

IDENTIFICATION

PRODUCT CODE:	MAINDEC-8E-DDDS-D
PRODUCT NAME:	RANDOM AND TEST
DATE CREATED:	JUNE 7, 1971
MAINTAINER:	DIAGNOSTIC GROUP
AUTHOR:	MICHAEL DAVIS

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1. ABSTRACT

THIS PROGRAM TESTS THE AND INSTRUCTING OF THE PDP-8E, THE AND INSTRUCTION, INSTRUCTION ADDRESS, OPERAND ADDRESS AND BOTH OPERANDS ARE PRODUCED BY RANDOM NUMBER GENERATORS,

2. REQUIREMENTS

2.1 EQUIPMENT

PDP-8E EQUIPPED WITH AT LEAST 4K OF MEMORY,

TELETYPE,

2.2 STORAGE

THE PROGRAM IS INITIALLY LOADED INTO LOCATIONS 0000 THRU 1177. THE INITIAL TEST AREA IS 1200-7777. WHEN THE PROGRAM RELOCATES, IT OCCUPIES 6000-7777, THE TEST AREA IS THEN 0000-6577.

2.3 PRELIMINARY PROGRAMS

MAINDEC-8E-DBAA, DBBA, DBCA

3. LOADING PROCEDURE

THE STANDARD PROCEDURE FOR LOADING BINARY TAPES IS TO BE USED.

4. STARTING PROCEDURE

4.1 STARTING ADDRESS

0200

4.2 CONTROL SWITCH SETTINGS

SR00#1, SUPPRESS HALT ON ERROR
SR01#1, HALT AT END OF PASS, RESTORE LOADERS
SR02#1, SUPPRESS PROGRAM RELOCATION
SR03#1, SUPPRESS END OF PASS TYPEOUT
SR09#1, HOLD DATA 1 CONSTANT
SR10#1, HOLD DATA 2 CONSTANT
SR11#1, HOLD INSTRUCTION CONSTANT

4.3 OPERATOR ACTION

4.3.1 SET SR TO 0200

4.3.2 PRESS LOAD ADDRESS SWITCH

4.3.3 SET SR TO 0000

4.3.4 PRESS CLEAR AND CONTINUE SWITCHES

5. OPERATING PROCEDURE

SAME AS 4.

6. ERRORS

6.1 RELOCATION ERROR

IF AN ERROR OCCURS DURING PROGRAM RELOCATION, THE PROGRAM WILL
HALT AT 234 OR 6634, DEPENDING UPON WHETHER THE PROGRAM IS
LOCATED LOW OR HIGH.

6.2 DATA ERRORS

IF THE LINK IS SET AFTER COMPLETION OF THE AND INSTRUCTION, OR
IF THE RESULTS OF THE AND INSTRUCTION ARE INCORRECT, THE PROGRAM
WILL HALT AT 731(7331) WITH DATA1 IN THE AC.

DEPRESS CONTINUE TO DISPLAY DATA2 IN THE AC.
DEPRESS CONTINUE TO DISPLAY AND INSTRUCTION IN AC.
DEPRESS CONTINUE TO DISPLAY INSTRUCTION ADDRESS IN AC.
DEPRESS CONTINUE TO DISPLAY DATA2 ADDRESS IN AC.
DEPRESS CONTINUE TO DISPLAY INDIRECT POINTER (USED BY INDIRECT
AND) IN AC.
DEPRESS CONTINUE TO RESUME TEST

6.3 ERROR RECOVERY

6.3.1 RELOCATION ERROR

RELOAD PROGRAM

6.3.2 DATA ERROR

SEE 6.2

6.4 LOOPING

SET SR00=1 TO PREVENT HALT AFTER ERROR,

SET SR02=1 TO PREVENT RELOCATION,

SET SR03=1 TO SUPPRESS END OF PASS TYPEOUT,

SET SR09-SR11=1 TO HOLD INSTRUCTION AND DATA CONSTANT,

7. RESTRICTIONS

NONE

8. EXECUTION TIME

THE PROGRAM PERFORMS 4096 RANDOM TESTS IN APPROXIMATELY 2 SECONDS AND THEN RELOCATES. THE PROGRAM WILL TYPE "A" AFTER EACH 4096 RANDOM TESTS UNLESS SR03=1.

9. PROGRAM DESCRIPTION

THE PROGRAM IS INITIALLY LOADED INTO LOCATIONS 0200-1177. WITH TEMPORARY STORAGE LOCATIONS ON PAGE 0. AFTER INITIAL KEYSTART, THE PROGRAM WILL SAVE R1M AND 01N LOADERS IN PAGE 0 AND WILL THEN PROCEED TO USE LOCATIONS 1200-7777 AS A TEST AREA.

THE PROGRAM USES SEPARATE RANDOM NUMBER GENERATORS TO GENERATE THE AND INSTRUCTION, INSTRUCTION AND DATA ADDRESSES, AND THE TWO ARGUMENTS TO BE "ANDed". THE INSTRUCTIONS AND DATA ARE STORED IN THEIR PREVIOUSLY GENERATED ADDRESSES. THE PROGRAM TRANSFERS TO THE LOCATION OF THE INSTRUCTION AND EXECUTES IT. THE PROGRAM THEN TRANSFERS TO A COMPARISON ROUTINE WHERE THE ACTUAL RESULT OF THE AND INSTRUCTION IS COMPARED TO A SIMULATED AND.

AFTER 4096 TESTS, THE PROGRAM TYPES "A", RELOCATES, AND CONTINUES TESTING.

0000	0000	*0	
0001	0000	TTANDL, 0	
0002	5001	INSTL, JMP	
0003	0002	INADDL, 2	/STORAGE FOR AND INSTRUCTION
0004	0003	DATADL, 3	/STORAGE FOR AND INSTRUCTION ADDRESS
0005	0004	IFLAGL, 3	/STORAGE FOR DATA ADDRESS
0006	0005	PADDL, 0	/STORAGE FOR INSTRUCTION INDIRECT FLAG
0007	0006	LIML, 0	/STORAGE FOR DATA INDIRECT ADDRESS
	0007	PAGL, 0	

0010	0010	*10	
	0000	PNTRL, 0	
6007		CAF=6007	
7501		HQA=7501	
7421		HQL=7421	
0266		CNTRL=LOHIL	
0020		*20	
0000		TEMP3L, 0	

/INITIALIZATION AND CONTROL ROUTINES

0200	0200	*200	
6007		STARTL, CAF	
1204		TAD	.+3
3201		DCA	.-1
4205		JMS	SAVBNL
5274		JMP	SETLKL

/SAVE RIM AND BIN IN PAGE 0
 /ONLY AT INITIAL KEYSTART
 /201 BECOMES JMP SETLKL
 /FOR ALL FUTURE PASSES

/TRANSFER RIM AND BIN LOADERS TO PAGE 0

0205	0000	SAVBNL, 0	
0206	1374	TAD	C7600L
0207	3266	DCA	CNTRL
0210	1374	TAD	C7600L
0211	3202	DCA	PNTRL
0212	3203	DCA	PNTRL
0213	4225	JMS	RELOL
0214	5625	JMP I	SAVBNL

/SET AC=-200, NUMBER OF
 /LOCATIONS TO BE TRANSFERRED
 /FIRST "FROM"
 /LOCATION=7600
 /FIRST "TO" LOCATION=0
 /PERFORM TRANSFER
 /EXIT

```

0215 0000 RESBNL, 0
0216 1374 TAD C7600L
0217 3266 DCA CNTRL
0220 3202 DCA PNTRL
0221 1374 TAD C7600L
0222 3203 DCA PNTRL
0223 4225 JMS RELOL
0224 5615 JMP I RESBNL
/
/SET AC=-200, NUMBER OF
/LOCATIONS TO BE TRANSFERRED
/FIRST "FROM" ADDRESS=0
/FIRST "TO"
/ADDRESS=7600
/PERFORM TRANSFER
/EXIT

```

/DATA TRANSFER ROUTINE

```

0225 0000 RELOL, 0
0226 1602 TAD I PNTRL
0227 3603 DCA I PNTRL
0230 1602 TAD I PNTRL
0231 7041 CIA
0232 1603 TAD I PNTRL
0233 7640 SZA CLA
0234 7402 HLT
0235 2202 ISZ
0236 7000 NOP
0237 2203 ISZ
0240 7000 NOP
0241 2266 ISZ
0242 5226 JMP RELOL+1
0243 5625 JMP I RELOL
/
/GET DATA
/TRANSFER
/GET DATA
/COMPARE
/TRANSFER ERROR
/NEXT "FROM" LOCATION
/NEXT "TO" LOCATION

```

```

0244 4215 REHL, JMS RESBNL
0245 1373 TAD C7000L
0246 3266 DCA CNTRL
0247 1365 TAD C200L
0250 3202 DCA PNTRL
0251 1372 TAD C6600L
0252 3203 DCA PNTRL
0253 4225 JMS RELOL
0254 5772 JMP I C6600L
/
/TRANSFER PROGRAM TO UPPER MEMORY
/TRANSFER RIM AND BIN LOADERS
/SET AC=-1000, NUMBER OF
/LOCATIONS TO BE TRANSFERRED
/FIRST "FROM"
/ADDRESS=200
/FIRST "TO"
/ADDRESS=6600
/PERFORM TRANSFER
/GO TO PROGRAM START

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0255 4205 REL, JMS SAVBNL
0256 1373 TAD C7000L
0257 3266 DCA CNTRL
0260 1372 TAD C6600L
0261 3202 DCA PNTRL
0262 1365 TAD C200L
0263 3203 DCA PNTRL
/
/TRANSFER PROGRAM TO LOWER MEMORY
/TRANSFER RIM AND BIN LOADERS
/SET AC=-1000, NUMBER OF
/LOCATIONS TO BE TRANSFERRED
/FIRST "FROM"
/ADDRESS=6600
/FIRST "TO"
/ADDRESS=200

```

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0264 4225 JMS RELOL
0265 5765 JMP I C200L
/GO TO PROGRAM START

```

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Address	Instruction	Comments
0266	LOHIL, 0000	/DETERMINE IF PROGRAM IS IN LOWER OR UPPER MEMORY
0267	0000	/PC
0268	0000	/SET AC=4000
0269	0000	/ADD PC
0270	0000	/IS LINK=0
0271	0000	/NO, HIGH CORE
0272	0000	/RETURN
0273	0000	/TRANSFER TO LINKAGE GENERATION
0274	0000	/CLEAR PASS COUNTER
0275	0000	/DETERMINE IF PROGRAM IS HIGH OR LOW
0276	0000	/GO TO TEST WITH ADDRESS MODIFIER IN AC
0277	0000	/SIMULATE LOGICAL AND WITH A AND B=NOT((NOTA)OR(NOTB))
0300	0000	/NOTA
0301	0000	/SAVE NOTA
0302	0000	/GET B
0303	0000	/NOTB
0304	0000	/SAVE NOTB
0305	0000	/GET NOTA
0306	0000	/OR WITH NOTB
0307	0000	/COMPLEMENT
0308	0000	/EXIT WITH RESULT IN AC
0309	0000	/TEST SWITCHES
0310	0000	/SAVE TEST BIT
0311	0000	/GET SWITCHES
0312	0000	/AND SWITCHES WITH TEST BIT
0313	0000	/IS SWITCH 0
0314	0000	/NO SKIP INSTRUCTION AFTER RETURN
0315	0000	
0316	0000	
0317	0000	
0318	0000	
0319	0000	
0320	0000	
0321	0000	/END OF PASS ?
0322	0000	/NO, RETURN
0323	0000	/SET AC=400
0324	0000	/TEST SR03
0325	0000	/SUPPRESS END OF PASS TYPEOUT
0326	0000	/TYPE CARRIAGE RETURN
0327	0000	/TYPE LINEFEED
0328	0000	/TYPE
0329	0000	
0330	0000	
0331	0000	
0332	0000	
0333	0000	
0334	0000	
0335	0000	

TEST FOR HALT, RELOCATION

JMP HALT

0336 5345

/OUTPUT CHARACTER

TYPEL

0337 0000
0340 6046
0341 6041
0342 5341
0343 7200
0344 5737

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/CHECK FOR HALT
/SET AC=2000
/TEST SR01
/SR01=1, HALT
/CHECK FOR RELOCATION
/DETERMINE IF PROGRAM IS HIGH OR LOW
/AC=0, PROGRAM LOW
/PROGRAM LOW, RESTORE LOADERS

/CHECK FOR HALT
CLA CLL CML RTR
JMS SWITCH
SKP
JMP RRELL
JMS LOHIL
SNA CLA RESBNL
JMS
HLT

0345 7332
0346 4312
0347 7410
0350 5355
0351 4266
0352 7650
0353 4215
0354 7402

/SET AC=1000
/TEST SR02
/SR02=1, DO NOT RELOCATE PROGRAM
/DETERMINE IF PROGRAM IS HIGH OR LOW
/AC=0, PROGRAM LOW
/PROGRAM HIGH, RELOCATE TO HIGH CORE
/PROGRAM LOW, RELOCATE TO LOW CORE

/CHECK FOR RELOCATION
CLA CLL CML RTR
RAR
JMS SWITCH
JMP I EPASL
JMS LOHIL
SNA CLA
JMP REHL
JMP REL

0355 7332
0356 7010
0357 4312
0360 5721
0361 4266
0362 7650
0363 5244
0364 5255
0365 0200
0366 0215
0367 0212
0370 0301
0371 6400
0372 6600
0373 7000
0374 7600

*377

GOSETL, NOP

0377 7000

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PAL10

/SET UP ADDRESS POINTERS AND CONSTANTS AND TRANSFER TO NEXT PAGE

0400 3237
0401 1242
0402 1237

0400
SETAL,
*400

DCA
TAD
TAD

TEMPL
LISTL
TEMPL

/SAVE ADDRESS MODIFIER
/GET POINTER FOR TRANSFER
/MODIFY FOR LOW OR HIGH CORE

0403	3010	DCA	PNTRL	/SET UP AUTO-INDEX REGISTER
0404	1243	TAD	LGENL	/GET POINTER TO INSTRUCTION GENERATION
0405	1237	TAD	TEMPL	/MODIFY FOR LOW OR HIGH CORE
0406	3410	DCA I	PNTRL	/TRANSFER TO NEXT PAGE
0407	1245	TAD	LSANDL	/GET POINTER TO AND SIMULATER
0410	1237	TAD	TEMPL	/MODIFY FOR LOW OR HIGH CORE
0411	3410	DCA I	PNTRL	/TRANSFER TO NEXT PAGE
0412	1246	TAD	LRETUL	/GET POINTER FOR EXECUTION RETURN
0413	1237	TAD	TEMPL	/MODIFY FOR LOW OR HIGH CORE
0414	3410	DCA I	PNTRL	/TRANSFER TO NEXT PAGE
0415	1247	TAD	LSWITL	/GET POINTER TO SWITCH SENSING
0416	1237	TAD	TEMPL	/MODIFY FOR LOW OR HIGH CORE
0417	3410	DCA I	PNTRL	/TRANSFER TO NEXT PAGE
0420	1244	TAD	LEPASL	/GET POINTER TO END OF PASS
0421	1237	TAD	TEMPL	/MODIFY FOR LOW OR HIGH CORE
0422	3410	DCA I	PNTRL	/TRANSFER TO NEXT PAGE
0423	1237	TAD	TEMPL	/GET ADDRESS MODIFIER
0424	7640	SZA CLA		/IS TEST IN LOW CORE
0425	5233	JMP	LHICOL	/NO,SET UP FOR HIGH CORE
0426	1240	TAD	L200L	/SET PAGE 0 EXCLUSION BIT
0427	3410	DCA I	PNTRL	/TRANSFER TO NEXT PAGE
0430	1250	TAD	L600L	/GET LOW CORE ADDRESS LIMIT
0431	3410	DCA I	PNTRL	/TRANSFER TO NEXT PAGE
0432	5377	JMP	GOTSTL	/GO TO TEST
0433	3410	DCA I	PNTRL	/CLERA PAGE 0 EXCLUSION BIT
0434	1251	TAD	L1201L	/GET HIGH CORE ADDRESS LIMIT
0435	3410	DCA I	PNTRL	/TRANSFER TO NEXT PAGE
0436	5377	JMP	GOTSTL	/GO TO TEST

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0437	0000	TEMPL,	0
0440	0200	L200L,	200
0441	7000	L7000L,	7000
0442	0753	L1STL,	TGENL-1
0443	1000	LGENL,	GENL
0444	0321	LEPASL,	EPASL
0445	0300	LSANDL,	SANDL
0446	0712	LRETUL,	TRETUL
0447	0312	LSWITL,	SWITCL
0450	6600	L600L,	6600
0451	1201	L1201L,	1201
0577	0577	*577	
0577	7000	GOTSTL,	NOP

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/GENERATE TEST INSTRUCTION AND DATA

0600	0600	TEST1L,	CLA	CLL	
0601	7300	TAD	TANDL		/GET POINTER TO SIMULATED AND
0602	1355	DCA	TTANDL		/PLACE IN TRANSFER LOCATION
0603	3000	IAC			/SET
0604	7001	JMS I	TSWITL		/TEST
0604	4757				

0605	JMP	TDAT1L	/SR	DO NOT GENERATE INSTRUCTION
0606	TAD	TLIML	/NO	T ADDRESS LIMIT
0607	DCA	LIML	/SAVE	
0610	TAD	TPAGBL	/GET	PAGE EXCLUSION BIT
0611	DCA	PAGL		
0612	JMS	I	/GENERATE	INSTRUCTION
0613	DCA	TGENTL	/SAVE	INDIRECT FLA
0614	TAD	TIFLGL	/GET	INSTRUCTION
0615	DCA	INSTL	/SAVE	IT
0616	TAD	TINSTL	/GET	INSTRUCTION ADDRESS
0617	DCA	INADDL	/SAVE	IT
0620	TAD	TINADL	/GET	DATA ADDRESS
0621	DCA	DATADL	/SAVE	IT
0622	TAD	TDATAL	/GET	INDIRECT TO DATA
0623	DCA	PADDL	/SAVE	IT
0624	TAD	TPADDL	/SET	AC=2
0625	JMS	I	/TEST	SR10
0626	JMP	TDAT2L	/SR10=1, DO NOT GENERATE DATA1	
0627	TAD	TDA1L	/GENERATE	RANDOM NUMBER
0630	CLL	RAL		
0631	SZL		/SET	AC=4
0632	TAD	T3L	/TEST	SR09
0633	DCA	TDAT2L	/SR09=1, DO NOT GENERATE DATA2	
0634	JMS	I	/GENERATE	RANDOM NUMBER
0635	JMP	SETTL		
0636	TAD	TDA2L		
0637	CLL	RAL		
0640	SZL			
0641	TAD	T3L		
0642	DCA	TDAT2L		
0643				

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0644	SETTL,	CLA	CLL	TINSTL	/GET	INSTRUCTION
0645	TAD	DCA	I	TINADL	/STORE	IN TEST LOCATION
0646	TAD	TAD		TIFLGL	/GET	INDIRECT FLAG
0647	SNA	CLA			/IS	INSTRUCTION INDIRECT
0650	JMP			DIRL	/NO,	GET DATA
0651	TAD			TDATAL	/INDIRECT,	IS ADDRESS
0652	TAD			T7760	/AUTO-INDEX	REGISTER
0653	SZL	CLA			/NO,	USE POINTER AS IS
0654	JMP			+5		
0655	TAD			TDATAL		
0656	TAD			T7770		
0657	SZL	CLA				
0660	CMA					
0661	TAD			TPADDL	/ADDRESS	IS AUTO-INDEX REGISTER
0662	DCA	I		TDATAL	/GET	INDIRECT ADDRESS
0663	TAD			TDAT1L	/STORE	IN TEST LOCATION
0664	DCA	I		TPADDL	/GET	DATA
0665	JMP			DOTSTL	/STORE	IN TEST LOCATION
0666	TAD			TDAT1L	/GET	DATA
0667						

0670 3/66 DCA I TDATA1 /STORE IN TEST LOCATION

/SIMULATE "AND"

0671 7300 DOTSTL, CLA CLL /GET DATA1
0672 1370 TAD TDA1L /SAVE IN MQ
0673 7421 MQL /GET DATA2
0674 1371 TAD TDA2L /DO SIMULATION
0675 4755 JMS I TANL /SAVE ANSWER
0676 3372 DCA /

/GO TO TEST

0677 1356 DOANDL, TAD TRETL /GET RETURN ADDRESS
0700 3000 DCA TTANDL /SAVE
0701 1364 TAD TINADL /GET INSTRUCTION ADDRESS
0702 7001 IAC /INCREMENT
0703 7450 SNA /IS IT 0
0704 5200 JMP /YES, GENERATE NEW INFORMATION
0705 3353 DCA TEMP2L /NO, SAVE
0706 1373 TAD T5400L /GET RETURN INSTRUCTION
0707 3753 DCA I TEMP2L /PUT IN TEST LOCATION
0710 1371 TAD TDA2L /GET DATA2
0711 5764 JMP I TINADL /EXECUTE "AND"

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/RETURN HERE AFTER EXECUTION

0712 3377 TRATUL, DCA TRACL /SAVE AC
0713 7430 SEL /IS LINK=1
0714 4324 JMS /LINK=1, ERROR
0715 1372 TAD /GET SIMULATION RESULT
0716 7041 CIA
0717 1377 TAD TRACL /ADD REAL RESULT
0720 7640 SEA CLA /ARE THEY THE SAME
0721 4324 JMS /NO, ERROR
0722 4760 JMS I TEPASL /END OF PASS
0723 5200 JMP

/ERROR HANDLER

0724 0000 ERROR, 0 /SET AC=4000
0725 7330 CLA CLL CML RAR /TEST SR00
0726 4757 JMS I TSWITL /SR00=1, DO NOT HALT ON ERROR
0727 5351 JMP TEXTITL /DISPLAY DATA1 IN AC
0730 1370 TAD TDA1L
0731 7402 HLT
0732 7200 CLA
0733 1371 TAD TDA2L /DISPLAY DATA2 IN AC
0734 7402 HLT
0735 7200 CLA
0736 1001 TAD INSTL /DISPLAY INSTRUCTION IN AC
0737 7402 HLT
0740 7200 CLA /DISPL INSTRUCTION ADDRESS IN AC
41 TAD

0742	0742	HLT		
0743	7200	CLA	TDATAL	/DS1, DATA ADDRESS IN AC
0744	1366	TAD		
0745	7422	HLT		
0746	7200	CLA	TPADOL	/DSIPLAY INDIRECT IN AC
0747	1367	TAD		
0750	7422	HLT		
0751	7320	TEXTL, CLA CLL		
0752	5724	JMP I	ERROR	

0753	0020	TEMP2L, 0		
0754	0020	TGENL, 0		
0755	0000	TANOL, 0		
0756	0000	TRETYL, 0		
0757	0000	TSWITL, 0		
0760	0000	TEPASL, 0		
0761	0000	TPAGBL, 0		
0762	0000	TLIML, 0		
0763	0000	TINSTL, 0		
0764	0000	TINADL, 0		
0765	0000	TIFLGL, 0		

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0766	0000	TDATAL, 0			
0767	0000	TPADOL, 0			
0770	0021	TDA1L, 21			
0771	0037	TDA2L, 37			
0772	0000	TSIML, 0			
0773	5400	T5400L, 5400			
0774	0003	T3L, 3			
0775	7760	T7760, 7760			
0776	7770	T7770, 7770			
0777	0000	TRACL, 0			

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/ GENERATE INSTRUCTIONS AND ADDRESSES

1000	1000	GENL, 0
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/ GENERATE "AND" INSTRUCTION

1001	1367	GANDL, 0		
1002	4340	TAD	R1L	/GENERATE RANDOM NUMBER
1003	3367	JMS	RANDL	/SAVE NUMBER
1004	1367	DCA	R1L	
1005	7421	TAD	R1L	
1006	1007	MQL	PAGL	
1007	7501	TAD		
1010	7421	MQA		
1011	1371	MQL		
1012	4400	TAD	K0777	/OR RANDOM NUMBER WITH EXCLUSION BIT
1013	3001	JMS I	TTANDL	/MASK OFF 3MSB
1014	1001	DCA	INSTL	/TO GET "0" OP CODE
		TAD	INSTL	/SAVE INSTRUCTION
				/GET INSTRUCTION

1015	4354	JMS	AND17L	/EXTRACT PAGE ADDRESS OF INSTRUCTION
1016	3020	DCA	TEMP3L	/SAVE PAGE ADDRESS OF INSTRUCTION
		/	/GENERATE ADDRESS FOR INSTRUCTION	
		/		
1017	1372	GANADL,	TAD	R2L
1020	4340	JMS	RANDL	/GENERATE RANDOM NUMBER
1021	3372	DCA	R2L	/SAVE NUMBER
1022	4345	JMS	CLIML	/SET UP TO TEST ADDRESS LIMITS
1023	1372	TAD	R2L	
1024	7620	SNL	CLA	/IS ADDRESS WITHIN LIMITS
1025	5217	JMP	GANADL	/NO, GENERATE NEW ADDRESS
1026	1372	TAD	R2L	
1027	1373	TAD	P0L	
1030	7620	SNL	CLA	/IS ADDRESS ON PAGE 0
1031	5246	JMP	PAGADL	/NO
1032	1020	TAD	TEMP3L	/GET PAGE ADDRESS OF INSTRUCTION
1033	7041	CIA		
1034	1372	TAD	R2L	/SUBTRACT ADDRESS
1035	4361	JMS	ABSL	
1036	7700	SMA	CLA	/IS DIFFERENCE >2
1037	5217	JMP	GANADL	/NO
1040	1020	TAD	TEMP3L	/GET PAGE ADDRESS OF INSTRUCTION
1041	7650	SNA	CLA	/DOES INSTRUCTION REFERENCE LOCATION 0
1042	5201	JMP	GANDL	/YES, GENERATE NEW INSTRUCTION
1043	1372	TAD	R2L	/YES, USE ADDRESS
1044	3002	DCA	INADDL	
1045	5261	JMP	DAADL	/GENERATE ADDRESS FOR DATA
1046	1001	TAD	INSTL	/GET INSTRUCTION
1047	7421	MQL		
1050	1376	TAD	K200L	/MASK CURRENT PAGE BIT
1051	4400	JMS	I	/IS PAGE BIT SET
1052	7650	SNA	CLA	/NO, USE ADDRESS AS IS
1053	5240	JMP	PAL	
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1054	1372	TAD	R2L	
1055	4354	JMS	AND17L	
1056	7041	CIA		
1057	1020	TAD	TEMP3L	
1060	5235	JMP	PAGAL	
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		/	/GENERATE ADDRESS FOR DATA	
		/		
1061	1001	DAADL,	TAD	INSTL
1062	7421	MQL		/GET INSTRUCTION
1063	1376	TAD	K200L	
1064	4400	JMS	I	/DOES INSTRUCTION REFERENCE PAGE 0
1065	7650	SNA	CLA	
1066	5306	JMP	P0AL	/YES
1067	1002	TAD	INADDL	
1070	7421	MQL		
1071	1373	TAD	P0L	

1072 4400	JMS I	TTANDL	/EXT PAGE OF ADDRESS
1073 7421	MQL		
1074 1020	TAD	TEMP3L	
1075 7521	MQA		/OR" TOGETHER TO GET
1076 3023	DCA	DATADL	/DATA ADDRESS
1077 1021	TAD	INSTL	
1100 7421	MQL		
1101 1375	TAD	K400L	
1102 4420	JMS I	TTANDL	
1103 7640	SZA CLA		/IS INSTRUCTION INDIRECT
1104 5311	JMP I	PADL	/YES, INSTRUCTION IS INDIRECT
1105 5600	JMP I	GENL	/EXIT
1106 1020	TAD	TEMP3L	
1107 3023	DCA	DATADL	
1110 5277	JMP	INDIRL	
	/	/GENERATE INDIRECT ADDRESS FOR DATA	
	/	/GENERATE RANDOM NUMBER	
1111 1377	TAD	R3L	
1112 4340	JMS	RANDL	
1113 3377	DCA	R3L	
1114 4345	JMS	CLIML	
1115 1377	TAD	R3L	
1116 7620	SNL CLA		/IS ADDRESS WITHIN LIMITS
1117 5311	JMP	PADL	/NO, TRY AGAIN
1120 1002	TAD	INADDL	/GET INSTRUCTION ADDRESS
1121 7041	CIA		
1122 1377	TAD	R3L	
1123 4361	JMS	ABSL	/SUBSTRACT INDIRECT
1124 7700	SMA CLA		/GENERATE -ABSOLUTE VALUE
1125 5311	JMP	PADL	/DO INSTRUCTION AND ADDRESS INTERFERE
1126 1003	TAD	DATADL	/YES
1127 7041	CIA		
1130 1377	TAD	R3L	
1131 4361	JMS	ABSL	
1132 7700	SMA CLA		
1133 5311	JMP	PADL	
1134 1377	TAD	R3L	/NO
1135 3085	DCA	PADDL	
1136 7040	CMA		
/	PAL10	V141	17-JUN-71 7123 PAGE 12-1
1137 5600	JMP I	GENL	/EXIT
/	PAL10	V141	17-JUN-71 7123 PAGE 13
1140 0000	RANDL,	0	
1141 7104	CLL	RAL	
1142 7430	S2L		
1143 1370	TAD	K3L	
1144 5740	JMP I	RANDL	
	/	/	
	/	/	
1145 0000	CLIML,	0	
1146 1007	TAD	PAGL	
1147 7100	CLL		

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4000
4100

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4500

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4700

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5100

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5300

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5600
5700

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6100
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6300
6400
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6600
6700
7000
7100
7200
7300
7400
7500
7600
7700

/	PAL10	V141	17-JUN-71	7:23	PAGE 13-3
A	0370		PADDL	0005	TSIML 0772
ABSL	1161		PADL	1111	TSWITL 0757
AND17L	1154		PAGAOL	1046	TTANDL 0000
C200L	0365		PAGAL	1035	TYPEL 0337
C212L	0367		PAGL	0007	
C215L	0366		PAL	1040	
C6400L	0371		PNTR1L	0202	
C6600L	0372		PNTR2L	0203	
C7000L	0373		PNTRL	0010	
C7600L	0374		R1L	1167	
CAF	0007		R2L	1172	
CLIML	1145		R3L	1177	
CNTR1L	0266		RANDL	1140	
DAADL	1061		REHL	0244	
DATADL	0003		RELL	0255	
DIRL	0667		RELOL	0225	
DOANDL	0677		RESBNL	0215	
DOTSTL	0671		RRELL	0355	
EPASL	0321		SANDL	0300	
ERROR	0724		SAVBNL	0205	
GANADL	1017		SETAL	0400	
GANDL	1001		SETLKL	0274	
GENL	1000		SETTL	0644	
GOSETL	0377		STARTL	0200	
GOTSTL	0577		SWITCL	0312	
HALTL	0345		T3L	0774	
IFLAGL	0004		T5400L	0773	
INADDL	0002		T7760	0775	
INDIRL	1077		T7770	0776	
INSTL	0001		TANDL	0755	
77L	1174		TDA1L	0770	
77	1171		TDA2L	0771	

K7 1176
K8 1170
K400L 1175
L1201L 0451
L200L 0440
L6600L 0450
L7000L 0441
LEPASL 0444
LGENL 0443
LHICOL 0433
LIML 0006
LISTL 0442
LOHIL 0266
LRETUL 0446
LSANDL 0445
LSWITL 0447
MQA 7501
MQL 7421
P0AL 1106
P0L 1173

TDAT1L 0624
TDATEL 0634
TDATAL 0766
TEMP1L 0204
TEMP2L 0753
TEMP3L 0020
TEML 0437
TEPASL 0760
TEST1L 0600
TEXT1L 0751
TGENL 0754
TIFLGL 0765
TINADL 0764
TINSTL 0763
TLIML 0762
TPADDL 0767
TPAGBL 0761
TRACL 0777
TRETTL 0756
TRETUL 0712

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ERRORS DETECTED: 0

LINKS GENERATED: 0

RUN-TIME: 5 SECONDS

2K CORE USED

