

1. IDENTIFICATION
- 1.1 Maindec 839
- 1.2 PDP-8 Memory Parity Option
- 1.3 February 22, 1966



AFTER RUNNING RELOAD THE LOADERS

Maindec 839
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2. ABSTRACT

This program is designed to exercise and detect memory parity control and data errors on the PDP-8.

3. REQUIREMENTS

3.1 Storage

$0000_8 - 7700_8$

3.2 Subprograms and/or Subroutines

RIM Loader, Binary Loader.

3.3 Equipment

PDP-8, memory parity option, keyboard reader and teleprinter, 2 jumper wires.

4. USAGE

4.1 Loading

Normal binary tape loading procedures.

4.2 Calling Sequence

4.3 Switch Settings

4.4 Start Up and/or Entry

The starting address of this test is 0200_8 .

4.5 Errors in Usage

Errors detected by the program will cause the program to halt and display a 7402_8 in the MB register.

The error halt information is as follows:

Mnemonic	Halt Address	Cause
E1	0205	Parity error forced; 6101 skipped in error.
E2	0213	Parity error forced; interrupt did not occur.
E3	0222	PWR CLR did not clear the parity error flop; or 6101 did not skip.
E4	0227	No parity error; interrupt occurred.

Mnemonic	Halt Address	Cause
E5	0240	6104 did not clear parity error flop.
E6,E7	0002	Parity error detected by parity option.

Memory address 0000 contains the address +1 of the program when the parity error interrupt occurred.

4.6 Recovery from Such Errors

4.6.1 E1, 2, 3, 4, 5 should be restarted from 0200₈ after the program has halted. E6, E7 should be restarted from T6 (0252₈).

5. RESTRICTIONS

Parity errors are not forced into memory.

6. DESCRIPTION

6.1 Discussion

This program requires operator intervention in its operation. The program has four printout messages for the operator to follow:

- (1) GROUND PIN U R202 MF11 SET PARITY ERROR
PRESS CONTINUE
- (2) UNGROUND PIN U R202 MF11
GROUND PIN K B104 MF9
PRESS START
- (3) GROUND PIN U R202 MF11 SET PARITY ERROR
PRESS CONTINUE
- (4) UNGROUND PIN K B104 MF9
UNGROUND PIN U R202 MF11
PRESS CONTINUE

Message (1) relates to E1, E2 error halts.

Message (2) relates to E3, E4 error halts.

Message (3) relates to E5, error halt.

Message (4) removes all hardware restrictions.

Test T6 uses a sequential number generator to test parity at one memory address only (PATR).

Test T7 uses a random number generator to test memory parity from 1000₈ - 7700₈ registers. The program will then loop in test T7 until an error occurs.

7. METHODS (Not Applicable)
8. FORMAT (Not Applicable)
9. EXECUTION TIME
3 msec
10. PROGRAM
- 10.1 Core Map (None)
- 10.2 Dimension List (None)
- 10.3 Macro, Parameter, and Variable Lists (None)
- 10.4 Program Listing

ADDRX	0115	OX	0143	Y0	0157
AX	0163	PAR	0600	X1	0162
BX	0166	PARX	0133	X2	0156
CR	0151	PATR	0125	X3	0171
CRLF	0026	PRES	0636	X4	0167
CX	0142	PRESX	0131	X9	0170
DX	0154	PRX	0020	YX	0164
EX	0147	PX	0145	D	
E1	0205	RAN	0311		
E2	0213	RET	0274		
E3	0222	RJMP1	0117		
E4	0227	RJMP2	0121		
E5	0240	RNUM	0135		
E6	0002	RRJMP1	0120		
FX	0161	RRJMP2	0122		
GRN	0473	RX	0146		
GRNX	0130	SETX	0555		
GX	0153	SETXX	0132		
HALT	0134	SPX	0141		
INRET	0214	SIAR	0457		
IX	0155	SIART	0200		
KX	0165	SIARX	0123		
K0003	0136	SX	0150		
K0077	0116	TX	0144		
LF	0152	T1	0203		
LOC	0523	T2	0211		
LOCX	0127	T3	0221		
LOC1	0427	T3ADD	0400		
LOC1X	0126	T3ADPX	0124		
LX	0172	T4	0223		
MSG1	0053	T5	0234		
MSG2	0065	T6	0252		
MSG3	0077	T7	0267		
MSG4	0035	UN	0106		
MX	0160	UX	0137		
NX	0140	UXX	0273		

/PDP-8 MEMORY PARITY OPTION

*0000

0000 0000 0
 0001 6144 CMP
 0002 7402 R6, HLT

/MA 0000 = ERROR ADDRESS+1
 /ERROR, DATA OR INSTRUCTION
 /RESTART AT TEST T6

*0020

0020 0000 PRX, 0
 0021 6046 TLS
 0022 6741 TSP
 0023 5022 JMP , -1
 0024 7200 CLA
 0025 5420 JMP I PRX

0026 0000 CRLF, 0
 0027 7200 CLA
 0030 1151 TAD CR /CR
 0031 4020 JMS PRX
 0032 1152 TAD LF /LF
 0033 4020 JMS PRX
 0034 5426 JMP I CRLF

0035 0000 MSG4, 0
 0036 7200 CLA
 0037 1141 TAD SPX /SP
 0040 4020 JMS PRX
 0041 1142 TAD CX
 0042 4020 JMS PRX /C
 0043 1143 TAD OX
 0044 4020 JMS PRX /O
 0045 1140 TAD NX
 0046 4020 JMS PRX /N
 0047 1144 TAD TX
 0050 4020 JMS PRX /T
 0051 4026 JMS CRLF /CRLF
 0052 5435 JMP I MSG4

0053 0000 MSG1, 0
 0054 4020 JMS CRLF /CRLF
 0055 4530 JMS I GRNX /GROUND PIN
 0056 4527 JMS I LUCX /R202 MF11
 0057 4532 JMS I SETXX /SET
 0060 4533 JMS I PARX /PARITY ERROR
 0061 4026 JMS CRLF /CRLF
 0062 4531 JMS I PRESX /PRESS
 0063 4035 JMS MSG4 /CONT
 0064 5453 JMP I MSG1

0065	0000	MESG2,	0	
0066	4026	JMS CRLF		/CRLF
0067	4106	JMS UN		/UN
0070	4530	JMS I GRNX		/GROUND PIN
0071	4527	JMS I LOCX		/R202 MF11
0072	5465	JMP I MESG2		
0073	0000	UXX,	0	
0074	1137	TAD UX		
0075	4020	JMS PRX		/U
0076	5473	JMP I UXX		
0077	0000	MESG3,	0	
0100	4530	JMS I GRNX		/GROUND PIN
0101	4526	JMS I LOC1X		/K B104 MF9
0102	4026	JMS CRLF		
0103	4531	JMS I PRESX		/PRESS
0104	4523	JMS I STARX		/START
0105	5477	JMP I MESG3		
0106	0000	UN,	0	
0107	7200	CLA		
0110	1137	TAD UX		/U
0111	4020	JMS PRX		
0112	1140	TAD NX		/N
0113	4020	JMS PRX		
0114	5506	JMP I UN		
0115	0777	ADDRX,	0777	
0116	0077	K0077,	0077	
0117	5520	RJMP1,	JMP I RRJMP1	
0120	0214	RRJMP1,	INRET	
0121	5522	RJMP2,	JMP I RRJMP2	
0122	0227	RRJMP2,	E4	
0123	0457	STARX,	STAR	
0124	0400	T3ADDRX,	T3ADR	
0125	0000	PARX,	0000	
0126	0427	LOC1X,	LOC1	
0127	0523	LOCX,	LOC	
0130	0473	GRNX,	GRN	
0131	0636	PRESX,	PRES	
0132	0555	SETXX,	SETX	
0133	0600	PARX,	PAR	
0134	7402	HALT,	7402	
0135	1234	RNUMB,	1234	
0136	0003	K0003,	0003	
0137	0325	UX,	325	
0140	0316	NX,	316	
0141	0240	SPX,	240	
0142	0303	CX,	303	
0143	0317	OX,	317	
0144	0324	TX,	324	
0145	0320	PX,	320	
0146	0322	RX,	322	
0147	0305	FX,	305	

0150	0323	SA,	323
0151	0215	CH,	215
0152	0212	IF,	212
0153	0307	AX,	307
0154	0304	AX,	304
0155	0311	IX,	311
0156	0262	Y2,	262
0157	0260	Y0,	260
0160	0315	AX,	315
0161	0306	AX,	306
0162	0261	V1,	261
0163	0301	AX,	301
0164	0331	YX,	331
0165	0313	AX,	313
0166	0302	AX,	302
0167	0264	Y4,	264
0170	0271	Y9,	271
0171	0263	Y3,	263
0172	0314	IX,	314

x0200

0200	6202	START,	10F	/GROUND PIN U R202 MF11
0201	4053	JMS MSG1		/TO SET PARITY ERROR FLOP
0202	7602	HLT CLA		/PRINT ABOVE MESSAGE
0203	6101	T1,	6101	/ATTACH GROUND LEAD NOW AND
0204	7610	CLA SKP		/PRESS (CONTINUE)
0205	7402	F1,	HLT	/PARITY ERROR FORCED
0206	7200	CLA		/SNPE SKIPPED IN
0207	1117	TAD Z RJMP1		/ERROR, (SNPE=SKP ON NO
0210	3001	DCA Z 0001		/PARITY ERROR)
0211	6001	T2,	10N	/TURN ON INTERRUPT
0212	7000	NOP		
0213	7402	F2,	HLT	/ERROR, INTERRUPT FAILED
0214	6002	INRET,	10F	/INTERRUPT RETURN
0215	4065	JMS MSG2		/REMOVE GROUND LEAD
0216	4026	JMS CHLF		
0217	4077	JMS MSG3		/FROM PIN U R202 MF11
0220	7602	HLT CLA		/AND GROUND PIN K B104 MF9
0221	6101	T3,	6101	/HAD T3 ADDRESS AND PRESS (STA
0222	7402	F3,	HLT	/ERROR, PWR CLR DID NOT CLEAR
0223	1121	T4,	TAD Z RJMP2	/THE PARITY ERROR FLOP,
0224	3001	DCA Z 0001		/OR SNPE FAILED TO SKIP
0225	6001	10N		/PARITY ERROR INHIBITED
0226	7410	SKP		/BY GROUND LEAD
0227	7402	F4,	HLT	/ERROR, INTERRUPT SHOULD
0230	6002	10F		/NOT HAVE OCCURED
0231	4026	JMS CHLF		
0232	4053	JMS MSG1		/PRINT MESSAGE 1
0233	7602	HLT CLA		/PRESS (CONTINUE)
0234	6104	T5,	6104	/CLEAR PARITY ERROR FLOP
0235	7000	NOP		
0236	7000	NOP		
0237	6101	6101		
0240	7402	F5,	HLT	/ERROR, CMP FAILED TO CLEAR
				/PARITY ERROR FLOP

0241	4026	JMS CRLF	/CRLF
0242	4106	JMS UN	/UN
0243	4530	JMS I GRNX	/GROUND
0244	4526	JMS I LOGIX	/K B104 MF9
0245	4065	JMS MSG2	/UNGROUND PIN U R202 MF11
0246	4026	JMS CRLF	
0247	4531	JMS I PRESX	/PRESS
0250	4035	JMS MSG4	/CONTINUE
0251	7602	HLT CLA	
0252	6242	T6, 6042	/T6 TEST ALL PATTERNS 1 CORE
0253	1234	TAD T5	/LOCATION PATR
0254	3001	DCA 0001	
0255	6104	6104	
0256	6001	ION	/TST FETCH OF ION
0257	7000	NOP	/TST FETCH OF NOP
0260	6002	IOF	/TST FETCH OF IOF
0261	6001	ION	
0262	1125	TAD PATR	/TST TAD PATR
0263	3125	DCA PATR	/TST DCA PATR
0264	6002	IOF	
0265	2125	ISZ PATH	/COUNT PATTERN REG
0266	5261	JMP .-5	/LOOP
0267	7200	T7, CLA	/RANDOM TEST
0270	1115	TAD ADDR X	
0271	3012	DCA 0012	
0272	1115	TAD ADDR X	/STARTING ADDRESS=1
0273	3011	DCA 0011	/AUTO INDEX
0274	1011	RET, TAD 0011	
0275	1116	TAD K0077	/LAST ADDRESS COMPARE
0276	7040	CMA	
0277	7450	SNA	
0300	5267	JMP T7	/LOOP RANDOM
0301	4311	JMS RAN	/RANDOM NUMBER GENERATOR
0302	1135	TAD RNUMB	
0303	6001	ION	
0304	3411	DCA I 0011	
0305	1412	TAD I 0012	
0306	6002	IOF	
0307	7200	CLA	
0310	5274	JMP RET	/CONTINUE
0311	0000	RAN, 0	/RANDOM NUMBER GENERATOR
0312	7200	CLA	
0313	1135	TAD RNUMB	
0314	7104	RAI CLL	
0315	7430	SZL	
0316	1136	TAD K0003	
0317	3135	DCA RNUMB	
0320	5711	JMP I RAN	

x0400

0400	0000	T3ADR,	
0401	4026	JMS CRLF	
0402	1172	TAD LX	/L
0403	4020	JMS PRX	
0404	1154	TAD DX	/D
0405	4020	JMS PRX	
0406	1141	TAD SPX	
0407	4020	JMS PRX	/Sp
0410	1144	TAD TX	
0411	4020	JMS PRX	/T
0412	1171	TAD X3	
0413	4020	JMS PRX	/3
0414	1141	TAD SPX	
0415	4020	JMS PRX	/Sp
0416	1163	TAD AX	
0417	4020	JMS PRX	/A
0420	1154	TAD DX	
0421	4020	JMS PRX	/D
0422	1154	TAD DX	
0423	4020	JMS PRX	/D
0424	1146	TAD RX	
0425	4020	JMS PRX	/R
0426	5670	JMP I T3ADR	
0427	0000	L0C1,	
0430	1141	TAD SPX	/Sp
0431	4020	JMS PRX	
0432	1165	TAD KX	
0433	4020	JMS PRX	/K
0434	1141	TAD SPX	
0435	4020	JMS PRX	/Sp
0436	1166	TAD BX	
0437	4020	JMS PRX	/B
0440	1162	TAD X1	
0441	4020	JMS PRX	/1
0442	1157	TAD X0	
0443	4020	JMS PRX	/0
0444	1167	TAD X4	
0445	4020	JMS PRX	/4
0446	1141	TAD SPX	
0447	4020	JMS PRX	/Sp
0450	1160	TAD MX	
0451	4020	JMS PRX	/M
0452	1161	TAD FX	
0453	4020	JMS PRX	/F
0454	1170	TAD X9	
0455	4020	JMS PRX	/9
0456	5627	JMP I L0C1	

0457	0000	STAR.	
0460	1150	TAD SX	
0461	4020	JMS PRX	/S
0462	1144	TAD TX	
0463	4020	JMS PRX	/T
0464	1163	TAD AX	
0465	4020	JMS PRX	/A
0466	1146	TAD RX	
0467	4020	JMS PRX	/R
0470	1144	TAD TX	
0471	4020	JMS PRX	/T
0472	5657	JMP I STAR	
0473	0000	GRN.	
0474	1153	TAD GX	/G
0475	4020	JMS PRX	
0476	1146	TAD RX	/R
0477	4020	JMS PRX	
0500	1143	TAD OX	/O
0501	4020	JMS PRX	
0502	1137	TAD UX	/U
0503	4020	JMS PRX	
0504	1140	TAD NX	/N
0505	4020	JMS PRX	
0506	1154	TAD OX	/D
0507	4020	JMS PRX	
0510	1141	TAD SPX	/Sp
0511	4020	JMS PRX	
0512	1145	TAD PX	/P
0513	4020	JMS PRX	
0514	1155	TAD IX	/I
0515	4020	JMS PRX	
0516	1140	TAD NX	/N
0517	4020	JMS PRX	
0520	1141	TAD SPX	/Sp
0521	4020	JMS PRX	
0522	5673	JMP I GRN	
0523	0000	LOC.	
0524	1137	TAD UX	/U
0525	4020	JMS PRX	
0526	1141	TAD SPX	/Sp
0527	4020	JMS PRX	
0530	1146	TAD RX	/R
0531	4020	JMS PRX	
0532	1156	TAD X2	/2
0533	4020	JMS PRX	
0534	1157	TAD X0	/0
0535	4020	JMS PRX	
0536	1156	TAD X2	/2
0537	4020	JMS PRX	
0540	1141	TAD SPX	/Sp
0541	4020	JMS PRX	
0542	1160	TAD MX	/M
0543	4020	JMS PRX	
0544	1161	TAD FX	/F
0545	4020	JMS PRX	

0546	1162	TAD X1	/I
0547	4220	JMS PRX	
0550	1162	TAD X1	/I
0551	4220	JMS PRX	
0552	1141	TAD SPX	/Sp
0553	4220	JMS PRX	
0554	5723	JMP I LUC	

0555	0000	SETX,	
0556	1150	TAD SX	/S
0557	4220	JMS PRX	
0560	1147	TAD EX	/E
0561	4220	JMS PRX	
0562	1144	TAD TX	/T
0563	4220	JMS PRX	
0564	5755	JMP I SETX	

x600

0600	0000	PAR,	
0601	1141	TAD SPX	/Sp
0602	4220	JMS PRX	
0603	1145	TAD PX	/P
0604	4220	JMS PRX	
0605	1163	TAD AX	/A
0606	4220	JMS PRX	
0607	1146	TAD RX	/R
0610	4220	JMS PRX	
0611	1155	TAD IX	/I
0612	4220	JMS PRX	
0613	1144	TAD TX	/T
0614	4220	JMS PRX	
0615	1164	TAD YX	/Y
0616	4220	JMS PRX	
0617	1141	TAD SPX	/Sp
0620	4220	JMS PRX	
0621	1147	TAD EX	/E
0622	4220	JMS PRX	
0623	1146	TAD RX	/R
0624	4220	JMS PRX	
0625	1146	TAD RX	/R
0626	4220	JMS PRX	
0627	1143	TAD OX	/O
0630	4220	JMS PRX	
0631	1146	TAD RX	/R
0632	4220	JMS PRX	
0633	1141	TAD SPX	/Sp
0634	4220	JMS PRX	
0635	5620	JMP I PAR	

0636	0000	RES,	
0637	1145	TAD PX	/P
0640	4220	JMS PRX	
0641	1146	TAD RX	/R
0642	4220	JMS PRX	
0643	1147	TAD EX	/E
0644	4220	JMS PRX	

0645	1150	TAD SX	/S
0646	4020	JMS PRX	
0647	1150	TAD SX	/S
0650	4020	JMS PRX	
0651	1141	TAD SPX	/SP
0652	4020	JMS PRX	
0653	5636	JMP I PRES	

ADDRX	0115
AX	0163
BX	0166
CR	0151
CRLF	0026
CX	0142
DX	0154
EX	0147
E1	0205
E2	0213
E3	0222
E4	0227
E5	0240
E6	0002
FX	0161
GRN	0473
GRNX	0130
GX	0153
HALT	0134
INRET	0214
IX	0155
KX	0165
K0003	0136
K0077	0116
LF	0152
LUC	0523
LUCX	0127
LUC1	0427
LUC1X	0126
LX	0172
MESG1	0053
MESG2	0065
MESG3	0077
MESG4	0035
MX	0160
NX	0140
OX	0143
PAR	0600
PARX	0133
PATR	0125

PRES	0636
PRESX	0131
PRX	0020
PX	0145
RAN	0311
RET	0274
RJMP1	0117
RJMP2	0121
RNUMR	0135
RRJMP1	0120
RRJMP2	0122
RX	0146
SETX	0555
SETXX	0132
SPX	0141
STAR	0457
START	0200
STARX	0123
SX	0150
TX	0144
T1	0203
T2	0211
T3	0221
T3ADR	0400
T3ADRX	0124
T4	0223
T5	0234
T6	0252
T7	0267
UN	0106
UX	0137
UXX	0073
X0	0157
X1	0162
X2	0156
X3	0171
X4	0167
X9	0170
YX	0164
D	

