

IDENTIFICATION

PRODUCT CODE:	MAINDEC-8E-DBCC-0
PRODUCT NAME:	8E ADDER TESTS
DATE CREATED:	SEPT. 1, 1971
MAINTAINER:	DIAGNOSTIC GROUP
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1, ABSTRACT

THIS PROGRAM TESTS THE ADDER CIRCUITS OF THE PDP-8E. THE PROGRAM IS COMPOSED OF FIVE PARTS,
A SIMULATOR FOR THE TAD INSTRUCTION WHICH TESTS ALL COMBINATIONS OF TWO ARGUMENT ADDITIONS,
A SIMULATOR FOR ROTATE INSTRUCTIONS THAT TESTS ROTATION OF ALL POSSIBLE ARGUMENTS WITH RAL, RAR, RTL, RTR AND BSW,
A CARRY GENERATION TEST
A SERIES OF RANDOM NUMBER TESTS
A FIELD RELOCATION ADDER TEST

2, REQUIREMENTS

2.1 EQUIPMENT

PDP-8E EQUIPPED WITH AT LEAST 4K OF MEMORY AND A TELETYPE

2.2 STORAGE

THE PROGRAM IS STORED IN LOCATIONS 0000-6000 AND UTILIZES LOCATIONS 7775-7777 AS A TEST AREA.

2.3 PRELIMINARY PROGRAMS

MAINDEC-8E-00AA, 00BA

RUN ALL EXTENDED MEMORY TESTS PRIOR TO RUNNING RELOCATION ADDER TEST.

3, LOADING PROCEDURE

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

4, STARTING PROCEDURE

4.1 CONTROL SWITCH SETTINGS

SR00=1 SUPPRESS HALT ON ERROR
SR01=1 SUPPRESS ERROR TYPEOUT
SR02=1 LOOP ON ERROR
SR03=1 FAST TEST
SR04=0 LOOP IN CURRENT MEMORY BANK
SR04=1 RELOCATE TO NEXT EXISTING BANK
SR06=08 AMOUNT OF EXTENDED BANKS OF MEMORY
SR09=1 HALT AT END OF TEST
SR10=1 SUPPRESS END OF TEST TYPEOUT
SR11=1 LOOP ON PRESENT TEST

4.2

STARTING ADDRESSES

NORMAL STARTING ADDRESS=0200
RESTORE LOADERS=7600

```

4,3 OPERATOR ACTION
4,3.1 SET SR=0200
4,3,2 PRESS ADDR LOAD SWITCH
4,3,3 SET SR=0000
4,3,4 SET SWITCH REGISTER TO DESIRED FUNCTIONS SEE 4,1
4,3,5 PRESS CLEAR AND CONT SWITCHES
5, OPERATING PROCEDURE
5,1 FAST TEST

THE ADDITION SIMULATOR NORMALLY STARTS WITH ARG1
AND ARG2 0000, TO SPEED UP THE TEST, THE VALUE OF ARG2
MAY BE SET AT SOME OTHER VALUE INITIALLY. TO DO THIS,
DEPOSIT THE DESIRED VALUE IN LOCATION 170, AND PROCEED
AS IN 4,, BUT WITH SR=0400 INSTEAD OF 0000 IN 4,3,3

5,2 TO RESTORE AND START BINARY LOADER, STOP PROGRAM, LOAD
ADDRESS 7600 AND START COMPUTER.
5,3 RELOCATION ADDER TEST

IF SR04=1 THE ADDER TEST WILL RELOCATE TO THE NEXT
SEQUENTIAL EXISTING MEMORY BANK AT THE COMPLETION
OF EVERY PASS, THE EXACT AMOUNT OF EXISTING EXTENDED
MEMORY BANKS MUST BE IN SR06=00 TO RUN THIS PORTION
OF THE ADDER TEST, PRIOR TO EACH RELOCATION THE
PROGRAM WILL COMPARE THE BANKS FOUND UNDER TEST TO
THE BANK AMOUNT IN SR05=00 AND START RELOCATION,
THE FOLLOWING MESSAGE WILL BE TYPED ON TELETYPE.

***** X EXTENDED BANKS OF MEMORY TO BANK X *****

5,4 OPTIONS
SEE 4,1
6, ERRORS
6,1 ERROR MESSAGES
6,1.1 SIMULATED ADDITION TEST

IF A FAILURE OCCURS DURING THE SIMULATED ADDITION TEST,
THE PROGRAM WILL TYPE THE FOLLOWING MESSAGE AND THEN HALT:

ARG1 SIMULATED ADD TEST FAILED
XXXXXXXXXXXXX ARG2 SIMULATED ARG1+ARG2 ARG2+ARG1
XXXXXXXXXXXXX XXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXX

ARG1 AND ARG2 ARE THE TWO NUMBERS THAT WERE ADDED,
SIMULATED IS THE ANSWER PRODUCED BY THE ADDITION SIMULATOR
(K AND AC)
1+ARG2 IS THE RESULT OF ADDING ARG2 TO ARG1

```

(ARG1 IS IN AC INITIALLY)
 ARG2+ARG1 IS THE RESULT OF ADDING ARG1 TO ARG2
 (ARG2 IS IN AC INITIALLY),

NOTE! EITHER THE SIMULATION OR THE ACTUAL ADDITIONS MAY HAVE FAILED.

6.1.1.2 SIMULATED ROTATE TEST

IF A FAILURE OCCURS DURING THE SIMULATED ROTATE TEST, THE PROGRAM WILL TYPE THE FOLLOWING MESSAGE AND THEN HALT!

SIMULATED AAA TEST FAILED
 ORIGINAL SIMULATED ACTUAL
 XXXXXXXXXXXX X XXXXXXXXXXXX X XXXXXXXXXXXX

ORIGINAL IS THE LINK AND ACCUMULATOR TO BE ROTATED
 SIMULATED IS THE SIMULATED RESULT OF ROTATION
 ACTUAL IS THE REAL RESULT OF ROTATION
 AAA IS THE INSTRUCTION BEING TESTED, I.E. RAL,RAR,RTL,RTR,BSW

6.1.1.3 FALSE CARRY TEST

IF A FAILURE OCCURS DURING THE FALSE CARRY TEST, THE PROGRAM WILL TYPE THE FOLLOWING MESSAGE AND THEN HALT!

DATA ERROR
 AAAA X XXXXXXXXXXXX

AAAA IS THE STARTING ADDRESS OF THE TEST THAT FAILED
 X XXXXXXXXXXXX ARE THE CONTENTS OF THE LINK AND AC

NOTE! EACH FALSE CARRY TEST EXPECTS LINK#1 AND AC#0 AS A RESULT.

6.1.1.4 RANDOM ADD TEST 1

IF A FAILURE OCCURS DURING RANDOM ADD TEST 1, THE PROGRAM WILL TYPE THE FOLLOWING MESSAGE AND THEN HALT!

RANDOM ADD TEST 1 FAILED
 RANDA RANDC RESULT
 XXXXXXXXXXXX XXXXXXXXXXXX X XXXXXXXXXXXX

RANDA IS A RANDOM NUMBER
 RANDC IS THE COMPLEMENT OF RANDA
 RESULT IS THE RESULT OF CONSECUTIVE ADDITIONS OF RANDA AND RANDC

NOTE! THE EXPECTED RESULT IS LINK#1, AC#0

6.1.1.5 RANDOM ADD TEST 2

IF A FAILURE OCCURS DURING RANDOM ADD TEST 2, THE PROGRAM WILL TYPE THE FOLLOWING MESSAGE AND THEN HALT!

RANDOM ADD TEST 2 FAILED
 ARG1 ARG2 EXPECTED ARG1+ARG2
 XXXXXXXXXXXX XXXXXXXXXXXX X XXXXXXXXXXXX X XXXXXXXXXXXX

6.1.6 RANDOM ROTATE TESTS

IF A FAILURE OCCURS DURING ONE OF THE RANDOM ROTATE TESTS, THE PROGRAM WILL TYPE THE FOLLOWING MESSAGE AND THEN HALT!

RANDOM AAA TEST FAILED
ORIGINAL ACTUAL
X XXXXXXXXXXXX X XXXXXXXXXXXX
AAA=RAR, RAL, RTR OR RTL

6.2 ERROR HALTS

THE FOLLOWING TABLE LISTS ERROR HALT LOCATIONS AND THE TEST THAT THEY APPLY TO

LOCATION	TEST
502	SIMAD
1066	SIMROT (WITH LOCATION OF SPECIFIC TEST IN AC)
3035	PCT (WITH LOCATION OF SPECIFIC TEST IN AC)
3510	RNAD1
4041	RNAD2
5061	RANDOM ROTATE (WITH LOCATION OF SPECIFIC TEST IN AC)

6.2 ERROR RECOVERY

DEPRESS CONT TO RESUME TEST

6.3 LOOPING ON ERROR

6.3.1 SWITCH REGISTER CONTROL

SET SR00=1 TO SUPPRESS ERROR HALT
SET SR01=1 TO SUPPRESS ERROR IYPEOUT
SET SR02=2 TO LOOP
DEPRESS CONT

6.3.2 PROGRAM MODIFICATION

THERE ARE NOPS IN EACH TEST PROVIDED TO ALLOW THE OPERATOR TO SET UP LOOPS TIGHTER THAN THOSE AVAILABLE IN 6.3.1,

7. RESTRICTIONS

EXTENDED MEMORY TESTS SHOULD BE RUN PRIOR TO RUNNING RELOCATION ADDER TEST,

8.

EXECUTION TIME

TIME DEPENDENT ON AMOUNT OF MEMORY, FOR EACH BANK APPROXIMATELY 35 MINUTES. IF SR03=1, AND KXXX=7777 (SEE 5.1) ONE PASS TAKES APPROXIMATELY 40 SECONDS.

AS EACH TEST OR GROUP OF TESTS IS COMPLETED, THE NAME OF THAT TEST WILL BE TYPED, THE SEQUENCE IS:

SIMAD
SIMROY
ACT
RANDOM

9.

PROGRAM DESCRIPTION

9.1

SIMULATED ADDITION TEST

THE SIMULATED ADDITION TESTS SIMULATES THE ADDITION OF TWO ARGUMENTS, ARG1 AND ARG2. ACTUAL ADDITIONS ARE PERFORMED, AND THEN THE ACTUAL RESULTS ARE COMPARED TO THE SIMULATED ANSWER.

THE SIMULATOR OPERATES IN THE FOLLOWING MANNER!
THE ARGUMENTS ARE "AND'ED" TOGETHER, AND ANY BITS IN THE RESULT THAT ARE 1'S WILL BE CARRY BITS. THE ARGUMENTS ARE "OR'ED" TOGETHER AND THE RESULT IS STORED. THE PREVIOUSLY GENERATED CARRIES ARE ROTATED ONCE TO THE LEFT AND THEN "AND'ED" WITH THE "OR" OF THE TWO ARGUMENTS. ANY BITS THAT ARE 1'S ARE ALSO CARRIES AND THESE ARE COMBINED WITH THE PREVIOUS CARRIES. THE PROCEDURE CONTINUES UNTIL NO NEW CARRIES ARE GENERATED. THE FINAL CARRY RESULT IS EXCLUSIVE "OR" WITH THE "OR" OF THE ARGUMENTS TO GET THE SIMULATED SUM.

9.2

SIMULATED ROTATE TESTS

EACH OF THE ROTATE INSTRUCTIONS, RAR, RAL, RTR, RTL AND BSW IS SIMULATED FOR ALL POSSIBLE COMBINATIONS OF AC AND LINK, AND THE RESULTS ARE COMPARED TO THE RESULTS OF THE ACTUAL ROTATE.

9.3

FALSE CARRY TEST

VARIOUS COMBINATIONS OF INSTRUCTIONS AND DATA ARE USED TO DETECT EITHER FALSE CARRIES, OR MISSING CARRIES.

9.4

RANDOM ADD TEST 1

A RANDOM NUMBER AND ITS COMPLEMENT ARE ADDED SUCCESSIVELY
AND THE EXPECTED RESULT IS ALWAYS LINK=1, AC=0.

9.5

RANDOM ADD TEST 2

A RANDOM NUMBER, AND ITS MODIFIED COMPLIMENT ARE ADDED TO
PRODUCE 1 KNOW BIT IN THE AC, WITH THE LINK=1.

9.6

RANDOM ROTATE TEST

A RANDOM NUMBER IS SUCCESSIVELY ROTATED AND THE EXPECTED
RESULT IS THE ORIGINAL NUMBER.

9.6

RELOCATION ADDER TEST

ALL TESTS LISTED ABOVE ARE RELOCATED TO EXTENDED BANKS
AND RUN.

10:

LISTING

PA110 V141 13-SEP-71 13131 E 1
/
/ ADDER TEST
/ FOR PDP-8/E
/ COPYRIGHT 1970 DIGITAL EQUIPMENT CORP, MAYNARD MASS,
/ V 82 07552

/ADDER TEST
/FOR PDP-8/E
/COPYRIGHT 1
/V 82 07552

/INSTRUCTION DEFINITIONS

7501
7421
7002
6007

/ SWITCH REGISTER MASK BITS

0103	SR00=K4000
0104	SR01=K2000
0105	SR02=K1000
0106	SR03=K0400
0107	SR04=K0200
0110	SR05=K0100
0111	SR06=K0040
0112	SR07=K0020
0113	SR08=K0010
0114	SR09=K0008
0115	SR10=K0006
0116	SR11=K0001

LOCATION EQUIVALENCIES

```
0023      RAC=ARG1
0024      RLNK=ARG2
0031      RRAC=SUM1
0033      RRLNK=SUM2
0025      TEMPAC=SIMAC
0026      TEMPL=SIMLNK
0037      TEMPI=WD1
0037      W1=WD1
0040      W2=WD2
0035      RHFLG=AHFLG
0067      NERROP=XLOOP
```

```

/AC TO BE ROTATED
/LINK TO BE ROTATED
/AC AFTER REAL ROTATE
/LINK AFTER REAL ROTATE
/TEMPORARY AC STORAGE
/TEMPORARY LINK STORAGE
/TEMPORARY DATA STORAGE
/
/
/ROTATE TEST ERROR HEAD

```

```

7775      0000      *0000      TSTA3;      0      JMP
7776      0000      TSTA0;      0
7777      0000      TSTA1;      2
          0000      TSTA2;      3
          0000      TSTA6;      0
          0000      TSTA7;

```

0010 *10

/ INDEX REGISTERS

0010 0000 TSTIND, 0
0011 0000 POINT1, 0
0012 0000 POINT2, 0

0020 0000 *20
0021 0000 CNTRI, 0
0022 0022 ADA1, ADA2
0022 7777 ADA2, 7777

/ SIMULATION VARIABLES

0023 0000 ARG1, 0
0024 0000 ARG2, 0
0025 0000 SIMAG, 0
0026 0000 SIMLNK, 0
0027 0000 AIDRA2, 0
0030 0000 CARRY, 0
0031 0000 SUM1, 0
0032 0000 LINK1, 0
0033 0000 SUM2, 0
0034 0000 LINK2, 0

/ MESSAGE OUTPUT VARIABLES

0035 0000 AMPLG, 0
0036 0000 CHAR, 0
0037 0000 HQ1, 0
0040 0000 HQ2, 0

/ RANDOM VARIABLES

0041 0037 RANDA, 37
0042 0000 RANDB, 0
0043 0000 RANDC, 0
0044 0000 LINKR, 0
0045 0000 LINKRC, 0

/ INDIRECT POINTERS

0046 1600 XPRINT, PRINT
0047 1652 XTYPE, TYPE
0050 1133 XRHD, RHD
/ CHARACTER STRING TYPE
/ CHARACTER TYPE
/ TYPE ROTATE ERROR HEADER

PAL10	V141	13-SEP-71	13131	JE 1-2
0051	1200	XSROT,	COMMON ROTATE SIMULATOR	
0052	0756	XRALTA,	RAL MASK TABLE	
0053	1157	XRTLTA,	RTL MASK TABLE	
0054	1140	XRTRTA,	RTR MASK TABLE	
0055	1657	XBSHTA,	BSWAP MASK TABLE	
0056	1000	XCOMRO,	ROTATE COMPARISON FOR SIMULATION	
0057	1031	XNXTRO,	ROTATE SETUP FOR SIMULATION	
0060	0504	XLNKOU,	TYPE LINK	
0061	0523	XWDOUT,	TYPE DATA WORD	
0062	3000	XAMEAS,	COMPARE DATA	
0063	3730	XAMEA,	SAVE AC AND LINK	
0064	3017	XAVREG,	DATA ERROR HANDLER FOR FCT	
0065	3037	XDATER,	DATA ERROR HALT FOR FCT	
0066	3027	XHALT2,	LOOP ON TEST	
0067	3046	XLOOP,		
0070	7775	XSTAB,		
0071	7776	XSTA1,		
0072	7777	XSTA2,		
0073	3512	XRAND,	RANDOM NUMBER GENERATOR	
0074	0410	XLOOP2,		
0075	0052	XLOOP1,		
/WIDELY USED CONSTANTS				
0076	0240	K240,	240	
0077	0260	K260,	260	
0100	0261	K261,	261	
0101	6000	K6000,	6000	
0102	0102	XRARTA,		
0103	4000	K4000,	4000	
0104	2000	K2000,	2000	
0105	1000	K1000,	1000	
0106	0400	K0400,	400	
0107	0200	K0200,	200	
0110	0100	K0100,	100	
0111	0040	K0040,	40	
0112	0020	K0020,	20	
0113	0010	K0010,	10	
0114	0004	K0004,	4	
0115	0002	K0002,	2	
0116	0001	K0001,	1	
0117	0000		0	
0120	4000		4000	
0121	0001		1	
/TEST POINTERS FOR FCT				
0122	2004	SEQ1,	FCT1	
0123	2043	SEQ2,	FCT2	
0124	2076	SEQ3,	FCT3	
0125	2200	SEQ4,	FCT4	
0126	2232	SEQ5,	FCT5	

0127 2270
0130 2400
0131 2436
0132 2472
0133 2600
0134 2634
0135 2667

SEQ6,
SEQ7,
SEQ8,
SEQ9,
SEQ10,
SEQ11,
SEQ12,

FCY6
FCY7
FCY8
FCY9
FCY10
FCY11
FCY12

/SETUP INSTRUCTIONS FOR FCT

```

0136 1376      /BTAD 1=1 IN 7777
0137 7001      /BTAC
0140 5404      /BJMP 1,1 IN 0002
0141 5402      /BJMP 1,1 IN 0001
0142 7070      /BCHA CML RAR
0143 2376      /BISZ 1=1 IN 7777
0144 2000      /BISZ 1=1 IN 7777
0145 2410      /BISZ 1 TSTIND
0146 4000      /BJS 1=1 IN 7777
0147 4776      /BJS 1=1 IN 7777
0150 4410      /BJS 1 TSTIND
0151 5403      /BJMP 1,1 IN 0002
0152 5401      /BJMP 1,1 IN 0000
0153 4377      /BJS 1 IN 7777
0154 2004      FCT1
0155 5301      BIN,
    
```

/TEST FOR FAST TAD SIMULATION

```

0156 6007      /CAP
0157 7604      /LAS
0160 0100      /AND SR03
0161 7650      /SNA CLA
0162 5177      /JMP CMA GOTEST
0163 7240      /CLA CMA
0164 0170      /AND KXXXX
0165 3024      /DCA ARG2
0166 5567      /JMP 1,1
0167 0202      /RSINAD#2
0170 0000      KXXXX,
0171 0000      K0,
0172 0007      K0007,
0173 0070      K0070,
0174 0000      FLONUM,
0175 0000      FLDSAV,
0176 0000      FLDCNT,
0177 0177      #177
0177 7410      /GOTEST, SKP
    
```

/INSERT DESIRED STARTING VALUE FOR ARG2 HERE

/SKIP JMP TO START

/SIMULATED ADDITION TEST

PAL10 V141 13-SEP-71 13131 E 1-4

0200 0200 5156 0201 0202 0203 0203
RSIMAD, JMP START
DCA ARG2 /GO TO FAST TEST CHECK
DCA ARG1 /CLEAR SIMULATION VARIABLES
DCA AHFLG /CLEAR ERROR MESSAGE FLAG
/

/SIMULATE ADDITION BY SIMULATED GENERATEION OF SUM
/AND CARRY BITS
/

/FORM OR OF ARG1 WITH ARG2
/

SIMAD, CLA CLL CMA /LOAD AC WITH ARG1
AND ARG1 /PLACE IN MQ
MQL
CMA
AND ARG2 /LOAD AC WITH ARG2
MQA /FORM ARG1 OR ARG2
DCA A10RA2 /SAVE ARG1 OR ARG2
/

/FORM XOR(EXCLUSIVE OR) OF ARG1 WITH ARG2
/BY A XOR B=(A AND NOTB)OR(NOTA AND B)
/

MQA /GET ARG1 FROM MQ
CMA /FORM NOTARG1
AND ARG2 /AND WITH ARG2 TO GET ARG2 AND NOTARG1
MQL /SAVE IN MQ
CMA
AND ARG2 /LOAD AC WITH ARG2
CMA /FORM NOTARG2
AND ARG1 /AND WITH ARG1 TO GET ARG1 AND NOTARG2
MQA /OR WITH ARG2 AND NOTARG1
DCA SIMAC /TO GET ARG1 XOR ARG2
DCA SIMLNK
/

/AND ARG1 WITH ARG2
/TEST FOR CARRIES
/IF THERE ARE NO BITS IN COMMON BETWEEN ARG1 AND ARG2
/THERE WILL BE NO CARRIES GENERATED
/

CMA /LOAD AC WITH ARG1
AND ARG1 /AND WITH ARG2
AND ARG2 /ARE THERE ANY CARRIES
SNA ADD /NO, TERMINATE SIMULATION
JMP
/GENERATE CARRIES
/

NXTCAR, MQL /SAVE FIRST CARRIES
MQA MQL /GET CARRIES FROM MQ
AND A10RA2 /AND WITH A10RA2 TO SEE IF MORE CARRIES ARE GENERATED
0233 7421
0234 7521
0235 0027

```

PAL10      V141      13-SEP-71      13131      PAGE 1-5
0236      7450      SNA
0237      5244      JMP      ENCAR
0240      7104      CLL RAL
0241      7521      MQA MQL
0242      7501      MQA
0243      5234      JMP      NXTCAR

```

```

/ARE THERE ANY MORE CARRIES
/NO, END SIMULATION OF CARRIES
/PROPAGATE CARRIES
/GET PREVIOUS CARRIES FROM MQ, SAVE NEW CARRIES
/OR NEW CARRIES WITH PREVIOUS CARRIES
/CONTINUE

```

```

/TEST FOR CARRY INTO LINK

```

```

ENCAR,      MQA      /GET CARRIES
0244      7501      /AND WITH A1ORA2
0245      0027      /TEST BIT 00
0246      0103      /IS BIT 00 1
0247      7450      ENCAR1
0250      5253      /NO, CARRIES DID NOT PROPAGATE INTO LINK
0251      3026      /YES, SAVE CARRY INTO LINK
0252      5260      /COMPLETE SIMULATION
0253      7130      /SET AC=4000
0254      0023      /AND WITH ARG1
0255      0024      /AND WITH ARG2 TO SEE IF ORIGINAL
0256      7440      /NUMBERS GENERATED CARRY INTO LINK
0257      3026      /SAVE SIMULATED LINK

```

```

/FORM XOR OF ARG1, ARG2 AND CARRIES
/TO GET FINAL SIMULATED SUM

```

```

XORALL,      MQA      /SAVE SIMULATED CARRIES
0260      7501      CARRY
0261      3030      DCA
0262      7501      MQA
0263      7040      CMA
0264      0025      /FORM A1ORA2 AND NOTCARRY
0265      7421      /SAVE IN MQ
0266      7040      MQL
0267      0025      CMA
0268      7040      AND
0269      0025      SIMAC
0270      7040      CMA
0271      0030      CARRY
0272      7501      MQA
0273      3025      DCA

```

```

/FORM CARRY AND NOTA1ORA2
/OR WITH CONTENTS OF MQ
/TO GET FINAL SIMULATED SUM

```

```

ADD,      CLA CLL CMA
0274      7340      /PERFORM ADDITIONS ARG1+ARG2 AND ARG2+ARG1
0275      0023      AND
0276      1024      ARG1
0277      7000      ARG2
0278      0023      TAD
0279      7010      NOP
0280      3031      DCA
0281      7010      RAR
0282      3032      DCA
0283      7040      CMA
0284      0024      LINK1
0285      1023      ARG2
0286      7000      ARG1
0287      3033      TAD
0288      7010      NOP
0289      3033      DCA
0290      7010      RAR

```

```

/LOAD AC WITH ARG1
/ADD ARG2
/SAVE RESULT
/SAVE LINK
/LOAD AC WITH ARG2
/ADD ARG1
/SAVE RESULT

```

PAL10	V141	13=SEP=71	13131	2 1=6
0311		DCA	LINK2	/SAVE LINK
0312		NOP		
		/		
		/		
		/COMPARE RESULTS OF REAL ADDS		
		/IF A=B, A XOR B=0, THIS IS USED TO COMPARE RESULTS		
		/		
0313	7340	CLA CLL CMA		
0314	0031	AND SUM1		/GET RESULT OF ARG1+ARG2
0315	7040	CMA		/COMPLEMENT
0316	0033	AND SUM2		/AND RESULTS OF ARG2+ARG1
0317	7440	SEA		/IS SUM2 AND NOTSUM1=0
0320	5377	JMP ERROR1		/NO, ERROR
0321	7040	CMA		
0322	0033	AND SUM2		/LOAD AC WITH RESULTS OF ARG2+ARG1
0323	7040	CMA		/COMPLEMENT
0324	0031	AND SUM1		/AND WITH SUM1
0325	7440	SEA		/IS SUM1 AND NOTSUM2=0
0326	5377	JMP ERROR1		/NO, ERROR
		/		
		/		
		/COMPARE REAL AND SIMULATED ADDS		
		/		
0327	7340	CLA CLL CMA		
0330	0031	AND SUM1		/LOAD AC WITH RESULTS OF ARG1+ARG2
0331	7040	CMA		/COMPLEMENT
0332	0025	AND SIMAC		/AND WITH RESULTS OF SIMULATION
0333	7440	SEA		/IS SIMAC AND NOTSUM1=0
0334	5377	JMP ERROR1		/NO, ERROR
0335	7040	CMA		
0336	0025	AND SIMAC		/LOAD AC WITH SIMULATION RESULTS
0337	7040	CMA		/COMPLEMENT
0340	0031	AND SUM1		/AND WITH RESULTS OF ARG1+ARG2
0341	7440	SEA		/IS SUM1 AND NOTSIMAC=0
0342	5377	JMP ERROR1		/NO, ERROR
		/		
		/		
		/COMPARE LINKS GENERATED BY REAL ADDS		
		/		
0343	7340	CLA CLL CMA		
0344	0032	AND LINK1		/GET LINK FROM ARG1+ARG2
0345	7004	RAL		
0346	7240	CLA CMA		
0347	0034	AND LINK2		/GET LINK FROM ARG2+ARG1
0350	7640	SEA CLA		
0351	7020	CML		
0352	7430	SEL		/ARE THEY THE SAME
0353	5377	JMP ERROR1		/NO, ERROR
		/		
		/		
		/COMPARE LINKS GENERATED BY REAL AND SIMULATED ADDS		

0424	0425	0426	0427	0430	0431	0432	0433	0434	0435	0436	0437	0440	0441	0442	0443	0444	0445	0446	0447	0450	0451	0452	0453	0454	0455	0456	0460	0461	0462	0463	0464	0465	0466	
7040	0023	3037	4323	7040	0024	3037	4323	7040	0026	3040	7040	0025	3037	4304	4323	7040	0032	3040	7040	0031	3037	4304	4323	7040	0034	3040	7040	0033	3037	4304	4323	4446	5742	5204

/OUTPUT ARB1

/OUTPUT ARG2

OUTPUT	SIMULATED	LINK
OUTPUT	SIMULATED	SUM

```

/OUTPUT LINKI
/OUTPUT SUMI

```

```

/OUTPUT LINK2
/OUTPUT SUM2

```

TEST FOR HALT

/TYPE HEADER FOR ADDITION TEST ERROR MESSAGE

ABOUT

00000 4446 5417 4446 5177 7240 3035 5667

00467 00470 00471 00472 00473 00474 00475 00476

JMS ! XPRINT

ACTIVE 1031 FOR ACTIVE INVESTORS

/TYPE ARG1, ARG2, SIMULATED, ARG1+ARG2, ARG2+ARG1

/SET ADD TEST HEADER FLAG
/TO PREVENT MULTIPLE HEADER TYPEOUTS

HALT WITH ADDRESS OF TEST IN AC

HALT!

00477	00000
00500	7240
00501	0351
00502	7402
00503	5677

CLA CMA

AND ADT

—

JMP ! HALTA

/HA/ WITH ADDRESS OF ADDITION TEST IN AC

```

0504 0000 LNKOUT, 0
0505 7340 CLA CLL CMA
0506 0040 AND WD2
0507 7640 SEA CLA
0510 5320 JMP OUT1
0511 7040 CMA
0512 0077 AND K260
0513 4447 JMS I XTYPE
0514 7040 CMA
0515 0076 AND K240
0516 4447 JMS I XTYPE
0517 5704 JMP I LNKOUT
0520 7040 CMA
0521 0100 AND K261
0522 5313 JMP TYLNK

```

```

/TYPE DATA WORD
0523 0000 WDOUT, 0
0524 7340 CLA CLL CMA
0525 0102 AND XRARTA
0526 3011 DCA POINT1
0527 7040 CMA
0530 0411 AND I POINT1
0531 7450 SNA
0532 5345 JMP SP1
0533 0037 AND WD1
0534 7640 SEA CLA
0535 5342 JMP OUT1A
0536 7040 CMA
0537 0077 AND K260

```

```

0540 4447 TYBIT, JMS I XTYPE
0541 5327 JMP NXBIT
0542 7040 CMA
0543 0100 AND K261
0544 5340 JMP TYBIT
0545 7040 CMA
0546 0076 AND K240
0547 4447 JMS I XTYPE
0550 5723 JMP I WDOUT
0551 0204 ADT, SIMAD

```

```

/END OF SIMULATED ADD TEST
0552 7604 LOOP1, LAS
0553 0115 AND SR10
0554 7650 SNA CLA

```

/TEST SR10
/IS SR10=1

/ / **TEST ROTATION BY COMPARISON OF REAL AND SIMULATED
ROTATES**

```

0001 7340 SIMRAL, CLA CLL CMA /GET MASK TABLE FOR
0002 0052 AND XRLTA /SIMULATED RAL
0003 3012 DCA POINT2 /SIMULATE RAL
0004 4451 JMS I XSROT /SIMULATE RAL
0005 7340 RRAL, CLA CLL CMA /SET UP TO DO REAL ROTATES
0006 0024 AND RLNK
0007 7640 SEA CLA

```

0613	7004
0614	7000
0615	7031
0616	7000

```

0620 RRLNK /SAVE ROTATED LINK
0621 XCOMRO /COMPARE ROTATES
0622 RRAL /RETURN HERE FOR LOOP ON ERROR
0623 XNXTRO /SET UP FOR NEXT ROTATE
0624 SIMRAL /CONTINUE RAL TEST
3033 DCA I
4456 JMS
5205 JMP
4457 JMS
5201 JMP

```

00625 4753 SIMR02, JMS I XR2
/TEST PAR

```

0626 7340 SIMRAR, CLA CLL CMA /
0627 0102 AND XRARTA /
0630 3012 DCA POINT2 /
0631 4451 JMS I XSROT /
0632 7340 CLA CLL CMA /
0633 0024 AND RLNK /
0634 7640 SZA CLA /
0635 7020 CML /
0636 7040 CMA /
0637 0023 AND /
0640 7010 RAR /
0641 7000 NOP /
0642 3031 DCA RRAC /
0643 7430 SZL /
0644 7040 CMA /
0645 3033 RRLNK /
0646 4456 JMS I XCOMRO /
0647 5232 JMP RRAR /
0650 4457 JMS I XNXTRO /
0651 5226 JMP SIMRAR /

```

/GET MASK TABLE FOR
 /SIMULATED RAR
 /SIMULATED RAR
 /SET UP TP DO REAL RAR

 /DO REAL RAR
 /SAVE ROTATED ACCUMULATOR

 /SAVE ROTATED LINK
 /COMPARE ROTATES
 /RETURN HERE FOR LOOP ON ERROR
 /SET UP FOR NEXT ROTATE
 /CONTINUE RAR TEST

```

0652 4754 SIMR03, JMS I XRS /
/TEST RTL /
/
0653 7340 SIMRTL, CLA CLL CMA /
0654 0053 AND XRTLTA /
0655 3012 DCA POINT2 /
0656 4451 JMS I XSROT /
0657 7340 CLA CLL CMA /
0660 0024 AND RLNK /
0661 7640 SZA CLA /
0662 7020 CML /
0663 7040 CMA /
0664 0023 AND /
0665 7006 RTL RAC /
0666 7000 NOP RRAC /
0667 3031 DCA /
0670 7430 SZL /
0671 7040 CMA /
0672 3033 DCA RRLNK /
0673 4456 JMS I XCOMRO /
0674 5257 JMP RRTL /
0675 4457 JMS I XNXTRO /
0676 5253 JMP SIMRTL /

```

/GET MASK TABLE FOR
 /SIMULATED RTL
 /SIMULATE RTL
 /SET UP TO DO REAL ROTATE

 /DO REAL ROTATE
 /SAVE ROTATED ACCUMULATOR

 /SAVE ROTATED LINK
 /COMPARE ROTATES
 /RETURN HERE FOR LOOP ON ERROR
 /SET UP TO DO NEXT ROTATE
 /CONTINUE RTL TEST

```

0677 4755 SIMR04, JMS I XR4 /
/TEST RTR /

```

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 PAL10 7340 0700
 0701 0054
 0702 3012
 0703 4451
 0704 7340
 0705 0024
 0706 7640
 0707 7020
 0710 7040
 0711 0023
 0712 7012
 0713 7000
 0714 3031
 0715 7430
 0716 7040
 0717 3033
 0720 4456
 0721 5304
 0722 4457
 0723 5300

SIMRTR, CLA CLL CMA
 AND XRTRTA
 DCA POINT2
 JMS I XSROT
 CLA CLL CMA
 AND RLNK
 SZA CLA
 CHL
 CMA
 AND
 RTR
 NOP
 DCA
 SZL
 CMA
 DCA
 JMS I
 JMP
 JMS I
 JMP

RRTR, CLA CLL CMA
 AND RLNK
 SZA CLA
 CHL
 CMA
 AND
 RTR
 NOP
 DCA
 SZL
 CMA
 DCA
 JMS I
 JMP
 JMS I
 JMP

AND XRTRTA
 POINT2
 XSROT
 CMA
 RLNK
 CMA
 RAC
 RRAC
 RRLNK
 XCOMRO
 RTR
 XNXTRO
 SIMRTR

/GET MASK TABLE FOR
 /SIMULATED RTR
 /SIMULATE RTR
 /SET UP TO DO REAL ROTATE
 /DO REAL ROTATE
 /SAVE ROTATED ACCUMULATOR
 /SAVE ROTATED LINK
 /COMPARE ROTATES
 /RETURN HERE FOR LOOP ON ERROR
 /SET UP TO DO NEXT ROTATE
 /CONTINUE RTR TEST

SIMR05, JMS I XRS
 /TEST BYTE SWAP
 SIMBSW, CLA CLL CMA
 AND XBSNTA
 DCA POINT2
 JMS I XSBSW
 CLA CLL CMA
 AND RLNK
 SZA CLA
 CHL
 CMA
 AND
 BSW
 NOP
 DCA
 SZL
 CMA
 DCA
 JMS I
 JMP
 JMS I
 JMP
 JMP I

RRAC
 RRAC
 RRLNK
 XCOMRO
 RBSW
 XNXTRO
 SIMBSW
 XROTDN

R1
 R2
 R3
 R4
 R5
 RALTAB, 1

0724 4756
 0725 7340
 0726 0055
 0727 3012
 0730 4776
 0731 7340
 0732 0084
 0733 7640
 0734 7020
 0735 7040
 0736 0023
 0737 7002
 0740 7000
 0741 3031
 0742 7430
 0743 7040
 0744 3033
 0745 4456
 0746 5331
 0747 4457
 0750 5325
 0751 5777

0752 1400
 0753 1410
 0754 1420
 0755 1430
 0756 1440
 0757 0001

/GET MASK TABLE FOR
 /SIMULATED BSW
 /SIMULATE BSW
 /SET UP FOR REAL BSW
 /DO REAL BSW
 /SAVE ROTATED ACCUMULATOR
 /SAVE ROTATED LINK
 /COMPARE ROTATES
 /RETURN HERE FOR LOOP ON ERROR
 /SET UP FOR NEXT ROTATE
 /CONTINUE BSW TEST
 /END OF ROTATE SIMULATION TESTS

```

0760 0002
0761 0004
0762 0010
0763 0020
0764 0040
0765 0100
0766 0200
0767 0400
0770 1000
0771 2000
0772 4000
0773 0000
0774 0001
0775 4000
0776 1236
0777 1323

X88SH, S8SH
XROT0N, ROYDNE

```

```

/ (TAPE 2)
/COMPARE RESULTS OF REAL AND SIMULATED ROTATES
/
1000 1000
COMROT, 0
/COMPARE ROTATED ACCUMULATORS
/
1001 7340
1002 0025
1003 7040
1004 0031
1005 7440
1006 5226
1007 7040
1010 0031
1011 7040
1012 0025
1013 7440
1014 5226
/COMPARE ROTATED LINKS
/
1015 7340
1016 0026
1017 7640
1020 7020
1021 7040
1022 0033
1023 7440
1024 7020
1025 7430
1026 5246
/GET REAL ROTATED ACCUMULATOR
/COMPLEMENT
/AND WITH REAL ROTATED ACCUMULATOR
/IS NOT SIMAC AND RRAC=0
/NO, ERROR
/GET REAL ROTATED ACCUMULATOR
/COMPLEMENT
/AND WITH SIMULATED ROTATED ACCUMULATOR
/IS SIMAC AND NOT RRAC=0
/NO, ERROR
/GET SIMULATED LINK
/GET REAL ROTATED LINK
/ARE THEY THE SAME
/NO, ERROR

```

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V141 PAL18

1027 2200 ISE COMROT /RETURN HERE IF NO LOOP ON ERROR
1030 5600 JMP I COMROT

/SET UP TO DO NEXT ROTATE

1031 0000 NXTROT, 0
1032 7340 CLA CLL CMA
1033 0024 AND RLNK
1034 7640 SZA CLA
1035 5244 JMP NEWLNK
1036 7040 CMA
1037 3024 DCA
1038 2023 RLNK
1039 5631 RAC
1040 2231 JMP I NXTROT
1041 5631 ISE
1042 2231 JMP I NXTROT
1043 5631 DCA
1044 3024 RLNK
1045 5631 JMP I NXTROT

/GET LINK OF WORD TO BE ROTATED
/IS IT 0
/NO, CLEAR IT
/YES, SET IT
/INCREMENT NUMBER TO BE ROTATED
/CONTINUE SIMULATION OF PRESENT ROTATE INSTRUCTION
/PRESENT SIMULATION DONE
/GO TO NEXT TEST

/ERROR HANDLER FOR ROTATE TEST

1046 7604 ERROR2, LAS
1047 0104 AND SR01
1048 7650 SNA CLA
1049 4271 JMS ROTPRT
1050 7604 LAS
1051 0103 AND SR00
1052 7650 SNA CLA
1053 5263 JMP HALTB
1054 7604 LAS
1055 0103 AND SR02
1056 7650 SNA CLA
1057 5227 JMP ERROT+1
1058 5230 JMP ERROT+2
1059 7340 CLA CLL CMA
1060 0451 AND I
1061 1270 TAD M4
1062 7402 HLT
1063 5256 JMP HLTB+4
1064 7774 M4, 4

/TEST SR01
/IS SR01=1
/NO, TYPE ERROR MESSAGE
/TEST SR00
/IS SR00=1
/NO, HALT WITH ADDRESS OF TEST IN AC
/TEST SR02
/IS SR02=1
/NO, GO TO NEW DATA
/YES, LOOP WITH SAME DATA

/ERROR TYPEOUT FOR SIMULATED ROTATE TEST ERRORS

1071 0000 ROTPRT, 0
1072 7340 CLA CLL CMA
1073 0035 AND RHFLG
1074 7650 SNA CLA

/GET ROTATE TEST HEADER FLAG
/HAS HEADER BEEN TYPED

PAL10	V141	13=SEP=71	13131	PAGE 1=15	
1075	4331	JMS	RHOUT	/NO, TYPE HEADER	
1076	7040	CMA			
1077	0023	AND	RAC		
1100	3037	DCA	WD1		
1101	7040	CMA			
1102	0024	AND	RLNK		
1103	3040	DCA	WD2		
1104	4460	JMS I	XLNKOU	/OUTPUT ORIGINAL LINK	
1105	4461	JMS I	XWDOUT	/OUTPUT ORIGINAL WORD	
1106	7040	CMA			
1107	0025	AND	SIMAC		
1110	3037	DCA	WD1		
1111	7040	CMA			
1112	0026	AND	SIMLNK		
1113	3040	DCA	WD2		
1114	4460	JMS I	XLNKOU	/OUTPUT SIMULATED ROTATED LINK	
1115	4461	JMS I	XWDOUT	/OUTPUT SIMULATED ROTATED WORD	
1116	7040	CMA			
1117	0031	AND	RRAC		
1120	3037	DCA	WD1		
1121	7040	CMA			
1122	0033	AND	RLNK		
1123	3040	DCA	WD2		
1124	4460	JMS I	XLNKOU	/OUTPUT ACTUAL ROTATED LINK	
1125	4461	JMS I	XWDOUT	/OUTPUT ACTUAL ROTATED WORD	
1126	4446	JMS I	XPRINT		
1127	5742	CRLF=1			
1130	5671	JMP I	ROTPRT		
1131	0000	/	/OUTPUT HEADER FOR ROTATE ERROR MESSAGE		
1132	4446	RHOUT,			
1133	0000	RHD,			
1134	4446	JMS I	XPRINT	/TYPE SIMULATED XXX TEST FAILED	
1135	5244	JMS I	XPRINT	/WHERE XXX IS THE INSTRUCTION THAT FAILED	
1136	7240	DH2=1		/TYPE ORIGINAL, SIMULATED ACTUAL	
1137	3035	CLA CMA			
1140	5731	DCA	RHFLG		
		JMP I	RHOUT		

1141	2000	RIRTAB, 2000
1142	0400	400
1143	0100	100
1144	0020	20
1145	0004	4
1146	0001	1
1147	4000	4000
1150	1000	1000
1151	0200	200
1152	0040	40
1153	0010	10
1154	0002	2

1155 0000
1156 2000
1157 0002

1160 0002
1161 0010
1162 0040
1163 0200
1164 1000
1165 4000
1166 0001
1167 0004
1170 0020
1171 0100
1172 0400
1173 2000
1174 0000
1175 0002
1176 2000

RICTAB, 2

/ROTATION SIMULATOR COMMON ROUTINE
/ROTATE FUNCTION SIMULATED DEPENDS
/UPON MASK TABLE SELECTED

1200 0000
1201 7300
1202 3025
1203 3026
1204 7040
1205 0412
1206 3037
1207 7040
1208 0412
1209 7450
1210 5303
1211 3040
1212 7040
1213 0023
1214 0037
1215 7440
1216 4225
1217 7040
1218 0040
1219 3037
1220 5207
1221 0000
1222 7240
1223 0000
1224 7240

1200 SROTAL, 0
1201 CLA CLL
1202 DCA
1203 DCA
1204 CMA
1205 AND I
1206 DCA
1207 CMA
1208 AND I
1209 SNA
1210 JMP
1211 DCA
1212 CMA
1213 AND
1214 AND
1215 SEA
1216 JMS
1217 CMA
1218 AND
1219 DCA
1220 JMP
1221 /OR BITS TO FORM PARTIALLY ROTATED WORD
1222 0
1223 CLA CMA
1224

/CLEAR SIMULATION ARGUMENTS
/GET FIRST MASK BIT FROM TABLE
/GET MASK BIT FROM TABLE
/IS IT 0
/YES, FINISH SIMULATION
/LOAD AC WITH WORD TO BE ROTATED
/TEST BIT TO BE ROTATED
/IS IS 0
/NO, PLACE BIT INTO NEW POSITION
/BIT TO BE ROTATED
/BECOMES NEW MASK
/CONTINUE SIMULATION

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1227 0040	AND	WD2		
1230 7421	MQL			/GET BIT TO BE INSERTED
1231 7040	CMA			/SAVE IN M0
1232 0025	AND	SIMAC		
1233 7501	MQA			/GET SIMULATED ROTATED WORD
1234 3025	DCA	SIMAC		/OR BIT INTO POSITION
1235 5625	JMP I	ORI		/SAVE PARTIALLY ROTATED WORD

1236 0000				/SIMULATE BYTE SWAP
1237 7340	SBSW,			/
1240 0236	CLA CLL	CMA		
1241 3451	AND	SBSW		/SET UP FOR ERROR RETURN
1242 3025	DCA I	XSR0T		/CLEAR SIMULATION ARGUMENTS
1243 3026	DCA	SIMAC		
1244 7040	DCA	SIMLNK		
1245 0412	CMA			/GET MASK FROM TABLE
1246 7450	AND I	POINT2		/IS IT 0
1247 5277	SNA			/YES, FINISH SIMULATION
1250 3037	JMP	ENDBSW		
1251 7040	DCA	WD1		
1252 0412	CMA			
1253 3040	AND I	POINT2		
1254 7040	DCA	WD2		
1255 0023	CMA			
1256 0037	AND	RAC		/GET WORD TO BE ROTATED
1257 7440	AND	WD1		/TEST BIT TO BE ROTATED
1260 4225	SEA			/IS IT 0
1261 7040	JMS	ORI		/NO, PLACE BIT IN NEW POSITION
1262 0037	CMA			/INTERCHANGE MASK AND BIT TO BE ROTATED
1263 7421	AND	WD1		
1264 7040	MQL			
1265 0040	CMA			
1266 3037	AND	WD2		
1267 7501	DCA	WD1		
1270 3040	MQA			
1271 7040	DCA	WD2		
1272 0023	CMA			
1273 0037	AND	RAC		/GET WORD TO BE ROTATED
1274 7440	AND	WD1		/TEST BIT TO BE ROTATED
1275 4225	SEA			/IS IT 0
1276 5244	JMS	ORI		/NO, PLACE BIT IN NEW POSITION
1277 7340	JMP	N1BIT		/CONTINUE SIMULATION
1300 0024	CLA CLL	CMA		
1301 3026	AND	RLNK		
1302 5636	DCA	SIMLNK		
	JMP I	SBSW		

PAL10	V141	13=SEP=71	13131	2E 1=18
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1303	7340	ENDROT,	CLA CLL CMA	/	/END OF ROTATE, SHIFT LINK
1304	0412		AND I POINT2		
1305	3040		DCA WD2		/GET BIT TO BE ROTATED FROM LINK
1306	7040		CMA		
1307	0116		AND K0001		/GET MASK FOR LINK
1310	0024		AND RLNK		/TEST LINK
1311	7440		SZA		/IS LINK 0
1312	4225		JMS OR1		/PLACE LINK IN NEW POSITION
1313	7040		CMA		
1314	0412		AND I POINT2		/GET MASK FOR BIT TO BE ROTATED INTO LINK
1315	0023		AND RAC		/TEST BIT IN WORD TO BE ROTATED INTO LINK
1316	7440		SZA		/IS IT 0
1317	7240		CLA CMA		/NO, SET LINK=1
1320	0116		AND K0001		
1321	3026		DCA SIMLNK		
1322	5600		JMP I SROTAL		
1323	7604	ROTFONE,	LAS		/TEST SR10
1324	0115		AND SR10		/IS SR10=1
1325	7650		SNA CLA SROTOK		/NO, TYPE "SIMROT"
1326	5342		JMP LAS		
1327	7684	ROTHLT,	LAS		/TEST SR09
1330	0114		AND SR09		/IS SR09=1
1331	7640		SZA CLA		/YES, HALT AT END OF ROTATE TESTS
1332	7402		HLT		
1333	7604		LAS		
1334	0116		AND SR11		/TEST SR11
1335	7650		SNA CLA		/IS SR11=1
1336	5740		JMP I +2		/NO, GO TO NEXT TEST
1337	5741		JMP I +2		/YES, REPEAT ROTATE TESTS
1340	2000		FCI		
1341	0000		SIMRO1		
1342	4446	SROTOK,	JMS I XPRINT		
1343	5725		OK2=1		
1344	5327		JMP ROTHLT		

1400	0000	PAGE	/	/SET UP FOR ROTATE TESTS
1401	7340	R1,	/	
1402	0250		/	
1403	3450		/	
1404	3035			
1405	3024			
1406	3023			
1407	5600			
1410	0000			
1411	7340			

0	CLA CLL CMA	/SET UP HEADER
AND XM2		/FOR RAL TEST ERROR MESSAGE
DCA I XHMD		/CLEAR ROTATE HEADER FLAG
DCA RHFLG		
DCA RLNK		
DCA RAC		
JMP I R1		
0	CLA CLL CMA	

1412	0251	AND	XM3	13-SEP-71	13131	PAGE 1-19
1413	3450	DCA I	XRHD			/SET UP HEADER
1414	3035	DCA	RHFLG			/FOR RAR TEST ERROR MESSAGE
1415	3024	DCA	RLNK			
1416	3023	DCA	RAC			
1417	5610	JMP I	R2			
1420	0000					
1421	7340	CLA CLL	CMA			/SET UP HEADER
1422	0252	AND	XM4			/FOR RTR TEST ERROR MESSAGE
1423	3450	DCA I	XRHD			
1424	3035	DCA	RHFLG			
1425	3024	DCA	RLNK			
1426	3023	DCA	RAC			
1427	5620	JMP I	R3			
1430	0000					
1431	7340	CLA CLL	CMA			/SET UP HEADER
1432	0253	AND	XM5			/FOR RIL TEST ERROR MESSAGE
1433	3450	DCA I	XRHD			
1434	3035	DCA	RHFLG			
1435	3024	DCA	RLNK			
1436	3023	DCA	RAC			
1437	5630	JMP I	R4			
1440	0000					
1441	7340	CLA CLL	CMA			/SET UP HEADER
1442	0254	AND	XM6			/FOR BSW TEST ERROR MESSAGE
1443	3450	DCA I	XRHD			
1444	3035	DCA	RHFLG			
1445	3024	DCA	RLNK			
1446	3023	DCA	RAC			
1447	5640	JMP I	R5			
1450	5440	EM2-1				
1451	5461	EM3-1				
1452	5502	EM4-1				
1453	5523	EM5-1				
1454	5544	EM6-1				

/
 /
 /CHARACTER STRING TYPE ROUTINE
 /*=RETURN, +=LINE FEED

1600	1600	PAGE	
1601	0000	PRINT,	
1602	7300		
1603	1600		
1604	3011	CLA CLL	
1605	2200	TAD I	
1606	1411	PRINT	
1607	3036	ISE	
1608	1036	TAD I	
1609	7012	DCA	
1610	7012	TAD	
1611	7012	RTR	
1612	7012	RTR	
1613	4217	JMS	
1614	1036	TAD	
1615	4217	JMS	

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V141

PA110

```
1616 5205 JMP PRINT+5
1617 0000 AND K0077
1620 0245 SNA JMP I
1621 7450 TAD M40
1622 1246 SPA JMP I
1623 1246 JMP K240
1624 7510 TAD MTP
1625 5230 JMP I
1626 1076 TAD K240
1627 5243 JMP MTP
1638 7001 IAC
1639 7440 SZA
1632 5235 JMP I
1633 1251 TAD K215
1634 5243 JMP MTP
1635 7001 IAC
1636 7440 SZA
1637 5242 JMP I
1640 1250 TAD K212
1641 5243 JMP MTP
1642 1247 TAD K336
1643 4447 JMP I
1644 5617 JMP I
1645 0077 K0077
1646 7740 M40
1647 0336 K336
1650 0212 K212
1651 0215 K215
1652 0000 TYPE
1653 6046 TLS
1654 6041 TSP
1655 5254 JMP I
1656 7200 CLA
1657 5652 JMP I
```

```
BSWTAB, 1
0001 100
0100 2
0200 200
0300 4
0400 400
0500 10
0600 1000
0700 20
0800 2000
0900 40
1000 4000
1100 0
```

```
PAGE PAGE
FCT, FCT,
CLA CLL SEQ1
TAD DCA SEQ
DCA DCA SEQ
```

2003 3020 DCA CNTR1

/ FALSE CARRY TEST#1

2004 7300 FCT1, CLA CLL

/ PLACE INSTRUCTIONS AND DATA IN TEST ADDRESSES

```
2005 7300 CLA CLL /DATA=0000
2006 3471 DCA I XSTA1 /LOC:=7776
2007 1136 TAD INS1 /INSTRUCTION=TAD ;01
2010 3472 DCA I XSTA2 /LOC:=7777
2011 1332 TAD INS2 /INSTRUCTION=TAD ;13
2012 3000 DCA TSTA3 /LOC:=0000
2013 1137 TAD INS3 /INSTRUCTION=IAC
2014 3001 DCA TSTA4 /LOC:=0001
2015 1140 TAD INS4 /INSTRUCTION=JMP I ;+2
2016 3002 DCA TSTA5 /LOC:=0002
2017 7240 CLA CMA /DATA=7777
2020 3003 DCA TSTA6 /LOC:=0003
2021 1327 TAD ADI /ADDRESS=RETI
2022 3004 DCA TSTA7 /LOC:=0004
```

/ EXECUTE INSTRUCTIONS PREVIOUSLY ASSEMBLED IN TEST
/ ADDRESSES

```
2023 7300 FCL1, CLA CLL /PROVIDED FOR PROGRAM MODIFICATION
2024 5472 JMP I XSTA2 /SAVE LINK AND AC
2025 7000 NOP /EXPECTED RESULTS ARE AC=0, LINK=1
2026 7000 NOP
2027 4464 JMS I XAVREG
```

```
2030 7430 /
2031 7440 SZL /COMPUTATION ERROR HAS OCCURED
2032 4465 SEA /TEST FOR HALT
2033 7410 JMS I XDATER /TEST FOR LOOP
2034 4466 JMS I XHALT2
2035 4467 JMS I XLOOP
2036 5223 JMP FCL1
2037 7200 CLA SEQ2 /ADDRESS OF NEXT TEST
2040 1123 TAD SEQ /GO TO NEXT TEST
2041 3154 DCA SEQ
2042 5554 JMP I SEQ
```

/ FALSE CARRY TEST#2

2043 7300 FCT2, CLA CLL

```

PAL10      V141      13-SEP=71      13:31      P. 2      1=22
) /
/PLACE INSTRUCTIONS AND DATA IN TEST ADDRESSES
/
2044 7340      FCS2,      CLA CLL CMA      /DATA=7777
2045 3471      DCA I      XSTA1      /LOC,=7776
2046 1136      TAD I      INS1      /INSTRUCTION=TAD I,=1
2047 3472      DCA I      XSTA2      /LOC,=7777
2050 1137      TAD I      INS3      /INSTRUCTION=IAC
2051 3000      DCA I      TSTA3      /LOC,=0000
2052 1141      TAD I      INS5      /INSTRUCTION=JMP I,=1
2053 3001      DCA I      TSTA4      /LOC,=0001
2054 1330      TAD I      AD2      /ADDRESS=RET2
2055 3002      DCA I      TSTA5      /LOC,=0002
/EXECUTE INSTRUCTIONS PREVIOUSLY ASSEMBLED IN TEST
/ADDRESSES
/
2056 7300      FCL2,      CLA CLL      JMP I      XSTA2
2057 5472      JMP I      XSTA2
2060 7000      RET2,      NOP
2061 7000      NOP
2062 4464      JMS I      XAVREG      /SAVE AC AND LINK
/EXPECTED RESULTS ARE AC=0, LINK=1
/
2063 7430      SEL
2064 7440      SEA
2065 4465      JMS I      XDATER
2066 7410      SKP
2067 4466      JMS I      XHALT2
2070 4467      JMS I      XLOOP
2071 5256      JMP      FCL2
2072 7300      CLA
2073 1124      TAD      SEQ3
2074 3154      DCA      SEQ
2075 5554      JMP I      SEQ
/
/
/FALSE CARRY TEST #3
/
2076 7300      FCT3,      CLA CLL
/
/
/
2077 1137      FCS3,      TAD      INS3
2100 3471      DCA I      XSTA1
2101 1333      TAD      INS16
2102 3472      DCA I      XSTA2
2103 1152      TAD      INS14
2104 3000      DCA      TSTA3
2105 1331      TAD      AD3
2106 3001      DCA      TSTA4
/INSTRUCTION=IAC
/LOC,=7776
/INSTRUCTION=TAD I 21
/LOC,=7777
/INSTRUCTION=JMP I,=1
/LOC,=0000
/ADDRESS=RET3
/LOC,=0001

```

2107 7300 FCL3,
2110 5471 JMP I XSTA1
2111 7000 NOP
2112 7000 NOP
2113 4464 JMS I XAVREG

2114 7430 SEL
2115 7440 SZA
2116 4465 JMS I XDATER
2117 7410 SKP
2120 4466 JMS I XHALT2
2121 4467 JMS I XLOOP
2122 5307 JMP FCL3
2123 7200 CLA
2124 1125 TAD
2125 3154 DCA
2126 5554 JMP I
2127 2025 RET1
2130 2060 RET2
2131 2111 RET3
2132 1003 INS2,
2133 1421 INS16,

/*TAD ,+3 IN 0000

2200 PAGE

/*FALSE CARRY TEST #4

2200 7300 FCT4,
2201 7340 FCS4,
2202 3471
2203 1136
2204 3472
2205 1142
2206 3000
2207 1141
2210 3001
2211 1324
2212 5002

CLA CLL CMA
DCA I XSTA1
TAD INS1
DCA I XSTA2
TAD INS6
DCA TSTA3
TAD INS5
DCA TSTA4
TAD AD4
DCA TSTA5

/*DATA=7777
/*LOC,=7776
/*INSTRUCTION=TAD ,+1
/*LOC,=7777
/*INSTRUCTION=CMA CML RAR
/*LOC,=0000
/*INSTRUCTION=JMP I ,+1
/*LOC,=0001
/*ADDRESS=RET4
/*LOC,=0002

2213 7340 FCL4,
2214 7340 CLA CLL CMA

PAL10	V141	13-SEP-71	
2214 5472	JMP I	XSTA2	
2215 7000	NOP		
2216 7000	NOP		
2217 4464	JMS I	XAVREG	
	/		
	/		
2220 7430	SZL		
2221 7440	SZA		
2222 4465	JMS I	XDATER	
2223 7410	SKP		
2224 4466	JMS I	XHALT2	
2225 4467	JMS I	XLOOP	
2226 5213	JMP	FCL4	
2227 1126	TAD	SEQ5	
2228 3134	DCA	SEQ	
2231 5554	JMP I	SEQ	

/FALSE CARRY TEST #5

2232 7300	FC75,	CLA CLL	
-----------	-------	---------	--

2233 7300	FC95,	CLA CLL	INS7	/INSTRUCTION=ISZ ;+1
2234 1143	TAD	XSTA2		/LOC.=7777
2235 3472	DCA I	INS3		/INSTRUCTION=IAC
2236 1137	TAD	TSTA3		/LOC.=0000
2237 3000	DCA	INS3		/INSTRUCTION=IAC
2240 1137	TAD	TSTA4		/LOC.=0001
2241 3001	DCA	INS13		/INSTRUCTION=JMP I ;+1
2242 1151	TAD	TSTA5		/LOC.=0002
2243 3002	DCA	AD5		/ADDRESS=RET5
2244 1325	TAD	TSTA6		/LOC.=0003
2245 3003	DCA			

2246 7340	FC15,	CLA CLL	CMA
2247 3471	DCA I	XSTA1	
2250 7040	CMA		
2251 5472	JMP I	XSTA2	
2252 7000	NOP		
2253 7000	NOP		
2254 4464	JMS I	XAVREG	

2255 7430	SZL		
2256 7440	SZA		
2257 4465	JMS I	XDATER	

```
2260 7410 SKP
2261 4466 JMS I XHALT2
2262 4467 JMS I XLOOP
2263 5246 JMP FCL5
2264 7200 CLA
2265 1127 TAD SEQ6
2266 3124 DCA SEQ
2267 5554 JMP I SEQ

/
/
/ FALSE CARRY TEST #6
/
2270 7300 FCL6, CLA CLL
/
2271 7300 FCS6, CLA CLL
2272 1144 TAD INS8
2273 3472 DCA I XSTA2
2274 1137 TAD INS3
2275 3001 DCA TSTA4
2276 1151 TAD INS13
2277 3002 DCA TSTA5
2280 1326 TAD AD6
2301 3003 DCA TSTA6

/
/
/ INSTRUCTION=152 ,+1
/ LOC,=7777
/ INSTRUCTION=1AC
/ LOC,=0001
/ INSTRUCTION=JMP I ,+1
/ LOC,=0002
/ ADDRESS=RET6
/ LOC,=0003
```

```
2302 7340 FCL6, CLA CLL CMA
2303 3000 DCA TSTA3
2304 7240 CLA CMA
2305 5472 JMP I XSTA2
2306 7000 NOP
2307 7000 NOP
2310 4464 JMS I XAVREG

/
/
```

```
2311 7430 SZL
2312 7440 SZA
2313 4465 JMS I XDATER
2314 7410 SKP
2315 4466 JMS I XHALT2
2316 4467 JMS I XLOOP
2317 5302 JMP FCL6
2320 7200 CLA
2321 1130 TAD SEQ7
2322 3154 DCA SEQ
2323 5554 JMP I SEQ
2324 2215 RET4
2325 2252 RET5
2326 2306 RET6

AD4,
AD5,
AD6,
```

PAL10 V141
2400 PAGE

/FALSE CARRY TEST#7

CLA CLL

2400 7300 FCT7,

2401 7300 FCS7,

2402 1145
2403 3472
2404 1137
2405 3001
2406 1151
2407 3002
2410 1326
2411 3003
CLA CLL
TAD
DCA I
TAD
DCA
TAD
DCA
TAD
DCA
INS9
XSTA2
INS3
TSTA4
INS13
TSTA5
AD7
TSTA6
/INSTRUCTION=ISE I TSTIND
/LOC,=7777
/INSTRUCTION=IAC
/LOC,=0001
/INSTRUCTION=JMP I ,+1
/LOC,=0002
/ADDRESS=RET7
/LOC,=0003

CLA CLL CMA
DCA TSTIND

2412 7340 FCL7,

2413 3010
2414 7040
2415 3000
2416 7040
2417 5472
2420 7000
2421 7000
2422 4464
CMA
DCA
CMA
DCA
CMA
JMP I
NOP
NOP
JMS I
XAVREG
TSTA3
XSTA2

RET7,

2423 7430
2424 7440
2425 4465
2426 7410
2427 4466
2430 4467
2431 5212
2432 7200
2433 1131
2434 3134
2435 5554
SZL
SZA
JMS I
SKP I
JMS I
JMS I
JMP
CLA
TAD
DCA
JMP I
XDATA
XHALT2
XLOOP
FCL7
SEQ8
SEQ
SEQ

/FALSE CARRY TEST #8

CLA CLL

2436 7300 FCT8,

2437 7300
2440 1137
CLA CLL
TAD
INS3
/INSTRUCTION=IAC

2441	3000	PAL10	V141	13=SEP=71	13131	PAGE 1=27	
2442	1137			DCA		/LOC,=0000	
2443	3001			TAD		/INSTRUCTION=IAC	
2444	1140			DCA		/LOC,=0001	
2445	3002			TAD		/INSTRUCTION=JMP I ,+2	
2446	1327			DCA		/LOC,=0002	
2447	3004			TAD		/ADDRESS=RET8	
				DCA		/LOC,=0004	
				/			
				/			
2450	7300			CLA CLL		/INSTRUCTION=JMS I ,+1	
2451	1146			TAD		/LOC,=7777	
2452	3472			DCA I			
2453	7240			CLA CMA			
2454	5472			JMP I			
2455	7000			NOP			
2456	7000			NOP			
				/			
				/			
2457	7430			SZL			
2460	7440			SEA			
2461	4463			JMS I			
2462	7410			SKP			
2463	4466			JMS I			
2464	4467			JMS I			
2465	5250			JMP			
2466	7200			CLA			
2467	1132			TAD			
2470	3154			DCA			
2471	5554			JMP I			
				/			
				/			
2472	7300			FALSE CARRY TEST #9			
				CLA CLL			
				/			
				/			
2473	7340			CLA CLL		/DATA=7777	
2474	3471			DCA I		/LOC,=7776	
2475	1137			TAD		/INSTRUCTION=IAC	
2476	3000			DCA		/LOC,=0000	
2477	1141			TAD		/INSTRUCTION=JMP I ,+1	
2500	3001			DCA		/LOC,=0001	
2501	1330			TAD		/ADDRESS=RET9	
2502	3002			DCA		/LOC,=0002	
				/			
				/			
2503	7300			CLA CLL		/INSTRUCTION=JMS I ,+1	
2504	1147			TAD			

2505 3472
2506 7240
2507 5472
2510 7000
2511 7000
2512 4464

DCA I XSTA2
CLA CMA
JMP I XSTA2
NOP
NOP
JMS I XAVREG
/
/
/
SZL
SZL
JMS I XDATE
SKP
JMS I XHALT2
JMS I XLOOP
JMP FCL9
CLA
TAD
DCA
JMP I
RET7
RET8
RET9

2513 7430
2514 7440
2515 4465
2516 7410
2517 4466
2520 4467
2521 5303
2522 7200
2523 1133
2524 3154
2525 5554
2526 2420
2527 2455
2530 2510

AD7,
AD8,
AD9,

PAGE

2600

/FALSE CARRY TEST #10

FCT10,

2600 7300

FCS10,

2601 7300
2602 1150
2603 3472
2604 1137
2605 3001

CLA CLL
TAD
DCA I
TAD
DCA

/INSTRUCTION=JMS I TSTIND
/LOC,=777
/INSTRUCTION=IAC
/LOC,=0001

/INSTRUCTION=JMP I ,+1
/LOC,=0002
/ADDRESS=RET10
/LOC,=0003

TAD
DCA
TAD
DCA

FCL10,

2612 7340
2613 3010
2614 7040
2615 5472
2616 7000
2617 7000

CLA CLL CMA
DCA
CMA
JMP I XSTA2
NOP
NOP

RET10,

Address	Instruction	Comment
2620	JMS I XAVREG	
2621	SEL	
2622	SZA	
2623	JMS I XDATER	
2624	SKP	
2625	JMS I XHALT2	
2626	JMS I XLOOP	
2627	JMP FCL10	
2630	CLA	
2631	TAD SEQ11	
2632	DCA SEQ	
2633	JMP I SEQ	
2634	FCL11, FALSE CARRY TEST #11	
2635	FCS11, CLA CLL	
2636	TAD INS3	
2637	DCA TSTA3	
2640	TAD INS5	
2641	DCA TSTA4	
2642	TAD AD11	
2643	DCA TSTA5	
2644	FCL11, CLA CLL	
2645	TAD INS15	
2646	DCA I XSTA2	
2647	CLA CMA	
2650	JMP I XSTA2	
2651	NOP	
2652	NOP	
2653	JMS I XAVREG	
2654	SEL	
2655	SZA	
2656	JMS I XDATER	
2657	SKP	
2660	JMS I XHALT2	
2661	JMS I XLOOP	
2662	JMP FCL11	
2663	CLA	
2664	TAD SEQ12	

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2665 3154 DCA SEQ
2666 5554 JMP I SEQ

/FALSE CARRY TEST #12

2667 7300 FCT12, CLA CLL

2670 7300 FCS12, CLA CLL
2671 1137 TAD INS3
2672 3472 DCA I XSTA2
2673 1152 TAD INS14
2674 3000 DCA TSTA3
2675 1317 TAD AD12
2676 3001 DCA TSTA4

/INSTRUCTION=IAC
/LOC.=7777
/INSTRUCTION=JMP I ,+1
/LOC.=0000
/ADDRESS=RET12
/LOC.=0001

2677 7340 FCL12, CLA CLL CMA
2678 5472 JMP I XSTA2
2679 7000 NOP
2680 7000 NOP
2681 4464 JMS I XAVREG

2684 7430 SEL
2685 7440 SZA
2686 4465 JMS I XOATER
2687 7410 SKP
2688 4466 JMS I XHALT2
2689 4467 JMS I XLOOP
2690 5277 JMP I FCL12
2691 5714 JMP I ,+1
2692 3200 ENDFCT
2693 2616 RET10
2694 2051 RET11
2695 2701 RET12

AD10,
AD11,
AD12,

3000 PAGE

3000 0000 SAMEAS, 0
3001 7340 CLA CLL CMA
3002 0040 AND W2
3003 7040 CMA

/(TAPE 3)
/COMPARE TWO NUMBERS! W1*NOT(W2)*W2*NOT(W1)=0, W1=W2

```

3004 0037 AND W1
3005 7640 SZA CLA
3006 5600 JMP I SAMEAS
3007 7040 CMA
3008 0037 AND W1
3009 7040 CMA
3010 0040 AND W2
3011 7640 SZA CLA
3012 5600 JMP I SAMEAS
3013 2200 ISE
3014 5600 JMP I SAMEAS
3015 5600 /
3016 5600 /SAVE AC AND LINK

```

```

3017 0000 SAVREG, 0
3018 3025 DCA
3019 7430 SZL
3020 7040 CMA
3021 3026 DCA
3022 7040 CMA
3023 0025 AND
3024 5617 JMP I SAVREG

```

/HALT ON ERROR; DISPLAY ADDRESS OF FAILED TEST IN AC

```

3027 0000 HALT2, 0
3028 7604 LAS
3029 0103 AND SR00
3030 7640 SZA CLA
3031 5627 JMP I HALT2
3032 1154 TAD
3033 7402 HLT
3034 5627 JMP I HALT2

```

/TEST SR00
/SUPPRESS HALT IF SR00=1

/PUT ADDRESS OF FAILED TEST IN
/AC AND STOP
/CONTINUE TESTING

/DATA ERROR HAS OCCURED

```

3037 0000 DATER, 0
3038 7604 LAS
3039 0104 AND SR01
3040 7450 SNA
3041 4256 JMS
3042 2237 ISE
3043 5637 JMP I DATER

```

/TEST SR01
/SUPPRESS ERROR TYPE IF SR01=1
/SET UP FOR ERROR TYPE

/LOOP ON DATA ERROR

```

3046 0000 LOOP, 0
3047 7604 LAS

```



```

) /
PAL10 0105
V141 13=SEP-71 13131 1=32
AND SR02 /TEST SR02
SNA CLA /LOOP IF SR02=1
JMP NLOOP /DO NOT LOOP
JMP I LOOP
JMP I LOOP
JMP I LOOP
NLOOP,
JMP I LOOP

```

```

/TYPE DATA ERROR MESSAGE
/
0
TYP2,
M000
3056 4446
3057 4446
3060 5744
3061 1037
3062 4673
3063 7340
3064 0025
3065 3037
3066 0026
3067 3040
3070 4460
3071 4461
3072 5656
3073 3227
XADOUT,
/END OF PASS

```

```

PAGE
ENDFCT,
3200 3200 CLA CLL CNTR1
3201 2020 ISE OUT
3202 5224 JMP LAS SR10
3203 7604 AND SNA CLA FCTOK
3204 0115 JMP SR09
3205 7650 AND SNA CLA FCTOK
3206 5221 JMP SR09
3207 7604 AND SNA CLA FCTOK
3210 0114 AND SNA CLA FCTOK
3211 7640 AND SNA CLA FCTOK
3212 7402 AND SNA CLA FCTOK
3213 7604 AND SNA CLA FCTOK
3214 0116 AND SNA CLA FCTOK
3215 7640 AND SNA CLA FCTOK
3216 5224 JMP LAS SR11
3217 5620 JMP I OUT
3220 3400 RNAD1
3221 4446 JMS I XPRINT
3222 5732 OK3=1
3223 5207 JMP FCTHLT
3224 1122 TAD SEQ1
3225 3154 DCA SEQ
3226 5554 JMP I SEQ

```

```

/INCREMENT PASS COUNT
/PASS NOT COMPLETE
/TEST SR10
/IS SR10=1
/NO, TYPE PCT
/TEST SR09
/IS SR09=1
/YES, HALT
/TEST SR11
/IS SR11=1
/YES, LOOP ON PCT
/NO, GO TO NEXT TEST

```

3227	0000	ADOUT,	0
3230	3037	DCA	TEMP1
3231	1037	TAD	TEMP1
3232	0172	AND	K0007
3233	3264	DCA	A2
3234	1037	TAD	TEMP1
3235	7006	RTL	
3236	7004	RAL	
3237	0266	AND	K0700
3240	1264	TAD	A2
3241	1267	TAD	K6060
3242	3264	DCA	A2
3243	1037	TAD	TEMP1
3244	7012	RTR	
3245	7012	RTR	
3246	7012	RTR	
3247	0172	AND	K0007
3250	3263	DCA	A1
3251	1037	TAD	TEMP1
3252	7012	RTR	
3253	7010	RAR	
3254	0266	AND	K0700
3255	1203	TAD	A1
3256	1267	TAD	K6060
3257	3263	DCA	A1
3260	4446	JMS I	XPRINT
3261	3262	A1=1	
3262	5627	JMP I	ADOUT
3263	0000	0	
3264	0000	0	
3265	4000	A1,	
3266	0700	A2,	
3267	6060	K0700,	
		K6060,	
		6060	

/MULTIPLE ADDITIONS OF RANDOM NUMBER AND ITS TWO'S COMPLEMENT

PAGE	RNA01,	CLA CLL	XRAND	/GENERATE RANDOM NUMBERS
3400	7300	JMS I		
3401	4473	CLA CLL		
3402	7300	TAD	RANDA	
3403	1041	TAD	RANDC	/AC=0
3404	1043	TAD	RANDC	/AC=0
3405	1043	TAD	RANDA	
3406	1041	TAD	RANDA	/AC=0
3407	1041	TAD	RANDC	
3410	1041	TAD	RANDA	
3411	1043	TAD	RANDC	/AC=0
3412	1043	TAD	RANDA	
3413	1041	TAD	RANDC	
3414	1041	TAD	RANDA	
3415	1043	TAD	RANDC	/AC=0
3416	1041	TAD	RANDA	
3417	1043	TAD	RANDC	
3420	1043	TAD	RANDC	/AC=0

```

PAL10 V141 13=SEP=71 13131 1=34
3421 1041 TAD RANOA
3422 1041 TAD RANOA
3423 1043 TAD RANOC
3424 1043 TAD RANOC
3425 1043 TAD RANOC
3426 1041 TAD RANOA
3427 1043 TAD RANOC
3430 1041 TAD RANOA
3431 1041 TAD RANOA
3432 1041 TAD RANOA
3433 1043 TAD RANOC
3434 1043 TAD RANOC
3435 7000 NOP
3436 4464 JMS I XAVREG
3437 7430 SZL
3440 7440 SZA
3441 4646 JMS I XRN1ER
3442 4467 JMS I NERROP
3443 5202 JMP RNAD1+2
3444 5645 JMP I
3445 3600 RNAD2
3446 3447 XRN1ER, RN1ER

```

/AC=0

/AC=0

/AC=0

/SAVE AC AND LINK
/IS LINK=1, AND AC=0

/ERROR, AC NOT 0, OR LINK NOT 1 OR BOTH
/RESULTS OK

```

/RANDOM ADD TEST 1 ERROR HANDLER
/
RN1ER,
0
LAS
AND SR01
SZA CLA SKHLT
JMP XPRINT
JMS I XPRINT
EM10-1
JMS I XPRINT
DH4-1
CLA CLL CMA
AND RANOA
DCA WD1
JMS I XWDOUT
CLA CLL CMA
AND RANOC
DCA WD1
JMS I XWDOUT
CLA CLL CMA
AND TEMPAC
DCA WD1
CMA
AND TEMPL
DCA WD2
JMS I XLNKOU
JMS I XWDOUT
JMS I XPRINT
CRLF-1

```

/OUTPUT RANOA

/OUTPUT RANOC

/OUTPUT RESULTANT LINK
/OUTPUT RESULTANT AC

```

3447 0000
3450 7604
3451 0104
3452 7640
3453 5302
3454 4446
3455 5565
3456 4446
3457 5316
3460 7340
3461 0041
3462 5037
3463 4461
3464 7340
3465 0043
3466 5037
3467 4461
3470 7340
3471 0025
3472 5037
3473 7040
3474 0026
3475 5040
3476 4460
3477 4461
3480 4446
3501 5742

```

```

/ PAL10 V141 13-SEP-71 13131 PAGE 1-35
3502 7604 SKHLT, LAS SR00 /TEST SR00
3503 0103 AND SZA CLA RN1ER /IS SR00=1
3504 7640 JMP I CLA CLL /YES, SUPPRESS ERROR HALT
3505 5647 TAD HLT /HALT WITH ADDRESS OF RNAD1 IN AC
3506 7300 JMP I RN1ER
3507 1247
3510 7402
3511 5647

```

/RANDOM NUMBER GENERATOR

```

RANDOM, 0
3512 0000 CLA CLL RANDA
3513 7300 TAD RAL
3514 1041 SEL
3515 7004 TAD K0003
3516 7430 TAD RANDA
3517 1342 DCA RANDC
3520 3041 TAD R2A
3521 1041 TAD K0003
3522 7041 TAD R2A
3523 3043 CLA LINKR
3524 7100 DCA LINKR
3525 1341 SEL LINKRC
3526 7004 TAD RANDOM
3527 7430 RAL
3530 1342 TAD JMP I
3531 3341 DCA 1
3532 7430 SEL 3
3533 7040 CMA
3534 3044 DCA
3535 1044 TAD
3536 7040 CMA
3537 3045 DCA
3540 5712 JMP I
3541 0001 R2A,
3542 0003 K0003,

```

/ADDITION OF RANDOM NUMBER AND MODIFIED
/COMPLEMENT TO PRODUCE ONE KNOWN BIT
/SET IN AC
/

```

3600 PAGE CLA CLL CMA /GET RANDOM NUMBER
3601 7340 RNAD2, AND RANDA /STORE IT
3602 0041 DCA APOS
3603 3346 CMA
3604 7040 AND RANDA
3605 0041 CMA
3606 7040 DCA ANEG
3607 3347

```

/ONE'S COMPLIMENT OF RANDOM NUMBER

PAL10	V141	13-SEP-71	13131	1-36
3607 7040		CMA		
3610 0103		AND		
3611 3352		DCA		/GET MASK
3612 7040	NXTBT,	CMA		
3613 0352		AND		
3614 7040		CMA		
3615 3353		DCA		/COMPLIMENT MASK
3616 7040	ALT1BT,	CMA		
3617 0346		AND		/GET RANDOM NUMBER
3620 0352		AND		/TEST SIGN BIT
3621 7440		SZA		/IS NUMBER NEGATIVE
3622 5232		JMP		/YES, MODIFY COMPLIMENT OF NUMBER
3623 7040		CMA		
3624 0346		AND		/GET RANDOM NUMBER
3625 4301		JMS		/MODIFY WITH MASK
3626 7040		CMA		
3627 0347		AND		/GET COMPLIMENT OF RANDOM NUMBER
3630 3351		DCA		/AND USE AS IS
3631 5240	MODNEG,	JMP		
3632 7240		CMA		/MODIFY NEGATIVE NUMBER
3633 0347		AND		/GET COMPLIMENT OF RANDOM NUMBER
3634 4315		JMS		/MODIFY WITH MASK
3635 7040		CMA		
3636 0346		AND		/GET RANDOM NUMBER
3637 3351		DCA		/AND USE AS IS
3640 7340	CBTST1,	CMA		
3641 0350		AND		/LOAD AC WITH MODIFIED ARGUMENT
3642 1351		TAD		/ADD UNMODIFIED ARGUMENT
3643 7430		SZL		/DID CARRY PROPAGATE INTO LINK
3644 7001		IAC		/NO, INCREMENT NUMBER
3645 4464		JMS		/SAVE AC
3646 4463		JMS		/COMPARE MODIFIED BIT AND MASK
3647 7410		SKP		/AC AND MASK DIFFERENT, ERROR
3650 4756		JMS		/NO ERROR, AC AND MASK THE SAME
3651 4467		JMS		/RETURN HERE FOR LOOPING
3652 5240		JMP		
3653 5254		JMP		
3654 7340	CBTST2,	CLL		
3655 0351		AND		/LOAD AC WITH UNMODIFIED ARGUMENT
3656 1350		TAD		/ADD MODIFIED ARGUMENT
3657 7430		SZL		/DID CARRY PROPAGATE INTO LINK
3658 7001		IAC		/NO, INCREMENT NUMBER
3661 4464		JMS		/SAVE AC
3662 4463		JMS		/COMPARE AC AND MASK
3663 7410		SKP		/AC AND MASK NOT THE SAME, ERROR
3664 4756		JMS		/NO ERROR, AC AND MASK THE SAME
3665 4467		JMS		/RETURN HERE FOR LOOPING
3666 5254		JMP		
3667 7340	MOVMSK,	CLL		
3670 0352		AND		
3671 7010		RAR		
3672 3352		DCA		

/HAVE ALL BITS BEEN TESTED
/NO, CONTINUE
/YES, TEST FOR LOOP ON RNAD2

3673	7420	SNL	NXTBT
3674	5212	JMP I	NERROP
3675	4467	JMP I	RNAD2
3676	5200	JMP I	,*1
3677	5700	RARR	
3700	4200		
3701	0000	0	
3702	0353	AND	NMASK
3703	7040	CMA	
3704	3354	DCA	ABNOT
3705	7040	CMA	
3706	0347	AND	ANEG
3707	0352	AND	MASK
3710	7040	CMA	
3711	0354	AND	ABNOT
3712	7040	CMA	
3713	3350	DCA	BPOS
3714	5701	JMP I	XOR1
3715	0000	0	
3716	0352	AND	MASK
3717	7040	CMA	
3720	3354	DCA	ABNOT
3721	7040	CMA	
3722	0346	AND	APOS
3723	0353	AND	NMASK
3724	7040	CMA	
3725	0354	AND	ABNOT
3726	3350	DCA	BPOS
3727	5715	JMP I	XOR2

XOR1,

XOR2,

3730	0000	0	
3731	7040	CMA	
3732	3355	DCA	NOTAC
3733	7040	CMA	
3734	0025	AND	TEMPAC
3735	0353	AND	NMASK
3736	7440	SEA	
3737	5344	JMP	EROUT1
3740	7040	CMA	
3741	0352	AND	MASK
3742	0355	AND	NOTAC
3743	7440	SEA	
3744	2330	EROUT1, ISE	SAMEA
3745	5730	JMP I	SAMEA
3746	0000	0	
3747	0000	APOS,	
3750	0000	ANEG,	
3751	0000	BPOS,	
3752	0000	BNeg,	
3753	0000	MASK,	
3754	0000	NMASK,	
3755	0000	ABNOT,	
3756	4000	NOTAC,	
		XRN2ER,	RN2ER

SAMEA,

EROUT1,

XRN2ER,

```
4000 PAGE
/ERROR HANDLER FOR RANDOM ADD TEST 2,
/
RN2ER, 0
4000 0000 LAS
4001 7604 AND
4002 0104 SZA CLA
4003 7640 SR01
4004 5253 JMP I
4005 4446 JMS I
4006 5605 EM11=1
4007 4446 JMS I
4008 5364 XPRINT
4009 7340 XPRINT
4010 0777 CLA CLL
4011 3037 AND
4012 0777 DCA I
4013 3037 JMS I
4014 4461 CMA
4015 7040 BPOS
4016 0776 W01
4017 3037 XWDOUT
4018 4461 BNEG
4019 7040 W01
4020 0775 JMS I
4021 3037 CMA
4022 0775 AND
4023 3037 DCA
4024 4461 JMS I
4025 7040 CMA
4026 0025 AND
4027 3037 DCA
4028 4461 JMS I
4029 7040 CMA
4030 4461 TEMPAC
4031 4446 W01
4032 5742 XWDOUT
4033 7604 XPRINT
4034 0103 CRLF=1
4035 5600 LAS
4036 5600 SR00
4037 7300 SZA CLA
4038 1200 JMP I
4039 7402 CLA CLL
4040 5600 TAD
4041 7402 HLT
4042 5600 JMP I
/TEST SR00
/IS SR00 = 1
/YES SUPPRESS ERROR TYPEOUT
/NO, TYPE "RANDOM ADD TEST 2 FAILED"
/TYPE ARG1, ARG2, ARG1+ARG2, EXPECTED
/OUTPUT ARG1
/OUTPUT ARG2
/OUTPUT EXPECTED RESULT
/OUTPUT RESULTANT IC
/TEST SR00
/IS SR00 = 1
/YES, DO NOT HALT
/NO, HALT WITH ADDRESS IN AC
```

/ROTATE RANDOM NUMBER RIGHT USING RAR

```
4175 3752
4176 3751
4177 3750
4200 4200
4200 7300
```

PAGE
RARR, CLA CLL

/	PAL10	V141	13=SEP=71	13131	PAGE 1=39	
4201	1044		TAD	LINKR		
4202	7440		SEA		/GET LINK TO BE ROTATED	
4203	7220		CLA CML			
4204	1041		TAD	RANDA		
4205	7010		RAR		/GET NUMBER TO BE ROTATED	
4206	7010		RAR			
4207	7010		RAR			
4210	7010		RAR			
4211	7010		RAR			
4212	7010		RAR			
4213	7010		RAR			
4214	7010		RAR			
4215	7010		RAR			
4216	7010		RAR			
4217	7010		RAR			
4220	7010		RAR			
4221	7010		RAR			
4222	7010		RAR			
4223	7010		RAR			
4224	7010		RAR			
4225	7010		RAR			
4226	7010		RAR			
4227	7010		RAR			
4230	7010		RAR			
4231	7010		RAR			
4232	7010		RAR			
4233	7010		RAR			
4234	7010		RAR			
4235	7010		RAR			
4236	7010		RAR			
4237	7000		NOP			
4240	7000		NOP			
4241	4464		JMS I	XAVREG	/SAVE AC AND LINK	
4242	1043		TAD	RANDC	/ADD COMPLEMENT OF NUMBER TO AC	
4243	7640		SEA CLA		/ARE THEY EQUAL	
4244	5250		JMP	I+4	/NO, ERROR	
4245	1044		TAD	LINKR		
4246	3037		DCA	WD1		
4247	1026		TAD	TEMPL		
4250	3040		DCA	WD2		
4251	4462		JMS I	XAMEAS	/ARE LINKS THE SAME	
4252	4735		JMS I	XRARR	/NO, ERROR	
4253	4467		JMS I	NERROP	/TEST FOR LOOPING	
4254	5200		JMP	RARR	/LOOP ON RARR	
4255	7300	RALR,	/ROTATE RANDOM NUMBER LEFT USING RAL			
4256	1044		CLA CCL			
4257	7440		TAD	LINKR	/GET LINK TO BE ROTATED	
4260	7220		SEA			
4261	1041		CLA CML			
4262	7004		TAD	RANDA	/GET NUMBER TO BE ROTATED	
4263	7004		RAL			
4264	7004		RAL			

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4265	7004	RAL			
4266	7004	RAL			
4267	7004	RAL			
4270	7004	RAL			
4271	7004	RAL			
4272	7004	RAL			
4273	7004	RAL			
4274	7004	RAL			
4275	7004	RAL			
4276	7004	RAL			
4277	7004	RAL			
4300	7004	RAL			
4301	7004	RAL			
4302	7004	RAL			
4303	7004	RAL			
4304	7004	RAL			
4305	7004	RAL			
4306	7004	RAL			
4307	7004	RAL			
4310	7004	RAL			
4311	7004	RAL			
4312	7004	RAL			
4313	7004	RAL			
4314	7000	NOP			
4315	7000	NOP			
4316	4464	JMS I	XAVREG	/SAVE AC AND LINK	
4317	1043	TAD	RANDC	/ADD COMPLIMENT OF	ORIGINAL NUMBER TO AC
4320	7440	SZA		/ARE THEY THE SAME	
4321	5325	JMP		/NO, ERROR	
4322	1044	TAD			
4323	5037	DCA			
4324	1026	TAD			
4325	3040	DCA			
4326	4462	JMS I	XAMEAS	/COMPARE ORIGINAL AND ROTATED LINKS	
4327	4734	JMS I	XRALR	/LINKS NOT THE SAME, ERROR	
4330	4467	JMS I	NERROP		
4331	5255	JMP I	RALR		
4332	5733	JMP I			
4333	4400	RTL			
4334	5013	RALR			
4335	5000	XRARR			

ROTATE RANDOM NUMBER LEFT USING RTL

CLA CLL	LINKR	/GET LINK TO BE ROTATED
TAD		
SZA		
CLA CML	RANDA	/GET NUMBER TO BE ROTATED
TAD		
RTL		
RTL		
RTL		

PAGE
RTL

4400	7300
4401	1044
4402	7440
4403	7220
4404	1041
4405	7006
4406	7006
4407	7006
4410	7006

4411	7006	RTL	
4412	7006	RTL	
4413	7006	RTL	
4414	7006	RTL	
4415	7006	RTL	
4416	7006	RTL	
4417	7006	RTL	
4420	7006	RTL	
4421	7006	RTL	
4422	7006	RTL	
4423	7006	RTL	
4424	7006	RTL	
4425	7006	RTL	
4426	7006	RTL	
4427	7006	RTL	
4430	7006	RTL	
4431	7006	RTL	
4432	7006	RTL	
4433	7006	RTL	
4434	7006	RTL	
4435	7006	RTL	
4436	7006	RTL	
4437	7000	NOP	
4440	7000	NOP	
4441	4464	JMS I	XAVREG
4442	1043	TAD	RANDC
4443	7440	SEA	
4444	5250	JMP	I+4
4445	1044	TAD	LINKR
4446	3037	DCA	WD1
4447	1026	TAD	TEMPL
4450	3040	DCA	WD2
4451	4462	JMS I	XANEAS
4452	4771	JMS I	XRTL
4453	4467	JMS I	NERROP
4454	5200	JMP	RTL

/SAVE AC AND LINK
/ADD COMPLEMENT OF ORIGINAL NUMBER TO AC
/ARE THEY THE SAME
/NO, ERROR

/COMPARE ORIGINAL AND ROTATED LINKS
/LINKS NOT THE SAME, ERROR

/ROTATE RANDOM NUMBER RIGHT USING RTR

4455	7300	RTR,	CLA CML	LINKR	/GET LINK TO BE ROTATED
4456	1044	TAD			
4457	7440	SEA			
4460	7220	CLA CML	RANDA		/GET NUMBER TO BE ROTATED
4461	1041	TAD			
4462	7012	RTR			
4463	7012	RTR			
4464	7012	RTR			
4465	7012	RTR			
4466	7012	RTR			
4467	7012	RTR			
4470	7012	RTR			
4471	7012	RTR			
4472	7012	RTR			
4473	7012	RTR			

```

4474 7012 RTR
4475 7012 RTR
4476 7012 RTR
4477 7012 RTR
4500 7012 RTR
4501 7012 RTR
4502 7012 RTR
4503 7012 RTR
4504 7012 RTR
4505 7012 RTR
4506 7012 RTR
4507 7012 RTR
4510 7012 RTR
4511 7012 RTR
4512 7012 RTR
4513 7012 RTR
4514 7000 NOP
4515 7000 NOP
4516 4464 JMS I
4517 1043 TAD
4520 7440 SZA
4521 5325 JMP
4522 1044 TAD
4523 3037 DCA
4524 1026 TAD
4525 3040 DCA
4526 4462 JMS I
4527 4770 JMS I
4530 4467 JMS I
4531 5255 JMP

XAVREG
RANDC
+4
LINKR
WD1
TEMPL
WD2
XAMEAS
XRTRR
NERROP
RTRR

/SAVE AC AND LINK
/ADD COMPLEMENT OF ORIGINAL NUMBER TO AC
/ARE THEY THE SAME
/NO, ERROR

/ARE LINKS THE SAME
/NO, ERROR

```

```

4532 2020 ISZ
4533 5366 JMP
4534 7604 LAS
4535 0115 AND
4536 7650 SNA CLA
4537 5363 JMP
4540 7604 LAS
4541 0114 AND
4542 7640 SZA CLA
4543 7402 HLT
4544 7604 LAS
4545 0116 AND
4546 7640 SZA CLA
4547 5366 JMP
4550 7604 LAS
4551 0173 AND
4552 7110 RAR CLL
4553 7012 RTR
4554 3175 DCA FLOSAV
4555 7604 LAS
4556 0107 AND SR04
4557 7640 SZA CLA

CNTR1
ENRN
SR10
SNA CLA
RNDOK
SR09
SZA CLA
HLT
LAS
AND
SZA CLA
ENRN
FLOSW,
AND K0070
RAR CLL
RTR
DCA FLOSAV
LAS
AND SR04
SZA CLA

/INCREMENT PASS COUNTER
/NOT END OF PASS
/TEST SR10
/IS SR10=1
/NO, TYPE RANDOM
/TEST SR09
/IS SR09=1
/YES, HALT AT END OF RANDOM
/TEST SR11
/IS SR11=1
/YES, LOOP ON RANDOM TESTS

/SAVE THE SWITCHES
/MASK FIELD RELOCATION SWITCH

```

PAL10	V141	13-SEP-71	13131	PAGE 1-43	
4560	5772	JMP I XFLDCK		/GOT FIELD RELOCATION SWITCH AND GO	
4561	5762	JMP I ,+1		/NO, GO TO SIMULATED ADDITION TEST	
4562	0200	RSIMAD			
4563	4446	JMS I XPRINT			
4564	5735	OK4-1			
4565	5340	JMP I RNDHLY			
4566	5767	JMP I ,+1			
4567	3400	RNAD1			
4570	5026	XRTRR,			
4571	5041	XRTLRL,			
4572	4600	XFLDCK, FLDCCHK			
		/			
	4600	PAGE			
		/ROUTINE TO SORT AND COMPARE RELOCATION INFORMATION			
		/			
4600	4231	FLDCCHK,		/YES, FIND NUMBER OF FIELDS PRESENT	
4601	4264	JMS FLDFND		/RELOCATE TO NEXT BANK PRESENT OR BANK 0	
4602	7346	JMS RELOC			
4603	4341	CLA CLL CHA RTL		/AG TO 7775	
4604	4331	JMS LFCR		/PRINT SOME CR-LF	
4605	4352	JMS ASTRK		/PRINT SOME *****	
4606	4446	JMS FLDFNO		/PRINT AMOUNT OF MEMORY	
4607	5735	JMS I XPRINT		/PRINT " EXTENDED BANKS OF MEMORY TO BANK "	
4610	4360	BKMS		/TEXT FOR EXTENDED BANKS OF MEMORY TO BANK	
4611	4331	JMS FLDFHR		/PRINT NEW FIELD	
4612	7344	JMS ASTRK		/PRINT SOME *****	
4613	4341	CLA CLL CHA RAL		/AG TO 7776	
4614	1175	JMS LFCR		/PRINT SOME CR - LP	
4615	7041	TAD FLDSAV			
4616	1174	CLA			
4617	7050	TAD FLDFNUM		/COMPARE SWITCHES	
4620	5223	SNA CLA			
4621	7602	JMP ,+3			
4622	5770	HLT CLA		/TRY IT AGAIN	
4623	1314	JMP I XFLDSH			
4624	1115	TAD FLDFGO			
4625	3226	TAD K0002		/MODIFIED FOR NEW FIELD	
4626	0000	DCA ,+1			
4627	5630	0000		/START POINTER	
4630	0200	JMP I ,+1			
		RSIMAD			
		/ROUTINE TO DETERMINE NUMBER OF BANKS OF MEM.			
		/			
		/			
4631	0000	FLDFND, 0			
4632	7300	CLA CLL			
4633	3174	DCA FLDFNUM			
4634	1371	TAD KSTOP		/JUST A COUNTER	
4635	3176	DCA FLDFCNT		/TO FIELD 0	
4636	6201	DCA FLDFCNT			
4637	3571	DCF 0			
4640	1372	DCA I K0			
4641	1113	TAD KDCF			
4642	3243	TAD K0010			
4643	0000	DCA FLDOF		/MODIFIED BY TEST	

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1=44

4644 7340
 4645 3571
 4646 1571
 4647 7650
 4650 5255
 4651 2174
 4652 1243
 4653 2176
 4654 5241
 4655 7300
 4656 4201
 4657 1571
 4660 7650
 4661 5631
 4662 7602
 4663 5274

CLA CLL CMA
 DCA I K0
 TAD I K0
 SNA CLA
 JMP I+5
 ISZ FLDRAM
 TAD FLDG
 ISZ FLDGNT
 JMP FLDG -2
 CLA CLL
 CDF 0
 TAD I K0
 SNA CLA
 JMP I FLDGND
 HLT CLA
 JMP FLDGND I+1

/TRY EXTENDED FIELD
 /SAME IF FIELD PRESENT
 /DATA BAD OR FIELD NOT THERE
 /UPDATE FIELD COUNT
 /GET LAST FIELD CDF
 /STOP AFTER 7
 /TRY NEXT FIELD
 /BACK TO FIELD 0
 /DID FIELD 0 CHANGE
 /FIELD 0 O.K. EXIT
 /FIELD ERROR
 /TRY AGAIN

/ROUTINE TO MOVE PROGRAM TO NEXT FIELD OR FIELD 0

RELOC,

4664 0000
 4665 7300
 4666 3176
 4667 6224
 4670 1113
 4671 0375
 4672 3312
 4673 7301
 4674 1174
 4675 7804
 4676 7806
 4677 7041
 4700 1312
 4701 7600
 4702 1312
 4703 1372
 4704 3314
 4705 6224
 4706 1372
 4707 3312
 4710 1312
 4711 3317
 4712 0000
 4713 1576
 4714 0000
 4715 3576
 4716 1576
 4717 0000
 4720 7041
 4721 1576
 4722 7650
 4723 5326
 4724 7602
 4725 5312
 4726 2176
 4727 5312

0
 CLA CLL
 DCA FLDGNT
 RIF
 TAD K0010
 AND K0070
 DCA FLDGNT
 CLA CLL IAC
 TAD FLDRAM
 RAL
 RTL
 CIA
 TAD FLDGNT
 SNL CLA
 TAD FLDGNT
 TAD K00F
 DCA FLDG
 RIF
 TAD K00F
 DCA FLDGNT
 TAD FLDGNT
 DCA FLDGNT
 FLDGNT, 0000
 TAD I FLDGNT
 FLDG, 0000
 DCA I FLDGNT
 TAD I FLDGNT
 FLDGNT, 0000
 CIA
 TAD I FLDGNT
 SNA CLA
 JMP I+3
 HLT CLA
 JMP FLDGNT
 ISZ FLDGNT
 JMP FLDGNT

/GET CURRENT FIELD
 /UPDATE TO NEXT FIELD
 /MASK 0-8
 /NEW FIELD POINTER

/MOVE TO 6-8

/COMPARE TO FIELDS PRESENT
 /YES, GOOD FIELD
 /GO BACK TO FIELD 0
 /SET POINTER FOR NEW FIELD
 /WHERE IS PROGRAM

/SET POINTER FOR FIELD JUST TESTED

/SAME MOVE
 /MODIFIED TO CURRENT FIELD
 /GET DATA WORD

/STORE DATA

/THIS THE GOOD ONE
 /DID DATA CHANGE
 /DATA O.K.
 /RELOCATION ERROR
 /TRY SAME WORD AGAIN
 /UPDATE TO NEXT ADDRESS
 /TRANSFER NEXT WORD

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PAL10	5664	JMP I RELOC	
4730	5664	ASTRK,	
4731	0000	0	
4732	1371	TAD KSTOP	
4733	3176	DCA FLDGNT	
4734	1376	TAD K252	
4735	4447	JMS I XTYPE	
4736	2176	ISZ FLDGNT	
4737	5334	JMP I=3	
4740	5731	JMP I ASTRK	/GET ASTRK CHAR.
4741	0000	0	
4742	3176	DCA FLDGNT	
4743	1374	TAD KCR	
4744	4447	JMS I XTYPE	
4745	1373	TAD KLF	
4746	4447	JMS I XTYPE	
4747	2176	ISZ FLDGNT	
4750	5343	JMP I=3	
4751	5741	JMP I LFCR	
4752	0000	0	
4753	1174	TAD FLDNUM	
4754	0172	AND K0007	
4755	1077	TAD K260	
4756	4447	JMS I XTYPE	
4757	5752	JMP I FLDNO	
4760	0000	0	
4761	1314	TAD FLDGO	
4762	0173	AND K0070	
4763	7010	RAR	
4764	7012	RTR	
4765	1077	TAD K260	
4766	4447	JMS I XTYPE	
4767	5760	JMP I FLDHR	
4770	4550	XFLDSW, FLDH	
4771	7771	KSTOP, 7771	
4772	6201	KQDF, 6201	
4773	0212	KLF, 0212	
4774	0215	KCR, 0215	
4775	0170	K0170, 0170	
4776	0252	K252, 0252	
5000	5000	PAGE	
5001	0000	RARER,	
5002	7604	0	
5003	0104	LAS	
5004	7640	AND	
5005	5210	SZA CLA	
5006	4446	JMP I=4	
5007	5625	JMS I XPRINT	
5008	4264	EM12=1	
5009	4264	JMS	
5010	4264	ROPRT	

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PAL10

5010 7300
5011 1200
5012 5253

5013 0000
5014 7604
5015 0104
5016 7640
5017 5223
5020 4446
5021 3644
5022 4264
5023 7380
5024 1213
5025 5253
5026 0000
5027 7604
5030 0104
5031 7640
5032 5253
5033 4446
5034 5663
5035 4264
5036 7380
5037 1226
5040 5253
5041 0000
5042 7604
5043 0104
5044 7640
5045 5251
5046 4446
5047 5792
5050 4264
5051 7380
5052 1241
5053 3243
5054 7604
5055 0103
5056 7640
5057 3242
5060 1263
5061 7402
5062 5663
5063 0000

RALER, 0
LAS
AND SR01
SEA CLA
JMP
JMS I
EM13-1 XPRINT
JMS
CLA CLL
TAD ROPRT
JMP RALER
ROHLT

RTRER, 0
LAS
AND SR01
SEA CLA
JMP
JMS I
EM14-1 XPRINT
JMS
CLA CLL
TAD ROPRT
JMP RTRER
ROHLT

RTLER, 0
LAS
AND SR01
SEA CLA
JMP
JMS I
EM15-1 XPRINT
JMS
CLA CLL
TAD ROPRT
JMP RTLER
ROBACK

ROHLT, 0
LAS
AND SR00
SEA CLA
JMP
TAD
HLT
JMP I
ROBACK

ROBACK, 0
JMS I
DMS-1 XPRINT
CLA CLL
AND CMA
DCA LINKR
WD2

5064 0000
5065 4446
5066 5347
5067 7340
5070 0044
5071 5040

ROPRY, 0
JMS I
DMS-1 XPRINT
CLA CLL
AND CMA
DCA LINKR
WD2

PAL10 V141 13-SEP-74
5072 7040 CMA
5073 0041 AND
5074 3037 DCA
5075 4460 JMS I
5076 4461 XLNKOU
5077 7040 JMS I
5078 7040 XWDOUT
5079 0026 CMA
5080 3040 AND
5081 3040 DCA
5082 4460 JMS I
5083 7040 CMA
5084 0025 AND
5085 3037 DCA
5086 4461 JMS I
5087 4446 JMS I
5088 5742 CRLF=1
5089 5664 JMP I
5090 ROPRT

PAGE 5200
DH1, 5201 3736
5202 4040
5203 4001
5204 2207
5205 6140
5206 4040
5207 4040
5208 4040
5209 4040
5210 0122
5211 0762
5212 4040
5213 4040
5214 4040
5215 4040
5216 4040
5217 4023
5220 1113
5221 2514
5222 0124
5223 0504
5224 4040
5225 4040
5226 4040
5227 4001
5230 2207
5231 6133
5232 0122
5233 0762
5234 4040
5235 4040
5236 4001
5237 2207
5240 6253
5241 0122

TEXT /.. ARG1 ARG2 SIMULATED ARG1+ARG2 ARG2+ARG1+..

PAL10 V141 13-SEP-71 13131 1-48

	DH2,	TEXT	/%	ORIGINAL	SIMULATED	ACTUAL-00/
5242	0761					
5243	3736					
5244	0000					
5245	3736					
5246	4040					
5247	4040					
5250	4017					
5251	2211					
5252	0711					
5253	1601					
5254	1440					
5255	4040					
5256	4040					
5257	4023					
5260	1115					
5261	2514					
5262	0124					
5263	0504					
5264	4040					
5265	4040					
5266	4040					
5267	4001					
5270	0324					
5271	2501					
5272	1437					
5273	3600					
5274	3736					
5275	2201					
5276	1604					
5277	0140					
5300	4040					
5301	4040					
5302	4040					
5303	4022					
5304	0116					
5305	0403					
5306	4040					
5307	4040					
5310	4040					
5311	4040					
5312	2205					
5313	2325					
5314	1424					
5315	3736					
5316	0000					
5317	3736					
5320	2201					
5321	1604					
5322	0140					
5323	4040					
5324	4040					
5325	4040					
5326	4002					
5327	2017					
5330	2340					

DH3, TEXT /%%RANDA RANDC RESULT-00/

DH4, TEXT /%%RANDA BPOS BNEG RESULT-00/

PAL10		V141		13-SEP-71		13131		PAGE 1-49	
5331		4040							
5332		4040							
5333		4040							
5334		4040							
5335		0216							
5336		0507							
5337		4040							
5340		4040							
5341		4040							
5342		4040							
5343		4022							
5344		0523							
5345		2514							
5346		2437							
5347		3600							
5350		3736							
5351		1722							
5352		1107							
5353		1116							
5354		0114							
5355		4040							
5356		4040							
5357		4040							
5360		0103							
5361		2425							
5362		0114							
5363		3736							
5364		0000							
5365		3736							
5366		4040							
5367		4040							
5370		0122							
5371		0701							
5372		4040							
5373		4040							
5374		4040							
5375		4040							
5376		4001							
5377		2207							
5400		6240							
5401		4040							
5402		4040							
5403		4040							
5404		0530							
5405		2005							
5406		0324							
5407		0504							
5410		4040							
5411		4040							
5412		4040							
5413		0103							
5414		2425							
5415		0114							
5416		3736							
5417		0000							

V141	13-SEP-71	13131	1-50
EM1,	TEXT	/..	SIMULATED ADD TEST FAILED/
PAL10	3736		
	5420		
	5421		
	5422		
	5423		
	5424		
	5425		
	5426		
	5427		
	5430		
	5431		
	5432		
	5433		
	5434		
	5435		
	5436		
	5437		
	5440		
EM2,	3736	/..	SIMULATED RAL TEST FAILED/
	5441		
	5442		
	5443		
	5444		
	5445		
	5446		
	5447		
	5450		
	5451		
	5452		
	5453		
	5454		
	5455		
	5456		
	5457		
	5460		
	5461		
EM3,	3736	/..	SIMULATED RAR TEST FAILED/
	5462		
	5463		
	5464		
	5465		
	5466		
	5467		
	5470		
	5471		
	5472		
	5473		
	5474		
	5475		
	5476		
	5477		
	5500		
	5501		
	5502		
EM4,	3736	/..	SIMULATED RTL TEST FAILED/
	5503		
	5504		
	5505		
	5506		

5507 1115
5510 2514
5511 0124
5512 0504
5513 4022
5514 2414
5515 4024
5516 0523
5517 2440
5520 0601
5521 1114
5522 0504
5523 0000
5524 3736
5525 4040
5526 4040
5527 4023
5530 1115
5531 2514
5532 0124
5533 0504
5534 4022
5535 2422
5536 4024
5537 0523
5540 2440
5541 0601
5542 1114
5543 0504
5544 0000
5545 3736
5546 4040
5547 4040
5550 4023
5551 1115
5552 2514
5553 0124
5554 0504
5555 4002
5556 2327
5557 4024
5560 0523
5561 2440
5562 0601
5563 1114
5564 0504
5565 0000
5566 3736
5567 4040
5570 4040
5571 4022
5572 0116
5573 0417
5574 1540
5575 0104

EM5, TEXT /.. SIMULATED RTR TEST FAILED/

EM6, TEXT /.. SIMULATED BSW TEST FAILED/

EM10, TEXT /.. RANDOM ADD TEST 1 FAILED/

PAL10	V141	13-SEP-71	13131	1-50
5420	EM1,	TEXT	/	SIMULATED ADD TEST FAILED/
5421				
5422				
5423				
5424				
5425				
5426				
5427				
5428				
5429				
5430				
5431				
5432				
5433				
5434				
5435				
5436				
5437				
5438				
5439				
5440				
5441	EM2,	TEXT	/	SIMULATED RAL TEST FAILED/
5442				
5443				
5444				
5445				
5446				
5447				
5448				
5449				
5450				
5451				
5452				
5453				
5454				
5455				
5456				
5457				
5458				
5459				
5460				
5461				
5462	EM3,	TEXT	/	SIMULATED RAR TEST FAILED/
5463				
5464				
5465				
5466				
5467				
5468				
5469				
5470				
5471				
5472				
5473				
5474				
5475				
5476				
5477				
5478				
5479				
5480				
5481				
5482				
5483				
5484				
5485				
5486				
5487				
5488				
5489				
5490				
5491				
5492				
5493				
5494				
5495				
5496				
5497				
5498				
5499				
5500				
5501				
5502				
5503	EM4,	TEXT	/	SIMULATED RTL TEST FAILED/
5504				
5505				
5506				

5507 1115
5510 2514
5511 0124
5512 0504
5513 4022
5514 2414
5515 4024
5516 0523
5517 2440
5520 0601
5521 1114
5522 0504
5523 0000
5524 3736
5525 4040
5526 4040
5527 4023
5530 1115
5531 2514
5532 0124
5533 0504
5534 4022
5535 2422
5536 4024
5537 0523
5540 2440
5541 0601
5542 1114
5543 0504
5544 0000
5545 3736
5546 4040
5547 4040
5550 4023
5551 1115
5552 2514
5553 0124
5554 0504
5555 4002
5556 2327
5557 4024
5560 0523
5561 2440
5562 0601
5563 1114
5564 0504
5565 0000
5566 3736
5567 4040
5570 4040
5571 4022
5572 0116
5573 0417
5574 1540
5575 0104

EM5, TEXT /.. SIMULATED RTR TEST FAILED/

EM6, TEXT /.. SIMULATED BSW TEST FAILED/

EM10, TEXT /.. RANDOM ADD TEST 1 FAILED/

PAL10 V141 13=SEP=71 13131 1=52

5276 0440
5277 2405
5280 2324
5281 4061
5282 4006
5283 0111
5284 1405
5285 0400
5286 3736
5287 4040
5288 4040
5289 4022
5290 0116
5291 0417
5292 1540
5293 0104
5294 0440
5295 2405
5296 2324
5297 4062
5298 4006
5299 0111
5300 1405
5301 0417
5302 1540
5303 0104
5304 0440
5305 2405
5306 2324
5307 4062
5308 4006
5309 0111
5310 1405
5311 0417
5312 1540
5313 0104
5314 0440
5315 2405
5316 2324
5317 4062
5318 4006
5319 0111
5320 1405
5321 0417
5322 1540
5323 0104
5324 0440
5325 2405
5326 2324
5327 4062
5328 4006
5329 0111
5330 1405
5331 0417
5332 1540
5333 0104
5334 0440
5335 2405
5336 2324
5337 4062
5338 4006
5339 0111
5340 1405
5341 0417
5342 1540
5343 0104
5344 0440
5345 2405
5346 2324
5347 4062
5348 4006
5349 0111
5350 1405
5351 0417
5352 1540
5353 0104
5354 0440
5355 2405
5356 2324
5357 4062
5358 4006
5359 0111
5360 1405
5361 0417
5362 1540
5363 0104
5364 3736

EM11, TEXT /.. RANDOM ADD TEST 2 FAILED/

EM12, TEXT /.. RANDOM RAR TEST FAILED/

EM13, TEXT /.. RANDOM RAL TEST FAILED/

EM14, TEXT /.. RANDOM RTL TEST FAILED/

5665 4040
5666 4040
5667 4022
5670 0116
5671 0417
5672 1540
5673 2224
5674 1440
5675 2485
5676 2324
5677 4006
5700 0111
5701 1405
5702 0400
5703 3736
5704 4040
5705 4040
5706 4022
5707 0116
5710 0417
5711 1540
5712 2224
5713 2240
5714 2485
5715 2324
5716 4006
5717 0111
5720 1405
5721 0400
5722 3736
5723 2311
5724 1501
5725 0400
5726 3736
5727 2311
5730 1522
5731 1724
5732 0000
5733 3736
5734 0603
5735 2400
5736 3736
5737 2201
5740 1604
5741 1715
5742 0000
5743 3736
5744 0000
5745 3736
5746 4004
5747 0124
5750 0140
5751 0522
5752 2217
5753 2237

EM15, TEXT /.. RANDOM RTR TEST FAILED?

OK1, TEXT /..SIMAD/

OK2, TEXT /..SIMROT/

OK3, TEXT /..FCT/

OK4, TEXT /..RANDOM/

CRLF, TEXT /..//

DATE, TEXT /.. DATA ERROR..//

13131 1-54

13-SEP-71 V141

PAL10

5754 3600

BKMS,

5755 7777 7777
5756 4005 4005
5757 3024 3024
5760 0516 0516
5761 0405 0405
5762 0440 0440
5763 0201 0201
5764 1613 1613
5765 2340 2340
5766 1706 1706
5767 4015 4015
5770 0515 0515
5771 1722 1722
5772 3140 3140
5773 2417 2417
5774 4002 4002
5775 0116 0116
5776 1340 1340
5777 0000 0000

/TEXT FOR EXTENDED BANKS OF MEMORY TO BANK

/RESTORE BINARY LOADER AND START LOADER

*7600

7600
7601
7602
7603

CLA CLL
TAD BIN
DCA TSTA2
JMP TSTA2
S

[illegible]

PAL10	V141	13=SEP=71	13131	PAGE 1=57
A1	3263	DH5	FCT12	2667
A10RA2	0027	DH6	FCT2	2043
A2	3264	EM1	FCT3	2076
ABNOT	3754	EM10	FCT4	2200
AD1	2127	EM11	FCT5	2232
AD10	2715	EM12	FCT6	2270
AD11	2716	EM13	FCT7	2290
AD12	2717	EM14	FCT8	2400
AD2	2130	EM15	FCT9	2436
AD3	2131	EM2	FCT10	2472
AD4	2324	EM3	FCT11	3207
AD5	2325	EM4	FCT12	3221
AD6	2326	EM5	FCT13	4600
AD7	2526	EM6	FCT14	0176
AD8	2527	ENCAR	FCT15	4643
AD9	2530	ENCAR1	FCT16	4627
ADA1	0021	ENCAR2	FCT17	4631
ADA2	0022	ENCAR3	FCT18	4712
ADA3	0023	ENCAR4	FCT19	4714
ADA4	0024	ENCAR5	FCT20	4752
ADA5	0025	ENCAR6	FCT21	0174
ADA6	0026	ENCAR7	FCT22	4717
ADA7	0027	ENCAR8	FCT23	0175
ADA8	0028	ENCAR9	FCT24	4590
ADA9	0029	ENCAR10	FCT25	0177
ADA10	0030	ENCAR11	FCT26	3027
ADA11	0031	ENCAR12	FCT27	0497
ADA12	0032	ENCAR13	FCT28	1063
ADA13	0033	ENCAR14	FCT29	0404
ADA14	0034	ENCAR15	FCT30	1052
ADA15	0035	ENCAR16	FCT31	0136
ADA16	0036	ENCAR17	FCT32	0147
ADA17	0037	ENCAR18	FCT33	0150
ADA18	0038	ENCAR19	FCT34	0151
ADA19	0039	ENCAR20	FCT35	0152
ADA20	0040	ENCAR21	FCT36	0153
ADA21	0041	ENCAR22	FCT37	2133
ADA22	0042	ENCAR23	FCT38	2132
ADA23	0043	ENCAR24	FCT39	0137
ADA24	0044	ENCAR25	FCT40	0140
ADA25	0045	ENCAR26	FCT41	0141
ADA26	0046	ENCAR27	FCT42	0142
ADA27	0047	ENCAR28	FCT43	0143
ADA28	0048	ENCAR29	FCT44	0144
ADA29	0049	ENCAR30	FCT45	0145
ADA30	0050	ENCAR31	FCT46	0171
ADA31	0051	ENCAR32	FCT47	0116
ADA32	0052	ENCAR33	FCT48	0115
ADA33	0053	ENCAR34	FCT49	3542
ADA34	0054	ENCAR35	FCT50	0114
ADA35	0055	ENCAR36	FCT51	0172
ADA36	0056	ENCAR37	FCT52	
ADA37	0057	ENCAR38	FCT53	
ADA38	0058	ENCAR39	FCT54	
ADA39	0059	ENCAR40	FCT55	
ADA40	0060	ENCAR41	FCT56	
ADA41	0061	ENCAR42	FCT57	
ADA42	0062	ENCAR43	FCT58	
ADA43	0063	ENCAR44	FCT59	
ADA44	0064	ENCAR45	FCT60	
ADA45	0065	ENCAR46	FCT61	
ADA46	0066	ENCAR47	FCT62	
ADA47	0067	ENCAR48	FCT63	
ADA48	0068	ENCAR49	FCT64	
ADA49	0069	ENCAR50	FCT65	
ADA50	0070	ENCAR51	FCT66	
ADA51	0071	ENCAR52	FCT67	
ADA52	0072	ENCAR53	FCT68	
ADA53	0073	ENCAR54	FCT69	
ADA54	0074	ENCAR55	FCT70	
ADA55	0075	ENCAR56	FCT71	
ADA56	0076	ENCAR57	FCT72	
ADA57	0077	ENCAR58	FCT73	
ADA58	0078	ENCAR59	FCT74	
ADA59	0079	ENCAR60	FCT75	
ADA60	0080	ENCAR61	FCT76	
ADA61	0081	ENCAR62	FCT77	
ADA62	0082	ENCAR63	FCT78	
ADA63	0083	ENCAR64	FCT79	
ADA64	0084	ENCAR65	FCT80	
ADA65	0085	ENCAR66	FCT81	
ADA66	0086	ENCAR67	FCT82	
ADA67	0087	ENCAR68	FCT83	
ADA68	0088	ENCAR69	FCT84	
ADA69	0089	ENCAR70	FCT85	
ADA70	0090	ENCAR71	FCT86	
ADA71	0091	ENCAR72	FCT87	
ADA72	0092	ENCAR73	FCT88	
ADA73	0093	ENCAR74	FCT89	
ADA74	0094	ENCAR75	FCT90	
ADA75	0095	ENCAR76	FCT91	
ADA76	0096	ENCAR77	FCT92	
ADA77	0097	ENCAR78	FCT93	
ADA78	0098	ENCAR79	FCT94	
ADA79	0099	ENCAR80	FCT95	
ADA80	0100	ENCAR81	FCT96	
ADA81	0101	ENCAR82	FCT97	
ADA82	0102	ENCAR83	FCT98	
ADA83	0103	ENCAR84	FCT99	
ADA84	0104	ENCAR85	FCT100	
ADA85	0105	ENCAR86	FCT101	
ADA86	0106	ENCAR87	FCT102	
ADA87	0107	ENCAR88	FCT103	
ADA88	0108	ENCAR89	FCT104	
ADA89	0109	ENCAR90	FCT105	
ADA90	0110	ENCAR91	FCT106	
ADA91	0111	ENCAR92	FCT107	
ADA92	0112	ENCAR93	FCT108	
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ADA95	0115	ENCAR96	FCT111	
ADA96	0116	ENCAR97	FCT112	
ADA97	0117	ENCAR98	FCT113	
ADA98	0118	ENCAR99	FCT114	
ADA99	0119	ENCAR100	FCT115	
ADA100	0120	ENCAR101	FCT116	
ADA101	0121	ENCAR102	FCT117	
ADA102	0122	ENCAR103	FCT118	
ADA103	0123	ENCAR104	FCT119	
ADA104	0124	ENCAR105	FCT120	
ADA105	0125	ENCAR106	FCT121	
ADA106	0126	ENCAR107	FCT122	
ADA107	0127	ENCAR108	FCT123	
ADA108	0128	ENCAR109	FCT124	
ADA109	0129	ENCAR110	FCT125	
ADA110	0130	ENCAR111	FCT126	
ADA111	0131	ENCAR112	FCT127	
ADA112	0132	ENCAR113	FCT128	
ADA113	0133	ENCAR114	FCT129	
ADA114	0134	ENCAR115	FCT130	
ADA115	0135	ENCAR116	FCT131	
ADA116	0136	ENCAR117	FCT132	
ADA117	0137	ENCAR118	FCT133	
ADA118	0138	ENCAR119	FCT134	
ADA119	0139	ENCAR120	FCT135	
ADA120	0140	ENCAR121	FCT136	
ADA121	0141	ENCAR122	FCT137	
ADA122	0142	ENCAR123	FCT138	
ADA123	0143	ENCAR124	FCT139	
ADA124	0144	ENCAR125	FCT140	
ADA125	0145	ENCAR126	FCT141	
ADA126	0146	ENCAR127	FCT142	
ADA127	0147	ENCAR128	FCT143	
ADA128	0148	ENCAR129	FCT144	
ADA129	0149	ENCAR130	FCT145	
ADA130	0150	ENCAR131	FCT146	
ADA131	0151	ENCAR132	FCT147	
ADA132	0152	ENCAR133	FCT148	
ADA133	0153	ENCAR134	FCT149	
ADA134	0154	ENCAR135	FCT150	
ADA135	0155	ENCAR136	FCT151	
ADA136	0156	ENCAR137	FCT152	
ADA137	0157	ENCAR138	FCT153	
ADA138	0158	ENCAR139	FCT154	
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ADA142	0162	ENCAR143	FCT158	
ADA143	0163	ENCAR144	FCT159	
ADA144	0164	ENCAR145	FCT160	
ADA145	0165	ENCAR146	FCT161	
ADA146	0166	ENCAR147	FCT162	
ADA147	0167	ENCAR148	FCT163	
ADA148	0168	ENCAR149	FCT164	
ADA149	0169	ENCAR150	FCT165	
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ADA151	0171	ENCAR152	FCT167	
ADA152	0172	ENCAR153	FCT168	
ADA153	0173	ENCAR154	FCT169	
ADA154	0174	ENCAR155	FCT170	
ADA155	0175	ENCAR156	FCT171	
ADA156	0176	ENCAR157	FCT172	
ADA157	0177	ENCAR158	FCT173	
ADA158	0178	ENCAR159	FCT174	
ADA159	0179	ENCAR160	FCT175	
ADA160	0180	ENCAR161	FCT176	
ADA161	0181	ENCAR162	FCT177	
ADA162	0182	ENCAR163	FCT178	
ADA163	0183	ENCAR164	FCT179	
ADA164	0184	ENCAR165	FCT180	
ADA165	0185	ENCAR166	FCT181	
ADA166	0186	ENCAR167	FCT182	
ADA167	0187	ENCAR168	FCT183	
ADA168	0188	ENCAR169	FCT184	
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ADA170	0190	ENCAR171	FCT186	
ADA171	0191	ENCAR172	FCT187	
ADA172	0192	ENCAR173	FCT188	
ADA173	0193	ENCAR174	FCT189	
ADA174	0194	ENCAR175	FCT190	
ADA175	0195	ENCAR176	FCT191	
ADA176	0196	ENCAR177	FCT192	
ADA177	0197	ENCAR178	FCT193	
ADA178	0198	ENCAR179	FCT194	
ADA179	0199	ENCAR180	FCT195	
ADA180	0200	ENCAR181	FCT196	
ADA181	0201	ENCAR182	FCT197	
ADA182	0202	ENCAR183	FCT198	
ADA183	0203	ENCAR184	FCT199	
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ADA186	0206	ENCAR187	FCT202	
ADA187	0207	ENCAR188	FCT203	
ADA188	0208	ENCAR189	FCT204	
ADA189	0209	ENCAR190	FCT205	
ADA190	0210	ENCAR191	FCT206	
ADA191	0211	ENCAR192	FCT207	
ADA192	0212	ENCAR193	FCT208	
ADA193	0213	ENCAR194	FCT209	
ADA194	0214	ENCAR195	FCT210	
ADA195	0215	ENCAR196	FCT211	
ADA196	0216	ENCAR197	FCT212	
ADA197	0217	ENCAR198	FCT213	
ADA198	0218	ENCAR199	FCT214	
ADA199	0219	ENCAR200	FCT215	
ADA200	0220	ENCAR201	FCT216	
ADA201	0221	ENCAR202	FCT217	
ADA202	0222	ENCAR203	FCT218	
ADA203	0223	ENCAR204	FCT219	
ADA204	0224	ENCAR205	FCT220	
ADA205	0225	ENCAR206	FCT221	
ADA206	0226	ENCAR207	FCT222	
ADA207	0227	ENCAR208	FCT223	
ADA208	0228	ENCAR209	FCT224	
ADA209	0229	ENCAR210	FCT225	
ADA210	0230	ENCAR211	FCT226	
ADA211	0231	ENCAR212	FCT227	
ADA212	0232	ENCAR213	FCT228	
ADA213	0233	ENCAR214	FCT229	
ADA214	0234	ENCAR215	FCT230	
ADA215	0235	ENCAR216	FCT231	
ADA216	0236	ENCAR217	FCT232	
ADA217	0237	ENCAR218	FCT233	
ADA218	0238	ENCAR219	FCT234	
ADA219	0239	ENCAR220	FCT235	
ADA220	0240	ENCAR221	FCT236	
ADA221	0241	ENCAR222	FCT237	
ADA222	0242	ENCAR223	FCT238	
ADA223	0243	ENCAR224	FCT239	
ADA224	0244	ENCAR225	FCT240	
ADA225	0245	ENCAR226	FCT241	
ADA226	0246	ENCAR227	FCT242	
ADA227	0247	ENCAR228	FCT243	
ADA228	0248	ENCAR229	FCT244	
ADA229	0249	ENCAR230	FCT245	
ADA230	0250	ENCAR231	FCT246	
ADA231	0251	ENCAR232	FCT247	
ADA232	0252	ENCAR233	FCT248	
ADA233	0253	ENCAR234	FCT249	
ADA234	0254	ENCAR235	FCT250	
ADA235	0255	ENCAR236	FCT251	
ADA236	0256	ENCAR237	FCT252	
ADA237	0257	ENCAR238	FCT253	
ADA238	0258	ENCAR239	FCT254	
ADA239	0259	ENCAR240	FCT255	
ADA240	0260	ENCAR241	FCT256	
ADA241	0261	ENCAR242	FCT257	
ADA242	0262	ENCAR243	FCT258	
ADA243	0263	ENCAR244	FCT259	
ADA244	0264	ENCAR245	FCT260	
ADA245	0265	ENCAR246	FCT261	
ADA246	0266	ENCAR247	FCT262	
ADA247	0267	ENCAR248	FCT263	
ADA248	0268	ENCAR249	FCT264	
ADA249	0269	ENCAR250	FCT265	
ADA250	0270	ENCAR251	FCT266	
ADA251	0271	ENCAR252	FCT267	
ADA252	0272	ENCAR253	FCT268	
ADA253	0273	ENCAR254	FCT269	
ADA254	0274	ENCAR255	FCT270	

PAL18

V141

13=SEP=71

13131

E 1=58

NXTBT	3612	RNDHLI	4540	SIMRTL	0653	XFLDSW	4770
NXTCAR	0234	RNDOK	4563	SIMRTR	0700	XHALT2	0066
NXTROT	1031	ROBACK	5063	SKHLT	3502	XLNK09	0080
OK1	5722	ROHLT	5053	SP1	0545	XL00P	0067
OK2	5726	ROPRT	5064	SR00	0103	XLOOP1	0075
OK3	5733	ROTDNE	1323	SR01	0104	XLOOP2	0074
OK4	5736	ROTHLT	1327	SR02	0105		1450
OR1	1225	ROTPRT	1071	SR03	0106	XM2	1451
OUT	3224	RRAC	0031	SR04	0107	XM3	1452
OUT1	0520	RRAL	0605	SR05	0110	XM4	1453
OUT1A	0542	RRAR	0632	SR06	0111	XM5	1454
POINT1	0011	RRLNK	0033	SR07	0112	XM6	0416
POINT2	0012	RRTL	0657	SR08	0113	XNXTAD	0057
PRINT	1600	RRTR	0704	SR09	0114	XNXTRO	3701
R1	1400	RSIMAD	0200	SR10	0115	XOR1	3715
R2	1410	RTLR	5041	SR11	0116	XOR2	0260
R2A	3541	RTLRTAB	4400	SROTAL	1200	XORALL	0046
R3	1420	RTLTAB	1160	SROTOK	1342	XPRINT	0752
R4	1430	RYRER	5026	START	0156	XR1	0753
R5	1440	RTRR	4455	SUM1	0031	XR2	0754
RAC	0023	RTRTAB	1141	SUM2	0033	XR3	0755
RALER	5013	SADOK	0570	TEMP1	0037	XR4	0756
RALR	4255	SAMEA	3730	TEMPAC	0025	XRALR	4334
RALTAB	0757	SAMEAS	3000	TEMPL	0026	XRALTA	0052
RANDA	0041	SAVREG	3017	TSTA0	7775	XRAND	0093
RANDB	0042	SBSW	1236	TSTA1	7776	XRARR	4335
RANDB	0043	SEQ	0154	TSTA2	7777	XRARTA	0102
RANDB	0043	SEQ1	0122	TSTA3	0000	XRHD	0050
RANDB	0043	SEQ10	0133	TSTA4	0001	XRN1ER	3446
RANDB	0043	SEQ11	0134	TSTA5	0002	XRN2ER	3756
RANDB	0043	SEQ12	0135	TSTA6	0003	XROTDN	0777
RANDB	0043	SEQ2	0123	TSTA7	0004	XRTL	4571
RANDB	0043	SEQ3	0124	TSTA7	0010	XRTLTA	0053
RANDB	0043	SEQ4	0125	TYBIT	0540	XRTTR	4590
RANDB	0043	SEQ5	0126	TYLNK	0513	XRTRTA	0094
RANDB	0043	SEQ6	0127	TYPE	1652	XSBSW	0776
RANDB	0043	SEQ7	0130	TYPSET	3056	XSROT	0051
RANDB	0043	SEQ8	0131	W1	1617	XSTA0	0070
RANDB	0043	SEQ9	0132	W2	0037	XSTA1	0071
RANDB	0043	SHLT	4033	WD1	0040	XSTA2	0072
RANDB	0043	SIMAC	0025	WD2	0040	XTYPE	0047
RANDB	0043	SIMAD	0204	WDOUT	0523	XWDOUT	0061
RANDB	0043	SIMBSW	0725	XADD	0415		
RANDB	0043	SIMLNK	0026	XADOUT	3073		
RANDB	0043	SIMR	0577	XAMEA	0063		
RANDB	0043	SIMRAL	0601	XAMEAS	0062		
RANDB	0043	SIMRAR	0626	XAVREG	0064		
RANDB	0043	SIMRO1	0600	XBSWA	0055		
RANDB	0043	SIMRO2	0625	XCOMRO	0056		
RANDB	0043	SIMRO3	0652	XDLCK	4572		
RANDB	0043	SIMRO4	0677				
RANDB	0043	SIMRO5	0724				

ERRORS DETECTED: 0

LINKS GENERATED: 3

RUN-TIME: 32 SECONDS

3K CORE USED