 177776                CLR     @#PS ;INITIALIZE PROCESSOR STATUS
015362 012706 001000                MOV     #KSTACK, SP ;INITIALIZE KERNEL STACK POINTER
015366 005077 165432                CLR     @SR0 ;INITIALIZE SR0
015372 012746 000004                MOV     #4, -(SP) ;PUSH RRWT KEY ON STACK
015376 004767 004706                JSR     %7, SETUP ;MAKE KERNEL PAGE 1 RRWT, BANK 0
;MAKE KERNEL PAGE 7 RW, EXTERNAL
;MAKE ALL OTHER PAGES RW, BANK 0
;RESTORE STACK POINTER
;SETUP TRAP RETURN
015402 005726                TST     (SP)+
015404 012777 015452 165422  MOV     #RET42, @KTVEC
015412 005077 165420                CLR     @KTSTA
015416 012767 125252 165766  MOV     #125252, DESTAD ;INITIALIZE LOCATION TO BE READ
015424 005003                CLR     R3 ;CLEAR REGISTER TO SAVE WHAT WAS READ
;ALLOWS CHECKING TO SEE THAT THE
;INSTRUCTION COMPLETED BEFORE
;TRAPPING
015426 012701 023412                MOV     #DESTAD+20000, R1 ;R1 CONTAINS VIRTUAL ADDRESS OF
;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
015432 012777 001001 165364  MOV     #1001, @SR0 ;TURN ON KT11-C, SET MMGT TRAP ENABLE
015440 012103                MOV     (R1)+, R3 ;DATI TO RRWT PAGE-SHOULD TRAP
015442 105077 165356                CLR     @SR0 ;IF NO TRAP, TURN OFF KT11-C
015446 104006                HLT                ;DATI TO RRWT PAGE WITH MEMORY
015450 000440                BR        DONE42 ;MANAGEMENT TRAP ENABLE SET DIDN'T
;CAUSE A TRAP
015452 017702 165346                RET42:  MOV     @SR0, R2 ;SAVE CONTENTS OF SR0
015456 005377 165342                DEC     @SR0 ;TURN OFF KT11-C
015462 022702 011021                CMP     #11021, R2 ;CHECK SAVED CONTENTS OF SR0
015466 001401                BEQ     .+4
015470 104006                HLT                ;SR0 INCORRECT-SHOULD HAVE TRACKED

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015472 022777 000027 165326      CMP      #27,@SR1      ;THE REFERENCE TO DATA SPACE, PAGE
015502 001401      BEQ      .+4          ;0, WHICH GOT THE ADDRESS OF SRO,
015502 104006      HLT                       ;AND MGMT TRAP SHOULD BE SET
                                ;CHECK SR1
015504 022777 015504 165316      CMP      #,@SR2      ;SR1 INCORRECT-SHOULD CONTINUE
015512 001401      BEQ      .+4          ;TRACKING WITH KT11-C OFF
015514 104006      HLT                       ;CHECK SR2
015516 022777 077404 165516      CMP      #77404,@KIPDR1 ;SR2 INCORRECT-SHOULD STILL BE
015524 001401      BEQ      .+4          ;TRACKING EVEN WITH KT11-C OFF
015526 104006      HLT                       ;CHECK INSTRUCTION SPACE PDR
015530 022777 077604 165524      CMP      #77604,@KDPDR1 ;KIPDR1 INCORRECT-SHOULD NOT
015536 001401      BEQ      .+4          ;HAVE BEEN CHANGED SINCE THE RRWT
015540 104006      HLT                       ;REFERENCE WAS TO DATA SPACE
                                ;CHECK DATA SPACE PDR
015542 022703 125252      CMP      #125252,R3   ;KDPDR1 INCORRECT-"A" BIT SHOULD
015546 001401      BEQ      .+4          ;BE SET SINCE DATA SPACE WAS RRWT
015550 104006      HLT                       ;AND WAS READ
                                ;CHECK LOCATION WRITTEN INTO
015552 016777 165260 165254  DONE42: MOV      KTSTA,@KTVEC ;THE INSTRUCTION REFERENCING THE RRWT
015560 005077 165252      CLR      @KTSTA      ;PAGE TRAPPED BEFORE COMPLETING
015564 005077 165234      CLR      @SRO        ;OR RELOCATION FAILED SINCE THE
015570 005037 177776      CLR      @#PS        ;MOVE DID NOT CORRECTLY LOAD R3
                                ;CHANGE KT11-C FAULT RETURN TO
                                ;CAUSE A HALT ON AN UNEXPECTED TRAP
                                ;SHOW THAT A DATO (NO DATIP) TO A RRWT PAGE (ACF=4) WITHOUT
                                ;MEMORY MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
                                ;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT THE PDR
                                ;CORRESPONDING TO THE REFERENCE IS CORRECT
015574 104400      TEST43: SCOPE
015576 012737 000043 177570      MOV      #43,@#SR    ;LOAD TEST NUMBER INTO THE DISPLAY
015604 005037 177776      CLR      @#PS        ;INITIALIZE PROCESSOR STATUS
015610 012706 001000      MOV      #KSTACK,SP ;INITIALIZE KERNEL STACK POINTER
015614 005077 165204      CLR      @SRO        ;INITIALIZE SRO
015620 012746 000004      MOV      #4,-(SP)   ;PUSH RRWT KEY ON STACK
015624 004767 004460      JSR      %7,SETUP   ;MAKE KERNEL PAGE 1 RRWT, BANK 0
                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                ;MAKE ALL OTHER PAGES RW, BANK 0
                                ;SETUP ABORT RETURN IN CASE
015630 012777 015770 165176      MOV      #RET43,@KTVEC ;INITIALIZE LOCATION TO BE ADDRESSED
015636 005077 165174      CLR      @KTSTA      ;BY DATO TO RRWT PAGE
015642 005067 165544      CLR      DESTAD      ;R1 CONTAINS VIRTUAL ADDRESS OF
                                ;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
015646 012701 023412      MOV      #DESTAD+20000,R1 ;TURN ON KT11-C
015652 112777 000001 165144      MOV      #1,@SRO    ;DATO TO RRWT PAGE-SHOULDN'T TRAP OR ABORT
015660 012721 125252      MOV      #125252,(R1)+ ;SAVE CONTENTS OF SRO
015664 017702 165134      MOV      @SRO,R2    ;TURN OFF KT11-C
015670 005377 165130      DEC      @SRO        ;CHECK SAVED CONTENTS OF SRO
015674 022702 010021      CMP      #10021,R2

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015700	001401			BEQ	.+4				
015702	104006			HLT					;SR0 INCORRECT-SHOULD HAVE TRACKED
									;THE REFERENCE TO DATA SPACE, PAGE 0,
									;WHICH GOT THE ADDRESS OF SR0, AND MMGT TRAP
									;SHOULD BE SET
015704	022777	000027	165114	CMP	#27,@SR1				;CHECK SR1
015712	001401			SEQ	.+4				;SR1 INCORRECT-SHOULD KEEP TRACKING
015714	104006			HLT					;EVEN WITH KT11-C OFF
									;CHECK SR2
015716	022777	015716	165104	CMP	#,@SR2				;SR2 INCORRECT-SHOULD KEEP TRACKING
015724	001401			BEQ	.+4				;CHECK INSTRUCTION SPACE PDR
015726	104006			HLT					
015730	022777	077404	165304	CMP	#77404,@KIPDR1				;KIPDR1 INCORRECT-SHOULD NOT HAVE
015736	001401			BEQ	.+4				;BEEN CHANGED SINCE THE RRWT REFERENCE
015740	104006			HLT					;WAS TO DATA SPACE
									;CHECK DATA SPACE PDR
015742	022777	077704	165312	CMP	#77704,@KDPDR1				;KDPDR1 INCORRECT- "A" BIT SHOULD BE SET SINCE PAGE
015750	001401			BEQ	.+4				;WAS ACCESSED, AND "W" BIT SHOULD
015752	104006			HLT					;BE SET SINCE IT WAS WRITTEN INTO
									;MAKE CERTAIN THAT DESTINATION
015754	026727	165432	125252	CMP	DESTAD,#125252				;LOCATION WAS WRITTEN INTO
015762	001401			BEQ	.+4				;DATO TO RRWT PAGE DIDN'T WRITE
015764	104006			HLT					;INTO THE DESTINATION LOCATION
015766	000404			BR	DONE43				;TURN OFF KT11-C
015770	042777	000001	165026	RET43:	BIC	#1,@SR0			;DATO TO RRWT PAGE TRAPPED WITHOUT MMGT TRAP ENABLED
015776	104006			HLT					;CHANGE KT11-C FAULT RETURN
016000	016777	165032	165026	DONE43:	MOV	KTSTA,@KTVEC			;TO CAUSE A HALT ON AN UNEXPECTED TRAP
016006	005077	165024		CLR	@KTSTA				
016012	005077	165006		CLR	@SR0				
016016	005037	177776		CLR	@PS				
									;SHOW THAT A DATO (NO DATIP) TO A RRWT PAGE (ACF=4) WITH
									;MEMORY MANAGEMENT TRAP ENABLE SET TRAPS AFTER THE INSTRUCTION IS COMPLETED
									;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT THE PDR
									;CORRESPONDING TO THE REFERENCE IS CORRECT
									TEST44: SCOPE
016022	104400								
016024	012737	000044	177570	MOV	#44,@SR				;LOAD TEST NUMBER INTO THE DISPLAY
016032	005037	177776		CLR	@PS				;INITIALIZE PROCESSOR STATUS
016036	012706	001000		MOV	#KSTACK,SP				;INITIALIZE KERNEL STACK POINTER
016042	005077	164756		CLR	@SR0				;INITIALIZE SR0
016046	012746	000004		MOV	#4,-(SP)				;PUSH RRWT KEY ON STACK
016052	004767	004232		JSR	%7,SETUP				;MAKE KERNEL PAGE 1 RRWT, BANK 0
									;MAKE KERNEL PAGE 7 RW, EXTERNAL
									;MAKE ALL OTHER PAGES RW, BANK 0
									;RESTORE STACK POINTER
									;SETUP TRAP RETURN
016056	005726			TST	(SP)+				
016060	012777	016124	164746	MOV	#RET44,@KTVEC				
016066	005077	164744		CLR	@KTSTA				
016072	005067	165314		CLR	DESTAD				;INITIALIZE LOCATION TO BE ADDRESSED
									;BY DATO TO RRWT PAGE
016076	012702	023412		MOV	#DESTAD+20000,R2				;R2 CONTAINS VIRTUAL ADDRESS OF
									;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
016102	012777	001001	164714	MOV	#1001,@SR0				;TURN ON KT11-C, SET MMGT TRAP ENABLE
016110	012722	125252		MOV	#125252,(R2)+				;DATO TO RRWT PAGE-SHOULD TRAP

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016114 105377 164704          DECB  @SRO          ;TURN OFF KT11-C
016120 104006                HLT                ;DATO TO RRWT PAGE FAILED TO TRAP
016122 000441                BR                ;WITH MEMORY MANAGEMENT TRAP ENABLE SET
016124 017701 164674          RET44: MOV  @SRO,R1  ;SAVE CONTENTS OF SRO
016130 005377 164670          DEC  @SRO          ;TURN OFF KT11-C
016134 022701 011021          CMP  #11021,R1    ;CHECK SAVED CONTENTS OF SRO
016140 001401                BEQ  .+4
016142 104006                HLT                ;SRO INCORRECT-SHOULD HAVE TRACKED THE
                                ;REFERENCE TO DATA SPACE, PAGE 0,
                                ;WHICH GOT THE ADDRESS OF SRO, AND MMGT TRAP
                                ;SHOULD BE SET
                                ;CHECK SRI

016144 022777 000027 164654          CMP  #27,@SRI
016152 001401                BEQ  .+4
016154 104006                HLT                ;SRI INCORRECT-SHOULD
                                ;KEEP TRACKING EVEN WITH KT11-C OFF
                                ;CHECK SR2

016156 022777 016156 164644          CMP  #.@SR2
016164 001401                BEQ  .+4
016166 104006                HLT                ;SR2 INCORRECT-SHOULD KEEP TRACKING
016170 022777 077404 165044          CMP  #77404,@KIPDR1 ;CHECK INSTRUCTION SPACE PDR
016176 001401                BEQ  .+4
016200 104006                HLT                ;KIPDR1 INCORRECT-SHOULD NOT
                                ;HAVE BEEN CHANGED SINCE THE RRWT
                                ;REFERENCE WAS TO DATA SPACE
                                ;CHECK DATA SPACE PDR

016202 022777 077704 165052          CMP  #77704,@KDPDR1
016210 001401                BEQ  .+4
016212 104006                HLT                ;KDPDR1 INCORRECT-"A" AND "W" BITS
                                ;SHOULD BE SET SINCE PAGE WAS
                                ;ACCESSED AND WRITTEN INTO
                                ;MAKE CERTAIN THAT DESTINATION
                                ;LOCATION WAS WRITTEN
                                ;DATO TO RRWT PAGE DIDN'T WRITE
                                ;INTO THE DESTINATION LOCATION
                                ;CHANGE KT11-C FAULT RETURN
                                ;TO CAUSE A HALT ON AN UNEXPECTED TRAP

016214 026727 165172 125252          CMP  DESTAD,#125252
016222 001401                BEQ  .+4
016224 104006                HLT

016226 016777 164604 164600  DONE44: MOV  KTSTA,@KTVEC
016234 005077 164576          CLR  @KTSTA
016240 005077 164560          CLR  @SRO
016244 005037 177776          CLR  @#PS

;SHOW THAT A DATIP,DATO SEQUENCE TO A RRWT PAGE (ACF=4) WITHOUT MEMORY
;MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT
;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
TEST45: SCOPE
016250 104400                MOV  #45,@#SR      ;LOAD TEST NUMBER INTO THE DISPLAY
016252 012737 000045 177570          CLR  @#PS          ;INITIALIZE PROCESSOR STATUS
016260 005037 177776          MOV  #KSTACK,SP   ;INITIALIZE KERNEL STACK POINTER
016264 012706 001000          CLR  @SRO          ;INITIALIZE SRO
016270 005077 164530          MOV  #4,-(SP)     ;PUSH RRWT KEY ON STACK
016274 012746 000004          JSR  %7,SETUP     ;MAKE KERNEL PAGE 1 RRWT, BANK 0
016300 004767 004004          ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                ;MAKE ALL OTHER PAGES RW, BANK C
                                ;RESTORE STACK POINTER
                                ;SETUP ABORT RETURN IN CASE

016304 005726                TST  (SP)+
016306 012777 016444 164520          MOV  #RET45,@KTVEC
016314 005077 164516          CLR  @KTSTA
016320 012767 125252 165064          MOV  #125252,DESTAD ;INITIALIZE LOCATION TO BE REFERENCED
016326 012701 023414          MOV  #DESTAD+20002,R1 ;R1 CONTAINS VIRTUAL ADDRESS +2 OF
                                ;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1

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016532	005726			TST	(SP)+		;RESTORE STACK POINTER
016534	012777	016604	164272	MOV	#RET46, @KTVEC		;SETUP TRAP RETURN
016542	005077	164270		CLR	@KTSTA		
016546	012767	125252	164636	MOV	#125252, DESTAD		;INITIALIZE LOCATION TO BE READ
016554	005003			CLR	R3		;CLEAR REGISTER TO SAVE WHAT WAS READ
							;ALLOWS CHECKING TO SEE THAT THE
							;INSTRUCTION COMPLETED BEFORE
							;TRAPPING
016556	012704	023412		MOV	#DESTAD+20000, R4		;R4 CONTAINS VIRTUAL ADDRESS OF
							;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
016562	012777	001001	164234	MOV	#1001, @SRO		;TURN ON KT11-C, SET MGMT TRAP ENABLE
016570	062724	052526		ADD	#52526, (R4)+		;DATIP, DATO TO RRWT PAGE-SHOULD TRAP
							;SINCE TRAP ENABLE IS SET
016574	105077	164224		CLRB	@SRO		;IF NO TRAP, TURN OFF KT11-C
016600	104006			HLT			;DATIP, DATO TO RRWT PAGE WITH MEMORY
016602	000444			BR	DONE46		;MANAGEMENT TRAP ENABLE SET DIDN'T
							;CAUSE A TRAP
016604	017702	164214		MOV	@SRO, R2		;SAVE CONTENTS OF SRO
016610	005377	164210		DEC	@SRO		;TURN OFF KT11-C
016614	022702	011021		CMP	#11021, R2		;CHECK SAVED CONTENTS OF SRO
016620	001401			BEQ	.+4		
016622	104006			HLT			;SRO INCORRECT-SHOULD HAVE TRACKED
							;THE REFERENCE TO DATA SPACE, PAGE
							;0, WHICH GOT THE ADDRESS OF SRO,
							;AND MGMT TRAP SHOULD BE SET
							;CHECK SR1
016624	022777	000027	164174	CMP	#27, @SR1		
016632	001401			BEQ	.+4		
016634	104006			HLT			;SR1 INCORRECT-SHOULD CONTINUE
							;TRACKING WITH KT11-C OFF
							;CHECK SR2
016636	022777	016636	164164	CMP	#., @SR2		
016644	001401			BEQ	.+4		
016646	104006			HLT			;SR2 INCORRECT-SHOULD STILL BE
							;TRACKING EVEN WITH KT11-C OFF
							;CHECK INSTRUCTION SPACE PDR
016650	022777	077404	164364	CMP	#77404, @KIPDR1		
016656	001401			BEQ	.+4		
016660	104006			HLT			;KIPDR1 INCORRECT-SHOULD NOT
							;HAVE BEEN CHANGED SINCE THE RRWT
							;REFERENCE WAS TO DATA SPACE
							;CHECK DATA SPACE PDR
016662	022777	077704	164372	CMP	#77704, @KDPDR1		
016670	001401			BEQ	.+4		
016672	104006			HLT			;KDPDR1 INCORRECT-"A" AND "W" BITS SHOULD
							;BE SET SINCE DATA SPACE WAS RRWT
							;AND WAS READ AND WRITTEN
							;CHECK LOCATION WRITTEN INTO
016674	005767	164512		TST	DESTAD		
016700	001401			BEQ	.+4		
016702	104006			HLT			;THE INSTRUCTION REFERENCING THE RRWT
							;PAGE TRAPPED BEFORE COMPLETING
							;CHECK TO SEE THAT R4 AUTOINCREMENTED
016704	022704	023414		CMP	#DESTAD+20002, R4		
016710	001401			BEQ	.+4		
016712	104006			HLT			;AUTOINCREMENT OF R4 ON TRAPPED INSTRUCTION DIDN'T OCCUR
016714	016777	164116	164112	MOV	KTSTA, @KTVEC		;CHANGE KT11-C FAULT RETURN TO
016722	005077	164110		CLR	@KTSTA		;CAUSE A HALT ON AN UNEXPECTED TRAP
016726	005077	164072		CLR	@SRO		
016732	005037	177776		CLR	@#PS		

;SHOW THAT DATIP, DATOB SEQUENCE TO A RRWT PAGE (ACF=4) WITHOUT MEMORY

:MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS  
:SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT  
:THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT

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016736 104400
016740 012737 000047 177570
016746 005037 177776
016752 012706 001000
016756 005077 164042
016762 012746 000004
016766 004767 003316

C16772 005726
016774 012777 017130 164032
017002 005077 164030
017006 005067 164400
017012 012701 023413

017016 005277 164002
017022 105221

017024 017702 163774
017030 105377 163770
017034 022702 010021
017040 001401
017042 104006

017044 022777 000027 163754
017052 001401
017054 104006

017056 022777 017056 163744
017064 001401
017066 104006

017070 022777 077404 164144
017076 001401
017100 104006

017102 022777 077704 164152
017110 001401
017112 104006

017114 022767 000400 164270
017122 001401
017124 104006

017126 000404
017130 042777 000001 163666 RET47:
017136 104006
    
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TEST47: SCOPE

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MOV #47, @#SP ;LOAD TEST NUMBER INTO THE DISPLAY
CLR @#PS ;INITIALIZE PROCESSOR STATUS
MOV #KSTACK, SP ;INITIALIZE KERNEL STACK POINTER
CLR @SRO ;INITIALIZE SRO
MOV #4, -(SP) ;PUSH RRWT KEY ON STACK
JSR %7, SETUP ;MAKE KERNEL PAGE 1 RRWT, BANK 0
;MAKE KERNEL PAGE 7 RW, EXTERNAL
;MAKE ALL OTHER PAGES RW, BANK 0
TST (SP)+ ;RESTORE STACK POINTER
MOV #RET47, @KTVEC ;SETUP ABORT RETURN IN CASE
CLR @KTSTA
CLR DESTAD ;INITIALIZE LOCATION TO BE REFERENCED
MOV #DESTAD+20001, R1 ;R1 CONTAINS VIRTUAL ADDRESS OF
;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
INC @SRO ;TURN ON KT11-C
INCB (R1)+ ;DATIP, DATOB TO RRWT PAGE-SHOULDN'T TRAP
;SINCE TRAP ENABLE ISN'T SET
MOV @SRO, R2 ;SAVE CONTENTS OF SRO
DECB @SRO ;TURN OFF KT11-C
CMP #10021, R2 ;CHECK SAVED CONTENTS OF SRO
BEQ .+4
HLT ;SRO INCORRECT-SHOULD HAVE
;TRACKED REFERENCE TO DATA SPACE,
;PAGE 0, WHICH GOT THE ADDRESS
;OF SRO, AND MGMT TRAP SHOULD BE SET
CMP #27, @SR1 ;CHECK SR1
BEQ .+4
HLT ;SR1 INCORRECT-SHOULD KEEP
;TRACKING EVEN WITH KT11-C OFF
CMP #, @SR2 ;CHECK SR2
BEQ .+4
HLT ;SR2 INCORRECT-SHOULD TRACK EVEN
;WHEN KT11-C IS OFF
CMP #77404, @KIPDR1 ;CHECK INSTRUCTION SPACE PDR FOR
;THE RRWT PAGE REFERENCED
BEQ .+4 ;KIPDR1 INCORRECT-SHOULD NOT
;HAVE BEEN CHANGED SINCE THE
;RRWT REFERENCE WAS TO DATA SPACE
HLT ;CHECK DATA SPACE PDR CORRESPONDING
;TO THE RRWT REFERENCE
CMP #77704, @KDPDR1 ;KDPDR1 INCORRECT-"A" AND "W" BITS SHOULD
;BE SET SINCE DATA SPACE WAS WRITTEN INTO
;AND WAS RRWT
BEQ .+4 ;CHECK TO SEE THAT INSTRUCTION WAS CORRECTLY EXECUTED
HLT ;DATIP, DATOB TO RRWT PAGE LEFT WRONG VALUE
;IN DESTINATION ADDRESS
BR DONE47
BIC #1, @SRO ;TURN OFF KT11-C
HLT ;DATIP, DATOB TO RRWT PAGE CAUSED
;A TRAP OR ABORT ALTHOUGH MEMORY
;MANAGEMENT TRAP ENABLE WAS NOT SET
    
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017570	022777	077405	163444		CMP	#77405, @KIPDR1	:CHECK INSTRUCTION SPACE PDR FOR
017576	001401				BEQ	.+4	:THE RRWTW PAGE REFERENCED
017600	104006				HLT		:KIPDR1 INCORRECT-SHOULD NOT
							:HAVE BEEN CHANGED
017602	022777	077405	163452		CMP	#77405, @KDPDR1	:CHECK DATA SPACE PDR CORRESPONDING
017610	001401				BEQ	.+4	:TO THE RRWTW REFERENCE
017612	104006				HLT		:KDPDR1 INCORRECT - SHOULD NOT
							:HAVE BEEN CHANGED
017614	000404				BR	DONES1	
017616	042777	000001	163200	RETS1:	BIC	#1, @SRO	:TURN OFF KT11-C
017624	104006				HLT		:DATI TO RRWTW PAGE CAUSED
							:A TRAP OR ABORT
017626	016777	163204	163200	DONES1:	MOV	KTSTA, @KTVEC	:RESTORE TRAP RETURN TO CAUSE HALT
017634	005077	163176			CLR	@KTSTA	:ON AN UNEXPECTED TRAP
017640	005077	163160			CLR	@SRO	:INITIALIZE SRO
017644	005037	177776			CLR	@PS	:INITIALIZE PROCESSOR STATUS
							:SHOW THAT A DATI TO A RRWTW PAGE (ACF=5) WITH MEMORY MANAGEMENT
							:TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
							:SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT THE
							:PDR'S FOR THE PAGE REFERENCED ARE CORRECT
							TEST52: SCOPE
017650	104400						
017652	012737	000052	177570		MOV	#52, @SR	:LOAD TEST NUMBER INTO THE DISPLAY
017660	005037	177776			CLR	@PS	:INITIALIZE PROCESSOR STATUS
017664	012706	001000			MOV	#KSTACK, SP	:INITIALIZE KERNEL STACK POINTER
017670	005077	163130			CLR	@SRO	:INITIALIZE SRO
017674	012746	000006			MOV	#6, -(SP)	:PUSH RW KEY ON STACK
017700	004767	002404			JSR	%7, SETUP	:MAKE KERNEL PAGE 7 RW, EXTERNAL
							:MAKE ALL OTHER PAGES RW, BANK 0
							:RESTORE STACK POINTER
017704	005726				TST	(SP)+	
017706	012777	000200	163406		MOV	#200, @KDPAR1	:MAP KERNEL PAGE 1
017714	012777	000200	163360		MOV	#200, @KIPAR1	:TO BANK 1
017722	012777	077405	163334		MOV	#77405, @KDPDR2	:CHANGE MAP TO MAKE PAGE 2 RRWTW
017730	012777	077405	163306		MOV	#77405, @KIPDR2	
017736	012777	020072	163070		MOV	#RETS2, @KTVEC	:SETUP TRAP RETURN IN CASE
017744	005077	163066			CLR	@KTSTA	
017750	012767	125252	163434		MOV	#125252, DESTAD	:INITIALIZE LOCATION TO BE READ
017756	012701	043412			MOV	#DESTAD+40000, R1	:R1 CONTAINS VIRTUAL ADDRESS OF
							:LOCATION TO BE REFERENCED THRU KERNEL PAGE 2
017762	012777	001001	163034		MOV	#1001, @SRO	:TURN ON KT11-C, SET MMGT TRAP ENABLE
017770	022721	125252			CMP	#125252, (R1)+	:DATI TO RRWTW PAGE-SHOULDN'T TRAP OR ABORT
017774	001401				BEQ	.+4	
017776	104006				HLT		:RELOCATION FAILED THRU KERNEL PAGE 2
020000	017702	163020			MOV	@SRO, R2	:SAVE CONTENTS OF SRO
020004	005377	163014			DEC	@SRO	:TURN OFF KT11-C
020010	022702	001021			CMP	#1021, R2	:CHECK SAVED CONTENTS OF SRO
020014	001401				BEQ	.+4	
020016	104006				HLT		:SRO INCORRECT-SHOULD HAVE TRACKED
							:THE REFERENCE TO DATA SPACE, PAGE
							:0, WHICH GOT THE ADDRESS OF SRO
							:CHECK SR1
020020	022777	000027	163000		CMP	#27, @SR1	
020026	001401				BEQ	.+4	
020030	104006				HLT		:SR1 INCORRECT-SHOULD CONTINUE
							:TRACKING WITH KT11-C OFF
020032	022777	020032	162770		CMP	#, @SR2	:CHECK SR2
020040	001401				BEQ	.+4	

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020042 104006          HLT          ;SR2 INCORRECT-SHOULD STILL BE
020044 022777 077405 163172    CMP      #77405, @KIPDR2 ;TRACKING EVEN WITH KT11-C OFF
020052 001401          BEQ      .+4           ;CHECK INSTRUCTION SPACE PDR
020054 104006          HLT          ;KIPDR2 INCORRECT-SHOULD NOT
                                ;HAVE BEEN CHANGED
020056 022777 077405 163200    CMP      #77405, @KDPDR2 ;CHECK DATA SPACE PDR
020064 001401          BEQ      .+4           ;KDPDR2 INCORRECT - SHOULD NOT
020066 104006          HLT          ;HAVE BEEN CHANGED

020070 000404          BR       DONE52
020072 042777 000001 162724    RET52: BIC      #1, @SRO ;TURN OFF KT11-C
020100 104006          HLT          ;DAT1 TO RRWTW PAGE TRAPPED OR ABORTED
020102 016777 162730 162724    DONE52: MOV     KTSTA, @KTVEC ;CHANGE KT11-C FAULT RETURN TO
020110 005077 162722          CLR      @KTSTA      ;CAUSE A HALT ON AN UNEXPECTED TRAP
020114 005077 162704          CLR      @SRO
020120 005037 177776          CLR      @#PS

;SHOW THAT A DATO (NO DATIP) TO A RRWTW PAGE (ACF=5) WITHOUT
;MEMORY MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT THE PDR
;CORRESPONDING TO THE REFERENCE IS CORRECT
TEST53: SCOPE
020124 104400          MOV      #53, @#SR ;LOAD TEST NUMBER INTO THE DISPLAY
020126 012737 000053 177570    CLR      @#PS      ;INITIALIZE PROCESSOR STATUS
020134 005037 177776          MOV      #KSTACK, SP ;INITIALIZE KERNEL STACK POINTER
020140 012706 001000          CLR      @SRO      ;INITIALIZE SRO
020144 005077 162654          MOV      #6, -(SP)  ;PUSH RW KEY ON STACK
020150 012748 000006          JSR     %7, SETUP  ;MAKE KERNEL PAGE 7 RW, EXTERNAL
020154 004767 002130          TST     (SP)+      ;MAKE ALL OTHER PAGES RW, BANK 0
                                ;RESTORE STACK POINTER
020160 005726          MOV      #200, @KDPAR1 ;CHANGE MAP TO RUN CODE IN SECOND BANK
020162 012777 000200 163132    MOV      #200, @KIPAR1
020170 012777 000200 163104    MOV      #77405, @KDPDR2 ;MAP KERNEL PAGE 2 RRWTW
020176 012777 077405 163060    MOV      #77405, @KIPDR2
020204 012777 077405 163032    MOV      #RET53, @KTVEC ;SETUP ABORT RETURN IN CASE
020212 012777 020352 162614    CLR      @KTSTA
020220 005077 162612          CLR      DESTAD    ;INITIALIZE LOCATION TO BE ADDRESSED
020224 005067 163162          MOV      #DESTAD+40000, R1 ;BY DATO TO RRWTW PAGE
                                ;R1 CONTAINS VIRTUAL ADDRESS OF LOCATION
                                ;TO BE REFERENCED THRU KERNEL PAGE 2
020230 012701 043412          MOV8    #1, @SRO   ;TURN ON KT11-C
020234 112777 000001 162562    MOV      #125252, (R1)+ ;DATO TO RRWTW PAGE-SHOULDN'T TRAP
020242 012721 125252          MOV     @SRO, R2  ;SINCE TRAP ENABLE ISN'T SET
                                ;SAVE CONTENTS OF SRO
020246 017702 162552          DEC     @SRO      ;TURN OFF KT11-C
020252 005377 162546          CMP     #10021, R2 ;CHECK SAVED CONTENTS OF SRO
020256 022702 010021          BEQ     .+4
020262 001401          HLT
020264 104006          ;SRO INCORRECT-SHOULD HAVE TRACKED
                                ;THE REFERENCE TO DATA SPACE, PAGE 0,
                                ;WHICH GOT THE ADDRESS OF SRO, AND MGMT
                                ;TRAP SHOULD BE SET
                                ;CHECK SRI

020266 022777 000027 162532    CMP     #27, @SRI1
020274 001401          BEQ     .+4
020276 104006          HLT          ;SRI INCORRECT-SHOULD KEEP TRACKING

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020300 022777 020300 162522      CMP      #, @SR2      ;EVEN WITH KT11-C OFF
020306 001401                      BEQ      .+4        ;CHECK SR2
020310 104006                      HLT
020312 022777 077405 162724      CMP      #77405, @KIPDR2 ;SR2 INCORRECT-SHOULD KEEP TRACKING
020320 001401                      BEQ      .+4        ;CHECK INSTRUCTION SPACE PDR
020322 104006                      HLT                ;KIPDR2 INCORRECT-SHOULD NOT HAVE
                                ;BEEN CHANGED SINCE THE RRWTW REFERENCE
                                ;WAS TO DATA SPACE
020324 022777 077705 162732      CMP      #77705, @KDPDR2 ;CHECK DATA SPACE PDR
020332 001401                      BEQ      .+4
020334 104006                      HLT                ;KDPDR2 INCORRECT- "A" BIT SHOULD BE SET SINCE PAGE
                                ;WAS ACCESSED, AND "W" BIT SHOULD
                                ;BE SET SINCE IT WAS WRITTEN INTO
020336 026727 163050 125252      CMP      DESTAD, #125252 ;MAKE CERTAIN THAT DESTINATION
020344 001401                      BEQ      .+4        ;LOCATION WAS WRITTEN INTO
020346 104006                      HLT                ;DATO TO RRWTW PAGE DIDN'T WRITE
                                ;INTO THE DESTINATION LOCATION
020350 000404                      BR        DONE53
020352 042777 000001 162444      RET53:  BIC      #1, @SRO ;TURN OFF KT11-C
020360 104006                      HLT                ;DATO TO RRWTW PAGE TRAPPED WITHOUT MMGT TRAP ENABLED
020362 016777 162450 162444      DONE53: MOV      KTSTA, @KTVEC ;CHANGE KT11-C FAULT RETURN
020370 005077 162442                      CLR      @KTSTA    ;TO CAUSE A HALT ON AN UNEXPECTED TRAP
020374 005077 162424                      CLR      @SRO
020400 005037 177776                      CLR      @PS

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;SHOW THAT A DATO (NO DATIP) TO A RRWTW PAGE (ACF=5) WITH
;MEMORY MANAGEMENT TRAP ENABLE SET TRAPS AFTER THE INSTRUCTION IS COMPLETED
;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT THE PDR
;CORRESPONDING TO THE REFERENCE IS CORRECT

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020404 104400
020406 012737 000054 177570      TEST54: SCOPE
020414 005037 177776                      MOV      #54, @SR
020420 012706 001000                      CLR      @PS
020424 005077 162374                      MOV      #KSTACK, SP ;LOAD TEST NUMBER INTO THE DISPLAY
020430 012746 000006                      CLR      @SRO        ;INITIALIZE PROCESSOR STATUS
020434 004767 001650                      MOV      #6, -(SP)   ;INITIALIZE KERNEL STACK POINTER
                                ;INITIALIZE SRO
                                ;PUSH RW KEY ON STACK
020440 005726                      JSR      %7, SETUP   ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                ;MAKE ALL OTHER PAGES RW, BANK 0
                                ;RESTORE STACK POINTER
                                ;NOW CHANGE MAP TO ALLOW RUNNING CODE
                                ;ABOVE PHYSICAL ADDRESS 20000
                                ;MAP KERNEL PAGE 1 TO BANK 1
020442 012777 000200 162652      MOV      #200, @KDPAR1
020450 012777 000200 162624      MOV      #200, @KIPAR1
020456 012777 077405 162600      MOV      #77405, @KDPDR2 ;MAKE KERNEL PAGE 2 RRWTW
020464 012777 077405 162552      MOV      #77405, @KIPDR2
020472 012777 020536 152334      MOV      #RET54, @KTVEC ;SETUP TRAP RETURN
020500 005077 162332                      CLR      @KTSTA
020504 005067 162702                      CLR      DESTAD     ;INITIALIZE LOCATION TO BE ADDRESSED
                                ;BY DATO TO RRWTW PAGE
                                ;R2 CONTAINS VIRTUAL ADDRESS OF LOCATION
                                ;TO BE REFERENCED THRU KERNEL PAGE 2
020510 012702 043412                      MOV      #DESTAD+40000, R2 ;TURN ON KT11-C, SET MMGT TRAP ENABLE
020514 012777 001001 162302      MOV      #1001, @SRO ;DATO TO RRWTW PAGE-SHOULD TRAP
020522 012722 125252                      MOV      #125252, (R2)+ ;SINCE TRAP ENABLE IS SET
020526 105377 162272                      DECB    @SRO        ;TURN OFF KT11-C
020532 104006                      HLT                ;DATO TO RRWTW PAGE FAILED TO TRAP

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020534	000441			BR	DONE54		
020536	017701	162262		MOV	SR0,R1		;SAVE CONTENTS OF SRO
020542	005377	162256		DEC	SR0		;TURN OFF KT11-C
020546	022701	011021		CMP	#11021,R1		;CHECK SAVED CONTENTS OF SRO
020552	001401			BEQ	.+4		
020554	104006			HLT			;SRO INCORRECT-SHOULD HAVE TRACKED THE
							;REFERENCE TO DATA SPACE, PAGE 0,
							;WHICH GOT THE ADDRESS OF SRO, AND MMGT TRAP
							;SHOULD BE SET
							;CHECK SR1
020556	022777	000027	162242	CMP	#27,SR1		
020564	001401			BEQ	.+4		
020566	104006			HLT			;SR1 INCORRECT-SHOULD
							;KEEP TRACKING EVEN WITH KT11-C OFF
							;CHECK SR2
020570	022777	020570	162232	CMP	#,SR2		
020576	001401			BEQ	.+4		
020600	104006			HLT			;SR2 INCORRECT-SHOULD KEEP TRACKING
020602	022777	077405	162434	CMP	#77405,KIPDR2		;CHECK INSTRUCTION SPACE PDR
020610	001401			BEQ	.+4		
020612	104006			HLT			;KIPDR2 INCORRECT-SHOULD NOT
							;HAVE BEEN CHANGED SINCE THE RRWTW
							;REFERENCE WAS TO DATA SPACE
							;CHECK DATA SPACE PDR
020614	022777	077705	162442	CMP	#77705,KDPDR2		
020622	001401			BEQ	.+4		
020624	104006			HLT			;KDPDR2 INCORRECT-"A" AND "W" BITS
							;SHOULD BE SET SINCE PAGE WAS WRITTEN INTO
							;MAKE CERTAIN THAT DESTINATION
							;LOCATION WAS WRITTEN
							;DATA TO RRWTW PAGE DIDN'T WRITE
							;INTO THE DESTINATION LOCATION
							;CHANGE KT11-C FAULT RETURN
							;TO CAUSE A HALT ON AN UNEXPECTED TRAP
020626	026727	162560	125252	CMP	DESTAD,#125252		
020634	001401			BEQ	.+4		
020636	104006			HLT			
020640	016777	162172	162166	MOV	KTSTA,KTVEC		
020646	005077	162164		CLR	KTSTA		
020652	005077	162146		CLR	SR0		
020656	005037	177776		CLR	PS		
							;SHOW THAT A DATIP, DATA SEQUENCE TO A RRWTW PAGE (ACF=5) WITHOUT MEMORY
							;MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS
							;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT
							;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
020662	104400			TEST55: SCOPE			
020664	012737	000055	177570	MOV	#55,SR		;LOAD TEST NUMBER INTO THE DISPLAY
020672	005037	177776		CLR	PS		;INITIALIZE PROCESSOR STATUS
020676	012706	001000		MOV	KSTACK,SP		;INITIALIZE KERNEL STACK POINTER
020702	005077	162116		CLR	SR0		;INITIALIZE SRO
020706	012746	006006		MOV	#6,-(SP)		;PUSH RW KEY ON STACK
020712	004767	001372		JSR	%7,SETUP		;MAKE KERNEL PAGE 7 RW, EXTERNAL
							;MAKE ALL OTHER PAGES RW, BANK 0
020716	005726			TST	(SP)+		;RESTORE STACK POINTER
							;NOW CHANGE MAP TO ALLOW RUNNING CODE
							;IN BANK 1
							;MAP KERNEL PAGE 1 TO BANK 1
020720	012777	000200	162374	MOV	#200,KDPAR1		
020726	012777	000200	162346	MOV	#200,KIPAR1		
020734	012777	077405	162322	MOV	#77405,KDPDR2		;MAKE KERNEL PAGE 2 RRWTW
020742	012777	077405	162274	MOV	#77405,KIPDR2		
020750	012777	021106	162056	MOV	RET55,KTVEC		;SETUP ABORT RETURN IN CASE
020756	005077	162054		CLR	KTSTA		
020762	012767	125252	162422	MOV	#125252,DESTAD		;INITIALIZE LOCATION TO BE REFERENCED



021174	005726			TST	(SP)+		;RESTORE STACK POINTER
021176	012777	000200	162116	MOV	#200, @KOPAR1		;ALTER MAP TO ALLOW EXECUTING CODE IN BANK 1
021204	012777	000200	162070	MOV	#200, @KIPAR1		;MAP KERNEL PAGE 1 TO BANK 1
021212	012777	077405	162044	MOV	#77405, @KOPDR2		;MAKE KERNEL PAGE 2 RRWTW
021220	012777	077405	162016	MOV	#77405, @KIPDR2		
021226	012777	021274	161600	MOV	#RET56, @KTVEC		;SETUP TRAP RETURN
021234	005077	161576		CLR	@KTSTA		
021240	012767	125252	162144	MOV	#125252, DESTAD		;INITIALIZE LOCATION TO BE READ
021246	012704	043412		MOV	#DESTAD+40000, R4		;R4 CONTAINS VIRTUAL ADDRESS OF LOCATION TO BE REFERENCED THRU KERNEL PAGE 2
021252	012777	001001	161544	MOV	#1001, @SRO		;TURN ON KT11-C, SET MMGT TRAP ENABLE
021260	062724	052526		ADD	#52526, (R4)+		;DATIP, DATO TO RRWTW PAGE-SHOULD TRAP
021264	105077	161534		CLRB	@SRO		;SINCE TRAP ENABLE IS SET
021270	104006			HLT			;IF NO TRAP, TURN OFF KT11-C
021272	000444			BR	DONE56		;DATIP, DATO TO RRWTW PAGE WITH MEMORY
021274	017702	161524		MOV	@SRO, R2		;MANAGEMENT TRAP ENABLE SET DIDN'T
021300	005377	161520		DEC	@SRO		;CAUSE A TRAP
021304	022702	011021		CMP	#11021, R2		;SAVE CONTENTS OF SRO
021310	001401			BEQ	.+4		;TURN OFF KT11-C
021312	104006			HLT			;CHECK SAVED CONTENTS OF SRO
021314	022777	000027	161504	CMP	#27, @SR1		;SRO INCORRECT-SHOULD HAVE TRACKED
021322	001401			BEQ	.+4		;THE REFERENCE TO DATA SPACE, PAGE
021324	104006			HLT			;0, WHICH GOT THE ADDRESS OF SRO,
021326	022777	021326	161474	CMP	#, @SR2		;AND MMGT TRAP SHOULD BE SET
021334	001401			BEQ	.+4		;CHECK SR1
021336	104006			HLT			;SR1 INCORRECT-SHOULD CONTINUE
021340	022777	077405	161676	CMP	#77405, @KIPDR2		;TRACKING WITH KT11-C OFF
021346	001401			BEQ	.+4		;CHECK SR2
021350	104006			HLT			;SR2 INCORRECT-SHOULD STILL BE
021352	022777	077705	161704	CMP	#77705, @KOPDR2		;TRACKING EVEN WITH KT11-C OFF
021360	001401			BEQ	.+4		;CHECK INSTRUCTION SPACE PDR
021362	104006			HLT			;KIPDR2 INCORRECT-SHOULD NOT
021364	005767	162022		TST	DESTAD		;HAVE BEEN CHANGED SINCE THE RRWTW
021370	001401			BEQ	.+4		;REFERENCE WAS TO DATA SPACE
021372	104006			HLT			;CHECK DATA SPACE PDR
021374	022704	043414		CMP	#DESTAD+40002, R4		;KOPDR2 INCORRECT-"A" AND "W" BITS SHOULD
021400	001401			BEQ	.+4		;BE SET SINCE DATA SPACE WAS RRWTW
021402	104006			HLT			;AND WAS WRITTEN
021404	016777	161426	161422	MOV	KTSTA, @KTVEC		;CHECK LOCATION WRITTEN INTO
021412	005077	161420		CLR	@KTSTA		;THE INSTRUCTION REFERENCING THE RRWTW
021416	005077	161402		CLR	@SRO		;PAGE TRAPPED BEFORE COMPLETING
021422	005037	177776		CLR	@#PS		;CHECK TO SEE THAT R4 AUTOINCREMENTED
							;AUTOINCREMENT OF R4 ON TRAPPED INSTRUCTION DIDN'T OCCUR
							;CHANGE KT11-C FAULT RETURN TO
							;CAUSE A HALT ON AN UNEXPECTED TRAP

;SHOW THAT DATIP, DATOB SEQUENCE TO A RRWTW PAGE (ACF=5) WITHOUT MEMORY  
;MANAGEMENT TRAP ENABLE SET NEITHER TRAPS NOR ABORTS  
;SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT  
;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT

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021426 104400
021430 012737 000057 177570
021436 005037 177776
021442 012706 001000
021446 005077 161352
021452 012746 000006
021456 004767 000626

021462 005726

021464 012777 000200 161630
021472 012777 000200 161602
021500 012777 077405 161556
021506 012777 077405 161530
021514 012777 021650 161312
021522 005077 161310
021526 005067 161660
021532 012701 043413

021536 005277 161262
021542 105221

021544 017702 161254
021550 105377 161250
021554 022702 010021
021560 001401
021562 104006

021564 022777 000027 161234
021572 001401
021574 104006

021576 022777 021576 161224
021604 001401
021606 104006

021610 022777 077405 161426
021616 001401
021620 104006

021622 022777 077705 161434
021630 001401
021632 104006

021634 022767 000400 161550
021642 001401
021644 104006
    
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TESTS7: SCOPE

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MOV #57, @#SR ;LOAD TEST NUMBER INTO THE DISPLAY
CLR @#PS ;INITIALIZE PROCESSOR STATUS
MOV #KSTACK, SP ;INITIALIZE KERNEL STACK POINTER
CLR @SRO ;INITIALIZE SRO
MOV #6, -(SP) ;PUSH RW KEY ON STACK
JSR %7, SETUP ;MAKE KERNEL PAGE 7 RW, EXTERNAL
;MAKE ALL OTHER PAGES RW, BANK 0
TST (SP)+ ;RESTORE STACK POINTER
;ALTER MAP TO ALLOW EXECUTING CODE IN BANK 1
;MAP KERNEL PAGE 1 TO BANK 1
MOV #200, @KDPAR1
MOV #200, @KIPAR1
MOV #77405, @KDPDR2 ;MAKE KERNEL PAGE 2 RRWTW
MOV #77405, @KIPDR2
MOV #RET57, @KTVEC ;SETUP ABORT RETURN IN CASE
CLR @KTSTA
CLR DESTAD ;INITIALIZE LOCATION TO BE REFERENCED
MOV #DESTAD+40001, R1 ;R1 CONTAINS VIRTUAL ADDRESS OF
;LOCATION TO BE REFERENCED THRU KERNEL PAGE 2
INC @SRO ;TURN ON KT11-C
INCB (R1)+ ;DATIP, DATOB TO RRWTW PAGE-SHOULDN'T TRAP
;SINCE TRAP ENABLE ISN'T SET
MOV @SRO, R2 ;SAVE CONTENTS OF SRO
DECB @SRO ;TURN OFF KT11-C
CMP #10021, R2 ;CHECK SAVED CONTENTS OF SRO
BEQ .+4
HLT ;SRO INCORRECT-SHOULD HAVE
;TRACKED REFERENCE TO DATA SPACE,
;PAGE 0, WHICH GOT THE ADDRESS
;OF SRO, AND MGMT TRAP SHOULD BE SET
;CHECK SR1
CMP #27, @SR1
BEQ .+4
HLT ;SR1 INCORRECT-SHOULD KEEP
;TRACKING EVEN WITH KT11-C OFF
;CHECK SR2
CMP #, @SR2
BEQ .+4
HLT ;SR2 INCORRECT-SHOULD TRACK EVEN
;WHEN KT11-C IS OFF
;CHECK INSTRUCTION SPACE PDR FOR
;THE RRWTW PAGE REFERENCED
;KIPDR2 INCORRECT-SHOULD NOT
;HAVE BEEN CHANGED SINCE THE
;RRWTW REFERENCE WAS TO DATA SPACE
;CHECK DATA SPACE PDR CORRESPONDING
;TO THE RRWTW REFERENCE
;KDPDR2 INCORRECT-"A" AND "W" BITS SHOULD
;BE SET SINCE DATA SPACE WAS WRITTEN INTO
;AND WAS RRWTW
;CHECK TO SEE THAT INSTRUCTION WAS CORRECTLY EXECUTED
CMP #400, DESTAD
BEQ .+4
HLT ;DATIP, DATOB TO RRWTW PAGE LEFT WRONG VALUE
;IN DESTINATION ADDRESS
    
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# K05

DCKTC-A MACY:1 27.732) 01-OCT-76 13:43 PAGE 63  
DCKTCA

021646	000404				BN	DONE57	
021650	042777	000001	161146	RET57:	BIC	#1, 2SR0	: TURN OFF KT11-C
021656	104006				HLT		: DATIP, DATOB TO RRWTW PAGE CAUSED
							: A TRAP OR ABORT ALTHOUGH MEMORY
							: MANAGEMENT TRAP ENABLE WAS NOT SET
021660	016777	161152	161146	DONE57:	MOV	KTSTA, 2KTVEC	: RESTORE TRAP RETURN TO CAUSE HALT
021666	005077	161144			CLR	2KTSTA	: ON AN UNEXPECTED TRAP
021672	005077	161126			CLR	2SR0	: INITIALIZE SRO
021676	005037	177776			CLR	2#PS	: INITIALIZE PROCESSOR STATUS
							: SHOW THAT A DATIP, DATOB SEQUENCE TO A RRWTW PAGE (ACF=5) WITH MEMORY MANAGEMENT
							: TRAP ENABLE SET CAUSES A TRAP AT THE END OF THE INSTRUCTION
							: SHOW THAT THE KT11-C STATUS REGISTERS CONTINUE TO TRACK, AND THAT THE
							: PDR'S FOR THE PAGE REFERENCED ARE CORRECT
				TEST60:	SCOPE		
021702	104400						
021704	012737	000060	177570		MOV	#60, 2#SR	: LOAD TEST NUMBER INTO THE DISPLAY
021712	005037	177776			CLR	2#PS	: INITIALIZE PROCESSOR STATUS
021716	012706	001000			MOV	#KSTACK, SP	: INITIALIZE KERNEL STACK POINTER
021722	005077	161076			CLR	2SR0	: INITIALIZE SRO
021726	012746	000006			MOV	#6, -(SP)	: PUSH RW KEY ON STACK
021732	004767	000352			JSR	%7, SETUP	: MAKE KERNEL PAGE 7 RW, EXTERNAL
							: MAKE ALL OTHER PAGES RW, BANK 0
021736	005726				TST	(SP)+	: RESTORE STACK POINTER
							: ALTER MAP TO ALLOW EXECUTING CODE IN BANK 1
021740	012777	000200	161354		MOV	#200, 2KDPAR1	: MAP KERNEL PAGE 1 TO BANK 1
021746	012777	000200	161326		MOV	#200, 2KIPAR1	
021754	012777	077405	161302		MOV	#77405, 2KDPDR2	: MAKE KERNEL PAGE 2 RRWTW
021762	012777	077405	161254		MOV	#77405, 2KIPDR2	
021770	012777	022034	161036		MOV	#RET60, 2KTVEC	: SETUP TRAP RETURN
021776	005077	161034			CLR	2KTSTA	
022002	012767	125252	161402		MOV	#125252, DESTAD	: INITIALIZE LOCATION TO BE ACCESSED
022010	012702	043413			MOV	#DESTAD+40001, R2	: R2 CONTAINS VIRTUAL ADDRESS OF
							: LOCATION TO BE REFERENCED THRU KERNEL PAGE 2
022014	012777	001001	161002		MOV	#1001, 2SR0	: TURN ON KT11-C, SET MMGT TRAP ENABLE
022022	105222				INCB	(R2)+	: DATIP, DATOB TO RRWTW PAGE-SHOULD TRAP
							: SINCE TRAP ENABLE IS SET
022024	105077	160774			CLRB	2SR0	: IF NO TRAP, TURN OFF KT11-C
022030	104006				HLT		: DATIP, DATOB TO RRWTW PAGE WITH MEMORY
022032	000445				BR	DONE60	: MANAGEMENT TRAP ENABLE SET DIDN'T
							: CAUSE A TRAP
022034	017703	160764		RET60:	MOV	2SR0, R3	: SAVE CONTENTS OF SRO
022040	005377	160760			DEC	2SR0	: TURN OFF KT11-C
022044	022703	011021			CMP	#11021, R3	: CHECK SAVED CONTENTS OF SRO
022050	001401				BEQ	.+4	
022052	104006				HLT		: SRO INCORRECT-SHOULD HAVE TRACKED
							: THE REFERENCE TO DATA SPACE, PAGE
							: 0, WHICH GOT THE ADDRESS OF SRO,
							: AND MMGT TRAP SHOULD BE SET
022054	022777	000027	160744		CMP	#27, 2SR1	: CHECK SR1
022062	001401				BEQ	.+4	
022064	104006				HLT		: SR1 INCORRECT-SHOULD CONTINUE
							: TRACKING WITH KT11-C OFF
022066	022777	022066	160734		CMP	#., 2SR2	: CHECK SR2
022074	001401				BEQ	.+4	
022076	104006				HLT		: SR2 INCORRECT-SHOULD STILL BE
							: TRACKING EVEN WITH KT11-C OFF

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022100 022777 077405 161136      CMP      #77405, @KIPDR2 ;CHECK INSTRUCTION SPACE PDR
022106 001401                      BEQ      .+4
022110 104006                      HLT
                                ;KIPDR2 INCORRECT-SHOULD NOT
                                ;HAVE BEEN CHANGED SINCE THE RRWTW
                                ;REFERENCE WAS TO DATA SPACE
022112 022777 077705 161144      CMP      #77705, @KOPDR2 ;CHECK DATA SPACE PDR
022120 001401                      BEQ      .+4
022122 104006                      HLT
                                ;KOPDR2 INCORRECT-"A" AND "W" BITS SHOULD
                                ;BE SET SINCE DATA SPACE WAS RRWTW
                                ;AND WAS WRITTEN
022124 022767 125652 161260      CMP      #125652, DESTAD ;CHECK LOCATION WRITTEN INTO
022132 001401                      BEQ      .+4
022134 104006                      HLT
                                ;THE INSTRUCTION REFERENCING THE RRWTW
                                ;PAGE TRAPPED BEFORE COMPLETING
022136 022702 043414      CMP      #DESTAD+40002, R2
022142 001401                      BEQ      .+4
022144 104006                      HLT
                                ;THE AUTOINCREMENT IN THE INSTRUCTION
                                ;REFERENCING THE RRWTW PAGE
                                ;FAILED TO COMPLETE
                                ;CHANGE KT11-C FAULT RETURN TO
                                ;CAUSE A HALT ON AN UNEXPECTED TRAP
022146 016777 160664 160660  DONE60: MOV      KTSTA, @KTVEC
022154 005077 160656                      CLR      @KTSTA
022160 005077 160640                      CLR      @SR0
022164 005037 177776                      CLR      @#PS
022170 104400                      SCOPE
022172 004767 001076      JSR      %7, BELL
022176 013701 000042      MOV      @#42, R1 ;MONITOR HOOK
022202 001405                      BEQ      END
022204 000005                      RESET
022206 004711      LOGIC: JSR      %7, @R1
022210 000240                      NOP
022212 000240                      NOP
022214 000240                      NOP
022216 000167 161172      END:    JMP      START
                                ;SUBROUTINE TO CLEAR ALL KT11-C REGISTERS (EXCEPT SR1, SR2, SR3)
022222 005077 160576      CLRALL: CLR      @SR0
022226 005000                      CLR      R0
022230 012701 000140      MOV      #96, R1 ;COUNT OF REGISTERS TO BE CLEARED
022234 005070 003040      CLRLP: CLR      @ADRTAB(R0) ;CLEAR REGISTERS THRU ADDRESS TABLE
022240 005720                      TST      (R0)+ ;MOVE POINTER
022242 077104                      SOB      R1, CLRLP ;LOOP TILL DONE
022244 000207                      RTS      %7
                                ;SUBROUTINE TO MAKE ALL PAGES RW, BANK 0, 4K, UP
022246 005077 160552      RWALL: CLR      @SR0
022252 012701 003040      MOV      @ADRTAB, R1
022256 012700 000020      RWL1:  MOV      #20, R0
022262 005071 000040      RWL2:  CLR      @40(R1)
022266 012731 077406      MOV      #77406, @ (R1)+
022272 077005                      SOB      R0, RWL2
022274 062701 000040      ADD      #40, R1
022300 020127 003336      CMP      R1, #ADREND

```

022304 003764  
022306 000207BLE RVL1  
RTS %7;SUBROUTINE TO SET ALL PAGES RW EXCEPT KERNEL PAGE 1  
;KERNEL PAGE 1 IS SET TO DESIRED KEY  
;KEY IS PASSED VIA THE STACK  
;ALL PAGES ARE MAPPED TO BANK 0 EXCEPT KERNEL PAGE 7, WHICH IS MAPPED TO  
;THE EXTERNAL BANK022310 004767 177732  
022314 012777 077400 160720  
022322 012777 077400 160732  
022330 056677 000002 160704  
022336 056677 000002 160716  
022344 012777 007600 160744  
022352 012777 007600 160756  
022360 000207SETUP: JSR %7,RWALL ;INITIALLY MAP ALL PAGES RW, BANK 0  
MOV #77400,@KIPDR1 ;MAKE KERNEL PAGE ONE 4K, UP  
MOV #77400,@KDPDR1  
BIS 2(SP),@KIPDR1 ;SET TO DESIRED KEY  
BIS 2(SP),@KDPDR1  
MOV #7600,@KIPAR7 ;MAP KERNEL PAGE 7 EXTERNAL  
MOV #7600,@KDPAR7  
RTS %7;ROUTINE TO LOOP THRU A SINGLE INSTRUCTION TEST  
;LOAD THE STARTING ADDRESS OF THE TEST  
;YOU WISH TO RUN (THE ADDRESS OF THE TESTXX  
;TAG) AT THE 1ST HALT, SET SWITCH REGISTER  
;OPTIONS AT THE 2ND HALT.  
;NOTE THAT SW11 MUST BE DOWN AFTER THE 2ND HALT022362 005037 177776  
022366 012706 001000  
022372 012737 040000 177776  
022400 012706 002000  
022404 012737 140000 177776  
022412 012706 003000  
022416 005037 177776  
022422 000000  
022424 016767 155140 000036  
022432 062767 000002 000030  
022440 000000  
022442 005067 000150  
022446 012767 022460 000144  
022454 000177 000010  
022460 005067 000132  
022464 000177 000000  
022470 000000TESTX: CLR @#PS  
MOV #KSTACK,SP  
MOV #40000,@#PS ;SETUP SUPERVISOR STACK POINTER  
MOV #SSTACK,SP  
MOV #140000,@#PS ;SETUP USER STACK POINTER  
MOV #USTACK,SP  
CLR @#PS  
HALT ;WAIT FOR STARTING ADDRESS  
MOV SR,RETRNX ;LOAD STARTING ADDRESS IN RETRNX  
ADD #2,RETRNX ;ADD 2 TO POINT TO INSTRUCTION AFTER  
HALT ;SET SR OPTIONS  
CLR SCOPEF ;KEEP COUNT AT ZERO  
MOV #XLOOP,RETURN ;LOAD SCOPE LOOP RETURN POINTER  
JMP @RETRNX ;JUMP TO TEST  
XLOOP: CLR SCOPEF ;KEEP COUNT AT ZERO  
JMP @RETRNX ;JUMP TO TEST  
RETRNX: 0022472 032737 040000 177570  
022500 001015  
022502 032737 004000 177570  
022510 001025  
022512 026767 000100 000074  
022520 100021  
022522 005267 000070  
022526 012737 000340 177776  
022534 022606  
022536 012637 177776  
022542 032737 000400 177570  
022550 001403  
022552 113777 177570 160620  
022560 000177 000034;SCOPE AND/OR ITERATION LOOP FOR EACH TEST 4000 TIMES  
SCOPEC: BIT #40000,@#SR ;TEST SR FOR SCOPE  
BNE SCOPEB ;YES SCOPE  
BIT #4000,@#SR ;NO-TEST FOR ITERATION  
BNE SCOPEB ;INHIBIT ITERATION  
CMP SCOPEF,ICOUNT ;COMPARE CURRENT COUNT TO MAX NUMBER  
BPL SCOPEB ;EXIT-DONE  
INC SCOPEF ;INCREMENT COUNT  
MOV #340,@#PS ;PREVENT TRAPPING WHILE MOVING STACK  
SCOPEB: CMP (6)+,%6 ;REPOSITION STACK  
MOV (6)+,@#PS ;RESTORE PREVIOUS PROCESSOR STATUS  
BIT #400,@#SR ;TEST FOR LOAD MICROBREAK REGISTER  
BEQ .+10  
MOVB @#SR,@UBRK ;LOAD MICROBREAK REGISTER IF SW08 IS SET  
JMP @RETURN ;REPEAT TEST

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022564 005067 000026 SCOPEG: CLR SCOPEF ;CLEAR COUNT
022570 011667 000024 MOV @%6,RETURN ;SAVE SCOPE RETURN POINTER
022574 032737 000400 177570 BIT #400,@#SR ;TEST FOR LOAD MICROBREAK REGISTER
022602 001403 BEQ .+10
022604 113777 177570 160566 MOVB @#SR,@UBRK ;LOAD MICROBREAK REGISTER IF SW08 IS SET
022612 000002 RTI ;RETURN INLINE-NEXT TEST
022614 004000 ICOUNT:4000 ;ITERATION COUNT
022616 000000 SCOPEF: 0 ;COUNT LOCATION FOR ITERATION LOOP
022620 000000 RETURN: 0 ;ADDRESS OF LAST TEST
    
```

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;ENTERED WITH SYSTEM TRAP CALL (HLT)
;PRINT OUT THE ERROR PC+2 AND STATUS REGISTER
022622 012767 000340 155146 PRINT: MOV #340,PS ;SET PRIORITY TO 7
022630 036727 154734 020000 BIT SR,#20000 ;TEST FOR INHIBIT PRINT OUT
022636 001401 BEQ .+4 ;BRANCH TO PRINT
022640 000432 BR CK ;INHIBIT, CHECK FOR HALT
022642 012667 000100 MOV (6)+,SAVPC ;PC OF FAILING ROUTINE
022646 012667 000076 MOV (6)+,SAVPSR ;PSR OF ERROR CONDITION
022652 024646 CMP -(6),-(6) ;RESTORE STACK
022654 012767 000200 155114 MOV #200,PS
022662 004767 000424 JSR %7,CRLF ;OUTPUT CARRIAGE RETURN AND LINE FEED
022666 016767 000054 000322 MOV SAVPC,PTEMP1 ;LOAD WITH FAILING PC+2
022674 004767 000104 JSR %7,PROCT ;PRINT FAILING PC+2
022700 105777 160106 TSTB @TCSR ;WAIT FOR TTY READY
022704 100375 BPL .-4
022706 012777 000240 160100 MOV #240,@TDBR ;OUTPUT A SPACE
022714 016767 000030 000274 MOV SAVPSR,PTEMP1 ;LOAD PROCESSOR STATUS
022722 004767 000056 JSR %7,PROCT ;PRINT PROCESSOR STATUS
022726 005767 154636 CK: TST SR ;CHECK SR FOR HALT SWITCH
022732 100001 BPL .+4 ;BRANCH IF NOT SET
022734 000000 HALT ;HALT ON ERROR UP
022736 000002 RTI ;RETURN TO MAIN LINE
022740 000000 SAVR2: 0
022742 000000 SAVR3: 0
022744 000000 SAVR4: 0
022746 000000 SAVPC: 0
022750 000000 SAVPSR: 0
    
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;SUBROUTINE TO PRINT OUT OCTAL NUMBER
;PRSHRT DELETES LEADING ZEROS
;PROCT PRINTS OUT 6 OCTAL DIGITS
022752 012767 000001 000232 PRSHRT: MOV #1,PRSFLG ;SET FLAG TO INDICATE SHORT PRINTOUT
022760 005767 000232 TST PTEMP1 ;CHECK FOR ZERO
022764 001011 BNE PROCT+4 ;BRANCH IF NOT ZERO
022766 105777 160020 TSTB @TCSR ;WAIT FOR TTY READY
022772 100375 BPL .-4
022774 012777 000260 160012 MOV #260,@TDBR ;OUTPUT A SINGLE ZERO
023002 000207 RTS ;RETURN
023004 005067 000202 PROCT: CLR PRSFLG ;CLEAR FLAG TO INDICATE FULL PRINTOUT
023010 005067 000206 CLR PTEMP3 ;CLEAR R4 FOR COUNTING CHARACTERS OUTPUT
023014 005067 000174 CLR PRFLG ;INITIALIZE CARRY FLAG FOR ROTATES
023020 012767 000260 000172 MOV #260,PTEMP2 ;SETUP R3
023026 005767 000164 TST PTEMP1 ;CHECK BIT 15 OF NUMBER
023032 100002 BPL .+6 ;BRANCH IF ZERO
023034 005267 000160 INC PTEMP2 ;INCREMENT R3 IF ONE
    
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023040 006167 000152          ROL    PTEMP1      ;ROTATE LEFT MOST OCTAL TO RIGHT END
023044 006167 000146          ROL    PTEMP1
023050 005567 000140          ADC    PRFLG       ;STORE CARRY
023054 005767 000132          P.CK:  TST    PRSFLG  ;CHECK FOR SHORT PRINTOUT
023060 001404          BEQ    P.WAIT     ;BRANCH IF NOT SET
023062 026727 000132 000260    CMP    PTEMP2,#260 ;CHECK FOR ZERO IF SET
023070 001410          BEQ    P.CONT     ;IF SET, GO TO NEXT CHARACTER
023072 105777 157714          P.WAIT: TSTB   @TCSR  ;WAIT FOR TTY READY
023076 100375          BPL    P.WAIT
023100 016777 000114 157706    MOV    PTEMP2,@TDBR ;OUTPUT NEXT CHARACTER
023106 005067 000100          CLR    PRSFLG     ;PRINT REST OF NUMBER AFTER A NON-ZERO DIGIT
023112 005267 000104          P.CONT: INC    PTEMP3 ;COUNT
023116 026727 000100 000006    CMP    PTEMP3,#6   ;CHECK FOR DONE
023124 001001          P.CNT1: P.CNT1  ;BRANCH IF NOT DONE
023126 000207          RLS    %7
023130 000241          P.CNT1: CLC      ;CLEAR CARRY
023132 005767 000056          TST    PRFLG     ;CHECK FOR PREVIOUS CARRY
023136 001403          BEQ    .+10      ;BRANCH IF PREVIOUSLY ZERO
023140 005067 000050          CLR    PRFLG     ;INITIALIZE FLAG
023144 000261          SEC      ;SET CARRY
023146 006167 000044          ROL    PTEMP1    ;ROTATE NEXT CHARACTER INTO RIGHT END OF REGISTER
023152 006167 000040          ROL    PTEMP1
023156 006167 000034          ROL    PTEMP1
023162 005567 000026          ADC    PRFLG     ;STORE CARRY
023166 016767 000024 000024    MOV    PTEMP1,PTEMP2 ;LOAD DATA INTO R3
023174 042767 177770 000016    BIC    #177770,PTEMP2 ;CLEAR ALL BUT LOWEST OCTAL DIGIT
023202 052767 000260 000010    BIS    #260,PTEMP2  ;SET TO ASCII EQUIVALENT
023210 000721          BR     P.CK      ;LOOP
023212 000000          PRSFLG: 0
023214 000000          PRFLG: 0
023216 000000          PTEMP1: 0      ;CONTAINS VALUE TO BE OUTPUT
023220 000000          PTEMP2: 0      ;SCRATCH
023222 000000          PTEMP3: 0      ;USED TO COUNT CHARACTERS OUTPUT

;EMT HANDLER
;FIRST 3 CALLS LEFT OPEN IN TABLE FOR EASY PATCHES
023224 011667 000032          EMTSRV: MOV    @SP,EPC ;GET CALL
023230 162767 000002 000024    SUB    #2,EPC
023236 017767 000020 000016    MOV    @EPC,EPC
023244 105067 000013          CLRB   EPC+1     ;SAVE OFFSET ONLY
023250 062767 023264 000004    ADD    @EMTAB,EPC ;POINT TO TABLE OF ADDRESSES
023256 017707 000000          MOV    @EPC,PC   ;JUMP TO DESIRED ROUTINE
023262 000000          EPC: 0
023264 000000          PATCH1=0      ;SUBSTITUTE 104000 WHERE 1ST PATCH IS NEEDED
023266 000000          PATCH2=0      ;104002 FOR 2ND PATCH
023270 000000          PATCH3=0      ;104004 FOR 3RD PATCH
023272 022622          EMTAB: PATCH1  ;LOAD ADDRESS OF 1ST PATCH HERE
023274 105777 157512          PATCH2  ;LOAD ADDRESS OF 2ND PATCH HERE
023300 100375          PATCH3  ;LOAD ADDRESS OF 3RD PATCH HERE
023302 012777 000207 157504    PRINT

;BELL ON PASS COMPLETE
023274 105777 157512          BELL:  TSTB   @TCSR
023300 100375          BPL    .-4
023302 012777 000207 157504    MOV    #207,@TDBR

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023310 000207

RTS %7

023312 105777 157474

:SUBROUTINE TO OUTPUT CARRIAGE RETURN AND LINEFEED

023316 100375

CR LF: TSTB @TCSR ;WAIT FOR TTY READY

023320 012777 000215 157466

BPL .-4

023326 105777 157460

MOV #215,@DDBR ;ROUTPUT CARRIAGE RETURN

023332 100375

TSTB @TCSR ;WAIT FOR TTY READY

023334 012777 000212 157452

BPL .-4

023342 000207

MOV #212,@DDBR ;OUTPUT LINEFEED

000001

RTS %7

:RETURN

.END





		2798	2802	2833	2840	2846	2850	2854	2859	2864	2868	2899	2905	2911
		2915	2919	2923	2927	2959	2964	2969	2973	2977	2981	2985	3022	3028
		3032	3035	3040	3045	3049	3084	3090	3096	3100	3103	3103	3112	3150
		3156	3160	3164	3169	3173	3177	3212	3219	3225	3229	3233	3238	3243
		3247	3283	3289	3293	3297	3302	3307	3311	3346	3353	3359	3363	3367
		3372	3377	3381										
ICOUNT	022614	432*	3467	3483*										
KDPAR0	003320	391*												
KDPAR1	003322	392*	2947*	3005*	3070*	3134*	3199*	3267*	3333*					
KDPAR2	003324	393*												
KDPAR3	003326	394*												
KDPAR4	003330	395*												
KDPAR5	003332	396*												
KDPAR6	003334	397*												
KDPAR7	003336	398*	3435*											
KDPDR0	003260	375*												
KDPDR1	003262	376*	483	548	611	672	735	796	857	917	975	1030	1087	1146
		1206	1266	1327	1387	1455	1515	1576	1637	1699	1760	1822	1883	1955
		2013	2067	2125	2183	2241	2299	2357	2420	2485	2542	2604	2661	2731
		2791	2857	2921	3431*	3433*								
KDPDR2	003264	377*	2949*	2979	3007*	3038	3072*	3106	3136*	3167	3201*	3236	3269*	3300
		3335*	3370											
KDPDR3	003266	378*												
KDPDR4	003270	379*												
KDPDR5	003272	380*												
KDPDR6	003274	381*												
KDPDR7	003276	382*												
KIPAR0	003300	383*												
KIPAR1	003302	384*	2948*	3006*	3071*	3135*	3200*	3268*	3334*					
KIPAR2	003304	385*												
KIPAR3	003306	386*												
KIPAR4	003310	387*												
KIPAR5	003312	388*												
KIPAR6	003314	389*												
KIPAR7	003316	390*	3434*											
KIPDR0	003240	367*	407											
KIPDR1	003242	368*	478	543	606	667	730	791	853	913	971	1027	1083	1142
		1202	1262	1323	1383	1449	1509	1570	1631	1693	1754	1816	1877	1951
		2009	2063	2121	2179	2237	2295	2353	2415	2480	2537	2599	2656	2726
		2786	2852	2917	3430*	3432*								
KIPDR2	003244	369*	2950*	2975	3008*	3033	3073*	3101	3137*	3162	3202*	3231	3270*	3295
		3336*	3365											
KIPDR3	003246	370*												
KIPDR4	003250	371*												
KIPDR5	003252	372*												
KIPDR6	003254	373*												
KIPDR7	003256	374*												
KSTACK	001000	284*	426	444	505	571	632	695	756	818	878	938	994	1048
		1107	1167	1227	1288	1348	1411*	1416	1476	1537	1598	1660	1721	1783
		1844	1904*	1917	1975	2033	2091	2149	2207	2265	2323	2380	2442	2508
		2566	2625	2687	2755	2817	2883	2941	2999	3062	3126	3192	3260	3326
		3445												
KTSTA	003036	301*	452*	493	494*	513*	559	560*	579*	620	621*	640*	682	683*
		703*	744	745*	764*	805	806*	826*	866	867*	886*	926	927*	946*
		982	983*	1002*	1036	1037*	1056*	1095	1096*	1115*	1154	1155*	1175*	1215
		1216*	1235*	1275	1276*	1296*	1336	1337*	1356*	1396	1397*	1422*	1464	1465*

		1482*	1525	1526*	1543*	1586	1587*	1604*	1647	1648*	1666*	1709	1710*	1727*
		1770	1771*	1789*	1832	1833*	1850*	1893	1894*	1925*	1963	1964*	1983*	2021
		2022*	2041*	2078	2079*	2099*	2136	2137*	2157*	2194	2195*	2215*	2252	2253*
		2273*	2310	2311*	2331*	2368	2369*	2388*	2430	2431*	2450*	2496	2497*	2515*
		2554	2555*	2574*	2613	2614*	2633*	2675	2676*	2695*	2743	2744*	2763*	2805
		2806*	2825*	2871	2872*	2891*	2929	2930*	2952*	2986	2997*	3010*	3050	3051*
		3075*	3114	3115*	3139*	3180	3181*	3204*	3248	3249*	3272*	3314	3315*	3338*
		3384	3385*											
KTVEC	003034	300#	451*	493*	512*	559*	578*	620*	639*	682*	702*	744*	763*	805*
		825*	866*	885*	926*	945*	982*	1001*	1036*	1055*	1095*	1114*	1154*	1174*
		1215*	1234*	1275*	1295*	1336*	1355*	1396*	1421*	1464*	1481*	1525*	1542*	1586*
		1603*	1647*	1665*	1709*	1726*	1770*	1788*	1832*	1849*	1893*	1924*	1963*	1982*
		2021*	2040*	2078*	2098*	2136*	2156*	2194*	2214*	2252*	2272*	2310*	2330*	2368*
		2387*	2430*	2449*	2496*	2514*	2554*	2573*	2613*	2632*	2675*	2694*	2743*	2762*
		2805*	2824*	2871*	2890*	2929*	2951*	2986*	3009*	3050*	3074*	3114*	3138*	3180*
		3203*	3248*	3271*	3314*	3337*	3384*							
		3396#												
LOGIC	022206	247#												
NOP =	000240	418#	434*	1899*	1900	1902	1907*							
NRCNT	003402	419#	1904											
NRKEYS	003404	1901	1907#											
NXTST	012616	952	956#											
OK11	006056	1008	1012#											
OK12	006310	1931	1935#											
OK31	012734	1989	1993#											
OK32	013166	2395	2399#											
OK41	015222	2897	2901#											
OK51	017524	403#												
PARTAB	003346	3576#	3579											
PATCH1=	000300	3577#	3580											
PATCH2=	000000	3578#	3581											
PATCH3=	000000	257#	3574*											
PC =	000007	400#												
PDRTAB	003340	3528*	3535*	3549	3551*	3556*	3562#							
PRFLG	023214	3490#	3582											
PRINT	022622	3500	3505	3521	3526#									
PROCT	023004	3519*	3526*	3536	3543*	3561#								
PRFLG	023212	3519#												
PRSHRT	022752	259#	260	425*	427*	429*	431*	443*	496*	504*	562*	570*	623*	631*
PS =	177776	685*	694*	747*	755*	808*	817*	869*	877*	929*	937*	985*	993*	1039*
		1047*	1098*	1106*	1157*	1166*	1218*	1226*	1278*	1287*	1339*	1347*	1399*	1415*
		1467*	1475*	1528*	1536*	1589*	1597*	1650*	1659*	1712*	1720*	1773*	1782*	1835*
		1843*	1896*	1916*	1966*	1974*	2024*	2032*	2081*	2090*	2139*	2148*	2197*	2206*
		2255*	2264*	2313*	2322*	2371*	2379*	2433*	2441*	2499*	2507*	2557*	2565*	2616*
		2624*	2678*	2686*	2746*	2754*	2808*	2816*	2874*	2882*	2932*	2940*	2989*	2998*
		3053*	3061*	3117*	3125*	3183*	3191*	3251*	3259*	3317*	3325*	3387*	3444*	3446*
		3448*	3450*	3470*	3472*	3490*	3497*							
PTEMP1	023216	3499*	3504*	3520	3530	3533*	3534*	3553*	3554*	3555*	3557	3563#		
PTEMP2	023220	3529*	3532*	3538	3542	3557*	3558*	3559*	3564#					
PTEMP3	023222	3527*	3544*	3545	3565#									
P. CK	023054	3536#	3560											
P. CNT1	023130	3546	3548#											
P. CONT	023112	3539	3544#											
P. WAIT	023072	3537	3540#	3541										
RETRN	022470	3452*	3453*	3457	3459	3460#								
RETURN	022620	433*	1905*	1908*	3456*	3476	3478*	3485#						





SIPAR1	003202	352*												
SIPAR2	003204	353*												
SIPAR3	003206	354*												
SIPAR4	003210	355*												
SIPAR5	003212	356*												
SIPAR6	003214	357*												
SIPAR7	003216	358*												
SIPDR0	003140	335*	409											
SIPDR1	003142	336*												
SIPDR2	003144	337*												
SIPDR3	003146	338*												
SIPDR4	003150	339*												
SIPDR5	003152	340*												
SIPDR6	003154	341*												
SIPDR7	003156	342*												
SP	=%000006	256*	426*	428*	430*	444*	446*	450	505*	507*	511	571*	573*	577
		632*	634*	638	695*	697*	701	756*	758*	762	818*	820*	824	878*
		880*	884	938*	940*	944	994*	996*	1000	1048*	1050*	1054	1107*	1109*
		1113	1167*	1169*	1173	1227*	1229*	1233	1288*	1290*	1294	1348*	1350*	1354
		1416*	1476*	1537*	1598*	1660*	1721*	1783*	1844*	1917*	1919*	1923	1975*	1977*
		1981	2033*	2035*	2039	2091*	2093*	2097	2149*	2151*	2155	2207*	2209*	2213
		2265*	2267*	2271	2323*	2325*	2329	2380*	2382*	2386	2442*	2444*	2448	2508*
		2510*	2566*	2568*	2572	2625*	2627*	2631	2687*	2689*	2693	2755*	2757*	2761
		2817*	2819*	2823	2883*	2885*	2889	2941*	2943*	2946	2999*	3001*	3004	3062*
		3064*	3067	3126*	3128*	3131	3192*	3194*	3197	3260*	3262*	3265	3326*	3328*
		3331	3432	3433	3445*	3447*	3449*	3569						
SR	= 177570	258*	442*	503*	569*	630*	693*	754*	816*	876*	936*	992*	1046*	1105*
		1165*	1225*	1286*	1346*	1414*	1474*	1535*	1596*	1658*	1719*	1781*	1842*	1915*
		1973*	2031*	2089*	2147*	2205*	2263*	2321*	2378*	2440*	2506*	2564*	2623*	2685*
		2753*	2815*	2881*	2939*	2997*	3060*	3124*	3190*	3258*	3324*	3452	3463	3465
		3473	3475	3479	3481	3491	3506							
SRO	003024	296*	445*	456*	459*	462	463*	489*	495*	506*	521*	523*	527	528*
		561*	572*	584*	586*	589	590*	622*	633*	645*	647*	650	651*	684*
		696*	708*	710*	713	714*	746*	757*	769*	771*	774	775*	807*	819*
		831*	833*	836	837*	868*	879*	891*	893*	896	897*	928*	939*	950*
		953*	956	957*	979*	984*	995*	1006*	1009*	1012	1013*	1034*	1038*	1049*
		1061*	1063*	1066	1067*	1097*	1108*	1120*	1122*	1125	1126*	1156*	1168*	1180*
		1182*	1185	1186*	1217*	1228*	1240*	1242*	1245	1246*	1277*	1289*	1301*	1303*
		1306	1307*	1338*	1349*	1361*	1363*	1366	1367*	1398*	1417*	1427*	1429*	1432
		1433*	1466*	1477*	1489*	1491*	1495	1496*	1527*	1538*	1548*	1550*	1553	1554*
		1588*	1599*	1609*	1611*	1614	1615*	1649*	1661*	1671*	1673*	1676	1677*	1711*
		1722*	1732*	1734*	1737	1738*	1772*	1784*	1794*	1796*	1799	1800*	1834*	1845*
		1855*	1857*	1860	1861*	1895*	1918*	1929*	1932*	1935	1936*	1960*	1965*	1976*
		1987*	1990*	1993	1994*	2018*	2023*	2034*	2045*	2047	2048*	2075*	2080*	2092*
		2103*	2105	2106*	2133*	2138*	2150*	2161*	2163	2164*	2191*	2196*	2208*	2219*
		2221	2222*	2249*	2254*	2266*	2277*	2279	2280*	2307*	2312*	2324*	2335*	2337
		2338*	2365*	2370*	2381*	2392*	2396*	2399	2400*	2426*	2432*	2443*	2458*	2460*
		2464	2465*	2498*	2509*	2520*	2522	2523*	2552*	2556*	2567*	2579*	2581*	2584
		2585*	2615*	2626*	2637*	2640	2641*	2671*	2677*	2688*	2703*	2706*	2710	2711*
		2745*	2756*	2767*	2770	2771*	2801*	2807*	2818*	2829*	2832*	2836	2837*	2873*
		2884*	2895*	2898*	2901	2902*	2926*	2931*	2942*	2956*	2960	2961*	2984*	2988*
		3000*	3015*	3018	3019*	3048*	3052*	3063*	3080*	3083*	3086	3087*	3116*	3127*
		3143*	3146	3147*	3176*	3182*	3193*	3208*	3211*	3215	3216*	3250*	3261*	3276*
		3279	3280*	3310*	3316*	3327*	3342*	3345*	3349	3350*	3386*	3404*	3413*	
SPJH	003372	414*												
SR1	003026	297*	470	535	596	657	720	781	843	903	963	1019	1073	1132





741	777	782	787	792	797	802	839	844	849	854	858	863
899	904	909	914	918	923	959	964	967	968	972	976	1015
1020	1023	1024	1028	1031	1069	1074	1079	1084	1088	1092	1128	1133
1138	1143	1147	1151	1188	1193	1198	1203	1207	1212	1248	1253	1258
1263	1267	1272	1309	1314	1319	1324	1328	1333	1369	1374	1379	1384
1388	1393	1435	1440	1446	1452	1458	1462	1498	1502	1506	1512	1518
1522	1556	1561	1566	1573	1579	1583	1617	1622	1627	1634	1640	1644
1679	1684	1689	1696	1702	1706	1740	1745	1750	1757	1763	1767	1802
1807	1812	1819	1825	1829	1863	1868	1873	1880	1886	1890	1938	1944
1947	1948	1952	1956	1996	2002	2005	2006	2010	2014	2050	2056	2059
2060	2064	2068	2072	2108	2114	2117	2118	2122	2126	2130	2166	2172
2175	2176	2180	2184	2188	2224	2230	2232	2234	2238	2242	2246	2282
2288	2291	2292	2296	2300	2304	2340	2346	2349	2350	2354	2358	2362
2402	2408	2411	2412	2416	2421	2467	2473	2476	2477	2481	2486	2491
2525	2531	2534	2535	2538	2543	2548	2587	2593	2596	2597	2600	2605
2610	2643	2649	2652	2653	2657	2662	2667	2713	2719	2722	2723	2727
2732	2737	2741	2773	2779	2782	2783	2787	2792	2797	2839	2845	2848
2849	2853	2858	2863	2867	2904	2910	2913	2914	2918	2922	2958	2963
2968	2971	2972	2976	2980	3021	3027	3030	3031	3034	3039	3044	3089
3095	3098	3099	3102	3107	3111	3149	3155	3158	3159	3163	3168	3172
3218	3224	3227	3228	3232	3237	3242	3246	3282	3288	3291	3292	3296
3301	3306	3352	3358	3361	3362	3366	3371	3376	3380	3474	3480	3492
3502	3507	3523	3531	3550	3587	3593	3596					



.SRAND	10
.SRODE	10
.SROOC	10
.SRERO	10
.SRERZ	10
.SSAVM	10
.SSBZO	10
.SSBZO	10
.SSCOP	10
.SSIFM	10
.SSUPR	10
.STRAP	10
.STYBE	10
.STYPO	10
.STYPE	10
.STYPC	10
.SHOCP	10
.1170	10

ADC	3535	3556																
ADG	2638	2704	3144	3209	3419	3453	3573											
ASL	1903																	
BEG	458	465	471	475	479	484	530	536	540	544	549	554	592	597	602			
	627	612	617	653	658	663	668	673	679	716	721	726	731	736	741			
	777	782	787	792	797	802	839	844	849	854	858	653	899	904	909			
	914	918	923	952	959	964	968	972	976	1008	1015	1020	1024	1028	1031			
	1069	1074	1079	1084	1088	1092	1128	1133	1138	1143	1147	1151	1188	1193	1198			
	1203	1207	1212	1248	1253	1258	1263	1267	1272	1309	1314	1319	1324	1328	1333			
	1369	1374	1379	1384	1388	1393	1435	1440	1446	1452	1458	1462	1498	1502	1506			
	1512	1518	1522	1556	1561	1566	1573	1579	1583	1617	1622	1627	1634	1640	1644			
	1679	1684	1689	1696	1702	1706	1740	1745	1750	1757	1763	1767	1802	1807	1812			
	1819	1825	1829	1863	1868	1873	1880	1886	1890	1901	1931	1938	1944	1948	1952			
	1956	1989	1996	2002	2006	2010	2014	2050	2056	2060	2064	2068	2072	2108	2114			
	2118	2122	2126	2130	2166	2172	2176	2180	2184	2188	2224	2230	2234	2238	2242			
	2246	2282	2288	2292	2296	2300	2304	2340	2346	2350	2354	2358	2362	2395	2402			
	2408	2412	2416	2421	2467	2473	2477	2481	2486	2491	2525	2531	2535	2538	2543			
	2548	2587	2593	2597	2600	2605	2610	2643	2649	2653	2657	2662	2667	2713	2719			
	2723	2727	2732	2737	2741	2773	2779	2783	2787	2792	2797	2839	2845	2849	2953			
	2858	2863	2867	2897	2904	2910	2914	2918	2922	2958	2963	2968	2972	2976	2980			
	3021	3027	3031	3034	3039	3044	3089	3095	3099	3102	3107	3111	3149	3155	3159			
	3163	3168	3172	3218	3224	3228	3232	3237	3242	3246	3282	3288	3292	3296	3301			
	3306	3352	3358	3362	3366	3371	3376	3380	3394	3474	3480	3492	3537	3539	3550			
BIC	489	586	710	714	771	775	979	1034	1063	1182	1186	1242	1246	1450	1456			
	1510	1516	1550	1571	1577	1632	1638	1673	1677	1694	1700	1734	1738	1755	1761			
	1817	1823	1878	1884	1960	2018	2075	2133	2191	2222	2249	2307	2365	2426	2552			
	2671	2801	2926	2984	3048	3176	3310	3558										
BIS	708	769	831	891	1180	1240	1301	1361	1671	1732	1794	1855	1987	3432	3433			
	3559																	
BIT	3463	3465	3473	3479	3491													
BLE	3421																	
BME	3464	3466	3521	3546														
BPL	3468	3502	3507	3523	3531	3541	3587	3593	3596									
BR	461	488	525	588	649	712	773	835	895	955	978	1011	1033	1065	1124			
	1184	1244	1305	1365	1431	1493	1552	1613	1675	1736	1798	1859	1934	1959	1992			
	2017	2074	2132	2190	2248	2306	2364	2398	2425	2462	2551	2583	2670	2708	2800			
	2834	2900	2925	2983	3047	3085	3175	3213	3309	3347	3493	3560						
CLC	3548																	
CLR	425	431	434	443	445	452	494	495	496	504	506	513	515	560	561			
	562	570	572	579	580	621	622	623	631	633	640	641	683	684	685			
	694	696	703	704	745	746	747	755	757	764	765	806	807	808	817			
	819	826	827	867	868	869	877	879	886	887	927	928	929	937	939			
	946	983	984	985	993	995	1002	1037	1038	1039	1047	1049	1056	1057	1096			
	1097	1098	1106	1108	1115	1116	1155	1156	1157	1166	1168	1175	1176	1216	1217			
	1218	1226	1228	1235	1236	1277	1278	1287	1287	1289	1296	1297	1337	1338	1339			
	1347	1349	1356	1357	1397	1398	1399	1411	1415	1417	1422	1423	1465	1466	1467			
	1475	1477	1482	1484	1526	1527	1528	1536	1538	1543	1544	1587	1588	1589	1597			
	1599	1604	1605	1648	1649	1650	1659	1661	1666	1667	1710	1711	1712	1720	1722			
	1727	1728	1771	1772	1773	1782	1784	1789	1790	1833	1834	1835	1843	1845	1850			
	1851	1894	1895	1896	1907	1916	1918	1925	1964	1965	1966	1974	1976	1983	2022			
	2023	2024	2032	2034	2041	2042	2079	2080	2081	2090	2092	2099	2100	2137	2138			
	2139	2148	2150	2157	2158	2195	2196	2197	2206	2208	2215	2216	2253	2254	2255			
	2264	2266	2273	2274	2311	2312	2313	2322	2324	2331	2332	2369	2370	2371	2379			
	2381	2388	2431	2432	2433	2441	2443	2450	2452	2497	2498	2499	2507	2509	2515			
	2516	2555	2556	2557	2565	2567	2574	2575	2614	2615	2616	2624	2626	2633	2676			
	2677	2678	2686	2688	2695	2697	2744	2745	2746	2754	2756	2763	2764	2806	2807			

	2808	2816	2818	2825	2872	2873	2874	2882	2884	2891	2930	2931	2932	2940	2942
	2952	2987	2988	2989	2998	3000	3010	3011	3051	3052	3053	3061	3063	3075	3076
	3115	3116	3117	3125	3127	3139	3181	3182	3183	3191	3193	3204	3249	3250	3251
	3259	3261	3272	3273	3315	3316	3317	3325	3327	3328	3385	3386	3387	3404	3405
	3427	3413	3416	3444	3450	3455	3458	3477	3526	3527	3528	3543	3551		
CLRB	523	1491	2164	2460	2706	2832	3211	3345	3572						
OMP	457	464	470	474	478	483	529	535	539	543	548	553	591	596	601
	606	611	652	657	662	667	672	715	720	725	730	735	776	781	786
	791	796	838	843	848	853	857	898	903	908	913	917	951	958	963
	967	971	975	1007	1014	1019	1023	1027	1030	1068	1073	1078	1083	1087	1127
	1132	1137	1142	1146	1187	1192	1197	1202	1206	1247	1252	1257	1262	1265	1308
	1313	1318	1323	1327	1368	1373	1378	1383	1387	1434	1439	1445	1451	1457	1497
	1501	1505	1511	1517	1555	1560	1565	1572	1578	1616	1621	1626	1633	1639	1678
	1683	1688	1695	1701	1739	1744	1749	1756	1762	1801	1806	1811	1818	1824	1862
	1867	1872	1879	1885	1900	1930	1937	1943	1947	1951	1955	1988	1995	2001	2005
	2009	2013	2049	2055	2059	2063	2067	2071	2107	2113	2117	2121	2125	2129	2165
	2171	2175	2179	2183	2187	2223	2229	2233	2237	2241	2245	2281	2287	2291	2295
	2299	2303	2339	2345	2349	2353	2357	2361	2393	2401	2407	2411	2415	2420	2466
	2472	2476	2480	2485	2490	2524	2530	2534	2537	2542	2547	2586	2592	2596	2599
	2604	2609	2642	2648	2652	2656	2661	2712	2718	2722	2726	2731	2740	2772	2778
	2782	2786	2791	2796	2838	2844	2848	2852	2857	2862	2866	2896	2903	2909	2913
	2917	2921	2957	2962	2967	2971	2975	2979	3020	3026	3030	3033	3038	3043	3088
	3094	3098	3101	3106	3110	3148	3154	3158	3162	3167	3217	3223	3227	3231	3236
	3245	3281	3287	3291	3295	3300	3305	3351	3357	3361	3365	3370	3375	3379	3420
	3467	3471	3498	3538	3545										
DEC	459	528	590	647	651	833	837	893	897	953	1009	1013	1067	1126	1303
	1307	1363	1367	1429	1496	1554	1615	1796	1800	1957	1861	1932	1990	2396	2465
DECE	2523	2585	2711	2837	2898	2961	3019	3087	3216	3350					
	463	957	1122	1433	1611	1936	1994	2048	2106	2278	2280	2336	2338	2400	2581
	2641	2771	2902	3083	3147	3280									
HALT	267	3451	3454	3508											
INC	456	709	770	950	1181	1241	1427	1672	1733	1899	1929	2045	2161	2162	2220
	2277	2392	2637	2767	2895	3143	3276	3469	3532	3544					
INCB	832	892	1302	1362	1795	1856	2768	2830	3277	3343					
JMP	278	280	1906	3401	3457	3459	3476								
JSR	447	508	574	635	698	759	821	881	941	997	1051	1110	1170	1230	1291
	1351	1418	1478	1539	1600	1662	1723	1785	1846	1920	1978	2036	2094	2152	2210
	2258	2326	2383	2445	2511	2569	2628	2690	2758	2820	2886	2944	3002	3065	3129
	3195	3263	3329	3391	3396	3429	3498	3500	3505						
MOV	426	427	428	429	430	432	433	435	442	444	446	451	453	454	462
	493	503	505	507	512	514	519	521	522	527	553	569	571	573	578
	582	585	589	620	630	632	634	639	643	645	646	650	682	693	695
	697	702	706	713	744	754	756	758	763	767	774	805	816	818	820
	825	829	836	866	876	878	880	885	889	896	926	936	938	940	945
	947	948	956	982	992	994	996	1001	1003	1004	1006	1012	1036	1046	1048
	1050	1055	1059	1062	1066	1095	1105	1107	1109	1114	1118	1120	1121	1125	1154
	1165	1167	1169	1174	1178	1185	1215	1225	1227	1229	1234	1238	1245	1275	1286
	1288	1290	1295	1299	1306	1336	1346	1348	1350	1355	1359	1366	1396	1414	1416
	1421	1424	1425	1428	1432	1449	1455	1464	1474	1476	1481	1483	1487	1489	1490
	1495	1509	1515	1525	1535	1537	1542	1546	1549	1553	1570	1576	1586	1596	1598
	1603	1607	1609	1610	1614	1631	1637	1647	1658	1660	1665	1669	1676	1693	1699
	1709	1719	1721	1726	1730	1737	1754	1760	1770	1781	1783	1788	1792	1799	1816
	1822	1832	1842	1844	1849	1853	1860	1877	1883	1893	1902	1904	1905	1908	1915
	1917	1919	1924	1926	1927	1935	1963	1973	1975	1977	1982	1984	1985	1993	2021
	2031	2033	2035	2040	2043	2046	2047	2078	2089	2091	2093	2098	2101	2103	2104
	2105	2136	2147	2149	2151	2156	2159	2163	2194	2205	2207	2209	2214	2217	2219

	2221	2252	2263	2265	2267	2272	2275	2279	2310	2321	2323	2325	2330	2333	2335
	2337	2368	2378	2380	2382	2387	2389	2390	2393	2430	2440	2442	2444	2449	2451
	2456	2458	2459	2464	2496	2506	2508	2510	2514	2518	2521	2522	2554	2564	2566
	2568	2573	2577	2579	2580	2584	2613	2623	2625	2627	2632	2634	2635	2640	2675
	2685	2687	2689	2694	2696	2701	2703	2710	2743	2753	2755	2757	2762	2765	2770
	2805	2815	2817	2819	2824	2826	2827	2829	2836	2871	2881	2893	2885	2890	2892
	2893	2901	2929	2939	2941	2943	2947	2948	2949	2950	2951	2953	2954	2956	2960
	2986	2997	2999	3001	3005	3006	3007	3008	3009	3013	3016	3018	3050	3060	3062
	3064	3070	3071	3072	3073	3074	3078	3080	3081	3086	3114	3124	3126	3128	3134
	3135	3136	3137	3138	3140	3141	3146	3180	3190	3192	3194	3199	3200	3201	3202
	3203	3205	3206	3208	3215	3248	3258	3260	3262	3267	3268	3269	3270	3271	3274
	3279	3314	3324	3326	3328	3333	3334	3335	3336	3337	3339	3340	3342	3349	3384
	3393	3406	3414	3415	3417	3430	3431	3434	3435	3445	3446	3447	3448	3449	3452
	3456	3470	3472	3478	3490	3494	3495	3497	3499	3503	3504	3519	3524	3529	3542
	3557	3569	3571	3574	3588	3594	3597								
MOV8	584	1061	1548	2520	3015	3475	3481								
POP	3397	3398	3399												
RESET	3395														
ROL	3533	3534	3553	3554	3555										
RTI	3482	3509													
RTS	3410	3422	3436	3525	3547	3589	3598								
SEC	3552														
SQB	3409	3418													
SUB	3570														
TRAP	246														
TST	450	511	577	616	638	678	701	740	762	801	824	862	884	922	944
	1000	1054	1091	1113	1150	1173	1211	1233	1271	1294	1332	1354	1392	1461	1521
	1582	1643	1705	1766	1828	1889	1923	1981	2039	2097	2155	2213	2271	2329	2386
	2448	2572	2631	2666	2693	2736	2761	2823	2889	2946	3004	3067	3131	3171	3197
	3241	3265	3331	3408	3506	3520	3530	3536	3549						
TSTB	3501	3522	3540	3586	3592	3595									
.ABS	1														
.ENABL	1														
.END	3599														
.LIST	1	267	423	442	503	569	630	693	754	816	876	936	992	1046	1105
	1165	1225	1286	1346	1414	1474	1535	1596	1658	1719	1781	1842	1915	1973	2031
	2089	2147	2205	2263	2321	2378	2440	2506	2564	2623	2685	2753	2815	2881	2939
	2997	3060	3124	3190	3258	3324									
.MACF	423	687	810	1159	1280	1652	1775								
.MACRO	1														
.NLIST	1	267	423	442	503	569	630	693	754	816	876	936	992	1046	1105
	1165	1225	1286	1346	1414	1474	1535	1596	1658	1719	1781	1842	1915	1973	2031
	2089	2147	2205	2263	2321	2378	2440	2506	2564	2623	2685	2753	2815	2881	2939
	2997	3060	3124	3190	3258	3324									
.REM	1														
.REPT	267														
.TITLE	1														
.WORD	289														

ERRORS DETECTED: 0  
DEFAULT GLOBALS GENERATED: 0

\*,DCKTCA.SEG/SOL/CRF/PAGNUM/NL:TOC=SYSMAC.CO,DCKTCA

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DCKTCA CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

RUN-TIME: 33 45 5 SECONDS  
RUN-TIME RATIO: 169/84=2.0  
CORE USED: 36k (71 PAGES)

