

WORST PATTERN TEST

JA BB6B

August 15, 1961

1. Programs becoming obsolete - JA CB6 Worst Pattern Test.
2. Used to check for picking and/or dropping bits under pattern conditions in memory.

1. PURPOSE

The purpose of this test is to check for data pickup or dropout when a checkerboard or inverted checkerboard is present in memory. It is designed to run on a system having two 16K-A memories and four 16K-B memories.

2. PROGRAM INTRODUCTION1) General

The program alternately tests upper and lower memories, re-locating the portion of the program which runs in upper memory while upper memory is tested, and relocating the portion of the program which runs in lower memory while lower memory is tested.

2) Output

If an error is encountered, the program will stop. Refer to the listing and neons to determine the nature of the failure. No error print-out is provided.

3. OPERATING PROCEDURES1) Loading Procedure

1.1. PUNFUL binary deck consists of 21 cards

1.2. Procedure

1.2.1. Push Master Reset

1.2.2. Place Maintenance switch in active (Maintenance Mode) position.

1.2.3. Turn error injection switch OFF (see options)

1.2.4. Place error stop switch to single error position.

1.2.5. Depress initial program load or maintenance console.

1.2.6. Place deck in card reader and start.

1.2.7. Disable two levels of lookahead.

2) Options

Switch 36 Active bypasses Error Injecting tests.
Switch 37 Active Loops on test of Upper Memory.
Switch 38 Active Loops on test of Lower Memory.

If the Error Injection Switch is ON and the Error Stop switch is in the Double Error position, a single error will be forced, and any other error will meet the condition to Stop a Double Error.

3) Index Reg 14 is used as a pass counter. Stepping of Index 14 indicates success.

4. PROGRAM PHILOSOPHY

A checkerboard pattern is stored and checked, and inverted and checked. Running with Error Injection ON and Error Stop in the Double Error position makes use of Error Correction circuitry.

7050 DTS

PROGRAM WRITEUP ADDENDUM

FIG. NO. WORST PATTERN
FIG. NO. JA BB 6B

MAIN MEMORY TAPE CONTROL CARD

Location of Bit Patterns

1 0 0 1 4 4 . 4

Pre-loading Manual Intervention Required No

Pre-loading Procedure (B Am)

PRNID, WORST PATTERN %6 BOX# A. BROWN

PRNID, AUG-15, 1961, JA-BB6B

2
1
10
9
8
7
6
5
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3
2

	SEM,6,6		
	PUNFUL		
	SLC,511		000777.00
	CW%CDSC,512,,M06AZ-START1,CW2Q	1000.00 60 005000.02 9D	000777.00
	START1 BD,\$+0.32	1000.44 00	001000.00
	Z,\$MASK-RESET MASK	14.22 00	001000.40
	Z,\$IND-RESET INDICATORS	13.22 00	001001.00
	Z,\$SUB-RESET BOUNDS	3.22 00	001001.40
	LVI,\$X10,INT1	1163.25 01	001002.00
	SV,\$X10,\$IA-SET UP INTERRUPT ADDRESS	2.25 30	001002.40
	BMKZ,\$+0.32	1003.40 46	001003.00
	BIKZ,\$+0.32	1004.00 C6	001003.40
	BLJZ,\$+0.32	1004.41 46	001004.00
	BEKZ,\$+0.32	1005.01 C6	001004.40
	BISZ,\$+0.32	1005.42 46	001005.00
	BCPUZ,\$+0.32	1006.02 C6	001005.40
	BEKJZ,\$+0.32	1006.43 46	001006.00
	BUNRJZ,\$+0.32	1007.03 C6	001006.40
	BCBJZ,\$+0.32	1007.44 46	001007.00
	BEPGKZ,\$+0.32	1010.04 C6	001007.40
2	BUKZ,\$+0.32	1010.45 46	001010.00
1	BEEZ,\$+0.32	1011.05 C6	001010.40
10	BEOPZ,\$+0.32	1011.46 46	001011.00
9	BCSZ,\$+0.32	1012.06 C6	001011.40
8	BOPZ,\$+0.32	1012.47 C6	001012.00
7	BADZ,\$+0.32	1013.10 46	001012.40
6	BUSAZ,\$+0.32	1013.50 C6	001013.00
5	BEXEZ,\$+0.32	1014.11 46	001013.40
4	BDSZ,\$+0.32	1014.51 C6	001014.00
3	NOP	0.30 00	001014.40
2	NOP	0.30 00	001015.00
	-B,PH1 FOR NON PRINT		
	LCI,\$X14.0-USED AS PASS COUNTER	0.35 02	001015.40

	BB,4,32,PH1	-BYPASS PRINT IE ACTIVE	4.40 80 001021.34 02	001016.00
	W,TYPE,CWA1	-CONTROLS PATTERN	23.40 80 001223.03 00	001017.00
	BEW,\$+0,32-START OF TEST		1020.60 00	001020.00
	BD,PH1		1021.04 00	001020.40
		-DOUBLE ERROR CHECKING FOR UPPER MEMORY		
PH1	LCL,\$X15,500		764.37 02	001021.00
	T,\$X15,START2,START1+500.--SAVE LOWER TEST		100000.00 80 001764.36 20	001021.40
	LX,\$X1,CTLA1-CKERBOARD PATTERN		1224.02 10	001022.40
	LX,\$X2,CTLB1-SPLIT OR UPPER MEMORY		1225.04 10	001023.00
	LX,\$X4,CTLD1	-UPPER LIMIT	1227.10 10	001023.40
	LX,\$X6,CTLD1-COMPLEMENTING		1227.14 10	001024.00
	BE,PH1A		1026.00 00	001024.40
PH1AR	LX,\$X1,CTLA1		1224.02 10	001025.00
		NOP,0.0 -TO REPEAT THIS PHASE	0.30 00	001025.40
		-CHECKERBOARD GENERATING ROUTINE		
		CNOP		
PH1A	CM1111%V+ICR#%BU,64,8#1.%\$X2#-STORE ALL ONES WORD		1.00 82 300000.36 F0	001026.00
	BXCZ,BR1-CT 0 SPLIT OR UPPER MEM.		1032.70 42	001027.00
	CBR,\$X1,PH1A		1026.02 4C	001027.40
		CNOP-CONTROLS PATTERN		
PH1B	CM0000%V+ICR#%BU,64,8#1.%\$X2#-STORE ALL ZEROES WORD		1.00 82 300000.00 F0	001030.00
12	BXCZ,BR1-CT 0 SPLIT OR UPPER MEM.		1032.70 42	001031.00
11	CBR,\$X1,PH1B-CONTROLS PATTERN		1030.02 4C	001031.40
10	B,PH1A-NO LIMIT REACHED-REPEAT		1026.10 00	001032.00
9	BR1 CBRZ,\$X4,BR2-IFCT 1 SPLIT-IF 0 UPPER MEM.		1034.50 4E	001032.40
8	SWAP1,1,PH1B,PH1A-SET UP FOR SPLIT		1030.00 80 001026.02 E0	001033.00
7	B,PH1A-RETURN TO GENERATE LOOP		1026.10 00	001034.00
6	BR2 SWAP1,1,PH1A,PH1B-RESTORE LOOP		1026.00 80 001030.02 E0	001034.40
5		-CHECKING ROUTINE		
4	CK1 LX,\$X1,CTLA1-CONTROLS CHECK PATTERN		1224.02 10	001035.40
3	LX,\$X2,CTLB1		1225.04 10	001036.00
2		CNOP-CONTROLS STEPPING	0.30 00	001036.40
CK1A	CT1100%V+ICR#%BU,64,8#1.%\$X2#-CK ONES WORD		1.00 82 300000.31 70	001037.00

	BXCZ, BR3	1061.30 42	001040.00
	NOP-CK FOR SPLIT OR UPPER LIMIT	0.30 00	001040.40
	SX, \$X2, M6AZZ	1237.05 10	001041.00
	BRGZ, \$ -IE HANG UP, ADDR. AT M6AZZ IS NOT 1- S	1041.75 42	001041.40
	V-1, \$X2, 1.	1.05 0D	001042.00
	CM1100%BU, 64, 8H, 0%\$X2H-WORK LOCATION ADJACENT	0.00 82 000000.30 F0	001042.40
	CM1100%BU, 64, 8H, 0%\$X2H-TO LOCATION CHECKED	0.00 82 000000.30 F0	001043.40
	CM1100%BU, 64, 8H, 0%\$X2H	0.00 82 000000.30 F0	001044.40
	CM1100%BU, 64, 8H, 0%\$X2H	0.00 82 000000.30 F0	001045.40
	V+1, \$X2, 1.-RESTORE VALUE OF X2	1.05 05	001046.40
	CBR, \$X1, CK1A	1037.02 4C	001047.00
	CNOP	0.30 00	001047.40
	CK1B CT0011%V+1CRH%BU, 64, 8H, 1.%\$X2H-CK ZEROES WORD	1.00 82 300000.07 70	001050.00
	BXCZ, BR3	1061.30 42	001051.00
	NOP-CK FOR SPLIT OR UPPER LIMIT	0.30 00	001051.40
	SX, \$X2, M6AZZ	1237.05 10	001052.00
	BRGZ, \$ -IE HANG UP, ADDR. AT M6AZZ IS NOT 0- S	1052.75 42	001052.40
	V-1, \$X2, 1.	1.05 0D	001053.00
	CM1100%BU, 64, 8H, 0%\$X2H-WORK LOCATION ADJACENT TO	0.00 82 000000.30 F0	001053.40
	CM1100%BU, 64, 8H, 0%\$X2H-LOCATION CHECKED	0.00 82 000000.30 F0	001054.40
	CM1100%BU, 64, 8H, 0%\$X2H	0.00 82 000000.30 F0	001055.40
12	CM1100%BU, 64, 8H, 0%\$X2H	0.00 82 000000.30 F0	001056.40
11	V+1, \$X2, 1.-RESTORE VALUE OF X2	1.05 05	001057.40
10	CBR, \$X1, CK1B	1050.02 4C	001060.00
9	B, CK1A-REPEAT LOOP	1037.10 00	001060.40
8	BR3 CBRZ, \$X4, BR4-CT IS ONE SPLIT 0 UPPER LIMIT	1063.10 4E	001061.00
7	SWAP1, 3, CK1A, CK1B-SET UP LOOP FOR SPLIT	1037.00 80 001050.06 E0	001061.40
6	B, CK1A-RETURN TO LOOP	1037.10 00	001062.40
5	BR4 SWAP1, 3, CK1A, CK1B-RESTORE LOOP	1037.00 80 001050.06 E0	001063.00
4	CBRZ, \$X6, BR5-IF CT IS 1 SET UP PH1 AND CK1	1067.14 4E	001064.00
3	SWAP1, 1, PH1A, PH1B-FOR COMPL. TEST	1026.00 80 001030.02 E0	001064.40
2	SWAP1, 3, CK1A, CK1B	1037.00 80 001050.06 E0	001065.40
	B, PH1AR -REPEAT PHASE	1025.10 00	001066.40

	BR5	SWAP1,1,PH1A,PH1B-RESTORE ORIGINAL LOOP	1026.00 80 001030.02 E0	001067.00
		SWAP1,3,CK1A,CK1B-RESTORE ORIGINAL CONNECTIVES	1037.00 80 001050.06 E0	001070.00
		LX,\$X2,CTL11-RESET ALL LOCATIONS	1232.04 10	001071.00
		Z,0%\$X2	0.22 02	001071.40
		CBR+,\$X2,\$=0.32	1071.45 4C	001072.00
		NOP,0.0	0.30 00	001072.40
		NOP,0.0	0.30 00	001073.00
		BB,4.36,BR13P -LOOP ON CHECKERBOARDS	4.44 80 001156.74 02	001073.40
		BD,CK1C-TO SINGLE ERROR TEST	1075.04 00	001074.40
		-SET UP FOR SINGLE ERROR INJECTION		
	CK1C	LX,\$X7,CTLE1-FOR ERROR INJECTION	1230.16 10	001075.00
		CM1111%BU,64.8H,\$X8-FOR ONES WORD	30.00 80 000000.36 F0	001075.40
		LX,\$X2,CTLB1-FIRST ADDRESS	1225.04 10	001076.40
		LX,\$X1,CTLA1-PATTERN	1224.02 10	001077.00
	BR6	SX,\$X7,SUB -TURN ON ERROR INJECTION	3.17 10	001077.40
		CNOP		
	PH1C	SX,\$X8,0%\$X2	0.21 12	001100.00
		CNOP	0.30 00	001100.40
		Z,\$SUB	3.22 00	001101.00
		NQP	0.30 00	001101.40
		NOP	0.30 00	001102.00
2		NOP	0.30 00	001102.40
11		NQP	0.30 00	001103.00
10		NQP	0.30 00	001103.40
9				
8		NOP	0.30 00	001104.00
7		NOP	0.30 00	001104.40
6		NQP	0.30 00	001105.00
5		NQP	0.30 00	001105.40
4		NOP	0.30 00	001106.00
3				
2		KV,\$X2,CTLG1-CHECK FOR SPLIT	1231.04 90	001106.40
		BXEZ,BR8-TO NEW PATTERN	1122.32 C6	001107.00

		V+1,\$X2,1.-INCREMENT ADDRESS FOR NEXT STORE	1.05 05	001107.40
		CBR,\$X1,BR6-LOOP	1077.42 4C	001110.00
	BR7	SX,\$X7,\$SUB -TURN ON ERROR INJECTION	3.17 10	001110.40
		CNOP		
	PH1D	Z,0%\$X2	0.22 02	001111.00
		CNOP	0.30 00	001111.40
		Z,\$SUB	3.22 00	001112.00
		NOP	0.30 00	001112.40
		NOP	0.30 00	001113.00
		NOP	0.30 00	001113.40
		NOP	0.30 00	001114.00
		NOP	0.30 00	001114.40
		NOP	0.30 00	001115.00
		NOP	0.30 00	001115.40
		NOP	0.30 00	001116.00
		NOP	0.30 00	001116.40
		NOP	0.30 00	001117.00
		KV,\$X2,CTLG1-CHECK FOR SPLIT	1231.04 90	001117.40
		BXEZ,BR8-TO NEW PATTERN	1122.32 C6	001120.00
12		V+1,\$X2,1.-INC. ADDRESS FOR NEXT STORE	1.05 05	001120.40
11		CBR,\$X1,BR7-LOOP	1110.42 4C	001121.00
10		B,BR6-REPEAT UNTIL SPLIT IS REACHED	1077.50 00	001121.40
9	BR8	LX,\$X2,CTLG1-SET UP FOR REMAINDER OF MEM	1226.04 10	001122.00
8	BR9	SX,\$X7,\$SUB -TURN ON ERROR INJECTION	3.17 10	001122.40
7		CNOP		
6	PH1E	Z,0%\$X2	0.22 02	001123.00
5		CNOP	0.30 00	001123.40
4		Z,\$SUB	3.22 00	001124.00
3		NOP	0.30 00	001124.40
2		NOP	0.30 00	001125.00
		NOP	0.30 00	001125.40

	NOP		0.30 00	001126.00
	NOP		0.30 00	001126.40
	NOP		0.30 00	001127.00
	NOP		0.30 00	001127.40
	NOP		0.30 00	001130.00
	NOP		0.30 00	001130.40
	NOP		0.30 00	001131.00
	KV,\$X2,CTLH1-CK FOR UPPER LIMIT		1231.44 90	001131.40
	BXEZ,CK1D-TO CHECK PATTERN		1145.32 C6	001132.00
	V+I,\$X2,1.-INCR ADDRESS		1.05 05	001132.40
	CBR,\$X1,BR9-LOOP		1122.42 4C	001133.00
	BR10 SX,\$X7,\$SUB -TURN ON ERROR INJECTION		3.17 10	001133.40
	CNOP			
	PH1E SX,\$X8,0%\$X2		0.21 12	001134.00
	CNOP		0.30 00	001134.40
	Z,\$SUB		3.22 00	001135.00
	NOP		0.30 00	001135.40
	NOP		0.30 00	001136.00
	NOP		0.30 00	001136.40
12	NOP		0.30 00	001137.00
11	NOP		0.30 00	001137.40
10				
9	NOP		0.30 00	001140.00
8	NOP		0.30 00	001140.40
7	NOP		0.30 00	001141.00
6	NOP		0.30 00	001141.40
5	NOP		0.30 00	001142.00
4				
3	KV,\$X2,CTLH1-CK FOR UPPER LIMIT		1231.44 90	001142.40
2	BXEZ,CK1D-TO CHECK PATTERN		1145.32 C6	001143.00
	V+I,\$X2,1.-INCR ADDRESS		1.05 05	001143.40

	CBR,\$X1,BR10	1133.42 4C	001144.00
	B,BR9-REPEAT UNTIL UPPER LIMIT REACHED	1122.50 00	001144.40
	-SINGLE ERROR CHECKING		
CK1D	LX,\$X2,CTL11-CTL ADDRESS STEPPING	1232.04 10	001145.00
	BE,BR11	1146.00 00	001145.40
BR11	CM1100%BU,64,8H,0%\$X2H-INVERT DATA AND CHECK	0.00 82 000000.30 F0	001146.00
	CBR,\$X1,BR11-EOR PICK UP	1146.02 4C	001147.00
	CBR+,\$X2,BR11-REPEAT UNTIL UPPER LIMIT	1146.05 4C	001147.40
BR12	CM0011%BU,64,8H,0%\$X2H-RECHECK ALL LOCATIONS	0.00 82 000000.06 F0	001150.00
	CBR+,\$X2,BR12	1150.05 4C	001151.00
	-COMPLEMENT TEST		
COMP1	CBRZ,\$X6,BR13-COMPL. TEST CTRL	1154.54 4E	001151.40
	SWAP1,1,PH1C,PH1D-SET UP FOR COMPL %SINGLEH	1100.00 80 001111.02 E0	001152.00
	SWAP1,1,PH1E,PH1F	1123.00 80 001134.02 E0	001153.00
	BD,CK1C-START COMPL TEST	1075.04 00	001154.00
BR13	SWAP1,1,PH1C,PH1D-RESTORE	1100.00 80 001111.02 E0	001154.40
	SWAP1,1,PH1E,PH1F	1123.00 80 001134.02 E0	001155.40
BR13P	LX,\$X2,CTL11 -RESET ALL LOCATIONS	1232.04 10	001156.40
	Z,0%\$X2H	0.22 02	001157.00
	CBR+,\$X2,\$-0.32	1157.05 4C	001157.40
BR14	LCI,\$X15,500	764.37 02	001160.00
12	T,\$X15,START1+500.,START2-RELOCATE LOWER TEST	1764.00 80 100000.36 20	001160.40
11	BB,4.37,PH1 -LOOP ON UPPER MEMORY	4.45 80 001021.34 02	001161.40
10	BD,START2	100000.04 00	001162.40
9	-INTERRUPT TABLE UPPER TEST		
8	INT1 NOP,0.0	0.30 00	001163.00
7	NOP,0.0	0.30 00	001163.40
6	NOP,0.0	0.30 00	001164.00
5	NOP,0.0	0.30 00	001164.40
4	NOP,0.0	0.30 00	001165.00
3	NOP,0.0	0.30 00	001165.40
2	NOP,0.0	0.30 00	001166.00
	NOP,0.0	0.30 00	001166.40

	NOP,0.0	0.30 00	001167.00
	NOP,0.0	0.30 00	001167.40
	NOP,0.0	0.30 00	001170.00
	NOP,0.0	0.30 00	001170.40
	NOP,0.0	0.30 00	001171.00
	NOP,0.0	0.30 00	001171.40
	NOP,0.0	0.30 00	001172.00
	NOP,0.0	0.30 00	001172.40
	NOP,0.0	0.30 00	001173.00
	NOP,0.0	0.30 00	001173.40
	NOP,0.0	0.30 00	001174.00
	NOP,0.0	0.30 00	001174.40
	NOP,0.0	0.30 00	001175.00
	NOP,0.0	0.30 00	001175.40
	NOP,0.0	0.30 00	001176.00
	NOP,0.0	0.30 00	001176.40
	NOP,0.0	0.30 00	001177.00
	NOP,0.0	0.30 00	001177.40
	NOP,0.0	0.30 00	001200.00
	NOP,0.0	0.30 00	001200.40
	NOP,0.0	0.30 00	001201.00
12	NOP,0.0	0.30 00	001201.40
11	NOP,0.0	0.30 00	001202.00
10	NOP,0.0	0.30 00	001202.40
9	NOP,0.0	0.30 00	001203.00
8	NOP,0.0	0.30 00	001203.40
7	NOP,0.0	0.30 00	001204.00
6	NOP,0.0	0.30 00	001204.40
5	NOP,0.0	0.30 00	001205.00
4	NOP,0.0	0.30 00	001205.40
3	NOP,0.0	0.30 00	001206.00
2	NOP,0.0	0.30 00	001206.40
	CNOP		

	TITLA1	DD%BU,64,8,0,0,0		00000000000000000000	001207.00
				00000000000000000000	001210.00
				00000000000000000000	001211.00
		%16DD%BU,64,8,00000000000000	-	00000000000000000000	001212.00
		%16DD%BU,64,8,453545494F5D0059	-MEMORY W	0424652124451727200131	001213.00
		%16DD%BU,64,8,494F5153004B2D53	-ORST PAT	0445172425140022626523	001214.00
		%16DD%BU,64,8,53354F4700533551	-TERN TES	0514652364340024632521	001215.00
		%16DD%BU,64,8,53000025513D5B00	-I %SIX	0514000002252117255400	001216.00
		%16DD%BU,64,8,2F495B35512700FD	-BOXES RET	0275112663252111600375	001217.00
		DD%BU,0,0,0		00000000000000000000	001220.00
				00000000000000000000	001221.00
				00000000000000000000	001222.00
			-INDEX AND CONTROL WORDS FOR UPPER TEST 6 MEMORIES		
	CWA1	CW%CR,ITLA1,9,CWA1	-TITLE	1207.00 00 000220.02 93	001223.00
	CTLA1	XW,0,8,CTLA1-6M		0.00 00 000200.02 94	001224.00
	CTLB1	XW,32768,32768,CTLB1-SPLIT CONTROL-6M		100000.00 02 000000.02 96	001225.00
	CTLC1	XW,65536,32268,CTLC1	-REMAINING ADDRESSES	200000.00 01 760300.02 95	001226.00
	CTLD1	XW,0,2,CTLD1		0.00 00 000040.02 97	001227.00
	CTLE1	XW,%8401000,0,000040	-CT	401000.00 00 000000.00 28	001230.00
	CTLG1	VF,65535,-6M		177777.00+	001231.00
	CTLH1	VF,97803,-6M		277013.00+	001231.40
12	CTLI1	XW,32768,65036,CTLI1-6M		100000.00 03 760300.02 9A	001232.00
11	NOCOM	%16DD%BU,64,8,60 62 64 66 68 6A 6C 6E -01234567		0601423106315032466156	001233.00
10	ACC1	DR%BU,64,8,%1		1.00	001234.00
9	CW2Q	CW%CD,32768,M06AZZ-START2,S		100000.00 20 004020.02 9D	001235.00
8		NOP		0.30 00	001236.00
7		NOP		0.30 00	001236.40
6	M06AZ	SYN,M6AZZ+1.0		1240.00+ +00000000	BU, 40,10
5	M6AZZ	NOP,0.0		0.30 00	001237.00
4		NOP,0.0		0.30 00	001237.40
3	TYPE	SYN,19.32		23.40+ +00000000	
2		SLC,32768.			100000.00

-DOUBLE ERROR CHECKING FOR LOWER MEMORY

	START2	LCL,\$X15,900		1604.37 02	100000.00
		T,\$X15,64.0,START2+500.	-SAVE UPPER TEST	100.00 80 100764.36 20	100000.40
		LX,\$X1,CTLA2	CHECKERBOARD PATTERN	100171.02 10	100001.40
		LX,\$X2,CTLB2	SPLIT OR UPPER MEM	100172.04 10	100002.00
		LX,\$X4,CTLD2	UPPER LIMIT	100174.10 10	100002.40
		LX,\$X6,CTLD2	COMPLEMENTING	100174.14 10	100003.00
		Z,\$SUB	RESET BOUNDS	3.22 00	100003.40
		LVI,\$X10,INT2		100145.25 01	100004.00
		SV,\$X10,\$IA	SET INTRT ADDRESS	2.25 30	100004.40
		BE,PH2A		100007.00 00	100005.00
			-CHECKERBOARD GENERATING ROUTINE		
	PH2AR	LX,\$X1,CTLA2		100171.02 10	100005.40
		NOP,0.0	-TO REPEAT THIS PHASE	0.30 00	100006.00
		CNOP		0.30 00	100006.40
	PH2A	CM1111%V+ICR%BU,64,8,1.%\$X2	ST ALL ONES	1.00 82 300000.36 F0	100007.00
		BXCZ,BR1A	CT0 SPLIT OR UPPER MEM	100013.70 42	100010.00
		CBR,\$X1,PH2A		100007.02 4C	100010.40
			CNOP-CTRL PATTERN		
	PH2B	CM0000%V+ICR%BU,64,8,1.%\$X2	ST ALL ZEROES	1.00 82 300000.00 F0	100011.00
		BXCZ,BR1A		100013.70 42	100012.00
		CBR,\$X1,PH2B		100011.02 4C	100012.40
12		B,PH2A	NO LIMIT REACHED-REPEAT	100007.10 00	100013.00
11	BR1A	CBRZ,\$X4,BR2A	IF 1 SPLIT-0 UPPER MEM	100015.50 4E	100013.40
10		SWAP1,1,PH2B,PH2A	SET UP FOR SPLIT	100011.00 80 100007.02 E0	100014.00
9		B,PH2A	RETURN TO GEN LOOP	100007.10 00	100015.00
8	BR2A	SWAP1,1,PH2A,PH2B	RESTORE LOOP	100007.00 80 100011.02 E0	100015.40
7			-CHECKING ROUTINE		
6	CK2	LX,\$X1,CTLA2	-CTRL CHECK PATTERN	100171.02 10	100016.40
5		LX,\$X2,CTLB2		100172.04 10	100017.00
4			CNOP-CTRL STEPPING	0.30 00	100017.40
3	CK2A	CT1100%V+ICR%BU,64,8,1.%\$X2	CK ONE WORD	1.00 82 300000.31 70	100020.00
2		BXCZ,BR3A		100042.30 42	100021.00
		NOP	CK SPLIT OR UPPER LIMIT	0.30 00	100021.40

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	SX,\$X2,M6AZZ2	100200.05 10	100022.00
	BRGZ,\$-IF HANG UP,ADDR. AT 100222 IS NOT 1-S	100022.75 42	100022.40
	V-1,\$X2,1.	1.05 0D	100023.00
	CM1100%BU,64,8H,0%\$X2H-WORK LOCATION ADJACENT	0.00 82 000000.30 E0	100023.40
	CM1100%BU,64,8H,0%\$X2H-TO ONE CHECKED	0.00 82 000000.30 F0	100024.40
	CM1100%BU,64,8H,0%\$X2H	0.00 82 000000.30 F0	100025.40
	CM1100%BU,64,8H,0%\$X2H	0.00 82 000000.30 F0	100026.40
	V+1,\$X2,1.-RESTORE VALUE OF X2	1.05 05	100027.40
	CBR,\$X1,CK2A	100020.02 4C	100030.00
	CNOP	0.30 00	100030.40
	CK2B CT0011%V+1CRH%BU,64,8H,1.%\$X2H-CK ZERO WORD	1.00 82 300000.07 70	100031.00
	BXCZ,BR3A	100042.30 42	100032.00
	NOP-CK FOR SPLIT OR UPPER MEM	0.30 00	100032.40
	SX,\$X2,M6AZZ2	100200.05 10	100033.00
	BRGZ,\$-IF HANG UP,ADDR. AT 100222 IS NOT 0-S	100033.75 42	100033.40
	V-1,\$X2,1.	1.05 0D	100034.00
	CM1100%BU,64,8H,0%\$X2H-WORK LOCATION TO	0.00 82 000000.30 F0	100034.40
	CM1100%BU,64,8H,0%\$X2H-ONE CHECKED	0.00 82 000000.30 F0	100035.40
	CM1100%BU,64,8H,0%\$X2H	0.00 82 000000.30 F0	100036.40
	CM1100%BU,64,8H,0%\$X2H	0.00 82 000000.30 F0	100037.40
	V+1,\$X2,1.-RESTORE VALUE OF X2	1.05 05	100040.40
12	CBR,\$X1,CK2B	100031.02 4C	100041.00
11	B,CK2A-REPEAT LOOP	100020.10 00	100041.40
10	BR3A CBRZ,\$X4,BR4A-CT 1 SPLIT 0 UPPER MEM	100044.10 4E	100042.00
9	SWAP1,3,CK2A,CK2B-SETUP FOR SPLIT	100020.00 80 100031.06 E0	100042.40
8	B,CK2A-RETURN TO LOOP	100020.10 00	100043.40
7	BR4A SWAP1,3,CK2A,CK2B-RESTORE LOOP	100020.00 80 100031.06 E0	100044.00
6	CBRZ,\$X6,BR5A-IF CT 1 SETUP FOR COMPL	100050.14 4E	100045.00
5	SWAP1,1,PH2A,PH2B	100007.00 80 100011.02 E0	100045.40
4	SWAP1,3,CK2A,CK2B	100020.00 80 100031.06 E0	100046.40
3	B,PH2AR -REPEAT PHASE	100005.50 00	100047.40
2	BR5A SWAP1,1,PH2A,PH2B-RESTORE LOOP	100007.00 80 100011.02 E0	100050.00
	SWAP1,3,CK2A,CK2B	100020.00 80 100031.06 E0	100051.00

	LX,\$X2,CTL12=RESET ALL LOCATIONS	100177.04 10	100052.00
	Z,0%\$X2	0.22 02	100052.40
	CBR+,\$X2,\$-0.32	100052.45 4C	100053.00
	NOP,0.0	0.30 00	100053.40
	NOP,0.0	0.30 00	100054.00
	BB,4.36,BR13Q -LOOP ON CHECKERBOARDS	4.44 80 100137.74 02	100054.40
	BD,CK2C-TO SINGLE ERROR TEST	100056.04 00	100055.40
	-SET UP FOR SINGLE ERROR INJECTION		
CK2C	LX,\$X7,CTLE2-FOR ERROR INJ. INV. CO	100175.16 10	100056.00
	CM1111%BU,64.8,\$X8-FOR ONES WORD	30.00 80 000000.36 FO	100056.40
	LX,\$X2,CTLB2-FIRST ADDRESS	100172.04 10	100057.40
	LX,\$X1,CTLA2-PATTERN	100171.02 10	100060.00
BR6A	SX,\$X7,\$UB -TURN ON ERROR INJECTION	3.17 10	100060.40
	CNOP		
PH2C	SX,\$X8,0%\$X2	0.21 12	100061.00
	CNOP	0.30 00	100061.40
	Z,\$UB	3.22 00	100062.00
	NOP	0.30 00	100062.40
	NOP	0.30 00	100063.00
	NOP	0.30 00	100063.40
	NOP	0.30 00	100064.00
12	NOP	0.30 00	100064.40
11			
10	NOP	0.30 00	100065.00
9	NOP	0.30 00	100065.40
8	NOP	0.30 00	100066.00
7	NOP	0.30 00	100066.40
6	NOP	0.30 00	100067.00
5			
4	KV,\$X2,CTLG2-CK FOR SPLIT	100176.04 90	100067.40
3	BXEZ,BR8A-TO NEW PATTERN	100103.32 C6	100070.00
2	V+1,\$X2,1.-INCREMENT ADDRESS	1.05 05	100070.40
1	CBR,\$X1,BR6A-LOOP	100060.42 4C	100071.00

	BR7A	SX,\$X7,\$SUB	-TURN ON ERROR INJECTION	3.17 10	100071.40
		CNOP			
	PH2D	Z,0%\$X2H		0.22 02	100072.00
		CNOP		0.30 00	100072.40
		Z,\$SUB		3.22 00	100073.00
		NOP		0.30 00	100073.40
		NOP		0.30 00	100074.00
		NOP		0.30 00	100074.40
		NOP		0.30 00	100075.00
		NOP		0.30 00	100075.40
		NOP		0.30 00	100076.00
		NOP		0.30 00	100076.40
		NOP		0.30 00	100077.00
		NOP		0.30 00	100077.40
		NOP		0.30 00	100100.00
		KV,\$X2,CTLG2	-CHK FOR SPLIT	100176.04 90	100100.40
		BXEZ,BR8A-TO NEW PATTERN		100103.32 C6	100101.00
		V+1,\$X2,1.-INCR. ADDRESS		1.05 05	100101.40
		CBR,\$X1,BR7A-LOOP		100071.42 4C	100102.00
12		B,BR6A-REPEAT UNTIL SPLIT		100060.50 00	100102.40
11	BR8A	LX,\$X2,CTLC2-SET UP FOR REMAINDER OF MEM		100173.04 10	100103.00
10	BR9A	SX,\$X7,\$SUB	-TURN ON ERROR INJECTION	3.17 10	100103.40
9		CNOP			
8	PH2E	Z,0%\$X2H		0.22 02	100104.00
7		CNOP		0.30 00	100104.40
6		Z,\$SUB		3.22 00	100105.00
5		NOP		0.30 00	100105.40
4		NOP		0.30 00	100106.00
3		NOP		0.30 00	100106.40
2		NOP		0.30 00	100107.00
		NOP		0.30 00	100107.40

	NOP		0.30 00	100110.00
	NOP		0.30 00	100110.40
	NOP		0.30 00	100111.00
	NOP		0.30 00	100111.40
	NOP		0.30 00	100112.00
	KV,\$X2,CTLH2-UPPER MEM		100176.44 90	100112.40
	BXEZ,CK2D-TO CK PATTERN		100126.32 C6	100113.00
	V+1,\$X2,1.-INCR ADDRESS		1.05 05	100113.40
	CBR,\$X1,BR9A-LOOP		100103.42 4C	100114.00
	BR10A SX,\$X7,\$SUB -TURN ON ERROR INJECTION		3.17 10	100114.40
	CNOP			
	PH2E SX,\$X8,0%\$X2		0.21 12	100115.00
	CNOP		0.30 00	100115.40
	Z,\$SUB		3.22 00	100116.00
	NOP		0.30 00	100116.40
	NOP		0.30 00	100117.00
	NOP		0.30 00	100117.40
	NOP		0.30 00	100120.00
	NOP		0.30 00	100120.40
12				
11	NOP		0.30 00	100121.00
10	NOP		0.30 00	100121.40
9	NOP		0.30 00	100122.00
8	NOP		0.30 00	100122.40
7	NOP		0.30 00	100123.00
6				
5	KV,\$X2,CTLH2-MEM LIMIT		100176.44 90	100123.40
4	BXEZ,CK2D-TO CHECK PATTERN		100126.32 C6	100124.00
3	V+1,\$X2,1.-INCR ADDRESS		1.05 05	100124.40
2	CBR,\$X1,BR10A		100114.42 4C	100125.00
	B,BR9A-REPEAT UNTIL UPPER MEM		100103.50 00	100125.40

-----SINGLE ERROR CHECKING-----			
CK2D	LX,\$X2,CTL12-CTL ADDR STEPPING	100177.04 10	100126.00
	BE,BR11A	100127.00 00	100126.40
BR11A	CM1100%BU,64,8H,0%\$X2H-INVERT DATA AND CK	0.00 82 000000.30 F0	100127.00
	CBR,\$X1,BR11A-FOR ERROR	100127.02 4C	100130.00
	CBR+,\$X2,BR11A-REPEAT UNTIL UPPER LIMIT	100127.05 4C	100130.40
BR12A	CM0011%BU,64,8H,0%\$X2H-RECHECK ALL LOCATIONS	0.00 82 000000.06 F0	100131.00
	CBR+,\$X2,BR12A	100131.05 4C	100132.00
-----COMPLEMENT TEST-----			
COMP2	CBRZ,\$X6,BR13A-CTRL COMPL	100135.54 4E	100132.40
	SWAP1,1,PH2C,PH2D-SET UP FOR COMPL	100061.00 80 100072.02 E0	100133.00
	SWAP1,1,PH2E,PH2F	100104.00 80 100115.02 E0	100134.00
	BD,CK2C-START COMPL	100056.04 00	100135.00
BR13A	SWAP1,1,PH2C,PH2D-RESTORE	100061.00 80 100072.02 E0	100135.40
	SWAP1,1,PH2E,PH2F	100104.00 80 100115.02 E0	100136.40
BR13Q	LX,\$X2,CTL12 -RESET ALL LOCATIONS	100177.04 10	100137.40
	Z,0%\$X2H	0.22 02	100140.00
	CBR+,\$X2,\$-0.32	100140.05 4C	100140.40
BR14A	M+1%DU,18,4H,\$X14+0.17-UPDATE PASS COUNTER	36.21 80 022400.26 B0	100141.00
	LCL,\$X15,900	1604.37 02	100142.00
	T,\$X15,START2+500,64.0 -RESTORE UPPER TEST	100764.00 80 000100.36 20	100142.40
12	BB,4.38,START2 -LOOP ON LOWER MEMORY	4.46 80 100000.34 02	100143.40
11	BD,PH1-RESTART TEST	1021.04 00	100144.40
10	-INTERRUPT TABLE LOWER TEST		
9	INT2 NOP,0.0	0.30 00	100145.00
8	NOP,0.0	0.30 00	100145.40
7	NOP,0.0	0.30 00	100146.00
6	NOP,0.0	0.30 00	100146.40
5	NOP,0.0	0.30 00	100147.00
4	NOP,0.0	0.30 00	100147.40
3	NOP,0.0	0.30 00	100150.00
2	NOP,0.0	0.30 00	100150.40
	NOP,0.0	0.30 00	100151.00

	NOP,0.0	0.30 00	100151.40
	NOP,0.0	0.30 00	100152.00
	NOP,0.0	0.30 00	100152.40
	NOP,0.0	0.30 00	100153.00
	NOP,0.0	0.30 00	100153.40
	NOP,0.0	0.30 00	100154.00
	NOP,0.0	0.30 00	100154.40
	NOP,0.0	0.30 00	100155.00
	NOP,0.0	0.30 00	100155.40
	NOP,0.0	0.30 00	100156.00
	NOP,0.0	0.30 00	100156.40
	NOP,0.0	0.30 00	100157.00
	NOP,0.0	0.30 00	100157.40
	NOP,0.0	0.30 00	100160.00
	NOP,0.0	0.30 00	100160.40
	NOP,0.0	0.30 00	100161.00
	NOP,0.0	0.30 00	100161.40
	NOP,0.0	0.30 00	100162.00
	NOP,0.0	0.30 00	100162.40
	NOP,0.0	0.30 00	100163.00
	NOP,0.0	0.30 00	100163.40
12	NOP,0.0	0.30 00	100164.00
11	NOP,0.0	0.30 00	100164.40
10	NOP,0.0	0.30 00	100165.00
9	NOP,0.0	0.30 00	100165.40
8	NOP,0.0	0.30 00	100166.00
7	NOP,0.0	0.30 00	100166.40
6	NOP,0.0	0.30 00	100167.00
5	NOP,0.0	0.30 00	100167.40
4	NOP,0.0	0.30 00	100170.00
3	NOP,0.0	0.30 00	100170.40
2	CNOP		

CTLA2	XW,0.,.4,CTLA2=PATTERN	0.00 00 000102.00 79	100171.00
CTLB2	XW,64.,.16320,CTLC2=STARTING ADDRESS TO SPLIT	100.00 00 776002.00 7B	100172.00
CTLC2	XW,16384.,.16384,CTLB2 -REMAINING ADDRESSES	40000.00 01 000002.00 7A	100173.00
CTLD2	XW,0.,.2,CTLD2=COMPL AND SPLIT CTL	0.00 00 000042.00 7C	100174.00
CTLE2	XW,%8#401000.,.0,000040 -CT	401000.00 00 000000.00 28	100175.00
CTLG2	VF,16383.-SPLIT	37777.00+	100176.00
CTLH2	VF,32767.-UPPER LIMIT	77777.00+	100176.40
CTLI2	XW,64.,.32704,CTLI2= CTL STEPPING THRU LOC CKED	100.00 01 776002.00 7F	100177.00
M06AZ2	SYN,M6AZZ2+1.0	100201.00+ +00000000	BU, 40,10
M6AZZ2	NOP,0.0	0.30 00	100200.00
	NOP,0.0	0.30 00	100200.40
	END,100.	144.00	100201.00

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