

LISTING

096-000441-00

PROGRAM

MICRO NOVA POWER FAIL  
DIAGNOSTIC

TAPE

095-000441-00

ABSTRACT

THIS DIAGNOSTIC IS DESIGNED TO CHECK THE AUTO-RESTART OF MICRO  
NOVA AFTER A POWER FAIL.

0001 MNPWR MACHO REV 04.00

15:23:24 12/03/76

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/ NAME: MNPWR,SK PART NUMBER: 094-000039  
/ DESCRIPTION: MICRO NOVA POWER FAIL DIAGNOSTIC  
/ REVISION HISTORY:  
/ REV. DATE  
/ 00 12/03/76  
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0002 MNPWR

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.TITL MNPWR  
.DD 0  
1. ABSTRACT  
THIS DIAGNOSTIC IS DESIGNED TO CHECK THE AUTO-RESTART OF MICRO-NOVA AFTER A POWER FAIL.  
2. MACHINE REQUIREMENTS  
2.1 MICRO-NOVA CPU  
2.2 4K OF READ/WRITE MEMORY  
2.3 TELETYPE OR CRT  
2.4 BATTERY BACK-UP UNIT  
3. OPERATING PROCEDURE  
THE DIAGNOSTIC CAN BE LOADED FROM DTOS OR PAPER TAPE. HOWEVER THE PROGRAM CAN NOT BE RUN IN "RUN ALL" MODE OF DTOS. AFTER THE DIAGNOSTIC IS LOADED IT WILL AUTO START AT 200. THE OPERATOR WILL BE ASKED TO TURN THE KEY TO LOCK POSITION AND TURN THE POWER OFF. WHEN THE POWER IS RESUMED THE MEMORY AND ACCUMULATORS WILL BE CHECKED FOR THE PROPER DATA. IN EVENT OF A FAILURE AN APPROPRIATE MESSAGE WILL BE REPORTED. IF A DEVICE OTHER THAN POWER FAIL UNIT INTERRUPTS THE CPU AFTER THE OPERATOR HAS BEEN ASKED TO TURN THE POWER OFF, A MESSAGE REPORTING THE INTERRUPTING DEVICE WILL BE PRINTED OUT.  
4. ERROR DESCRIPTION  
ON ENCOUNTERING AN ERROR A SELF EXPLANATORY MESSAGE WILL BE TYPED OUT  
5. PROGRAM DESCRIPTION  
AFTER STARTING THE PROGRAM THE MEMORY IS SIZED AND WRITTEN TO A BACKGROUND PATTERN, THE ACCUMULATORS ARE LOADED WITH PREDETERMINED VALUES AND THEIR COPY IS PLACED IN PAGE 0. A COUNTER FOR 2 MSEC. IS SET. OPERATOR IS THEN ASKED TO TURN OFF THE POWER. AFTER THE POWER FAIL INTERRUPT, PROGRAM WAITS FOR NEARLY 2 MSEC. BEFORE EXECUTING A HALT. WHEN THE POWER IS TURNED ON THE STATES OF CARRY AND INTERRUPTS ARE CHECKED AND THE CONTENTS OF ACCUMULATORS AND MEMORY ARE VERIFIED. IF THE POWER UP STARTS THE PROGRAM THRU LOCATION 1 THEN AN ERROR IS REPORTED.  
.ENDC

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10003 MNPWR
01 00000 000000 .LOC 0
02 00000 001046 DIRT
03
04 00000 000045 .LOC 45
05 00045 001037 IEGBS: EGGS
06
07 00000 000060 .LOC 60
08
09 00060 000000 ACNUM: 0
10 00061 000000 BKGN0: 0
11 00062 000000 ENDCNT: 0
12 00063 000000 RPR1: 0
13 00064 000000 RTADD: 0
14 00065 000000 TPMEH: 0
15 00066 000000 XDTA: 0
16
17 00067 000000 ACC0: 0
18 00070 000000 ACC1: 0
19 00071 000000 ACC2: 0
20 00072 000000 ACC3: 0
21 00073 000000 SAV0: 0
22 00074 000000 SAV1: 0
23 00075 000000 SAV2: 0
24 00076 000000 SAV3: 0
25 00077 000000 SAV4: 0
26 00100 000000 RTN7A: 0
27 00101 000000 PCR7Y: 0
28 00102 000000 PAC70: 0
29 00103 000000 PAC71: 0
30 00104 000000 PAC72: 0
31 00105 000000 CHR7Z: 0
32 00106 000000 TYP7R: 0
33 00107 000000 ZSU7P: 0
34 00110 000000 PSP7: 0
35 00111 000000 SPT7G: 0
36 00112 000000 CHR7E: 0
37 00113 000000 CAC70: 0
38 00114 000000 TMP7: 0
39 00115 000000 TAC70: 0
40 00116 000264 IFAULT: FAULT
41 00117 000506 IMESS: MES7S
42 00120 000655 ITYPE: TYP7E
43 00121 000544 ICRLF: CRL7F
44 00122 000556 IPOCT: POC7T
45 00123 000552 IZOCT: ZOC7T
46 00124 000067 STACK: ACC0
47 00125 001046 ENDR: DIRT
48 00126 002000 INST: JMP 00
49 00127 177331 COUNT: -295.
50 00130 000063 N3: 3
51 00131 000011 N11: 11
52 00132 000177 P1777: 177
53 00133 000012 PC172: 12
54 00134 000015 PC175: 15

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JCRY SAVE LOCATION
JAC0 SAVE LOCATION
JAC1 SAVE LOCATION
JAC2 SAVE LOCATION

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JAC0 SAVE IN CHC7T ROUTINE
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10004 MNPWR
01 000200 .LOC 200
02
03 00200 060277 START: INTDS
04 00201 030125 PWRTS: LDA 2,ENDPR
05 00202 151400 INC 2,2
06 00203 035000 LDA 3,0,2
07 00204 051000 STA 2,0,2
08 00205 021000 LDA 0,0,2
09 00206 050000 STA 3,0,2
10 00207 112415 SUB# 0,2,SNR
11 00210 151112 MOVLN# 2,2,SZC
12 00211 102401 SUB 0,0,SKP
13
14 00212 000202 JMP PWRTS+1
15 00213 112000 ADC 0,2
16 00214 034132 LDA 3,P1777
17 00215 026045 LDA 1,0IEGBS
18 00216 125004 MOV 1,1,SZR
19 00217 172000 ADC 3,2
20 00220 050005 STA 2,TPMEH
21 00221 120520 SUBZL 1,1
22 00222 044007 WRITE: STA 1,ACC0
23 00223 040001 STA 0,BKGN0
24 00224 030005 LDA 2,TPMEH
25 00225 034125 LDA 3,ENDPR
26 00226 041400 STA 0,0,3
27 00227 175400 INC 3,3
28 00230 172053 ADCOM 3,2,SNC
29
30 00231 000226 JMP 0,3
31 00232 020127 LDA 0,COUNT
32 00233 040002 STA 0,ENDCNT
33 00234 020007 TOUT: LDA 0,ACC0
34 00235 110000 COM 0,2
35 00236 050071 STA 2,ACC2
36 00237 000117 JSR 0IMESS
37 00240 000706 PWROF
38 00241 176400 SUB 3,3
39 00242 075111 ODAS 3,TTO
40 00243 063011 SKPDN TTO
41 00244 000243 JMP 0,-1
42 00245 034126 LDA 3,INST
43 00246 054011 STA 3,11
44 00247 034131 LDA 3,N11
45 00250 060177 INTEN
46 00251 054001 STA 3,1
47
48 00252 065477 INTA 1
49 00253 166415 SUB# 3,1,SNR
50 00254 000250 JMP 0,-4
51 00255 120415 INC# 1,1,SNR
52
53 00256 000502 JMP PWROF
54 00257 000117 JSR 0IMESS
55 00260 000741 ILIGL
56 00261 000123 JSR 0IZOCT
57 00262 061277 ODAC 0,CPU
58 00263 000234 JMP TOUT
59
60 00264 000117 FAULT: JSR 0IMESS

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```

JDISABLE INTERRUPTS
JAC2 = END OF PROGRAM

JREAD
JRESTORE THE LOCATION
JSKIP IF SIZING IS OVER
JSKIP IF STILL SIZING
JMEMORY WILL BE WRITTEN TO A
JBACKGROUND OF 0
JKEEP ON SIZING
JDECREMENT AC2
JAC3 = 177

JSKIP IF NOT UNDER DTOS
JSAVE THE MINI-MONITOR
JSAVE THE TOP OF THE MEM.
JAC1 = 1
JSAVE THE ACCUMULATOR PATTERN
JSAVE THE MEMORY BACK GROUND

JWRITE
JSKIP AFTER REACHING THE
JEND

JPREPARE TO WAIT FOR 2 MSEC
JAC0 = ACCUMULATOR PATTERN

JSEND A NULL CHARACTER
JWAIT FOR TTO DONE
JAC3 = JMP 00

JENABLE INTERRUPTS
JRETURN AFTER INTERRUPT TO
JTHE LOCATION AT 0
JREAD THE INTERRUPTING DEV.
JSKIP IF NOT TTO
JIGNORE TTO INTERRUPTS
JSKIP IF NOT A POWER FAIL
JINTERRUPT

JILLEGALLY INTERRUPTING DEV. #
JIORST

JPROGRAM WILL COME HERE IF

```

```

#005 MNPWR
01
02 00265 041024 THRU1
03 00266 000117 JSR @IMESS
04 00267 040764 ONPWR
05 00270 000200 JMP START
06
07 00271 010060 NXTAC: ISZ ACNUM
08 00272 024000 LDA 1,ACNUM
09 00273 034130 LDA 3,N3
10 00274 137404 AND 1,3,SZR
11
12 00275 000574 JMP CHKAC
13 00276 054066 STA 3,XDTA
14 00277 024062 LDA 1,ENDCNT
15 00300 125005 MOV 1,1,SNR
16 00301 000305 JMP CHKCR
17 00302 004351 JSR REPORT
18 00303 000617 JSR @IMESS
19 00304 000776 INCNT
20 00305 024007 CHKCR: LDA 1,ACCO
21 00306 127100 ADDL 1,1
22 00307 102500 SUBCL 0,0
23 00310 024077 LDA 1,SAVC
24 00311 122415 SUB# 1,0,SNR
25 00312 000317 JMP MEMCHK
26 00313 040066 STA 0,XDTA
27 00314 004351 JSR REPORT
28 00315 000617 JSR @IMESS
29 00316 001006 ASCRY
30 00317 030125 MEMCHK: LDA 2,ENDPR
31 00320 020061 LDA 0,BKGN0
32 00321 020000 LDA 1,0,2
33 00322 122415 SUB# 1,0,SNR
34 00323 000332 JMP NXTCL
35 00324 040066 STA 0,XDTA
36 00325 004351 JSR REPORT
37 00326 000617 JSR @IMESS
38 00327 001017 BU MEM
39 00330 145000 MOV 2,1
40 00331 000123 JSR @IZOCT
41 00332 151400 NXTCL: INC 2,2
42 00333 034065 LDA 3,TPMEM
43 00334 150053 AUCC# 2,3,SNC
44
45 00335 000320 JMP MEMCHK+1
46 00336 020061 LDA 0,BKGN0
47 00337 100000 COM 0,0
48
49
50 00340 061277 DUAC 0,CPU
51 00341 024067 LDA 1,ACCO
52 00342 135100 MOVL 1,3
53 00343 125100 MOVL 1,1
54 00344 125235 MOVZR# 1,1,SNR
55
56 00345 120121 ADCZL 1,1,SKP
57 00346 124234 COMZR# 1,1,SZR
58
59 00347 000222 JMP WRITE
60 00350 000221 JMP WRITE-1

```

THE POWER UP STARTS AT LOC 1

GET THE NEXT ACC. NUMBER  
IAC3 = 3  
SKIP AFTER CHECKING ALL OF  
THE ACCUMULATORS

ENDCNT SHOULD BE 0  
CHECK THE CARRY

IAC0 = EXPECTED CARRY  
CARRY FOUND

GET THE BACK GROUND WORD  
I READ  
I CHECK  
I CHECK THE NEXT MEM. CELL

SKIP AFTER CHECKING ALL THE  
LOCATIONS

NEXT TIME THE MEMORY WILL BE  
WRITTEN TO COMPLEMENTED BACK  
GROUND WORD  
I ORST

FLOAT THE 0 OR ONE  
DON'T SKIP AFTER FLOATING THE  
1 FOR 16 TIMES  
IAC1 = 177776  
SKIP AFTER FLOATING THE 0 FOR  
16 TIMES

#006 MNPWR

```

01
02 00351 054004 REPORT: STA 3,RTADD
03 00352 010063 ISZ RPRT
04 00353 000356 JMP .+3
05 00354 000117 JSR @IMESS
06 00355 000075 DFND
07 00356 000121 JSR @ICKLF
08 00357 000123 JSR @IZOCT
09 00360 000117 JSR @IMESS
10 00361 000073 SLASH
11 00362 024005 LDA 1,XDTA
12 00363 000123 JSR @IZOCT
13 00364 000064 JMP @RTADD

```

SAVE THE RETURN ADDRESS  
LOOK AT THE REPORT TAG  
I TYPE THE MESSAGE ONLY ONCE

PRINT THE DATA FOUND

PRINT THE EXPECTED DATA  
RETURN

```

10007 MNPWR
01      000440      .LOC      440
02
03 00440 104400 PWRUN: NEG      0,1
04 00441 044070      STA      1,ACC1
05 00442 034116      LDA      3,IFALT      FAC3 = ADDRESS OF FAULTY START
06                                          JROUTINE
07 00443 054001      STA      3,1
08 00444 115020      MOVZ     0,3
09 00445 177100      ADDL     3,3      JLOAD AC3 WITH A WORD PAT.
10 00446 054072      STA      3,ACC3
11 00447 010062      ISZ     ENDCNT
12 00450 000777      JMP      -1
13 00451 063077      HALT
14
15 00452 040073 PWRUP: STA      0,SAV0
16 00453 044074      STA      1,SAV1
17 00454 050075      STA      2,SAV2
18 00455 054076      STA      3,SAV3
19 00456 126500      SUBCL   1,1      JLOAD THE CARRY
20 00457 044077      STA      1,SAVC  JAND SAVE IT
21 00460 063477      SKPBN   CPU      JSKIP IF INTERRUPTS ARE
22                                          JENABLED
23 00461 000404      JMP      +4
24 00462 060277      INTUS
25 00463 006117      JSR     0,IMESS
26 00464 000755      ENINT
27 00465 120000      AUC     1,1
28 00466 044063      STA      1,RPRT  JSET REPORT TAG
29 00467 126400      SUB     1,1
30 00470 044060      STA      1,ACNUM
31 00471 034124 CHKAC: LDA      3,STACK
32 00472 137000      AUD     1,3
33 00473 025404      LDA      1,4,3
34
35 00474 021400      LDA      0,0,3
36
37 00475 122415      SUBW   1,0,SNR
38 00476 000271      JMP     NXTAC
39 00477 040066      STA      0,XDTA
40 00500 004351      JSR     REPORT
41 00501 024060      LDA      1,ACNUM
42 00502 006117      JSR     0,IMESS
43 00503 000773      ACUM
44 00504 006123      JSR
45 00505 000271      JMP     NXTAC

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10008 MNPWR
01
02
03      JFILENAME=TTYIO
04
05      JTELETYPE NON INTERRUPT PACKAGE
06      JCARRY,AC0,AC1,AC2 SAVED
07
08      J"MESS" PRINTS ASCII MESSAGES AS SPECIFIED BY ASSEMBLER
09
10      J"CRLF" PRINTS A CARRIAGE RETURN
11
12      J"POC?T" PRINTS C(1) IN OCTAL
13      J"ZOC?T" PRINTS C(1) IN OCTAL, LEADING ZEROS SUPPRESSED
14      J"PDE?C" PRINTS C(1) IN DECIMAL, LEADING ZEROS SUPPRESSED,
15      JTHE ABOVE THREE ARE FOLLOWED BY A TAB
16      J"PDC?S" PRINTS C(1) IN DECIMAL, LEADING ZEROS SUPPRESSED,
17      JFOLLOWED BY THE CHARACTER STORED AT CALLING LOCATION +1,
18      JPROGRAM RETURNS TO CALLING LOCATION +2.
19
20      J"TI?D" ACCEPTS OCTAL, AND
21      J"TI?D" ACCEPTS DECIMAL SINGLE PRECISION SIGNED INTEGERS
22      JINTO AC1 FROM THE TTI. LEADING NULLS, TABS,
23      JAND SPACES ARE IGNORED. A 16 BIT UNSIGNED INTEGER IS
24      JFORMED, THEN NEGATED IF A MINUS SIGN IS TYPED.
25      JEXIT AT CALL+1 IF INPUT ERROR WITH AC0=BAD CHARACTER,
26      J (NOT A LEGAL DIGIT OR TERMINATING CHARACTER)
27      JEXIT AT CALL+2 UPON TERMINATING CHARACTER
28      J WITH AC0=0, 0, 40, 12, 15, 55
29      J FOR NULL, SPACE, LINE-FEED, CARRIAGE RETURN, COMMA
30      JTHE ABOVE WAIT FOR TTY DONE, THEN TTY IS CLEARED,
31      JHUBOT WILL DELETE THE LAST DIGIT TYPED IN 'TI?D' AND
32      J'TI?D'
33
34      J"CHC?T" PRINTS ASCII CHARACTER IN C(0)R; C(0)L MUST BE 0.
35      JEXITS CALL +2 IF C(0)R=0; SIMULATES TAB
36
37      J"TY?E" PRINTS C(0)R TO THE TTY OR LPT OR BOTH AS PER THE
38      JSWITCH SELECTION REGISTER 'SWREG'.
39      JEXITS AT CALL+1. REPLACE "TY?E" WITH
40      J"INTERRUPT 'TY?E' IF DESIRED.
41
42      J"TPS?P" PRINTS A SPACE AND EXITS AT CALL+1 WITH AC0 = 40
43
44

```

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10009 MNPWR
01      )
02      )MES?S ROUTINE
03      )
04      )THE CALLING SEQUENCE IS:
05      )
06      )      JSR      #MES?S
07      )      POINTER TO MESSAGE TO BE PRINTED
08      )
09
10 00506 054100 MES?S: STA      3,RTN?A      )SAVE THE RTN ADDRESS
11 00507 004532      JSR      SAV?E          )SAVE THE STATE OF MACHINE
12 00510 034100      LDA      3,RTN?A      )
13 00511 010100      ISZ      RTN?A
14 00512 031400      LWA      2,0,3        )C(2) POINTS TO MESSAGE
15 00513 024415      LWA      1,P37?7      )A 8 BIT MASK
16 00514 021000 MES?M: LWA      0,0,2        )C(2)=DATA WORD
17 00515 125112      MOVLM  1,1,S4C
18 00516 123701      ANDS   1,0,SKP
19 00517 123401      AND    1,0,SKP
20 00520 131400      INC     2,2
21 00521 124000      COM     1,1
22 00522 004407      JSR     CMC?T
23 00523 000771      JMP     MES?M
24 00524 000402      JMP     .+2
25 00525 004404 PLS?T: JSR     CMC?T
26 00526 004521 PEX?T: JSR     RST?R
27 00527 002100      JMP     #RTN?A      )RESTORE THE STATE OF MACHINE
28

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10010 MNPWR
01      )
02      )CMC?T ROUTINE
03      )
04      )THE CALLING SEQUENCE IS:
05      )
06      )      LDA      0,CHARACTER TO BE PRINTED (RIGHT BYTE)
07      )      JSR      #ICMC?T
08      )
09
10 00530 000377 P37??: 377
11
12 00531 040113 CMC?T: STA      0,CAC?0      )SAVE ACB
13 00532 101315      MOVSH  0,0,SNR      )RETURN +2 IF NULL
14 00533 001401      JMP     1,3
15 00534 175100      MOVL   3,3          )FOR CARRY SAVE
16 00535 054112      STA      3,CHR?E      )PRINT C(0) RIGHT
17 00536 004517      JSR     TYP?E          )PRINT IT
18 00537 020113 CHE?X: LDA      0,CAC?0      )RESTORE ACB
19 00540 034112      LDA      3,C1R?E      )RESTORE CRY
20 00541 175200      MOVR  3,3
21 00542 001400      JMP     0,3
22
23 00543 000007 PC??: 7
24
25

```

10011 MNPWR

```
01 /
02 /CRLF ROUTINE
03 /
04 /THE CALLING SEQUENCE IS:
05 /
06 / JSR #ICRLF
07 /
08 /
09 /
10 00544 054100 CRLF: STA 3,RTN?A
11 00545 004474 JSR SAV?E
12 00546 020134 LDA 0,K15?
13 00547 004506 JSR TYP?E
14 00550 020133 LDA 0,K12?
15 00551 000754 JMP PLS?T
16 000133 K12?# PC1?2
17 000134 K15?# PC1?5
18 /
19 /
```

```
10 SAVE RETURN
11 SAVE THE WORLD
12 PRINT CARRIAGE AND LF
13 GO TO RESTORE THE WORLD
```

10012 MNPWR

```
01 /
02 /ZOC?T, POC?T, POC?S AND PDE?C ROUTINES.
03 /
04 /THE CALLING SEQUENCE IS:
05 /
06 / LDA 1,OCTAL NUMBER TO BE PRINTED
07 / (LEADING ZEROES SUPPRESSED)
08 / JSR #IZOC?T
09 /
10 /THE CALLING SEQUENCE IS:
11 /
12 / LDA 1,OCTAL NUMBER TO BE PRINTED
13 / (LEADING ZEROES NOT SUPPRESSED)
14 / JSR #IPOC?T
15 /
16 /THE CALLING SEQUENCE IS:
17 /
18 / LDA 1,DECIMAL NUMBER TO BE PRINTED
19 / (LEADING ZEROES SUPPRESSED)
20 / JSR #IPDE?C
21 /
22 /THE CALLING SEQUENCE IS:
23 /
24 / LDA 1,DECIMAL NUMBER TO BE PRINTED
25 / (LEADING ZEROES SUPPRESSED)
26 / JSR #IPDC?S
27 / ALPHA WHERE ALPHA IS THE CHARACTER PRINTED
28 / AFTER THE DECIMAL NUMBER
29 /
30 /
31 00552 054100 ZOC?T: STA 3,RTN?A
32 00553 004460 JSR SAV?E
33 00554 102400 SUB 0,0
34 00555 000404 JMP ZPO?T
35 00556 054100 POC?T: STA 3,RTN?A
36 00557 004462 JSR SAV?E
37 00560 020456 LDA 0,PC6?0
38 00561 152620 ZPO?T: SUBZR 2,2
39 00562 034455 LDA 3,PC1?0
40 00563 000416 JMP POC?I
41 00564 175400 POC?S: INC 3,3
42 00565 054100 STA 3,RTN?A
43 00566 004453 JSR SAV?E
44 00567 034100 LDA 3,RTN?A
45 00570 021777 LDA 0,-1,3
46 /
47 /
48 00571 040110 STA 0,PSP?
49 00572 102000 ADC 0,0
50 00573 000404 JMP POC?2
51 00574 054100 PDE?C: STA 3,RTN?A
52 00575 004444 JSR SAV?E
53 00576 102400 SUB 0,0
54 00577 034133 POC?2: LDA 3,K12?
55 00600 030440 LDA 2,DET?B
56 00601 040111 POC?I: STA 0,SPT?G
57 /
58 /
59 00602 101415 INC# 0,0,SNR
60 00603 101400 INC 0,0
```

```
10 SAVE THE RTN ADDRESS
11 SAVE THE WORLD
12 /
13 SAVE THE RTN ADDRESS
14 SAVE THE WORLD
15 /
16 PRINT C(1) IN OCTAL
17 C(2)=100000, C(3)=10
18 /
19 UPDATE THE RTN ADDR PNTR
20 /
21 SAVE THE WORLD
22 /
23 READ THE CHARACTER TO BE
24 PRINTED AFTER THE DECIMAL
25 NUMBER
26 /
27 SAVE THE SPECIAL CHAR.
28 ACW# =1
29 /
30 SAVE THE RTN ADDRESS
31 SAVE THE WORLD
32 /
33 C(3)=12
34 PRINT C(1) IN DECIMAL
35 INACTIVATE/DEACTIVATE THE TAG FOR
36 SPECIAL CHARACTER
37 BOTH ENTRIES PRINT NUMBER
38 SKIP IF ACW IS NOT =1
```

```

10013 MNPWR
01 00004 040107 STA 0,ZSU7P
02 00005 054114 STA 3,TMP?
03 00006 034107 DCO?T: LDA 3,ZSU7P
04 00007 102001 DEC?T: AUC 0,0,SKP
05 00010 146400 SUB 2,1
06 00011 101405 INC 0,0,SNR
07 00012 151235 MOVZRH 2,2,SNR
08 00013 034423 LDA 3,PC070
09 00014 140453 SUB0# 2,1,SNC
10 00015 000773 JMP -5
11 00016 054107 STA 3,ZSU7P
12
13 00017 163004 ADD 3,0,SZR
14 00020 004711 JSR CHC?T
15 00021 034114 LDA 3,TMP?
16 00022 102400 SUB 0,0
17 00023 172423 SUBZ 3,2,SNC
18
19 00024 000403 JMP +3
20 00025 101400 INC 0,0
21 00026 000775 JMP -3
22 00027 111004 MOV 0,2,SZR
23 00030 000756 JMP DCO?T
24 00031 034111 LDA 3,SPT?G
25 00032 020440 LDA 0,PC4?0
26 00033 175405 INC 3,3,SNR
27 00034 020110 LDA 0,PSP?
28 00035 000670 JMP PLS?T
29
30 00030 000000 PC6?0: 60
31 00037 000010 PC1?0: 10
32 00040 023420 DET?B: 10000.

```

```

)THEN TAB TO NEXT POSITION
)SAVE AC3
)ZEMOS SUPPRESS STUF
)SKIP FIRST TIME HERE PER DIGIT
)DIVIDE C(AC1) BY C(AC2)
)
)FOR ZERO SUPPRESS
)
)SUBTRACT MORE?
)YES,GO BACK
)NO,SAVE ZERO SUPPRESS FLAG
)C(0)=DIGIT
)MAKE ASCII
)PRINT
)RESTORE AC3
)
)DIVIDE C(AC2) BY C(AC3)
)
)SKIP IF AC3 > AC2
)AC3 < AC2
)SUBTRACT MORE
)WAS IT LAST DIGIT?
)NO,GET NEXT DIGIT
)YES,CHECK THE SPECIAL CHAR FLAG
)FOLLOW THE PRINTOUT WITH
)SPACE IF NOT SPCL CHAR FLAG
)OTHERWISE FOLLOW WITH THE CHAR
)TO EXIT

```

```

10014 MNPWR
01
02
03
04
05
06
07
08 00041 040102 SAV?E: STA 0,PAC?0
09 00042 044103 STA 1,PAC?1
10 00043 050104 STA 2,PAC?2
11 00044 101100 MOVL 0,0
12 00045 040101 STA 0,PCR?Y
13 00046 001400 JMP 0,3
14
15
16
17
18
19
20
21
22 00047 020101 RST?R: LDA 0,PCR?Y
23 00050 101200 MOVH 0,0
24 00051 020102 LDA 0,PAC?0
25 00052 024103 LDA 1,PAC?1
26 00053 030104 LDA 2,PAC?2
27 00054 001400 JMP 0,3
28

```



```

10015 MNPWR
01 00055 040115 TYP?E: STA 0,TAC?0
02 00056 175100 MOVL 3,3
03 00057 054106 STA 3,TYP?R
04 00060 034132 LDA 3,P17?7
05 00061 163400 AND 3,0
06 00062 061111 TTY?I: OQAS 0,TTO
07 00063 020115 LDA 0,TAC?0
08 00064 063511 SKPBZ TTO
09 00065 000777 JMP .-1
10 00066 060211 NIOC TTO
11 00067 034106 LDA 3,TYP?R
12 00070 175200 MUVR 3,3
13 00071 001400 JMP 0,3
14 00072 000040 PC4?0: 40
15
16

```

```

;SAVE AC0
;SAVE CRY AND RTN ADDR
;TYPE THE RIGHT BYTE OF AC0
;STRIP THE PARITY BIT
;
;RESTORE AC0
;
;CLEAR TTO DONE FLAG
;
;RETURN

```

```

10016 MNPWR
01 00073 120257 SLASH: .TXTE 1/ 1
02 00000 000000
03 00075 005215 DFND: .TXTE 1<15><12>FOUND / XPECTED!
04 147706
05 047125
06 120104
07 120257
08 050330
09 141705
10 142724
11 000104
12 00706 005215 PWR0F: .TXTE /<15><12>TURN THE KEY TO LOCK POSITION & TURN OF
13 052724
14 047322
15 152240
16 142510
17 045640
18 054705
19 152240
20 120317
21 147714
22 045703
23 050240
24 051717
25 152311
26 147711
27 120116
28 120246
29 052724
30 047322
31 147640
32 143306
33 152240
34 142510
35 050240
36 153717
37 151305
38 000000
39 00741 005215 ILIGL: .TXTE /<15><12>ILLEGAL INT. BY DEV /
40 146311
41 142714
42 040507
43 120314
44 047311
45 027324
46 041240
47 120131
48 142504
49 120126
50 000000
51 00755 005215 ENINT: .TXTE /<15><12>ENABLED INT. ON POWER UP/
52 047305
53 041101
54 142714
55 120104
56 047311
57 027324
58 147640
59 120116
60 147520

```

```

0017 MNPWR
01 142727
02 120322
03 050125
04 000000
05 000754 ONPWR= ENINT+7
06 00773 047311 ACUM: .TXTE /IN AC/
07 040640
08 000303
09 00776 047311 INCNT: .TXTE /IN THE COUNTER/
10 152240
11 142510
12 141640
13 052717
14 152116
15 151305
16 000000
17 01000 051501 ASCRY: .TXTE /AS THE CARRY BIT/
18 152240
19 142510
20 141640
21 151101
22 054722
23 041240
24 152311
25 000000
26 01017 152101 BDMEM: .TXTE /AT LOC. /
27 146240
28 141717
29 120056
30 000000
31 01024 005215 THRU1: .TXTE /<15><12>STARTED THRU LOC 1/
32 152123
33 151101
34 142724
35 120104
36 044324
37 052722
38 146240
39 141717
40 130640
41 000000
42
43 01037 000007 EGGS: .BLK 7
44 01046 047115 DIRT: .TXTE /MNPWR 00/
45 153520
46 120322
47 120240
48 030240
49 000000
50 01054 000000 0
51 01055 000200 START
52 01056 176773 176773
53 01057 177777 -1
54 01060 177777 -1
55 01061 177777 -1
56 01062 177777 -1
57 01063 000000 0
58
59
00 01064 047503 .TXT /COPYRIGHT (C) DGC, 1976

```

```

0018 MNPWR
01 054520
02 044522
03 044107
04 020124
05 041450
06 020051
07 043504
08 026103
09 030440
10 033471
11 01077 040406 ALL RIGHTS RESERVED./
12 046114
13 051040
14 043511
15 052110
16 020123
17 042522
18 042523
19 053122
20 042105
21 000056
22
23 .END
**00000 TOTAL ERRORS, 00000 PASS 1 ERRORS

```

0019 MNPWR

ACC0	000067	3/17	3/46	4/22	4/33	5/20	5/51		
ACC1	000070	3/18	7/04						
ACC2	000071	3/19	4/35						
ACC3	000072	3/20	7/10						
ACNUM	000060	3/09	5/07	5/08	7/30	7/41			
ACUM	000773	7/43	17/06						
ASCHY	001006	5/29	17/17						
BDMEM	001017	5/38	17/26						
BKGN0	000061	3/18	4/20	5/31	5/46				
CAC70	000113	3/37	10/12	10/18					
CHC71	000531	9/22	9/25	10/12	13/14				
CHE7X	000537	10/18							
CHKAC	000471	5/12	7/31						
CHKCR	000305	5/16	5/20						
CHR7E	000112	3/36	10/16	10/19					
CHR7Z	000105	3/31							
COUNT	000127		3/49	4/31					
CHL7F	000544	3/43	11/10						
DCO7T	000606	13/03	13/23						
DEC7T	000607	13/04							
DET7B	000640	12/55	13/32						
DFND	000675	6/06	16/03						
DIRT	001046	3/02	3/47	17/44					
EGGS	001037	3/05	17/43						
ENDCN	000062	3/11	4/32	5/14	7/11				
ENDPR	000125	3/47	4/04	4/25	5/30				
ENINT	000755	7/26	16/51	17/05					
FAULT	000264	3/40	4/60						
ICRLF	000121	3/43	6/07						
IEGGS	000645	3/05	4/17						
IFAIL	000116	3/40	7/05						
ILIGL	000741	4/55	16/39						
IMESS	000117	3/41	4/36	4/54	4/60	5/03	5/18	5/28	
		5/37	6/05	6/09	7/25	7/42			
INCNT	000776	5/19	17/09						
INST	000126	3/48	4/42						
IPOCT	000122	3/44							
IITYPE	000120	3/42							
IZOCT	000123	3/45	4/56	5/40	6/08	6/12	7/44		
K127	000133	11/14	11/16	12/54					
K157	000134	11/12	11/17						
MEMCH	000317	5/25	5/30	5/45					
MES7M	000514	9/16	9/23						
MES7S	000506	3/41	9/10						
N11	000131	3/51	4/44						
N3	000130	3/50	5/09						
NXTAC	000271	5/07	7/36	7/45					
NXTCL	000332	5/34	5/41						
ONPWR	000764	5/04	17/05						
P1777	000132	3/52	4/16	15/04					
P3777	000530	9/15	10/10						
PAC70	000102	3/28	14/08	14/24					
PAC71	000103	3/29	14/09	14/25					
PAC72	000104	3/30	14/10	14/26					
PC170	000637	12/39	13/31						
PC172	000133	3/53	11/16						
PC175	000134	3/54	11/17						
PC470	000672	13/25	15/14						
PC670	000630	12/37	13/08	13/30					

0020 MNPWR

PC77	000543	10/23							
PCR7Y	000101	3/27	14/12	14/22					
PUC71	000601	12/40	12/50						
PUC72	000577	12/50	12/54						
PUC7S	000564	12/41							
PUE7C	000574	12/51							
PEX7T	000526	9/26							
PLS7T	000525	9/25	11/15	13/20					
PUC7T	000556	3/44	12/35						
PS7T	000110	3/34	12/48	13/27					
PWRDN	000440	4/53	7/03						
PWRDF	000706	4/37	16/12						
PWRTS	000201	4/04	4/14						
PWRUP	000452	7/15							
REPOR	000351	2/20	2/31	2/54	5/17	5/27	5/36	6/02	
		7/40							
RPRT	000063	3/12	6/03	7/20					
RST7R	000647	9/26	14/22						
RTADD	000064	3/13	6/02	6/13					
RTN7A	000100	3/26	9/10	9/12	9/13	9/27	11/10	12/31	
		12/35	12/42	12/44	12/51				
SAV0	000073	3/21	7/15						
SAV1	000074	3/22	7/16						
SAV2	000075	3/23	7/17						
SAV3	000076	3/24	7/18						
SAVC	000077	3/25	5/23	7/20					
SAV7E	000041	9/11	11/11	12/32	12/36	12/43	12/52	14/00	
SLASH	000673	6/10	16/01						
SPT7G	000111	3/35	12/50	13/24					
STACK	000124	3/46	7/31						
START	000200	2/24	2/43	2/53	4/03	5/05	17/51		
TAC70	000115	3/39	15/01	15/07					
THRU1	001024	5/02	17/31						
THP7	000114	3/38	13/02	13/15					
TPHEM	000065	3/14	4/20	4/24	5/42				
TTOUT	000234	4/33	4/58						
TTY7	000662	15/06							
TYP7E	000655	3/42	10/17	11/13	15/01				
TYP7R	000106	3/32	15/03	15/11					
WITE	000222	2/14	4/22	5/59	5/60				
XOTA	000066	3/15	5/13	5/26	5/35	6/11	7/39		
ZOC7T	000561	3/45	12/31						
ZPO7T	000561	12/34	12/38						
ZSU7P	000107	3/33	13/01	13/03	13/11				