

LISTING

096-000137-02

PROGRAM

MEMORY CHECKERBOARD V

TAPE

095-000168-02

ABSTRACT

CHECKERBOARD V IS A MAINTAINANCE PROGRAM DESIGNED TO PRODUCE WORST NOISE CONDITIONS ON THE SENSE/INHIBIT WIRES. THE PROGRAM SHOULD BE RUN TO INSURE PROPER OPERATION OF THE MEMORY SYSTEM.

0001 ,MAIN

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01
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08
09 /*****
10 /
11 /
12 / NAME: CHECKV,SR          PART NUMBER: 094-000535
13 /
14 / DESCRIPTION:  MEMORY CHECKERBOARD V
15 /
16 / REVISION HISTORY:
17 /
18 /      REV.      DATE
19 /      00        12/05/73
20 /      01        01/25/74
21 /      02        05/10/74
22 /
23 /
24 / COPYRIGHT (C) DATA GENERAL CORPORATION, 1973, 1974
25 / ALL RIGHTS RESERVED.
26 /*****/
```

0002 ,MAIN

```
01
02
03 /
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MEMORY CHECKERBOARD V

11. ABSTRACT

CHECKERBOARD 5 IS A MAINTENANCE PROGRAM
DESIGNED TO PRODUCE WORST CASE NOISE CONDITIONS
ON THE SENSE/INHIBIT WIRES. THE PROGRAM
SHOULD BE RUN TO INSURE PROPER OPERATION OF THE
MEMORY SYSTEM

12. MACHINE REQUIREMENTS

ANY NOVA PROCESSOR

13. SWITCH SETTINGS

STARTING ADDRESS=2
SWITCH 15 (1) =INHIBIT HALT ON ERROR

14. OPERATING PROCEDURE

LOAD THE PROGRAM VIA THE BINARY LOADER.
SET SWITCHES TO 000002
PRESS START
THE PROGRAM WILL RUN UNTIL AN ERROR IS DETECTED.

15. ERROR DESCRIPTION

THE PROGRAM CONTAINS TWO ERROR HALTS. THE FIRST
OF WHICH IS IN THE MEMORY SIZE ROUTINE. IF THE
PROGRAM IS UNABLE TO DETERMINE MEMORY SIZE
PROPERLY THE MACHINE WILL HALT WITH C(AC2)
CONTAINING THE FAILING ADDRESS AND C(AC0) THE
FAILED DATA.

15.1 OTHER ERRORS DETECTED

WILL CAUSE THE TELETYPE BELL TO BE RUNG,
AC3 WILL CONTAIN THE ADDRESS OF THE FAILURE
AND AC1 WILL CONTAIN THE WORD IN ERROR.
PRESSING CONTINUE WILL CAUSE THE TEXT TO
BE RESUMED. SETTING SWITCH 15 (1) WILL INHIBIT
THE HALT BUT STILL ALLOW THE BELL TO BE RUNG.

A 0003 ,MAIN

```

01
02
03
04 16. PROGRAM DESCRIPTION
05 / CHECKERBOARD V GENERATES THE WORST CASE NOISE
06 / PATTERN BY A SERIES OF 16 "STA" INSTRUCTIONS
07 / STORING EITHER ALL ZEROS OR ALL ONES. WHEN ALL
08 / DATA IS STORED THE CHECK CYCLE IS ENTERED. CHEC
09 / OF THE ZEROS CONSIST OF 16 "DSZ" INSTRUCTIONS WH
10 / COMPLEMENT ALL THE ZEROS TO ONES,
11 / THIS IS FOLLOWED BY 16 ISZ INSTRUCTIONS, EACH OF
12 / WHICH SHOULD SET MEMORY BACK TO ZEROS AND SKIP
13 / IF ALL WAS CORRECT. CHECKING OF ONES
14 / IS PERFORMED BY A SERIES OF 16 "ISZ" INSTRUCTIONS
15 / EACH OF WHICH SETS MEMORY TO ZEROS AND SKIPS
16 / IF ALL BITS ARE CORRECT. A SERIES OF
17 / 16 DSZ INSTRUCTIONS WILL RESTORE THE ZEROS TO
18 / ONES. THE ONES ARE THEN CHECKED VIA "LDA" INSTR
19 / THE COMBINATION OF ISZ/DSZ INSTRUCTIONS TO
20 / PERFORM BIT CHECKING AND COMPLEMENT FUNCTIONS
21 / PERMITS VERY FAST PROGRAAM EXECUTION.
22
23 17. MISC
24 / BECAUSE OF THE NATURE OF THE TEST, THE WORD
25 / IN ERROR MAY NOT ACCURATELY DESCRIBE THE FAILED
26 / BIT.

```

A 0004 ,MAIN

```

01
02
03 000002 ,LOC 2
04
05 00002 030035 SIZE1 LDA 2,K377 ;SIZE OF MEMORY
06 00003 151400 INC 2,2
07 00004 151112 MOVL# 2,2,SZC
08 00005 000021 JMP SIZE1
09 00006 025000 LDA 1,0,2
10 00007 051000 STA 2,0,2
11 00010 021000 LDA 0,0,2
12 00011 045000 STA 1,0,2
13 00012 112415 SUB# 0,2,SNR
14 00013 000003 JMP SIZE+1
15 00014 024032 LDA 1,K1777
16 00015 100014 COM# 0,0,SZR ;MEMORY FAILURE IN SIZE
17 00016 101005 MOV 0,0,SNR ;ROUTINE, C(AC2)=ADDRESS
18 00017 133414 AND# 1,2,SZR ;C(AC2)=CORRECT
19 00020 063077 E1: HALT ;C(AC0)=ERROR WORD
20
21 00021 151220 SIZE1: MOVZR 2,2
22 00022 151220 MOVZR 2,2
23 00023 151220 MOVZR 2,2
24 00024 151220 MOVZR 2,2
25 00025 151220 MOVZR 2,2 ;DIVIDE BY 32,
26 00026 024042 LDA 1,K14
27 00027 132400 SUB 1,2
28 00030 050033 STA 2,MEMBK
29 00031 000047 JMP FILL
30

```

A 0005 .MAIN

```

01
02
03 00032 001777 K1777: 1777
04 00033 000000 MEMBK: 0
05 00034 000000 FTEM: 0
06 00035 000377 K377: 377
07 00036 000400 ADR: 400
08 00037 000000 PATT: 0
09 00040 000020 K20: 20
10 00041 000007 K7: 7
11 00042 000014 K14: 14
12 00043 000137 KCKZ1: CKZ1+2
13 00044 000200 KCONE: CONE+2
14 00045 000260 KCONE2: CONE2+2
15 00046 000000 ERET: 0
16
17 00047 034033 FILL: LDA 3, MEMBK
18 00050 054034 STA 3, FTEM
19 00051 034035 LDA 3, K377
20 00052 030036 LDA 2, ADR
21 00053 024040 LDA 1, K20
22 00054 020037 LDA 0, PATT
23 00055 101020 MOVZ 0, 0
24
25 00056 041000 F2: STA 0, 0, 2
26 00057 041001 STA 0, 1, 2
27 00058 041002 STA 0, 2, 2
28 00059 041003 STA 0, 3, 2
29 00060 041004 STA 0, 4, 2
30 00061 041005 STA 0, 5, 2
31 00062 041006 STA 0, 6, 2
32 00063 041007 STA 0, 7, 2
33 00064 041010 STA 0, 10, 2
34 00065 041011 STA 0, 11, 2
35 00066 041012 STA 0, 12, 2
36 00067 041013 STA 0, 13, 2
37 00068 041014 STA 0, 14, 2
38 00069 041015 STA 0, 15, 2
39 00070 041016 STA 0, 16, 2
40 00071 041017 STA 0, 17, 2
41 00072 133000 ADD 1, 2
42 00073 100062 COMC 0, 0, 3ZC
43 00074 000056 JMP F2
44
45 00101 157415 F3: AND# 2, 3, 3NR
46 00102 100000 COM 0, 0
47 00103 014034 DSZ FTEM
48 00104 000056 JMP F2
49

```

IFIRST LOCATION IN PATTERN
IPATTERN

IFILL MEMORY WITH PATTERN

ISTORE 16 TIMES

A 0005 .MAIN

```

01 00105 034033 C1: LDA 3, MEMBK
02 00106 175120 MOVZL 3, 3
03 00107 054034 STA 3, FTEM
04 00110 034035 LDA 3, K377
05 00111 030036 LDA 2, ADR
06 00112 020037 LDA 0, PATT
07 00113 101004 C0: MOV 0, 0, SZR
08 00114 000176 JMP CUNE
09
10 00115 015000 CKZ1: DSZ 0, 2
11 00116 015001 DSZ 1, 2
12 00117 015002 DSZ 2, 2
13 00120 015003 DSZ 3, 2
14 00121 015004 DSZ 4, 2
15 00122 015005 DSZ 5, 2
16 00123 015006 DSZ 6, 2
17 00124 015007 DSZ 7, 2
18 00125 015010 DSZ 10, 2
19 00126 015011 DSZ 11, 2
20 00127 015012 DSZ 12, 2
21 00130 015013 DSZ 13, 2
22 00131 015014 DSZ 14, 2
23 00132 015015 DSZ 15, 2
24 00133 015016 DSZ 16, 2
25 00134 015017 DSZ 17, 2
26 00135 011000 CKZ1: ISZ 0, 2
27 00136 004350 JSR ERZ
28 00137 011001 ISZ 1, 2
29 00140 004350 JSR ERZ
30 00141 011002 ISZ 2, 2
31 00142 004350 JSR ERZ
32 00143 011003 ISZ 3, 2
33 00144 004350 JSR ERZ
34 00145 011004 ISZ 4, 2
35 00146 004350 JSR ERZ
36 00147 011005 ISZ 5, 2
37 00150 004350 JSR ERZ
38 00151 011006 ISZ 6, 2
39 00152 004350 JSR ERZ
40 00153 011007 ISZ 7, 2
41 00154 004350 JSR ERZ
42 00155 011010 ISZ 10, 2
43 00156 004350 JSR ERZ
44 00157 011011 ISZ 11, 2
45 00160 004350 JSR ERZ
46 00161 011012 ISZ 12, 2
47 00162 004350 JSR ERZ
48 00163 011013 ISZ 13, 2
49 00164 004350 JSR ERZ
50 00165 011014 ISZ 14, 2
51 00166 004350 JSR ERZ
52 00167 011015 ISZ 15, 2
53 00170 004350 JSR ERZ
54 00171 011016 ISZ 16, 2
55 00172 004350 JSR ERZ
56 00173 011017 ISZ 17, 2
57 00174 004350 JSR ERZ
58 00175 000336 JMP C1

```

ICHECK MEMORY DATA

ICHECK ONES....

ICHECK ZEROS.....
ICOMP ZEROS TO ONES,

IRESTORE THE ONES BACK
ITO ZEROS AND CHECK,

A 0007 ,MAIN

```

01
02 00176 011000 CONE1: ISZ 0,2
03 00177 004352 JSR ERO
04 00200 011001 ISZ 1,2
05 00201 004352 JSR ERO
06 00202 011002 ISZ 2,2
07 00203 004352 JSR ERO
08 00204 011003 ISZ 3,2
09 00205 004352 JSR ERO
10 00206 011004 ISZ 4,2
11 00207 004352 JSR ERO
12 00210 011005 ISZ 5,2
13 00211 004352 JSR ERO
14 00212 011006 ISZ 6,2
15 00213 004352 JSR ERO
16 00214 011007 ISZ 7,2
17 00215 004352 JSR ERO
18 00216 011010 ISZ 10,2
19 00217 004352 JSR ERO
20 00220 011011 ISZ 11,2
21 00221 004352 JSR ERO
22 00222 011012 ISZ 12,2
23 00223 004352 JSR ERO
24 00224 011013 ISZ 13,2
25 00225 004352 JSR ERO
26 00226 011014 ISZ 14,2
27 00227 004352 JSR ERO
28 00230 011015 ISZ 15,2
29 00231 004352 JSR ERO
30 00232 011016 ISZ 16,2
31 00233 004352 JSR ERO
32 00234 011017 ISZ 17,2
33 00235 004352 JSR ERO
34
35 00236 015000 CONE1: DSZ 0,2
36 00237 015001 DSZ 1,2
37 00240 015002 DSZ 2,2
38 00241 015003 DSZ 3,2
39 00242 015004 DSZ 4,2
40 00243 015005 DSZ 5,2
41 00244 015006 DSZ 6,2
42 00245 015007 DSZ 7,2
43 00246 015010 DSZ 10,2
44 00247 015011 DSZ 11,2
45 00250 015012 DSZ 12,2
46 00251 015013 DSZ 13,2
47 00252 015014 DSZ 14,2
48 00253 015015 DSZ 15,2
49 00254 015016 DSZ 16,2
50 00255 015017 DSZ 17,2

```

ICHECK ONES AND COMP
IBACK TO ZEROS

IRECOMP THE ZEROS

A 0008 ,MAIN

```

01
02 00256 025000 CONE2: LUA 1,0,2
03 00257 124014 COMM 1,1,SZR
04 00260 004370 JSR ERL
05 00261 025001 LDA 1,1,2
06 00262 124014 COMM 1,1,SZR
07 00263 004370 JSR ERL
08 00264 025002 LDA 1,2,2
09 00265 124014 COMM 1,1,SZR
10 00266 004370 JSR ERL
11 00267 025003 LDA 1,3,2
12 00270 124014 COMM 1,1,SZR
13 00271 004370 JSR ERL
14 00272 025004 LDA 1,4,2
15 00273 124014 COMM 1,1,SZR
16 00274 004370 JSR ERL
17 00275 025005 LDA 1,5,2
18 00276 124014 COMM 1,1,SZR
19 00277 004370 JSR ERL
20 00300 025006 LDA 1,6,2
21 00301 124014 COMM 1,1,SZR
22 00302 004370 JSR ERL
23 00303 025007 LDA 1,7,2
24 00304 124014 COMM 1,1,SZR
25 00305 004370 JSR ERL
26 00306 025010 LDA 1,10,2
27 00307 124014 COMM 1,1,SZR
28 00310 004370 JSR ERL
29 00311 025011 LDA 1,11,2
30 00312 124014 COMM 1,1,SZR
31 00313 004370 JSR ERL
32 00314 025012 LDA 1,12,2
33 00315 124014 COMM 1,1,SZR
34 00316 004370 JSR ERL
35 00317 025013 LDA 1,13,2
36 00320 124014 COMM 1,1,SZR
37 00321 004370 JSR ERL
38 00322 025014 LDA 1,14,2
39 00323 124014 COMM 1,1,SZR
40 00324 004370 JSR ERL
41 00325 025015 LDA 1,15,2
42 00326 124014 COMM 1,1,SZR
43 00327 004370 JSR ERL
44 00330 025016 LDA 1,16,2
45 00331 124014 COMM 1,1,SZR
46 00332 004370 JSR ERL
47 00333 025017 LDA 1,17,2
48 00334 124014 COMM 1,1,SZR
49 00335 004370 JSR ERL

```

IFINAL CHECK,.....

A 0009 .MAIN

```
01
02 00336 024040 C1: LDA 1,K20
03 00337 133000 AUD 1,2
04 00340 157414 AND# 2,3,SZR
05 00341 100000 COM 0,0
06 00342 014034 DSZ FTEM
07 00343 000113 JMP C0
08 00344 020037 LDA 0,PATT
09 00345 100000 COM 0,0
10 00346 040037 STA 0,PATT
11 00347 000047 JMP FILL
12
13 00350 024043 ERZ: LDA 1,KCKZ1
14 00351 125001 MOV 1,1,SKP
15 00352 024044 ERD: LDA 1,KCONE
16 00353 054046 STA 3,ERET
17 00354 136640 SUBUR 1,3
18 00355 157000 ERXX: ADD 2,3
19 00356 064477 REAUS 1
20 00357 125200 MOVK 1,1
21 00360 024041 LDA 1,K7
22 00361 063411 SKPHN TTD
23 00362 065111 OQAS 1,TTD
24 00363 025400 LDA 1,0,3
25 00364 101013 MOV# 0,0,SNC
26 00365 063077 HALT
27 00366 034035 LDA 3,K377
28 00367 002046 JMP #ERET
29
30 00370 054046 ERL: STA 3,ERET
31 00371 025775 LDA 1,-3,3
32 00372 034035 LDA 3,K377
33 00373 137400 AND 1,3
34 00374 000355 JMP ERXX
35
36 .TXT /COPYRIGHT (C) DGC,1973,74
```

```
00375 047503
00376 054520
00377 044522
00400 044107
00401 020124
00402 041450
00403 020051
00404 043504
00405 026103
00406 034461
00407 031467
00410 033454
37 00411 040464 ALL RIGHTS RESERVED/
00412 046114
00413 051040
00414 043511
00415 052110
00416 020123
00417 042522
00420 042523
00421 053122
00422 042105
00423 000000
```

IUPDATA ADDRESS.

FERROM ON ZERO....

IC(AC1)=WORD IN ERROR
IC(AC3)=ADDRESS

0010 .MAIN

```
01
02 .END
```

```

0011 .MAIN
ADR 000036 5/07 5/20 6/05
C 000105 6/01
C0 000113 6/07 9/07
C1 000336 6/50 9/02
CKZ 000115 6/10
CKZ1 000135 5/12 6/26
CONE 000176 5/13 6/00 7/02
CONE1 000236 7/35
CONE2 000256 5/14 8/02
E1 000020 4/10
ERET 000046 5/15 9/16 9/28 9/30
ERL 000370 8/04 8/07 8/10 8/13 8/16 8/19 8/22 8/25
8/28 8/31 8/34 8/37 8/40 8/43 8/46 8/49
9/30
EMO 000352 7/03 7/05 7/07 7/09 7/11 7/13 7/15 7/17
7/19 7/21 7/23 7/25 7/27 7/29 7/31 7/33
9/15
ERXX 000355 9/18 9/34
ERZ 000350 6/27 6/29 6/31 6/33 6/35 6/37 6/39 6/41
6/43 6/45 6/47 6/49 6/51 6/53 6/55 6/57
9/13
F2 000056 5/25 5/43 5/48
F3 000101 5/45
FILL 000047 4/29 5/17 9/11
FTEM 000034 5/05 5/18 5/47 6/03 9/06
K14 000042 4/26 5/11
K1777 000032 4/15 5/03
K20 000040 5/09 5/21 9/02
K377 000035 4/05 5/06 5/19 6/04 9/27 9/32
K7 000041 5/10 9/21
KCKZ1 000043 5/12 9/13
KCON2 000045 5/14
KCONE 000044 5/13 9/15
MEMBK 000033 4/28 5/04 5/17 6/01
PATT 000037 5/08 5/22 6/06 9/08 9/10
SIZE 000002 4/05 4/14
SIZE1 000021 4/08 4/21

```