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IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DCKTB-B
PRODUCT NAME: KT11-C BASIC LOGIC TEST TWO
DATE CREATED: 15 APRIL 1972
MAINTAINER: DIAGNOSTIC GROUP
AUTHOR: RICK FADDEN

1.0 ABSTRACT

THIS PROGRAM AND THE PREVIOUS ONE (DCKTA) INCREMENTALLY TEST THE BASIC LOGIC FUNCTIONS OF THE KT11-C MEMORY MANAGEMENT OPTION FOR THE PDP-11/45. THEY FULLY TEST RELOCATION, DIRECT AND INDIRECT ADDRESSING OF THE MEMORY MANAGEMENT REGISTERS, AND CORRECT OPERATION OF ALL THE BITS IN THE REGISTERS. THE VARIOUS ABORTS ARE TESTED, AS IS PROPER "LOCKING" AND "UNLOCKING" OF THE ERROR TRACKING LOGIC.

2.0 REQUIREMENTS

2.1 EQUIPMENT

PDP-11/45 WITH KT11-C OPTION

2.2 STORAGE

THE PROGRAM REQUIRES MEMORY LOCATIONS 0 TO 17474.

3.0 LOADING PROCEDURE

LOAD PROGRAM INTO MEMORY USING ABS LOADER.

4.0 STARTING PROCEDURE

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.

5.0 OPERATING PROCEDURE

5.1 OPERATIONAL SWITCH SETTINGS

SW 15=1 OR UP -- HALT ON ERROR
SW 14=1 OR UP -- SCOPE LOOP
SW 13=1 OR UP -- INHIBIT PRINTOUT
SW 11=1 OR UP -- INHIBIT ITERATIONS
SW 08=1 OR UP -- LOAD MICROBREAK REGISTER WITH VALUE IN
SW 00-07.

5.2 SUBROUTINE ABSTRACTS

5.2.1 SCOPE

THIS SUBROUTINE CALL IS PLACED BETWEEN EACH SUBTEST. IT RECORDS THE STARTING ADDRESS OF EACH SUBTEST 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 ENT 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 EMTSRV (EMT DECODER)

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

5.2.5 CLRALL

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

5.2.6 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.

5.2.7 RWISP

THIS ROUTINE MAPS ALL I-SPACE PAGES RW,4K, BANK 0.

5.2.8 RWDSP

THIS ROUTINE MAPS ALL D-SPACE PAGES RW,4K, BANK 0.

5.3 PROGRAM AND/OR OPERATOR ACTION

THIS TEST CONTINUES THE SERIES OF TESTS OF THE KT11-C OPTION STARTED IN MAINDEC-11-DCKTA. NO OPERATOR INTERVENTION IS REQUIRED. THE BELL IS RUNG AT THE END OF EACH PASS, AND THE CURRENT SUBTEST NUMBER IS DISPLAYED IN THE DISPLAY REGISTER.

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.

6.3 BRANCH SELF

A BRANCH TO SELF IS USED IN THE KT11-C DIAGNOSTICS TO INDICATE A FAILURE WHEN A HALT OR A HLT TRAP CALL COULD CAUSE A PROBLEM.

7.0 RESTRICTIONS

PROGRAM MUST BE LOADED INTO LOWER 4K OF MEMORY.

8.0 MISCELLANEOUS

8.1 EXECUTION TIME

EACH PASS TAKES APPROXIMATELY 1 MINUTE WITH CORE MEMORY.

8.2 STACK POINTERS

THE KERNEL STACK POINTER IS USUALLY INITIALIZED TO 1000. HOWEVER, IN CERTAIN TESTS IT MAY BE INITIALIZED TO A LOWER ADDRESS (VIRTUAL) TO MAKE UP FOR RELOCATION OF THE BANK.

THE SUPERVISOR STACK POINTER IS INITIALIZED TO 2000.

THE USER STACK POINTER IS INITIALIZED TO 3000.

8.3 DISPLAY REGISTER

THE NUMBER OF THE CURRENT SUBTEST IS DISPLAYED.

8.4 EXECUTION ORDER CHECKING

SINCE THE KT11-C MAY CAUSE AN INCORRECT FETCH IF IT IS NOT WORKING CORRECTLY, THE ORDER OF EXECUTION OF ALL SUBTESTS IS CHECKED. THE SCOPE ROUTINE, WHEN IT CHANGES FROM ONE SUBTEST TO THE NEXT, INCREMENTS A COUNTER CALLED TESTCT. AT THE START OF EACH SUBTEST, THIS COUNTER IS CHECKED FOR THE CORRECT VALUE FOR THAT SUBTEST. IF TESTS ARE NOT EXECUTED IN THE CORRECT ORDER, TESTCT WILL NOT CONTAIN THE EXPECTED VALUE, AND AN ERROR PRINTOUT WILL OCCUR.

9.0 PROGRAM DESCRIPTION

THIS PROGRAM COMPLETES THE SERIES OF TESTS OF THE KT11-C OPTION STARTED IN MAINDEC-11-DCKTA (BASIC LOGIC TEST ONE). THE BELL IS RUNG AT THE END OF EACH PASS, AND THE CURRENT SUBTEST NUMBER IS DISPLAYED IN THE DISPLAY REGISTER.

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;SECOND BASIC LOGIC TEST OF KT11-C
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;OPERATING INSTRUCTIONS
;1. LOAD TEST USING THE ABSOLUTE LOADER
;2. LOAD SA 200
;3. SET SR TO INITIAL SETTINGS
;4. PRESS START

;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 SWITCH REGISTER

;DEFINITIONS
;SCOPE=TRAP
;NOP=240
;R0=%0
;R1=%1
;R2=%2
;R3=%3
;R4=%4
;R5=%5
;R6=%6
;R7=%7
;SP=%6
;PC=%7
;SR=177570
;PS=177776

;LOAD TRAP CATCHER INTO 0 THRU 777
;LOAD EACH VECTOR ADDRESS WITH THE ADDRESS OF THE NEXT
;LOCATION, AND LOAD EACH LOCATION IMMEDIATELY FOLLOWING
;A VECTOR ADDRESS WITH A HALT INSTRUCTION
;CODE NOT LISTED TO MAKE LISTING EASIER TO READ

;LOAD VECTOR AREA

000030 000030
000030 015614
000032 000340
000034 000034
000034 015056
000036 000000
000046 000046
000046 014500
000052 000052
000052 040000

.=30
EMTSRV
340
.=34
SCOPEC
0
.=46
LOGIC
.=52
40000

;LOAD STARTING AREA

000200 000200
000200 000167 003216

.=200
JMP START

;LOAD DATA AREA
.=1000

001000

001000	000000	KSTACK: 0	;KERNEL STACK BUFFER AREA
	002000	. = +776	
002000	000000	SSTACK: 0	;SUPERVISOR STACK BUFFER AREA
	003000	. = +776	
003000	000000	USTACK: 0	;USER STACK BUFFER AREA
003002	000000	.WORD 0,0,0,0	
003010	000000		
003012	000200	K200: 200	;CONSTANTS
003014	001000	K1000: 1000	
003016	177564	TCSR: 177564	;TELEPRINTER REGISTERS
003020	177566	TDBR: 177566	
003022	000000	TEMP: 0	;TEMPORARY STORAGE LOCATIONS
003024	000000	TEMPX: 0	
003026	000000	TEMP1: 0	
003030	000000	TEMP2: 0	
003032	177572	SR0: 177572	;KT11-C STATUS REGISTER ADDRESSES
003034	177573	SROH: 177573	
003036	177574	SR1: 177574	
003040	177575	SR1H: 177575	
003042	177576	SR2: 177576	
003044	177577	SR2H: 177577	
003046	172516	SR3: 172516	
003050	172517	SR3H: 172517	
003052		ADRTAB:	
003052	177600	UIPDR0: 177600	;USER I-SPACE PAGE DESCRIPTOR REGISTER ADDRESSES
003054	177602	UIPDR1: 177602	
003056	177604	UIPDR2: 177604	
003060	177606	UIPDR3: 177606	
003062	177610	UIPDR4: 177610	
003064	177612	UIPDR5: 177612	
003066	177614	UIPDR6: 177614	
003070	177616	UIPDR7: 177616	
003072	177620	UDPDR0: 177620	;USER D-SPACE PAGE DESCRIPTOR REGISTER ADDRESSES
003074	177622	UDPDR1: 177622	
003076	177624	UDPDR2: 177624	
003100	177626	UDPDR3: 177626	
003102	177630	UDPDR4: 177630	
003104	177632	UDPDR5: 177632	
003106	177634	UDPDR6: 177634	
003110	177636	UDPDR7: 177636	
003112	177640	UIPAR0: 177640	;USER I-SPACE PAGE ADDRESS REGISTER ADDRESSES
003114	177642	UIPAR1: 177642	
003116	177644	UIPAR2: 177644	
003120	177646	UIPAR3: 177646	
003122	177650	UIPAR4: 177650	
003124	177652	UIPAR5: 177652	
003126	177654	UIPAR6: 177654	
003130	177656	UIPAR7: 177656	
003132	177660	UDPAR0: 177660	;USER D-SPACE PAGE ADDRESS REGISTER ADDRESSES
003134	177662	UDPAR1: 177662	
003136	177664	UDPAR2: 177664	
003140	177666	UDPAR3: 177666	
003142	177670	UDPAR4: 177670	
003144	177672	UDPAR5: 177672	
003146	177674	UDPAR6: 177674	

003150	177676	UDPAR7:	177676
003152	172200	SIPDR0:	172200
003154	172202	SIPDR1:	172202
003156	172204	SIPDR2:	172204
003160	172206	SIPDR3:	172206
003162	172210	SIPDR4:	172210
003164	172212	SIPDR5:	172212
003166	172214	SIPDR6:	172214
003170	172216	SIPDR7:	172216
003172	172220	SDPDR0:	172220
003174	172222	SDPDR1:	172222
003176	172224	SDPDR2:	172224
003200	172226	SDPDR3:	172226
003202	172230	SDPDR4:	172230
003204	172232	SDPDR5:	172232
003206	172234	SDPDR6:	172234
003210	172236	SDPDR7:	172236
003212	172240	SIPAR0:	172240
003214	172242	SIPAR1:	172242
003216	172244	SIPAR2:	172244
003220	172246	SIPAR3:	172246
003222	172250	SIPAR4:	172250
003224	172252	SIPAR5:	172252
003226	172254	SIPAR6:	172254
003230	172256	SIPAR7:	172256
003232	172260	SDPAR0:	172260
003234	172262	SDPAR1:	172262
003236	172264	SDPAR2:	172264
003240	172266	SDPAR3:	172266
003242	172270	SDPAR4:	172270
003244	172272	SDPAR5:	172272
003246	172274	SDPAR6:	172274
003250	172276	SDPAR7:	172276
003252	172300	KIPDR0:	172300
003254	172302	KIPDR1:	172302
003256	172304	KIPDR2:	172304
003260	172306	KIPDR3:	172306
003262	172310	KIPDR4:	172310
003264	172312	KIPDR5:	172312
003266	172314	KIPDR6:	172314
003270	172316	KIPDR7:	172316
003272	172320	KDPDR0:	172320
003274	172322	KDPDR1:	172322
003276	172324	KDPDR2:	172324
003300	172326	KDPDR3:	172326
003302	172330	KDPDR4:	172330
003304	172332	KDPDR5:	172332
003306	172334	KDPDR6:	172334
003310	172336	KDPDR7:	172336
003312	172340	KIPAR0:	172340
003314	172342	KIPAR1:	172342
003316	172344	KIPAR2:	172344
003320	172346	KIPAR3:	172346
003322	172350	KIPAR4:	172350

;SUPERVISOR I-SPACE PAGE DESCRIPTOR REGISTER ADDRESSES

;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

003324	172352	KIPAR5:	172352	
003326	172354	KIPAR6:	172354	
003330	172356	KIPAR7:	172356	
003332	172360	KDPAR0:	172360	;KERNEL D-SPACE PAGE ADDRESS REGISTER ADDRESSES
003334	172362	KDPAR1:	172362	
003336	172364	KDPAR2:	172364	
003340	172366	KDPAR3:	172366	
003342	172370	KDPAR4:	172370	
003344	172372	KDPAR5:	172372	
003346	172374	KDPAR6:	172374	
003350	172376	KDPAR7:	172376	
	003350	ADREND=	.-2	
003352	177600	PDRTAB:	177600	;STARTING ADDRESSES OF PDR'S FOR EACH MODE
003354	172200		172200	
003356	172300		172300	
003360	177640	PARTAB:	177640	;STARTING ADDRESSES OF PAR'S FOR EACH MODE
003362	172240		172240	
003364	172340		172340	
003366	003252	STATAB:	KIPDR0	;ADDRESS OF KERNEL TABLE OF PDR'S AND PAR'S
003370	000000		0	
003372	003152		SIPDR0	;ADDRESS OF SUPERVISOR TABLE OF PDR'S AND PAR'S
003374	040000		40000	
003376	003052		UIPDR0	;ADDRESS OF USER TABLE OF PDR'S AND PAR'S
003400	140000	STAEND:	140000	
003402	000000	STAPNT:	0	
003404	000000	SAVEA:	0	
003406	000000	SAVEB:	0	
003410	000250	KTVEC:	250	;KT11-C TRAP AND ABORT VECTOR ADDRESS
003412	000252	KTSTA:	252	
003414	177770	UBRK:	177770	;MICROBREAK REGISTER ADDRESS
003416	177770	MSKB:	177770	
003420	000000	TESTCT:	0	;INDICATES NUMBER OF CURRENT TEST
003422	005037	177776	:SET UP FOR START OF BASIC LOGIC TESTS	
003426	012706	001000	START: CLR @#PS ;INITIALIZE STATUS	
003432	012737	040000	MOV #KSTACK,SP ;SETUP KERNEL STACK	
003440	012706	002000	MOV #40000,@#PS ;INITIALIZE SUPERVISOR STACK	
003444	012737	140000	MOV #SSTACK,SP	
003452	012706	003000	MOV #140000,@#PS ;INITIALIZE USER STACK	
003456	005037	177776	MOV #USTACK,SP	
003462	012767	002000	CLR @#PS	
003470	012767	003510	MOV #2000,ICOUNT ;INITIALIZE ITERATION COUNT	
003476	012767	000001	MOV #TEST1+2,RETURN ;SETUP SCOPE AND ITERATION LOOP RETURN	
003504	000401		MOV #1,TESTCT ;INITIALIZE TEST COUNTER	
			BR .+4 ;SKIP SCOPE INSTRUCTION	
003506	104400		:SHOW THAT INIT CLEARS SR0<9,11-15>	
003510	012737	000001	TEST1: SCOPE	
003516	005037	177776	MOV #1,@#SR ;DISPLAY TEST NUMBER	
003522	012706	001000	CLR @#PS ;INITIALIZE PROCESSOR STATUS	
003526	005077	177314	MOV #KSTACK,SP ;INITIALIZE KERNEL STACK POINTER	
			CLR @SR3 ;INITIALIZE SR3	

003532	005077	177274		CLR	SR0	; INITIALIZE SR0
003536	026727	177656	000001	CMP	TESTCT, #1	; IS THIS TEST BEING EXECUTED IN THE
003544	001401			BEQ	.+4	; CORRECT SEQUENCE? - BRANCH IF YES
003546	104006			HLT		; TEST EXECUTED OUT OF ORDER - TESTCT
						; CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE
003550	112777	000372	177256	MOVB	#372, SR0H	; SET SR0 BITS 9,11-15
003556	122777	000372	177250	CMPB	#372, SR0H	; MAKE SURE THEY SET CORRECTLY
003564	001401			BEQ	.+4	
003566	104006			HLT		; SR0 INCORRECT (HIGH BYTE)
003570	105777	177222		TSTB	ATCSR	; WAIT FOR TTY READY
003574	100375			BPL	.-4	
003576	000005			RESET		; ISSUE INIT
003600	122777	000000	177226	CMPB	#0, SR0H	; CHECK SR0 HIGH BYTE
003606	001401			BEQ	.+4	
003610	104006			HLT		; SR0 INCORRECT AFTER INIT
003612	012767	000010	011364	MOV	#10, ICOUNT	; DROP ITERATION COUNT

SHOW THAT IF AN INSTRUCTION IS COMPLETED BEFORE A MEMORY MANAGEMENT FAULT OCCURS, BIT 7 OF SR0 WILL BE SET ("INSTRUCTION COMPLETE") AND SR2 WILL CONTAIN THE ADDRESS OF THE VECTOR REFERENCE THAT ABORTED TO TEST THIS, TRACE TRAP IS USED. THE VECTOR IS MADE NON-RESIDENT BY MAKING KERNEL PAGE 0 READ/WRITE, MAPPED DOWN FROM 17776 TO 100. THUS THE MEMORY MANAGEMENT VECTOR IS RESIDENT WHILE THE TRACE TRAP VECTOR IS OUTSIDE THE ALLOWED PAGE LENGTH. ALL D-SPACES ARE ENABLED.

003620	104400			TEST2:	SCOPE	
003622	012737	000002	177570	MOV	#2, SR	; DISPLAY TEST NUMBER
003630	005037	177776		CLR	PS	; INITIALIZE PROCESSOR STATUS
003634	012706	001000		MOV	#KSTACK, SP	; INITIALIZE KERNEL STACK POINTER
003640	005077	177202		CLR	SR3	; INITIALIZE SR3
003644	005077	177162		CLR	SR0	; INITIALIZE SR0
003650	026727	177544	000002	CMP	TESTCT, #2	; IS THIS TEST BEING EXECUTED IN THE
003656	001401			BEQ	.+4	; CORRECT SEQUENCE? - BRANCH IF YES
003660	104006			HLT		; TEST EXECUTED OUT OF ORDER - TESTCT
						; CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE
003662	004767	010656		JSR	%7, RWALL	; INITIALIZE ALL PAGES RW, 4K, BANK 0
003666	012777	000416	177376	MOV	#416, KDPDR0	; MAP KERNEL D- SPACE PAGE 0 TO EXCLUDE
						; LOCATIONS 0 TO 77
003674	012777	007600	177446	MOV	#7600, KDPAR7	; MAP KERNEL D- SPACE PAGE 7 TO THE
						; EXTERNAL BANK
003702	012777	000007	177136	MOV	#7, SR3	; ENABLE D-SPACES
003710	012777	003756	177472	MOV	#RET2, KTVEC	; SETUP MEMORY MANAGEMENT ABORT RETURN
003716	005077	177470		CLR	KTSTA	
003722	012746	000020		MOV	#20, -(SP)	; PREPARE STACK TO TURN ON T-BIT
003726	012746	003734		MOV	#.+6, -(SP)	
003732	000006			RTT		; SET T-BIT VIA RTT
003734	012777	000001	177070	MOV	#1, SR0	; TURN ON KT11-C - SHOULD
						; ATTEMPT TO TRACE TRAP AT END OF
						; INSTRUCTION - SHOULD GET A PAGE
						; LENGTH ERROR ON THAT ATTEMPT
						; NO PAGE LENGTH ERROR ON TRACE TRAP
						; SETUP TO CLEAR T-BIT
003742	000000			HALT		
003744	005046			CLR	-(SP)	
003746	012746	003754		MOV	#.+6, -(SP)	
003752	000006			RTT		; CLEAR T-BIT
003754	000422			BR	CONT2	

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003756	042777	000001	177046	RET2:	BIC	#1,SR0	;TURN OFF KT11-C
003764	022777	040220	177040		CMP	#40220,SR0	;CK SR0
003772	001401				BEQ	+.4	
003774	104006				HLT		;SR0 INCORRECT - SHOULD SHOW PL FAULT
							;KERNEL 0 D-SPACE REFERENCE
							;AND INSTRUCTION WAS COMPLETED
003776	022777	000000	177032		CMP	#0,SR1	;CK SR1
004004	001401				BEQ	+.4	
004006	104006				HLT		;SR1 INCORRECT - INSTRUCTION WAS COMPLETED
							;SO SR1 SHOULD CONTAIN ZERO
004010	022777	000014	177024		CMP	#14,SR2	;CK SR2
004016	001401				BEQ	+.4	
004020	104006				HLT		;SR2 INCORRECT - SHOULD CONTAIN
							;ADDRESS OF TRACE TRAP VECTOR WHICH ABORTED
004022	005077	177004		CONT2:	CLR	SR0	;REINITIALIZE SR0
004026	016777	177360	177354		MOV	KTSTA,KTVEC	;RESTORE TRAP CATCHER
004034	005077	177006			CLR	SR3	;DISABLE D-SPACE
004040	104400						;SHOW THAT INIT CLEARS SR0 <7> (INSTRUCTION COMPLETE)
004042	012737	000003	177570	TEST3:	SCOPE		
004050	005037	177776			MOV	#3,SR	;DISPLAY TEST NUMBER
004054	012706	001000			CLR	PS	;INITIALIZE PROCESSOR STATUS
004060	005077	176762			MOV	KTSTACK,SP	;INITIALIZE KERNEL STACK POINTER
004064	005077	176742			CLR	SR3	;INITIALIZE SR3
004070	026727	177324	000003		CLR	SR0	;INITIALIZE SR0
004076	001401				CMP	TESTCT,#3	;IS THIS TEST BEING EXECUTED IN THE
004100	104006				BEQ	+.4	;CORRECT SEQUENCE? - BRANCH IF YES
					HLT		;TEST EXECUTED OUT OF ORDER - TESTCT
							;CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE
004102	004767	010436			JSR	%7,RWALL	;MAP ALL PAGES 4K,RW,BANK 0
004106	012777	000416	177136		MOV	#416,KTIPDR0	;MAP KERNEL 0 RW,4K LESS 1 PAGE
							;DOWN (100-17776 RW)
004114	012777	007600	177206		MOV	#7600,KTIPAR7	;MAP KERNEL PAGE 7 TO THE EXTERNAL BANK
004122	012777	077403	177124		MOV	#77403,KTIPDR1	;MAP KERNEL PAGE 1 NR
004130	012777	004170	177252		MOV	#RET3,KTVEC	;SETUP ABORT RETURN
004136	005077	177250			CLR	KTSTA	
004142	012746	000020			MOV	#20,-(SP)	;SET T BIT IN STATUS ON STACK
004146	012746	004160			MOV	#ADR3,-(SP)	;SETUP ADDRESS ON STACK
004152	005277	176654			INC	SR0	;TURN ON KT11-C
004156	000002				RTI		;SHOULD TRACE TRAP IMMEDIATELY SINCE T-BIT
							;IS SET - SINCE T-BIT VECTOR IS OUTSIDE ALLOWED
							;PAGE LENGTH,SHOULD DO A MEMORY
							;MANAGEMENT ABORT

Address	Instruction	Comments
004160	000000	ADR3: HALT
004162	005037	CLR
004166	000415	BR
004170	022777	040201 176634 RET3: CMP
004176	001401	BEQ
004200	104006	HLT
		;NO PL ABORT OCCURRED
		;RESTORE STATUS
		;CHECK SRO
		;SRO INCORRECT - SHOULD SHOW
		;REFERENCE TO KERNEL I-SPACE 0.
		;INSTRUCTION COMPLETE SHOULD BE SET,
		;AND PL ABORT SHOULD BE SET
		;WAIT FOR ANY TTY OUTPUT TO FINISH
004202	105777	176610 TSTB
004206	100375	BPL
004210	000005	RESET
004212	005777	176614 TST
004216	001401	BEQ
004220	104006	HLT
004222	005077	176604 DONE3: CLR
004226	016777	177160 177154 MOV
004234	012737	000016 000014 MOV
		;SRO INCORRECT AFTER INIT
		;REINITIALIZE SRO
		;RESTORE T-BIT TRAP CATCHER
		;SHOW THAT INIT CLEARS SRO(0-6)
		;REFERENCE NR USER PAGE 7 D-SPACE TO SET ALL BITS(0-6)
		;THEN ISSUE INIT
004242	104400	TEST4: SCOPE
004244	012737	000004 177570 MOV
004252	005037	177776 CLR
004256	012706	001000 MOV
004262	005077	176560 CLR
004266	005077	176540 CLR
004272	026727	177122 000004 CMP
004300	001401	BEQ
004302	104006	HLT
		;DISPLAY TEST NUMBER
		;INITIALIZE PROCESSOR STATUS
		;INITIALIZE KERNEL STACK POINTER
		;INITIALIZE SR3
		;INITIALIZE SRO
		;IS THIS TEST BEING EXECUTED IN THE
		;CORRECT SEQUENCE? - BRANCH IF YES
		;TEST EXECUTED OUT OF ORDER - TESTCT
		;CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE
004304	004767	010234 JSR
004310	012777	077407 176572 MOV
004316	012777	007600 177024 MOV
		;MAP ALL PAGES INITIALLY RW,4K,BANK 0
		;MAKE USER 7 D-SPACE NR
		;MAP KERNEL 7 D-SPACE TO THE
		;EXTERNAL BANK
		;ENABLE ALL D-SPACES
		;SETUP ABORT RETURN
004324	012777	000007 176514 MOV
004332	012777	004370 177050 MOV
004340	005077	177046 CLR
004344	012737	140000 177776 MOV
004352	012706	003000 MOV
004356	005277	176450 INC
004362	005737	160000 TST
004366	000777	BR
		;SET MODE TO USER
		;SETUP USER STACK IN CASE NEEDED
		;TURN ON KT11-C
		;REFERENCE NR PAGE 7
		;NO ABORT ON NR REFERENCE TO USER D-SPACE
		;PAGE 7
		;CHECK SRO
004370	022777	100177 176434 RET4: CMP
004376	001401	BEQ
004400	104006	HLT
		;SRO INCORRECT - SHOULD HAVE LOCKED
		;ON NR REFERENCE TO USER 7 D-SPACE
		;WAIT FOR ANY TTY OUTPUT TO FINISH
004402	105777	176410 TSTB
004406	100375	BPL
004410	000005	RESET
004412	005777	176414 TST
004416	001401	BEQ
004420	104006	HLT
		;ISSUE INIT
		;CHECK SRO
		;SRO INCORRECT AFTER INIT

004422	005077	176404		CLR	2SR0	:REINITIALIZE SR0
004426	012767	000010	010550	MOV	#10,ICOUNT	:DROP ITERATION COUNT
004434	016777	176752	176746	MOV	KTSTA,2KTVEC	
:SHOW THAT BYTE ADDRESSING OF SR0 WORKS						
004442	104400			TEST5:	SCOPE	
004444	012737	000005	177570	MOV	#5,2#SR	:DISPLAY TEST NUMBER
004452	005037	177776		CLR	2#PS	:INITIALIZE PROCESSOR STATUS
004456	012706	001000		MOV	#KSTACK,SP	:INITIALIZE KERNEL STACK POINTER
004462	005077	176360		CLR	2SR3	:INITIALIZE SR3
004466	005077	176340		CLR	2SR0	:INITIALIZE SR0
004472	026727	176722	000005	CMP	TESTCT,#5	:IS THIS TEST BEING EXECUTED IN THE
004500	001401			BEQ	+.4	:CORRECT SEQUENCE? - BRANCH IF YES
004502	104006			HLT		:TEST EXECUTED OUT OF ORDER - TESTCT
						:CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE
004504	004767	010034		JSR	%7,RWALL	:MAP ALL PAGES RW,4K,BANK 0
004510	012777	007600	176612	MOV	#7600,2KIPAR7	:MAP KERNEL 7 TO THE EXTERNAL BANK
004516	012777	170001	176306	MOV	#170001,2SR0	:TURN ON KT11-C AND SET ERROR FLAGS
004524	105077	176302		CLRB	2SR0	:DATOB (LOW) TO SR0
004530	022777	170000	176274	CMP	#170000,2SR0	:CHECK SR0
004536	001401			BEQ	+.4	
004540	104006			HLT		:SR0 INCORRECT AFTER CLRB (LOW)
004542	012777	170001	176262	MOV	#170001,2SR0	
004550	105077	176260		CLRB	2SR0H	:DATOB (HIGH) TO SR0
004554	017701	176252		MOV	2SR0,R1	:SAVE CONTENTS OF SR0
004560	005077	176246		CLR	2SR0	:TURN OFF KT11-C
004564	022701	000001		CMP	#1,R1	:CHECK SAVED CONTENTS OF SR0
004570	001401			BEQ	+.4	
004572	104006			HLT		:SR0 INCORRECT AFTER DATOB
						: (SEE CONTENTS SAVED IN R1)
:SHOW THAT SR0 <1-3> TRACK THE PAGE REFERENCED IF						
:KT11-C IS ON AND THE REFERENCE IS NOT TO A KT11-C REGISTER						
:SHOW THAT EACH VALUE IS CORRECTLY "LOCKED" IN SR0 AFTER AN ABORT						
004574	104400			TEST6:	SCOPE	
004576	012737	000006	177570	MOV	#6,2#SR	:DISPLAY TEST NUMBER
004604	005037	177776		CLR	2#PS	:INITIALIZE PROCESSOR STATUS
004610	012706	001000		MOV	#KSTACK,SP	:INITIALIZE KERNEL STACK POINTER
004614	005077	176226		CLR	2SR3	:INITIALIZE SR3
004620	005077	176206		CLR	2SR0	:INITIALIZE SR0
004624	026727	176570	000006	CMP	TESTCT,#6	:IS THIS TEST BEING EXECUTED IN THE
004632	001401			BEQ	+.4	:CORRECT SEQUENCE? - BRANCH IF YES
004634	104006			HLT		:TEST EXECUTED OUT OF ORDER - TESTCT
						:CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE
004636	004767	007702		JSR	%7,RWALL	:INITIALLY SET ALL PAGES 4K,RW,BANK 0
004642	012777	007600	176500	MOV	#7600,2KDPA7	:MAP KERNEL 7 D-SPACE TO THE EXTERNAL BANK
004650	012777	000006	176170	MOV	#6,2SR3	:ENABLE KERNEL AND SUPERVISOR D-SPACES
004656	012777	004734	176524	MOV	#RET6,2KTVEC	:SET UP ABORT RETURN
004664	005077	176522		CLR	2KTSTA	
004670	016701	176276		MOV	SDPDR0,R1	:LOAD R1 WITH THE ADDRESS OF THE FIRST
						:SUPERVISOR D-SPACE PDR
004674	005002			CLR	R2	:R2 WILL BE USED TO ADDRESS THE NR PAGE
004676	012703	100061		MOV	#100061,R3	:R3 CONTAINS THE EXPECTED CONTENTS OF SR0
004702	012704	000010		MOV	#10,R4	:R4 IS A COUNTER


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004706 012711 077400      LOOP6: MOV      #77400,R1      ;MAP SUPERVISOR PDR BEING TESTED 4K,NR
004712 012737 040000 177776 MOV      #40000,R#PS    ;SET MODE TO SUPERVISOR
004720 005277 176106      INC      @SR0      ;TURN ON KT11-C
004724 005712      TST      @R2      ;ADDRESS NON-RESIDENT PAGE
004726 000777      BR        .      ;REFERENCE TO NR PAGE DIDN'T ABORT
004730 000005      RESET      .      ;AFTER ERROR, TURN OFF KT11-C
004732 000416      BR        DONE6      ;
004734 017705 176072      RET6:  MOV      @SR0,R5      ;SAVE CONTENTS OF SR0
004740 005077 176066      CLR      @SR0      ;TURN OFF KT11-C
004744 020503      CMP      R5,R3      ;CHECK SAVED CONTENTS
                                           ;OF SR0 (IN R5)
004746 001401      BEQ      .+4
004750 104006      HLT
                                           ;SR0 INCORRECT AFTER NR ABORT
                                           ;R3 CONTAINS THE EXPECTED CONTENTS
                                           ;R5 CONTAINS THE ACTUAL CONTENTS
                                           ;RESTORE STACK POINTER
004752 022626      CMP      (R6)+,(R6)+    ;MOVE POINTER TO ADDRESS NEXT PDR
004754 005721      TST      (R1)+      ;CHANGE R3 TO EXPECTED CONTENTS OF SR0
004756 062703 000002      ADD      #2,R3    ;AFTER A NR REFERENCE TO THE NEXT PAGE
004762 062702 020000      ADD      #20000,R2 ;CHANGE R2 TO ADDRESS THE NEXT SUPERVISOR PAGE
004766 077431      SOB      R4,LOOP6      ;CHECK REFERENCE TO ALL SUPERVISOR D-SPACE PAGES
004770 016777 176416 176412 DONE6: MOV      KTSTA,@KTVEC ;RESTORE TRAP CATCHER
004776 005077 176410      CLR      @KTSTA

;SHOW THAT SR0 <4> TRACKS PAGE REFERENCES (I-SPACE VS. D-SPACE) IF
;KT11-C IS ON AND REFERENCE IS NOT TO A KT11-C REGISTER
;SHOW THAT EACH VALUE IS CORRECTLY "LOCKED"
;IN SR0 AFTER AN ABORT
005002 104400      TEST7: SCOPE
005004 012737 000007 177570 MOV      #7,@SR      ;DISPLAY TEST NUMBER
005012 005037 177776      CLR      @#PS    ;INITIALIZE PROCESSOR STATUS
005016 012706 001000      MOV      @KSTACK,SP ;INITIALIZE KERNEL STACK POINTER
005022 005077 176020      CLR      @SR3    ;INITIALIZE SR3
005026 005077 176000      CLR      @SR0    ;INITIALIZE SR0
005032 026727 176362 000007 CMP      TESTCT,#7 ;IS THIS TEST BEING EXECUTED IN THE
005040 001401      BEQ      .+4      ;CORRECT SEQUENCE? - BRANCH IF YES
005042 104006      HLT      ;TEST EXECUTED OUT OF ORDER - TESTCT
                                           ;CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE

005044 004767 007474      JSR      %7,RWALL ;INITIALLY MAKE ALL PAGES 4K,RW,BANK 0
005050 012777 007600 176272 MOV      #7600,@KDPAR7 ;MAP KERNEL D-SPACE PAGE 7 TO THE EXTERNAL BANK
005056 012777 077400 176170 MOV      #77400,@KIPDR1 ;MAKE KERNEL PAGE 1 NR
005064 012777 077400 176202 MOV      #77400,@KDPDR1
005072 012777 005126 176310 MOV      @RET7A,@KTVEC ;SETUP ABORT RETURN
005100 012777 000004 175740 MOV      #4,@SR3    ;ENABLE KERNEL D-SPACE
005106 005277 175720      INC      @SR0    ;TURN ON KT11-C
005112 005737 020000      TST      @#20000 ;REFERENCE KERNEL 1 D-SPACE
                                           ;SHOULD ABORT SINCE IT'S MAPPED NR
005116 005077 175710      CLR      @SR0    ;TURN OFF KT11-C
005122 104006      HLT      ;REFERENCE TO NR PAGE DIDN'T ABORT
005124 000435      BR        .
005126 017701 175700      RET7A: MOV      @SR0,R1 ;SAVE CONTENTS OF SR0
005132 005077 175674      CLR      @SR0    ;TURN OFF KT11-C
005136 022701 100023      CMP      #100023,R1 ;CHECK SAVED CONTENTS OF SR0
005142 001401      BEQ      .+4
005144 104006      HLT      ;SR0 INCORRECT (SAVED IN R1) - SHOULD SHOW

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005146	012777	005200	176234	MOV	#RET7B, &KTVEC	; NR ABORT, KERNEL D-SPACE PAGE 1
005154	005277	175652		INC	&SR0	; SETUP NEW ABORT RETURN
005160	012707	025164		MOV	#ADR7+20000, PC	; TURN ON KT11-C
005164	000000		ADR7:	HALT		; CHANGE TO KERNEL PAGE 1 PC
005166	042707	160000		BIC	#160000, PC	; NR FETCH FROM THIS ADDRESS SHOULD ABORT
005172	005077	175634		CLR	&SR0	; RESTORE TO BANK 0 PC
005176	000410			BR	DONE7	; TURN OFF KT11-C
005200	017701	175626	RET7B:	MOV	&SR0, R1	; SAVE CONTENTS OF SR0
005204	005077	175622		CLR	&SR0	; TURN OFF KT11-C
005210	022701	100003		CMP	#100003, R1	; CHECK SAVED CONTENTS OF SR0
005214	001401			BEQ	.+4	
005216	104006			HLT		; SR0 INCORRECT - (CONTENTS SAVED IN R1)
005220	016777	176166	176162	DONE7:	MOV	KTSTA, &KTVEC
						; SHOULD SHOW NR ABORT, KERNEL PAGE 1 I-SPACE
						; RESTORE TRAP CATCHER
						; SHOW THAT SR0 (5-6) TRACK PAGE REFERENCED (MODE) IF
						; KT11-C IS ON AND THE REFERENCE IS NOT TO A KT11-C REGISTER
						; SHOW THAT EACH VALUE IS CORRECTLY "LOCKED" IN SR0 AFTER AN ABORT
005226	104400			TEST10:	SCOPE	
005230	012737	000010	177570	MOV	#10, &SR	; DISPLAY TEST NUMBER
005236	005037	177776		CLR	&PS	; INITIALIZE PROCESSOR STATUS
005242	012706	001000		MOV	#KSTACK, SP	; INITIALIZE KERNEL STACK POINTER
005246	005077	175574		CLR	&SR3	; INITIALIZE SR3
005252	005077	175554		CLR	&SR0	; INITIALIZE SR0
005256	026727	176136	000010	CMP	TESTCT, #10	; IS THIS TEST BEING EXECUTED IN THE
005264	001401			BEQ	.+4	; CORRECT SEQUENCE? - BRANCH IF YES
005266	104006			HLT		; TEST EXECUTED OUT OF ORDER - TESTCT
						; CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE
005270	004767	007250		JSR	%7, RWALL	; MAP ALL PAGES RW, 4K, BANK 0
005274	012777	007600	176046	MOV	#7600, &KDPA7	; MAP KERNEL 7 D-SPACE TO EXTERNAL BANK
005302	012777	077400	175764	MOV	#77400, &KDPA7	; MAKE PAGE 1 IN EACH MODE'S D-SPACE
005310	012777	077400	175656	MOV	#77400, &SDPA7	; NON-RESIDENT
005316	012777	077400	175550	MOV	#77400, &UDPA7	
005324	012777	005360	176056	MOV	#RET10A, &KTVEC	; SETUP ABORT RETURN
005332	012777	000007	175506	MOV	#7, &SR3	; ENABLE ALL D-SPACES
005340	005277	175466		INC	&SR0	; TURN ON KT11-C
005344	005737	020000		TST	&20000	; REFERENCE KERNEL PAGE 1 D-SPACE (NR) - SHOULD ABORT
005350	005077	175456		CLR	&SR0	; TURN OFF KT11-C
005354	104006			HLT		; NR REFERENCE DIDN'T ABORT
005356	000464			BR	DONE10	
005360	017701	175446	RET10A:	MOV	&SR0, R1	; SAVE SR0 CONTENTS IN R1
005364	005077	175442		CLR	&SR0	; TURN OFF KT11-C
005370	022701	100023		CMP	#100023, R1	; CHECK SAVED CONTENTS OF SR0
005374	001401			BEQ	.+4	
005376	104006			HLT		; SR0 INCORRECT (CONTENTS SAVED IN R1) - SHOULD SHOW NR
005400	012777	005434	176002	MOV	#RET10B, &KTVEC	; ERROR, KERNEL D-SPACE PAGE 1
005406	012737	040000	177776	MOV	#40000, &PS	; SETUP NEXT ABORT RETURN
005414	005277	175412		INC	&SR0	; CHANGE MODE TO SUPERVISOR
005420	005737	020000		TST	&20000	; TURN ON KT11-C
005424	005077	175402		CLR	&SR0	; REFERENCE SUPERVISOR PAGE 1
005430	104006			HLT		; D-SPACE (NR)-SHOULD ABORT
005432	000436			BR	DONE10	; TURN OFF KT11-C
						; NR REFERENCE DIDN'T ABORT


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005434 017701 175372      RET10B: MOV    2SR0,R1      ;SAVE CONTENTS OF SRO
005440 005077 175366      CLR    2SR0      ;TURN OFF KT11-C
005444 022701 100063      CMP    2SR0,2R1      ;CHECK SAVED CONTENTS OF SRO
005450 001401      BEQ    .+4
005452 104006      HLT
                                ;SRO INCORRECT (CONTENTS SAVED IN R1) - SHOULD SHOW NR
                                ;ERROR, SUPERVISOR D-SPACE PAGE 1
005454 012777 005510 175726      MOV    2RET10C,2KTVEC      ;SETUP NEXT ABORT RETURN
005462 012737 140000 177776      MOV    2R140000,22PS      ;CHANGE MODE TO USER
005470 005277 175336      INC    2SR0      ;TURN ON KT11-C
005474 005737 020000      TST    220000      ;REFERENCE USER PAGE 1 D-SPACE (NR)
005500 005077 175326      CLR    2SR0      ;TURN OFF KT11-C
005504 104006      HLT      ;NR REFERENCE DIDN'T ABORT
005506 000410      BR
005510 017701 175316      RET10C: MOV    2SR0,R1      ;SAVE CONTENTS OF SRO
005514 005077 175312      CLR    2SR0      ;TURN OFF KT11-C
005520 022701 100163      CMP    2SR0,2R1      ;CHECK SAVED CONTENTS OF SRO
005524 001401      BEQ    .+4
005526 104006      HLT      ;SRO INCORRECT - SHOULD SHOW NR
                                ;ERROR, USER D-SPACE PAGE 1
                                ;(CONTENTS SAVED IN R1)
005530 016777 175656 175652      DONE10: MOV    KTSTA,2KTVEC      ;RESTORE TRAP CATCHER
                                ;SHOW THAT SRO <1-6> DOESN'T TRACK IF KT11-C IS OFF OR IF REFERENCE IS TO
                                ;AN INTERNAL (KT11-C) REGISTER
005536 104400      TEST11: SCOPE
005540 012737 000011 177570      MOV    2R11,2SR      ;DISPLAY TEST NUMBER
005546 005037 177776      CLR    22PS      ;INITIALIZE PROCESSOR STATUS
005552 012706 001000      MOV    2KTSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
005556 005077 175264      CLR    2SR3      ;INITIALIZE SR3
005562 005077 175244      CLR    2SR0      ;INITIALIZE SRO
005566 026727 175626 000011      CMP    TESTCT,2R11      ;IS THIS TEST BEING EXECUTED IN THE
005574 001401      BEQ    .+4      ;CORRECT SEQUENCE? - BRANCH IF YES
005576 104006      HLT      ;TEST EXECUTED OUT OF ORDER - TESTCT
                                ;CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE
005600 004767 006740      JSR    27,RWALL      ;SET ALL PAGES RW, 4K, BANK 0
005604 012777 007600 175436      MOV    27600,2SDPAR7      ;MAP SUPERVISOR 7 D-SPACE TO THE
                                ;EXTERNAL BANK
005612 012777 000007 175226      MOV    27,2SR3      ;ENABLE ALL D-SPACES
005620 012737 040000 177776      MOV    240000,22PS      ;SET MODE TO SUPERVISOR
005626 005277 175200      INC    2SR0      ;TURN ON KT11-C
005632 042777 000001 175172      BIC    21,2SR0      ;TURN OFF KT11-C - SHOULD
                                ;NOT TRACK REFERENCE TO SUPERVISOR
                                ;D-SPACE 7 WHICH IS AN INTERNAL
                                ;REFERENCE (TO SRO)
005640 005037 177776      CLR    22PS      ;CHANGE TO KERNEL MODE
005644 022777 000060 175160      CMP    260,2SR0      ;CHECK SRO
005652 001401      BEQ    .+4
005654 104006      HLT      ;SRO INCORRECT - SHOULD SHOW REFERENCE
                                ;TO SUPERVISOR 0 D-SPACE
                                ;IF IT SHOWS SUPERVISOR 7 D-SPACE,
                                ;IT TRACKED THE INTERNAL REFERENCE
                                ;IF IT SHOWS KERNEL 0, IT IS
                                ;TRACKING WITH KT11-C OFF
005656 005077 175150      CLR    2SR0
005662 005077 175160      CLR    2SR3

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;SHOW THAT ALL BITS IN SR2 WORK BY ROTATING A BIT THRU SR2.  MAP USER NR
;(ALL PAGES).  THEN SET UP THE DESIRED VALUE FOR SR2 ON THE KERNEL
;STACK AND RTI TO USER.  THIS SHOULD GIVE A NR ABORT WITH THE DESIRED
;VALUE IN SR2
TEST12: SCOPE
005666 104400 000012 177570      MOV      #12, @SR
005670 012737 177776          CLR      @PS
005676 005037 177776          MOV      @KSTACK, SP
005702 012706 001000          CLR      @SR3
005706 005077 175134          CLR      @SR0
005712 005077 175114          CMP      TESTCT, #12
005716 026727 175476 000012  BEQ      .+4
005724 001401              HLT
005726 104006

;DISPLAY TEST NUMBER
;INITIALIZE PROCESSOR STATUS
;INITIALIZE KERNEL STACK POINTER
;INITIALIZE SR3
;INITIALIZE SR0
;IS THIS TEST BEING EXECUTED IN THE
;CORRECT SEQUENCE? - BRANCH IF YES
;TEST EXECUTED OUT OF ORDER - TESTCT
;CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE

005730 004767 006560          JSR      %7, CLRAL
005734 012777 077406 175310  MOV      #77406, @KIPDR0
005742 012777 007600 175360  MOV      #7600, @KIPAR7
005750 012777 077406 175312  MOV      #77406, @KIPDR7
005756 012700 000002          MOV      #2, R0
005762 012777 006012 175420  MOV      @RET12, @KTVEC
005770 005077 175416          CLR      @KTSTA
005774 012746 140000          LOOP12: MOV    #140000, -(R6)
006000 010046              MOV      R0, -(R6)
006002 005277 175024          INC      @SR0
006006 000002              RTI

;PUSH USER MODE ON STACK
;PUSH VALUE TO BE CHECKED ON STACK
;TURN ON KT11-C
;POP STACK - NEW PC SHOULD
;GIVE NR ABORT
;SHOULDN'T BE ANY WAY TO ARRIVE HERE
;TURN OFF KT11-C
;CHECK VALUE IN SR2

006010 000777              BR       .
006012 042777 000001 175012  RET12: BIC      #1, @SR0
006020 020077 175016          CMP      R0, @SR2
006024 001401              BEQ      .+4
006026 104006              HLT

;SR2 INCORRECT - SHOULD CONTAIN
;THE PC POPPED OFF THE STACK
;WHOSE VALUE IS IN R0

006030 005077 174776          CLR      @SR0
006034 022626              CMP      (R6)+, (R6)+
006036 006300              ASL      R0
006040 103355              BCC      LOOP12
006042 016777 175344 175340  MOV      KTSTA, @KTVEC

;RESTORE STACK POINTER
;SHIFT BIT TO BE TESTED
;BRANCH IF NOT DONE
;RESTORE TRAP CATCHER

;SHOW THAT A MEMORY MANAGEMENT TRAP CONDITION WILL NOT CAUSE A TRAP IF
;THE MANAGEMENT TRAP FLAG IN SR0 IS ALREADY SET
;SHOW THAT HAVING THE ABORT ERROR
;BITS SET WILL NOT PREVENT A MEMORY MANAGEMENT TRAP
TEST13: SCOPE
006050 104400 000013 177570      MOV      #13, @SR
006052 012737 177776          CLR      @PS
006060 005037 177776          MOV      @KSTACK, SP
006064 012706 001000          CLR      @SR3
006070 005077 174752          CLR      @SR0
006074 005077 174732          CMP      TESTCT, #13
006100 026727 175314 000013  BEQ      .+4
006106 001401              HLT
006110 104006

;DISPLAY TEST NUMBER
;INITIALIZE PROCESSOR STATUS
;INITIALIZE KERNEL STACK POINTER
;INITIALIZE SR3
;INITIALIZE SR0
;IS THIS TEST BEING EXECUTED IN THE
;CORRECT SEQUENCE? - BRANCH IF YES
;TEST EXECUTED OUT OF ORDER - TESTCT
;CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE

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006112	004767	006426		JSR	%7,RWALL	;INITIALIZE ALL PAGES RW,4K, BANK 0
006116	012777	077405	175132	MOV	#77405,%KIPDR2	;SET KERNEL PAGE 2 RRTW,4K
006124	012777	007600	175176	MOV	#7600,%KIPAR7	;MAP KERNEL PAGE 7 TO EXTERNAL BANK
006132	012777	006174	175250	MOV	#RET13A,%KTVEC	;SETUP MEMORY MANAGEMENT ABORT RETURN
006140	005077	175246		CLR	%KTSTA	
006144	005277	174662		INC	%SRO	;TURN ON KT11-C
006150	012777	161001	174654	MOV	#161001,%SRO	;ENABLE MEMORY MANAGEMENT TRAPPING
						;AND SET THE ABORT ERROR BITS
006156	013737	007000	047000	MOV	%7000,%47000	;WRITE KERNEL PAGE 2 (RRTW)-SHOULD TRAP
006164	005077	174642		CLR	%SRO	
006170	104006			HLT		;NO TRAP OCCURRED
006172	000416			BR	CONT13	
006174	022626			RET13A: CMP	(SP)+,(SP)+	;RESTORE THE STACK POINTER
006176	017701	174630		MOV	%SRO,R1	;SAVE CONTENTS OF SRO
006202	005077	174624		CLR	%SRO	;TURN OFF KT11-C
006206	022701	171001		CMP	#171001,R1	;CHECK SAVED CONTENTS OF SRO
006212	001401			BEQ	.+4	
006214	104006			HLT		;SAVED CONTENTS OF SRO INCORRECT (CONTAINED IN R1)
006216	022777	077705	175032	CMP	#77705,%KIPDR2	;CHECK THE PDR CORRESPONDING TO THE TRAP REFERENCE
006224	001401			BEQ	.+4	
006226	104006			HLT		;THE PDR CORRESPONDING TO THE TRAP REFERENCE
						;IS INCORRECT
006230	012777	006314	175152	CONT13: MOV	#RET13B,%KTVEC	;SETUP MEMORY MANAGEMENT TRAP RETURN
006236	012777	011001	174566	MOV	#11001,%SRO	;TURN ON KT11-C, ENABLE MMGT TRAPPING,
						;AND SET MEMORY MANAGEMENT TRAP
006244	012777	077405	175004	MOV	#77405,%KIPDR2	;CLEAR A AND W BITS
006252	013737	007000	047000	MOV	%7000,%47000	;WRITE KERNEL PAGE 2 (RRTW) -
						;SHOULDN'T TRAP SINCE MEMORY MANAGEMENT
						;TRAP HASN'T BEEN CLEARED YET
						;TURN OFF KT11-C
006260	042777	000001	174544	BIC	#1,%SRO	;CHECK SRO
006266	022777	011000	174536	CMP	#11000,%SRO	
006274	001401			BEQ	.+4	
006276	104006			HLT		;SRO INCORRECT-SHOULD SHOW MEMORY MANAGEMENT TRAP,
						;MMGT ENABLE, AND PAGE 0 I-SPACE
006300	022777	077705	174750	CMP	#77705,%KIPDR2	;CHECK PDR CORRESPONDING TO THE TRAP REFERENCE
006306	001401			BEQ	.+4	
006310	104006			HLT		;PDR CORRESPONDING TO THE TRAP REFERENCE IS INCORRECT
006312	000405			BR	DONE13	
006314	022626			RET13B: CMP	(SP)+,(SP)+	;RESTORE THE STACK POINTER
006316	042777	000001	174506	BIC	#1,%SRO	;TURN OFF KT11-C
006324	104006			HLT		;MMGT TRAP ACCESS TRAPPED BEFORE
						;PREVIOUS MMGT TRAP WAS CLEARED
006326	016777	175060	175054	DONE13: MOV	KTSTA,%KTVEC	;RESTORE MEMORY MANAGEMENT TRAP RETURN
						;TO CAUSE A HALT ON A FALSE TRAP OR ABORT
006334	005077	174472		CLR	%SRO	;REINITIALIZE SRO
						;IF MEMORY MANAGEMENT ENABLE IS SET WITH AN ATTENTION (A) BIT ALREADY SET, NO TRAP
						;WILL OCCUR UNTIL ANOTHER MEMORY MANAGEMENT FAULT OCCURS
006340	104400			TEST14: SCOPE		
006342	012737	000014	177570	MOV	#14,%SR	;DISPLAY TEST NUMBER
006350	005037	177776		CLR	%PS	;INITIALIZE PROCESSOR STATUS
006354	012706	001000		MOV	#KSTACK,SP	;INITIALIZE KERNEL STACK POINTER
006360	005077	174462		CLR	%SR3	;INITIALIZE SR3
006364	005077	174442		CLR	%SRO	;INITIALIZE SRO
006370	026727	175024	000014	CMP	TESTCT,#14	;IS THIS TEST BEING EXECUTED IN THE

Address	Op Code	Op 2	Op 3	Op 4	Op 5	Op 6	Op 7	Op 8	Op 9	Op 10	Op 11	Op 12	Op 13	Op 14	Op 15	Op 16	Op 17	Op 18	Op 19	Op 20	Op 21	Op 22	Op 23	Op 24	Op 25	Op 26	Op 27	Op 28	Op 29	Op 30	Op 31	Op 32	Op 33	Op 34	Op 35	Op 36	Op 37	Op 38	Op 39	Op 40	Op 41	Op 42	Op 43	Op 44	Op 45	Op 46	Op 47	Op 48	Op 49	Op 50	Op 51	Op 52	Op 53	Op 54	Op 55	Op 56	Op 57	Op 58	Op 59	Op 60	Op 61	Op 62	Op 63	Op 64	Op 65	Op 66	Op 67	Op 68	Op 69	Op 70	Op 71	Op 72	Op 73	Op 74	Op 75	Op 76	Op 77	Op 78	Op 79	Op 80	Op 81	Op 82	Op 83	Op 84	Op 85	Op 86	Op 87	Op 88	Op 89	Op 90	Op 91	Op 92	Op 93	Op 94	Op 95	Op 96	Op 97	Op 98	Op 99	Op 100	Op 101	Op 102	Op 103	Op 104	Op 105	Op 106	Op 107	Op 108	Op 109	Op 110	Op 111	Op 112	Op 113	Op 114	Op 115	Op 116	Op 117	Op 118	Op 119	Op 120	Op 121	Op 122	Op 123	Op 124	Op 125	Op 126	Op 127	Op 128	Op 129	Op 130	Op 131	Op 132	Op 133	Op 134	Op 135	Op 136	Op 137	Op 138	Op 139	Op 140	Op 141	Op 142	Op 143	Op 144	Op 145	Op 146	Op 147	Op 148	Op 149	Op 150	Op 151	Op 152	Op 153	Op 154	Op 155	Op 156	Op 157	Op 158	Op 159	Op 160	Op 161	Op 162	Op 163	Op 164	Op 165	Op 166	Op 167	Op 168	Op 169	Op 170	Op 171	Op 172	Op 173	Op 174	Op 175	Op 176	Op 177	Op 178	Op 179	Op 180	Op 181	Op 182	Op 183	Op 184	Op 185	Op 186	Op 187	Op 188	Op 189	Op 190	Op 191	Op 192	Op 193	Op 194	Op 195	Op 196	Op 197	Op 198	Op 199	Op 200	Op 201	Op 202	Op 203	Op 204	Op 205	Op 206	Op 207	Op 208	Op 209	Op 210	Op 211	Op 212	Op 213	Op 214	Op 215	Op 216	Op 217	Op 218	Op 219	Op 220	Op 221	Op 222	Op 223	Op 224	Op 225	Op 226	Op 227	Op 228	Op 229	Op 230	Op 231	Op 232	Op 233	Op 234	Op 235	Op 236	Op 237	Op 238	Op 239	Op 240	Op 241	Op 242	Op 243	Op 244	Op 245	Op 246	Op 247	Op 248	Op 249	Op 250	Op 251	Op 252	Op 253	Op 254	Op 255	Op 256	Op 257	Op 258	Op 259	Op 260	Op 261	Op 262	Op 263	Op 264	Op 265	Op 266	Op 267	Op 268	Op 269	Op 270	Op 271	Op 272	Op 273	Op 274	Op 275	Op 276	Op 277	Op 278	Op 279	Op 280	Op 281	Op 282	Op 283	Op 284	Op 285	Op 286	Op 287	Op 288	Op 289	Op 290	Op 291	Op 292	Op 293	Op 294	Op 295	Op 296	Op 297	Op 298	Op 299	Op 300	Op 301	Op 302	Op 303	Op 304	Op 305	Op 306	Op 307	Op 308	Op 309	Op 310	Op 311	Op 312	Op 313	Op 314	Op 315	Op 316	Op 317	Op 318	Op 319	Op 320	Op 321	Op 322	Op 323	Op 324	Op 325	Op 326	Op 327	Op 328	Op 329	Op 330	Op 331	Op 332	Op 333	Op 334	Op 335	Op 336	Op 337	Op 338	Op 339	Op 340	Op 341	Op 342	Op 343	Op 344	Op 345	Op 346	Op 347	Op 348	Op 349	Op 350	Op 351	Op 352	Op 353	Op 354	Op 355	Op 356	Op 357	Op 358	Op 359	Op 360	Op 361	Op 362	Op 363	Op 364	Op 365	Op 366	Op 367	Op 368	Op 369	Op 370	Op 371	Op 372	Op 373	Op 374	Op 375	Op 376	Op 377	Op 378	Op 379	Op 380	Op 38
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006646 005077 174540          CLR      3KTSTA
006652 012777 010001 174152  MOV      310001,3SR0      ;TURN ON KT11-C AND SET
                                ;MEMORY MANAGEMENT FAULT
006660 005737 020000          TST      3320000      ;REFERENCE KERNEL PAGE 1-SHOULD
                                ;ABORT SINCE IT'S MAPPED NR
006664 042777 000001 174140  BIC      31,3SR0      ;TURN OFF KT11-C IF NO ABORT
006672 104006          HLT                      ;NO ABORT ON REFERENCE TO NR
                                ;KERNEL PAGE 1 AFTER SETTING
006674 000403          BR      DONE15      ;MEMORY MANAGEMENT FAULT
006676 005077 174130  RET15:  CLR      3SR0      ;TURN OFF KT11-C AFTER ABORT
006702 022626          CMP      (SP)+,(SP)+      ;RESTORE STACK POINTER
006704 016777 174502 174476  DONE15: MOV      KTSTA,3KTVEC ;RESTORE TRAP CATCHER

;SHOW THAT IF THE INSTRUCTION SETTING MEMORY MANAGEMENT TRAP ENABLE
;CAUSES A TRAP REFERENCE BEFORE SETTING ENABLE, THE TRAP WILL NOT OCCUR
;ALSO SHOW THAT MEMORY MANAGEMENT WILL NOT TRAP ON AN INTERNAL REFERENCE
006712 104400          TEST16: SCOPE
006714 012737 000016 177570  MOV      316,33SR      ;DISPLAY TEST NUMBER
006722 005037 177776          CLR      33PS      ;INITIALIZE PROCESSOR STATUS
006726 012706 001000          MOV      3KSTACK,SP ;INITIALIZE KERNEL STACK POINTER
006732 005077 174110          CLR      3SR3      ;INITIALIZE SR3
006736 005077 174070          CLR      3SR0      ;INITIALIZE SR0
006742 026727 174452 000016  CMP      TESTCT,316 ;IS THIS TEST BEING EXECUTED IN THE
006750 001401          BEQ      .+4      ;CORRECT SEQUENCE? - BRANCH IF YES
006752 104006          HLT                      ;TEST EXECUTED OUT OF ORDER - TESTCT
                                ;CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE

006754 004767 005564          JSR      37,RWALL ;MAP ALL PAGES 4K, RW, BANK 0
006760 012777 007600 174342  MOV      37600,3KIPAR7 ;MAP KERNEL 7 TO THE EXTERNAL BANK, RWT
006766 012777 077404 174274  MOV      377404,3KIPDR7
006774 012777 077404 174252  MOV      377404,3KIPDR1 ;MAP KERNEL 1 RWT, 4K
007002 012777 007100 174400  MOV      3RET16,3KTVEC ;SETUP TRAP RETURN IN CASE
007010 005077 174376          CLR      3KTSTA
007014 005277 174012          INC      3SR0
007020 053777 023014 174004  BIS      33K1000+20000,3SR0 ;TURN ON KT11-C
                                ;SET MEMORY MANAGEMENT TRAP ENABLE
                                ;AND REFERENCE A RWT PAGE (KERNEL PAGE 1) FIRST
007026 012777 007112 174354  MOV      3RET16A,3KTVEC
007034 032777 001000 173770  BIT      31000,3SR0 ;TRAP REFERENCE TO A KT11-C REGISTER
007042 001001          BNE      .+4
007044 104006          HLT                      ;MEMORY MANAGEMENT TRAP ENABLE WASN'T SET
007046 005077 173760          CLR      3SR0      ;TURN OFF KT11-C
007052 022777 077604 174174  CMP      377604,3KIPDR1 ;CHECK KERNEL PDR1
007060 001401          BEQ      .+4
007062 104006          HLT                      ;KERNEL PDR 1 WRONG-SHOULD SHOW THAT
                                ;PAGE WAS REFERENCED BUT NOT WRITTEN
007064 022777 077404 174176  CMP      377404,3KIPDR7 ;CHECK KERNEL PDR 7
007072 001401          BEQ      .+4
007074 104006          HLT                      ;KERNEL PDR 7 INCORRECT-SHOULDN'T HAVE
                                ;TRACKED REFERENCE TO KT11-C REGISTER
007076 000411          BR      DONE16
007100 042777 000001 173724  RET16: BIC      31,3SR0 ;TURN OFF KT11-C
007106 104006          HLT                      ;TRAP OCCURRED ON THE INSTRUCTION SETTING TRAP ENABLE
007110 000404          BR      DONE16
007112 042777 000001 173712  RET16A: BIC      31,3SR0
007120 104006          HLT                      ;TRAP OCCURRED ON A REFERENCE TO AN INTERNAL
                                ;KT11-C REGISTER

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007122 005077 173704      DONE16: CLR      JSRO
007126 016777 174260 174254      MOV      KTSTA,KTVEEC

;SHOW THAT IF AN INSTRUCTION WHICH TURNS OFF MEMORY MANAGEMENT
;TRAPPING MAKES A TRAP REFERENCE, A TRAP WILL OCCUR
TEST17: SCOPE
007134 104400      MOV      #17,2#SR      ;DISPLAY TEST NUMBER
007136 012737 000017 177570      CLR      2#PS      ;INITIALIZE PROCESSOR STATUS
007144 005037 177776      MOV      #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
007150 012706 001000      CLR      2SR3      ;INITIALIZE SR3
007154 005077 173666      CLR      2SRO      ;INITIALIZE SRO
007160 005077 173646      CMP      TESTCT,#17      ;IS THIS TEST BEING EXECUTED IN THE
007164 026727 174230 000017      BEQ      .+4      ;CORRECT SEQUENCE? - BRANCH IF YES
007172 001401      HLT
007174 104006

;CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE

007176 004767 005342      JSR      %7,RWALL      ;MAP ALL PAGES 4K, RW, BANK 0
007202 012777 077404 174044      MOV      #77404,2KIPDR1      ;MAP KERNEL 1 RWT
007210 012777 007600 174112      MOV      #7600,2KIPAR7      ;MAP KERNEL 7 TO THE EXTERNAL BANK
007216 012777 007256 174164      MOV      #RET17,2KTVEC      ;SETUP TRAP RETURN
007224 005077 174162      CLR      2KTSTA
007230 012777 001001 173574      MOV      #1001,2SRO      ;TURN ON KT11-C AND ENABLE MEMORY MANAGEMENT TRAPPING
007236 043777 023014 173566      BIC      2#K1000+20000,2SRO      ;PICK UP VALUE TO DO BIT CLEAR
;WITH THRU KERNEL 1(RWT)
;CAUSES A TRAP REFERENCE WHICH SHOULD TRAP
;IF NO TRAP, TURN OFF KT11-C
;TRAP REFERENCE TO KERNEL PAGE 1 WHEN CLEARING
;TRAP ENABLE DIDN'T TRAP

007244 042777 000001 173560      BIC      #1,2SRO
007252 104006      HLT

007254 000410      BR      DONE17
007256 042777 000001 173546 RET17: BIC      #1,2SRO      ;TURN OFF KT11-C AFTER TRAP
007264 022777 010000 173540      CMP      #10000,2SRO      ;CHECK SRO
007272 001401      BEQ      .+4
007274 104006      HLT
007276 016777 174110 174104 DONE17: MOV      KTSTA,2KTVEC

;SHOW THAT SETTING PROGRAMMER'S AID SYSTEM TRAP (BIT 11) WON'T PREVENT POTENTIAL
;MEMORY MANAGEMENT TRAPS
TEST20: SCOPE
007304 104400      MOV      #20,2#SR      ;DISPLAY TEST NUMBER
007306 012737 000020 177570      CLR      2#PS      ;INITIALIZE PROCESSOR STATUS
007314 005037 177776      MOV      #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
007320 012706 001000      CLR      2SR3      ;INITIALIZE SR3
007324 005077 173516      CLR      2SRO      ;INITIALIZE SRO
007330 005077 173476      CMP      TESTCT,#20      ;IS THIS TEST BEING EXECUTED IN THE
007334 026727 174060 000020      BEQ      .+4      ;CORRECT SEQUENCE? - BRANCH IF YES
007342 001401      HLT
007344 104006

;CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE

007346 004767 005172      JSR      %7,RWALL      ;INITIALIZE ALL PAGES RW, 4K, BANK 0
007352 012777 077404 173674      MOV      #77404,2KIPDR1      ;MAP KERNEL PAGE 1 RWT, 4K, BANK 0
007360 012777 007600 173742      MOV      #7600,2KIPAR7      ;MAP KERNEL PAGE 7 TO THE EXTERNAL BANK
007366 012777 007424 174014      MOV      #RET20,2KTVEC      ;SETUP MEMORY MANAGEMENT TRAP RETURN
007374 005077 174012      CLR      2KTSTA
007400 012777 005001 173424      MOV      #5001,2SRO      ;TURN ON KT11-C, MGMT TRAP ENABLE
;AND SET PROGRAMMER'S AID SYSTEM
;TRAP (BIT 11)

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007406 005737 021000      TST      @#21000      ;REFERENCE KERNEL PAGE 1 (RRWT)-SHOULD TRAP
007412 042777 000001 173412 BIC      #1,@SR0      ;TURN OFF KT11-C
007420 104006      HLT                      ;SETTING SRO <11> INHIBITED
007422 000411      BR      DONE20      ;A MEMORY MANAGEMENT TRAP
007424 022626      RET20: CMP      (SP)+,(SP)+ ;RESTORE STACK POINTER
007426 042777 000001 173376 BIC      #1,@SR0      ;TURN OFF KT11-C
007434 022777 015000 173370 CMP      #15000,@SR0 ;CHECK SRO
007442 001401      BEQ      .+4
007444 104006      HLT                      ;SRO INCORRECT AFTER MEMORY
                                           ;MANAGEMENT TRAP
007446 005077 173360      DONE20: CLR      @SR0      ;INITIALIZE SRO
007452 016777 173734 173730 MOV      KTSTA,@KTVEC ;RESTORE TRAP RETURN TO CAUSE A
                                           ;HALT IN CASE OF A FALSE ABORT OR TRAP

                                           ;SETTING SRO<11> SHOULD NOT PREVENT ABORTS OR LOCK UP TRACKING
007460 104400      TEST21: SCOPE
007462 012737 000021 177570 MOV      #21,@#SR      ;DISPLAY TEST NUMBER
007470 005037 177776      CLR      @#PS      ;INITIALIZE PROCESSOR STATUS
007474 012706 001000      MOV      #KSTACK,SP ;INITIALIZE KERNEL STACK POINTER
007500 005077 173342      CLR      @SR3      ;INITIALIZE SR3
007504 005077 173322      CLR      @SR0      ;INITIALIZE SRO
007510 026727 173704 000021 CMP      TESTCT,#21 ;IS THIS TEST BEING EXECUTED IN THE
007516 001401      BEQ      .+4      ;CORRECT SEQUENCE? - BRANCH IF YES
007520 104006      HLT                      ;TEST EXECUTED OUT OF ORDER - TESTCT
                                           ;CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE

007522 004767 005016      JSR      %7,RWALL ;INITIALIZE ALL PAGES RW, 4K, BANK 0
007526 012777 077400 173520 MOV      #77400,@KIPDR1 ;MAP KERNEL PAGE 1 NR
007534 012777 007600 173566 MOV      #7600,@KIPAR7 ;MAP KERNEL PAGE 7 TO EXTERNAL BANK
007542 012777 007616 173640 MOV      #RET21,@KTVEC ;SETUP MEMORY MANAGEMENT ABORT
007550 005077 173636      CLR      @KTSTA ;RETURN
007554 012777 004001 173250 MOV      #4001,@SR0 ;TURN ON KT11-C, AND SET PROGRAMMER'S AID
007562 000240      NOP                      ;SYSTEM TRAP (BIT 11)
007564 017701 173252      AD21: MOV      @SR2,R1 ;CHECK TO SEE THAT SR2 IS STILL TRACKING
007570 022701 007564      CMP      #AD21,R1
007574 001401      BEQ      .+4
007576 104006      HLT                      ;SR2 NOT TRACKING AFTER SRO<11> SET
007600 005737 021000      TST      @#21000 ;READ NR PAGE-SHOULD ABORT
007604 042777 000001 173220 BIC      #1,@SR0 ;TURN OFF KT11-C IF NO ABORT
007612 104006      HLT                      ;SRO <11> SET PREVENTED NR REFERENCE FROM ABORTING
007614 000410      BR      DONE21
007616 042777 000001 173206 RET21: BIC      #1,@SR0 ;TURN OFF KT11-C
007624 022777 104002 173200 CMP      #104002,@SR0 ;CHECK SRO
007632 001401      BEQ      .+4
007634 104006      HLT                      ;SRO INCORRECT - SHOULD SHOW NR REFERENCE TO KERNEL
                                           ;PAGE 1, AND BIT 11 SHOULD STILL BE SET
007636 016777 173550 173544 DONE21: MOV      KTSTA,@KTVEC ;RESTORE TRAP CATCHER

                                           ;SHOW THAT IF THE STACK IS MAPPED TO A RRWTW PAGE AN IMPLICIT
                                           ;STACK WRITE WILL CAUSE A MEMORY MANAGEMENT TRAP TO OCCUR
007644 104400      TEST22: SCOPE
007646 012737 000022 177570 MOV      #22,@#SR      ;DISPLAY TEST NUMBER
007654 005037 177776      CLR      @#PS      ;INITIALIZE PROCESSOR STATUS
007660 012706 001000      MOV      #KSTACK,SP ;INITIALIZE KERNEL STACK POINTER
007664 005077 173156      CLR      @SR3      ;INITIALIZE SR3
007670 005077 173136      CLR      @SR0      ;INITIALIZE SRO

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007674	026727	173520	000022	CMP	TESTCT, #22	: IS THIS TEST BEING EXECUTED IN THE
007702	001401			BEQ	.+4	: CORRECT SEQUENCE? - BRANCH IF YES
007704	104006			HLT		: TEST EXECUTED OUT OF ORDER - TESTCT
						: CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE
007706	004767	004602		JSR	%7, CLRALL	: INITIALLY CLEAR ALL KT11-C REGISTERS
007712	012777	077405	173352	MOV	#77405, %KDPDR0	: SETUP KERNEL 0 D-SPACE RRTW
007720	012777	007600	173422	MOV	#7600, %KDPDR7	: MAP KERNEL 7 D-SPACE 4K, RW,
007726	012777	077406	173354	MOV	#77406, %KDPDR7	: EXTERNAL BANK
007734	012777	077406	173310	MOV	#77406, %KIPDR0	: SETUP KERNEL 0 I-SPACE RW
007742	012777	000004	173076	MOV	#4, %SR3	: ENABLE KERNEL D-SPACE
007750	012777	010002	173432	MOV	%RET22, %KTVEC	: SETUP TRAP RETURN
007756	012777	001001	173046	MOV	#1001, %SR0	: TURN ON KT11-C AND ENABLE MEMORY
						: MANAGEMENT TRAPPING
007764	004767	000002		JSR	PC, ADR22	: IMPLICIT STACK WRITE TO RRTW SPACE
007770	000240			NOP		
007772	005077	173034		ADR22: CLR	%SR0	: TURN OFF KT11-C
007776	104006			HLT		: IMPLICIT STACK WRITE OF RRTW SPACE
010000	000425			BR	DONE22	: VIA JSR DIDN'T TRAP
010002	042777	000001	173022	RET22: BIC	#1, %SR0	: TURN OFF KT11-C
010010	022706	000772		CMP	%KSTACK-6, SP	: CHECK STACK POINTER
010014	001401			BEQ	.+4	
010016	104006			HLT		: STACK POINTER INCORRECT - SHOULD HAVE BEEN
						: PUSHED ONCE BY JSR AND TWICE BY MMGT TRAP
010020	022777	011020	173004	CMP	#11020, %SR0	: CHECK SR0
010026	001401			BEQ	.+4	
010030	104006			HLT		: SR0 INCORRECT - SHOULD SHOW KERNEL
						: I-SPACE 0, WITH TRAP ENABLE AND MMGT TRAP SET
010032	022766	007770	000004	CMP	%ADR22-2, 4(R6)	: CHECK CONTENTS OF STACK
010040	001401			BEQ	.+4	
010042	104006			HLT		: ADDRESS OF RETURN FROM JSR NOT
						: ON STACK CORRECTLY
010044	022716	007772		CMP	%ADR22, (SP)	: CHECK CONTENTS OF STACK
010050	001401			BEQ	.+4	
010052	104006			HLT		: ADDRESS IN PC AT TIME OF
						: MEMORY MANAGEMENT TRAP NOT
						: CORRECTLY STORED ON-STACK
010054	005077	172766		DONE22: CLR	%SR3	: DISABLE D-SPACES
010060	016777	173326	173322	MOV	KTSTA, %KTVEC	: RESTORE TRAP CATCHER
						: TEST PAGE LENGTH ERROR CHECKING (EXPAND DOWN NOT SET)
						: KERNEL PAGE 1 IS USED WITH ALL PAGE LENGTH VALUES
						: SHOW THAT REFERENCES TO BOTH BOUNDARIES OF THE ALLOWED AREA DON'T TRAP OR ABORT
						: SHOW THAT A REFERENCE TO THE FIRST WORD BEYOND THE ALLOWABLE AREA DOES TRAP
010066	104400			TEST23: SCOPE		
010070	012737	000023	177570	MOV	#23, %SR	: DISPLAY TEST NUMBER
010076	005037	177776		CLR	%PS	: INITIALIZE PROCESSOR STATUS
010102	012706	001000		MOV	%KSTACK, SP	: INITIALIZE KERNEL STACK POINTER
010106	005077	172734		CLR	%SR3	: INITIALIZE SR3
010112	005077	172714		CLR	%SR0	: INITIALIZE SR0
010116	026727	173276	000023	CMP	TESTCT, #23	: IS THIS TEST BEING EXECUTED IN THE
010124	001401			BEQ	.+4	: CORRECT SEQUENCE? - BRANCH IF YES
010126	104006			HLT		: TEST EXECUTED OUT OF ORDER - TESTCT
						: CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE

010130	004767	004410		JSR	%7,RWALL	: INITIALIZE ALL PAGES TO RW, 4K, BANK 0
010134	012777	007600	173166	MOV	#7600, %KIPAR7	: MAP KERNEL PAGE 7 TO THE EXTERNAL BANK
010142	012702	000006		MOV	#6, R2	: R2 CONTAINS VALUE TO BE LOADED IN THE
						: PDR BEING CHECKED (INCLUDING PLF)
010146	012701	020076		MOV	#20076, R1	: R1 IS USED TO REFERENCE THE TOP ADDRESS
						: WITHIN THE ALLOWED AREA
010152	012777	010232	173230	MOV	#RET23A, %KTVEC	: SETUP ABORT RETURN IN CASE REFERENCE
010160	005077	173226		CLR	%KTSTA	: WITHIN ALLOWED AREA ABORTS
010164	005277	172642		LOOP23: INC	%SR0	: TURN ON KT11-C
010170	010277	173060		MOV	R2, %KIPDR1	: SET KERNEL PAGE 1 TO NEW PAGE LENGTH
010174	005727	020000		TST	#20000	: READ LOWER BOUNDARY-SHOULDN'T ABORT
010200	005711			TST	%R1	: READ UPPER ALLOWED BOUNDARY-SHOULDN'T
						: ABORT
010202	012777	010252	173200	MOV	#RET23B, %KTVEC	: SETUP ABORT RETURN
010210	020127	037776		CMP	R1, #37776	: CHECK FOR DONE (TO AVOID REFERENCING
						: NEXT PAGE)
010214	103041			BHIS	DONE23	: EXIT LOOP IF DONE
010216	005761	000002		TST	2(R1)	: REFERENCE OUTSIDE ALLOWED AREA -
						: SHOULD ABORT
010222	005077	172604		CLR	%SR0	: TURN KT11-C OFF IF NO ABORT
010226	104006			HLT		: NO ABORT OCCURRED ON A REFERENCE
						: OUTSIDE THE ALLOWED PAGE LENGTH
						: THE ADDRESS REFERENCED WAS THE VALUE CONTAINED IN
						: R1 PLUS 2
010230	000426			BR	CONT23	
010232	042777	000001	172572	RET23A: BIC	#1, %SR0	: TURN OFF KT11-C
010240	022626			CMP	(SP)+, (SP)+	: RESTORE STACK POINTER
010242	104006			HLT		: REFERENCE WITHIN ALLOWED AREA
						: CAUSED A TRAP OR ABORT
010244	005077	172562		CLR	%SR0	: CLEAR ERROR BITS
010250	000416			BR	CONT23	
010252	022626			RET23B: CMP	(SP)+, (SP)+	: RESTORE STACK POINTER
010254	017703	172552		MOV	%SR0, R3	: SAVE CURRENT SR0
010260	005077	172546		CLR	%SR0	: TURN OFF KT11-C
010264	022703	040003		CMP	#40003, R3	: CK SAVED SR0
010270	001401			BEQ	.+4	
010272	104006			HLT		: CONTENTS OF SR0 INCORRECT AFTER
						: PAGE LENGTH ERROR ABORT - SHOULD SHOW PL ERROR
						: AND KERNEL PAGE 1
010274	022777	000002	172530	CMP	#2, %SR0	: CHECK SR0 TO BE SURE PL BIT CLEARED
010302	001401			BEQ	.+4	
010304	104006			HLT		: SR0 INCORRECT AFTER CLEARING IT
						: ONLY KERNEL PAGE 1 SHOULD STILL BE SET
010306	062701	000100		CONT23: ADD	#100, R1	: SETUP R1 TO REFERENCE BOUNDARY OF
						: NEXT PAGE
010312	062702	000400		ADD	#400, R2	: ADD 1 TO VALUE TO BE LOADED IN
						: PAGE LENGTH FIELD
010316	000722			BR	LOOP23	: CHECK NEXT PAGE LENGTH VALUE
010320	005077	172506		DONE23: CLR	%SR0	: TURN OFF KT11-C
010324	016777	173062	173056	MOV	KTSTA, %KTVEC	: RESTORE MEMORY MANAGEMENT ABORT RETURN
010332	005077	173054		CLR	%KTSTA	: TO CAUSE HALT ON A FALSE TRAP
						: OR ABORT

: TEST PAGE LENGTH ERROR CHECKING (EXPAND DOWN SET)
 : KERNEL PAGE 1 IS TESTED WITH ALL VALUES OF PAGE LENGTH FIELD
 : SHOW THAT REFERENCES TO BOTH BOUNDARIES OF THE ALLOWED AREA DON'T TRAP OR ABORT


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;SHOW THAT A REFERENCE TO THE WORD IMMEDIATELY BELOW THE ALLOWED AREA DOES TRAP
TEST24: SCOPE
010336 104400 000024 177570 MOV #24, @SR ;DISPLAY TEST NUMBER
010340 012737 000024 177570 CLR @SP ;INITIALIZE PROCESSOR STATUS
010346 005037 177776 MOV #KSTACK, SP ;INITIALIZE KERNEL STACK POINTER
010352 012706 001000 CLR @SR3 ;INITIALIZE SR3
010356 005077 172464 CLR @SR0 ;INITIALIZE SR0
010362 005077 172444 CMP TESTCT, #24 ;IS THIS TEST BEING EXECUTED IN THE
010366 026727 173026 000024 BEQ .+4 ;CORRECT SEQUENCE? - BRANCH IF YES
010374 001401 ;TEST EXECUTED OUT OF ORDER - TESTCT
010376 104006 HLT ;CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE

010400 004767 004140 JSR %7, RWALL ;INITIALIZE ALL PAGES RW, 4K, BANK 0
010404 012777 007600 172716 MOV #7600, @KIPAR7 ;MAP KERNEL PAGE 7 TO EXTERNAL BANK
010412 012702 077416 MOV #77416, R2 ;R2 CONTAINS VALUE TO BE LOADED IN THE
;PDR BEING CHECKING (INCLUDING PLF)
010416 012701 037700 MOV #37700, R1 ;R1 IS USED TO REFERENCE THE LOWEST
;ALLOWED ADDRESS IN THE PAGE
010422 012777 010502 172760 MOV #RET24A, @KTVEC ;SETUP ABORT RETURN IN CASE REFERENCE
010430 005077 172756 CLR @KTSTA ;WITHIN ALLOWED AREA ABORTS
010434 005277 172372 LOOP24: INC @SR0 ;TURN ON KT11-C
010440 010277 172610 MOV R2, @KIPDR1 ;SET KERNEL PAGE 1 TO NEW PAGE LENGTH
010444 005727 037776 TST #37776 ;REFERENCE UPPER ALLOWED BOUNDARY
010450 005711 TST @R1 ;REFERENCE LOWER ALLOWED BOUNDARY
; - NEITHER REFERENCE SHOULD ABORT
010452 012777 010522 172730 MOV #RET24B, @KTVEC ;SETUP ABORT RETURN
010460 020127 020000 CMP R1, #20000 ;CHECK FOR DONE
010464 003441 BLE DONE24 ;EXIT LOOP IF DONE
010466 005761 177776 TST -2(R1) ;REFERENCE BELOW ALLOWED AREA -
;SHOULD ABORT
010472 005077 172334 CLR @SR0 ;TURN KT11-C OFF
010476 104006 HLT ;NO ABORT OCCURRED ON A REFERENCE
;OUTSIDE THE ALLOWED PAGE LENGTH
;THE ADDRESS REFERENCED WAS THE VALUE CONTAINED IN
;R1 MINUS 2

010500 000426 000001 172322 RET24A: BR CONT24 ;TURN OFF KT11-C
010502 042777 BIC #1, @SR0 ;RESTORE STACK POINTER
010510 022626 CMP (SP)+, (SP)+ ;REFERENCE WITHIN ALLOWED AREA CAUSED
010512 104006 HLT ;A TRAP OR ABORT
;CLEAR ERROR BITS

010514 005077 172312 CLR @SR0 ;RESTORE STACK POINTER
010520 000416 BR CONT24 ;SAVE CURRENT SR0
010522 022626 RET24B: CMP (SP)+, (SP)+ ;TURN OFF KT11-C
010524 017703 172302 MOV @SR0, R3 ;CK SAVED SR0
010530 005077 172276 CLR @SR0
010534 022703 040003 CMP #40003, R3
010540 001401 BEQ .+4 ;CONTENTS OF SR0 INCORRECT AFTER
010542 104006 HLT ;PAGE LENGTH ERROR ABORT
;CHECK SR0 TO BE SURE PL BIT CLEARED

010544 022777 000002 172260 CMP #2, @SR0 ;SR0 INCORRECT AFTER CLEARING IT
010552 001401 BEQ .+4 ;SETUP R1 TO REFERENCE BOUNDARY
010554 104006 HLT ;OF NEXT PAGE DOWN
010556 162701 000100 CONT24: SUB #100, R1 ;INCREASE ALLOWED PAGE LENGTH
; (DOWN) BY 1 PAGE
010562 162702 000400 SUB #400, R2

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010566	000722			BR	LOOP24	:CHECK NEXT PAGE LENGTH VALUE
010570	005077	172236		CLR	SR0	:TURN OFF KT11-C
010574	016777	172612	172606	MOV	KTSTA,KTVEC	:RESTORE MEMORY MANAGEMENT ABORT RETURN
010602	005077	172604		CLR	KTSTA	:TO CAUSE A HALT ON A FALSE TRAP
						:OR ABORT
						:TEST ALL COMBINATIONS OF VALUES FOR THE PAGE LENGTH COMPARATORS-
						:USE KERNEL I-SPACE PAGE 1
010606	104400			TEST25:	SCOPE	
010610	012737	000025	177570	MOV	#25,SR	:DISPLAY TEST NUMBER
010616	005037	177776		CLR	SP	:INITIALIZE PROCESSOR STATUS
010622	012706	001000		MOV	KTSTACK,SP	:INITIALIZE KERNEL STACK POINTER
010626	005077	172214		CLR	SR3	:INITIALIZE SR3
010632	005077	172174		CLR	SR0	:INITIALIZE SR0
010636	026727	172556	000025	CMP	TESTCT,#25	:IS THIS TEST BEING EXECUTED IN THE
010644	001401			BEQ	.+4	:CORRECT SEQUENCE? - BRANCH IF YES
010646	104006			HLT		:TEST EXECUTED OUT OF ORDER - TESTCT
						:CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE
010650	012767	000020	004326	MOV	#20,ICOUNT	:DROP ITERATION COUNT
010656	004767	003662		JSR	X7,RWALL	:INITIALIZE ALL PAGES RW, BANK 0
010662	012777	007600	172440	MOV	#7600,KTVEC	:MAP KERNEL PAGE 7 EXTERNAL
010670	012777	011000	172512	MOV	RET25,KTVEC	:SETUP ABORT RETURN
010676	005077	172510		CLR	KTSTA	
010702	012701	000006		MOV	#6,R1	:R1 CONTAINS THE VALUE TO BE
						:LOADED INTO THE PDR
010706	012777	000001	172116	MOV	#1,SR0	:TURN ON KT11-C
010714	012703	020000		MOV	#20000,R3	:R3 CONTAINS VA USED TO REFERENCE PAGE 1
010720	010177	172330		MOV	R1,KTIPDR1	:LOAD NEW PAGE LENGTH FIELD
010724	010102			MOV	R1,R2	:R2 IS A COPY OF R1 USED FOR CALCULATIONS
010726	010304			MOV	R3,R4	:R4 IS A COPY OF R3 USED FOR CALCULATIONS
010730	042704	160000		BIC	#160000,R4	:CLEAR ALL BUT ADDRESS OFFSET IN R4
010734	005713			TST	(R3)	:USE VA IN R3 TO REFERENCE PAGE 1
010736	000302			SWAB	R2	:NO TRAP-CHECK TO MAKE SURE
010740	042702	177400		BIC	#177400,R2	:THAT THE ADDRESS REFERENCED WAS
010744	072427	177772		ASH	#-6,R4	:WITHIN THE ALLOWED PAGE LENGTH
010750	020402			CMP	R4,R2	
010752	003401			BLE	.+4	
010754	104006			HLT		
						:REFERENCE OUTSIDE ALLOWED PAGE LENGTH
						:DIDN'T ABORT - R3 CONTAINS VA USED
010756	062703	000100		C25:	ADD	:R1 CONTAINS VALUE LOADED INTO THE PDR
010762	020327	037776		CMP	R3,#37776	:CHANGE R3 TO REFERENCE NEXT BLOCK
010766	003756			BLE	L25B	:CHECK FOR ALL BLOCKS REFERENCED
010770	062701	000400		ADD	#400,R1	:BRANCH IF NOT
						:INCREMENT VALUE TO BE LOADED INTO
						:THE PAGE LENGTH FIELD
010774	100347			BPL	L25A	:BRANCH IF NOT DONE
010776	000412			BR	DONE25	:EXIT
011000	022626			CMP	(SP)+,(SP)+	:RESTORE STACK POINTER
011002	000302			SWAB	R2	:CHECK TO MAKE SURE VIRTUAL
011004	042702	177400		BIC	#177400,R2	:ADDRESS WAS OUTSIDE ALLOWED
011010	072427	177772		ASH	#-6,R4	:PAGE LENGTH
011014	020402			CMP	R4,R2	
011016	003001			BGT	.+4	
011020	104006			HLT		
011022	000755			BR	C25	:REFERENCE WITHIN ALLOWED
						:PAGE LENGTH ABORTED-R3 CONTAINS

Address	Hex	Dec	Label	Instruction	Comment
011024	016777	172362	172356	DONE25: MOV	VA USED, R1 CONTAINS VALUE
011032	005077	171774		CLR	LOADED INTO THE PDR
				KTSTA, 2KTVEC	RESTORE TRAP CATCHER
				2SR0	TURN OFF KT11-C
					SHOW THAT THE W BIT DOESN'T SET IF THE KT11-C IS OFF
011036	104400			TEST26: SCOPE	
011040	012737	000026	177570	MOV	#26, 2#SR
011046	005037	177776		CLR	2#PS
011052	012706	001000		MOV	#KSTACK, SP
011056	005077	171764		CLR	2SR3
011062	005077	171744		CLR	2SR0
011066	026727	172326	000026	CMP	TESTCT, #26
011074	001401			BEQ	+.4
011076	104006			HLT	
					IS THIS TEST BEING EXECUTED IN THE
					CORRECT SEQUENCE? - BRANCH IF YES
					TEST EXECUTED OUT OF ORDER - TESTCT
					CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE
011100	012767	002000	004076	MOV	#2000, ICOUNT
011106	004767	003402		JSR	%7, CLALL
011112	013737	010000	010000	MOV	2#10000, 2#10000
011120	005777	172126		TST	2KIPDR0
011124	001401			BEQ	+.4
011126	104006			HLT	
					RESTORE ITERATION COUNT
					CLEAR ALL KT11-C REGISTERS
					WRITE BANK 0
					CHECK CORRESPONDING PDR
					W BIT SET OR ANOTHER BIT INCORRECT
					IN KERNEL I-SPACE 0 PDR
					SHOW THAT THE W BIT IS CLEARED BY WRITING (VIA DAT0) THE CORRESPONDING PAR
					CHECK EACH PDR
011130	104400			TEST27: SCOPE	
011132	012737	000027	177570	MOV	#27, 2#SR
011140	005037	177776		CLR	2#PS
011144	012706	001000		MOV	#KSTACK, SP
011150	005077	171672		CLR	2SR3
011154	005077	171652		CLR	2SR0
011160	026727	172234	000027	CMP	TESTCT, #27
011166	001401			BEQ	+.4
011170	104006			HLT	
					IS THIS TEST BEING EXECUTED IN THE
					CORRECT SEQUENCE? - BRANCH IF YES
					TEST EXECUTED OUT OF ORDER - TESTCT
					CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE
011172	004767	003346		JSR	%7, RWALL
011176	012777	000007	171642	MOV	#7, 2SR3
011204	012777	007600	172136	MOV	#7600, 2KDPAR7
011212	012777	007600	172030	MOV	#7600, 2SDPAR7
011220	012777	007600	171722	MOV	#7600, 2UDPAR7
011226	012737	040000	177776	MOV	#40000, 2#PS
011234	012706	002000		MOV	#SSTACK, R6
011240	012737	140000	177776	MOV	#140000, 2#PS
011246	012706	003000		MOV	#USTACK, R6
011252	012700	003366		MOV	#STATAB, R0
011256	012001			LOP27: MOV	(R0)+, R1
					INITIALLY MAP ALL PAGES RW, 4K, BANK 0
					ENABLE ALL D-SPACES
					MAP D-SPACE 7, ALL MODES,
					TO THE EXTERNAL BANK
					SET MODE TO SUPERVISOR
					SETUP SUPERVISOR STACK POINTER
					SET MODE TO USER
					SETUP USER STACK POINTER
					POINT R0 TO THE TABLE OF MODE INFORMATION</

011276	005027	000000		ADR27A:	CLR	#0	;WRITE I-SPACE
011302	042707	160000			BIC	#160000,PC	;CHANGE TO PAGE 0 PC
011306	005077	171520			CLR	SR0	;TURN OFF KT11-C
011312	004767	000056			JSR	%7,CKWBIT	;TEST W BIT
011316	005721				TST	(R1)+	;MOVE POINTER
011320	062702	020000			ADD	#20000,R2	;CHANGE VA TO REFERENCE NEXT PAGE
011324	103361				BCC	LOP27A	;LOOP UNTIL ALL I-SPACE PDR'S HAVE BEEN
							;CHECKED IN THE CURRENT MODE
011326	012702	017776			MOV	#17776,R2	;SETUP R2 TO REFERENCE DESIRED PAGE
011332	005277	171474		LOP27B:	INC	SR0	;TURN ON KT11-C
011336	011212				MOV	(R2),(R2)	;WRITE IN D-SPACE
011340	005077	171466			CLR	SR0	;TURN OFF KT11-C
011344	004767	000024			JSR	%7,CKWBIT	;TEST W BIT
011350	005721				TST	(R1)+	;MOVE POINTER
011352	062702	020000			ADD	#20000,R2	;CHANGE VA TO REFERENCE NEXT PAGE
011356	103365				BCC	LOP27B	;LOOP UNTIL ALL D-SPACE PDR'S HAVE BEEN
							;CHECKED IN THE CURRENT MODE
011360	020027	003400			CMP	R0,#STAEND	;HAVE ALL MODES BEEN TESTED?
011364	002734				BLT	LOP27	;NO, BRANCH
011366	005077	171454			CLR	SR3	;YES, CLEAR ALL D-SPACE ENABLES
011372	000415				BR	TEST30	;EXIT
011374	032771	000100	000000	CKWBIT:	BIT	#100,2(R1)	;CHECK W BIT
011402	001001				BNE	.+4	
011404	104006				HLT		
							;W BIT DIDN'T SET IN PDR WHOSE
							;ADDRESS IS POINTED TO BY R1
011406	005071	000040			CLR	240(R1)	;CLEAR W BIT BY WRITING CORRESPONDING
							;PAR VIA DAT0
011412	032771	000100	000000		BIT	#100,2(R1)	;CHECK W BIT
011420	001401				BEQ	.+4	
011422	104006				HLT		
							;W BIT DIDN'T CLEAR IN PDR WHOSE
							;ADDRESS IS POINTED TO BY R1
011424	000207				RTS	%7	
							;SHOW THAT THE W BIT IS CLEARED BY A DAT0B TO THE PDR
							;CHECK BOTH HIGH AND LOW DAT0B'S, ON KERNEL 0 I-SPACE ONLY
011426	104400			TEST30:	SCOPE		
011430	012737	000030	177570		MOV	#30,2SR	;DISPLAY TEST NUMBER
011436	005037	177776			CLR	2PS	;INITIALIZE PROCESSOR STATUS
011442	012706	001000			MOV	#KSTACK,SP	;INITIALIZE KERNEL STACK POINTER
011446	005077	171374			CLR	SR3	;INITIALIZE SR3
011452	005077	171354			CLR	SR0	;INITIALIZE SR0
011456	026727	171736	000030		CMP	TESTCT,#30	;IS THIS TEST BEING EXECUTED IN THE
011464	001401				BEQ	.+4	;CORRECT SEQUENCE? - BRANCH IF YES
011466	104006				HLT		;TEST EXECUTED OUT OF ORDER - TESTCT
							;CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE
011470	004767	003050			JSR	%7,RWALL	;MAP ALL PAGES 4K, RW, BANK 0
011474	012777	007600	171626		MOV	#7600,2KIPAR7	;MAP KERNEL 7 TO THE EXTERNAL BANK
011502	005277	171324			INC	SR0	;TURN ON KT11-C
011506	013737	000000	000000		MOV	2#0,2#0	;WRITE INTO PAGE 0
011514	005077	171312			CLR	SR0	;TURN OFF KT11-C
011520	032777	000100	171524		BIT	#100,2KIPDR0	;CHECK W BIT
011526	001001				BNE	.+4	
011530	104006				HLT		
							;W BIT NOT SET AFTER WRITING PAGE 0
011532	112777	000106	171512		MOV8	#106,2KIPDR0	;DAT0B SHOULD CLEAR W BIT
011540	032777	000100	171504		BIT	#100,2KIPDR0	

011546	001401			BEQ	+.4	
011550	104006			HLT		;W BIT DIDN'T CLEAR VIA DATOB (LOW)
011552	005277	171254		INC	2SR0	;TO THE PDR
011556	013737	017776	017776	MOV	2#17776,2#17776	;TURN ON KT11-C
011564	005077	171242		CLR	2SR0	;WRITE INTO PAGE 0 AGAIN
011570	032777	000100	171454	BIT	#100,2KIPDR0	;TURN OFF KT11-C
011576	001001			BNE	+.4	;CHECK W BIT
011600	104006			HLT		;W BIT NOT SET AFTER WRITING PAGE 0
011602	016701	171444		MOV	KIPDR0,R1	;SETUP R1 TO REFERENCE HIGH BYTE
011606	005201			INC	R1	;OF KIPDR0
011610	112711	000177		MOVB	#177,2R1	;DATOB TO HIGH BYTE OF KIPDR0
011614	032777	000100	171430	BIT	#100,2KIPDR0	;CHECK W BIT
011622	001401			BEQ	+.4	
011624	104006			HLT		;W BIT DIDN'T CLEAR VIA DATOB
						;TO HIGH BYTE OF PDR
;SHOW THAT THE W BIT IS CLEARED BY A DATOB TO THE PAR						
;CHECK BOTH HIGH AND LOW DATOB'S, ON KERNEL 0 I-SPACE ONLY						
011626	104400			TEST31: SCOPE		
011630	012737	000031	177570	MOV	#31,2#SR	;DISPLAY TEST NUMBER
011636	005037	177776		CLR	2#PS	;INITIALIZE PROCESSOR STATUS
011642	012706	001000		MOV	#KSTACK,SP	;INITIALIZE KERNEL STACK POINTER
011646	005077	171174		CLR	2SR3	;INITIALIZE SR3
011652	005077	171154		CLR	2SR0	;INITIALIZE SR0
011656	026727	171536	000031	CMP	TESTCT,#31	;IS THIS TEST BEING EXECUTED IN THE
011664	001401			BEQ	+.4	;CORRECT SEQUENCE? - BRANCH IF YES
011666	104006			HLT		;TEST EXECUTED OUT OF ORDER - TESTCT
						;CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE
011670	004767	002650		JSR	%7,RWALL	;MAP ALL PAGES 4K, RW, BANK 0
011674	012777	007600	171426	MOV	#7600,2KIPAR7	;MAP KERNEL 7 TO THE EXTERNAL BANK
011702	005277	171124		INC	2SR0	;TURN ON KT11-C
011706	013737	000000	000000	MOV	2#0,2#0	;WRITE INTO PAGE 0
011714	005077	171112		CLR	2SR0	;TURN OFF KT11-C
011720	032777	000100	171324	BIT	#100,2KIPDR0	;CHECK W BIT
011726	001001			BNE	+.4	
011730	104006			HLT		;W BIT NOT SET AFTER WRITING PAGE 0
011732	112777	000000	171352	MOVB	#0,2KIPAR0	;DATOB TO THE PAR
011740	032777	000100	171304	BIT	#100,2KIPDR0	;CHECK W BIT
011746	001401			BEQ	+.4	
011750	104006			HLT		;W BIT DIDN'T CLEAR VIA DATOB
						; (LOW) TO THE PAR
011752	005277	171054		INC	2SR0	;TURN ON KT11-C
011756	013737	017776	017776	MOV	2#17776,2#17776	;WRITE INTO PAGE 0 AGAIN
011764	005077	171042		CLR	2SR0	;TURN OFF KT11-C
011770	032777	000100	171254	BIT	#100,2KIPDR0	;CHECK W BIT
011776	001001			BNE	+.4	
012000	104006			HLT		;W BIT NOT SET AFTER WRITING PAGE 0
012002	016701	171304		MOV	KIPAR0,R1	;SETUP R1 TO REFERENCE HIGH BYTE
012006	005201			INC	R1	;OF KIPAR0
012010	112711	000000		MOVB	#0,2R1	;DATOB TO HIGH BYTE OF KIPAR0
012014	032777	000100	171230	BIT	#100,2KIPDR0	;CHECK W BIT
012022	001401			BEQ	+.4	
012024	104006			HLT		;W BIT DIDN'T CLEAR VIA DATOB
						;TO HIGH BYTE OF PAR


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;SHOW THAT THE W BIT IS NOT CLEARED BY INIT
;INITIALLY SET ALL THE W BITS, THEN DO A RESET AND CHECK THE W BITS
012026 104400          TEST32: SCOPE
012030 012737 000032 177570      MOV    #32,2#SR
012036 005037 177776          CLR    2#PS
012042 012706 001000          MOV    #KSTACK,SP
012046 005077 170774          CLR    2SR3
012052 005077 170754          CLR    2SR0
012056 026727 171336 000032      CMP    TESTCT,2#32
012064 001401          BEQ     .+4
012066 104006          HLT

;DISPLAY TEST NUMBER
;INITIALIZE PROCESSOR STATUS
;INITIALIZE KERNEL STACK POINTER
;INITIALIZE SR3
;INITIALIZE SR0
;IS THIS TEST BEING EXECUTED IN THE
;CORRECT SEQUENCE? - BRANCH IF YES
;TEST EXECUTED OUT OF ORDER - TESTCT
;CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE

012070 004767 002450          JSR     %7,RWALL
012074 012777 000007 170744      MOV    #7,2SR3
012102 012777 007600 171240      MOV    #7600,2KDPAR7
012110 012777 007600 171132      MOV    #7600,2SDPAR7
012116 012777 007600 171024      MOV    #7600,2UDPAR7
012124 012737 040000 177776      MOV    #40000,2#PS
012132 012706 002000          MOV    #SSTACK,R6
012136 012737 140000 177776      MOV    #140000,2#PS
012144 012706 003000          MOV    #USTACK,R6
012150 012700 003366          MOV    #STATAB,R0

;INITIALIZE ALL PAGES RW,4K,BANK 0
;ENABLE ALL D-SPACES
;MAP D-SPACE PAGE 7, ALL MODES,
;TO THE EXTERNAL BANK

012154 005720          LOOP32: TST    (R0)+
012156 012037 177776          MOV    (R0)+,2#PS

;SET MODE TO SUPERVISOR
;SETUP SUPERVISOR STACK
;SET MODE TO USER
;SETUP USER STACK
;R0 POINTS TO INFORMATION FOR
;CURRENT MODE
;MOVE POINTER
;SETUP MODE TO REFERENCE NEXT
;SET OF REGISTERS
;R2 CONTAINS VA TO REFERENCE
;DESIRED PAGE
;TURN ON KT11-C
;CHANGE PC TO REFERENCE NEXT PAGE
;WRITE IN I-SPACE
;SETUP NEXT VIRTUAL ADDRESS
;LOOP TILL ALL I-SPACE PAGES IN
;THIS MODE HAVE BEEN WRITTEN INTO
;CHANGE TO BANK ZERO PC
;SETUP R2 TO REFERENCE DESIRED
;D-SPACE PAGE

012162 012702 012174          MOV    #ADR32,R2

;WRITE IN D-SPACE
;CHANGE VA TO REFERENCE NEXT PAGE
;SET ALL W-BITS IN CURRENT MODE
;TURN OFF KT11-C
;CHECK FOR DONE SETTING THE W BITS
;IF NOT, LOOP TO DO NEXT MODE
;SETUP R1 TO REFERENCE ADDRESSES
;OF PDR'S
;USE R2 AS COUNTER TO CHANGE ADDRESS
;AT END OF EACH SET OF REGISTERS
;CHECK W BIT

012166 005277 170640          LOP32A: INC    2SR0
012172 010207          LOP32B: MOV    R2,PC
012174 005027 000000          ADR32: CLR    #0
012200 062702 020000          ADD    #20000,R2
012204 103372          BCC     LOP32B

;WRITE IN D-SPACE
;CHANGE VA TO REFERENCE NEXT PAGE
;SET ALL W-BITS IN CURRENT MODE
;TURN OFF KT11-C
;CHECK FOR DONE SETTING THE W BITS
;IF NOT, LOOP TO DO NEXT MODE
;SETUP R1 TO REFERENCE ADDRESSES
;OF PDR'S
;USE R2 AS COUNTER TO CHANGE ADDRESS
;AT END OF EACH SET OF REGISTERS
;CHECK W BIT

012206 042707 160000          BIC    #160000,PC
012212 012702 017776          MOV    #17776,R2

;WRITE IN D-SPACE
;CHANGE VA TO REFERENCE NEXT PAGE
;SET ALL W-BITS IN CURRENT MODE
;TURN OFF KT11-C
;CHECK FOR DONE SETTING THE W BITS
;IF NOT, LOOP TO DO NEXT MODE
;SETUP R1 TO REFERENCE ADDRESSES
;OF PDR'S
;USE R2 AS COUNTER TO CHANGE ADDRESS
;AT END OF EACH SET OF REGISTERS
;CHECK W BIT

012216 011212          LOP32C: MOV    (R2),(R2)
012220 062702 020000          ADD    #20000,R2
012224 103374          BCC     LOP32C
012226 005077 170600          CLR    2SR0
012232 020027 003400          CMP    R0,#STAEND
012236 002746          BLT     LOOP32
012240 012701 003052          MOV    #ADRTAB,R1

;WRITE IN D-SPACE
;CHANGE VA TO REFERENCE NEXT PAGE
;SET ALL W-BITS IN CURRENT MODE
;TURN OFF KT11-C
;CHECK FOR DONE SETTING THE W BITS
;IF NOT, LOOP TO DO NEXT MODE
;SETUP R1 TO REFERENCE ADDRESSES
;OF PDR'S
;USE R2 AS COUNTER TO CHANGE ADDRESS
;AT END OF EACH SET OF REGISTERS
;CHECK W BIT

012244 012702 000020          LOP32D: MOV    #20,R2

;WRITE IN D-SPACE
;CHANGE VA TO REFERENCE NEXT PAGE
;SET ALL W-BITS IN CURRENT MODE
;TURN OFF KT11-C
;CHECK FOR DONE SETTING THE W BITS
;IF NOT, LOOP TO DO NEXT MODE
;SETUP R1 TO REFERENCE ADDRESSES
;OF PDR'S
;USE R2 AS COUNTER TO CHANGE ADDRESS
;AT END OF EACH SET OF REGISTERS
;CHECK W BIT

012250 032771 000100 000000      LOP32E: BIT    #100,2(R1)
012256 001001          BNE     .+4
012260 104006          HLT

;W BIT NOT SET IN PDR WHOSE
;ADDRESS IS POINTED TO BY R1-
;SHOULD HAVE BEEN SET WHEN
;PAGE WAS WRITTEN INTO

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012262	005721			TST	(R1)+	:MOVE POINTER
012264	077207			SQB	R2, LOP32E	:CHECK ALL PDR'S IN THIS SET
012266	062701	000040		ADD	#40, R1	:CHANGE R1 TO REFERENCE NEXT
						:SET OF PDR ADDRESSES
012272	020127	003350		CMP	R1, #ADREND	:CHECK FOR DONE
012276	002762			BLT	LOP32D	:IF NOT, CHECK NEXT SET OF PDR'S
012300	005037	177776		CLR	#PS	:SET MODE TO KERNEL
012304	005277	170522		INC	#SR0	:TURN KT11-C ON
012310	105777	170502		TSTB	#TCSR	:WAIT FOR ANY TTY OUTPUT TO FINISH
012314	100375			BPL	.-4	
012316	000005			RESET		:INIT WITH KT11-C ON
012320	000005			RESET		:INIT WITH KT11-C OFF
012322	012701	003052		MOV	#ADRTAB, R1	:R1 REFERENCES ADDRESS OF PDR
012326	012702	000020		LOP32F: MOV	#20, R2	:R2 KEEPS TRACK OF WHEN TO CHANGE
						:REGISTER SETS
012332	032771	000100	000000	LOP32G: BIT	#100, #2(R1)	:CHECK W BIT
012340	001001			BNE	.-4	
012342	104006			HLT		:INIT CLEARED W BIT IN PDR WHOSE
						:ADDRESS IS POINTED TO BY R1
012344	005721			TST	(R1)+	:MOVE POINTER
012346	077207			SQB	R2, LOP32G	:CHECK ALL PDR'S IN THIS SET
012350	062701	000040		ADD	#40, R1	:CHANGE R1 TO REFERENCE NEXT SET
						:OF PDR ADDRESSES
012354	020127	003350		CMP	R1, #ADREND	:CHECK FOR DONE
012360	002762			BLT	LOP32F	:IF NOT, CHECK NEXT SET OF PDR'S
012362	005077	170444		CLR	#SR0	:REINITIALIZE SR0, SR3
012366	005077	170454		CLR	#SR3	
						:SHOW THAT EACH "A" BIT IN THE I-SPACE PDR'S CAN BE SET BY REFERENCING
						:THE CORRESPONDING PAGE MAPPED READ WRITE AND TRAP ON WRITE WITHOUT
						:MEMORY MANAGEMENT ENABLE SET
						:SHOW THAT ONLY ONE "A" BIT SETS ON EACH REFERENCE
						:SHOW THAT EACH "A" BIT IN THE I-SPACE PDR'S IS CLEARED BY A DATO TO THE PDR,
						:AND BY A DATO TO THE CORRESPONDING PAR
012372	104400			TEST33: SCOPE		
012374	012737	000033	177570	MOV	#33, #SR	:DISPLAY TEST NUMBER
012402	005037	177776		CLR	#PS	:INITIALIZE PROCESSOR STATUS
012406	012706	001000		MOV	#KSTACK, SP	:INITIALIZE KERNEL STACK POINTER
012412	005077	170430		CLR	#SR3	:INITIALIZE SR3
012416	005077	170410		CLR	#SR0	:INITIALIZE SR0
012422	026727	170772	000033	CMP	TESTCT, #33	:IS THIS TEST BEING EXECUTED IN THE
012430	001401			BEQ	.-4	:CORRECT SEQUENCE? - BRANCH IF YES
012432	104006			HLT		:TEST EXECUTED OUT OF ORDER - TESTCT
						:CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE
012434	004767	002252		JSR	%7, RWTWAL	:MAP ALL PAGES 4K, RWTW
						:MAP ALL EXCEPT D-SPACE 7 (ALL MODES)
						:TO BANK 0 - MAP D-SPACE 7 (ALL MODES)
						:TO EXTERNAL BANK
012440	012737	040000	177776	MOV	#40000, #PS	:SET MODE TO SUPERVISOR
012446	012706	002000		MOV	#SSTACK, R6	:SETUP SUPERVISOR STACK POINTER
012452	012737	140000	177776	MOV	#140000, #PS	:SET MODE TO USER
012460	012706	003000		MOV	#USTACK, R6	:SETUP USER STACK POINTER
012464	012777	000007	170354	MOV	#7, #SR3	:ENABLE ALL D-SPACES
012472	012700	003366		MOV	#STATAB, R0	:POINT R0 TO TABLE OF MODE INFORMATION
012476	012001			LOP33A: MOV	(R0)+, R1	:R1 POINTS TO ADDRESS OF PDR BEING TESTED

012500	012037	177776		MOV	(R0)+,2#PS	;SET STATUS TO REFERENCE DESIRED MODE
012504	012702	012522		MOV	#ADR33A,R2	;R2 AND R3 CONTAIN VIRTUAL ADDRESSES
012510	012703	012642		MOV	#ADR33B,R3	;USED TO REFERENCE CURRENT PAGE
012514	005277	170312		LOP33B: INC	2SR0	;TURN ON KT11-C
012520	010207			MOV	R2,PC	;CHANGE ADDRESS TO REFERENCE DESIRED PAGE
012522	005027	000000		ADR33A: CLR	#0	;WRITE IN I-SPACE
012526	042707	160000		BIC	#160000,PC	;CHANGE TO BANK 0 ADDRESS
012532	005077	170274		CLR	2SR0	;TURN OFF KT11-C
012536	032771	000200	000000	BIT	#200,2(R1)	;CHECK "A" BIT
012544	001001			BNE	.+4	
012546	104006			HLT		
012550	012704	003052		MOV	#ADRTAB,R4	; "A" BIT NOT SET IN PDR WHOSE ADDRESS IS POINTED TO
012554	012705	000020		LOP33C: MOV	#20,R5	;BY R1, AFTER WRITING CORRESPONDING PAGE
012560	020104			LOP33D: CMP	R1,R4	;MAPPED RMTW
012562	001405			BEQ	CNT33A	;SETUP TO CHECK ALL OTHER "A" BITS
012564	032774	000200	000000	BIT	#200,2(R4)	;R5 KEEPS TRACK OF WHEN TO CHANGE REGISTER SETS
012572	001401			BEQ	.+4	;DON'T CHECK IF ITS THE PDR BEING
012574	104006			HLT		;TESTED
012576	005724			CNT33A: TST	(R4)+	;OTHERWISE MAKE SURE THE "A" BIT DIDN'T SET
012600	077511			SQB	R5,LOP33D	
012602	062704	000040		ADD	#40,R4	;THE "A" BIT WAS SET IN THE PDR WHOSE
012606	020427	003350		CMP	R4,#ADREND	;ADDRESS IS POINTED TO BY R4, WITHOUT THE
012612	002760			BLT	LOP33C	;CORRESPONDING PAGE HAVING BEEN REFERENCED
012614	012771	077605	000000	MOV	#77605,2(R1)	;R2 CONTAINS THE ADDRESS THAT WAS REFERENCED
012622	032771	000200	000000	BIT	#200,2(R1)	;MOVE POINTER
012630	001401			BEQ	.+4	;CHECK ALL PDR'S IN THIS SET
012632	104006			HLT		;CHANGE ADDRESS TO REFERENCE NEXT SET OF PDR'S
012634	005277	170172		INC	2SR0	;HAVE ALL REGISTERS BEEN CHECKED?
012640	010307			MOV	R3,PC	;NO-BRANCH
012642	005027	000000		ADR33B: CLR	#0	;YES-CLEAR "A" BIT BY DATO TO PDR
012646	042707	160000		BIC	#160000,PC	;CHECK THE "A" BIT
012652	005077	170154		CLR	2SR0	
012656	032771	000200	000000	BIT	#200,2(R1)	;DATO TO PDR WHOSE ADDRESS IS POINTED
012664	001001			BNE	.+4	;TO BY R1 DIDN'T CLEAR THE A BIT
012666	104006			HLT		;TURN ON KT11-C
012670	017171	000040	000040	MOV	240(R1),240(R1)	;SET "A" BIT AGAIN
012676	032771	000200	000000	BIT	#200,2(R1)	
012704	001401			BEQ	.+4	;TURN OFF KT11-C
012706	104006			HLT		;CHECK THE "A" BIT
012710	005721			TST	(R1)+	;A BIT NOT SET AFTER WRITING I-SPACE
012712	062702	020000		ADD	#20000,R2	;PAGE WHOSE ADDRESS IS POINTED TO BY R1-
012716	062703	020000		ADD	#20000,R3	;MAPPED RMTW
012722	103274			BCC	LOP33B	;CLEAR "A" BIT BY DATO TO PAR
012724	020067	170450		CMP	R0,STAEND	;CHECK THE "A" BIT
012730	002662			BLT	LOP33A	
012732	005077	170110		CLR	2SR3	;DATO TO CORRESPONDING PAR DIDN'T CLEAR "A" BIT
;IN PDR WHOSE ADDRESS IS POINTED TO BY R1						
;MOVE POINTER						
;CHANGE VIRTUAL ADDRESSES TO REFERENCE						
;NEXT PAGE						
;CHECK ALL I-SPACE PDR'S IN THIS MODE						
;CHECK ALL 3 MODES						
;CLEAR ALL D-SPACE ENABLES						


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; SHOW THAT EACH "A" BIT IN THE D-SPACE PDR'S CAN BE SET BY REFERENCING
; THE CORRESPONDING PAGE MAPPED READ WRITE AND TRAP ON WRITE
; WITHOUT MEMORY MANAGEMENT ENABLE SET
; SHOW THAT EACH "A" BIT IN THE D-SPACE PDR'S CAN BE CLEARED BY A DATO TO
; THE PDR, AND BY A DATO TO THE CORRESPONDING PAR
012736 104400
012740 012737 000034 177570
012746 005037 177776
012752 012706 001000
012756 005077 170064
012762 005077 170044
012766 026727 170426 000034
012774 001401
012776 104006

TEST34: SCOPE
MOV #34, @#SR
CLR @#PS
MOV #KSTACK, SP
CLR @SR3
CLR @SR0
CMP TESTCT, #34
BEQ .+4
HLT

; DISPLAY TEST NUMBER
; INITIALIZE PROCESSOR STATUS
; INITIALIZE KERNEL STACK POINTER
; INITIALIZE SR3
; INITIALIZE SR0
; IS THIS TEST BEING EXECUTED IN THE
; CORRECT SEQUENCE? - BRANCH IF YES
; TEST EXECUTED OUT OF ORDER - TESTCT
; CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE

013000 004767 001706 JSR %7, RWTWAL

; MAP ALL PAGES 4K, RWTW, BANK 0
; EXCEPT D-SPACE 7, MAPPED TO THE
; EXTERNAL BANK
; SET MODE TO SUPERVISOR
; SET UP SUPERVISOR STACK POINTER
; SET MODE TO USER
; SET UP USER STACK POINTER
; ENABLE ALL D-SPACES
; R0 POINTS TO TABLE OF MODE INFORMATION
; R1 POINTS TO ADDRESS OF PDR BEING
; TESTED
; SETUP MODE TO BE TESTED
; USE R2 TO REFERENCE PAGE TO SET THE A BIT
; TURN ON KT11-C
; WRITE IN D-SPACE PAGE TO SET "A" BIT
; TURN OFF KT11-C
; CHECK THE "A" BIT

013004 012737 040000 177776 MOV #40000, @#PS
013012 012706 002000 MOV #SSTACK, R6
013016 012737 140000 177776 MOV #140000, @#PS
013024 012706 003000 MOV #USTACK, R6
013030 012777 000007 170010 MOV #7, @SR3
013036 012700 003366 MOV #STATAB, R0
013042 012001 LOP34A: MOV (R0)+, R1
013044 062701 ADD #20, R1
013050 012037 MOV (R0)+, @#PS
013054 012702 017776 LOP34B: MOV #17776, R2
013060 005277 INC @SR0
013064 011212 MOV @R2, @R2
013066 005077 CLR @SR0
013072 032771 000200 000000 BIT #200, @ (R1)
013100 001001 BNE .+4
013102 104006 HLT

; "A" BIT NOT SET AFTER WRITING D-SPACE
; PAGE MAPPED RWTW
; ADDRESS REFERENCED IS IN R2
; CLEAR "A" BIT BY DATO TO PDR
; CHECK THE "A" BIT

013104 017171 000000 000000 MOV @ (R1), @ (R1)
013112 032771 000200 000000 BIT #200, @ (R1)
013120 001401 BEQ .+4
013122 104006 HLT

; DATO TO PDR DIDN'T CLEAR "A" BIT -
; PDR ADDRESS IS POINTED TO BY R1
; TURN ON KT11-C
; SET "A" BIT AGAIN
; TURN OFF KT11-C
; CHECK "A" BIT

013124 005277 167702 INC @SR0
013130 011212 MOV @R2, @R2
013132 005077 CLR @SR0
013136 032771 000200 000000 BIT #200, @ (R1)
013144 001001 BNE .+4
013146 104006 HLT

; "A" BIT NOT SET AFTER WRITING D-SPACE
; PAGE MAPPED RWTW
; ADDRESS REFERENCED IS IN R2
; CLEAR THE "A" BIT BY DATO TO PAR
; CHECK THE "A" BIT

013150 017171 000040 000040 MOV @40 (R1), @40 (R1)
013156 032771 000200 000000 BIT #200, @ (R1)
013164 001401 BEQ .+4
013166 104006 HLT

; DATO TO PAR DIDN'T CLEAR "A" BIT
; IN CORRESPONDING PDR WHOSE ADDRESS IS POINTED TO BY R1
; MOVE POINTER

013170 005721 TST (R1)+

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013172	062702	020000		ADD	#20000,R2	:CHANGE R2 TO REFERENCE NEXT PAGE
013176	103330			BCC	LOP34B	:CHECK ALL D-SPACE PDR'S IN THIS MODE
013200	020027	003400		CMP	RO,#STAEND	
013204	002716			BLT	LOP34A	:CHECK ALL 3 MODES
013206	005077	167634		CLR	JSR3	:CHECK ALL D-SPACE ENABLES
:SHOW THAT THE A BIT IS CLEARED BY A DATOB TO THE PDR AND ALSO BY						
:A DATOB TO THE CORRESPONDING PAR. CHECK BOTH HIGH AND LOW BYTES, ON						
:KERNEL PAGE 1 I-SPACE						
013212	104400			TEST35:	SCOPE	
013214	012737	000035	177570	MOV	#35,2#SR	:DISPLAY TEST NUMBER
013222	005037	177776		CLR	2#PS	:INITIALIZE PROCESSOR STATUS
013226	012706	001000		MOV	#KSTACK,SP	:INITIALIZE KERNEL STACK POINTER
013232	005077	167610		CLR	2SR3	:INITIALIZE SR3
013236	005077	167570		CLR	2SR0	:INITIALIZE SR0
013242	026727	170152	000035	CMP	TESTCT,#35	:IS THIS TEST BEING EXECUTED IN THE
013250	001401			BEQ	.+4	:CORRECT SEQUENCE? - BRANCH IF YES
013252	104006			HLT		:TEST EXECUTED OUT OF ORDER - TESTCT
:CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE						
013254	004767	001264		JSR	%7,RWALL	:MAP ALL PAGES 4K, RW, BANK 0
013260	012777	007600	170042	MOV	#7600,2KIPAR7	:MAP KERNEL 7 TO THE EXTERNAL BANK
013266	012777	077404	167760	MOV	#77404,2KIPDR1	:MAP KERNEL 1 RAWT
013274	005277	167532		INC	2SR0	:TURN ON KT11-C
013300	005737	020000		TST	2#20000	:SET THE A BIT
013304	005077	167522		CLR	2SR0	:TURN OFF KT11-C
013310	032777	000200	167736	BIT	#200,2KIPDR1	:MAKE SURE THAT THE A BIT SET
013316	001001			BNE	.+4	
013320	104006			HLT		:THE A BIT DIDN'T SET IN KIPDR1
013322	117777	167726	167724	MOVB	2KIPDR1,2KIPDR1	:DATOB TO THE LOW BYTE OF THE PDR
013330	032777	000200	167716	BIT	#200,2KIPDR1	:CHECK THE A BIT
013336	001401			BEQ	.+4	
013340	104006			HLT		:THE A BIT WASN'T CLEARED BY DATOB
013342	005277	167464		INC	2SR0	:TO THE LOW BYTE OF THE PDR
013346	005737	020000		TST	2#20000	:TURN ON KT11-C
013352	005077	167454		CLR	2SR0	:SET THE A BIT AGAIN
013356	016701	167672		MOV	KIPDR1,R1	:TURN OFF KT11-C
013362	005201			INC	R1	:SETUP R1 TO REFERENCE HIGH BYTE
013364	111111			MOVB	2R1,2R1	:OF THE PDR
013366	032777	000200	167660	BIT	#200,2KIPDR1	:DATOB TO HIGH BYTE OF PDR
013374	001401			BEQ	.+4	:CHECK A BIT
013376	104006			HLT		:THE A BIT WASN'T CLEARED BY A
013400	005277	167426		INC	2SR0	:DATOB TO THE HIGH BYTE OF THE PDR
013404	005737	020000		TST	2#20000	:TURN ON KT11-C
013410	005077	167416		CLR	2SR0	:SET THE A BIT AGAIN
013414	117777	167674	167672	MOVB	2KIPAR1,2KIPAR1	:TURN OFF KT11-C
013422	032777	000200	167624	BIT	#200,2KIPDR1	:DATOB TO LOW BYTE OF THE PAR
013430	001401			BEQ	.+4	:CHECK THE A BIT
013432	104006			HLT		:THE A BIT WASN'T CLEARED BY A DATOB
013434	005277	167372		INC	2SR0	:TO THE LOW BYTE OF THE PAR
013440	005737	020000		TST	2#20000	:TURN ON KT11-C
013444	005077	167362		CLR	2SR0	:SET THE A BIT AGAIN
013450	016701	167640		MOV	KIPAR1,R1	:TURN OFF KT11-C
:SETUP R1 TO ADDRESS THE HIGH						


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013454 005201          INC      R1          ;BYTE OF THE PAR
013456 111111          MOV      R1,R1      ;DATAB TO HIGH BYTE OF PAR
013460 032777 000200 167566 BIT      #200,3KIPDR1
013466 001401          BEQ      .+4
013470 104006          HLT

;THE A BIT WAS NOT CLEARED BY A
;DATAB TO THE HIGH BYTE OF THE PAR

;SHOW THAT INIT DOESN'T CLEAR THE "A" BITS, WITH KT11-C ON OR OFF
;ALL "A" BITS ARE CHECKED
TEST36: SCOPE
013472 104400          MOV      #36,3SR
013474 012737 000036 177570 CLR      3PS
013502 005037 177776          MOV      #KSTACK,SP
013506 012706 001000          CLR      3SR3
013512 005077 167330          CLR      3SR0
013516 005077 167310          CMP      TESTCT, #36
013522 026727 167672 000036 BEQ      .+4
013530 001401          HLT
013532 104006

;DISPLAY TEST NUMBER
;INITIALIZE PROCESSOR STATUS
;INITIALIZE KERNEL STACK POINTER
;INITIALIZE SR3
;INITIALIZE SR0
;IS THIS TEST BEING EXECUTED IN THE
;CORRECT SEQUENCE? - BRANCH IF YES
;TEST EXECUTED OUT OF ORDER - TESTCT
;CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE

013534 004767 001152          JSR      %7,RWTWAL
013540 012777 007600 167602 MOV      #7600,3KDPAR7
013546 012777 007600 167474 MOV      #7600,3SDPAR7
013554 012777 007600 167366 MOV      #7600,3UDPAR7
013562 012777 000007 167256 MOV      #7,3SR3
013570 012700 003366          MOV      #STATAB,R0
013574 005720          TST      (R0)+
013576 012037 177776          MOV      (R0)+,3PS

;MAKE ALL PAGES READ WRITE AND TRAP ON WRITE
;MAP D-SPACE PAGE 7, ALL MODES,
;TO THE EXTERNAL BANK

;ENABLE ALL D-SPACES
;POINT R0 TO THE TABLE OF MODE INFORMATION

;SET THE STATUS TO REFERENCE THE DESIRED SET OF
;REGISTERS
;R2 REFERENCES THE DESIRED PAGE
;TURN ON THE KT11-C
;CHANGE PC TO THE DESIRED PAGE
;WRITE I-SPACE
;CHANGE R2 TO REFERENCE THE NEXT PAGE
;WRITE ALL I-SPACES IN THIS MODE
;CHANGE TO BANK 0 PC
;SETUP R2 TO REFERENCE THE FIRST D-SPACE PAGE
;WRITE INTO D-SPACE
;CHANGE R2 TO REFERENCE THE NEXT PAGE
;REFERENCE ALL PAGES IN THIS MODE
;TURN OFF KT11-C

;SET "A" BITS IN ALL MODES
;RETURN TO KERNEL
;TURN ON KT11-C
;WAIT FOR ANY TTY OUTPUT TO FINISH

;ISSUE INIT WITH KT11-C ON
;ISSUE INIT WITH KT11-C OFF
;MAKE SURE KT11-C IS OFF
;R1 POINTS TO ADDRESS OF 1ST PDR
;R2 INDICATES WHEN TO CHANGE REGISTER SETS
;CHECK THE "A" BIT
;OK IF STILL SET
;RESET CLEARED "A" BIT IN
;PDR WHOSE ADDRESS IS

013602 012702 013616          MOV      #ADR36,R2
013606 012777 000001 167216 MOV      #1,3SR0
013614 010207          MOV      R2,PC
013616 005027 000000          CLR      #0
013622 062702 020000          ADD      #20000,R2
013626 103372          BCC      LOP36A
013630 042707 160000          BIC      #160000,PC
013634 012702 017776          MOV      #17776,R2
013640 011212          MOV      3R2,3R2
013642 062702 020000          ADD      #20000,R2
013646 103374          BCC      LOP36B
013650 005077 167156          CLR      3SR0
013654 020027 003400          CMP      R0,#STAEND
013660 002745          BLT      LOOP36
013662 005037 177776          CLR      3PS
013666 005277 167140          INC      3SR0
013672 105777 167120          TSTB   3TCSR
013676 100375          BPL      .-4
013700 000005          RESET
013702 000005          RESET
013704 005077 167122          CLR      3SR0
013710 012701 003052          MOV      #ADRTAB,R1
013714 012702 000020          MOV      #20,R2
013720 032771 000200 000000 LOP36C: BIT      #200,3(R1)
013726 001001          BNE      .+4
013730 104006          HLT

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013732	005721			TST	(R1)+	;POINTED TO BY R1
013734	077207			SQB	R2, LOP36D	;MOVE POINTER
013736	062701	000040		ADD	#40, R1	;CHECK ALL PDR'S IN THIS SET
013742	020127	003350		CMP	R1, #ADREND	
013746	002762			BLT	LOP36C	;CHECK ALL 3 SETS
013750	005077	167072		CLR	SR3	;DISABLE ALL D-SPACES

;SHOW THAT A DATO TO A PDR WILL CLEAR THE A AND W BITS
;EVEN WHEN THE INSTRUCTION ALSO CAUSES A TRAP REFERENCE TO
;THE CORRESPONDING PAGE
;MAP KERNEL PAGE 1 RRWT AND MAKE A WRITE ACCESS TO PAGE 1
;TO SET THE A AND W BITS
;THEN LOAD THE PDR, MAKING A TRAP REFERENCE TO PAGE 1 IN THE SOURCE
;FETCH OF THE SAME INSTRUCTION-THE A AND W BITS SHOULD BE CLEARED DUE
;TO THE DATO TO THE PDR

013754	104400			TEST37: SCOPE		
013756	012737	000037	177570	MOV	#37, SR	;DISPLAY TEST NUMBER
013764	005037	177776		CLR	PS	;INITIALIZE PROCESSOR STATUS
013770	012706	001000		MOV	#KSTACK, SP	;INITIALIZE KERNEL STACK POINTER
013774	005077	167046		CLR	SR3	;INITIALIZE SR3
014000	005077	167026		CLR	SR0	;INITIALIZE SR0
014004	026727	167410	000037	CMP	TESTCT, #37	;IS THIS TEST BEING EXECUTED IN THE
014012	001401			BEQ	.+4	;CORRECT SEQUENCE? - BRANCH IF YES
014014	104006			HLT		;TEST EXECUTED OUT OF ORDER - TESTCT
						;CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE

014016	004767	000522		JSR	%7, RWALL	;INITIALIZE ALL PAGES RW, BANK 0
014022	012777	007600	167300	MOV	#7600, KIPDR1	;MAP KERNEL PAGE 7 TO THE EXTERNAL BANK
014030	012777	077404	167216	MOV	#77404, KIPDR1	;MAKE KERNEL PAGE 1 RRWT
014036	012777	000001	166766	MOV	#1, SR0	;TURN ON KT11-C
014044	013737	020000	020000	MOV	#20000, SR0	;READ AND WRITE PAGE 1
014052	022777	077704	167174	CMP	#77704, KIPDR1	;CHECK PDR OF PAGE 1
014060	001401			BEQ	.+4	
014062	104006			HLT		;KERNEL I-SPACE PAGE 1 PDR
						;INCORRECT - A AND W BITS SHOULD
						;BE SET DUE TO PREVIOUS MOVE INSTRUCTION
014064	012767	077704	166730	MOV	#77704, TEMP	;LOAD TEMP WITH VALUE TO BE MOVED TO KIPDR1
014072	016777	006724	167154	MOV	TEMP+20000, KIPDR1	;PAGE 1 REFERENCE SHOULD SET
						;THE A BIT, BUT DATO TO THE PDR CLEARS A AND W BITS
014100	022777	077404	167146	CMP	#77404, KIPDR1	;CHECK PAGE 1 PDR
014106	001401			BEQ	.+4	
014110	104006			HLT		;PDR INCORRECT - A AND W BITS
014112	005077	166714		CLR	SR0	;SHOULD HAVE BEEN CLEARED

;CHECK TO SEE THAT MULTIPLE ACCESSES TO A PAGE AFTER SETTING THE
;A AND W BITS DON'T CLEAR THE A AND W BITS

014116	104400			TEST40: SCOPE		
014120	012737	000040	177570	MOV	#40, SR	;DISPLAY TEST NUMBER
014126	005037	177776		CLR	PS	;INITIALIZE PROCESSOR STATUS
014132	012706	001000		MOV	#KSTACK, SP	;INITIALIZE KERNEL STACK POINTER
014136	005077	166704		CLR	SR3	;INITIALIZE SR3
014142	005077	166664		CLR	SR0	;INITIALIZE SR0
014146	026727	167246	000040	CMP	TESTCT, #40	;IS THIS TEST BEING EXECUTED IN THE
014154	001401			BEQ	.+4	;CORRECT SEQUENCE? - BRANCH IF YES
014156	104006			HLT		;TEST EXECUTED OUT OF ORDER - TESTCT


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;CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE
014160 012767 000010 001016      MOV      #10,ICOUNT      ;DROP ITERATION COUNT
014166 004767 000352              JSR      %7,RWALL          ;INITIALIZE ALL PAGES 4K, RW, BANK 0
014172 012777 007600 167130      MOV      #7600,AKIPAR7      ;MAP KERNEL PAGE 7 TO THE EXTERNAL BANK
014200 012777 077405 167046      MOV      #77405,AKIPDR1    ;MAP KERNEL PAGE 1 RRTW
014206 012777 000001 166616      MOV      #1,ASR0          ;TURN ON KT11-C
014214 013737 020000 020000      MOV      #20000,ASR0        ;READ AND WRITE PAGE 1
014222 022777 077705 167024      CMP      #77705,AKIPDR1 ;CHECK THE PDR
014230 001401                      BEQ      .+4
014232 104006                      HLT
;KERNEL I-SPACE PDR1 INCORRECT
;A AND W BITS SHOULD BE SET
;POINT R1 TO PAGE 1
014234 012701 020000              MOV      #20000,R1
014240 012702 000100              MOV      #100,R2
014244 005721                      L40:   TST      (R1)+
014246 077202                      SOB      R2,L40
014250 005077 166556              CLR      ASR0          ;TURN OFF KT11-C
014254 022777 077705 166772      CMP      #77705,AKIPDR1 ;CHECK A AND W BITS AGAIN
014262 001401                      BEQ      .+4
014264 104006                      HLT
;KERNEL I-SPACE PDR 1
;INCORRECT AFTER REPEATEDLY READING PAGE 1
;SHOW THAT IF KT11-C IS ON, SETTING THE CURRENT MODE TO 10 WILL
;CAUSE A MEMORY MANAGEMENT ABORT. NON RESIDENT SHOULD BE SET, AND ALSO PL SHOULD
;BE SET IF THE REFERENCE IS OUTSIDE THE FIRST BLOCK
014266 104400                      TEST41: SCOPE
014270 012737 000041 177570      MOV      #41,ASR      ;DISPLAY TEST NUMBER
014276 005037 177776              CLR      ASR0        ;INITIALIZE PROCESSOR STATUS
014302 012706 001000              MOV      #KSTACK,SP  ;INITIALIZE KERNEL STACK POINTER
014306 005077 166534              CLR      ASR3        ;INITIALIZE SR3
014312 005077 166514              CLR      ASR0        ;INITIALIZE SR0
014316 026727 167076 000041      CMP      TESTCT,#41  ;IS THIS TEST BEING EXECUTED IN THE
014324 001401                      BEQ      .+4          ;CORRECT SEQUENCE? - BRANCH IF YES
014326 104006                      HLT          ;TEST EXECUTED OUT OF ORDER - TESTCT
;CONTAINS NUMBER OF PREVIOUS TEST PLUS ONE
014330 012767 002000 000646      MOV      #2000,ICOUNT  ;RESTORE ITERATION COUNT
014336 004767 000202              JSR      %7,RWALL      ;INITIALIZE ALL PAGES 4K, RW, BANK 0
014342 012777 007600 166760      MOV      #7600,AKIPAR7 ;MAP KERNEL 7 TO EXTERNAL BANK
014350 012777 014416 167032      MOV      #RET41,AKTVEC ;SETUP MEMORY MANAGEMENT ABORT RETURN
014356 005077 167030              CLR      AKTSTA
014362 012777 000001 166442      MOV      #1,ASR0      ;TURN ON KT11-C
014370 012737 100000 177776      MOV      #100000,ASR0 ;SET MODE TO 10-FETCH OF NEXT
014376 000240                      ADD41: NOP
014400 005037 177776              CLR      ASR0        ;INSTRUCTION SHOULD ABORT
014404 042777 000001 166420      BIC      #1,ASR0      ;RESTORE MODE TO KERNEL
014412 104006                      HLT          ;TURN OFF KT11-C
014414 000415                      BR      CONT41      ;NO ABORT WHEN MODE WAS SET
014416 042777 000001 166406      RET41: BIC      #1,ASR0 ;TO 10 (ILLEGAL) WITH KT11-C ON
014424 022777 140100 166400      CMP      #140100,ASR0 ;TURN OFF KT11-C AFTER ABORT
014432 001401                      BEQ      .+4          ;CK SR0
014434 104006                      HLT
;SR0 INCORRECT AFTER MODE 10 ABORT
;NR,PL,AND MODE 10 SHOULD BE SET
;CHECK SR2
014436 022777 014376 166376      CMP      #ADD41,ASR2
014444 001401                      BEQ      .+4
014446 104006                      HLT          ;SR2 INCORRECT - SHOULD CONTAIN

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; ADDRESS OF THE INSTRUCTION
; IMMEDIATELY AFTER THE ONE SETTING
; THE MODE TO 10
; REINITIALIZE SRO
; RESTORE TRAP CATCHER
014450 005077 166356 CONT41: CLR  SRO
014454 016777 166732 166726 MOV  KTSTA, SRO
                                ; MONITOR HOOK
014462 104400 SCOPE
014464 004767 001174 JSR  %7, BELL
014470 013701 000042 MOV  S#42, R1
014474 001405 BEQ  END
014476 000005 RESET
LOGIC: JSR  %7, SRO
        NOP
        NOP
        NOP
014510 000167 166706 END:  JMP  START

; SUBROUTINE TO CLEAR ALL KT11-C REGISTERS (EXCEPT SR1, SR2)
CLRALL: CLR  SRO
        CLR  SRO3
        CLR  RO
        MOV  S#96, R1
        CLRLP: CLR  SADR TAB(RO)
        TST  (RO)+
        SOB  R1, CLRLP
        RTS  %7
; RO IS USED TO INDEX THRU THE ADDRESS TABLE
; COUNT OF REGISTERS TO BE CLEARED
; CLEAR REGISTERS THRU ADDRESS TABLE
; MOVE POINTER
; LOOP TILL DONE

; SUBROUTINE TO MAKE ALL PAGES RW, BANK 0, 4K, UP
RWALL: CLR  SRO
        MOV  SADR TAB, R1
RWL1:  MOV  S#20, RO
RWL2:  CLR  S#40(R1)
        MOV  S#77406, S(R1)+
        SOB  RO, RWL2
        ADD  S#40, R1
        CMP  R1, S#ADREND
        BLT  RWL1
        RTS  %7
; R1 POINTS TO ADDRESS OF PDR
; RO KEEPS TRACK OF WHEN TO CHANGE REGISTER SETS
; CLEAR PAR
; SET PDR TO 4K, RW
; CHECK FOR END OF TABLE

; SUBROUTINE TO MAKE ALL I SPACE PAGES RW, BANK 0, 4K, UP
RWISP: CLR  SRO
        MOV  SADR TAB, R1
RWI1:  MOV  S#10, RO
RWI2:  CLR  S#40(R1)
        MOV  S#77406, S(R1)+
        SOB  RO, RWI2
        ADD  S#60, R1
        CMP  R1, S#ADREND
        BLT  RWI1
        RTS  %7
; R1 POINTS TO ADDRESS OF I-SPACE PDR
; CLEAR PAR
; MAP PDR RW, 4K
; CHECK FOR DONE
; BRANCH IF NOT

; SUBROUTINE TO MAKE ALL D-SPACE PAGES RW, BANK 0, 4K, UP
RWDSP: CLR  SRO
014650 005077 166156

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014654	012701	003072		MOV	#ADRTAB+20,R1	;R1 POINTS TO ADDRESS OF D-SPACE PDR
014660	012700	000010		RWD1: MOV	#10,R0	
014664	005071	000040		RWD2: CLR	#40(R1)	;CLEAR PAR
014670	012731	077406		MOV	#77406,#(R1)+	;MAP PDR RW,4K
014674	077005			SOB	R0,RWD2	
014676	062701	000060		ADD	#60,R1	
014702	020127	003350		CMP	R1,#ADREND	;CHECK FOR DONE
014706	002764			BLT	RWD1	;BRANCH IF NOT
014710	000207			RTS	%7	

;ROUTINE TO MAKE ALL PAGES READ/WRITE AND TRAP ON WRITE
;ALL PAGES ARE MAPPED 4K, BANK 0 EXCEPT FOR D-SPACE PAGE 7,
;ALL OF WHICH ARE MAPPED TO THE EXTERNAL BANK

014712	005077	166114		RMTW1: CLR	#SR0	
014716	012701	003052		MOV	#ADRTAB,R1	;R1 POINTS TO ADDRESS OF PDR
014722	012700	000020		RMTW1: MOV	#20,R0	
014726	005071	000040		RMTW2: CLR	#40(R1)	;CLEAR PAR
014732	012731	077405		MOV	#77405,#(R1)+	;MAP PDR RMTW,4K
014736	077005			SOB	R0,RMTW2	
014740	062701	000040		ADD	#40,R1	
014744	020127	003350		CMP	R1,#ADREND	
014750	002764			BLT	RMTW1	
014752	012777	007600	166370	MOV	#7600,#KDPAR7	;MAP PAGE 7, ALL MODES,
014760	012777	007600	166262	MOV	#7600,#SDPAR7	;TO THE EXTERNAL BANK
014766	012777	007600	166154	MOV	#7600,#JDPAR7	
014774	000207			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 HALT

014776	005037	177776		TESTXX: CLR	#PS	
015002	012706	001000		MOV	#KSTACK,SP	
015006	000000			HALT		;WAIT FOR STARTING ADDRESS
015010	016767	162554	000036	MOV	SR,RETRNX	;LOAD STARTING ADDRESS IN RETRNX
015016	062767	000002	000030	ADD	#2,RETRNX	;ADD 2 TO POINT TO INSTRUCTION AFTER
015024	000000			HALT		;SET SR OPTIONS
015026	005067	000154		CLR	SCOPEF	;KEEP COUNT AT ZERO
015032	012767	015044	000150	MOV	#XLOOP,RETURN	;LOAD SCOPE LOOP RETURN POINTER
015040	000177	000010		JMP	#RETRNX	;JUMP TO TEST
015044	005067	000136		XLOOP: CLR	SCOPEF	;KEEP COUNT AT ZERO
015050	000177	000000		JMP	#RETRNX	;JUMP TO TEST
015054	000000			RETRNX: 0		

015056	032737	040000	177570	;SCOPE AND/OR ITERATION LOOP FOR EACH TEST		
015064	001015			SCOPEC: BIT	#40000,#SR	;TEST SR FOR SCOPE
015066	032737	004000	177570	BNE	SCOPEC	;YES SCOPE
015074	001025			BIT	#4000,#SR	;NO-TEST FOR ITERATION
015076	026767	000104	000100	BNE	SCOPEC	;INHIBIT ITERATION
015104	100021			CMP	SCOPEF,ICOUNT	;COMPARE CURRENT COUNT TO MAX NUMBER
015106	005267	000074		BPL	SCOPEC	;EXIT-DONE
015112	012737	000340	177776	INC	SCOPEF	;INCREMENT COUNT
				MOV	#340,#PS	;PREVENT TRAPPING WHILE MOVING STACK

015120	022606			SCOPEB: CMP	(6)+,%6	:REPOSITION STACK
015122	012637	177776		MOV	(6)+,%6PS	:RESTORE PREVIOUS PROCESSOR STATUS
015126	032737	000400	177570	BIT	%400,%6SR	:LOAD MICROBREAK REGISTER?
015134	001403			BEQ	+10	:NO-BRANCH
015136	113777	177570	166250	MOVB	%6SR,%6UBRK	:YES-LOAD FROM LOW BYTE OF SR
015144	000177	000040		JMP	%RETURN	:REPEAT TEST
015150	005067	000032		SCOPEG: CLR	SCOPEF	:CLEAR COUNT
015154	005267	166240		INC	TESTCT	:STEP TEST COUNTER TO ALLOW CHECKING ORDER OF EXECUTION
015160	011667	000024		MOV	%6,%6RETURN	:SAVE SCOPE RETURN POINTER
015164	032737	000400	177570	BIT	%400,%6SR	
015172	001403			BEQ	+10	
015174	113777	177570	166212	MOVB	%6SR,%6UBRK	
015202	000002			RTI		:RETURN INLINE-NEXT TEST
015204	002000			ICOUNT: 2000		:ITERATION COUNT
015206	000000			SCOPEF: 0		:COUNT LOCATION FOR ITERATION LOOP
015210	000000			RETURN: 0		:ADDRESS OF LAST TEST
:ENTERED WITH SYSTEM TRAP CALL (HLT)						
:PRINT OUT THE ERROR PC+2 AND STATUS REGISTER						
015212	012767	000340	162556	PRINT: MOV	%340,%6PS	:SET PRIORITY TO 7
015220	036727	162344	020000	BIT	SR,%620000	:TEST FOR INHIBIT PRINT OUT
015226	001401			BEQ	+4	:BRANCH TO PRINT
015230	000432			BR	CK	:INHIBIT, CHECK FOR HALT
015232	012667	000100		MOV	(6)+,%6SAVPC	:PC OF FAILING ROUTINE
015236	012667	000076		MOV	(6)+,%6SAVPSR	:PSR OF ERROR CONDITION
015242	024646			CMP	-(6),-(6)	:RESTORE STACK
015244	012767	000200	162524	MOV	%200,%6PS	
015252	004767	000424		JSR	%7,CALF	:OUTPUT CARRIAGE RETURN AND LINE FEED
015256	016767	000054	000322	MOV	%SAVPC,PTMP1	:LOAD WITH FAILING PC+2
015264	004767	000104		JSR	%7,PROCT	:PRINT FAILING PC+2
015270	105777	165522		TSTB	%TCSR	:WAIT FOR TTY READY
015274	100375			BPL	+4	
015276	012777	000240	165514	MOV	%240,%6TDBR	:OUTPUT A SPACE
015304	016767	000030	000274	MOV	%SAVPSR,PTMP1	:LOAD PROCESSOR STATUS
015312	004767	000056		JSR	%7,PROCT	:PRINT PROCESSOR STATUS
015316	005767	162246		TST	SR	:CHECK SR FOR HALT SWITCH
015322	100001			BPL	+4	:BRANCH IF NOT SET
015324	000000			HALT		:HALT ON ERROR UP
015326	000002			RTI		:RETURN TO MAIN LINE
015330	000000			SAVR2: 0		
015332	000000			SAVR3: 0		
015334	000000			SAVR4: 0		
015336	000000			SAVPC: 0		
015340	000000			SAVPSR: 0		
:SUBROUTINE TO PRINT OUT OCTAL NUMBER						
:PRSHRT DELETES LEADING ZEROS						
:PROCT PRINTS OUT 6 OCTAL DIGITS						
015342	012767	000001	000232	PRSHRT: MOV	%1,PRSF LG	:SET FLAG TO INDICATE SHORT PRINTOUT
015350	005767	000232		TST	PTMP1	:CHECK FOR ZERO
015354	001011			BNE	PROCT+4	:BRANCH IF NOT ZERO
015356	105777	165434		TSTB	%TCSR	:WAIT FOR TTY READY
015362	100375			BPL	+4	
015364	012777	000260	165426	MOV	%260,%6TDBR	:OUTPUT A SINGLE ZERO
015372	000207			RTS	%7	:RETURN

015374	005067	000202		PROCT:	CLR	PRSF LG	:CLEAR FLAG TO INDICATE FULL PRINTOUT
015400	005067	000206			CLR	PTEMP3	:CLEAR R4 FOR COUNTING CHARACTERS OUTPUT
015404	005067	000174			CLR	PRFLG	:INITIALIZE CARRY FLAG FOR ROTATES
015410	012767	000230	000172		MOV	#260, PTEMP2	:SETUP R3
015416	005767	000164			TST	PTEMP1	:CHECK BIT 15 OF NUMBER
015422	100002				BPL	+6	:BRANCH IF ZERO
015424	005267	000160			INC	PTEMP2	:INCREMENT R3 IF ONE
015430	006167	000152			ROL	PTEMP1	:ROTATE LEFT MOST OCTAL TO RIGHT END
015434	006167	000146			ROL	PTEMP1	
015440	005567	000140			ADC	PRFLG	:STORE CARRY
015444	005767	000132		P.CK:	TST	PRSF LG	:CHECK FOR SHORT PRINTOUT
015450	001404				BEQ	P.WAIT	:BRANCH IF NOT SET
015452	026727	000132	000260		CMP	PTEMP2, #260	:CHECK FOR ZERO IF SET
015460	001410				BEQ	P.CONT	:IF SET, GO TO NEXT CHARACTER
015462	105777	165330		P.WAIT:	TSTB	@TCSR	:WAIT FOR TTY READY
015466	100375				BPL	P.WAIT	
015470	016777	000114	165322		MOV	PTEMP2, @TDBR	:OUTPUT NEXT CHARACTER
015476	005067	000100			CLR	PRSF LG	:PRINT REST OF NUMBER AFTER A NON-ZERO DIGIT
015502	005267	000104		P.CONT:	INC	PTEMP3	:COUNT
015506	026727	000100	000006		CMP	PTEMP3, #6	:CHECK FOR DONE
015514	001001				BNE	P.CNT1	:BRANCH IF NOT DONE
015516	000207				RTS	%7	
015520	000241			P.CNT1:	CLC		:CLEAR CARRY
015522	005767	000056			TST	PRFLG	:CHECK FOR PREVIOUS CARRY
015526	001403				BEQ	+10	:BRANCH IF PREVIOUSLY ZERO
015530	005067	000050			CLR	PRFLG	:INITIALIZE FLAG
015534	000261				SEC		:SET CARRY
015536	006167	000044			ROL	PTEMP1	:ROTATE NEXT CHARACTER INTO RIGHT END OF REGISTER
015542	006167	000040			ROL	PTEMP1	
015546	006167	000034			ROL	PTEMP1	
015552	005567	000026			ADC	PRFLG	:STORE CARRY
015556	016767	000024	000024		MOV	PTEMP1, PTEMP2	:LOAD DATA INTO R3
015564	042767	177770	000016		BIC	#177770, PTEMP2	:CLEAR ALL BUT LOWEST OCTAL DIGIT
015572	052767	000260	000010		BIS	#260, PTEMP2	:SET TO ASCII EQUIVALENT
015600	000721				BR	P.CK	:LOOP
015602	000000			PRSF LG:	0		
015604	000000			PRFLG:	0		
015606	000000			PTEMP1:	0		:CONTAINS VALUE TO BE OUTPUT
015610	000000			PTEMP2:	0		:SCRATCH
015612	000000			PTEMP3:	0		:USED TO COUNT CHARACTERS OUTPUT
:EMT HANDLER							
:FIRST 3 CALLS LEFT OPEN IN TABLE FOR EASY PATCHES							
015614	011667	000032		EMTSRV:	MOV	@SP, EPC	:GET CALL
015620	162767	000002	000024		SUB	#2, EPC	
015626	017767	000020	000016		MOV	@EPC, EPC	
015634	105067	000013			CLRB	EPC+1	:SAVE OFFSET ONLY
015640	062767	015654	000004		ADD	@EMTAB, EPC	:POINT TO TABLE OF ADDRESSES
015646	017707	000000			MOV	@EPC, PC	:JUMP TO DESIRED ROUTINE
015652	000000			EPC:	0		
	104000				PATCH1=EMT+0		
	104002				PATCH2=EMT+2		
	104004				PATCH3=EMT+4		
	104006				HLT =EMT+6		
015654	104000			EMTAB:	PATCH1		
015656	104002				PATCH2		

E04

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DCKTBB.P11

015660 104004
015662 015212

PATCH3
PRINT

015664 105777 165126 :BELL ON PASS COMPLETE
015670 100375 BELL: TSTB @TCSR
015672 012777 000207 165120 BPL -4
015700 000207 MOV #207,@TDBR
RTS X7

015702 105777 165110 :SUBROUTINE TO OUTPUT CARRIAGE RETURN AND LINEFEED
015706 100375 CRLF: TSTB @TCSR ;WAIT FOR TTY READY
015710 012777 000215 165102 BPL -4
015716 105777 165074 MOV #215,@TDBR ;ROUTPUT CARRIAGE RETURN
015722 100375 TSTB @TCSR ;WAIT FOR TTY READY
015724 012777 000212 165066 BPL -4
015732 000207 MOV #212,@TDBR ;OUTPUT LINEFEED
017712 017712 RTS X7 ;RETURN
.=17712

017712 125252
000001

DESTAD: 125252
.END

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DCKTBB.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

[illegible]

		1707 1852	1713 1889	1736 1915	1757 1925	1763 1933	1770 1946	1776 1957	1796 1966	1807 1980	1811 1993	1821 1998	1829 2002	1839 2224
ICOUNT	015204	436*	463*	604*	1350*	1404*	1949*	1983*	2111	2128*				
KDPAR0	003332	394*												
KDPAR1	003334	395*												
KDPAR2	003336	396*												
KDPAR3	003340	397*												
KDPAR4	003342	398*												
KDPAR5	003344	399*												
KDPAR6	003346	400*												
KDPAR7	003350	401*	486*	582*	650*	699*	746*	1170*	1427*	1571*	1856*	2081*		
KDPDR0	003272	378*	484*	1169*										
KDPDR1	003274	379*	701*	747*										
KDPDR2	003276	380*												
KDPDR3	003300	381*												
KDPDR4	003302	382*												
KDPDR5	003304	383*												
KDPDR6	003306	384*												
KDPDR7	003310	385*	1171*											
KIPAR0	003312	386*	1537*	1548										
KIPAR1	003314	387*	1826*	1834										
KIPAR2	003316	388*												
KIPAR3	003320	389*												
KIPAR4	003322	390*												
KIPAR5	003324	391*												
KIPAR6	003326	392*												
KIPAR7	003330	393*	536*	620*	846*	886*	944*	992*	1023*	1069*	1101*	1135*	1220*	1288*
KIPDR0	003252	1352*	1490*	1530*	1800*	1919*	1951*	1985*						
		370*	411	534*	845*	1172*	1407	1494	1497*	1498	1505	1508	1511	1534
KIPDR1	003254	1538	1545	1551										
		371*	537*	700*	945*	993*	1025*	1036	1068*	1100*	1134*	1228*	1296*	1359*
		1801*	1805	1808*	1809	1816	1819	1827	1837	1920*	1923	1929*	1931	1952*
		1955	1964											
KIPDR2	003256	372*	885*	902	909*	918								
KIPDR3	003260	373*												
KIPDR4	003262	374*												
KIPDR5	003264	375*												
KIPDR6	003266	376*												
KIPDR7	003270	377*	847*	1024*	1040									
KSTACK	001000	279*	430	445	475	525	572	611	641	690	737	798	836	876
		935	983	1014	1059	1091	1125	1160	1183	1211	1279	1342	1396	1417
KTSTA	003412	1481	1521	1561	1648	1731	1791	1847	1910	1941	1975	2093		
		422*	490*	518	539*	563	586*	605	653*	680	681*	729	791	850*
		867	888*	926	947*	976	995*	1006	1027*	1052	1071*	1084	1103*	1118
KTVEC	003410	1137*	1153	1202	1226*	1268	1269*	1294*	1333	1334*	1354*	1389	1987*	2007
		421*	489*	518*	538*	563*	585*	605*	652*	680*	702*	716*	729*	750*
		763*	777*	791*	849*	867*	887*	906*	926*	946*	952*	976*	994*	1006*
		1026*	1031*	1052*	1070*	1084*	1102*	1118*	1136*	1153*	1174*	1202*	1225*	1232*
		1268*	1293*	1300*	1333*	1353*	1389*	1986*	2007*					
K1000	003014	287*	1029	1073										
K200	003012	286*												
LOGIC	014500	269	2016*											
LOOP12	005774	851*	866											
LOOP23	010164	1227*	1266											
LOOP24	010434	1295*	1331											
LOOP32	012154	1580*	1600											

[illegible]

[illegible]

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 DCKTBB.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

R4	=%000004	246#	658*	679*	1361*	1362*	1366*	1367	1382*	1383	1680*	1682	1684	1690
R5	=%000005	1692*	1693											
R6	=%000006	247#	666*	668	1681*	1691*								
		248#	588*	674	851*	852*	864	1191	1431*	1433*	1575*	1577*	1661*	1663*
		1743*	1745*											
R7	=%000007	249#												
SAVEA	003404	419#												
SAVEB	003406	420#												
SAVPC	015336	2139*	2144	2158*										
SAVPSR	015340	2140*	2149	2159*										
SAVR2	015330	2155#												
SAVR3	015332	2156#												
SAVR4	015334	2157#												
SCOPE	= 104400	240#	442	472	522	569	608	638	687	734	795	833	873	932
		980	1011	1056	1088	1122	1157	1208	1276	1339	1393	1414	1478	1518
		1558	1645	1728	1788	1844	1907	1938	1972	2009				
SCOPEB	015120	2108	2115#											
SCOPEC	015056	266	2107#											
SCOPEF	015206	2098*	2101*	2111	2113*	2121*	2129#							
SCOPEG	015150	2110	2112	2121#										
SDPAR0	003232	361#												
SDPAR1	003234	362#												
SDPAR2	003236	363#												
SDPAR3	003240	364#												
SDPAR4	003242	365#												
SDPAR5	003244	366#												
SDPAR6	003246	367#												
SDPAR7	003250	368#	807*	1428*	1572*	1857*	2082*							
SDPDR0	003172	345#	654											
SDPDR1	003174	346#	748*											
SDPDR2	003176	347#												
SDPDR3	003200	348#												
SDPDR4	003202	349#												
SDPDR5	003204	350#												
SDPDR6	003206	351#												
SDPDR7	003210	352#												
SIPAR0	003212	353#												
SIPAR1	003214	354#												
SIPAR2	003216	355#												
SIPAR3	003220	356#												
SIPAR4	003222	357#												
SIPAR5	003224	358#												
SIPAR6	003226	359#												
SIPAR7	003230	360#												
SIPDR0	003152	337#	413											
SIPDR1	003154	338#												
SIPDR2	003156	339#												
SIPDR3	003160	340#												
SIPDR4	003162	341#												
SIPDR5	003164	342#												
SIPDR6	003166	343#												
SIPDR7	003170	344#												
SP	=%000006	250#	430*	432*	434*	445*	475*	491*	492*	499*	500*	525*	540*	541*
		572*	611*	641*	690*	737*	798*	836*	876*	896	922	935*	958	967
		983*	1005	1014*	1059*	1091*	1111	1125*	1160*	1183	1195	1211*	1245	1250
		1279*	1312	1317	1342*	1379	1396*	1417*	1481*	1521*	1561*	1648*	1731*	1791*

SR	= 177570	1847*	1910*	1941*	1975*	2093*	2214	639*	688*	735*	796*	834*	874*	933*
		252*	443*	473*	523*	570*	609*	629*	688*	735*	796*	834*	874*	933*
		981*	1012*	1057*	1089*	1123*	1158*	1209*	1277*	1340*	1394*	1415*	1479*	1519*
		1559*	1646*	1729*	1789*	1845*	1908*	1939*	1973*	2095	2107	2109	2117	2119
SRO	003032	2124	2126	2136	2151									
		294*	447*	477*	494*	503*	504	517*	527*	542*	550	559	562*	574*
		589*	593	600	603*	613*	621*	622*	623	626*	628	629*	643*	661*
		666	667*	692*	704*	707*	710	711*	717*	721*	723	724*	739*	752*
		754*	757	758*	765*	768*	771	772*	779*	781*	784	785*	800*	811*
		812*	817	825*	838*	853*	857*	863*	878*	889*	890*	893*	897	898*
		907*	913*	914	923*	928*	937*	948*	950*	957*	966*	971	975*	985*
		996*	1000*	1004*	1016*	1028*	1029*	1032	1035*	1045*	1048*	1051*	1061*	1072*
		1073*	1076*	1080*	1081	1093*	1104*	1108*	1112*	1113	1117*	1127*	1138*	1145*
		1148*	1149	1162*	1175*	1179*	1182*	1187	1213*	1227*	1238*	1244*	1248*	1251
		1252*	1258	1267*	1281*	1295*	1305*	1311*	1315*	1318	1319*	1324	1332*	1344*
		1357*	1390*	1398*	1419*	1440*	1445*	1452*	1454*	1483*	1491*	1493*	1502*	1504*
		1523*	1531*	1533*	1542*	1544*	1563*	1585*	1598*	1618*	1636*	1650*	1670*	1674*
		1700*	1704*	1733*	1752*	1754*	1765*	1767*	1793*	1802*	1804*	1813*	1815*	1823*
		1825*	1831*	1833*	1849*	1865*	1875*	1879*	1884*	1912*	1921*	1934*	1943*	1953*
		1963*	1977*	1988*	1992*	1995*	1996	2006*	2024*	2034*	2046*	2058*	2072*	
SR0H	003034	295*	453*	454	460	627*								
SR1	003036	296*	509											
SR1H	003040	297*												
SR2	003042	298*	513	858	1140	2000								
SR2H	003044	299*												
SR3	003046	300*	446*	476*	488*	519*	526*	573*	584*	612*	642*	651*	691*	703*
		738*	751*	799*	809*	826*	837*	877*	936*	984*	1015*	1060*	1092*	1126*
		1161*	1173*	1201*	1212*	1280*	1343*	1397*	1418*	1426*	1462*	1482*	1522*	1562*
		1570*	1637*	1649*	1664*	1721*	1732*	1746*	1783*	1792*	1848*	1859*	1897*	1911*
		1942*	1976*	2025*										
SR3H	003050	301*												
SSTACK	002000	281*	432	1431	1575	1661	1743							
STAEND	003400	416*	1460	1599	1719	1781	1876							
STAPNT	003402	418*												
START	003422	275	429*	2021										
STATAB	003366	411*	1434	1578	1665	1747	1860							
TCSR	003016	288*	457	556	597	1619	1880	2146	2167	2185	2231	2237	2240	
TDBR	003020	289*	2148*	2169*	2187*	2233*	2239*	2242*						
TEMP	003022	290*	1928*	1929										
TEMPX	003024	291*												
TEMP1	003026	292*												
TEMP2	003030	293*												
TESTCT	003420	425*	438*	448	478	528	575	614	644	693	740	801	839	879
		938	986	1017	1062	1094	1128	1163	1214	1282	1345	1399	1420	1484
		1524	1564	1651	1734	1794	1850	1913	1944	1978	2122*			
TESTN = 000042		427*	443*	473*	523*	570*	609*	639*	688*	735*	796*	834*	874*	933*
		981*	1012*	1057*	1089*	1123*	1158*	1209*	1277*	1340*	1394*	1415*	1479*	1519*
		1559*	1646*	1729*	1789*	1845*	1908*	1939*	1973*					
TESTXX	014776	2092*												
TEST1	003506	437	442*											
TEST10	005226	734*												
TEST11	005536	795*												
TEST12	005666	833*												
TEST13	006050	873*												
TEST14	006340	932*												
TEST15	006560	980*												

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 DCKTBB.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

TEST16	006712	1011#				
TEST17	007134	1056#				
TEST2	003620	472#				
TEST20	007304	1088#				
TEST21	007460	1122#				
TEST22	007644	1157#				
TEST23	010066	1208#				
TEST24	010336	1276#				
TEST25	010606	1339#				
TEST26	011036	1393#				
TEST27	011130	1414#				
TEST3	004040	522#				
TEST30	011426	1463	1478#			
TEST31	011626	1518#				
TEST32	012026	1558#				
TEST33	012372	1645#				
TEST34	012736	1728#				
TEST35	013212	1788#				
TEST36	013472	1844#				
TEST37	013754	1907#				
TEST4	004242	569#				
TEST40	014116	1938#				
TEST41	014266	1972#				
TEST5	004442	608#				
TEST6	004574	638#				
TEST7	005002	687#				
UBRK	003414	423#	2119#	2126#		
UDPAR0	003132	328#				
UDPAR1	003134	329#				
UDPAR2	003136	330#				
UDPAR3	003140	331#				
UDPAR4	003142	332#				
UDPAR5	003144	333#				
UDPAR6	003146	334#				
UDPAR7	003150	335#	1429#	1573#	1858#	2083#
UDPDR0	003072	312#				
UDPDR1	003074	313#	749#			
UDPDR2	003076	314#				
UDPDR3	003100	315#				
UDPDR4	003102	316#				
UDPDR5	003104	317#				
UDPDR6	003106	318#				
UDPDR7	003110	319#	581#			
UIPAR0	003112	320#				
UIPAR1	003114	321#				
UIPAR2	003116	322#				
UIPAR3	003120	323#				
UIPAR4	003122	324#				
UIPAR5	003124	325#				
UIPAR6	003126	326#				
UIPAR7	003130	327#				
UIPDR0	003052	304#	415			
UIPDR1	003054	305#				
UIPDR2	003056	306#				
UIPDR3	003060	307#				
UIPDR4	003062	308#				

M04

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 DCKTBB.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

UIPDR5	003064	309#												
UIPDR6	003066	310#												
UIPDR7	003070	311#												
USTACK	003000	283#	434	588	1433	1577	1663	1745						
XLOOP	015044	2099	2101#											
.	= 017714	260#	262#	265#	268#	270#	274#	278#	280#	282#	402	439	449	455
		458	461	479	492	500	505	510	514	529	551	557	560	576
		591	594	598	601	615	624	631	645	663	670	694	713	726
		741	760	774	787	802	818	840	856	859	880	900	903	915
		919	939	959	968	972	987	1018	1033	1037	1041	1063	1082	1095
		1114	1129	1142	1150	1164	1184	1188	1192	1196	1215	1254	1259	1283
		1321	1325	1346	1368	1384	1400	1408	1421	1465	1471	1485	1495	1499
		1506	1512	1525	1535	1539	1546	1552	1565	1606	1620	1627	1652	1676
		1685	1697	1706	1712	1735	1756	1762	1769	1775	1795	1806	1810	1820
		1828	1838	1851	1881	1888	1914	1924	1932	1945	1956	1965	1979	1997
		2001	2118	2125	2137	2147	2152	2168	2176	2195	2232	2238	2241	2244#

[illegible]

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DCKTBB.P11 CROSS REFERENCE TABLE -- MACRO NAMES

.\$SB20	10
.\$SCOP	10
.\$SIZE	10
.\$SUPR	10
.\$STRAP	10
.\$STYPB	10
.\$STYPD	10
.\$STYPE	10
.\$STYPO	10
.\$40CA	10
.\$1170	10

ROC	2180	2201													
ADD	676	678	1262	1264	1372	1375	1448	1457	1588	1596	1613	1632	1692	1716	1717
	1749	1779	1868	1873	1894	2040	2052	2064	2078	2096	2218				
ASH	1366	1382													
ASL	865														
BCC	866	1449	1458	1589	1597	1718	1780	1869	1874						
BEQ	449	455	461	479	505	510	514	529	551	560	576	594	601	615	624
	631	645	670	694	713	726	741	760	774	787	802	818	840	859	880
	900	903	915	919	939	968	972	987	1018	1037	1041	1063	1082	1095	1114
	1129	1142	1150	1164	1184	1188	1192	1196	1215	1254	1259	1283	1321	1325	1346
	1400	1408	1421	1471	1485	1499	1512	1525	1539	1552	1565	1652	1683	1685	1697
	1712	1735	1762	1775	1795	1810	1820	1828	1838	1851	1914	1924	1932	1945	1956
	1965	1979	1997	2001	2014	2118	2125	2137	2182	2184	2195				
BGT	1384														
BHIS	1235														
BIC	503	720	812	857	913	923	957	966	1000	1045	1048	1073	1076	1080	1108
	1112	1145	1148	1182	1244	1311	1362	1365	1381	1444	1591	1673	1703	1870	1992
	1995	2203													
BIS	1029	2204													
BIT	1032	1464	1470	1494	1498	1505	1511	1534	1538	1545	1551	1605	1626	1675	1684
	1696	1705	1711	1755	1761	1768	1774	1805	1809	1819	1827	1837	1887	2107	2109
	2117	2124	2136												
BLE	1302	1358	1374												
BLT	1461	1600	1616	1635	1694	1720	1782	1877	1896	2042	2054	2066	2080		
BNE	959	1033	1465	1495	1506	1535	1546	1606	1627	1676	1706	1756	1769	1806	1888
	2108	2110	2166	2191											
BPL	458	557	598	1377	1620	1881	2112	2147	2152	2168	2176	2186	2232	2238	2241
BR	439	502	549	591	663	665	709	722	756	770	783	856	895	921	956
	962	965	1003	1044	1047	1079	1110	1147	1181	1243	1249	1266	1310	1316	1331
	1378	1386	1463	1994	2138	2205									
CLC	2193														
CLR	429	435	444	446	447	474	476	477	490	499	517	519	524	526	527
	539	548	562	571	573	574	586	603	610	612	613	629	640	642	643
	653	656	667	681	689	691	692	707	711	721	724	736	738	739	754
	758	768	772	781	785	797	799	800	816	825	826	835	837	838	850
	863	875	877	878	888	893	898	928	934	936	937	947	975	982	984
	985	993	995	1004	1013	1015	1016	1027	1035	1051	1058	1060	1061	1071	1090
	1092	1093	1103	1117	1124	1126	1127	1137	1159	1161	1162	1179	1201	1210	1212
	1213	1226	1238	1248	1252	1267	1269	1278	1280	1281	1294	1305	1315	1319	1332
	1334	1341	1343	1344	1354	1390	1395	1397	1398	1416	1418	1419	1443	1445	1454
	1462	1468	1480	1482	1483	1493	1504	1520	1522	1523	1533	1544	1560	1562	1563
	1587	1598	1617	1636	1637	1647	1649	1650	1672	1674	1702	1704	1721	1730	1732
	1733	1754	1767	1783	1790	1792	1793	1804	1815	1825	1833	1846	1848	1849	1867
	1875	1878	1884	1897	1909	1911	1912	1934	1940	1942	1943	1963	1974	1976	1977
	1987	1991	2006	2024	2025	2026	2028	2034	2037	2046	2049	2058	2061	2072	2075
	2092	2098	2101	2121	2171	2172	2173	2188	2196						
CLRB	622	627	2217												
CMP	448	478	504	509	513	528	550	575	593	614	623	630	644	668	674
	693	712	725	740	759	773	786	801	817	839	858	864	879	896	899
	902	914	918	922	938	958	967	971	986	1005	1017	1036	1040	1062	1081
	1094	1111	1113	1128	1141	1149	1163	1183	1187	1191	1195	1214	1233	1245	1250
	1253	1258	1282	1301	1312	1317	1320	1324	1345	1367	1373	1379	1383	1399	1420
	1460	1484	1524	1564	1599	1615	1634	1651	1682	1693	1719	1734	1781	1794	1850
	1876	1895	1913	1923	1931	1944	1955	1964	1978	1996	2000	2041	2053	2065	2079
	2111	2115	2141	2183	2190										
CMPB	454	460													

Instruction	2221	2222	2223	2224	954	2094	2097	2153	811	853	889	1028	1227	1295	1440
EMT	2221	2222	2223	2224	954	2094	2097	2153	811	853	889	1028	1227	1295	1440
HALT	260	498	547	719	717	752	765	779	1618	1670	1700	1752	1765	1802	1813
INC	542	589	661	704	1531	1542	1549	1585	2189						
	1452	1491	1502	1509	1879	2113	2122	2177							
JMP	1817	1823	1831	1835	2120										
JSR	275	2021	2100	2102	649	698	745	806	844	884	943	991	1022	1067	1099
	483	533	580	619	1287	1351	1405	1425	1446	1455	1489	1529	1569	1656	1739
	1133	1168	1177	1219	1984	2011	2016	2143	2145	2150					
MOV	1799	1855	1918	1950	434	436	437	438	443	445	463	473	475	484	488
	430	431	432	433	494	500	518	523	525	534	536	537	538	540	541
	488	489	491	492	581	582	584	585	587	588	604	605	609	611	620
	563	564	570	572	641	650	651	652	654	657	658	659	660	666	680
	621	626	628	639	701	702	703	710	716	718	723	729	735	737	746
	688	690	699	700	751	757	763	764	771	777	778	784	791	796	798
	747	748	749	750	836	845	846	847	848	849	851	852	867	874	876
	807	809	810	834	892	897	906	907	909	910	926	933	935	944	945
	885	886	887	890	976	981	983	992	994	996	1006	1012	1014	1023	1024
	946	948	950	952	1057	1059	1068	1069	1070	1072	1084	1089	1091	1100	1101
	1025	1026	1031	1052	1125	1134	1135	1136	1138	1140	1153	1158	1160	1169	1170
	1102	1104	1118	1123	1175	1202	1209	1211	1220	1221	1223	1225	1228	1232	1251
	1171	1172	1173	1174	1289	1291	1293	1296	1300	1318	1333	1340	1342	1350	1352
	1268	1277	1279	288	1359	1360	1361	1389	1394	1396	1404	1406	1415	1417	1426
	1353	1355	1357	1358	1431	1432	1433	1434	1435	1437	1439	1441	1451	1453	1479
	1427	1428	1429	1430	1503	1519	1521	1530	1532	1543	1548	1559	1561	1570	1571
	1481	1490	1492	1503	1576	1577	1578	1581	1583	1586	1592	1595	1601	1603	1623
	1572	1573	1574	1575	1661	1662	1663	1664	1665	1666	1667	1668	1669	1671	1680</

E05

DCKTB-B MACV11 27(732) 01-OCT-76 13:14 PAGE 60
DCKTBB.P11 CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

	1729	1789	1845	1908	1939	1973										
.MACR	427															
.MACRO	1															
.NLIST	1	260	427	443	473	523	570	609	639	688	735	796	834	874	933	
	981	1012	1057	1089	1123	1158	1209	1277	1340	1399	1415	1479	1519	1559	1646	
	1729	1789	1845	1908	1939	1973										
.REM	1															
.REPT	260															
.TITLE	1															
.WORD	284															

ERRORS DETECTED: 0
DEFAULT GLOBALS GENERATED: 0

*, DCKTBB.SEG/SOL/CRF/PAGNUM/NL: TOC=SYSMAC.CO, DCKTBB.P11
RUN-TIME: 26 34 3 SECONDS
RUN-TIME RATIO: 134/65=2.0
CORE USED: 33K (65 PAGES)

Spooler runtime 9 Seconds, 42 KCS, 233 disk reads, 3 disk writes, 56 pages

[illegible][illegible]