

DHMCA

IDENTIFICATION  
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PRODUCT CODE: MAINDEC-8E-D1HB-D  
PRODUCT NAME: PDP8-E MEMORY EXTENSION  
AND TIME SHARE CONTROL TEST  
DATE CREATED: OCTOBER 8, 1971  
MAINTAINER: DIAGNOSTIC PROGRAMMING GROUP  
AUTHOR: J. VROBEL

**M. C. N. REQUIRED**  
**THIS PROGRAM REQUIRES MCN(S)**  
**IN ORDER TO WORK PROPERLY**



1. ABSTRACT

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THIS PROGRAM TESTS THE MEMORY EXTENSION AND TIME SHARE CONTROL LOGIC FOR PROPER OPERATION. THE PROGRAM EXERCISES AND TESTS ALL IOT'S ASSOCIATED WITH MEMORY EXTENSION AND TIME SHARE CONTROL.

ERRORS ENCOUNTERED DURING RUNNING WILL RESULT IN A PROGRAM "HALT" OR A "JUMP TO SELF", WHICH MAY OCCUR IN ANY FIELD DEPENDING ON THE PORTION OF THE TEST EXECUTED. ERRORS MAY BE IDENTIFIED BY REFERENCING THE PROGRAM LISTING.

2. REQUIREMENTS

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2.1 EQUIPMENT

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PDP8-E COMPUTER WITH THE KM8-E OPTION INSTALLED AND AT LEAST 4K OF EXTENDED MEMORY.

2.2 STORAGE

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THE PROGRAM REQUIRES 4200(8) LOCATIONS OF CORE MEMORY AND MUST RESIDE IN FIELD 0 ONLY.

2.3 PRELIMINARY PROGRAMS

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ALL THE PROGRAMS FOR THE BASIC PDP8-E MUST HAVE BEEN RUN SUCCESSFULLY.

3. LOADING PROCEDURE

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3.1 METHOD

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THE PROGRAM IS LOADED INTO "FIELD 0" USING THE STANDARD BINARY LOADER TECHNIQUE.

4. STARTING PROCEDURE

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4.1 CONTROL SWITCH SETTINGS

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SR 9, 10, AND 11 MUST CONTAIN AN OCTAL VALUE EQUAL TO THE NUMBER OF EXTENDED FIELDS AVAILABLE. NOTE THAT FIELD 0 IS NOT INCLUDED.

SR0=0 WILL RESULT IN COMPLETE PROGRAM EXECUTION OF THE MEMORY

EXTENSION AND TIME SHARE CONTROL.

SR0=1 WILL LOOP THE PROGRAM ON THE MEMORY EXTENSION PORTION AND TEST THAT THE TIME SHARE IS DISABLED.

SR1=1 WILL RESULT IN AN END OF TEST HALT AT LOCATION 1565(8).

4.2 STARTING ADDRESS

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THE STARTING ADDRESS IS LOCATION 0200(8).

4.3 OPERATOR ACTION

4.3.1 MEMORY EXTENSION AND TIME SHARE CONTROL (TIME SHARE ENABLED)

-----  
WITH THE PROGRAM IN MEMORY, SET THE SWITCH REGISTER TO 0000.

PRESS EXTENDED ADDRESS LOAD.

SET THE REGISTER TO 0200 OCTAL.

PRESS ADDRESS LOAD.

PLACE THE OCTAL VALUE OF EXTENDED FIELDS AVAILABLE IN SR9-11.

PRESS CLEAR AND THEN CONTINUE.

THE PROGRAM SHOULD RUN UNTIL A FAILURE OCCURS OR UNTIL STOPPED BY THE OPERATOR WITH SR1=1. NOTE THAT THE PROGRAM SHOULD ALWAYS BE STOPPED WITH SR1=1.

THE TTY BELL WILL SIGNAL A SUCCESSFUL TEST AT THE COMPLETION OF EVERY PASS.

4.3.2 MEMORY EXTENSION PORTION (TIME SHARE DISABLED)

-----  
WITH THE PROGRAM IN MEMORY, SET THE SWITCH REGISTER TO 0000.

PRESS EXTENDED ADDRESS LOAD.

SET THE SWITCH REGISTER TO 0200 OCTAL.

PRESS ADDRESS LOAD.

PLACE THE OCTAL VALUE OF EXTENDED FIELDS AVAILABLE IN SR9-11.

PLACE SR0=1 TO EXECUTE MEMORY EXTENSION ONLY.

PRESS CLEAR AND THEN CONTINUE.

THE PROGRAM SHOULD HALT AT LOCATION 3651(8). THIS WILL

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VERIFY THAT THE TIME SHARE IS DISABLED. ALL OTHER ERRORS AT THIS TIME WILL BE CONSIDERED AS AN ILLEGAL CONDITION.

PRESS CONTINUE.

THE PROGRAM SHOULD LOOP UNTIL AN ERROR OCCURS OR UNTIL STOPPED BY THE OPERATOR WITH SR1=1.

THE TTY BELL WILL SIGNAL A SUCCESSFULL TEST AT THE END OF EVERY PASS.

5. OPERATING PROCEDURE  
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5.1 OPERATOR ACTION  
-----

5.1.1 MEMORY EXTENSION AND TIME SHARE CONTROL  
-----

VISUALLY VERIFY THAT THE TIME SHARE DISABLE JUMPER IS "OUT" ON THE M837 MODULE AND FOLLOW THE OPERATOR ACTION IN 4.3.

5.1.2 MEMORY EXTENSION PORTION  
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VISUALLY VERIFY THAT THE TIME SHARE DISABLE JUMPER IS "IN" ON THE M837 MODULE AND FOLLOW THE OPERATOR ACTION 4.3.

6. ERRORS  
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6.1 ERROR DESCRIPTION  
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BOTH "HALTS" AND "JUMP TO SELF" ARE USED TO INDICATE ERROR CONDITIONS. IN EITHER CASE REFER TO THE PROGRAM LISTING FOR MORE INFORMATION.

6.2 ERROR RECOVERY  
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ALL ERRORS ENCOUNTERED MUST BE CORRECTED BEFORE PROCEEDING ON IN THE PROGRAM.

7. RESTRICTIONS  
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7.1 OPERATING RESTRICTIONS  
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PDP8-E ONLY WITH THE KM8-E OPTION INSTALLED AND AT LEAST 4K OF EXTENDED MEMORY.

THE NUMBER OF EXTENDED AVAILABLE FIELDS MUST BE IN SR9-11.

IF MEMORY EXTENSION ONLY, THE TIME SHARE MUST BE DISABLED AND SR0=1.

IF MEMORY EXTENSION AND TIME SHARE CONTROL, THE TIME SHARE MUST BE ENABLED AND SR0=0.

IN ALL CASES SR1=1 MUST BE USED TO STOP PROGRAM.

THE PROGRAM MUST RESIDE IN FIELD 0 ONLY.

BOTH PORTIONS OF THE TEST MUST BE RUN, 4,3,1 AND 4,3,2, TO VERIFY THAT THE TIME SHARE CAN BE DISABLED AND ENABLED.

8. MISCELLANEOUS  
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8.1 EXECUTION TIME  
-----

EXECUTION TIME DEPENDS ON THE AMOUNT OF AVAILABLE EXTENDED FIELDS. EXECUTION TIME FOR 32K APPROXIMATIVELY 3.75 MINUTES.

9. PROGRAM DESCRIPTION  
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THE PROGRAM EXERCISES AND TESTS ALL IOT'S ASSOCIATED WITH THE MEMORY EXTENSION AND TIME SHARE CONTROL; THE ABILITY TO RUN WITH THE TIME SHARE DISABLED; THE ABILITY TO RUN "EXECUTIVE" AND "USER MODES" IN ALL AVAILABLE FIELDS WITH THE TIME SHARE ENABLED; THE ABILITY TO REFERENCE ALL MEMORY FIELDS FROM FIELD 0 AND VICE-VERSA; THE ABILITY TO READ AND WRITE DATA IN ALL AVAILABLE FIELDS AND THE ABILITY TO RUN PROGRAM INTERRUPTS AND INTERRUPT INHIBIT IN ALL FIELDS.

THE TIME SHARE OPTION DEVELOPES A NEW MODE OF OPERATION OR THE "USER MODE", ALL HLT, OSR, AND IOT INSTRUCTIONS ARE ILLEGAL IN USER MODE AND SHOULD "TRAP OUT". THE PROGRAM WILL THEN DETERMINE IF AN ERROR CONDITION DOES EXIST, IN SOME CASES, IN TIME SHARING, AN ERROR CONDITION CANNOT BE INDICATED WITH A "HLT" OR "TYPE OUT" BECAUSE THIS WOULD BE ILLEGAL. THEREFORE A "JUMP TO SELF" IS USED TO INDICATE ERRORS.

9.1 TEST 00  
-----

TEST CDF AND RDF FOR ALL COMBINATIONS 0 TO 7.

9.2 TEST 01  
-----

TEST INTERRUPT BUFFER BITS 9-11 WITH RIB, PI IS ENABLED AND TTY FLAG IS USED FOR INTERRUPTS. DO ALL COMBINATIONS 0 TO 7.

- 9.3 TEST 02  
-----  
TEST DCA I AND TAD I TO ALL AVAILABLE FIELDS. EACH STACK  
WILL CONTAIN ITS DF# IN LOCATION 7000.
- 9.4 TEST 03  
-----  
TEST CIF INSTRUCTION. CHECKS THE ABILITY OF A CIF-ION-  
NOP-JMP AND CIF-ION-NOP-JMS.
- 9.5 TEST 04  
-----  
TEST GTF INSTRUCTION FOR TTY FLAG AND SAVE FIELD.  
GET SAVE FIELD AFTER INTERRUPT AND CHECK INTERRUPT  
INHIBIT. DO ALL COMBINATIONS 0 TO 7.
- 9.6 TEST 05  
-----  
TEST ION AND LINK FROM RTF. TEST INTERRUPT INHIBIT BEFORE  
PI. GET THE FLAGS WITH GTF.
- 9.7 TEST 06  
-----  
TEST READ AND WRITE DATA IN ALL AVAILABLE EXTENDED FIELDS.
- 9.8 TEST 07  
-----  
CONFIDENCE CHECK ON ALL EXISTENT FIELDS. MAKE SURE ALL  
STACKS ARE ACCESSED CORRECTLY.
- 9.9 TEST 08  
-----  
TEST DF AND IF FROM SAVE FIELD AFTER PI. USE RTF TO  
SET THE FLAGS AND GTF TO GET THE FLAGS. CHECK INTERRUPT  
INHIBIT. DO ALL SF COMBINATIONS 0 TO 77.
- 9.10 TEST 09  
-----  
TEST PROGRAM INTERRUPT IN ALL AVAILABLE EXTENDED FIELDS.  
USE RTP, GTF, RDP, AND RIF FOR CHECK.
- 9.11 TEST 10  
-----  
TEST INTERRUPT INHIBIT IN ALL AVAILABLE EXTENDED FIELDS.  
TEST CIF-ION-JMP COMBINATION.

9.12 TEST 11  
-----

TEST SAVE FIELD WITH RMF IOT.

9.13 TEST 12  
-----

TEST AUTO-INDEX IN ALL AVAILABLE EXTENDED FIELDS.

9.14 TEST 13  
-----

DYNAMIC RMF TEST. TEST ALL SF TO DF TRANSFERS AND SF  
TO IB TRANSFERS.

9.15 TEST 14  
-----

TEST NON-EXISTENT FIELDS FOR ALL 0'S. IF 32K PRESENT  
BY-PASS TEST.

9.16 TEST 15  
-----

TEST TIME SHARE IN FIELD 0.

9.17 TEST 16  
-----

TEST TIME SHARE IN ALL AVAILABLE EXTENDED FIELDS.

10. LISTING  
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/PDP8-E, MEMORY EXTENSION AND TIME SHARE CONTROL TEST.  
/  
/COPYRIGHT 1971, DIGITAL EQUIPMENT CORP.,MAYNARD,MASS.  
/  
/STARTING ADDRESS IS 0200.  
/  
/CONSTANTS  
/

6201	CDF=6201
6202	CIF=6202
6214	RDF=6214
6224	RIF=6224
6244	RMF=6244
6234	RIB=6234
6274	SUF=6274
6264	CUF=6264
6254	SINT=6254
6204	CINT=6204
6007	CAF=6007
6005	RTF=6005
6004	GTF=6004
6001	ION=6001
6002	IOF=6002
6000	SKON=6000
6003	SRQ=6003
6040	SPF=6040
6041	TSF=6041
6032	KCC=6032
6002	IOF=6002
6036	KRB=6036
6000	IOT=6000
7421	MOL=7421
	/
0000	*0
0000	0000
0001	5001
0002	0002
0003	0003
	/
0020	*20
	/
0020	5400
0021	2000
0022	2443
0023	2435
0024	1050
0025	1321
0026	1432
0027	0020
0030	0020
0031	0020
0032	0020
0033	0020
0034	0020
0035	1132

JMPI0,	JMP I 0
ISE0,	ISE 0
XTFLG,	TFLG
XSTKS,	NSTKS
XRMF,	TRMF
XRANS,	TRANS
XAUTO,	TAUTO
LOOP,	0
NDF,	0
STKS,	0
DAT,	0
NOSTAK,	0
NOFLD,	0
KCAIM,	CAI-1

0036	1133	KCAI,	CAI
0037	7402	KHLT,	HLT
0040	6201	KCDF,	6201
0041	6202	KCIF,	6202
0042	1316	XFD,	EXFD
0043	0001	K1,	1
0044	0007	K7,	7
0045	0010	K10,	10
0046	7777	K7777,	7777
0047	7000	K7000,	7000
0050	7707	K7707,	7707
0051	7767	K7767,	7767
0052	7757	K7757,	7757
0053	7747	K7747,	7747
0054	7737	K7737,	7737
0055	7727	K7727,	7727
0056	7717	K7717,	7717
0057	7776	K7776,	7776
0060	7775	K7775,	7775
0061	7774	K7774,	7774
0062	7773	K7773,	7773
0063	7772	K7772,	7772
0064	7771	K7771,	7771
0065	0067	POINT,	.+2
0066	0067	K75,	.+1
0067	7766	K7766,	7766
0070	7755		7755
0071	7744	K7744,	7744
0072	7733		7733
0073	7722		7722
0074	7711		7711
0075	7700		7700
0076	1127	XTDF,	STDF
0077	1130	XTDF1,	STDF+1
0100	1302	KXFLD,	EXFLD
0101	5402	KJMP,	JMP I 2
0102	1200	KNTR,	ENTER
0103	0020	K20,	20
0104	5505	JMP2,	JMP I KFLD0
0105	1427	KFLD0,	RTRN
0106	1422	KRTN,	CAG+2
0107	1400	XFIB,	SFIB
0110	7770	K7770,	7770
0111	0070	K0070,	0070
0112	0000	XSAV,	0000
0113	7770	XCOUNT,	7770
0114	0000	XTOR,	0000
0115	5200	K5200,	5200
0116	1200	K1200,	1200
0117	0077	K0077,	0077
0120	0011	K0011,	0011
0121	7700	K7700,	7700
0122	0002	K0002,	0002

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0123 0004 K0004, 0004
0124 7402 K7402, 7402
0125 6000 K6000, 6000
0126 0100 K0100, 0100
0127 0203 PLACE, BEGIN
0130 1000 K1000, 1000
0131 2600 TIME, T1
0132 0017 K0017, 0017
0133 6001 K6001, 6001
0134 5535 JMP I R, JMP I XRET
0135 2511 XRET, RET
0136 0000 XDATA, 0000
0137 0000 K0000, 0000
0140 0003 K0003, 0003
0141 0001 K0001, 0001
0142 1100 K1100, 1100
0143 7745 SRCO, 7745
0144 3577 K3577, 3577
0145 7745 K7745, 7745
0146 3633 XXSR0, XSR0
0147 1556 XELL, BELL+1
0150 1555 XBELL, BELL
0151 6046 TTR, TLS
0152 3643 XTRAP, TRAP
0153 5531 ATRAP, JMP I TIME
0154 0000 FCO, 0000
0155 2047 XDATE, DATER
0156 6211 KCDF1, CDF 10
0157 2525 KDATE, 2525

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/TEST 00
/TEST CDF AND RDF, USE CDF TO SET THE DATA
/FIELD AND RDF TO READ THE DATA FIELD.
/DO ALL COMBINATIONS 0 TO 7.
/

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```

0200 *200
/
0200 7604 BEGIN1, LAS
0201 7510 SPA
0202 5552 JMP I XTRAP
0203 7300 BEGIN, CLA CLL
0204 6007 CAP
0205 6264 CUP
0206 1037 TAD KHLT /STORE A HLT IN LOC. 1 AND
0207 3001 DCA 1 /CHECK FOR STRAY INTERRUPT ROST.
0210 6001 ION
/
0211 6201 DF0, CDF 00 /DF 0
0212 6214 RDF
0213 7450 SNA /SHOULD NOT SKIP
0214 5220 JMP DF7
0215 7402 HLT /ERROR. CDF OR RDF FAILED

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0216	7200		CLA	
0217	5211		JMP DF0	/REPEAT
0220	1050	/ DF7,	TAD K7707	/7707
0221	6271		CDF 70	/DF 7
0222	6214		RDF	
0223	7040		CMA	/AC = 0
0224	7450		SNA	/SHOULD NOT SKIP
0225	5231		JMP OK1	
0226	7402		HLT	/CDF OR RDF FAILED
0227	7200		CLA	
0230	5220		JMP DF7	
0231	2027	/ OK1,	ISE LOOP	/CHECK DONE
0232	5211		JMP DF0	
0233	7200	/	CLA	
0234	3027		DCA LOOP	/LOOP COUNTER
0235	1051	/ DF1,	TAD K7767	/7767
0236	6211		CDF 10	/DF 10
0237	6214		RDF	
0240	7040		CMA	/AC=0
0241	7450		SNA	
0242	5246		JMP DF2	
0243	7402		HLT	/CDF1 OR RDF FAILED
0244	7200		CLA	
0245	5235		JMP DF1	
0246	1052	/ DF2,	TAD K7757	/7757
0247	6221		CDF 20	/DF2
0250	6214		RDF	
0251	7040		CMA	/AC=0
0252	7450		SNA	
0253	5257		JMP OK2	
0254	7402		HLT	/CDF 2 OR RDF FAILED
0255	7200		CLA	
0256	5246		JMP DF2	
0257	2027	/ OK2,	ISE LOOP	/DONE IF SKP
0260	5235		JMP DF1	
0261	7200		CLA	
0262	3027		DCA LOOP	
0263	1053	/ DF3,	TAD K7747	/7747
0264	6231		CDF 30	/DF 3
0265	6214		RDF	
0266	7040		CMA	/AC=0
0267	7450		SNA	
0270	5274		JMP DF4	
0271	7402		HLT	/CDF 3 OR RDF FAILED
0272	7200		CLA	
0273	5263		JMP DF3	

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0274 1054 / DF4, TAD K7737 /7737
0275 6241 CDF 40 /DF 4
0276 6214 RDF
0277 7040 CMA /AC=0
0300 7450 SNA
0301 5305 JMP OK3
0302 7402 HLT /CDF 4 OR RDF FAILED
0303 7200 CLA
0304 5274 JMP DF4
    
```

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0305 2027 / OK3, ISZ LOOP /DONE IF SKP
0306 5263 JMP DF3
    
```

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0307 7200 / CLA
0310 3027 DCA LOOP
    
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0311 1055 / DF5, TAD K7727 /7727
0312 6251 CDF 50 /DF5
0313 6214 RDF
0314 7040 CMA /AC=0
0315 7450 SNA
0316 5322 JMP DF6
0317 7402 HLT /CDF 5 OR RDF FAILED.
0320 7200 CLA
0321 5311 JMP DF5
    
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0322 1056 / DF6, TAD K7717 /7717
0323 6261 CDF 60 /DF 6
0324 6214 RDF
0325 7040 CMA /AC=0
0326 7450 SNA
0327 5333 JMP OK4
    
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0330 7402 HLT /CDF 6 OR RDF FAILED
0331 7200 CLA
0332 5322 JMP DF6
    
```

```

0333 2027 / OK4, ISZ LOOP /DONE IF SKP
0334 5311 JMP DF5
0335 6000 SKON /SKP IF ION
0336 7402 HLT /IS ION STILL ON
    
```

```

/TEST 01
/NOW TEST INTERRUPT BUFFER (IB) BITS 9-11 WITH
/RIB. PI IS ENABLED. TELEPRINTER FLAG IS
/USED FOR INTERRUPT. DO ALL COMBINATIONS 0 TO 7.
    
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```

0337 6201 / CDF 00 /DF0
0340 1020 TAD JMP I0 /JMPI0=JMP I 0
0341 3021 DCA 1 /C(1)=JMP I 0
0342 3027 DCA LOOP
0343 6041 TSF /TEST TTY FLAG
0344 4422 JMS I XTFLG /SET FLAG
    
```

```

0345 6001 IB0, ION /ENABLE PI
0346 7200 CLA
0347 6234 RIB /READ SF
0350 7450 SNA
0351 5354 JMP IB1
0352 7402 HLT /RIB FAILED
0353 5345 JMP IB0

/
0354 6211 IB1, CDF 10 /DF 1
0355 6001 ION
0356 7200 CLA
0357 6214 RDF /DF SHOULD BE 0 AFTER A PI
0360 7450 SNA
0361 5364 JMP .+3
0362 7402 HLT
0363 5354 JMP IB1 /DF NOT CLEARED, OR NO PI

/
0364 1057 TAD K7776
0365 6234 RIB /READ SF
0366 7040 CMA /AC=0
0367 7450 SNA
0370 5373 JMP OK5
0371 7402 HLT /RIB OR SF FAILED
0372 5354 JMP IB1
0373 2027 OK5, ISZ LOOP /DONE IF SKP
0374 5345 JMP IB0
0375 5776 JMP I .+1
0376 0400 IB2-2

0400 0400 *400
0400 7200 CLA
0401 3027 DCA LOOP

/
0402 6221 IB2, CDF 20 /DF 2
0403 6001 ION
0404 7200 CLA
0405 6214 RDF /SHOULD BE 0 AFTER PI
0406 7450 SNA
0407 5212 JMP .+3
0410 7402 HLT /DF NOT CLEARED, OR NO PI
0411 5202 JMP IB2

/
0412 1060 TAD K7775
0413 6234 RIB /AC=7777
0414 7040 CMA /=0
0415 7450 SNA
0416 5221 JMP IB3
0417 7402 HLT /RIB OR SF FAILED
0420 5202 JMP IB2

/
0421 6231 IB3, CDF 30 /DF3
0422 6001 ION
0423 7200 CLA
0424 6214 RDF /DF SHOULD BE CLEARED

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0425	7450		SNA	
0426	5231		JMP .+3	
0427	7402		HLT	/DF NOT CLEARED
0430	5221		JMP IB3	
/				
0431	1061		TAD K7774	
0432	6234		RIB	/AC=7777
0433	7040		CMA	/AC=0
0434	7450		SNA	
0435	5240		JMP OK6	
0436	7402		HLT	/RIB OR SF FAILED
0437	5221		JMP IB3	
/				
0440	2027	OK6,	ISZ LOOP	/DONE IF SKP
0441	5202		JMP IB2	
/				
0442	7200		CLA	
0443	3027		DCA LOOP	
/				
0444	6241	IB4,	ODF 40	/DF 3
0445	6001		ION	
0446	7200		CLA	
0447	6214		RDF	/DF MUST BE 000 AFTER A PI
0450	7450		SNA	/ERROR IF SKIP
0451	5254		JMP .+3	
/				
0452	7402		HLT	/DF NOT 0 AFTER PI
0453	5244		JMP IB4	
/				
0454	1062		TAD K7773	/AC=7773
0455	6234		RIB	/AC=7777
0456	7040		CMA	/AC=0
0457	7450		SNA	
0460	5263		JMP IB5	
0461	7402		HLT	/RIB OR SF FAILED
0462	5244		JMP IB4	
/				
0463	6251	IB5,	ODF 50	/DF5
0464	6001		ION	
0465	7200		CLA	
0466	6214		RDF	/DF SHOULD=000
0467	7450		SNA	
0470	5273		JMP .+3	
0471	7402		HLT	/DF NOT 0 AFTER PI
0472	5263		JMP IB5	
/				
0473	1063		TAD K7772	/AC = 7772
0474	6234		RIB	/AC = 7777
0475	7040		CMA	/AC = 0000
0476	7450		SNA	
0477	5302		JMP OK7	
0500	7402		HLT	/RIB OR SF FAILED
0501	5263		JMP IB5	

```

0502 2027 OK7, ISZ LOOP /DONE IF 0 AND SKIP
0503 5244 JMP IB4
/
0504 7200 CLA
0505 3027 DCA LOOP
/
0506 6261 IB6, CDF 60 /DF6
0507 6001 ION
0510 7200 CLA
0511 6214 RDP /DF MUST=0 AFTER PI
0512 7490 SNA
0513 5316 JMP ,+3
0514 7402 HLT /DF NOT 0 AFTER PI
0515 5306 JMP IB6

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```

/
0516 1064 TAD K7771 /7771
0517 6234 RIB /AC=7777
0520 7040 CMA
0521 7490 SNA
0522 5325 JMP IB7
0523 7402 HLT /RIB OR SF FAILED
0524 5306 JMP IB6

```

```

/
0525 6271 IB7, CDF 70 /DF 7
0526 6001 ION
0527 7200 CLA
0530 6214 RDP /DF MUST = 0 AFTER PI
0531 7490 SNA
0532 5335 JMP ,+3
0533 7402 HLT /DF NOT 0
0534 5325 JMP IB7

```

```

/
0535 1110 TAD K7770
0536 6234 RIB /AC=7777
0537 7040 CMA
0540 7490 SNA
0541 5344 JMP OK8
0542 7402 HLT /RIB OR SF FAILED
0543 5325 JMP IB7

```

```

/
0544 2027 OK8, ISZ LOOP /DONE IF SKP
0545 5306 JMP IB6
0546 5747 JMP I ,+1 /NEW PAGE
0547 6000

```

```

0600 *600
/TEST 02
/NOW TEST DCA I AND TAD I TO ALL STACKS, NUMBER OF
/EXTENDED STACKS SHOULD BE IN SR9 TO 11. EACH STACK WILL
/CONTAIN ITS DF# IN LOCATION 7000.
/

```

```

0600 3027 DCA LOOP

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```

0601 4423 DCAI, JMS I XSTKS /READ SR 9-11
0602 7001 IAC
0603 3030 DCA NDF /DF NUMBER = 1 TO START
0604 1040 TAD KCDF /6201
0605 1045 TAD K10
0606 3207 DCA ,+1 /DF 001 TO START WITH
0607 6201 DFLD, CDF 00 /WILL BE INCREMENTED
0610 1030 TAD NDF /DF#
0611 3447 DCA I K7000 /PUT IN 7000 OF STACK
0612 2031 ISZ STKS /ALL STACKS WHEN 0
0613 7410 SKP
0614 5222 JMP TADI /TEST TAD I
0615 1045 TAD K10
0616 1207 TAD DFLD /INCR. CDF IOT
0617 3207 DCA DFLD
0620 2030 ISZ NDF
0621 5207 JMP DFLD

/
0622 4423 TADI, JMS I XSTKS /SR9-11 AGAIN
0623 7001 IAC
0624 3030 DCA NDF /DF#=1 AGAIN
0625 1040 TAD KCDF /6201
0626 1045 TAD K10
0627 3207 DCA ,+1
0630 6201 TFLD, CDF 00
0631 1447 TAD I K7000 /AC=DF CONTENTS NOW
0632 3032 DCA DAT /SAVE TEMP
0633 1032 TAD DAT
0634 7041 CIA /2'S COMP
0635 1030 TAD NDF /BETTER BE EQUAL
0636 7640 SEA CLA
0637 5252 JMP CAA-1 /ERROR PATH
0640 2031 ISZ STKS /ALL WHEN 0
0641 5245 JMP ,+4
0642 2027 ISZ LOOP /DONE WHEN 0
0643 5201 JMP DCAI
0644 5256 JMP IBSF /NEXT TEST
0645 1045 TAD K10
0646 1230 TAD TFLD /CDF IOT + 10
0647 3230 DCA TFLD
0650 2030 ISZ NDF
0651 5230 JMP TFLD

/
0652 1032 TAD DAT /DATA AS READ
0653 7402 CAA, HLT /AC=DATA READ
0654 7200 CLA
0655 5230 JMP TFLD

```

/TEST 03

/CIF TEST. CHECKS THE ABILITY OF A CIF-ION-NOP-JMP OR  
/CIF-ION-NOP-JMS SEQUENCE TO DO THE FOLLOWING:  
/1. CIF ENABLE MB TO IB TRANSFER,  
/2. INHIBIT INTERRUPT TILL JMP OR JMS EXECUTED.  
/3. INTERRUPT AFTER JMP OR JMS EXECUTED.

/4. JMP OR JMS ENABLES IB TO IF TRANSFER.  
/5. INTERRUPT ENABLES IF TO SF TRANSFER.

0656	6201	/SET UP FOR CIF-ION-NOP-JMP CHECK.
0657	1021	IBSF, CDF 00 /SET LOCS 1-2 TO ISZ 0.
0660	3001	TAD ISZ0 /JMP I 0 RESPECTIVELY,
0661	1352	DCA 1
0662	3002	TAD KNOP
0663	1020	DCA 2
0664	3023	TAD JMP10
		DCA 3

/NOW STORE HALTS IN LOC1, CIFJMP+1,  
/AND CIFJMS+1 OF ALL EXTENDED FIELDS.

0665	4423	JMS I	XSTKS
0666	1040	TAD	KCDF
0667	1049	TAD	K10
0670	3271	DCA	.+1
0671	6211	HLTS, CDF	10
0672	1037	TAD	KHLT
0673	3443	DCA I	K1
0674	1037	TAD	KHLT
0675	3754	DCA I	CAB
0676	1037	TAD	KHLT
0677	3755	DCA I	CAC
0700	2031	ISE	STKS
0701	7410	SKP	
0702	9305	JMP	.+3
0703	1271	TAD	HLTS
0704	5267	JMP	HLTS-2
0705	6201	CDF	00
0706	6041	TSP	
0707	4422	JMS I	XTFLG
0710	3027	DCA	LOOP
0711	1041	AGAIN1, TAD	KCIF
0712	3323	DCA	CIFJMP
0713	3353	DCA	CIFCK
0714	4423	JMS I	XSTKS
0715	1323	CIFJPL, TAD	CIFJMP
0716	1040	TAD	K10
0717	3323	DCA	CIFJMP
0720	1353	TAD	CIFCK
0721	1040	TAD	K10
0722	3353	DCA	CIFCK
0723	6202	CIFJMP, CIF	00

/ENSURE T10 FLAG SET.

/SET COUNTER FOR 4096 PASSES.  
/INITIALIZE TO CIF 00.

/INITIALIZE I.F. CHECK TO 0.  
/READ SR9-11.

/MODIFIED TO CURRENT FIELD  
/UNDER TEST.

0724	6001	ION
0725	7000	NOP
0726	5327	JMP .+1
0727	7402	HLT
0730	6234	RIB
0731	7041	CIA

/ERROR. NO PI OR INHIBIT PI.

0732	1353	TAD	CIFCK	
0733	7650	SNA CLA		
0734	5344	JMP	CAD+3	
0735	1353	TAD	CIFCK	
0736	7421	MQL		/LOAD MQ
0737	7300	CLA CLL		
0740	6234	RIB		
0741	7402	CAD, HLT		/ERROR. I.B. TO I.F. TRANSFER
0742	7200	CLA		/FAILED AFTER CIF-JMP, BAD
0743	5323	JMP	CIFJMP	/I.F. IN AC, GOOD I.F. IN
				/MG, REPEAT UPON CONTINUE.
0744	2031	ISE	STKS	/DONE?
0745	5315	JMP	CIFJPL	/NO, DO NEXT FIELD
0746	2027	ISE	LOOP	/4096 TIMES?
0747	5311	JMP	AGAIN1	/NO, DO TI ALL AGAIN,
0750	5751	JMP I	.*1	/YES. GO TEST CIF-JMS.
0751	1000	IBSF1		
0752	7000	KNOP, NOP		
0753	0000	CIFCK, 0		
0754	0724	CAB, CIFJMP+1		
0755	1020	CAC, CIFJMS+1		

1000	1000	*1000		
1000	7200	IBSF1, CLA		
1001	6201	CDP	00	
1002	6041	TSP		/ENSURE T10 FLAG SET,
1003	4422	JMS I	XTFLG	
1004	3027	DCA	LOOP	/SET UP FOR 4096 PASSES,
1005	1041	AGAIN2, TAD	KCIF	/INIT. TO CIF 00,
1006	3217	DCA	CIFJMS	
1007	3246	DCA	CIFCK1	/INIT. I.F. CHECK TO 0.
1010	4423	JMS I	XSTKS	/READ SR9-11,
1011	1217	CIFJSL, TAD	CIFJMS	
1012	1045	TAD	K10	
1013	3217	DCA	CIFJMS	
1014	1246	TAD	CIFCK1	
1015	1045	TAD	K10	
1016	3246	DCA	CIFCK1	
1017	6202	CIFJMS, CIF	00	/MODIFIED TO CURRENT FIELD
				/UNDER TEST,

1020	6001	ION		
1021	7000	NOP		
1022	4223	JMS	.*1	
1023	0000	0		
1024	7402	HLT		/ERROR. NO PI OR INHIBIT PI.
1025	6234	RIB		
1026	7041	CIA		
1027	1246	TAD	CIFCK1	
1030	7650	SNA CLA		
1031	5241	JMP	CAE+3	
1032	1246	TAD	CIFCK1	
1033	7110	CLL RAR		
1034	7012	RTR		

```

1035 6234          RIB
1036 7402    CAE,  HLT
1037 7200          CLA
1040 5217          JMP      CIFJMS
                        /ERROR.  I.B. TO I.F. TRANSFER
                        /FAILED AFTER CIF-JMS, BAD
                        /I.F. IN AC6-8, GOOD I.F.
                        /IN AC9-11. REPEAT UPON CONTINUE
1041 2031          ISZ      STKS
1042 5211          JMP      CIFJSL
1043 2027          ISZ      LOOP
1044 5205          JMP      AGAIN2
1045 5647          JMP I   XGTF1
1046 0000    CIFCK1,0
1047 2271    XGTF1,  GTF1
                        /DONE?
                        /NO. DO NEXT FIELD,
                        /4096 TIMES?
                        /NO. DO IT ALL AGAIN,
                        /YES. GO ON TO NEXT TEST

```

```

/
/TEST 10
/TEST INTERRUPT INHIBIT
/FROM EACH FIELD, REFER TO HEADING TITLED "EXTENDED
/FIELD TEST ROUTINE", THIS ROUTINE IS PLACED IN
/EACH TESTED FIELD AT THE ADDRESSES SPECIFIED. THE
/INDICATED ERROR HALTS WILL BE IN THE EXTENDED
/FIELD. PRESS CONT, TO RECOVER. ONLY 1 FIELD WILL
/CONTAIN THE ROUTINE AT ANY ONE TIME. OTHER FIELDS
/WILL CONTAIN ALL0'S. THE ROUTINE IS REPLACED WITH
/HALTS AFTER COMPLETION. THE PORTIONS OF THE FIELD
/WHICH DO NOT CONTAIN THE ROUTINE ARE SET TO 0000
/BEFOREHAND.
/
/

```

/SETUP FIELDS TO TEST, POINTERS, ETC.,

```

1050 4423    TRMF,  JMS I XSTKS  /READ SR9-11
1051 1040          TAD KCDF   /6201
1052 3260          DCA .+6
1053 1260          TAD .+5
1054 1045          TAD K10
1055 3260          DCA .+3
1056 7040          CMA
1057 3010          DCA 10
1060 6201          CDF 00
1061 3410          DCA I 10   /PLACE 0'S IN EACH FIELD FROM
1062 1010          TAD 10    /LOC. 0 TO 7777.
1063 7040          CMA
1064 7640          SZA CLA
1065 9261          JMP .-4
1066 2031          ISZ STKS
1067 5253          JMP TRMF+3

```

```

/
/NOW PUT A HLT IN EACH FIELD IN THE SAME
/LOCATION AS CAI, BELOW.
/

```

```

1070 4423          JMS I XSTKS  /READ SR 9-11
1071 1040          TAD KCDF
1072 1045          TAD K10

```

```

1073 3274          DCA ,+1
1074 6201    CHDF, CDF 00
1075 1036          TAD KCAI      /KCAI = ADDRESS OF CAI.
1076 3027          DCA LOOP      /SAVE TEMPORARILY
1077 1037          TAD KHLT      /KHLT = 7402 (HLT)
1100 3427          DCA I LOOP
1101 2031          ISZ STKS      /DONE ALL STACKS WHEN SKIP
1102 7410          SKP
1103 5306          JMP ,+3
1104 1274          TAD CHDF
1105 5272          JMP CHDF-2

/
1106 6201          CDF 00
1107 6041    STRMF, TSF          /CHECK TTY FLAG
1110 4422          JMS I XTFLG    /GO SET IT
1111 1030          TAD K7707
1112 3027          DCA LOOP
1113 1065          TAD POINT
1114 3066          DCA K7S      /POINTER FOR K7700 TO K7766
1115 4423          JMS I XSTKS    /READ SR 9-11
1116 1040          TAD KCDF      /6201
1117 1045          TAD K10      /10
1120 3327          DCA STDF
1121 1041          TAD KCIF      /6202
1122 1045          TAD K10      /10
1123 3330          DCA STDF+1
1124 1330          TAD STDF+1
1125 3442          DCA I XFD
1126 4425          JMS I XRANS    /PUT TEST ROUTINE INTO FIELD X

/
1127 6211    STDF, CDF 10      /FIELD 1 TO START WITH
1130 6212          CIF 10
1131 5332          JMP ,+1      /SHOULD ENTER EXTENDED FIELD
                                /AFTER THIS JMP. HLT IF NOT

1132 7000          NOP
1133 7402    CAI,  HLT          /ERROR. PI FAILED
                                /C(AC) = C(I.B.)
1134 5327          JMP STDF      /REPEAT SAME TEST.

/

```

```

/ENTER HERE AFTER PI FROM EXTENDED BANK
*1200
/

```

```

1200 6214    ENTER, RDF          /DF SHOULD BE 000
1201 7450          SNA          /ERROR IF SKIP
1202 5206          JMP ,+4      /CHECK C(SF)
1203 7402          HLT          /AC=C(DF)
1204 7200          CLA
1205 5476          JMP I XTDF    /REPEAT TEST
1206 6212          CIF 10      /SET I.B. TO FIELD 1
1207 6244          RMP          /I.B. NOW EQUAL TO SF
1210 6234          RIB          /READ IB
1211 6202          CIF 00
1212 6201          CDF 00

```

```

1213 1466          TAD I K7S
1214 7040          CMA
1215 7650          SNA CLA          /ERROR IF SKIP
1216 5226          JMP CKPC
1217 6244          RMF
1220 6254          RIB
1221 7402          HLT          /ERROR RMF AND PI WORKED, BUT
                               /I.B. NOT CORRECT AFTER RMF.
                               /AC=C(1B)
1222 7200          CLA
1223 6201          CDF 00
1224 6202          CIP 00
1225 5476          JMP I XTDF          /BACKUP A PAGE AND REPEAT
/
1226 1036          CKPC, TAD KCAI          /KCAI=ADDRESS OF CAI
1227 7001          IAC          /MAKE CAI+1
1230 7041          CIA
1231 1000          TAD 0          /COMPARE TO C(0)
1232 7650          SNA CLA          /SHOULD NOT SKIP
1233 5240          JMP .+5          /ALL OK SETUP FOR NEXT FIELD
1234 1000          TAD 0
1235 7402          HLT          /ERROR. ALL WORKED, BUT
                               /C(PC) WAS NOT=TO CAI+1
                               /AFTER PI IN EXTENDED
                               /FIELD, C(AC)=C(0),F0.
                               /CHECK FOR PI NOT INHIBITED,
                               /OR AUTO-INDEX REG.
                               /12 FAILING IN THE EXTENDED FIELD.
1236 7200          CLA
1237 5476          JMP I XTDF          /BACKUP AND REPEAT
/
/SETUP FOR NEXT FIELD
/
1240 2031          ISZ STKS          /DONE ALL IF SKIP
1241 5246          JMP .+5
1242 2027          ISZ LOOP          /DONE LOOPING IF SKIP
1243 5645          JMP I .+2          /REPEAT ALL AGAIN
1244 5507          JMP I XFIB          /EXIT TO NEXT TEST
1245 1113          STRMF+4          /BACK TO LAST PAGE
/
/SET LAST TESTED FIELD TO ALL 0'S AND PUT A
/HLT IN RESPECTIVE ADDRESS OF CAI
/
1246 7240          CLA CMA
1247 3010          DCA 10
1250 1476          TAD I XTDF          /CDF X0 AT STDF
1251 3252          DCA .+1
1252 6211          CDF 10          /F1 TO START WITH
1253 3410          DCA I 10
1254 1010          TAD 10
1255 7040          CMA
1256 7640          SZA CLA          /CLEAR IF SKIP
1257 5253          JMP .-4
1260 6201          CDF 00

```

```

1261 1476      TAD I XTDF      /CDF X0 AT STDF
1262 3263      DCA ,+1
1263 6211      CDF 10
1264 1037      TAD KHLT        /#7402 (HLT)
1265 3436      DCA I KCAI    /KCAI=ADDRESS OF CAI
1266 6201      CDF 00        /RESTORE DF
    
```

/INCREMENT CDF AND CIF 10T'S AT STDF, STDF+1  
/TO NEXT FIELD.

```

1267 1476      TAD I XTDF      /CDF X0 AT STDF
1270 1045      TAD K10
1271 3476      DCA I XTDF
1272 1477      TAD I XTDF1    /CIF X0 AT STDF
1273 1045      TAD K10
1274 3477      DCA I XTDF1
1275 1477      TAD I XTDF1
1276 3316      DCA EXFD
1277 2066      ISB K7S
1300 4321      JMS TRANS    /PUT ROUTINE IN NEW FIELD
1301 5476      JMP I XTDF    /TEST NEW FIELD
    
```

/EXTENDED FIELD TEST ROUTINE

/THE FOLLOWING INSTRUCTIONS ARE PLACED IN  
/EACH EXTENDED FIELD TESTED. THE NUMBERS IN THE  
/COMMENTS FIELD CORRESPOND TO THE  
/MEMORY LOCATIONS IN THE TESTED FIELD. LOCATIONS  
/0 THRU 11 ARE USED FOR AN ERROR ROUTINE  
/IN CASE FIELD 0 IS NOT ENTERED AFTER AN  
/INTERRUPT, THE EXTENDED FIELD SHOULD BE  
/ENTERED AT LOCATION CAI-1 WHICH CORRESPONDS  
/TO CAI-1 IN FIELD 0.

/EXTENDED FIELD INSTRUCTIONS:

```

1302 0000      EXFLD, 0      /0
1303 1000      TAD 0      /1
1304 7400      SNA      /IF LOC. 0 NOT =0 PI DIDN'T
                        /ENTER FIELD 0
1305 5312      JMP ,+5    /3
1306 7402      HLT      /4. INTERRUPTED TO THIS FIELD
                        /INSTEAD OF FIELD 0,C(AC)=C(0)
                        /WHICH SHOULD BE CAI+1
                        /IF NOT, CHECK LOC. 7777,IT
                        /MUST = 5412 (JMP I 12).
1307 7200      CLA      /5
1310 3000      DCA 0      /6
1311 5420      JMP I 20    /7. C(20) =CAI
1312 7402      HLT      /10. THE JMP I 12 AT LOC.
                        /7777 WAS NOT EXECUTED,
                        /OR INTERRUPT FAILED. IF
                        /NO INTERRUPT, LOCATION 12
                        /NOW CONTAINS 0 INSTEAD
    
```

```

1313 5307          JMP .-4 /OF ADDRESS CAI,
1314 1133          CAI   /11. REPEAT IN THIS FIELD
                   /12. AUTO-INDEXS TO CAI+1
                   /IN F 0 IF THE JMP I 12
                   /WORKS.
                   /LOCS. 13 TO 17 ARE ALL 0'S
/
1315 1133          CAI   /20. EQUALS CAI IN F0.
/
                   /LOCS. 21 TO CAI-2 ARE ALL 0'S
/
1316 6212          EXFD, CIF 10 /FIELD 1 TO START WITH
1317 6001          ION   /LOC. CAI, SEE SYMBOL TABLE
                   /FOR CAI.
                   /LOCS. CAI+1 TO 7776 ARE ALL 0'S
/
1320 5412          JMP I 12      /7777, PI SHOULD OCCUR,
                   /AFTER THIS INSTRUCTION,
                   /TO FIELD 0.

```

```

/ROUTINE TO TRANSFER TEST ROUTINE TO PROPER FIELD
/

```

```

1321 0000          TRANS, 0
1322 1101          TAD KJMP      /KJMP=JMP I 2
1323 3001          DCA 1        /IN FIELD 0
1324 1102          TAD KNTR      /KNTR = LOC. ENTER
1325 3002          DCA 2        /OF FIELD 0
1326 1100          TAD KXFLD     /KXFLD = LOC. EXFLD
1327 3010          DCA 10
1330 3011          DCA 11
1331 1007          TAD K7766     /1-10 DECIMAL
1332 3000          DCA 0        /SAVE
1333 1476          TAD I XTDF    /CDF X0 IN STDF
1334 3337          DCA .+3
1335 6201          CDF 00
1336 1410          TAD I 10
1337 6211          TRFLD, CDF 10 /F1 TO START WITH
1340 3411          DCA I 11     /PUT IN EXTENDED FIELD
1341 2000          ISE 0        /DONE LOCS 1 TO 12 IF SKIP
1342 5335          JMP .-5
1343 1337          TAD TRFLD
1344 3347          DCA .+3
1345 6201          CDF 00
1346 1410          TAD I 10
1347 6211          CDF 10
1350 3503          DCA I K20    /PUT E40 IN LOC. 20
1351 6201          CDF 00
1352 1337          TAD TRFLD
1353 3355          DCA .+2
1354 1410          TAD I 10
1355 6211          CDF 10
1356 3435          DCA I KCAIM  /PUT CIF X0 IN CAI-1
1357 6201          CDF 00

```

```

1360 1337      TAD TRFLD
1361 3363      DCA .+2
1362 1410      TAD I 10
1363 6211      CDF 10
1364 3436      DCA I KCAI      /ION TO LOC. CAI
1365 6201      CDF 00
1366 1337      TAD TRFLD
1367 3371      DCA .+2
1370 1410      TAD I 10
1371 6211      CDF 10
1372 3446      DCA I K7777     /PUT JMP I 12 IN 7777
1373 6201      CDF 00
1374 5721      JMP I TRANS     /EXIT

```

1400 \*1400

```

/
/TEST 11
/TEST SF WITH AN RMF IOT, AN INTERRUPT IN FIELD 0 IS CREATED, AFTER
/WHICH, THE DF AND IB REGISTERS ARE SET TO FIELD 1.
/THE SF SHOULD CONTAIN FIELD 0. THE TEST
/THEN MAKES SURE THE IB IS CLEARED, THEN SET BY ISSUING AN RMF,
/FOLLOWED BY A JMP I K7000, IF THE IB IS CLEARED, THE JMP GOES TO 7000 IN FIELD 2.
/IF THE IB AND SF ARE INCLUSIVE OR'D, THE JMP GOES TO 7000 IN FIELD 1, AND
/A HALT OCCURS THERE. RESTART FROM 1400 AFTER AN ERROR. THE TEST IS LOOPED
/512 TIMES,
/

```

```

1400 6041      SFIB,   TSF      /SEE IF FLAG IS SET.
1401 4422      JMS I XTFLG   /SET IT
1402 1047      TAD K7000   /7000
1403 3027      DCA LOOP
1404 6211      CDF 10      /DF=FIELD 1
1405 1037      TAD KHLT   /HLT
1406 3447      DCA I K7000  /7000, FIELD 1=HLT
1407 6201      CDF 00      /DF=0
1410 1104      TAD JMP2   /JMP2=JMP I KFLD0
1411 3447      DCA I K7000  /7000, FIELD 0=JMP I KFLD0
                               /KFLD0=LOC. RTRN
1412 1101      TAD KJMP   /KJMP=JMP I 2
1413 3001      DCA 1
1414 1106      TAD KRTN   /KRTN=LOC. CAG+2
1415 3002      DCA 2

```

/BEGIN TEST

```

1416 6001      ION      /ENABLE PI
1417 7000      NOP
1420 7402      CAG,   HLT      /ERROR NO PI
1421 5200      JMP SFIB   /REPEAT TEST

```

/RETURN HERE AFTER PI

```

1422 7200      CLA
1423 6211      CDF 10      /DF=FIELD1
1424 6212      CIF 10      /IB=FIELD1
1425 6244      RMF      /IB SHOULD=FIELD0

```

```

1426 5447          JMP I K7000      /IF SHOULD=FIELD0
/
1427 2027      RTRN,   ISE LOOP      /WORKED OK
1430 5216          JMP CAG-2      /LOOP
1431 5232          JMP TAUTO      /DONE, GO TO NEXT TEST

```

```

/
/
/TEST 12
/TEST ALL AUTO-INDEX REGISTERS IN EACH EXTENDED FIELD,
/IDENTICAL TEST ROUTINES ARE PERFORMED FROM EACH FIELD,
/AND ERROR HALTS OCCUR IN THE FIELD CURRENTLY RUNNING
/THE ROUTINE. PRESS CONT, TO RESUME TESTING, EACH
/FIELD CONTAINS ALL 0'S EXCEPT FOR THE AREA OCCUPIED
/BEYOND THE TEST ROUTINE, FIELD 0 IS RE-ENTERED
/AFTER EACH TEST, AND THE NEXT SEQUENTIAL FIELD
/IS THEN ENTERED. REFER TO THE HEADING "AUTO-
/INDEX TEST" FOR THE SEQUENCE OF OPERATIONS.
/

```

```

1432 6201      TAUTO,   CDF 00
1433 1050          TAD K7707
1434 3027          DCA LOOP      /LOOP COUNTER
1435 4423          JMS I XSTKS     /READ SR 9-11
1436 1040          TAD KCDF      /6201
1437 3246          DCA DFN
1440 1246      NEWDF,   TAD DFN
1441 1045          TAD K10      /INCREMENT DF
1442 3246          DCA DFN

```

```

/
/CLEAR ONE FIELD TO 0
/

```

```

1443 7040          CMA
1444 3010          DCA 10
1445 3000          DCA 0      /USE LOC. 0 FOR A COUNTER
1446 6211      DFN,    CDF 10     /FIELD 1 TO START WITH
1447 3410          DCA I 10
1450 2000          ISE 0
1451 5247          JMP .-2
1452 6201          CDF 00

```

```

/
/NOW PUT TEST ROUTINE IN THE EXTENDED FIELD
/

```

```

1453 1317          TAD 00AUTO     /1ST LOC. OF ROUTINE MINUS 1
1454 3010          DCA 10      /SOURCE
1455 1071          TAD K7744     /-28 DECIMAL
1456 3000          DCA 0      /USE LOC. 0 AS COUNTER
1457 1317          TAD 00AUTO
1460 3011          DCA 11      /DESTINATION
1461 1246          TAD DFN      /CDF X0
1462 3265          DCA .+3
1463 6201      MOVE,   CDF 00
1464 1410          TAD I 10
1465 6211          CDF 10      /FIELD 1 TO START
1466 3411          DCA I 11

```

```

1467 2000      ISE 0      /MOVE WHEN SKIP
1470 5263      JMP MOVE

```

```

/
/ NOW SET AUTO-I REGS 10 TO 17 TO 7777.
/

```

```

1471 1110      TAD K7770      /-8 DECIMAL
1472 3000      DCA 0
1473 1044      TAD K7          /7
1474 3010      DCA 10
1475 7040      CMA          /7777
1476 3410      DCA I 10
1477 2000      ISE 0      /10 TO 17 = 7777 WHEN SKIP
1500 5275      JMP , -3
1501 7040      CMA
1502 3440      DCA I K7777      /PUT 7777 IN LOC. 7777 OF EXTENDED FIELD
1503 6214      RDP          /READ D.F.
1504 1041      TAD KCIF      /6202
1505 3306      DCA , +1
1506 6212      CIF 10      /FIELD 1 TO START
1507 4716      JMS I FILDX      /ENTER EXTENDED FIELD
                               /515 OCTAL LOCS. BEFORE THE
                               /TAD I 10 INSTRUCTION.
                               /THIS IS A TEST OF THE
                               /DEFER BIT. 500 US DELAY

```

```

/
/ ENTER FIELD 0 FROM EXTENDED FIELD HERE.
/

```

```

1510 2031      GOTO0, ISE STKS      /DONE ALL WHEN SKIP
1511 5240      JMP NEWDF      /SETUP FOR NEXT
1512 2027      ISE LOOP      /ALL DONE IF SKIP
1513 5235      JMP NEWDF-3      /REPEAT ALL
1514 5715      JMP I LBTP
1515 1600      LBTP, RMFTST
/
1516 1002      FILDX, DOAUTO-515

```

```

/
/ AUTO-INDEX TEST
/

```

```

/ THE ROUTINE WILL BE PLACED IN THE SAME RESPECTIVE
/ LOCATIONS IN EACH EXTENDED FIELD. ANY ERROR
/ HALTS WILL OCCUR IN THE EXTENDED FIELD. PRESS
/ CONTINUE TO PROCEED WITH TESTING. THE INDEX
/ REGISTERS 10 TO 17 INITIALLY CONTAIN 7777, AND
/ ARE AUTO-INDEXED TO 0000 BY A TAD I INSTRUCTION.
/ A HALT OCCURS IF THE REG. IS NOT INCREMENTED TO 0.
/ THE TAD I WOULD HAVE THEN REFERENCED LOC. 7777,
/ WHICH CONTAINS 7777.
/

```

```

1517 1517      DOAUTO, .      /THIS LOC. IS NOT MOVED TO
1520 7200      CLA          /THE EXTENDED FIELD.

```

```

1521 1410      TAD I 10
1522 7440      SEA
1523 7402      HLT          /ERROR, INDEX REG. 10 FAILED
1524 1411      TAD I 11
1525 7440      SEA
1526 7402      HLT          /INDEX REG. 11 FAILED
1527 1412      TAD I 12
1530 7440      SEA
1531 7402      HLT          /12 FAILED
1532 1413      TAD I 13
1533 7440      SEA
1534 7402      HLT          /13 FAILED
1535 1414      TAD I 14
1536 7440      SEA
1537 7402      HLT          /14 FAILED
1540 1415      TAD I 15
1541 7440      SEA
1542 7402      HLT          /15 FAILED
1543 1416      TAD I 16
1544 7440      SEA
1545 7402      HLT          /16 FAILED
1546 1417      TAD I 17
1547 7440      SEA
1550 7402      HLT          /17 FAILED
1551 6201      CDF 00          /SET DF TO FIELD 0
1552 6202      CIF 00          /SET I.B. TO FIELD 0
1553 5310      JMP GOT00      /EXIT TO FIELD 0

```

/END OF TEST ROUTINE

/

/

/

/RING BELL AT THE COMPLETION OF TEST

/CHECK SR1=1 FOR HLT AT END OF TEST

/

```

1554 0007      AND 7
1555 1354      BELL, TAD .-1
1556 6046      TLS          /RING BELL
1557 6041      TSP
1560 5357      JMP .-1
1561 7604      LAS
1562 7004      RAL
1563 7500      SMA
1564 5527      JMP I PLACE      /START TEST OVER
1565 7402      HLT          /END OF TEST
1566 5527      JMP I PLACE      /HIT CONTINUE TO START TEST OVER

```

/TEST 13

/DYNAMIC RMF TEST.

/TESTS ALL SF TO DF TRANSFERS AND THOSE SF TO IB TRANSFERS

/AS APPLICABLE TO THE NUMBER OF EXTENDED FIELDS PRESENT.

/THE GENERAL METHOD IS TO INTERRUPT FROM EACH EXTENDED FIELD

/WITH THE DF=FROM 0 THROUGH 7. AN RMF INSTRUCTION IS THEN ISSUED

/AND CONTROL TRANSFERRED TO AN EXTENDED FIELD. THE RMFDY ROUTINE

/IN THAT FIELD THEN CHECKS THAT THE IF AND DF ARE CORRECT, IF NOT,  
 /THE FAILING IF OR DF IS IN THE IF OR DF REG. AND THE CORRECT FIELD  
 /NUMBER IS IN AC BITS 6 THRU 8.

```

1600      1600
          +1600
          /
          /
1600 7604 RMFTST, LAS
1601 0044      AND      K7
1602 7041      CIA
1603 3209      DCA      IFCN
1604 4700      JMS I    XFERP
1605 0000      IFCN,    0
1606 7744      -34
1607 1702      RMFDY-1
1610 3279      DCA      LBTSTC
1611 1302      TAD      JMP14
1612 3001      DCA      1
1613 1274      TAD      INTP
1614 3004      DCA      4
1615 6201      RMFL3,   CDF      00
1616 3341      DCA      KIFSHB
1617 1205      TAD      IFCN
1620 3276      DCA      RMFCN1
1621 1341      RMFL2,   TAD      KIFSHB
1622 1045      TAD      K10
1623 3341      DCA      KIFSHB
1624 1341      TAD      KIFSHB
1625 7041      CIA
1626 3342      DCA      MIFSHB
1627 1110      TAD      K7770
1630 3277      DCA      DFCN
1631 1110      TAD      K7770
1632 3337      DCA      KDFSHB
1633 1337      RMFL1,   TAD      KDFSHB
1634 1045      TAD      K10
1635 3337      DCA      KDFSHB
1636 1337      TAD      KDFSHB
1637 7041      CIA
1640 3340      DCA      MDFSHB
1641 1205      TAD      IFCN
1642 3244      DCA      .+2
1643 4700      JMS I    XFERP
1644 0000      0
1645 7774      -4
1646 1736      KDFSHB-1
1647 6201      CDF      00

1650 1040      TAD      KCDF
1651 1337      TAD      KDFSHB
1652 3260      DCA      RMFI1
1653 1041      TAD      KCIF
  
```

```

/CHECK HOW MANY EXTENDED FIELDS
/ARE PRESENT
/NEGATE AND SAVE.

/TRANSFER RMFDY ROUTINE TO ALL
/EXTENDED FIELDS.

/SET RMFTST COUNTER FOR 4096 PASSES
/SET INTERRUPT LINK.

/INITIALIZE IF TO 0.
/INITIALIZE TEST COUNTER

/UPDATE CURRENT IF.

/INITIALIZE DF COUNTER TO -10.
/INITIALIZE DF TO -10.
/UPDATE DF.

/TRANSFER DF AND IF INFORMATION
/TO EXTENDED FIELDS.
  
```

1654	1341		TAD	KIFSHB	
1655	3261		DCA	RMF12	
1656	6041	RMFE2,	TSP		/ENSURE T10 FLAG SET.
1657	4422		JMS I	XTFLG	
1660	6201	RMF11,	ODF		/SET DF AND IF TO CURRENT FIELD.
1661	6202	RMF12,	CIF		
1662	5303		JMP	RMFDY	/GO TO RMFDY IN CURRENT IF.
1663	6244	INTE,	RMF		/ENTER FROM INTERRUPT FROM EX. FLD.
1664	5310		JMP	RMFDY1	/GO BACK TO EXTENDED FIELD.
1665	2277	RMFE1,	ISZ	DFCN	/ALL DF'S USED WITH CURRENT IF.
1666	5233		JMP	RMFL1	/NO. DO NEXT DF.
1667	2276		ISZ	RMFCN1	/ONE PASS OF RMFTST COMPLETE?
1670	5221		JMP	RMFL2	/NO. DO NEXT IF.
1671	2275		ISZ	LBTSTC	/RMFTST DONE?
1672	5215		JMP	RMFL3	/NO. DO AGAIN.
1673	5701		JMP I	XMEM	/YES. GO TO NEXT TEST
1674	1663	INTEP,	INTE		
1675	0000	LBTSTC,	0		
1676	0000	RMFCN1,	0		
1677	0000	DFCN,	0		
1700	2000	XFERP,	XFER		
1701	2200	XMEM,	NOMEM		
1702	5404	JMP14,	JMP I 4		
		/			
		/			
		/			
		/			
		/			

/ROUTINE TO CHECK CORRECT TRANSFERS FOR SAVE FIELD TO DATA FIELD AND  
 /SAVE FIELD TO INST. BUFFER TO INSTRUCTION FIELD AFTER  
 /RMF.  
 /STORED IN ALL EXTENDED FIELDS.

1703	6001	RMFDY,	ION		/THIS IS NOT TRANSFERRED.
1704	7000		NOP		
1705	6002		IOF		
1706	7402		HLT		/INTERRUPT FAILURE.
1707	5333		JMP	REPEAT	
1710	7200	RMFDY1,	CLA		
1711	6214		RDF		/CHECK FOR CORRECT DATA FIELD
1712	1340		TAD	MDFSHB	
1713	7650		SNA	CLA	
1714	5320		JMP	.+4	
1715	1337		TAD	KDFSHB	/DATA FIELD INCORRECT
1716	7402		HLT		/SF TO DF TRANSFER FAILED AFTER RMF.
1717	5333		JMP	REPEAT	/REPEAT THIS TEST.
1720	6224		RIF		/CHECK FOR CORRECT INSTRUCTION FIELD.
1721	1342		TAD	MIFSHB	
1722	7650		SNA	CLA	
1723	5327		JMP	.+4	
1724	1341		TAD	KIFSHB	/INSTRUCTION FIELD INCORRECT.
1725	7402		HLT		/SF TO IB TRANSFER FAILED AFTER RMF
1726	5333		JMP	REPEAT	/REPEAT THIS TEST.

1727	6201	CDP	00	
1730	6202	CIF	00	/GO BACK AND RUN NEXT TEST.
1731	5732	JMP I	.+1	
1732	1665	RMFE1		
1733	6201	REPEAT, CDP	00	
1734	6202	CIF	00	/GO BACK AND REPEAT FAILING
1735	5736	JMP I	.+1	/TEST.
1736	1656	RMFE2		
1737	0000	KDFSHB, 0		
1740	0000	MDFSHB, 0		/DATA FIELD SHOULD BE
1741	0000	KIFSHB, 0		/TWO'S COMPLEMENT OF ABOVE.
1742	0000	MIFSHB, 0		/INSTRUCTION FIELD SHOULD BE
				/TWO'S COMPLEMENT OF ABOVE

/ROUTINE TO TRANSFER N1 WORDS STARTING AT P IN FIELD 0 TO P IN THE  
 /NEXT N2 EXTENDED FIELDS,  
 /THE CALLING SEQUENCE IS:  
 /JMS I XFERP  
 /-N2  
 /-N1  
 /P=1

2000	0000	*2000		
2001	7200	XFER,	0	
2002	1600	CLA		
2003	3242	TAD I	XFER	/GET -N2
2004	2200	DCA	N2	
2005	1600	ISE	XFER	/GET -N1
2006	3243	TAD I	XFER	
2007	2200	DCA	N1	
2010	1600	ISE	XFER	/GET P-1
2011	3244	TAD I	XFER	
2012	2200	DCA	P	
2013	1040	ISE	XFER	/UPDATE TO RETURN ADDRESS.
2014	3232	TAD	KCDF	/INITIALIZE CDF INST.
2015	1242	DCA	XFERIN	
2016	3245	TAD	N2	
2017	1244	DCA	XFERC2	
2020	3010	XFERL2, TAD	P	/PUT POINTER IN AUTO 10 AND 11.
2021	1244	DCA	10	
2022	3011	TAD	P	
2023	1243	DCA	11	
2024	3246	TAD	N1	/SET COUNTER 1 TO -N1
2025	1232	DCA	XFERC1	
2026	1045	TAD	XFERIN	/UPDATE CDF INST.
2027	3232	TAD	K10	
		DCA	XFERIN	

```

2030 6201 XFERL1, CDF 00 /TRANSFER
2031 1410 TAD I 10
2032 6201 XFERIN, CDF
2033 3411 DCA I 11
2034 2246 ISZ XFERC1 /DONE WITH CURRENT FIELD?
2035 5230 JMP XFERL1 /NO. CONTINUE.
2036 2245 ISZ XFERC2 /DONE WITH ALL FIELDS?
2037 5217 JMP XFERL2 /NO. DO NEXT FIELD
2040 6201 CDF 00 /ALL DONE. SET DF=0.
2041 5600 JMP I XFER /EXIT.
2042 0000 N2, 0
2043 0000 N1, 0
2044 0000 P, 0
2045 0000 XFERC2, 0
2046 0000 XFERC1, 0

```

```

/
/TEST 06
/NOW DO A READ AND WRITE DATA TEST IN
/ALL AVAILABLE EXTENDED FIELDS.
/IF A FAILURE OCCURS CHECK LOC. 10
/FOR BAD ADDRESS AREA AND LOC. RANA
/FOR THE MOST RECENT FIELD CHANGE.
/LOC. KDATEP CONTAINS DATA PATTERN USED.
/

```

```

2047 0000 DATER, 0000
2050 7300 CLA CLL
2051 4423 JMS I XSTKS
2052 1040 TAD KCDF
2053 1045 TAD K10
2054 3257 DCA RANA /MODIFIED UNDER TEST
2055 7340 CLA CLL CMA
2056 3010 DCA 10 /SET AUTO REGISTER
2057 6201 RANA, CDF
2060 4276 JMS FILL /LOAD UP FIELD WITH DATA
2061 7340 CLA CMA CLL
2062 3010 DCA 10
2063 4312 JMS CHECK /CHECK DATA IN FIELD
2064 7300 CLA CLL
2065 2031 ISZ STKS
2066 7410 SKP
2067 5274 JMP ,+5
2070 1257 TAD RANA
2071 1045 TAD K10
2072 3257 DCA RANA /CHECK NEXT FIELD
2073 5255 JMP RANA -2
2074 6201 CDF
2075 5647 JMP I DATER

```

```

/
/ROUTINE TO FILL FIELD WITH DATA
/

```

```

2076 0000 FILL, 0000
2077 7300 CLA CLL
2100 1157 TAD KDATEP
2101 3410 DCA I 10
2102 1157 TAD KDATEP

```

```

2103 7040      CMA
2104 3410      DCA I 10
2105 1010      TAD 10
2106 7001      IAC
2107 7640      SZA CLA
2110 5277      JMP FILL +1
2111 5676      JMP I FILL

```

/

/ROUTINE TO CHECK DATA IN FIELD

/

```

2112 0000      CHECK, 0000
2113 7300      CLA CLL
2114 1410      TAD I 10
2115 7001      IAC
2116 1410      TAD I 10
2117 7440      SZA          /AC CONTAINS BAD BITS
2120 7402      HLT          /MEMORY CONTROL WORKED BUT
2121 7300      CLA CLL      /DATA PATTERN FAILURE IN
2122 1010      TAD 10      /EXTENDED MEMORY.
2123 7001      IAC
2124 7640      SZA CLA      /IS CHECK DONE
2125 5313      JMP CHECK +1
2126 5712      JMP I CHECK

```

2200 \*2200

/

/TEST 14

/REFERENCE ALL 4K FIELDS NOT PRESENT.

/IF 32K IS PRESENT, THE TEST IS BY-PASSED.

/EACH FIELD NOT PRESENT IS REFERENCED

/BY THE PROGRAM WITH JMP, DCA AND TAD.

/THE PROGRAM MUST CONTINUE IN SEQUENCE

/BELL WILL SIGNAL A SUCCESSFUL TEST

/

```

2200 7200      NOMEM, CLA
2201 1110      TAD K7770
2202 3027      DCA LOOP      /TEST LOOP COUNTER
2203 7604      LAS          /READ SR9-11
2204 0044      AND K7
2205 7041      CIA
2206 1044      TAD K7      /SUBTRACT MAX. POSSIBLE
2207 7450      SNA
2210 5546      JMP I XXSR0    /32K PRESENT. CAN'T TEST
2211 3033      DCA NOSTAK  /SAVE NO. MISSING
2212 3547      DCA I XELL   /CLEAR THE TLS IOT AT
                          /BELL+1 TO PROHIBIT
                          /FALSE INDICATION. TLS
                          /IS RESTORED LATER WRONG
                          /ENTRY FROM NON-EXISTENT

```

2213	7624	LAS	/MEMORY MAY CAUSE A
2214	0044	AND K7	/HANG-UP AT BELL+2 AND +3,
2215	7001	IAC	/# OF FIELDS PRESENT
2216	7100	CLL	
2217	7006	RTL	/+1 TO GET 1ST MISSING
2220	7004	RAL	/POSITION TO AC 6-8,
2221	3034	DCA NOFLD	/1ST MISSING
2222	1033	TAD NOSTAK	/# STACKS NOT HERE
2223	7041	CIA	
2224	3033	DCA NOSTAK	/USED AS COUNTER

2225	1040	TAD KCDF	/6201
2226	1034	TAD NOFLD	/MISSING STACK
2227	3249	DCA CDF0S	

/

/NOW READ ALL 0'S FROM ALL NON-EXISTENT FIELDS

/IF CONTROL PORTION ONLY, RING BELL.

/IF NOT PROCEED TO TIME SHARE.

2230	4244	JMS ALL0	/READ ALL 0 FROM 1ST
2231	2033	CNSTK, ISZ NOSTAK	/DONE ALL MISSING IF SKIP
2232	5237	JMP POS	
2233	2027	ISZ LOOP	/DONE LOOPING IF SKIP
2234	5636	JMP I XNOM	/REPEAT
2235	5546	JMP I XXSR0	

2236	2203	XNOM, NOMEM+3	
2237	1245	POS, TAD CDF0S	
2240	1045	TAD K10	/DF PLUS 1
2241	3249	DCA CDF0S	
2242	4244	JMS ALL0	/READ ALL 0'S
2243	5231	JMP CNSTK	/CHECK DONE

/

/ROUTINE TO READ ALL 0'S.

2244	0000	ALL0, 0	
2245	6201	CDF0S, CDF 00	/SET DF TO 1ST MISSING
2246	7240	CLA CMA	
2247	3010	DCA 10	/10 AND 11 USED FOR ADDRESS
2250	7040	CMA	
2251	3011	DCA 11	
2252	3002	DCA 2	/USE AS COUNTER
2253	7040	CMA	
2254	3410	DCA : 10	/WRITE 1'S INTO NON-EXIS-
			/TENT FIELD.
2255	2022	ISZ 2	

```

2256 5253          JMP , -3
2257 1411          TAD I 11          /READ NON-EXIST. FIELD
2260 7650          SNA CLA          /SHOULD = 0000
2261 5264          JMP , +3
2262 1011          TAD 11
2263 7402          CAX, HLT          /ERROR. AN EXISTING FIELD
                                          /WAS REFERENCED. C(AC)=
                                          /ADDRESS REFERENCED

2264 2002          ISZ 2
2265 5257          JMP CAX-4          /READ NEXT

/
2266 6201          DONE0, CDF 00
2267 6202          CIF 00
2270 5644          JMP I ALL0          /EXIT

/
/TEST 04

/TEST GTF FOR FLAG AND SAVE FIELDS
/GET SAVE FIELDS AFTER INTERRUPT
/CHECK INTERRUPT INHIBIT, DO ALL
/COMBINATIONS 0 TO 7.
/
2271 7300          GTF1, CLA CLL
2272 1020          TAD JMP10          /SET FOR RETURN
2273 3001          DCA 1
2274 1040          TAD KCDF
2275 3304          DCA XSDF
2276 1304          MGTF, TAD XSDF          /GET FIRST FIELD
2277 0111          AND K0070
2300 7120          STL
2301 7010          RAR
2302 7012          RTR
2303 3112          DCA XSAV
2304 6201          XSDF, CDF 00
2305 6041          TSF
2306 4422          JMS I XTFLG          /IS TTY FLAG SET
2307 6001          ION          /GET THE FLAG
2310 7340          CLA CLL CMA          /CHECK FOR JAM ON GTF
2311 6004          GTF          /GET THE FLAGS
2312 7041          CIA
2313 1112          TAD XSAV          /TTY + CURRENT FIELD
2314 7440          SZA
2315 7402          HLT          /FLAG + FIELD
2316 2027          ISZ LOOP          /4096 TIMES
2317 5276          JMP MGTF
2320 1045          TAD K10
2321 1304          TAD XSDF
2322 3304          DCA XSDF
2323 2113          ISZ XCOUNT          /MORE FIELDS TO CHECK
2324 5276          JMP MGTF
2325 1110          TAD K7770
2326 3113          DCA XCOUNT
2327 5730          JMP I XION1          /YES. GO TO NEXT TEST

```

```

2330 2331 XION1, ION1
/
/TEST 05
/TEST ION AND LINK FROM RTF
/TEST INTERRUPT INHIBIT BEFORE PI
/GET THE FLAGS WITH GTF.
/
2331 7300 ION1, CLA CLL
2332 1021 TAD ISZ0
2333 3001 DCA 1
2334 1020 TAD JMP10
2335 3002 DCA 2
2336 6005 RTF
2337 5340 JMP .+1
2340 7402 HLT
2341 7300 CLA CLL /WAS INT, INH.
2342 1115 TAD K5200
2343 6005 RTF
2344 7240 CLA CMA /CHECK FOR JAM ON GTF
2345 6004 GTF /GET LINK,ION,TTY FLAG
2346 7041 CIA
2347 1115 TAD K5200 /EXPECTED BITS
2350 7440 SZA
2351 7402 HLT /WAS LINK,ION,TTY FLAG SET
2352 7300 CLA CLL
2353 6005 RTF /REPLACE ION,INT INH
2354 7300 CLA CLL
2355 6004 CIA
2356 7041 CIA
2357 1115 TAD K1200
2360 7440 SZA
2361 7402 HLT /TTY FLAG,ION,NO LINK
2362 5363 JMP .+1
2363 7402 HLT /WAS INT INH
2364 7300 CLA CLL
2365 2027 ISZ LOOP /4096 TIMES
2366 5331 JMP ION1
2367 4555 JMS I XDATER /GO TO NEXT TEST
2370 4773 JMS I XCON1 /GO TO NEXT TEST
2371 5772 JMP I XRTF1 /GO TO NEXT TEST
2372 2400 XRTF1, RTF1
2373 4000 XCON1, CON1
/
/TEST 08
/TEST DF00 + IF00 FROM SAVE FIELD AFTER PI
/USE RTF TO SET THE FLAGS AND GTF TO GET THE FLAGS
/CHECK INTERRUPT INHIBIT. DO ALL SAVE
/FIELD COMBINATIONS 0 TO 77.
/
2400 *2400
/
2400 7300 RTF1, CLA CLL
2401 4422 JMS I XTFLG /SET TTY FLAG
2402 1021 TAD ISZ7
2403 3001 DCA 1

```

```

2404 1020      TAD JMP10
2405 3002      DCA 2
2406 3114      DCA XTOR
2407 1114      XSRTF, TAD XTOR
2410 6009      RTF          /MAKE DF 00 + IF 00
2411 5212      JMP ,+1
2412 7402      HLT          /WAS INT INH
2413 7300      CLA CLL
2414 6004      GTF          /GET THE FLAGS
2415 0117      AND K0077
2416 7041      CIA
2417 1114      TAD XTOR      /EXPECTED BITS
2420 7440      SZA
2421 7402      HLT          /WAS DF + IF SET
2422 2027      ISZ LOOP      /4096 TIMES
2423 5207      JMP XSRTF
2424 1114      TAD XTOR
2425 1120      TAD K0011
2426 3114      DCA XTOR
2427 2113      ISZ XCOUNT
2430 5207      JMP XSRTF      /DO THE REST DF 00 + IF 00
2431 1110      TAD K7770
2432 3113      DCA XCOUNT
2433 5634      JMP I XRIG1
2434 2452      XRIG1, RIG1
2435 0000      NSTKS, 0
/
2436 7604      LAR          /READ SR 9-11
2437 0044      AND K7
2440 7041      CIA
2441 3031      DCA STKS
2442 5635      JMP I NSTKS
/
/SET TTY FLAG
/
2443 0000      TFLG, 0
2444 7200      CLA
2445 6040      SPF
2446 6041      TSF
2447 5246      JMP ,.-1
2450 7200      CLA
2451 5643      JMP I TFLG      /EXIT
/
/TEST 09
/TEST PROGRAM INTERRUPT IN EXISTING FIELDS
/USE RTF, GTF, RDF AND RIF FOR CHECK
/CHECK PC, AC, SF AND FLAGS AFTER PI
/IF FAILURE OCCURS CHECK XDATA FOR AC DATA,
/LOC. 0 FIELD 0 FOR CORRECT PC AFTER PI,
/AND IFDF FOR CORRECT DF XX + IF XX,
/PROGRAM SHOULD INTERRUPT INHIBIT TILL JMP I ADRS
/IF PI FAILS TO INTERRUPT HLT IN THAT FIELD
/
2452 7300      RIG1, CLA CLL
2453 4423      JMS I XSTKS

```

2454	1120		TAD K0011	
2455	3260		DCA IFDF	
2456	1132		TAD K0017	
2457	3010		DCA 0010	
2460	0000	IFDF,	0000	/SET TO CURRENT FIELD UNDER TEST
2461	7300		CLA CLL	
2462	1260		TAD IFDF	
2463	6005		RTF	/SET FIELDS AND TURN ION
2464	6002		IOP	
2465	7300		CLA CLL	
2466	2537		ISZ I K0000	
2467	7000		NOP	
2470	1537		TAD I K0000	
2471	3136		DCA XDATA	
2472	1124		TAD K7402	
2473	3541		DCA I K0001	/STORE A HLT IN LOC 1 OF THAT FIELD
2474	1133		TAD K6001	
2475	3410		DCA I 0010	/ION FOR THAT FIELD
2476	1130		TAD K1000	
2477	3410		DCA I 0010	/TAD FOR THAT FIELD
2500	1124		TAD K7402	
2501	3410		DCA I 0010	/HLT FOR FAILURE
2502	1010		TAD 10	
2503	1097		TAD K7776	
2504	3310		DCA ADRS	
2505	1134		TAD JMP IR	
2506	3001		DCA 0001	/SET LOC 1 FOR RETURN AFTER PI
2507	5710		JMP I .+1	/GO TO THAT FIELD
2510	0000	ADRS,	0000	
2511	7041	RET,	CIA	
2512	1136		TAD XDATA	
2513	7440		SEA	
2514	7402		HLT	/AC DATA FAILED DURING PI
2515	1000		TAD 0000	
2516	7041		CIA	
2517	1010		TAD 0010	
2520	7440		SEA	
2521	7402		HLT	/PC FAILED DURING PI
2522	6214		RDF	
2523	6224		RIF	
2524	7640		SEA CLA	
2525	7402		HLT	/SHOULD BE 0 AFTER PI
2526	6004		GTF	
2527	0117		AND K0077	
2530	7041		CIA	
2531	1260		TAD IFDF	
2532	7440		SEA	
2533	7402		HLT	/GTF OR RTF OR SF FAILED
2534	1010		TAD 0010	
2535	7001		IAC	
2536	7640		SEA CLA	
2537	5261		JMP IFDF+1	
2540	2031		ISZ STKS	
2541	7410		SKP	
2542	5750		JMP I XTRMF	

```

2543 7300      CLA CLL
2544 1120      TAD K0011
2545 1200      TAD IFDF
2546 3200      DCA IFDF          /SET FOR NEXT FIELD
2547 5256      JMP IFDF -2
2550 1050      XTRMF, TRMF
/

```

```

/TEST 15
/TEST TIME SHARE IN FIELD 0.
/ALL HLT, OSR, AND IOT INSTRUCTIONS
/SHOULD TRAP IN USER MODE.
/

```

2600

\*2600

```

2600 7300      T1, CLA CLL
2601 6007      CAF Clear all flags
2602 6264      CUF clear user flag
2603 6204      CINT Clear user int.
2604 1021      -TAD ISZ0 2000(ISZ)
2605 3001      DCA 1
2606 1020      -TAD JMP10 5400 (adv. given in 0000)
2607 3002      DCA 2
2610 6007      CAF clear all flags.
2611 7410      SKP
2612 5212      JMP .          /CAF TRAPED
2613 6001      ION
2614 7410      SKP
2615 5215      JMP .          /ION TRAPED
2616 6032      KCC
2617 7410      SKP
2620 5220      JMP .          /KCC TRAPED
2621 6002      IOF
2622 7410      SKP
2623 5223      JMP .          /IOF TRAPED
2624 6004      GTF
2625 7410      SKP
2626 5226      JMP .          /GTF TRAPED

```

Exec mode  
none should trap.

/THESE INSTRUCTIONS SHOULD TRAP

```

2627 6001      T2, ION Turn Interrupt enable on
2630 6274      CUF+10 = SUF /USER MODE set user flag
2631 5232      JMP .*1 allow user interrupt
2632 7402      HLT Trap and interrupt, go to 0000, 0001, 0002, return to 6254
2633 5233      JMP .          /HLT DID NOT TRAP

```

/EXECUTIVE MODE

```

2634 6254      SINT /SKIP ON TRAP FLAG skip on user interrupt.
2635 5235      JMP . /FLAG NOT UP
2636 6204      CINT /CLEAR TRAP FLAG clear user interrupt
2637 6254      SINT /SKIP ON TRAP FLAG skip on user interrupt.
2640 7410      SKP
2641 5241      JMP . /TRAP FLAG STILL SET
2642 7604      LAS /SHOULD NOT TRAP
2643 7410      SKP
2644 5244      JMP . /LAS TRAPED IN EXECUTIVE MODE

```

*This works*

No Int 2645 6244  
 No Int, I ON 2646 6001  
 2647 5250

I ON, UM 2650 7404  
 2651 9251

*Interrupts (INT, ION) BUS*

*INT BUS*

*no lights*

*Doesn't clear*

*flag up but this works*

2652 6254  
 2653 5253  
 2654 6007  
 2655 6254  
 2656 7410  
 2657 7402  
 2660 7404  
 2661 7410  
 2662 5262  
 2663 6244  
 2664 6001  
 2665 5266

2666 6005  
 2667 5267

2670 6254  
 2671 5271  
 2672 6204  
 2673 6254  
 2674 7410  
 2675 7402  
 2676 6004  
 2677 7410  
 2700 5300  
 2701 6244  
 2702 6001  
 2703 5304

2704 6001  
 2705 5305

2706 6254  
 2707 5307  
 2710 7300  
 2711 6004  
 2712 6126  
 2713 7450  
 2714 7402  
 2715 6204  
 2716 6254  
 2717 7410  
 2720 7402  
 2721 6002  
 2722 7410

```

RMF
ION
JMP .+1
/USER MODE
OSR
JMP .
/EXECUTIVE MODE
SINT
JMP .
CAF
SINT
SKP
HLT
OSR
SKP
JMP .
RMF
ION
JMP .+1
/USER MODE
RTF
JMP .
/EXECUTIVE MODE
SINT
JMP .
CINT
SINT
SKP
HLT
GTF
SKP
JMP .
RMF
ION
JMP .+1
/USER MODE
ION
JMP .
/EXECUTIVE MODE
SINT
JMP .
CLA CLL
GTF
AND K0120
SNA
HLT
CINT
SINT
SKP
HLT
IOF
SKP
  
```

/RESTORE USER *Restore user mode, as saved during interrupt. enable interrupt when jmp. (no int until then)*

/GO TO USER

/SHOULD TRAP ON OSR  
 /DID NOT TRAP

/SKIP ON TRAP FLAG  
 /DID NOT SKIP  
 /CLEAR TRAP FLAG  
 /TEST IF CLEARED

/TRAP FLAG NOT CLEARED  
 /SHOULD NOT TRAP

/ORS TRAPED IN EXECUTIVE MODE  
 /RESTORE MODE  
 /GO TN USER

/MAKE THE FLAGS  
 /RTF FAILED TO TRAP

/TRAP FLAG NOT SET  
 /CLEAR TRAP FLAG  
 /TEST IF CLEARED

/TRAP FLAG NOT CLEARED  
 /SHOULD NOT TRAP

/TRAPED IN EXECUTIVE MODE  
 /RESTORE MODE

/GO TO USER

/ION DID NOT TRAP

/SKIP ON TRAP FLAG  
 /TRAP FLAG NOT SET

/SUF NOT SET  
 /CLEAR TRAP FLAG  
 /TEST IF CLEARED

/FLAG NOT CLEARED  
 /SHOULD NOT TRAP

*INT is trap flag BUS*

*Trap & causes interrupt*

*should clear INT BUS*

2723	5323	JMP .	/IOF TRAPED IN EXECUTIVE MODE
2724	6244	RMF	/RESTORE MODE <del>Restore memory field (if used above)</del>
2725	6001	ION	enable interrupt
2726	5327	JMP .+1	/GO TO USER
		/USER MODE	
		/TEST CUF AND CUF+10	
2727	7604	LAS	
2730	5330	JMP .	/DID NOT TRAP
		/EXECUTIVE MODE	
2731	6204	CINT	
2732	6244	RMF	
2733	6264	CUF	/STAY IN EXECUTIVE MODE
2734	6001	ION	
2735	5336	JMP .+1	
2736	7404	OSR	
2737	7410	SKP	
2740	5340	JMP .	/CUF DID NOT WORK
		/TEST THAT INSTRUCTION ARE INHIBITED WHILE IN USER MODE	
2741	6204	CINT	
2742	6274	CUF+10	/SET USER
2743	6001	ION	
2744	5345	JMP .+1	/GO TO USER
		/USER MODE	
2745	7240	CMA CLA	/AC=7777
2746	7604	LAS	/SHOULD CLEAR AC
2747	5347	JMP .	/DID LAS TRAP
		/EXECUTIVE MODE	
2750	7440	SZA	
2751	7402	HLT	/LAS CHANGED AC
2752	6204	CINT	
2753	6244	RMF	
2754	6001	ION	
2755	5356	JMP .+1	
		/USER MODE	
2756	7200	CLA	
2757	7404	OSR	/SHOULD NOT READ SR
2760	5360	JMP .	
		/EXECUTIVE MODE	
2761	7440	SZA	
2762	7402	HLT	/OSR CHANGED AC
2763	6204	CINT	
2764	6244	RMF	
2765	6001	ION	
2766	5367	JMP .+1	
		/USER MODE	
2767	7240	CLA CMA	
2770	7602	HLT CLA	/SHOULD CLA
2771	5371	JMP .	/DID HLT TRAP
		/EXECUTIVE MODE	
2772	7440	SZA	
2773	7402	HLT	/(HLT CLA) DID NOT CLEAR
2774	6204	CINT	
2775	6003	SRC	
2776	7410	SKP	

*Restore user mode as saved for user buffer during interrupt*

```

2777 7402          HLT          /INTERRUPT REQUEST
3000 7300          CLA CLL
3001 1146          TAD K0100
3002 6005          RTF          /ENABLE USER

3003 6001          ION
3004 7000          NOP
3005 5206          JMP .+1
                /USER MODE
3006 6032          KCC
3007 5207          JMP ,          /DID KCC TRAP
                /EXECUTIVE MODE
3010 6003          SRQ          /IS USER FLAG SET

3011 5210          JMP .-1
3012 6204          CINT
3013 7300          CLA CLL
3014 1146          TAD K0100
3015 6005          RTF
3016 7300          CLA CLL
3017 6001          ION
3020 5221          JMP .+1          /ENTER USER
                /USER MODE
3021 6004          GTF
3022 5222          JMP .          /DID GTF TRAP
                /EXECUTIVE MODE
3023 0146          AND K0100
3024 7440          SZA          /DID GTF GET USER
3025 7402          HLT
3026 6003          SRQ          /IS USER FLAG SET
3027 5226          JMP .-1
3030 6204          CINT
3031 6244          RMF
3032 6001          ION
3033 5234          JMP .+1
                /USER MODE
3034 6004          GTF
3035 5235          JMP .          /GTF DID NOT TRAP
                /EXECUTIVE MODE
3036 6254          SINT          /SKIP ON TRAP FLAG
3037 5237          JMP .          /FLAG NOT UP
3040 6204          CINT          /CLEAR TRAP FLAG
3041 6254          SINT          /SKIP ON TRAP FLAG
3042 7410          SKP
3043 5243          JMP .          /TRAP FLAG STILL SET
3044 6001          ION
3045 7410          SKP
3046 5246          JMP .          /ION TRAPED IN EXECUTIVE MODE
3047 6244          RMF          /RESTORE USER
3050 5251          JMP .+1          /GO TO USER
                /USER MODE
3051 6202          CIF          /SHOULD TRAP ON CIF
3052 5252          JMP .          /DID NOT TRAP
                /EXECUTIVE MODE
3053 6254          SINT          /SKIP ON TRAP FLAG

```

```

3054 5254      JMP .           /DID NOT SKIP
3055 6204      CINT          /CLEAR TRAP FLAG
3056 6254      SINT          /TEST IF CLEARED
3057 7410      SKP
3060 7402      HLT          /TRAP FLAG NOT CLEARED
3061 6202      CIF          /SHOULD NOT TRAP
3062 7410      SKP
3063 5263      JMP .           /CIF TRAPED IN EXECUTIVE MODE
3064 6244      RMF          /RESTORE MODE
3065 6001      ION
3066 5267      JMP .+1       /GO TO USER

```

```

/USER MODE
3067 6214      RDF          /READ DATA FIELD
3070 5270      JMP .           /DID RDF TRAP
/EXECUTIVE MODE
3071 6254      SINT
3072 5272      JMP .           /TRAP FLAG NOT SET
3073 6204      CINT          /CLEAR TRAP FLAG
3074 6254      SINT          /TEST IF CLEARED
3075 7410      SKP
3076 7402      HLT          /TRAP FLAG NOT CLEARED
3077 6214      RDF          /SHOULD NOT TRAP
3100 7410      SKP
3101 5301      JMP .           /TRAPED IN EXECUTIVE MODE
/EXECUTIVE MODE
3102 6040      SPF          /FLAG SHOULD WORK
3103 6041      TSF
3104 5303      JMP .-1        /SHOULD SKP
3105 6003      SRQ
3106 5305      JMP .-1        /SHOULD SKP
3107 6001      ION
3110 7300      CLA CLL
3111 5311      JMP .           /DID PI WORK
3112 1126      TAD K0100
3113 6005      RTF
3114 6007      CAF
3115 6001      ION
3116 5317      JMP .+1
/USER MODE
3117 6007      CAF
3120 5320      JMP .           /DID CAF TRAP
/EXECUTIVE MODE
3121 6003      SRQ
3122 7402      HLT          /USER FLAG UP
3123 6007      CAF
3124 6254      SINT
3125 7410      SKP
3126 7402      HLT          /FLAG CLEARED
/TEST THAT TTI DOES NOT CHANGE AC
3127 7240      CLA CMA      /AC=7777
3130 7120      STL          /LINK=1

```

```

3131 6274          CUF+10
3132 6021          ION
3133 5334          JMP .+1
                /USER MODE
3134 6036          KRB          /SHOULD NOT ZERO LINK OR SHIFT AC
3135 5335          JMP .
                /EXECUTIVE MODE
3136 7040          CMA
3137 7440          SZA          /AC SHOULD=0000
3140 5340          JMP .          /AC WAS CHANGED
3141 7420          SNL          /LINK SHOULD EQUAL 1
3142 5342          JMP .          /LINK WAS CHANGE
3143 6254          SINT          /SKIP ON TRAP FLAG
3144 5344          JMP .          /TRAP FLAG NOT SET
3145 6224          CINT
3146 6244          RMF
3147 6021          ION
3150 5351          JMP .+1
                /USER MODE
3151 6040          SPF          /FLAG
3152 5352          JMP .          /DID SPF TRAP
                /EXECUTIVE MODE
3153 6041          TSF
3154 7410          SKP
3155 7422          HLT          /TTY FLAG
3156 6254          SINT
3157 5357          JMP .          /TRAP FLAG NOT SET
3160 6224          CINT          /CLEAR TRAP FLAG
3161 6244          RMF
3162 6021          ION
3163 5764          JMP I .+1      /GO TO USER
3164 3200          . 177+1
                *. 177+1
                /USER MODE
3200 6021          ION
3201 5221          JMP .          /ION DID NOT TRAP
                /EXECUTIVE MODE
3202 6254          SINT          /SKIP ON TRAP FLAG
3203 5223          JMP .          /TRAP FLAG NOT SET
3204 6224          CINT          /CLEAR TRAP FLAG
3205 6254          SINT          /TEST IF CLEARED
3206 7410          SKP
3207 7422          HLT          /FLAG NOT CLEARED
3210 6022          IOF          /SHOULD NOT TRAP
3211 7410          SKP
3212 5212          JMP .          /IOF TRAPED IN EXECUTIVE MODE
3213 6244          RMF          /RESTORE MODE
3214 6021          ION
3215 5216          JMP .+1      /GO TO USER
                /USER MODE
                /TEST CUF AND CUF+10
3216 6224          RIF

```

```

3217 5217          JMP .           /DID NOT TRAP
          /EXECUTIVE MODE
3220 6204          CINT
3221 6244          RMF
3222 6264          CUF           /STAY IN EXECUTIVE MODE
3223 5224          JMP .+1
3224 7404          OSR
3225 7410          SKP
3226 5226          JMP .           /CUF DID NOT WORK
          /EXECUTIVE MODE
3227 7240          CLA CMA
3230 6274          CUF +10       /SET UP USER
3231 6001          ION
3232 5233          JMP .+1
          /USER MODE
3233 7402          HLT           /SHOULD TRAP
3234 5234          JMP .           /DID HLT TRAP
          /EXECUTIVE MODE
3235 6203          CDF CIF
3236 6264          CUF           /SETUP FOR EXECUTIVE
3237 6204          CINT         /CLEAR INTERRUPT
3240 6001          ION
3241 5242          JMP .+1
3242 7604          LAS           /SHOULD NOT TRAP
3243 7410          SKP
3244 5244          JMP .
3245 7450          SNA           /SR AND AC SHOULD NOT EQUAL ZERO
3246 5246          JMP .           /LAS WAS INHIBITED

          /TEST HLT AND SKIP
3247 6274          CUF+10       /USER SETUP
3250 6001          ION
3251 5252          JMP .+1       /GO TO USER
          /USER MODE
3252 7412          SKP HLT       /SHOULD TRAP
3253 5253          JMP .         /DID NOT TRAP
3254 5254          JMP .         /SKP DID NOT INDEX PC.
          /EXECUTIVE MODE
3255 6254          SINT         /SKP ON TRAP FLAG
3256 5256          JMP .
3257 6204          CINT         /CLEAR FLAG
3260 6254          SINT         /IS IT CLEAR
3261 7410          SKP         /YES
3262 5262          JMP .         /NO-FLAG NO CLEAR

          /LOOP PROGRAM
3263 2266          ISZ .+3       /DO FIRST SECTION 4096
3264 5531          JMP I TIME
3265 7410          SKP
3266 0000          0           /COUNT FOR LOOP
3267 5670          JMP I .+1
3270 3400          . 177+1

```

```

/TEST THAT ALL IOTS TRAP IN USER MODE
3400 7200          CLA
3401 1125          TAD K6000      /BASIC IOT
3402 3207          DCA INST      /SET UP
3403 6274          IOTST, CUF+10  /SET FOR USER
3404 6204          CINT          /CLEAR FLAG
3405 6001          ION
3406 5207          JMP .+1        /GO TO USER MODE

/USER MODE
3407 6000          INST, 6000     /IOT THAT FAILED
3410 5210          JMP .          /IOT DID NOT TRAP

/EXECUTIVE MODE
3411 6254          SINT          /SKIP ON TRAP FLAG
3412 5212          JMP .          /TRAP FLAG NOT SET
3413 6204          CINT          /CLEAR FLAG
3414 6254          SINT
3415 7610          SKP CLA
3416 7402          HLT           /FLAG DID NOT CLEAR
3417 2207          ISZ INST      /CREATE NEW INSTRUCTION
3420 1207          TAD INST      /TESTED ALL IOT?
3421 0130          AND K1000
3422 7650          SNA CLA
3423 5203          JMP IOTST     /NO -- TEST THE REST

/TEST THAT ALL (HLT AND OSR) TRAP IN USER MODE
3424 1124          TAD K7402     /BASIC HALT INST
3425 3232          DCA INSTA     /SET UP
3426 6274          HALTA, CUF+10 /SET FOR USER
3427 6204          CINT          /CLEAR FLAG
3430 6001          ION
3431 5232          JMP .+1        /GO TO USER MODE

/USER MODE
3432 7406          INSTA, HLT OSR /OPERATE TRAP INST
3433 5233          JMP .          /DID NOT TRAP

/EXECUTIVE MODE
3434 7000          NOP           /FOR (HLT,SKP)(OSR,SKP)
3435 6254          SINT          /SKIP ON TRAP FLAG
3436 5236          JMP .          /TRAP FLAG NOT SET
3437 6204          CINT          /CLEAR FLAG
3440 6254          SINT
3441 7610          SKP CLA
3442 7402          HLT           /FLAG DID NOT CLEAR
3443 1232          TAD INSTA
3444 1123          TAD K0024     /GENERATE ALL GROUPS OF
3445 3232          DCA INSTA     /HALTS AND OSR
3446 1232          TAD INSTA
3447 1122          TAD K0002
3450 7640          SZA CLA       /GENERATED ALL
3451 5226          JMP HALTA     /NO - TEST THE REST
3452 6244          RMF
3453 6264          CUF
3454 6001          ION
3455 5256          JMP .+1
3456 6002          IOF          /SHOULD NOT TRAP

```

```

3457 6254          SINT
3460 7410          SKP
3461 7402          HLT          /TRAP FLAG SET
3462 6040          SPF
3463 6041          TSF          /SHOULD SKP
3464 5263          JMP      -1
3465 6001          ION
3466 7410          SKP
3467 7402          HLT          /DID PI INTERRUPT
3470 7402          HLT          /DID PC INCR.

3471 7300          CLA CLL
3472 6004          GTF
3473 0126          AND K0100
3474 7440          SZA
3475 7402          HLT          /SUF SET
3476 7300          CLA CLL
3477 6007          CAF
3500 6264          CUF
3501 7000          NOP

/
/TEST 16
/TEST TIME SHARE IN EXTENDED MEMORY
/NOW TEST USER MODE TRAP IN ALL EXTENDED FIELDS
/IF TRAP ERROR OCCURS HLT IN THAT FIELD
/USE RTF TO SET USER MODE AND GTF TO GET THE FLAGS
/TEST ALL IOT'S FOR TRAP AND RETURN
/
3502 7300          RIG2,    CLA CLL
3503 6007          CAF
3504 4423          JMS I XSTKS      /CHECK NO. OF FIELDS PRESENT
3505 1040          TAD KCDF
3506 1045          TAD K10
3507 3335          DCA SRD          /SET DF FOR FIRST FIELD
3510 1041          TAD KCIF
3511 1045          TAD K10
3512 3347          DCA SRI          /SET IF FOR FIRST FIELD
3513 1144          STAN,    TAD K3577      /GET START OF PROGRAM -1
3514 3010          DCA I0
3515 1145          TAD K7745      /NO. OF INSTRUCTIONS TO TRANSFER
3516 3143          DCA SRCO
3517 7040          CMA
3520 3011          DCA 11          /START AT 0000

3521 1335          TAD SRD          /MAKE FLAGS FOR RETURN CHECK
3522 0111          AND K0070
3523 7010          RAR
3524 7012          RTR
3525 3112          DCA XSAV
3526 1347          TAD SRI
3527 0111          AND K0070
3530 1112          TAD XSAV
3531 1142          TAD K1100
3532 3776          DCA I XFDCON
3533 6201          CDF 00

```

```

3534 1410      TAD I 10
3535 6201      SRD,   CDF 00
3536 3411      DCA I 11      /STORE INSTRUCTIONS
3537 2143      ISZ SR00
3540 5333      JMP SR0-2
3541 1021      TAD ISZ0
3542 3001      DCA 1        /SET FIELD 0 FOR RETURN
3543 1347      TAD SRI
3544 3002      DCA 2
3545 1020      TAD JMP10
3546 3003      DCA 3
3547 6202      SRI,   CIF 00
3550 5002      JMP 2        /GO TO FIELD UNDER TEST
3551 7300      SRRET,  CLA CLL
3552 2031      ISZ STKS
3553 7410      SKP        /MORE FIELDS
3554 5364      JMP EXITT   /GO TO CONTROL
3555 1335      TAD SR0    /SET UP FOR NEXT FIELD
3556 1045      TAD K10
3557 3335      DCA SR0
3560 1347      TAD SRI
3561 1045      TAD K10
3562 3347      DCA SRI
3563 5313      JMP STAN    /TEST THIS FIELD
3564 7300      EXITT,  CLA CLL   /TEST DONE GO TO BEGIN
3565 6007      CAF
3566 6264      CUF
3567 1151      TAD ITB
3570 3547      DCA I XELL
3571 7604      LAS
3572 7700      SMA CLA
3573 5550      JMP I XBELL
3574 7402      HLT        /TIME SHARE ENABLED
                               /AN ERROR CONDITION EXISTS.
                               /HIT CONTINUE TRY AGAIN
3575 5552      JMP I XTRAP
3576 3632      XFDCON, FDCON
/
/INSTRUCTIONS TO BE TRANSFERED TO FIELDS
/
3600          *3600
/
3600 7402      HLT        /SHOULD NOT HLT HERE
3601 7402      HLT        /SHOULD NOT TRAP HERE
3602 7300      FDGO,   CLA CLL
3603 1232      TAD FDCON  /GET USER BIT
3604 6005      RTF        /SET FOR USER
3605 5206      JMP .+1    /GO TO USER
/USER MODE
3606 6000      IOTX,   IOT
3607 5207      JMP .      /DID IOT TRAP
/EXECUTIVE MODE
3610 7300      CLA CLL
3611 6004      GTF        /GET THE FLAGS
3612 7041      CIA
3613 1232      TAD FDCON  /FLAGS THAT SHOULD BE PRESENT

```

```

3614 7640      SZA CLA
3615 7402      HLT                      /CHECK THE FLAGS
3616 6003      SRQ
3617 5216      JMP .-1                      /IS TRAP FLAG SET
3620 6204      CINT
3621 2206      ISZ IOTX
3622 1206      TAD IOTX
3623 1251      TAD F1000
3624 7640      SZA CLA
3625 5202      JMP FDGO
3626 6202      CIF
3627 5630      JMP I FRET                      /TEST DONE GO TO FIELD 2
3630 3551      FRET, SRRET
3631 1000      F1000, 1000
3632 0000      FDCON, 0000
/
/ CHECK SR0=1 FOR MEMORY EXTENSION ONLY
/
3633 7300      XSR0, CLA CLL
3634 7604      LAS
3635 7700      SMA CLA
3636 5531      JMP I TIME
3637 6007      CAF
3640 1151      TAD TTB
3641 3547      DCA I XBELL
3642 5550      JMP I XBELL
/
3643 7300      TRAP, CLA CLL
3644 1153      TAD ATRAP
3645 3001      DCA 1                      /SET FOR RETURN
3646 6274      SUF                      /SET FOR USER
3647 6001      ION
3650 5251      JMP .+1                      /GO TO USER
3651 7402      HLT                      /TIME SHARE DISABLED, HIT
3652 6254      SINT                      /CONTINUE TO LOOP ON CONTROL.
3653 7410      SKP
3654 7402      HLT                      /ERROR, TRAP INT, RQST. UP
3655 6264      CUF
3656 6007      CAF
3657 5527      JMP I PLACE                      /GO TO BEGIN
/
/TEST 07
/CONFIDENCE CHECK ON ALL EXISTENT FIELDS.
/MAKE SURE DCA I AND TAD I ARE TO CORRECT STACK.
/MAKE SURE JUMP IS TO CORRECT STACK.
/CHECK ALL COMBINATIONS.
/FIELDS WILL CONTAIN THEIR DF NUMBER IN LCC.
/
4000          *4000
/
4000 0000      CON1, 0000                      /FIRST FILL CORE, ALL STACKS
4001 7300      CLA CLL                      /DCA I FOR 32K
4002 3323      DCA F0NUM
4003 3324      DCA NUMX
4004 1040      TAD KCDF

```

4005	3252		DCA CONX	
4006	1110		TAD K7770	
4007	3327		DCA MSTKS	/SET FOR MAX. 32K
4010	1110		TAD K7770	
4011	3031		DCA STKS	
4012	1040		TAD KCDF	
4013	3214		DCA .+1	
4014	6201	FDWRD,	CDF	/MODIFIED UNDER TEST
4015	4307		JMS FILCOR	
4016	2031		ISZ STKS	/ARE ALL STACKS DONE
4017	5222		JMP .+3	
4020	4252		JMS CONCHK	/CHECK RESULTS
4021	5227		JMP CON2	
4022	1045		TAD K10	
4023	1214		TAD FDWRD	
4024	3214		DCA FDWRD	/UPDATE FIELD CHANGE
4025	2324		ISZ NUMX	
4026	5214		JMP FDWRD	
/				
4027	7300	CON2,	CLA CLL	/DO ONE AT A TIME
4030	1323		TAD FDNUM	
4031	3324		DCA NUMX	
4032	6201	CONX,	CDF	
4033	4307		JMS FILCOR	
4034	6203		CDF CIF	
4035	4252		JMS CONCHK	
4036	7300		CLA CLL	
4037	1232		TAD CONX	
4040	1045		TAD K10	
4041	3232		DCA CONX	/UPDATE FIELD CHANGE
4042	2323		ISZ FDNUM	
4043	2327		ISZ MSTKS	/ARE ALL STACKS DONE
4044	5227		JMP CON2	
4045	6203		CDF CIF	
4046	6007		CAF	
4047	2027		ISZ LOOP	/DO 4096 TIMES
4050	5201		JMP CON1 +1	
4051	5600		JMP I CON1	/TEST COMPLETE
/				
4052	0000	CONCHK,	0000	/CHECK ALL AVAILABLE STACKS
4053	7300		CLA CLL	
4054	3324		DCA NUMX	
4055	7604		LAS	
4056	0044		AND K7	
4057	7040		CMA	
4060	3031		DCA STKS	/STACKS PRESENT
4061	1041		TAD KCIF	
4062	3263		DCA .+1	/START WITH FIELD 0
4063	6202	CONCH,	CIF	/MODIFIED UNDER TEST
4064	5541		JMP I K2001	
4065	7041	RETADD,	CIA	/RETURN HERE FROM FIELDS
4066	1324		TAD NUMX	
4067	7450		SNA	
4070	5276		JMP .+6	/GOOD FIELD
4071	3112		DCA XSAV	

4072	1263	TAD CONCH	
4073	0111	AND K0070	
4074	1112	TAD XSAV	/INCORRECT STACK REFERENCED,
4075	7402	HLT	/AC BITS 6-8 GOOD FIELD,
4076	7300	CLA CLL	/AC BITS 9-11 BAD FIELD,
4077	2031	ISZ STKS	
4100	7410	SKP	/CHECK ALL AVAILABLE STACKS,
4101	5652	JMP I CONCHK	
4102	1263	TAD CONCH	
4103	1045	TAD K10	
4104	3263	DCA CONCH	/UPDATE FIELD CHANGE
4105	2324	ISZ NUMX	
4106	5263	JMP CONCH	
/			
4107	0000	FILCOR, 0000	/INSTRUCTIONS FOR FIELDS
4110	1324	TAD NUMX	/MODIFIED TO DF#
4111	3537	DCA I K0000	
4112	1130	TAD K1000	
4113	3541	DCA I K0001	
4114	1041	TAD KCIF	
4115	3522	DCA I K0002	
4116	1326	TAD JMPRET	
4117	3540	DCA I K0003	
4120	1325	TAD XRETAD	
4121	3523	DCA I K0004	
4122	5707	JMP I FILCOR	
/			
4123	0000	FDNUM, 0000	
4124	0000	NUMX, 0000	
4125	4065	XRETAD, RETADD	
4126	5404	JMPRET, JMP I 4	
4127	0000	MSTKS, 0000	
		S	



4000	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
4100	11111111	11111111	11111111	00000000	00000000	00000000	00000000	00000000

4200  
4300

4400  
4500

4600  
4700

5000  
5100

5200  
5300

5400  
5500

5600  
5700

6000  
6100

6200  
6300

6400  
6500

6600  
6700

7000  
7100

7200  
7300

7400  
7500

7600  
7700

ADRS	2510	DONE0	2266	K0004	0123	KNTR	2102
AGAIN1	0711	ENTER	1200	K0011	0120	KRR	6036
AGAIN2	1025	EXFD	1316	K0017	0132	KRTN	0106
ALL0	2244	EXFLD	1302	K0070	0111	KXFLD	0100
ATRAP	0153	EXITT	3564	K0077	0117	LBTPT	1515
BEGIN	0203	F1000	3631	K0100	0126	LBTSTC	1675
BEGIN1	0200	FCO	0154	K1	0043	LOOP	0027
BELL	1555	FDCON	3632	K10	0045	MDFSHB	1740
CAA	0653	FDGO	3602	K1000	0130	MGTF	2276
CAB	0754	FDNUM	4123	K1100	0142	MIFSHB	1742
CAC	0755	FDWRD	4014	K1200	0116	MOVE	1463
CAD	0741	FILCOR	4107	K20	0103	ML	7421
CAE	1036	FILDX	1516	K3577	0144	MSTKS	4127
CAF	6007	FILL	2076	K5200	0115	N1	2043
CAG	1420	FRET	3630	K6000	0125	N2	2042
CAI	1133	GOTO0	1510	K6001	0133	NDF	0030
CAX	2263	GTF	6004	K7	0044	NEWDF	1440
CDF	6201	GTF1	2271	K7000	0047	NOFLD	0034
CDP05	2245	HALTA	3426	K7402	0124	NOMEM	2200
CHDF	1074	HLTS	0671	K7700	0121	NOSTAK	0033
CHECK	2112	IB0	0345	K7707	0050	NSTKS	2435
CIF	6202	IB1	0354	K7717	0056	NUMX	4124
CIFCK	0753	IB2	0402	K7727	0055	OK1	0231
CIFCK1	1046	IB3	0421	K7737	0054	OK2	0257
CIFJMP	0723	IB4	0444	K7744	0071	OK3	0305
CIFJMS	1017	IB5	0463	K7745	0145	OK4	0333
CIFJPL	0715	IB6	0506	K7747	0053	OK5	0373
CIFJSL	1011	IB7	0525	K7757	0052	OK6	0440
CINT	6204	IBSF	0656	K7766	0067	OK7	0502
CKPC	1226	IBSF1	1000	K7767	0051	OK8	0544
CNSTK	2231	IFCN	1605	K7770	0110	P	2044
CON1	4000	IFDF	2460	K7771	0064	PLACE	0127
CON2	4027	INST	3407	K7772	0063	POINT	0065
CONCH	4063	INSTA	3432	K7773	0062	POS	2237
CONCHK	4052	INTE	1663	K7774	0061	RANA	2057
CONX	4032	INTEP	1674	K7775	0060	RDF	6214
CUF	6264	IOF	6002	K7776	0057	REPEAT	1733
DAT	0032	ION	6001	K7777	0046	RET	2511
DATER	2047	ION1	2331	K7S	0066	RETADD	4065
DCAI	0601	IOT	6000	KCAI	0036	RIB	6234
DF0	0211	IOTST	3403	KCAIM	0035	RIF	6224
DF1	0235	IOTX	3606	KCC	6032	RIG1	2452
DF2	0246	ISE0	0021	KCDF	0040	RIG2	3502
DF3	0203	JMP2	0104	KCDF1	0156	RMF	6244
DF4	0274	JMPI0	0020	KCIF	0041	RMFCN1	1676
DF5	0311	JMPI4	1702	KDATER	0157	RMFDY	1703
DF6	0322	JMPIR	0134	KDFSHB	1737	RMFDY1	1710
DF7	0220	JMPRET	4126	KFLD0	0105	RMFE1	1665
DFCN	1677	K0000	0137	KHLT	0037	RMFE2	1656
DFLD	0607	K0001	0141	KIFSHB	1741	RMFI1	1660
DFN	1446	K0002	0122	KJMP	0101	RMFI2	1661
DCAUTO	1517	K0003	0140	KNOP	0752	RMFL1	1633

RMFL2	1621	XMEM	1701
RMFL3	1613	XNOM	2236
RMFTST	1600	XRANS	0025
RTF	6005	XRET	0135
RTF1	2420	XRETAD	4125
RTRN	1427	XRIG1	2434
SFIB	1400	XRMF	0024
SINT	6254	XRTF1	2372
SKON	6000	XSAV	0112
SPF	6040	XSDF	2304
SRCO	0143	XSR0	3633
SRD	3535	XSRTF	2407
SRI	3547	XSTKS	0023
SRQ	0003	XTDF	0076
SRRET	3551	XTDF1	0077
STAN	3513	XTFLG	0022
STDF	1127	XTOR	0114
STKS	0031	XTRAP	0152
STRMF	1107	XTRMF	2530
SUF	6274	XXSR0	0146
T1	2600		
T2	2627		
TADI	0622		
TAUTO	1432		
TFLO	0630		
TFLG	2443		
TIME	0131		
TRANS	1321		
TRAP	3643		
TRFLD	1337		
TRMF	1050		
TSP	0041		
TTB	0191		
XAUTO	0026		
XBELL	0190		
XCON1	2373		
XCOUNT	0113		
XDATA	0136		
XDATER	0190		
XELL	0147		
XFD	0042		
XFDCON	3076		
XFER	2000		
XFERC1	2046		
XFERC2	2045		
XFERIN	2032		
XFERL1	2030		
XFERL2	2017		
XFERP	1700		
XFIB	0107		
XGTF1	1047		
XION1	2330		

ERRORS DETECTED: 0

LINKS GENERATED: 0

RUN-TIME: 17 SECONDS

2K CORE USED