

PDP11/34

MEM MANG ACCESS KEYS TST
MD-11-DFKTB-A

EP DFKTB-A-DL-A

OCT 1976

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digital

FICHE 1 OF 1

Made in U.S.A.

MEM	MANG	ACCESS	KEYS	TST
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IDENTIFICATION

PRODUCT CODE:	MAINDEC-11-DFKTB-A
PRODUCT NAME:	11/34 MEMORY MANAGEMENT ACCESS KEYS TEST
DATE:	DECEMBER 21, 1975
MAINTAINER:	DIAGNOSTIC GROUP
AUTHOR:	GLENN JOHNSON

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1.0 ABSTRACT

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

2.0 REQUIREMENTS

2.1 EQUIPMENT

PDP 11/34

2.2 STORAGE

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

3.0 LOADING PROCEDURE

LOAD PROGRAM INTO MEMORY USING ABS LOADER.

4.0 STARTING PROCEDURE

4.1 NORMAL DIAGNOSTIC OPERATION

SET DESIRED SWITCH REGISTER SETTINGS (ALL DOWN FOR WORST CASE).
(USE SOFTWARE SWITCH REG. AT LOC. 176 IF NECESSARY)

START AT 200

THE PROGRAM WILL RING THE BELL ON COMPLETION OF A PASS.

4.2 SINGLE SUBTEST LOOP (TESTX)

LOAD THE ADDRESS OF THE DESIRED SUBTEST
(THE ADDRESS OF THE TESTXX TAG) INTO THE LOCATION "RETRNX"

SET THE OPERATIONAL SWITCH SETTINGS DESIRED

(SW11 MUST BE SET TO ZERO).

START AT 210.

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5.0 OPERATING PROCEDURE

5.1 OPERATIONAL SWITCH SETTINGS

NOTE: IF NO HARDWARE SWITCH REGISTER IS AVAILABLE, THE PROGRAM WILL AUTOMATICALLY USE THE CONTENTS OF LOC. 176 AS THE SOFTWARE SWITCH REGISTER. THE USER SHOULD SET THIS LOCATION BEFORE STARTING THE PROGRAM.

BIT15=1 -- HALT ON ERROR
BIT14=1 -- SCOPE LOOP
BIT13=1 -- INHIBIT PRINTOUT
BIT11=1 -- INHIBIT ITERATIONS
BIT10=1 -- HALT AT END OF CURRENT TEST
NEXT TEST NUMBER IN RD

5.2 SUBROUTINE ABSTRACTS

5.2.1 SCOPE

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

5.2.2 HLT

THIS 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.

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

5.2.4 TESTX (SINGLE SUBTEST LOOP)

THIS ROUTINE ALLOWS A SINGLE SUBTEST TO BE RUN CONTINUOUSLY FOR SCOPE LOOP PURPOSES. WHILE A SCOPE LOOP SWITCH OPTION EXISTS, IT REQUIRES THAT YOU ARE WITHIN THE TEST IN WHICH YOU WISH TO

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LOOP. IN SOME CASES (SUCH AS WITH INTERMITTENT FAILURES) THAT'S
NOT EASY TO DO. THIS SUBROUTINE ALLOWS YOU TO LOAD THE ADDRESS
OF ANY SUBTEST AND THEN GO DIRECTLY TO THAT TEST.

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5.2.5 EMTSRV (EMT DECODER)

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

5.2.6 CLRALL

THIS ROUTINE CLEARS ALL THE PAR'S AND POR'S OF THE MEMORY MANAG., AS WELL AS SR0.

5.2.7 RWall

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

5.2.8 SETUP

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

5.3 PROGRAM AND/OR OPERATOR ACTION

5.3.1 SA 200 (NORMAL DIAGNOSTIC OPERATION)

THE PROGRAM EXECUTES SEVERAL TESTS OF EACH KEY. TESTS 5 THRU 10 ARE CYCLED THRU 3 TIMES, ONCE FOR EACH OF THE KEYS WHICH GIVES A NON-RESIDENT ABORT. AT THE END OF EACH PASS THRU THE DIAGNOSTIC THE BELL IS RUNG.

5.3.2 SA 210 (SINGLE SUBTEST LOOP)

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

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.

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6.2 ERROR RECOVERY

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

7.0 RESTRICTIONS

PROGRAM MUST BE LOADED INTO LOWER 5K OF MEMORY.

8.0 MISCELLANEOUS

8.1 EXECUTION TIME

EACH PASS TAKES APPROXIMATELY 1 MINUTE WITH CORE MEMORY.

9.0 PROGRAM DESCRIPTION

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

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;TEST OF THE MEMORY MANAG. ACCESS KEYS

;THIS PROGRAM IS A MODIFIED 11/40 DIAGNOSTIC, DFKTB. THIS VERSION
;HAS BEEN MODIFIED TO INCLUDE SOFTWARE SWITCH REGISTER CAPABILITIES
;AND TO ACCOUNT FOR ANY 11/40 - 11/34 DIFFERENCES.
;THIS PROGRAM IS INTENDED ONLY FOR USE ON AN 11/34.

;OPERATING INSTRUCTIONS

1. LOAD TEST USING THE ABSOLUTE LOADER
2. SET SR TO INITIAL SETTINGS (USE LOC. 176 FOR SOFTWARE SWR IF NECESSARY)
3. START AT 200.

;DYNAMIC SWITCH REGISTER SETTINGS ARE:

;SW15=1 CAUSES HALT ON ERROR
 ;SW14=1 CAUSES SCOPE LOOPING
 ;SW13=1 INHIBITS ERROR PRINTOUT
 ;SW11=1 INHIBITS ITERATIONS
 ;SW10=1 HALT AT END OF CURRENT TEST WITH NEXT TEST NUMBER
 ; IN RD. PRESS CONTINUE TO ADVANCE TO NEXT TEST.

;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
 PS=17776
 STATUS=PS
 HLT=104006

;LOAD TRAP CATCHER IN LOCATIONS 0 THRU 377
 ;EACH VECTOR ADDRESS IS LOADED WITH THE ADDRESS
 ;OF THE NEXT LOCATION, AND THE NEXT LOCATION IS LOADED
 ;WITH A HALT INSTRUCTION (00000)

;LOAD VECTOR AREA

.=30
 EMTSRV
 340
 .=34
 SCOPEC
 0
 .=46
 LOGIC
 .=176

;ACT HOOKS

;SOFTWARE SWITCH REGISTER

SWREG: 0

104400
 000240
 000000
 000001
 000002
 000003
 000004
 000005
 000006
 000007
 000006
 000007
 177776
 177776
 104006

000030 000030
 000032 006402
 000032 000340
 000034 000034
 000034 005706
 000036 000000
 000046 000046
 000046 005430
 000176 000176
 000000 000000


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295                                     ;LOAD STARTING AREA
296                                     .=200
297 000200 000167 001746                JMP      START
298                                     .=210
299 000210 000167 005404                JMP      TESTX
300
301                                     ;LOAD DATA AREA
302                                     .=1000
303 001000 000000                KSTACK: 0
304                                     .+.776
305 002000 000000                USTACK: 0
306 002002 000000 000000 000000        .WORD 0,0,0,0
307 002010 000000
308 002012 177564                TCSR:   177564                ;TELETYPE PRINTER CSR
309 002014 177566                TDBR:   177566
310 002016 177572                SR0:    177572                ;MEMORY MANAG. STATUS REGISTER ADDRESSES
311 002020 177574                SR1:    177574
312 002022 177576                SR2:    177576
313 002024 000250                KTVEC:  250                ;MEMORY MANAG. INTERRUPT VECTOR
314 002026 000252                KTSTA:  252
315 002030                ADRTAB:
316 002030 177600                UPDR0:  177600                ;USER PAGE DESCRIPTOR REGISTER ADDRESSES
317 002032 177602                UPDR1:  177602
318 002034 177604                UPDR2:  177604
319 002036 177606                UPDR3:  177606
320 002040 177610                UPDR4:  177610
321 002042 177612                UPDR5:  177612
322 002044 177614                UPDR6:  177614
323 002046 177616                UPDR7:  177616
324 002050 177640                UPAR0:  177640                ;USER PAGE ADDRESS REGISTER ADDRESSES
325 002052 177642                UPAR1:  177642
326 002054 177644                UPAR2:  177644
327 002056 177646                UPAR3:  177646
328 002060 177650                UPAR4:  177650
329 002062 177652                UPAR5:  177652
330 002064 177654                UPAR6:  177654
331 002066 177656                UPAR7:  177656
332 002070 172300                KPDR0:  172300                ;KERNEL PAGE DESCRIPTOR REGISTER ADDRESSES
333 002072 172302                KPDR1:  172302
334 002074 172304                KPDR2:  172304
335 002076 172306                KPDR3:  172306
336 002100 172310                KPDR4:  172310
337 002102 172312                KPDR5:  172312
338 002104 172314                KPDR6:  172314
339 002106 172316                KPDR7:  172316
340 002110 172340                KPAR0:  172340                ;KERNEL PAGE ADDRESS REGISTER ADDRESSES
341 002112 172342                KPAR1:  172342
342 002114 172344                KPAR2:  172344
343 002116 172346                KPAR3:  172346
344 002120 172350                KPAR4:  172350
345 002122 172352                KPAR5:  172352
346 002124 172354                KPAR6:  172354
347 002126 172356                KPAR7:  172356
348 002126 002126                ADREND= -2
349 002130 000000                FTITLE: 0                ;TITLE PRINTED FLAG
350 002132 177573                SROH:   177573                ;MEMORY MANAG. STATUS REGISTER HIGH BYTE ADDRESSES

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351	002134	177575				SR1H:	177575		
352	002136	177577				SR2H:	177577		
353	002140	000000				NRCNT:	0		: COUNTER FOR TEST OF THE 3 NR KEYS
354	002142	000000	000004			NRKEYS:	0,4		: VALUES OF THE 3 NON RESIDENT KEYS
355	002146	125252				DESTAD:	125252		: LOCATION USED FOR READS AND WRITES TO CHECK
356	002150	177570				SR:	177570		: SWITCH REG. POINTER
357									: EXECUTION OR ABORTING AT CORRECT POINT
358									
359									
360									
361									
362						: SET UP	FOR START OF TESTS		
363	002152	005037	177776			START:	CLR	0#PS	
364	002156	012706	001000				MOV	0#KSTACK, SP	: SETUP KERNEL STACK
365	002162	012737	140000	177776			MOV	0#140000, 0#PS	: SETUP USER STACK POINTER
366	002170	012706	002000				MOV	0#USTACK, SP	
367	002174	005037	177776				CLR	0#PS	
368	002200	013746	000004				MOV	0#4, -(SP)	:: SAVE ERROR VECTOR
369	002204	013746	000006				MOV	0#6, -(SP)	
370	002210	012767	002224	175566			MOV	0#15, 4	: SET UP TIME OUT VECTOR
371	002216	005777	177726				TST	0#SR	: TRY TO REFERENCE HARDWARE SR
372	002222	000404					BR	25	: BRANCH IF NO TIMEOUT TRAP OCCURS
373	002224	012767	000176	177716	1S:		MOV	0#SWREG, SR	: POINT TO SOFTWARE SR
374	002232	022626					CMP	(SP)+, (SP)+	: RESTORE STACK
375	002234	012637	000006		2S:		MOV	(SP)+, 0#6	: RESTORE ERROR VECTOR
376	002240	012637	000004				MOV	(SP)+, 0#4	
377	002244	012767	002000	003526			MOV	0#2000, ICOUNT	: INITIALIZE ITERATION COUNT
378	002252	012767	002326	003524			MOV	0#TEST1+2, RETURN	: SETUP SCOPE AND ITERATION LOOP RETURN
379	002260	005067	177654				CLR	NRCNT	: INITIALIZE FOR NR TEST
380	002264	012767	000001	004374			MOV	0#1, TESTCT	: SET UP TEST SEQUENCE
381	002272	005767	177632				TST	FTITLE	: TITLE PRINTED
382	002276	001013					BNE	TEST1+2	: YES, SKIP
383	002300	004767	004164				JSR	PC, CRLF	: PRINT TITLE
384	002304	004767	004212				JSR	PC, TYPE	
385	002310	005444					MTIT		
386	002312	004767	004152				JSR	PC, CRLF	
387	002316	005267	177606				INC	FTITLE	
388	002322	000401					BR	.+4	

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393 002324 104400
394 002326 012706 001000
395 002332 005077 177460
396 002336 004767 004240
397 002342 000001
398 002344 104006
399 002346 012746 000002
400 002352 004767 003212
401
402
403 002356 005726
404 002360 012777 002474 177436
405 002366 005077 177434
406 002372 012767 125252 177546
407 002400 012701 022146
408
409 002404 005277 177406
410 002410 022721 125252
411 002414 001404
412 002416 005377 177374
413 002422 104006
414 002424 000427
415 002426 017702 177364
416 002432 105377 177360
417 002436 022702 000017
418 002442 001401
419 002444 104006
420
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422 002446 022777 002446 177346
423 002454 001401
424 002456 104006
425
426 002460 022777 077402 177404
427 002466 001401
428 002470 104006
429
430 002472 000404
431 002474 042777 000001 177314
432 002502 104006
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434 002504 016777 177316 177312
435 002512 005077 177310
436 002516 005077 177274
437 002522 005037 177776
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442 002526 104400
443 002530 012706 001000
444 002534 005077 177256

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;SHOW THAT DATI TO A RRO PAGE (ACF=2) NEITHER TRAPS NOR ABORTS
 ;SHOW THAT THE MEMORY MANAG. STATUS REGISTERS CONTINUE TO TRACK, AND THAT
 ;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
 TEST1: SCOPE

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      MOV      #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
      CLR      %SRO            ;INITIALIZE SRO
      JSR      PC,ORDER        ;CHECK TEST SEQUENCE
      I
      HLT
      MOV      #2,-(SP)        ;TEST NUMBER
      JSR      %7,SETUP        ;TEST EXECUTED OUT OF SEQUENCE
                                ;PUSH RRO KEY ON STACK
                                ;MAKE KERNEL PAGE 1 RRO, BANK 0
                                ;MAKE KERNEL PAGE 7 RW, EXTERNAL
                                ;MAKE ALL OTHER PAGES RW, BANK 0
                                ;RESTORE STACK
                                ;SETUP ABORT RETURN IN CASE
      TST      (SP)+
      MOV      #RET1,%KTVEC
      CLR      %KTSTA
      MOV      #125252,DESTAD  ;SETUP LOCATION TO BE REFERENCED
      MOV      #DESTAD+20000,R1 ;R1 CONTAINS VIRTUAL ADDRESS OF LOCATION TO
                                ;BE REFERENCED THRU KERNEL PAGE 1
      INC      %SRO            ;TURN ON MEMORY MANAG.
      CMP      #125252,(R1)+   ;DATI TO RRO PAGE
      BEQ      CMPOK1         ;BRANCH IF CORRECT VALUE WAS READ
      DEC      %SRO            ;ON ERROR, TURN OFF MEMORY MANAG.
      HLT
      BR       DONE1          ;RELOCATION FAILED THRU KERNEL PAGE 1
CMPOK1:
      MOV      %SRO,R2        ;SAVE CONTENTS OF SRO
      DEC8    %SRO            ;TURN OFF MEMORY MANAG.
      CMP      #17,R2         ;CHECK SAVED CONTENTS OF SRO
      BEQ      .+4
      HLT
                                ;SRO INCORRECT-SHOULD HAVE
                                ;TRACKED REFERENCE TO PAGE 0,
                                ;WHICH GOT THE ADDRESS OF SRO
                                ;CHECK SR2
      CMP      #,%SR2
      BEQ      .+4
      HLT
                                ;SR2 INCORRECT-SHOULD TRACK EVEN
                                ;WHEN MEMORY MANAG. IS OFF
                                ;CHECK PDR FOR
                                ;THE RRO PAGE REFERENCED
                                ;KPDR1 INCORRECT-SHOULD NOT
                                ;HAVE BEEN CHANGED
      BR       DONE1
      BIC     #1,%SRO        ;TURN OFF MEMORY MANAG.
      HLT
                                ;DATI TO RRO PAGE CAUSED
                                ;A TRAP OR ABORT
                                ;RESTORE TRAP RETURN TO CAUSE HALT
                                ;ON AN UNEXPECTED TRAP
      MOV      %KTSTA,%KTVEC  ;INITIALIZE SRO
      CLR      %KTSTA
      CLR      %SRO
      CLR      %PS           ;INITIALIZE PROCESSOR STATUS
      HLT

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;SHOW THAT A DATO (NO DATIP) TO A RRO PAGE (ACF=2) ABORTS
 ;SHOW THAT THE MEMORY MANAG. STATUS REGISTERS LOCK UP, AND THAT THE PDR
 ;CORRESPONDING TO THE REFERENCE IS CORRECT
 TEST2: SCOPE

```

      MOV      #KSTACK,SP      ;INITIALIZE KERNEL STACK POINTER
      CLR      %SRO            ;INITIALIZE SRO

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445	002540	004767	004036			JSR	PC,ORDER	:CHECK TEST SEQUENCE
446	002544	000002				2		:TEST NUMBER
447	002546	104006				HLT		:TEST EXECUTED OUT OF SEQUENCE
448	002550	012746	000002			MOV	#2,-(SP)	:PUSH RRO KEY ON STACK
449	002554	004767	003010			JSR	%7,SETUP	:MAKE KERNEL PAGE 1 RRO, BANK 0
450								:MAKE KERNEL PAGE 7 RW, EXTERNAL
451								:MAKE ALL OTHER PAGES RW, BANK 0
452	002560	005726				TST	(SP)+	:RESTORE STACK POINTER
453	002562	012777	002626	177234		MOV	#RET4,%KTVEC	:SETUP ABORT RETURN
454	002570	005077	177232			CLR	%KTSTA	
455	002574	005067	177346			CLR	DESTAD	:INITIALIZE LOCATION TO BE ADDRESSED
456								:BY DATO TO RRO PAGE
457	002600	012702	022146			MOV	#DESTAD+20000,R2	:R2 CONTAINS ADDRESS OF LOCATION
458								:TO BE REFERENCED THRU KERNEL PAGE 1
459	002604	012777	000001	177204		MOV	#1,%SR0	:TURN ON MEMORY MANAG.
460	002612	012722	125252		AD4:	MOV	#125252,(R2)+	:DATO TO RRO PAGE-SHOULD ABORT
461	002616	005377	177174			DEC	%SR0	:TURN OFF MEMORY MANAG.
462	002622	104006				HLT		:DATO TO RRO PAGE FAILED TO ABORT
463	002624	000426				BR	DONE4	
464	002626	017701	177164		RET4:	MOV	%SR0,R1	:SAVE CONTENTS OF SR0
465	002632	005377	177160			DEC	%SR0	:TURN OFF MEMORY MANAG.
466	002636	022701	020003			CMP	#20003,R1	:CHECK SAVED CONTENTS OF SR0
467	002642	001401				BEQ	.+4	
468	002644	104006				HLT		:SR0 INCORRECT-SHOULD HAVE LOCKED
469								:ON DATO TO KERNEL PAGE 1(RRO)
470								:AND ACCESS FAULT SHOULD BE SET
471	002646	022777	002612	177146		CMP	#AD4,%SR2	:CHECK SR2
472	002654	001401				BEQ	.+4	
473	002656	104006				HLT		:SR2 INCORRECT-SHOULD HAVE LOCKED
474								:ON THE ABORTED REFERENCE, WITH THE
475								:VIRTUAL ADDRESS OF THE INSTRUCTION
476	002660	022777	077402	177204		CMP	#77402,%KPDR1	:CHECK INSTRUCTION SPACE PDR
477	002666	001401				BEQ	.+4	
478	002670	104006				HLT		:KPDR1 INCORRECT-SHOULD NOT
479								:HAVE BEEN CHANGED SINCE THE
480								:DATO DIDN'T WRITE
481	002672	005767	177250			TST	DESTAD	:MAKE CERTAIN THAT DESTINATION
482	002676	001401				BEQ	.+4	:LOCATION WAS NOT WRITTEN
483	002700	104006				HLT		:DATO TO RRO PAGE WROTE
484								:INTO THE DESTINATION LOCATION
485	002702	016777	177120	177114	DONE4:	MOV	%KTSTA,%KTVEC	:CHANGE MEMORY MANAG. TRAP RETURN
486	002710	005077	177112			CLR	%KTSTA	:TO CAUSE A HALT ON AN UNEXPECTED TRAP
487	002714	005077	177076			CLR	%SR0	
488	002720	005037	177776			CLR	%PS	
489								
490								:SHOW THAT A DATIP, DATO SEQUENCE TO A RRO PAGE (ACF=2) ABORTS
491								:SHOW THAT THE MEMORY MANAG. STATUS REGISTERS LOCK UP, AND THAT THE PDR
492								:CORRESPONDING TO THE REFERENCE IS CORRECT
493	002724	104400				TEST3:	SCOPE	
494	002726	012706	001000			MOV	#KSTACK,SP	:INITIALIZE KERNEL STACK POINTER
495	002732	005077	177060			CLR	%SR0	:INITIALIZE SR0
496	002736	004767	003640			JSR	PC,ORDER	:CHECK TEST SEQUENCE
497	002742	000003				3		:TEST NUMBER
498	002744	104006				HLT		:TEST EXECUTED OUT OF SEQUENCE
499	002746	012746	000002			MOV	#2,-(SP)	:PUSH RRO KEY ON STACK
500	002752	004767	002612			JSR	%7,SETUP	:MAKE KERNEL PAGE 1 RROT,BANK 0

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501						(SP)+		:MAKE KERNEL PAGE 7 RW, EXTERNAL
502						#RETS, &KTVEC	:MAKE ALL OTHER PAGES RW, BANK 0	
503	002756	005726			TST		:RESTORE STACK POINTER	
504	002760	012777	003024	177036	MOV		:SETUP ABORT RETURN	
505	002766	005077	177034		CLR	&KTSTA		
506	002772	005067	177150		CLR	DESTAD	:INITIALIZE LOCATION TO BE ADDRESSED	
507							:BY DATIP, DATO TO RRO PAGE	
508	002776	012703	022150			MOV	:R3 CONTAINS VIRTUAL ADDRESS+2 OF LOCATION	
509						#DESTAD+20002,R3	:TO BE REFERENCED THRU KERNEL PAGE 1	
510	003002	052777	000001	177006	BIS	#1, &SR0	:TURN ON MEMORY MANAG.	
511	003010	005243			INC	-(R3)	:DATIP, DATO TO RRO PAGE	
512	003012	042777	000001	176776	BIC	#1, &SR0	:TURN OFF MEMORY MANAG.	
513	003020	104006			HLT		:DATIP, DATO TO RROT PAGE FAILED TO	
514	003022	000427			BR	DONES	:ABORT	
515	003024	017701	176766			MOV	:SAVE CONTENTS OF SR0	
516	003030	042777	000001	176760	BIC	#1, &SR0	:TURN OFF MEMORY MANAG.	
517	003036	022701	020003			CMP	:CHECK SAVED CONTENTS OF SR0	
518	003042	001401			BEQ	.+4		
519	003044	104006			HLT		:SR0 INCORRECT-SHOULD HAVE LOCKED	
520							:ON DATO TO KERNEL PAGE 1(RRO) AND	
521							:ACCESS FAULT SHOULD BE SET	
522	003046	022777	003010	176746	CMP	#AD5, &SR2	:CHECK SR2	
523	003054	001401			BEQ	.+4		
524	003056	104006			HLT		:SR2 INCORRECT-SHOULD HAVE LOCKED	
525							:ON THE ABORTED REFERENCE, WITH THE	
526							:VIRTUAL ADDRESS OF THE INSTRUCTION	
527	003060	022777	077402	177004	CMP	#77402, &KPDR1	:CHECK PDR	
528	003066	001401			BEQ	.+4		
529	003070	104006			HLT		:KPDR1 INCORRECT - SHOULD NOT HAVE	
530							:BEEN CHANGED, SINCE DATIP IS ABORTED	
531							:SINCE IT WILL BE FOLLOWED BY A DATO OR DATOB	
532	003072	005767	177050			TST	:MAKE CERTAIN THAT DESTINATION	
533	003076	001401			BEQ	.+4	:LOCATION WAS NOT WRITTEN	
534	003100	104006			HLT		:DATO TO RRO PAGE WROTE INTO	
535							:THE DESTINATION LOCATION	
536	003102	016777	176720	176714	MOV	KTSTA, &KTVEC	:CHANGE PAGE FAULT RETURN	
537	003110	005077	176712		CLR	&KTSTA	:TO CAUSE A HALT ON AN UNEXPECTED	
538	003114	005077	176676		CLR	&SR0	:TRAP	
539	003120	005037	177776		CLR	&#PS		
540								
541							:SHOW THAT A DATIP, DATOB SEQUENCE TO A RRO PAGE (ACF=2) WORD ABORTS	
542							:SHOW THAT THE MEMORY MANAG. STATUS REGISTERS LOCK UP, AND THAT THE PDR	
543							:CORRESPONDING TO THE REFERENCE IS CORRECT	
544	003124	104400			TEST4:	SCOPE		
545	003126	012706	001000			MOV	:INITIALIZE KERNEL STACK POINTER	
546	003132	005077	176660			CLR	:INITIALIZE SR0	
547	003136	004767	003440			JSR	:CHECK TEST SEQUENCE	
548	003142	000004				4	:TEST NUMBER	
549	003144	104006			HLT		:TEST EXECUTED OUT OF SEQUENCE	
550	003146	012746	000002			MOV	:PUSH RRO KEY ON STACK	
551	003152	004767	002412			JSR	:MAKE KERNEL PAGE 1 RRO, BANK 0	
552							:MAKE KERNEL PAGE 7 RW, EXTERNAL	
553							:MAKE ALL OTHER PAGES RW, BANK 0	
554	003156	005726			TST	(SP)+	:RESTORE STACK POINTER	
555	003160	012777	003222	176636	MOV	#RET6, &KTVEC	:SETUP ABORT RETURN	
556	003166	005077	176634		CLR	&KTSTA		

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557	003172	005067	176750		CLR	DESTAD	; INITIALIZE LOCATION TO BE ADDRESSED
558							; BY DATIP, DATOB TO RRO PAGE
559	003176	012704	022146		MOV	#DESTAD+20000,R4	; R4 CONTAINS VIRTUAL ADDRESS OF LOCATION
560							; TO BE REFERENCED THRU KERNEL PAGE 1
561	003202	052777	000001	176606	BIS	#1,SR0 ; TURN ON	MEMORY MANAG.
562	003210	105224			AD6: INCB	(R4)+	; DATIP, DATOB TO RROT PAGE
563	003212	005377	176600		DEC	SR0	; TURN OFF MEMORY MANAG.
564	003216	104006			HLT		; DATIP, DATO TO RROT PAGE FAILED TO ABORT
565	003220	000426			BR	DONE6	
566	003222	017701	176570		RET6: MOV	SR0,R1	; SAVE CONTENTS OF SR0
567	003226	005377	176564		DEC	SR0	; TURN OFF MEMORY MANAG.
568	003232	022701	020003		CMP	#20003,R1	; CHECK SAVED CONTENTS OF SR0
569	003236	001401			BEQ	.+4	
570	003240	104006			HLT		; SR0 INCORRECT-SHOULD HAVE LOCKED ON
571							; DATOB TO KERNEL PAGE 1 (RRO)
572							; ACCESS FAULT SHOULD BE SET
573	003242	022777	003210	176552	CMP	#AD6,SR2	; CHECK SR2
574	003250	001401			BEQ	.+4	
575	003252	104006			HLT		; SR2 INCORRECT-SHOULD HAVE LOCKED
576							; ON THE ABORTED REFERENCE, WITH THE
577							; VIRTUAL ADDRESS OF THE INSTRUCTION
578	003254	022777	077402	176610	CMP	#77402,PKPDR1	; CHECK PDR
579	003262	001401			BEQ	.+4	
580	003264	104006			HLT		; KPDR1 INCORRECT - SHOULD NOT HAVE
581							; BEEN CHANGED-DATIP IS ABORTED
582							; SINCE IT MUST BE FOLLOWED BY A DATO
583	003266	005767	176654		TST	DESTAD	; MAKE CERTAIN THAT DESTINATION
584	003272	001401			BEQ	.+4	; LOCATION WAS NOT WRITTEN
585	003274	104006			HLT		; DATOB TO RRO PAGE WROTE INTO
586							; THE DESTINATION LOCATION
587	003276	016777	176524	176520	DONE6: MOV	KTSTA,KTVEC	; CHANGE MEMORY MANAG. FAULT
588	003304	005077	176516		CLR	KTSTA	; RETURN TO CAUSE A HALT ON AN
589	003310	005077	176502		CLR	SR0	; UNEXPECTED TRAP
590	003314	005037	177776		CLR	SRPS	
591							
592							; THE FOLLOWING TESTS (5-10) ARE RUN FOR BOTH OF THE NON-RESIDENT
593							; KEYS - A PASS IS MADE FOR KEY 0, THEN A PASS IS MADE FOR KEY 4,
594							; THE CURRENT KEY IS STORED ON THE STACK
595							; SHOW THAT DATI TO A NR PAGE ABORTS WITHOUT COMPLETING
596							; SHOW THAT THE MEMORY MANAG. STATUS REGISTERS LOCK UP, AND THAT
597							; THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
598	003320	104400			TEST5: SCOPE		
599	003322	012706	001000		MOV	#KSTACK,SP	; INITIALIZE KERNEL STACK POINTER
600	003326	005077	176464		CLR	SR0	; INITIALIZE SR0
601	003332	004767	003244		JSR	PC,ORDER	; CHECK TEST SEQUENCE
602	003336	000005			5		; TEST NUMBER
603	003340	104006			HLT		; TEST EXECUTED OUT OF SEQUENCE
604	003342	005037	001000		CLR	#KSTACK	; PUT 0 ON STACK AS FIRST NR KEY TO BE TESTED
605							; THIS INSTRUCTION IS SKIPPED WHEN TESTING THE
606							; OTHER WHICH IS SETUP AFTER TEST30
607	003346	012706	001000		RERUNA: MOV	#KSTACK,SP	
608	003352	005077	176440		CLR	SR0	
609	003356	004767	002206		JSR	%7,SETUP	; MAKE KERNEL PAGE 1 NR, BANK 0
610							; MAKE KERNEL PAGE 7 RW, EXTERNAL
611							; MAKE ALL OTHER PAGES RW, BANK 0
612	003362	012777	003426	176434	MOV	#RET21,KTVEC	; SETUP ABORT RETURN

613	003370	005077	176432		CLR	2KTSTA			
614	003374	005003			CLR	R3			: INITIALIZE DESTINATION LOCATION
615	003376	012767	125252	176542	MOV	8125252, DESTAD			: INITIALIZE SOURCE LOCATION
616	003404	012701	022146		MOV	8DESTAD+20000, R1			: R1 CONTAINS VIRTUAL ADDRESS OF LOCATION
617									: TO BE REFERENCED THRU KERNEL PAGE 1
618	003410	005277	176402		INC	2SR0			: TURN ON MEMORY MANAG.
619	003414	012103			AD21: MOV	(R1)+, R3			: DATI TO NR PAGE - SHOULD ABORT
620	003416	005377	176374		DEC	2SR0			: ON ERROR, TURN OFF MEMORY MANAG.
621	003422	104006			HLT				: NO ABORT ON DATI TO A NON-RESIDENT PAGE
622	003424	000430			BR	DONE21			
623	003426	017702	176364		RET21: MOV	2SR0, R2			: SAVE CONTENTS OF SR0
624	003432	105377	176360		DEC8	2SR0			: TURN OFF MEMORY MANAG.
625	003436	022702	100003		CMF	8100003, R2			: CHECK SAVED CONTENTS OF SR0
626	003442	001401			BEQ	.+4			
627	003444	104006			HLT				: SR0 INCORRECT-SHOULD HAVE
628									: LOCKED ON REFERENCE TO
629									: KERNEL PAGE 1 WHICH WAS NON-RESIDENT
630	003446	022777	003414	176346	CMF	8AD21, 2SR2			: CHECK SR2
631	003454	001401			BEQ	.+4			
632	003456	104006			HLT				: SR2 INCORRECT-SHOULD HAVE LOCKED ON
633									: NR REFERENCE
634	003460	017705	176406		MOV	2KPDR1, R5			: MOVE CONTENTS OF KPDR1 TO R5
635	003464	042705	000007		BIC	87, R5			: TO MASK OFF ACCESS KEY
636	003470	022705	077400		CMF	877400, R5			: CHECK PDR FOR
637	003474	001401			BEQ	.+4			: THE NR PAGE REFERENCED (BITS 0-2 MASKED OUT)
638	003476	104006			HLT				: KPDR1 INCORRECT-SHOULD NOT
639									: HAVE BEEN CHANGED
640	003500	005703			TST	R3			: CHECK DESTINATION LOCATION TO SEE
641	003502	001401			BEQ	.+4			: IF INSTRUCTION ALTERED IT BEFORE ABORTING
642	003504	104006			HLT				: INSTRUCTION COMPLETED BEFORE ABORT OCCURRED
643	003506	016777	176314	176310	DONE21: MOV	KTSTA, 2KTVEC			: RESTORE TRAP RETURN TO CAUSE HALT
644	003514	005077	176306		CLR	2KTSTA			: ON AN UNEXPECTED TRAP
645	003520	005077	176272		CLR	2SR0			: INITIALIZE SR0
646	003524	005037	177776		CLR	28PS			: INITIALIZE PROCESSOR STATUS
647									
648									: SHOW THAT A DATO (NO DATIP) TO A NR PAGE
649									: ABORTS WITHOUT COMPLETING THE DATO
650									: SHOW THAT THE MEMORY MANAG. STATUS REGISTERS LOCK UP, AND THAT THE PDR
651									: CORRESPONDING TO THE REFERENCE IS CORRECT
652	003530	104400			TEST6: SCOPE				
653	003532	012706	001000		MOV	8KSTACK, SP			: INITIALIZE KERNEL STACK POINTER
654	003536	005077	176254		CLR	2SR0			: INITIALIZE SR0
655	003542	004767	003034		JSR	PC, ORDER			: CHECK TEST SEQUENCE
656	003546	000006			6				: TEST NUMBER
657	003550	104006			HLT				: TEST EXECUTED OUT OF SEQUENCE
658	003552	004767	002012		JSR	87, SETUP			: MAKE KERNEL PAGE 1 NR, BANK 0
659									: MAKE KERNEL PAGE 7 RW, EXTERNAL
660									: MAKE ALL OTHER PAGES RW, BANK 0
661	003556	012777	003624	176240	MOV	8RET23, 2KTVEC			: SETUP ABORT RETURN
662	003564	005077	176236		CLR	2KTSTA			
663	003570	005067	176352		CLR	DESTAD			: INITIALIZE LOCATION TO BE ADDRESSED
664									: BY DATO TO NR PAGE
665	003574	012701	022146		MOV	8DESTAD+20000, R1			: R1 CONTAINS ADDRESS OF LOCATION
666									: TO BE REFERENCED THRU KERNEL PAGE 1
667	003600	112777	000001	176210	MOV8	81, 2SR0			: TURN ON MEMORY MANAG.
668	003606	012721	125252		AD23: MOV	8125252, (R1)+			: DATO TO NR PAGE-SHOULD ABORT

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669	003612	042777	000001	176176		BIC	#1,SR0	:TURN OFF MEMORY MANAG.
670	003620	104006				HLT		:DATO TO NR PAGE FAILED TO ABORT
671	003622	000431				BR	DONE23	
672	003624	017702	176166		RET23:	MOV	SR0,R2	:SAVE CONTENTS OF SR0
673	003630	005377	176162			DEC	SR0	:TURN OFF MEMORY MANAG.
674	003634	022702	100003			CMP	#100003,R2	:CHECK SAVED CONTENTS OF SR0
675	003640	001401				BEQ	.+4	
676	003642	104006				HLT		:SR0 INCORRECT-SHOULD HAVE LOCKED
677								:ON DATO TO KERNEL PAGE 1(NR)
678								:NR FAULT SHOULD BE SET
679	003644	022777	003606	176150		CMP	#AD23,SR2	:CHECK SR2
680	003652	001401				BEQ	.+4	
681	003654	104006				HLT		:SR2 INCORRECT-SHOULD HAVE LOCKED
682								:ON THE ABORTED REFERENCE, CONTAINING THE
683								:VIRTUAL ADDRESS OF THE INSTRUCTION
684	003656	017703	176210			MOV	#KPDRI,R3	:MOVE CONTENTS OF KPDRI TO R3
685	003662	042703	000007			BIC	#7,R3	:TO MASK OFF THE ACCESS KEY
686	003666	022703	077400			CMP	#77400,R3	:CHECK PDR
687	003672	001401				BEQ	.+4	: (BITS 0-2 MASKED OUT)
688	003674	104006				HLT		:KPDRI INCORRECT-SHOULD NOT HAVE
689								:BEEN CHANGED
690	003676	005767	176244			TST	DESTAD	:MAKE CERTAIN THAT DESTINATION
691	003702	001401				BEQ	.+4	:LOCATION WAS NOT WRITTEN
692	003704	104006				HLT		:DATO TO NR PAGE WROTE
693								:INTO THE DESTINATION LOCATION
694	003706	016777	176114	176110	DONE23:	MOV	KTSTA,#KTVEC	:CHANGE MEMORY MANAG. FAULT RETURN
695	003714	005077	176106			CLR	KTSTA	:TO CAUSE A HALT ON AN UNEXPECTED TRAP
696	003720	005077	176072			CLR	SR0	
697	003724	005037	177776			CLR	#PS	
698								
699								
700								:SHOW THAT A DATIP, DATO SEQUENCE TO A NR PAGE WORD ABORTS
701								:SHOW THAT THE MEMORY MANAG. STATUS REGISTERS LOCK UP, AND THAT THE PDR
702								:CORRESPONDING TO THE REFERENCE IS CORRECT
703	003730	104400			TEST7:	SCOPE		
704	003732	012706	001000			MOV	#KSTACK,SP	:INITIALIZE KERNEL STACK POINTER
705	003736	005077	176054			CLR	SR0	:INITIALIZE SR0
706	003742	004767	002634			JSR	PC,ORDER	:CHECK TEST SEQUENCE
707	003746	000007				7		:TEST NUMBER
708	003750	104006				HLT		:TEST EXECUTED OUT OF SEQUENCE
709	003752	004767	001612			JSR	#7,SETUP	:MAKE KERNEL PAGE 1 NR, BANK 0
710								:MAKE KERNEL PAGE 7 RW, EXTERNAL
711	003756	012777	004022	176040		MOV	#RET25,#KTVEC	:MAKE ALL OTHER PAGES RW, BANK 0
712	003764	005077	176036			CLR	KTSTA	:SETUP ABORT RETURN
713	003770	005067	176152			CLR	DESTAD	:INITIALIZE LOCATION TO BE ADDRESSED
714								:BY DATIP, DATO TO NR PAGE
715	003774	012703	022150			MOV	#DESTAD+20002,R3	:R3 CONTAINS ADDRESS+2 OF LOCATION
716								:TO BE REFERENCED THRU KERNEL PAGE 1
717	004000	052777	000001	176010		BIS	#1,SR0	:TURN ON MEMORY MANAG.
718	004006	005243			AD25:	INC	-(R3)	:DATIP, DATO TO NR PAGE-SHOULD ABORT
719	004010	042777	000001	176000		BIC	#1,SR0	:TURN OFF MEMORY MANAG.
720	004016	104006				HLT		:DATIP, DATO TO NR PAGE FAILED TO
721	004020	000432				BR	DONE25	:ABORT
722	004022	017701	175770		RET25:	MOV	SR0,R1	:SAVE CONTENTS OF SR0
723	004026	042777	000001	175762		BIC	#1,SR0	:TURN OFF MEMORY MANAG.
724	004034	022701	100003			CMP	#100003,R1	:CHECK SAVED CONTENTS OF SR0

725	004040	001401			BEG	+.4		
726	004042	104006			HLT			
727								:SRO INCORRECT-SHOULD HAVE LOCKED
728								:ON DATO TO KERNEL PAGE 1(NR)
729	004044	022777	004006	175750	CMP	#AD25,SR2		:NR FAULT SHOULD BE SET
730	004052	001401			BEG	+.4		:CHECK SR2
731	004054	104006			HLT			
732								:SR2 INCORRECT-SHOULD HAVE LOCKED
733								:ON THE ABORTED REFERENCE, CONTAINING THE
734	004056	017704	176010		MOV	2KPOR1,R4		:VIRTUAL ADDRESS OF THE INSTRUCTION
735	004062	042704	000007		BIC	87,R4		:MOVE CONTENTS OF POR TO R4
736	004066	022704	077400		CMP	877400,R4		:TO MASK OFF THE ACCESS KEY
737	004072	001401			BEG	+.4		:CHECK POR
738	004074	104006			HLT			:WITH BITS 0-2 MASKED OFF
739								:KPOR1 INCORRECT-SHOULD NOT HAVE
740	004076	005767	176044		TST	DESTAD		:BEEN CHANGED
741	004102	001401			BEG	+.4		:MAKE CERTAIN THAT DESTINATION
742	004104	104006			HLT			:LOCATION HAS NOT WRITTEN
743								:DATO TO NR PAGE WROTE INTO
744	004106	016777	175714	175710	MOV	KTSTA,2KTVEC		:THE DESTINATION LOCATION
745	004114	005077	175706		CLR	2KTSTA		:CHANGE PAGE FAULT RETURN
746	004120	005077	175672		CLR	2SRO		:TO CAUSE A HALT ON AN UNEXPECTED
747	004124	005037	177776		CLR	2APS		:TRAP
748								:SHOW THAT A DATIP DATOB SEQUENCE TO A NR-PAGE WORD ABORTS
749								:SHOW THAT THE MEMORY MANAG. STATUS REGISTERS LOCK UP, AND THAT THE POR
750								:CORRESPONDING TO THE REFERENCE IS CORRECT
751	004130	104400			TEST10:	SCOPE		
752	004132	012706	001000		MOV	#KSTACK,SP		:INITIALIZE KERNEL STACK POINTER
753	004136	005077	175654		CLR	2SRO		:INITIALIZE SRO
754	004142	004767	002434		JSR	PC,ORDER		:CHECK TEST SEQUENCE
755	004146	000010			LD	10		:TEST NUMBER
756	004150	104006			HLT			:TEST EXECUTED OUT OF SEQUENCE
757	004152	004767	001412		JSR	X7,SETUP		:MAKE KERNEL PAGE 1 NR, BANK 0
758								:MAKE KERNEL PAGE 7 RH, EXTERNAL
759								:MAKE ALL OTHER PAGES RH, BANK 0
760	004156	012777	004220	175640	MOV	#RET27,2KTVEC		:SETUP ABORT RETURN
761	004164	005077	175636		CLR	2KTSTA		
762	004170	005067	175752		CLR	DESTAD		:INITIALIZE LOCATION TO BE ADDRESSED
763								:BY DATIP DATOB TO NR PAGE
764	004174	012704	022146		MOV	#DESTAD+20000,R4		:R4 CONTAINS ADDRESS OF LOCATION
765								:TO BE REFERENCED THRU KERNEL PAGE 1
766	004200	052777	000001	175610	BIS	81,2SRO		:TURN ON MEMORY MANAG.
767	004206	105224			INCB	(R4)+		:DATIP, DATOB TO NR PAGE-SHOULD ABORT
768	004210	005377	175602		DEC	2SRO		:TURN OFF MEMORY MANAG.
769	004214	104006			HLT			:DATIP, DATO TO NR PAGE FAILED
770	004216	000431			BR	DONE27		:TO ABORT
771	004220	017701	175572		MOV	2SRO,R1		:SAVE CONTENTS OF SRO
772	004224	005377	175566		DEC	2SRO		:TURN OFF MEMORY MANAG.
773	004230	022701	100003		CMP	8100003,R1		:CHECK SAVED CONTENTS OF SRO
774	004234	001401			BEG	+.4		
775	004236	104006			HLT			:SRO INCORRECT-SHOULD HAVE LOCKED ON
776								:DATIP, DATOB TO KERNEL DATA PAGE 1 (NR)
777								:NR FAULT SHOULD BE SET
778	004240	022777	004206	175554	CMP	#AD27,SR2		:CHECK SR2
779	004246	001401			BEG	+.4		
780	004250	104006			HLT			:SR2 INCORRECT SHOULD HAVE LOCKED

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781
782
783 004252 017702 175614      MOV      2KPDR1,R2
784 004256 042702 000007      BIC      27,R2
785 004262 022702 077400      CLR      277400,R2
786 004266 001401      BEQ      .+4
787 004270 104006      HLT
788
789 004272 005767 175650      TST      DESTAD
790 004276 001401      BEQ      .+4
791 004300 104006      HLT
792
793 004302 016777 175520 175514  DONE27:  MOV      KTSTA,2KTVEC
794 004310 005077 175512      CLR      2KTSTA
795 004314 005077 175476      CLR      2SR0
796 004320 005037 177776      CLR      28PS
797 004324 104400      SCOPE
798 004326 005267 175606      INC      NRCNT
799 004332 022767 000002 175600      CMP      2,NRCNT
800 004340 001416      BEQ      NXTST
801 004342 016701 175572      MOV      NRCNT,R1
802 004346 006301      RSL      R1
803 004350 016137 002142 001000      MOV      NRKEYS(R1),28KSTACK ;PUT NEXT NR KEY ON STACK
804 004356 012767 003346 001420      MOV      2RERUNA,RETURN ;PUT NEW SCOPE LOOP ADDRESS IN RETURN
805 004364 012767 000005 002274      MOV      25,TESTCT ;REINIT TEST COUNTER SEQ
806 004372 000167 176750      JMP      RERUNA ;JUMP TO EXECUTE TESTS WITH NEXT NR KEY
807 004376 005067 175536      CLR      NRCNT
808 004402 012767 004000 001372      MOV      24000,SCOPEF
809 004410 005367 002252      DEC      TESTCT
810 004414
811
812
813
814
815
816 004414 104400
817 004416 012706 001000
818 004422 005077 175370
819 004426 004767 002150
820 004432 000011
821 004434 104006
822 004436 012746 000006
823 004442 004767 001122
824
825
826 004446 005726
827 004450 012777 004564 175346
828 004456 005077 175344
829 004462 012767 125252 175456
830 004470 012701 022146
831
832 004474 005277 175316
833 004500 022721 125252
834 004504 001404
835 004506 005377 175304
836 004512 104006

```

; ON THE ABORTED REFERENCE, CONTAINING THE
; VIRTUAL ADDRESS OF THE INSTRUCTION
; MOVE CONTENTS OF PDR 1 TO R2
; TO MASK OFF THE ACCESS KEY
; CHECK INSTRUCTION SPACE PDR
; WITH BITS 0-2 MASKED OFF
; KPDR1 INCORRECT-SHOULD NOT HAVE
; BEEN CHANGED
; MAKE CERTAIN THAT DESTINATION
; LOCATION WAS NOT WRITTEN
; DAT08 TO NR PAGE WROTE INTO
; THE DESTINATION LOCATION
; CHANGE MEMORY MANAG. FAULT
; RETURN TO CAUSE A HALT ON AN
; UNEXPECTED TRAP

; COUNT HOW MANY NR KEYS HAVE BEEN TESTED.

; IF ALL 2 HAVE BEEN TESTED, BRANCH
; OTHERWISE, CALCULATE OFFSET TO GET NEXT KEY

; PUT NEXT NR KEY ON STACK

; PUT NEW SCOPE LOOP ADDRESS IN RETURN

; REINIT TEST COUNTER SEQ

; JUMP TO EXECUTE TESTS WITH NEXT NR KEY

; SHOW THAT DAT1 TO A RW PAGE (ACF=6)
; NEITHER TRAPS NOR ABORTS
; SHOW THAT THE MEMORY MANAG. STATUS REGISTERS CONTINUE TO TRACK, AND THAT
; THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT

TEST11: SCOPE

; INITIALIZE KERNEL STACK POINTER

; INITIALIZE SR0

; CHECK TEST SEQUENCE

; TEST NUMBER

; TEST EXECUTED OUT OF SEQUENCE

; PUSH RW KEY ON STACK

; MAKE KERNEL PAGE 1 RW, BANK 0

; MAKE KERNEL PAGE 7 RW, EXTERNAL

; MAKE ALL OTHER PAGES RW, BANK 0

; RESTORE STACK POINTER

; SETUP ABORT RETURN IN CASE

; INITIALIZE LOCATION TO BE READ

; R1 CONTAINS VIRTUAL ADDRESS OF

; LOCATION TO BE REFERENCED THRU KERNEL PAGE 1

; TURN ON MEMORY MANAG.

; DAT1 TO RW PAGE-SHOULDN'T TRAP OR ABORT

; ON ERROR, TURN OFF MEMORY MANAG.

; RELOCATION FAILED THRU KERNEL PAGE 1

837	004514	000427				BR	DONE31		
838	004516	017702	175274		OK31:	MOV	2SR0,R2	:	SAVE CONTENTS OF SR0
839	004522	105377	175270			DECB	2SR0	:	TURN OFF MEMORY MANAG.
840	004528	022702	000017			CHP	817,R2	:	CHECK SAVED CONTENTS OF SR0
841	004532	001401				BEG	.+4		
842	004534	104006				HLT		:	SR0 INCORRECT-SHOULD HAVE
843								:	TRACKED REFERENCE TO
844								:	PAGE 0, WHICH GOT THE ADDRESS
845								:	OF SR0 TO TURN OFF MEMORY MANAG.
846	004536	022777	004536	175256		CHP	8,2SR2	:	CHECK SR2
847	004544	001401				BEG	.+4		
848	004546	104006				HLT		:	SR2 INCORRECT-SHOULD TRACK EVEN
849								:	WHEN MEMORY MANAG. IS OFF
850	004550	022777	077406	175314		CHP	877406,2KPOR1	:	CHECK POR FOR
851	004556	001401				BEG	.+4	:	THE RM PAGE REFERENCED
852	004560	104006				HLT		:	KPOR1 INCORRECT-SHOULD NOT
853								:	HAVE BEEN CHANGED
854	004562	000404				BR	DONE31		
855	004564	042777	000001	175224	RET31:	BIC	81,2SR0	:	TURN OFF MEMORY MANAG.
856	004572	104006				HLT		:	DATI TO RM PAGE CAUSED
857								:	A TRAP OR ABORT
858	004574	016777	175226	175222	DONE31:	MOV	KTSTA,2KTVEC	:	RESTORE TRAP RETURN TO CAUSE HALT
859	004602	005077	175220			CLR	2KTSTA	:	ON AN UNEXPECTED TRAP
860	004606	005077	175204			CLR	2SR0	:	INITIALIZE SR0
861	004612	005037	177776			CLR	28PS	:	INITIALIZE PROCESSOR STATUS
862									
863									
864									
865									
866									
867	004616	104400							
868	004620	012706	001000		TEST12:	MOV	8KSTACK,SP	:	INITIALIZE KERNEL STACK POINTER
869	004624	005077	175166			CLR	2SR0	:	INITIALIZE SR0
870	004630	004767	001746			JSR	PC,ORDER	:	CHECK TEST SEQUENCE
871	004634	000012				12		:	TEST NUMBER
872	004636	104006				HLT		:	TEST EXECUTED OUT OF SEQUENCE
873	004640	012746	000006			MOV	86,-(SP)	:	PUSH RM KEY ON THE STACK
874	004644	004767	000720			JSR	87,SETUP	:	MAKE KERNEL PAGE 1 RM, BANK 0
875								:	MAKE KERNEL PAGE 7 RM, EXTERNAL
876								:	MAKE ALL OTHER PAGES RM, BANK 0
877	004650	005726				TST	(SP)+	:	RESTORE STACK POINTER
878	004652	012777	004764	175144		MOV	8RET33,2KTVEC	:	SETUP ABORT RETURN IN CASE
879	004660	005077	175142			CLR	2KTSTA		
880	004664	005067	175256			CLR	DESTAD	:	INITIALIZE LOCATION TO BE REFERENCED
881	004670	012701	022146			MOV	8DESTAD+20000,R1	:	R1 CONTAINS VIRTUAL ADDRESS OF
882								:	LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
883	004674	005277	175116			INC	2SR0	:	TURN ON MEMORY MANAG.
884	004700	012721	125252			MOV	8125252,(R1)+	:	DATI TO RM PAGE-SHOULDN'T TRAP OR ABORT
885	004704	017702	175106			MOV	2SR0,R2	:	SAVE CONTENTS OF SR0
886	004710	105377	175102			DECB	2SR0	:	TURN OFF MEMORY MANAG.
887	004714	022702	000017			CHP	817,R2	:	CHECK SAVED CONTENTS OF SR0
888	004720	001401				BEG	.+4		
889	004722	104006				HLT		:	SR0 INCORRECT-SHOULD HAVE
890								:	TRACKED REFERENCE TO DATA SPACE,
891								:	PAGE 0, WHICH GOT THE ADDRESS
892								:	OF SR0 TO TURN OFF MEMORY MANAG.

893	004724	022777	004724	175070		CMP	%SR2	;CHECK SR2
894	004732	001401				BEG	.+4	
895	004734	104006				HLT		;SR2 INCORRECT-SHOULD TRACK EVEN
896								;WHEN MEMORY MANAG. IS OFF
897	004736	022777	077506	175126		CMP	%77506,%KPDRI	;CHECK PDR FOR
898	004744	001401				BEG	.+4	;THE RW PAGE REFERENCED
899	004746	104006				HLT		;KPDRI INCORRECT-"W" BIT SHOULD
900								;BE SET SINCE PAGE WAS WRITTEN
901	004750	022767	125252	175170		CMP	%125252,DESTAD	;MAKE SURE THAT THE WRITE ACTUALLY OCCURRED
902	004756	001401				BEG	.+4	
903	004760	104006				HLT		;DATO TO RW PAGE FAILED TO WRITE CORRECT LOCATION
904	004762	000404				BR	DONE33	
905	004764	042777	000001	175024	RET33:	BIC	%1,%SR0	;TURN OFF MEMORY MANAG.
906	004772	104006				HLT		;DATO TO RW PAGE CAUSED
907								;A TRAP OR ABORT
908	004774	016777	175026	175022	DONE33:	MOV	KTSTA,%KTVEC	;RESTORE TRAP RETURN TO CAUSE HALT
909	005002	005077	175020			CLR	%KTSTA	;ON AN UNEXPECTED TRAP
910	005006	005077	175004			CLR	%SR0	;INITIALIZE SR0
911	005012	005037	177776			CLR	%SPS	;INITIALIZE PROCESSOR STATUS
912								
913								;SHOW THAT A DATIP, DATO SEQUENCE TO A RW PAGE (ACF=6)
914								;NEITHER TRAPS NOR ABORTS
915								;SHOW THAT THE MEMORY MANAG. STATUS REGISTERS CONTINUE TO TRACK, AND THAT
916								;THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
917	005016	104400			TEST13:	SCOPE		
918	005020	012706	001000			MOV	%KSTACK,SP	;INITIALIZE KERNEL STACK POINTER
919	005024	005077	174766			CLR	%SR0	;INITIALIZE SR0
920	005030	004767	001546			JSR	PC,ORDER	;CHECK TEST SEQUENCE
921	005034	000013				13		;TEST NUMBER
922	005036	104006				HLT		;TEST EXECUTED OUT OF SEQUENCE
923	005040	012746	000006			MOV	%6,-(SP)	;PUSH RW KEY ON THE STACK
924	005044	004767	000520			JSR	%7,SETUP	;MAKE KERNEL PAGE 1 RW, BANK 0
925								;MAKE KERNEL PAGE 7 RW, EXTERNAL
926								;MAKE ALL OTHER PAGES RW, BANK 0
927	005050	005726				TST	(SP)+	;RESTORE STACK POINTER
928	005052	012777	005162	174744		MOV	%RET35,%KTVEC	;SETUP ABORT RETURN IN CASE
929	005060	005077	174742			CLR	%KTSTA	
930	005064	005067	175056			CLR	DESTAD	;INITIALIZE LOCATION TO BE REFERENCED
931	005070	012704	022150			MOV	%DESTAD+20002,%R4	;R4 CONTAINS VIRTUAL ADDRESS+2 OF
932								;LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
933	005074	005277	174716			INC	%SR0	;TURN ON MEMORY MANAG.
934	005100	005244				INC	-(R4)	;DATIP, DATO TO RW PAGE-SHOULDN'T TRAP OR ABORT
935	005102	017702	174710			MOV	%SR0,%R2	;SAVE CONTENTS OF SR0
936	005106	105077	174704			CLRB	%SR0	;TURN OFF MEMORY MANAG.
937	005112	022702	000017			CMP	%17,%R2	;CHECK SAVED CONTENTS OF SR0
938	005116	001401				BEG	.+4	
939	005120	104006				HLT		;SR0 INCORRECT-SHOULD HAVE
940								;TRACKED REFERENCE TO DATA SPACE,
941								;PAGE 0, WHICH GOT THE ADDRESS
942								;OF SR0 TO TURN OFF MEMORY MANAG.
943	005122	022777	005122	174672		CMP	%SR2	;CHECK SR2
944	005130	001401				BEG	.+4	
945	005132	104006				HLT		;SR2 INCORRECT-SHOULD TRACK EVEN
946								;WHEN MEMORY MANAG. IS OFF
947	005134	022777	077506	174730		CMP	%77506,%KPDRI	;CHECK PDR CORRESPONDING
948	005142	001401				BEG	.+4	;TO THE RW REFERENCE

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PC	OP	ADDR	COND	DESTAD	INSTR	COMMENT
949	005144	104006			HLT	: KPDR1 INCORRECT - "M" BIT SHOULD BE SET
950	005146	022767	000001	174772	CMP #1, DESTAD	: MAKE CERTAIN THAT THE INSTRUCTION WAS EXECUTED
951	005154	001401			BEQ .+4	
952	005156	104006			HLT	: DATIP, DATO TO RM PAGE DIDN'T EXECUTE CORRECTLY
953	005160	000404			BR	
954	005162	042777	000001	174625	RET35: BIC #1, JSRO	: TURN OFF MEMORY MANAG.
955	005170	104006			HLT	: DATIP, DATO TO RM PAGE CAUSED
956						: A TRAP OR ABORT
957	005172	016777	174630	174624	DONE35: MOV KTSTA, KTVVEC	: RESTORE TRAP RETURN TO CAUSE HALT
958	005200	005077	174622		CLR KTVSTA	: ON AN UNEXPECTED TRAP
959	005204	005077	174606		CLR JSRO	: INITIALIZE SRD
960	005210	005037	177776		CLR JSRS	: INITIALIZE PROCESSOR STATUS
961						
962						
963						: SHOW THAT A DATIP, DATOB SEQUENCE TO A RM PAGE (ACF=6)
964						: NEITHER TRAPS NOR ABORTS
965						: SHOW THAT THE MEMORY MANAG. STATUS REGISTERS CONTINUE TO TRACK, AND THAT
966						: THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
967	005214	104400				TEST14: SCOPE
968	005216	012706	001000		MOV #KSTACK, SP	: INITIALIZE KERNEL STACK POINTER
969	005222	005077	174570		CLR JSRO	: INITIALIZE SRD
970	005226	004767	001350		JSR PC, ORDER	: CHECK TEST SEQUENCE
971	005232	000014			14	: TEST NUMBER
972	005234	104006			HLT	: TEST EXECUTED OUT OF SEQUENCE
973	005236	012746	000006		MOV #6, -(SP)	: PUSH RM KEY ON THE STACK
974	005242	004767	000322		JSR X7, SETUP	: MAKE KERNEL PAGE 1 RM, BANK 0
975						: MAKE KERNEL PAGE 7 RM, EXTERNAL
976						: MAKE ALL OTHER PAGES RM, BANK 0
977	005246	005726			TST (SP)+	: RESTORE STACK POINTER
978	005250	012777	005360	174546	MOV #RET37, KTVVEC	: SETUP ABORT RETURN IN CASE
979	005256	005077	174544		CLR KTVSTA	
980	005262	005067	174660		CLR DESTAD	: INITIALIZE LOCATION TO BE REFERENCED
981	005266	012703	022147		MOV #DESTAD+20001, R3	: R3 CONTAINS VIRTUAL ADDRESS+1 OF
982						: LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
983	005272	005277	174520		INC JSRO	: TURN ON MEMORY MANAG.
984	005276	105343			DECB -(R3)	: DATIP, DATOB TO RM PAGE-SHOULDN'T TRAP OR ABORT
985	005300	017702	174512		MOV JSRO, R2	: SAVE CONTENTS OF SRD
986	005304	105377	174506		DECB JSRO	: TURN OFF MEMORY MANAG.
987	005310	022702	000017		CMP #17, R2	: CHECK SAVED CONTENTS OF SRD
988	005314	001401			BEQ .+4	
989	005316	104006			HLT	: SRD INCORRECT-SHOULD HAVE
990						: TRACKED REFERENCE TO DATA SPACE,
991						: PAGE 0, WHICH GOT THE ADDRESS
992						: OF SRD TO TURN OFF MEMORY MANAG.
993	005320	022777	005320	174474	CMP #, JSR2	: CHECK SR2
994	005326	001401			BEQ .+4	
995	005330	104006			HLT	: SR2 INCORRECT-SHOULD TRACK EVEN
996						: WHEN MEMORY MANAG. IS OFF
997	005332	022777	077506	174532	CMP #77506, KPDR1	: CHECK PDR CORRESPONDING
998	005340	001401			BEQ .+4	: TO THE RM REFERENCE
999	005342	104006			HLT	: KPDR1 INCORRECT - "M" BIT SHOULD BE SET
1000	005344	022767	000377	174574	CMP #377, DESTAD	: MAKE CERTAIN THAT THE INSTRUCTION WAS EXECUTED
1001	005352	001401			BEQ .+4	
1002	005354	104006			HLT	: DATIP, DATOB TO RM PAGE DIDN'T EXECUTE CORRECTLY
1003	005356	000404			BR	
1004	005360	042777	000001	174430	RET37: BIC #1, JSRO	: TURN OFF MEMORY MANAG.

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1005	005366	104006			HLT				
1006									
1007	005370	016777	174432	174426	DONE37:	MOV	KTSTA,KTVEC		:DATIP, DATOR TO RW PAGE CAUSED
1008	005376	005077	174424			CLR	KTSTA		:A TRAP OR ABORT
1009	005402	005077	174410			CLR	SR0		:RESTORE TRAP RETURN TO CAUSE HALT
1010	005406	005037	177776			CLR	PS		:ON AN UNEXPECTED TRAP
1011									:INITIALIZE SR0
1012	005412	104400							:INITIALIZE PROCESSOR STATUS
1013						SCOPE			
1014	005414	004767	001032			JSR	%7,BELL		
1015									
1016	005420	013701	000042			MOV	#42,R1		:MONITOR HOOK
1017	005424	001405				BEQ	END		
1018	005426	000005				RESET			
1019	005430	004711			LOGIC:	JSR	%7,R1		
1020	005432	000240				NOP			
1021	005434	000240				NOP			
1022	005436	000240				NOP			
1023	005440	000167	174506		END:	JMP	START		

1024									
1025									
1026	005444	030461	031457	020064					
1027	005452	042515	047515	054522					
1028	005460	046440	047101	043501					
1029	005466	020056	041501	042503					
1030	005474	051523	045440	054505					
1031	005502	020123	042524	052123					
1032	005510	100							
1033	005511	120	036503	040040	NPC:	.ASCII	'PC= a'		
1034	005516	020040	051520	020075	NPS:	.ASCII	'PS= a'		
1035	005524	100							
1036		005526							
1037									
1038	005526	005077	174264						
1039	005532	012701	002030						
1040	005536	012700	000010						
1041	005542	005071	000020						
1042	005546	012731	077406						
1043	005552	077005							
1044	005554	062701	000020						
1045	005560	020127	002126						
1046	005564	003764							
1047	005566	000207							
1048									
1049									
1050									
1051									
1052									
1053									
1054	005570	004767	177732						
1055	005574	012777	077400	174270					
1056	005602	056677	000002	174262					
1057	005610	012777	007600	174310					
1058	005616	000207							
1059									
1060									
1061									
1062									
1063									
1064									
1065	005620	005037	177776						
1066	005624	012706	001000						
1067	005630	012737	140000	177776					
1068	005636	012706	002000						
1069	005642	005037	177776						
1070	005646	062767	000002	000030					
1071	005654	000000							
1072	005656	005067	000120						
1073	005662	012767	005674	000114					
1074	005670	000177	000010						
1075	005674	005067	000102						
1076	005700	000177	000000						
1077	005704	000000							

```

: MESSAGE AREA
: ATIT: .ASCII '11/34 MEMORY MANAG. ACCESS KEYS TEST'

: NPC: .ASCII 'PC= a'
: NPS: .ASCII 'PS= a'

: EVEN
: SUBROUTINE TO MAKE ALL PAGES RW, BANK 0, 4K, UP
RVAL: CLR      JSR0
      MOV      @ADRTAB,R1
RML1: MOV      @10,R0
RML2: CLR      @20(R1)
      MOV      @77406,@(R1)+
      SOB     R0,RML2
      ADD     @20,R1
      CMP     R1,@ADREND
      BLE     RML1
      RTS     X7

: SUBROUTINE TO SET ALL PAGES RW EXCEPT KERNEL PAGE 1
: KERNEL PAGE 1 IS SET TO DESIRED KEY
: KEY IS PASSED VIA THE STACK
: ALL PAGES ARE MAPPED TO BANK 0 EXCEPT KERNEL PAGE 7, WHICH IS MAPPED TO
: THE EXTERNAL BANK
SETUP: JSR      X7,RVAL      ;INITIALLY MAP ALL PAGES RW, BANK 0
      MOV      @77400,@KPDRI ;MAKE KERNEL PAGE ONE 4K, UP
      BIS     2(SP),@KPDRI   ;SET TO DESIRED KEY
      MOV      @7600,@KPAR7  ;MAP KERNEL PAGE 7 EXTERNAL
      RTS     X7

: ROUTINE TO LOOP THRU A SINGLE INSTRUCTION TEST
: LOAD THE STARTING ADDRESS OF THE TEST
: YOU WISH TO RUN (THE ADDRESS OF THE TESTX
: TAG) IN THE LOCATION "RETRNX"., SET SWITCH REGISTER
: OPTIONS
: NOTE THAT SW11 MUST BE DOWN TO RUN THIS TEST
TESTX: CLR      @#PS
      MOV     @KSTACK,SP
      MOV     @140000,@#PS ;SETUP USER STACK POINTER
      MOV     @USTACK,SP
      CLR     @#PS
      ADD     @2,RETRNX    ;ADD 2 TO POINT TO INSTRUCTION AFTER
      HALT
      CLR     SCOPEF
      MOV     @XLOOP,RETURN ;KEEP COUNT AT ZERO
      JMP     @RETRNX      ;LOAD SCOPE LOOP RETURN POINTER
      JMP     @RETRNX      ;JUMP TO TEST
XLOOP: CLR     SCOPEF      ;KEEP COUNT AT ZERO
      JMP     @RETRNX      ;JUMP TO TEST
RETRNX: 0
    
```

```

1078
1079
1080 005706 032777 040000 174234 :SCOPE AND/OR ITERATION LOOP FOR EACH TEST 4000 TIMES
1081 005714 001015 SCOPEC: BIT #4000,JSR :TEST SR FOR SCOPE
1082 005716 032777 004000 174224 BNE SCOPEB :YES,SCOPE
1083 005724 001016 BIT #4000,JSR :NO-TEST FOR ITERATION
1084 005726 026767 000050 000044 BNE SCOPEA :INHIBIT ITERATION
1085 005734 100012 CMP SCOPEF,ICOUNT :COMPARE CURRENT COUNT TO MAX NUMBER
1086 005736 005267 000040 BPL SCOPEG :EXIT-DONE
1087 005742 012737 000340 177776 INC SCOPEF :INCREMENT COUNT
1088 005750 022606 SCOPEB: CMP #340,JSR :PREVENT TRAPPING WHILE MOVING STACK
1089 005752 012637 177776 MOV (6)+,%6 :REPOSITION STACK
1090 005756 000177 000022 JMP JRETURN :RESTORE PREVIOUS PROCESSOR STATUS
1091 005762 005067 000014 SCOPEG: CLR SCOPEF :REPEAT TEST
1092 005766 005267 000674 INC TESTCT :CLEAR COUNT
1093 005772 011667 000006 MOV #%,RETURN :STEP TEST COUNTER
1094 005776 000002 RTI :SAVE SCOPE RETURN POINTER
1095 006000 004000 ICOUNT: 4000 :RETURN INLINE-NEXT TEST
1096 006002 000000 SCOPEF: 0 :ITERATION COUNT
1097 006004 000000 RETURN: 0 :COUNT LOCATION FOR ITERATION LOOP
1098 :ADDRESS OF LAST TEST
1099
1100 :ENTERED WITH SYSTEM TRAP CALL (HLT)
1101 :PRINT OUT THE ERROR PC+2 AND STATUS REGISTER
1102 006006 012767 000340 171762 PRINT: MOV #340,PS :SET PRIORITY TO 7
1103 006014 037727 174130 020000 BIT JSR,#20000 :TEST FOR INHIBIT PRINT OUT
1104 006022 001401 BEQ .+4 :BRANCH TO PRINT
1105 006024 000432 BR CK :INHIBIT, CHECK FOR HALT
1106 006026 012667 000072 MOV (6)+,SAVPC :PC OF FAILING ROUTINE
1107 006032 012667 000070 MOV (6)+,SAVPSR :PSR OF ERROR CONDITION
1108 006036 024646 CMP -(6),-(6) :RESTORE STACK
1109 006040 012767 000200 171730 MOV #200,PS
1110 006046 004767 000416 JSR %7,CALF :OUTPUT CARRIAGE RETURN AND LINE FEED
1111 006052 016767 000046 000314 MOV SAVPC,PTEMP1 :LOAD WITH FAILING PC+2
1112 006060 004767 000436 JSR PC,TYPE
1113 006064 005511 MPC
1114 006066 004767 000036 JSR PC,PRSHRT
1115 006072 004767 000424 JSR PC,TYPE
1116 006076 005516 MPS
1117 006100 016767 000022 000266 MOV SAVPSR,PTEMP1 :LOAD PROCESSOR STATUS
1118 006106 004767 000050 JSR %7,PROCT :PRINT PROCESSOR STATUS
1119 006112 005777 174032 CK: TST JSR :CHECK SR FOR HALT SWITCH
1120 006116 100001 BPL .+4 :BRANCH IF NOT SET
1121 006120 000000 HALT :HALT ON ERROR UP
1122 006122 000002 RTI :RETURN TO MAIN LINE
1123 006124 000000 SAVPC: 0
1124 006126 000000 SAVPSR: 0

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1125
1126 ;SUBROUTINE TO PRINT OUT OCTAL NUMBER
1127 ;PRSHRT DELETES LEADING ZEROS
1128 ;PROCT PRINTS OUT 6 OCTAL DIGITS
1129 006130 012767 000001 000232 PRSHRT: MOV #1, PRSFLG ;SET FLAG TO INDICATE SHORT PRINTOUT
1130 006136 005767 000232 TST PTEMP1 ;CHECK FOR ZERO
1131 006142 001011 BNE PROCT+4 ;BRANCH IF NOT ZERO
1132 006144 012777 000260 173642 MOV #260, @TDBR ;OUTPUT A SINGLE ZERO
1133 006152 105777 173634 TSTB @TCSR ;WAIT FOR TTY READY
1134 006156 100375 BPL .-4
1135 006160 000207 RTS %7 ;RETURN
1136 006162 005067 000202 PROCT: CLR PRSFLG ;CLEAR FLAG TO INDICATE FULL PRINTOUT
1137 006166 005067 000206 CLR PTEMP3 ;CLEAR R4 FOR COUNTING CHARACTERS OUTPUT
1138 006172 005067 000174 CLR PRFLG ;INITIALIZE CARRY FLAG FOR ROTATES
1139 006176 012767 000260 000172 MOV #260, PTEMP2 ;SETUP R3
1140 006204 005767 000164 TST PTEMP1 ;CHECK BIT 15 OF NUMBER
1141 006210 100002 BPL .+6 ;BRANCH IF ZERO
1142 006212 005267 000160 INC PTEMP2 ;INCREMENT R3 IF ONE
1143 006216 006167 000152 ROL PTEMP1 ;ROTATE LEFT MOST OCTAL TO RIGHT END
1144 006222 006167 000146 ROL PTEMP1
1145 006226 005567 000140 ADC PRFLG ;STORE CARRY
1146 006232 005767 000132 P.CK: TST PRSFLG ;CHECK FOR SHORT PRINTOUT
1147 006236 001404 BEQ P.WAIT ;BRANCH IF NOT SET
1148 006240 026727 000132 000260 CMP PTEMP2, #260 ;CHECK FOR ZERO IF SET
1149 006246 001410 BEQ P.CONT ;IF SET, GO TO NEXT CHARACTER
1150 006250 016777 000122 173536 P.WAIT: MOV PTEMP2, @TDBR ;OUTPUT NEXT CHARACTER
1151 006256 105777 173530 TSTB @TCSR ;WAIT FOR TTY READY
1152 006262 100375 BPL .-4
1153 006264 005067 000100 CLR PRSFLG ;PRINT REST OF NUMBER AFTER A NON-ZERO DIGIT
1154 006270 005267 000104 P.CONT: INC PTEMP3 ;COUNT
1155 006274 026727 000100 000006 CMP PTEMP3, #6 ;CHECK FOR DONE
1156 006302 001001 BNE P.CNT1 ;BRANCH IF NOT DONE
1157 006304 000207 RTS %7
1158 006306 000241 P.CNT1: CLC ;CLEAR CARRY
1159 006310 005767 000056 TST PRFLG ;CHECK FOR PREVIOUS CARRY
1160 006314 001403 BEQ .+10 ;BRANCH IF PREVIOUSLY ZERO
1161 006316 005067 000050 CLR PRFLG ;INITIALIZE FLAG
1162 006322 000261 SEC ;SET CARRY
1163 006324 006167 000044 ROL PTEMP1 ;ROTATE NEXT CHARACTER INTO RIGHT END OF REGISTER
1164 006330 006167 000040 ROL PTEMP1
1165 006334 006167 000034 ROL PTEMP1
1166 006340 005567 000026 ADC PRFLG ;STORE CARRY
1167 006344 016767 000024 000024 MOV PTEMP1, PTEMP2 ;LOAD DATA INTO R3
1168 006352 042767 177770 000016 BIC #177770, PTEMP2 ;CLEAR ALL BUT LOWEST OCTAL DIGIT
1169 006360 052767 000260 000010 BIS #260, PTEMP2 ;SET TO ASCII EQUIVALENT
1170 006366 000721 BR P.CK ;LOOP
1171 006370 000000 PRSFLG: 0
1172 006372 000000 PRFLG: 0
1173 006374 000000 PTEMP1: 0 ;CONTAINS VALUE TO BE OUTPUT
1174 006376 000000 PTEMP2: 0 ;SCRATCH
1175 006400 000000 PTEMP3: 0 ;USED TO COUNT CHARACTERS OUTPUT

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1176
1177
1178      ;EMT HANDLER
1179      ;FIRST 3 CALLS LEFT OPEN IN TABLE FOR EASY PATCHES
1179 006402 011667 000032      EMTSRV: MOV    @SP, EPC      ;GET CALL
1180 006406 162767 000002 007024  SUB    #2, EPC
1181 006414 017767 000020 000016  MOV    @EPC, EPC
1182 006422 105067 000013      CLR    EPC+1      ;SAVE OFFSET ONLY
1183 006426 062767 006442 000004  ADD    @EMTAB, EPC ;POINT TO TABLE OF ADDRESSES
1184 006434 017707 000000      MOV    @EPC, PC   ;JUMP TO DESIRED ROUTINE
1185 006440 000000      EPC:    0
1186      000000      PATCH1=0      ;SUBSTITUTE 104000 WHERE 1ST PATCH IS NEEDED
1187      000000      PATCH2=0      ;104002 FOR 2ND PATCH
1188      000000      PATCH3=0      ;104004 FOR 3RD PATCH
1189 006442 000000      EMTAB: PATCH1   ;LOAD ADDRESS OF 1ST PATCH HERE
1190 006444 000000      PATCH2   ;LOAD ADDRESS OF 2ND PATCH HERE
1191 006446 000000      PATCH3   ;LOAD ADDRESS OF 3RD PATCH HERE
1192 006450 006006      PRINT
1193
1194
1195      ;BELL ON PASS COMPLETE
1196 006452 012777 000207 173334  BELL:  MOV    #207, @TDBR
1197 006460 105777 173326      TSTB   @TCSR
1198 006464 100375      BPL    #-4
1199 006466 000207      RTS    %7
1200
1201      ;SUBROUTINE TO OUTPUT CARRIAGE RETURN AND LINEFEED
1202 006470 012777 000215 173316  CRLF:  MOV    #215, @TDBR      ;ROUTPUT CARRIAGE RETURN
1203 006476 105777 173310      TSTB   @TCSR      ;WAIT FOR TTY READY
1204 006502 100375      BPL    #-4
1205 006504 012777 000212 173302  MOV    #212, @TDBR      ;OUTPUT LINEFEED
1206 006512 105777 173274      TSTB   @TCSR      ;WAIT FOR TTY READY
1207 006516 100375      BPL    #-4
1208 006520 000207      RTS    %7      ;RETURN

```

```

1209
1210
1211 006522 010067 000052      ;SUBROUTINE TO OUTPUT ASCII MESSAGE ON TELETYPE
1212 006526 011600              TYPE:  MOV    %0, SAVRO
1213 006530 062716 000002              MOV    (6), %0      ;GET ADDRESS THAT CONTAINS MESSAGE ADDRESS
1214 006534 011000              ADD    #2, %0      ;SET UP EXIT
1215 006536 112067 000034              MOV    %0, %0
1216 006542 122767 000100 000026  TYP A:  MOV B  (0)+, TYPDAT      ;GET CHARACTER
1217 006550 001003              CMP B  #100, TYPDAT ;CHECK FOR "3" CHARACTER
1218 006552 016700 000022              BNE   TYP B        ;BRANCH IF NOT "3"
1219 006556 000207              MOV    SAVRO, %0   ;RESTORE RO
1220 006560 116777 000012 173226  TYP B:  MOV B  TYPDAT, %TDBR ;TERMINATOR CHAR. EXIT
1221 006566 105777 173220              TST B  %TCSR      ;OUTPUT CHAR TO PRINTER
1222 006572 100375              BPL   -4           ;WAIT FOR TTY READY
1223 006574 000760              BR    TYP A
1224 006576 000000              TYPDAT: 0
1225 006600 000000              SAVRO: 0
1226
1227      ;SUBROUTINE TO CHECK TEST SEQUENCE
1228 006602 005037 177776      ORDER:  CLR    %PS      ;CLEAR PROCESSOR STATUS
1229 006606 011667 000052              MOV    (SP), TEMPN  ;GET TEST NUMBER ADDRESS
1230 006612 017767 000046 000044              MOV    %TEMPN, TEMPN ;GET TEST NUMBER
1231 006620 032777 002000 173322              BIT    #2000, %SR
1232 006626 001404              BEQ   ORDER B
1233 006630 016700 000030              MOV    TEMPN, RO
1234 006634 000705              RESET
1235 006636 007000              HALT
1236 006640 026767 000022 000016  ORDER B:  CMP    TESTCT, TEMPN ;IS TEST SEQUENCE CORRECT
1237 006646 001403              BEQ   ORDER A      ;YES, CONTINUE
1238 006650 062716 000002              ADD    #2, (SP)    ;UPDATE FOR ERROR RETURN
1239 006654 000207              RTS    PC
1240 006656 062716 000004              ORDER A:  ADD   #4, (SP) ;UPDATE FOR GOOD RETURN
1241 006662 000207              RTS    PC
1242 006664 000000              TEMPN: 0
1243 006666 000000              TESTCT: 0
1244      .END

```


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DFKTBA.P11 CROSS REFERENCE TABLE -- MACRO NAMES

TESTNO	360	393	442	493	544	598	652	702	751	816	867	917	967
--------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

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DFKTBA.P11 CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

TST	371	381	403	452	481	503	532	554	583	640	690	740	789	826	877
	927	977	1119	1130	1140	1146	1159								
TSTB	1133	1151	1197	1203	1206	1221									
.ABS	1														
.ASCII	1026	1033	1034												
.END	1244														
.EVEN	1036														
.LIST	1	281	360	393	442	493	544	598	652	702	751	816	867	917	967
.MACR	360														
.NLIST	1	281	360	393	442	493	544	598	652	702	751	816	867	917	967
.REM	1														
.REPT	281														
.TITLE	1														
.WORD	306														

ERRORS DETECTED: 0
DEFAULT GLOBALS GENERATED: 0

#DFKTBA,DFKTBA.SEQ/SOL/CRF/DS:ERFZ/EN:ABS=DSKM:DFKTBA.P11
RUN-TIME: 4 8 1 SECONDS
RUN-TIME RATIO: 31/15=2.0
CORE USED: 7K (13 PAGES)

