

PDP11/34

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

EP DFKTB-A DL-A

OCT 1976

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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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515059484746454443424140393837363534333231302928272625242322212019181716151413121110090807060504030201

1.0 ABSTRACT

THIS PROGRAM CHECKS THE OPERATION OF EACH ACCESS KEY FOR EACH OF THE FOUR UNIBUS CYCLES (OR COMBINATION OF CYCLES) WHICH MAY REFERENCE AN ADDRESS THRU SEGMENTATION. THESE CYCLES ARE DATI, DATO (NO DATIP), DATIP-DATO, AND DATIP-DATOB. EACH OF THESE CASES IS TESTED WITH AND WITHOUT MEMORY MANAGEMENT ENABLE SET. THUS EIGHT CASES ARE TESTED FOR EACH KEY. SRO, 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 RO

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.

5.2.5 EMTSRV (EMT DECODER)

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

5.2.6 CLRALL

THIS ROUTINE CLEARS ALL THE PAR'S AND PDR'S OF THE 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 PDR'S WITH
THE VALUE 77406.

5.2.8 SETUP

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

5.3 PROGRAM AND/OR OPERATOR ACTION

5.3.1 SA 200 (NORMAL DIAGNOSTIC OPERATION)

THE PROGRAM EXECUTES 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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;COPYRIGHT 1972, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
;TEST OF THE MEMORY MANAG. ACCESS KEYS

;THIS PROGRAM IS A MODIFIED 11/40 DIAGNOSTIC, DBKTB. 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 ERR. A 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=X0
R1=X1
R2=X2
R3=X3
R4=X4
R5=X5
R6=X6
R7=X7
SP=X6
PC=X7
PS=177776
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 (000000)

;LOAD VECTOR AREA

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

;ACT HOOKS

SWREG: 0

;SOFTWARE SWITCH REGISTER

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

000030
000032
000034
000034
000036
000036
000046
000046
000176
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 002000 002000 USTACK: 0
305 002000 000000 .WORD 0,0,0,0
306 002002 000000 000000 000000
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 AORTAB:
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 AOREND= -2
349 002130 000000 FTITLE: 0 ;TITLE PRINTED FLAG
350 002132 177573 SR0H: 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		
354	002142	000000	000004	NRKEYS:	0.4		
355	002146	125252		DESTAD:	125252		
356	002150	177570		SR:	177570		
357							
358							
359							
360							
361							
362	002152	005037	177776	START:	CLR	2#PS	
363	002156	012706	001000		MOV	#KSTACK, SP	
364	002162	012737	140000	177776		#140000, 2#PS	
365	002170	012706	002000		MOV	#USTACK, SP	
366	002174	005037	177776		CLR	2#PS	
367							
368	002200	013746	000004		MOV	2#4, -(SP)	
369	002204	013746	000006		MOV	2#6, -(SP)	
370	002210	012767	002224	175566		#15, 4	
371	002216	005777	177726		TST	2SR	
372	002222	000404			BR	2S	
373	002224	012767	000176	177716	1S:	MOV	#SWREG, SR
374	002232	022626				CMP	(SP)+, (SP)+
375	002234	012637	000006		2S:	MOV	(SP)+, 2#6
376	002240	012637	000004			MOV	(SP)+, 2#4
377	002244	012767	002000	003526		MOV	#2000, ICOUNT
378	002252	012767	002326	003524		MOV	#TEST1+2, RETURN
379	002260	005067	177654			CLR	NRCNT
380	002264	012767	000001	004374		MOV	#1, TESTCT
381	002272	005767	177632			TST	FTITLE
382	002276	001013				BNE	TEST1+2
383	002300	004767	004164			JSR	PC, CRLF
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

;COUNTER FOR TEST OF THE 3 NR KEYS
 ;VALUES OF THE 3 NON RESIDENT KEYS
 ;LOCATION USED FOR READS AND WRITES TO CHECK
 ;SWITCH REG. POINTER
 ;EXECUTION OR ABORTING AT CORRECT POINT
 ;SET UP FOR START OF TESTS
 ;SETUP KERNEL STACK
 ;SETUP USER STACK POINTER
 ;;SAVE ERROR VECTOR
 ;;SET UP TIME OUT VECTOR
 ;;TRY TO REFERENCE HARDWARE SR
 ;;BRANCH IF NO TIMEOUT TRAP OCCURS
 ;;POINT TO SOFTWARE SR
 ;;RESTORE STACK
 ;;RESTORE ERROR VECTOR
 ;INITIALIZE ITERATION COUNT
 ;SETUP SCOPE AND ITERATION LOOP RETURN
 ;INITIALIZE FOR NR TEST
 ;SET UP TEST SEQUENCE
 ;TITLE PRINTED
 ;YES, SKIP
 ;PRINT TITLE

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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
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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 RET1:
432 002500 104006
433
434 002504 016777 177316 177312 DONE1:
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
 MOV #KSTACK,SP ;INITIALIZE KERNEL STACK POINTER
 CLR @SR0 ;INITIALIZE SR0
 JSR PC,ORDER ;CHECK TEST SEQUENCE
 1 ;TEST NUMBER
 HLT ;TEST EXECUTED OUT OF SEQUENCE
 MOV #2,-(SP) ;PUSH RRO KEY ON STACK
 JSR %7,SETUP ;MAKE KERNEL PAGE 1 RRO, BANK 0
 ;MAKE KERNEL PAGE 7 RW, EXTERNAL
 ;MAKE ALL OTHER PAGES RW, BANK 0
 TST (SP)+ ;RESTORE STACK
 MOV @RET1,@KTVEC ;SETUP ABORT RETURN IN CASE
 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 @SR0 ;TURN ON MEMORY MANAG.
 CMP #125252,(R1)+ ;DATI TO RRO PAGE
 BEQ CMPOK1 ;BRANCH IF CORRECT VALUE WAS READ
 DEC @SR0 ;ON ERROR, TURN OFF MEMORY MANAG.
 HLT ;RELOCATION FAILED THRU KERNEL PAGE 1
 BR DONE1
 MOV @SR0,R2 ;SAVE CONTENTS OF SR0
 DECB @SR0 ;TURN OFF MEMORY MANAG.
 CMP #17,R2 ;CHECK SAVED CONTENTS OF SR0
 BEQ .+4
 HLT ;SR0 INCORRECT-SHOULD HAVE
 ;TRACKED REFERENCE TO PAGE 0,
 ;WHICH GOT THE ADDRESS OF SR0
 CMP #.,@SR2 ;CHECK SR2
 BEQ .+4
 HLT ;SR2 INCORRECT-SHOULD TRACK EVEN
 ;WHEN MEMORY MANAG. IS OFF
 CMP #77402,@KPDR1 ;CHECK PDR FOR
 BEQ .+4 ;THE RRO PAGE REFERENCED
 HLT ;KPDR1 INCORRECT-SHOULD NOT
 ;HAVE BEEN CHANGED
 BR DONE1
 BIC #1,@SR0 ;TURN OFF MEMORY MANAG.
 HLT ;DATI TO RRO PAGE CAUSED
 ;A TRAP OR ABORT
 MOV KTSTA,@KTVEC ;RESTORE TRAP RETURN TO CAUSE HALT
 CLR @KTSTA
 CLR @SR0 ;ON AN UNEXPECTED TRAP
 CLR @#PS ;INITIALIZE SR0
 ;INITIALIZE PROCESSOR STATUS
 ;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 @SR0 ;INITIALIZE SR0

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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		MOV	#125252, (R2)+	:DATO TO RRO PAGE-SHOULD ABORT
461	00 616	005377	177174		DEC	%SR0	:TURN OFF MEMORY MANAG.
462	00 622	104006			HLT		:DATO TO RRO PAGE FAILED TO ABORT
463	002624	000426			BR	DONE4	
464	002626	017701	177164		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(RR0)
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	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							:MAKE KERNEL PAGE 7 RW, EXTERNAL
502							:MAKE ALL OTHER PAGES RW, BANK 0
503	002756	005726			TST	(SP)+	:RESTORE STACK POINTER
504	002760	012777	003024	177036	MOV	#RET5,#KTVEC	: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	#DESTAD+20002,R3	:R3 CONTAINS VIRTUAL ADDRESS+2 OF LOCATION
509							:TO BE REFERENCED THRU KERNEL PAGE 1
510	003002	052777	000001	177006	BIS	#1,#SR0	:TURN ON MEMORY MANAG.
511	003010	005243			INC	-(R?)	: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	00C427			BR	DONES	:ABORT
515	003024	017701	176766		MOV	#SR0,R1	:SAVE CONTENTS OF SR0
516	003030	042777	000001	176760	BIC	#1,#SR0	:TURN OFF MEMORY MANAG.
517	003036	022701	020003		CMP	#20003,R1	: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,#KPOR1	:CHECK POR
528	003066	001401			BEQ	.+4	
529	003070	104006			HLT		:KPOR1 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	DESTAD	: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 POR
543							:CORRESPONDING TO THE REFERENCE IS CORRECT
544	03124	104400			TEST4:	SCOPE	
545	003126	012706	001000		MOV	#KSTACK,SP	:INITIALIZE KERNEL STACK POINTER
546	003132	005077	176660		CLR	#SR0	:INITIALIZE SR0
547	003136	004767	003440		JSR	PC,ORDER	:CHECK TEST SEQUENCE
548	003142	000004			4		:TEST NUMBER
549	003144	104006			HLT		:TEST EXECUTED OUT OF SEQUENCE
550	003146	012746	000002		MOV	#2,-(SP)	:PUSH RRO KEY ON STACK
551	003152	004767	002412		JSR	%7,SETUP	: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	

NO1

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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,AKPDR1	; 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,AKTVEC	; CHANGE MEMORY MANAG. FAULT
588	003304	005077	176516		CLR	AKTSTA	; RETURN TO CAUSE A HALT ON AN
589	003310	005077	176502		CLR	SR0	; UNEXPECTED TRAP
590	003314	005037	177776		CLR	#PS	
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			S		; 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,AKTVEC	; SETUP ABORT RETURN

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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	: DAT1 TO NR PAGE - SHOULD ABORT
620	003416	005377	176374		DEC	2SR0	: ON ERROR, TURN OFF MEMORY MANAG.
621	003422	104006			HLT		: NO ABORT ON DAT1 TO A NON-RESIDENT PAGE
622	003424	000430			BR	DONE21	
623	003426	017702	176364	RET21:	MOV	2SR0, R2	: SAVE CONTENTS OF SR0
624	003428	105377	176360		DEC	2SR0	: TURN OFF MEMORY MANAG.
625	003430	022702	100003		CMF	8100003, R2	: CHECK SAVED CONTENTS OF SR0
626	003432	001401			BEQ	.+4	
627	003434	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	2KPDRI, R5	: MOVE CONTENTS OF KPDRI 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		: KPDRI 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	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	2MPS	: 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	%7, 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	MOVB	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 SRO
673	003630	005377	176162		DEC	SR0	:TURN OFF MEMORY MANAG.
674	003634	022702	100003		CMP	#100003,R2	:CHECK SAVED CONTENTS OF SRO
675	003640	001401			BEQ	.+4	
676	003642	104006			HLT		:SRO 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	2KPOR1,R3	:MOVE CONTENTS OF KPOR1 TO R3
685	003662	042703	000007		BIC	#7,R3	:TO MASK OFF THE ACCESS KEY
686	003666	022703	077400		CMP	#77400,R3	:CHECK POR
687	003672	001401			BEQ	.+4	: (BITS 0-2 MASKED OUT)
688	003674	104006			HLT		:KPOR1 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,2KTVEC	:CHANGE MEMORY MANAG. FAULT RETURN
695	003714	005077	176106		CLR	2KTSTA	:TO CAUSE A HALT ON AN UNEXPECTED TRAP
696	003720	005077	176072		CLR	SR0	
697	003724	005037	177776		CLR	2#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 POR
702							:CORRESPONDING TO THE REFERENCE IS CORRECT
703	003730	104400			TEST7: SCOPE		
704	003732	012706	001000		MOV	2KSTACK,SP	:INITIALIZE KERNEL STACK POINTER
705	003736	005077	176054		CLR	SR0	:INITIALIZE SRO
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	X7,SETUP	:MAKE KERNEL PAGE 1 NR, BANK 0
710							:MAKE KERNEL PAGE 7 RW, EXTERNAL
711	003756	012777	004022	176040	MOV	#RET25,2KTVEC	:MAKE ALL OTHER PAGES RW, BANK 0
712	003764	005077	176036		CLR	2KTSTA	: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			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 SRO
723	004026	042777	000001	175762	BIC	#1,SR0	:TURN OFF MEMORY MANAG.
724	004034	022701	100003		CMP	#100003,R1	:CHECK SAVED CONTENTS OF SRO

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725	004040	001401			BEQ	.+4	
726	004042	104006			HLT		:SR0 INCORRECT-SHOULD HAVE LOCKED
727							:ON DATO TO KERNEL PAGE 1(NR)
728							:NR FAULT SHOULD BE SET
729	004044	022777	004006	175750	CMP	#AD25,SR2	:CHECK SR2
730	004052	001401			BEQ	.+4	
731	004054	104006			HLT		:SR2 INCORRECT-SHOULD HAVE LOCKED
732							:ON THE ABORTED REFERENCE, CONTAINING THE
733							:VIRTUAL ADDRESS OF THE INSTRUCTION
734	004056	017704	176010		MOV	2KPOR1,R4	:MOVE CONTENTS OF POR TO R4
735	004062	042704	000007		BIC	87,R4	:TO MASK OFF THE ACCESS KEY
736	004066	022704	077400		CMP	877400,R4	:CHECK POR
737	004072	001401			BEQ	.+4	:WITH BITS 0-2 MASKED OFF
738	004074	104006			HLT		:KPOR1 INCORRECT-SHOULD NOT HAVE
739							:BEEN CHANGED
740	004076	005767	176044		TST	DESTAD	:MAKE CERTAIN THAT DESTINATION
741	004102	001401			BEQ	.+4	:LOCATION WAS NOT WRITTEN
742	004104	104006			HLT		:DATO TO NR PAGE WROTE INTO
743							:THE DESTINATION LOCATION
744	004106	016777	175714	175710	MOV	KTSTA,2KTVEC	:CHANGE PAGE FAULT RETURN
745	004114	005077	175706		CLR	2KTSTA	:TO CAUSE A HALT ON AN UNEXPECTED
746	004120	005077	175672		CLR	2SR0	:TRAP
747	004124	005037	177776		CLR	2APS	
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	2SR0	:INITIALIZE SR0
754	004142	004767	002434		JSR	PC,ORDER	:CHECK TEST SEQUENCE
755	004146	000010			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 R4, EXTERNAL
759							:MAKE ALL OTHER PAGES R4, 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	81,2SR0	:TURN ON MEMORY MANAG.
767	004206	105224			INCB	(R4)+	:DATIP, DATOB TO NR PAGE-SHOULD ABORT
768	004210	005377	175602		DEC	2SR0	: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	2SR0,R1	:SAVE CONTENTS OF SR0
772	004224	005377	175566		DEC	2SR0	:TURN OFF MEMORY MANAG.
773	004230	022701	100003		CMP	#100003,R1	:CHECK SAVED CONTENTS OF SR0
774	004234	001401			BEQ	.+4	
775	004236	104006			HLT		:SR0 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	#AD27,2SR2	:CHECK SR2
779	004246	001401			BEQ	.+4	
780	004250	104006			HLT		:SR2 INCORRECT SHOULD HAVE LOCKED

						: ON THE ABORTED REFERENCE CONTAINING THE
						VIRTUAL ADDRESS OF THE INSTRUCTION
						MORE CONTENTS OF PDR 1 TO R2
						TO MASK OFF THE ACCESS KEY
						CHECK INSTRUCTION SPACE FOR
						WITH BITS 0-2 MASKED OFF
						KPDRI INCORRECT-SHOULD NOT HAVE
						BEEEN CHANGED
						MAKE CERTAIN THAT DESTINATION
						LOCATION WAS NOT WRITTEN
						DATOB TO NR PAGE WROTE INTO
						THE DESTINATION LOCATION
						CHANGE MEMORY MANAG. FAULT
						RETURN TO CAUSE A HALT ON AN
						UNEXPECTED TRAP
789	004272	005767	175650		TST	DESTAD
790	004276	001401			BEQ	.+4
791	004300	104006			HIT	
792						
793	004302	016777	175520	175514	DONE27:	MOV KTSTA,&KTVEC
794	004310	005077	175512		CLR &KTSTA	
795	004314	005077	175476		CLR &SRD	
796	004320	0C 137	177776		CLR &MPS	
797	004324	104400			SCOPE	
798	004326	005267	175606		INC NRCNT	;COUNT HOW MANY NR KEYS HAVE BEEN TESTED.
799	004332	022767	000002	175600	<2,NRCNT	
800	004340	001416			NXTST	;IF ALL 2 HAVE BEEN TESTED,BRANCH
801	004342	016701	175572		MOV NRCNT,R1	;OTHERWISE,CALCULATE OFFSET TO GET NEXT KEY
802	004346	006301			RSL R1	
803	004350	016137	002142	001000	MOV NRKEYS(R1),&KSTACK ;PUT NEXT NR KEY ON STACK	
804	004356	012767	003346	001420	BRERUNA RETURN : PUT NEW SCOPE LOOP ADDRESS IN RETURN	
805	004364	012767	000005	002274	#5,TESTCT ;REINIT TEST COUNTER SEQ	
806	004372	000167	176750		JMP RERUNA ;JUMP TO EXECUTE TESTS WITH NEXT NR KEY	
807	004376	005067	175536		NXTST: CLR NRCNT	
808	004402	012767	004000	001372	MOV #4000,SCOPF	
809	004410	005367	002252		DEC TESTCT	
810	004414				NXTST1:	
811						
812					:	SHOW THAT DATI TO A RW PAGE (ACF=6)
813					:	NEITHER TRAPS NOR ABORTS
814					:	SHOW THAT THE MEMORY MANAG. STATUS REGISTERS CONTINUE TO TRACK, AND THAT
815					:	THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
816	004414	104400			TEST11: SCOPE	
817	004416	012706	001000		MOV &KSTACK,SP	; INITIALIZE KERNEL STACK POINTER
818	004422	005077	175370		CLR J	; INITIALIZE SRD
819	004426	004767	002150		JSR PL,ORDER	; CHECK TEST SEQUENCE
820	004432	000011			LI	; TEST NUMBER
821	004434	104006			HIT	; T-ST EXECUTED OUT OF SEQUENCE
822	004436	012746	000006		MOV #6,-(SP)	; PUSH RW KEY ON STACK
823	004442	004767	001122		JSR X7,SETUP	; MAKE KERNEL PAGE 1 RW, BANK O
824						; MAKE KERNEL PAGE 7 RW, EXTERNAL
825						; MAKE ALL OTHER PAGES RW, BANK O .
826	004446	005726			TST (SP)+	; RESTORE STACK POINTER
827	004450	012777	004564	175346	MOV #RET31,&KTVEC	; SETUP ABORT RETURN IN CASE
828	004456	005077	175344		CLR &KTSTA	
829	004462	012767	125252	175456	MOV #125252,DESTAD	; INITIALIZE LOCATION TO BE READ
830	004470	012701	022146		MOV #DESTAD+20000,R1	; R1 CONTAINS VIRTUAL ADDRESS OF
831						LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
832	004474	005277	175316		INC &SRD	; TURN ON MEMORY MANAG.
833	004500	022721	125252		CMP #125252,(R1)+	; DATI TO RW PAGE-SHOLDN'T TRAP OR ABORT
834	004504	001404			BEQ OK31	
835	004506	005377	175304		DEC &SRD	; ON ERROR,TURN OFF MEMORY MANAG.
836	004512	104006			HIT	; RELOCATION FAILED THRU KERNEL PAGE 1

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837	004514	000427			BR	DONE31		
838	004516	017702	175274		MOV	@SR0,R2		:SAVE CONTENTS OF SR0
839	004522	105377	175270		DECB	@SR0		:TURN OFF MEMORY MANAG.
840	004526	022702	000017		CHP	@17,R2		:CHECK SAVED CONTENTS OF SR0
841	004532	001401			BEQ	.+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	@SR2		:CHECK SR2
847	004544	001401			BEQ	.+4		
848	004546	104006			HLT			:SR2 INCORRECT-SHOULD TRACK EVEN
849								:WHEN MEMORY MANAG. IS OFF
850	004550	022777	077406	175314	CHP	@77406,@KPOR1		:CHECK PDR FOR
851	004556	001401			BEQ	.+4		:THE RW PAGE REFERENCED
852	004560	104006			HLT			:KPOR1 INCORRECT-SHOULD NOT
853								:HAVE BEEN CHANGED
854	004562	000404			BR	DONE31		
855	004564	042777	000001	175224	BIC	@1,@SR0		:TURN OFF MEMORY MANAG.
856	004572	104006			HLT			:DATA TO RW PAGE CAUSED
857								:A TRAP OR ABORT
858	004574	016777	175226	175222	MOV	KTSTA,@KTVEC		:RESTORE TRAP RETURN TO CAUSE HALT
859	004602	005077	175220		CLR	@KTSTA		:ON AN UNEXPECTED TRAP
860	004606	005077	175204		CLR	@SR0		:INITIALIZE SR0
861	004612	005037	177776		CLR	@PS		:INITIALIZE PROCESSOR STATUS
862								
863								:SHOW THAT A DATO (NO DATIP) TO A RW PAGE (ACF=6)
864								:NEITHER TRAPS NOR ABORTS
865								:SHOW THAT THE MEMORY MANAG. STATUS REGISTERS CONTINUE TO TRACK, AND THAT
866								:THE PDR CORRESPONDING TO THE REFERENCE IS CORRECT
867	004616	104400			TEST12: SCOPE			
868	004620	012706	001000		MOV	@KSTACK,SP		:INITIALIZE KERNEL STACK POINTER
869	004624	005077	175166		CLR	@SR0		:INITIALIZE SR0
870	004630	004767	001746		JSR	PC,ORDER		:CHECK TEST SEQUENCE
871	004634	000012			12			:TEST NEXT
872	004636	104006			HLT			:TEST EXECUTED OUT OF SEQUENCE
873	004640	012746	000006		MOV	@6,-(SP)		:PUSH RW KEY ON THE STACK
874	004644	004767	000720		JSR	@7,SETUP		:MAKE KERNEL PAGE 1 RW, BANK 0
875								:MAKE KERNEL PAGE 7 RW, EXTERNAL
876								:MAKE ALL OTHER PAGES RW, BANK 0
877	004650	005726			TST	(SP)+		:RESTORE STACK POINTER
878	004652	012777	004764	175144	MOV	@RET33,@KTVEC		:SETUP ABORT RETURN IN CASE
879	004660	005077	175142		CLR	@KTSTA		
880	004664	005067	175256		CLR	DESTAD		:INITIALIZE LOCATION TO BE REFERENCED
881	004670	012701	022146		MOV	@DESTAD+20000,R1		:R1 CONTAINS VIRTUAL ADDRESS OF
882								:LOCATION TO BE REFERENCED THRU KERNEL PAGE 1
883	004674	005277	175116		INC	@SR0		:TURN ON MEMORY MANAG.
884	004700	012721	125252		MOV	@125252,(R1)+		:DATA TO RW PAGE-SHOULDN'T TRAP OR ABORT
885	004704	017702	175106		MOV	@SR0,R2		:SAVE CONTENTS OF SR0
886	004710	105377	175102		DECB	@SR0		:TURN OFF MEMORY MANAG.
887	004714	022702	000017		CHP	@17,R2		:CHECK SAVED CONTENTS OF SR0
888	004720	001401			BEQ	.+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.

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893	004724	022777	004724	175070	CMP	#, 2SR2	;CHECK SR2
894	004732	001401			BEQ	.+4	
895	004734	104006			HLT		;SP2 INCORRECT-SHOULD TRACK EVEN
896							;WHEN MEMORY MANAG. IS OFF
897	004736	022777	077506	175126	CMP	#77506, 2KPDR1	;CHECK PDR FOR
898	004744	001401			BEQ	.+4	;THE RW PAGE REFERENCED
899	004746	104006			HLT		;KPDR1 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			BEQ	.+4	
903	004760	104006			HLT		;DATO TO RW PAGE FAILED TO WRITE CORRECT LOCATION
904	004762	000404			BR	DONE33	
905	004764	042777	000001	175024	BIC	#1, 2SR0	;TURN OFF MEMORY MANAG.
906	004772	104006			HLT		;DATO TO RW PAGE CAUSED
907							;A TRAP OR ABORT
908	004774	016777	175026	175022	MOV	KTSTA, 2KTVEC	;RESTORE TRAP RETURN TO CAUSE HALT
909	005002	005077	175020		CLR	2KTSTA	;ON AN UNEXPECTED TRAP
910	005006	005077	175004		CLR	2SR0	;INITIALIZE SR0
911	005012	005037	177776		CLR	2#PS	;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	2SR0	;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, 2KTVEC	;SETUP ABORT RETURN IN CASE
929	005060	005077	174742		CLR	2KTSTA	
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	2SR0	;TURN ON MEMORY MANAG.
934	005100	005244			INC	-(R4)	;DATIP, DATO TO RW PAGE-SHOULDN'T TRAP OR ABORT
935	005102	017702	174710		MOV	2SR0, R2	;SAVE CONTENTS OF SR0
936	005106	105077	174704		CLRB	2SR0	;TURN OFF MEMORY MANAG.
937	005112	022702	000017		CMP	#17, R2	;CHECK SAVED CONTENTS OF SR0
938	005116	001401			BEQ	.+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	#, 2SR2	;CHECK SR2
944	005130	001401			BEQ	.+4	
945	005132	104006			HLT		;SR2 INCORRECT-SHOULD TRACK EVEN
946							;WHEN MEMORY MANAG. IS OFF
947	005134	022777	077506	174730	CMP	#77506, 2KPDR1	;CHECK PDR CORRESPONDING
948	005142	001401			BEQ	.+4	;TO THE RW REFERENCE

949	005144	104006			HLT		;KPDRI INCORRECT - "W" 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 RW PAGE DIDN'T EXECUTE CORRECTLY
953	005160	000404			BR	DONE35	
954	005162	042777	000001	174625	BIC	#1,SR0	;TURN OFF MEMORY MANAG.
955	005170	104006			HLT		;DATIP, DATO TO RW PAGE CAUSED
956							;A TRAP OR ABORT
957	005172	016777	174630	174624	DONE35:	MOV KTSTA,AKTVEC	;RESTORE TRAP RETURN TO CAUSE HALT
958	005200	005077	174622		CLR	AKTSTA	;ON AN UNEXPECTED TRAP
959	005204	005077	174606		CLR	SR0	;INITIALIZE SR0
960	005210	005037	177776		CLR	APS	;INITIALIZE PROCESSOR STATUS
961							
962							
963							;SHOW THAT A DATIP, DATOB SEQUENCE TO A RW 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	SR0	;INITIALIZE SR0
970	005226	004767	001350		JSR	PC,ORDER	;CHECK TEST SEQUENCE
971	005232	000014			LD	14	;TEST N = 14
972	005234	104006			HLT		;TEST EXECUTED OUT OF SEQUENCE
973	005236	012746	000006		MOV	#6,-(SP)	;PUSH RW KEY ON THE STACK
974	005242	004767	000322		JSR	%7,SETUP	;MAKE KERNEL PAGE 1 RW, BANK 0
975							;MAKE KERNEL PAGE 7 RW, EXTERNAL
976							;MAKE ALL OTHER PAGES RW, BANK 0
977	005246	005726			TST	(SP)+	;RESTORE STACK POINTER
978	005250	012777	005360	174546	MOV	#RET37,AKTVEC	;SETUP ABORT RETURN IN CASE
979	005256	005077	174544		CLR	AKTSTA	
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	SR0	;TURN ON MEMORY MANAG.
984	005276	105343			DECB	-(R3)	;DATIP, DATOB TO RW PAGE-SHOULDN'T TRAP OR ABORT
985	005300	017702	174512		MOV	SR0,R2	;SAVE CONTENTS OF SR0
986	005304	105377	174506		DECB	SR0	;TURN OFF MEMORY MANAG.
987	005310	022702	000017		CMP	#17,R2	;CHECK SAVED CONTENTS OF SR0
988	005314	001401			BEQ	.+4	
989	005316	104006			HLT		;SR0 INCORRECT-SHOULD HAVE
990							;TRACKED REFERENCE TO DATA SPACE,
991							;PAGE 0, WHICH GOT THE ADDRESS
992							;OF SR0 TO TURN OFF MEMORY MANAG.
993	005320	022777	005320	174474	CMP	#..,SR2	;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,AKPDR1	;CHECK PDR CORRESPONDING
998	005340	001401			BEQ	.+4	;TO THE RW REFERENCE
999	005342	104006			HLT		;KPDRI INCORRECT - "W" 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 RW PAGE DIDN'T EXECUTE CORRECTLY
1003	005356	000404			BR	DONE37	
1004	005360	042777	000001	174430	RET37:	BIC #1,SR0	;TURN OFF MEMORY MANAG.

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1005	005366	104006		HLT			
1006							
1007	005370	016777	174432	174426	DONE37:	MOV	KTSTA,KTVEC
1008	005376	005077	174424			CLR	KTSTA
1009	005402	005077	174410			CLR	SR0
1010	005406	005037	177776			CLR	SRPS
1011							
1012	005412	104400				SCOPE	
1013							
1014	005414	004767	001032			JSR	%7,BELL
1015							
1016	005420	013701	000042			MOV	%42,R1
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

;DATIP, DATOB TO RW PAGE CAUSED
;A TRAP OR ABORT
;RESTORE TRAP RETURN TO CAUSE HALT
;ON AN UNEXPECTED TRAP
;INITIALIZE SR0
;INITIALIZE PROCESSOR STATUS

;MONITOR HOOK

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1024
1025
1026 005444 030461 031457 020064 ;MESSAGE AREA
1027 005452 042515 047515 054522 ATIT: .ASCII '11/34 MEMORY MANAG. ACCESS KEYS TEST'
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 MPC: .ASCII 'PC= 0'
1034 005516 020040 051520 020075 MPS: .ASCII 'PS= 0'
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 005548 077005
1044 005554 062701 000020
1045 005560 020127 002126
1046 005564 003764
1047 005566 000207
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1054 005570 004767 177732
1055 005574 012777 077400 174270
1056 005602 056677 000002 174262
1057 005610 012777 007600 174310
1058 005616 000207
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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

;SUBROUTINE TO MAKE ALL PAGES RW, BANK 0, 4K, UP
RWALL: CLR 0
MOV #AORTAB,R1
RWL1: MOV #10,R0
RWL2: CLR #20(R1)
MOV #77406,2(R1)+
SOB R0,RWL2
ADD #20,R1
CMP R1,#ADREND
BLE RWL1
RTS %7

;SUPROUTINE 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 %7,RWALL ;INITIALLY MAP ALL PAGES RW, BANK 0
MOV #77400,2KPOR1 ;MAKE KERNEL PAGE ONE 4K, UP
BIS 2(SP),2KPOR1 ;SET TO DESIRED KEY
MOV #7600,2KPAR7 ;MAP KERNEL PAGE 7 EXTERNAL
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 TESTX
;TAG) IN THE LOCATION "RETRNX", SET SWITCH REGISTER
;OPTIONS
;NOTE THAT SW11 MUST BE DOWN TO RUN THIS TEST
TESTX: CLR 2#PS
MOV #KSTACK,SP
MOV #140000,2#PS ;SETUP USER STACK POINTER
MOV #USTACK,SP
CLR 2#PS
ADD #2,RETRNX ;ADD 2 TO POINT TO INSTRUCTION AFTER
HALT ;SET SR OPTIONS
CLR SCOPEF ;KEEP COUNT AT ZERO
MOV #XLOOP,RETURN ;LOAD SCOPE LOOP RETURN POINTER
JMP 2RETRNX ;JUMP TO TEST
XLOOP: CLR SCOPEF ;KEEP COUNT AT ZERO
JMP 2RETRNX ;JUMP TO TEST
RETRNX: 0

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1078
1079 ;SCOPE AND/OR ITERATION LOOP FOR EACH TEST 4000 TIMES
1080 005706 032777 040000 174234 SCOPE: BIT #4000,2SR ;TEST SR FOR SCOPE
1081 005714 001015 BNE SCOPEB ;YES SCOPE
1082 005716 032777 004000 174224 BIT #4000,2SR ;NO-TEST FOR ITERATION
1083 005724 001016 BNE SCOPEB ;INHIBIT ITERATION
1084 005726 026767 000050 000044 CMP SCOPE, ICOUNT ;COMPARE CURRENT COUNT TO MAX NUMBER
1085 005734 100012 BPL SCOPEB ;EXIT-DONE
1086 005736 005267 000040 INC SCOPE ;INCREMENT COUNT
1087 005742 012737 000340 177776 MOV #340,2#PS ;PREVENT TRAPPING WHILE MOVING STACK
1088 005750 022606 SCOPEB: CMP (6)+,2#PS ;REPOSITION STACK
1089 005752 012637 177776 MOV (6)+,2#PS ;RESTORE PREVIOUS PROCESSOR STATUS
1090 005756 000177 000022 JMP 2RETURN ;REPEAT TEST
1091 005762 005767 000014 SCOPE: CLR SCOPE ;CLEAR COUNT
1092 005766 005267 000674 INC TESTCT ;STEP TEST COUNTER
1093 005772 011667 000006 MOV 2#6,RETURN ;SAVE SCOPE RETURN POINTER
1094 005776 000002 RTI ;RETURN INLINE-NEXT TEST
1095 006000 004000 ICOUNT: 4000 ;ITERATION COUNT
1096 006002 000000 SCOPE: 0 ;COUNT LOCATION FOR ITERATION LOOP
1097 006004 000000 RETURN: 0 ;ADDRESS OF LAST TEST
1098
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 2SR,#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 ;OUTPUT CARRIAGE RETURN AND LINE FEED
1110 006046 004767 000416 JSR %7,CALF ;LOAD WITH FAILING PC+2
1111 006052 016767 000046 000314 MOV SAVPC,PTEMP1
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 2SR ;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
1127
1128
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 P.CONT: CLR PRSFLG ; PRINT REST OF NUMBER AFTER A NON-ZERO DIGIT
1154 006270 005267 000104 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 05767 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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M02

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1176
1177
1178 ;EMT HANDLER
1179 ;FIRST 3 CALLS LEFT OPEN IN TABLE FOR EASY PATCHES
1180 006402 011667 000032 000024 EMTSRV: MOV @SP,EPC ;GET CALL
1181 006406 162767 000002 SUB #2,EPC
1182 006414 017767 000020 000016 MOV @EPC,EPC
1183 006422 105067 000013 CLR# EPC+1 ;SAVE OFFSET ONLY
1184 006426 062767 006442 000004 ADD @EMTAB,EPC ;POINT TO TABLE OF ADDRESSES
1185 006434 017707 000000 MOV @EPC,PC ;JUMP TO DESIRED ROUTINE
1186 006440 000000 EPC: 0
1187 000000 PATCH1=0 ;SUBSTITUTE 104000 WHERE 1ST PATCH IS NEEDED
1188 000000 PATCH2=0 ;104002 FOR 2ND PATCH
1189 006442 000000 PATCH3=0 ;104004 FOR 3RD PATCH
1190 006444 000000 EMTAB: PATCH1 ;LOAD ADDRESS OF 1ST PATCH HERE
1191 006446 000000 PATCH2 ;LOAD ADDRESS OF 2ND PATCH HERE
1192 006450 006006 PRINT ;LOAD ADDRESS OF 3RD PATCH HERE
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

```

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1209
1210      ;SUBROUTINE TO OUTPUT ASCII MESSAGE ON TELETYPE
1211      TYPE:  MOV    %0, SAVRO
1212             MOV    (6), %0      ;GET ADDRESS THAT CONTAINS MESSAGE ADDRESS
1213             ADD    #2, %0        ;SET UP EXIT
1214             MOV    %0, %0
1215             TYPB:  MOVB   (0), TYPDAT      ;GET CHARACTER
1216             CMPB   #100, TYPDAT      ;CHECK FOR "2" CHARACTER
1217             BNE    TYPB              ;BRANCH IF NOT "2"
1218             MOV    SAVRO, %0        ;RESTORE RO
1219             RTS    PC              ;TERMINATOR CHAR. EXIT
1220             TYPB:  MOVB   TYPDAT, %0DBR    ;OUTPUT CHAR TO PRINTER
1221             TSTB   %0CSR            ;WAIT FOR TTY READY
1222             BPL    -4
1223             BR     TYPB
1224             TYPDAT: 0
1225             SAVRO: 0
1226
1227      ;SUBROUTINE TO CHECK TEST SEQUENCE
1228      ORDER:  CLR     %PS              ;CLEAR PROCESSOR STATUS
1229             MOV     (SP), TEMPN        ;GET TEST NUMBER ADDRESS
1230             MOV     %TEMPN, TEMPN      ;GET TEST NUMBER
1231             BIT     #200, %SR
1232             BEQ     ORDERB
1233             MOV     TEMPN, RO
1234             RESET
1235             HALT
1236             ORDERB:  CMP     TESTCT, TEMPN      ;IS TEST SEQUENCE CORRECT
1237             BEQ     ORDERA              ;YES, CONTINUE
1238             ADD     #2, (SP)            ;UPDATE FOR ERROR RETURN
1239             RTS    PC
1240             ORDERA:  ADD     #4, (SP)          ;UPDATE FOR GOOD RETURN
1241             RTS    PC
1242             TEMPN:  0
1243             TESTCT: 0
1244             .END

```

ADREN=	002126	348#	1045															
ADRTAB	002030	315#	1039															
AD21	003414	619#	630															
AD23	003606	668#	679															
AD25	004006	718#	729															
AD27	004206	767#	778															
AD4	002612	460#	471															
AD5	003010	511#	522															
AD6	003210	562#	573															
BELL	006452	1014	1196#															
CK	006112	1105	1119#															
CMPOK1	002426	411	415#															
CRLF	006470	383	386	1110	1202#													
DESTAD	002146	355#	406*	407	455*	457	481	506*	508	532	557*	559	583	615*				
		616	663*	665	690	713*	715	740	762*	764	789	829*	830	880*				
		881	901	930*	931	950	980*	981	1000									
DONE1	002504	414	430	434#														
DONE21	003506	622	643#															
DONE23	003706	671	694#															
DONE25	004106	721	744#															
DONE27	004302	770	793#															
DONE31	004574	837	854	858#														
DONE33	004774	904	908#															
DONE35	005172	953	957#															
DONE37	005370	1003	1007#															
DONE4	002702	463	485#															
DONE5	003102	514	536#															
DONE6	003276	565	587#															
ENTAB	006442	1183	1189#															
ENTSrv	006402	284	1179#															
END	005440	1017	1023#															
EPC	006440	1173*	1180#	1181#	1182*	1183#	1184	1185#										
FTITLE	002130	349#	381	387*														
HLT =	104006	275#	398	413	419	424	428	432	447	462	468	473	478	483				
		498	513	519	524	529	534	549	564	570	575	580	585	603				
		621	627	632	638	642	657	670	676	681	688	692	707	720				
		726	731	738	742	756	769	775	780	787	791	821	836	842				
		848	852	856	872	889	895	899	903	9								

KPDR7	002106	339#												
KSTACK	001000	303#	363	394	443	494	545	599	604*	607	653	703	752	803*
		817	819	918	968	1066								
KTSTA	002026	314#	405*	434	435*	454*	485	486*	505*	536	537*	556*	587	588*
		613#	643	644*	662*	694	695*	712*	744	745*	761*	783	794*	828*
		658	859*	879*	908	909*	929*	957	958*	979*	1007	1008*		
KTVEC	002024	313#	404*	434*	453*	485*	504*	536*	555*	587*	612*	643*	661*	694*
		711*	744*	760*	793*	827*	858*	878*	908*	928*	957*	978*	1007*	
LOGIC	005430	290	1019#											
MPC	005511	1033#	1113											
MPS	005516	1034#	1116											
MTIT	005444	395	1026#											
NOP =	000240	262#												
NRCNT	002140	353#	379*	798*	799	801	807*							
NRKEYS	001142	354#	803											
NXTST	004376	800	807#											
NXTST1	004414	810#												
OK31	004516	834	838#											
ORDER	006602	396	445	496	547	601	655	705	754	819	870	920	970	1228#
ORDERA	001656	1237	1240#											
ORDERB	001640	1232	1236#											
PATCH1=	000000	1186#	1189											
PATCH2=	000000	1187#	1190											
PATCH3=	000000	1188#	1191											
PC =	000007	272#	383*	384*	386*	396*	445*	496*	547*	601*	655*	705*	754*	819*
		870*	920*	970*	1112*	1114*	1115*	1184*	1219*	1239*	1241*			
PRFLG	006372	1138#	1145*	1159	1161*	1166*	1172#							
PRINT	006036	1102#	1192											
PRUCT	006162	1118	1131	1136#										
PRSFLG	006370	1129*	1136*	1146	1153*	1171#								
PRSHRT	006130	1114	1129#											
PS =	177776	273#	274	362*	364*	366*	437*	488*	539*	590*	646*	697*	747*	796*
		861*	911*	960*	1010*	1065*	1067*	1069*	1087*	1089*	1102*	1109*	1228*	
PTEMP1	006374	1111#	1117*	1130	1140	1143*	1144*	1163*	1164*	1165*	1167	1173#		
PTEMP2	006376	1139*	1142*	1148	1150	1167*	1168*	1169*	1174#					
PTEMP3	006400	1137*	1154*	1155	1175#									
P.OX	006232	1146#	1170											
P.CNT1	006306	1156	1158#											
P.CONT	006270	1149	1154#											
P.WAIT	006750	1147	1150#											
PERNA	006346	607#	804	806										
RET- OX	006704	1070*	1074	1076	1077#									
RETURN	006004	378#	804*	1073*	1090	1093*	1097#							
RET1	002474	404	431#											
RET21	003426	612	623#											
RET23	003624	661	672#											
RET25	004022	711	722#											
RET27	004220	760	771#											
RET31	004564	827	855#											
RET33	004764	878	905#											
RET35	005162	928	954#											
RET37	005360	978	1004#											
RET4	002626	453	464#											
RET5	003024	504	515#											
RET6	003222	555	566#											
RWALL	005526	1038#	1054											

RML1	005536	1040#	1046
RML2	005542	1041#	1043
R0	=x000000	263#	1040*
R1	=x000001	264#	407*
		722#	771#
		1039#	1041#
R2	=x000002	265#	415#
		840#	887#
R3	=x000003	266#	511#
R4	=x000004	267#	562#
R5	=x000005	268#	634#
R6	=x000006	269#	635#
R7	=x000007	270#	
SAVPC	006124	1106#	1111
SAVPSR	006126	1107#	1117
SAVRD	006600	1211#	1218
SCOPE =	104400	261#	393
		967	1012
SCOPEB	005750	1081#	1083#
SCOPEC	005706	287	1085#
SCOPEF	006002	808#	1072#
SCOPEG	005762	1083	1085
SETUP	005570	400	449
SP	=x000006	271#	363#
		452	494#
		822#	826
		1068#	1179
SR	002150	356#	371
SRO	002016	310#	395#
		487#	495#
		600#	608#
		704#	717#
		832#	835#
		933#	935
		350#	
SR0H	002132	311#	
SR1	002020	351#	
SR1H	002134	312#	422
SR2	002022	352#	471
SR2H	002136	297	522
START	002152	274#	573
STATUS=	177776	292#	630
SWREG	000176	308#	679
TCSR	002012	309#	729
TDSR	002014	1229#	778
TEMPN	006664	380#	846
TESTCT	006666	360#	893
TESTN =	000015	299	943
TESTX	005620	378	993
TEST1	002324	751#	
TEST10	004130	816#	
TEST11	004414	867#	
TEST12	004616	917#	
TEST13	005016	967#	
TEST14	005214	442#	
TEST2	002526	493#	
TEST3	002724		

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 DFKTBA.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

TEST4	003124	544#												
TEST5	003320	598#												
TEST6	003530	652#												
TEST7	003730	702#												
TYPA	006536	1215#	1223											
TYPB	006560	1217#	1220#											
TYDAT	006576	1215#	1216	1220	1224#									
TYPE	006522	384	1112	1115	1211#									
UPAR0	002050	324#												
UPAR1	002052	325#												
UPAR2	002054	326#												
UPAR3	002056	327#												
UPAR4	002060	328#												
UPAR5	002062	329#												
UPAR6	002064	330#												
UPAR7	002066	331#												
UPOR0	002030	316#												
UPOR1	002032	317#												
UPOR2	002034	318#												
UPOR3	002036	319#												
UPOR4	002040	320#												
UPOR5	002042	321#												
UPOR6	002044	322#												
UPOR7	002046	323#												
USTACK	002000	305#	365	1068										
XLOOP	005674	1073	1075#											
.	= 006670	281#	283#	286#	289#	291#	296#	298#	302#	304#	348	388	418	422
		423	427	467	472	477	482#	518#	523#	528#	533#	569	574	579
		584	626	631	637	641	675	680	687	691	725	730	737	741
		774	779	786	790	841	846	847	851	888	893	894	898	902
		938	943	944	948	951	988	993	994	998	1001	1036#	1104	1120
		1134	1141	1152	1160	1198	1204	1207	1222					

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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)

[illegible]