



DATA GENERAL
CORPORATION

Southboro,
Massachusetts 01772
(617) 485-9100

PROGRAM

Power Shut Down Test

TAPES

Binary: 095-000013

ABSTRACT

Power Shut Down Test is a maintenance routine designed to test retention of memory data upon loss of power. The routine also tests the Power Monitor Autorestart Option.

POWER SHUT DOWN TEST

- 11. ABSTRACT:
 - POWER SHUT DOWN TEST IS A MAINTENANCE PROGRAM DESIGNED TO TEST THE POWER MONITOR AND AUTORESTART OPTION. THE PROGRAM ALSO TEST FOR MEMORY RETENTION UPON POWER SHUT DOWN. IT IS TO BE USED WITH OR WITHOUT THE POWER MONITOR OPTION.
- 12. MACHINE REQUIREMENTS
 - 12.1 STANDRED NOVA PROCESSOR
 - 12.2 4K READ/WRITE MEMORY. (SEE 7. FOR 1-2K)
 - 12.3 OPTIONAL EQUIPMENT
 - 13.3.1 POWER MONITOR AUTORESTART OPTION
- 13. SWITCH SETTINGS
 - 13.1 STARTING ADDRESS =000002
 - 13.2 RESTART ADDRESS =000040
- 14. OPERATING PROCEEDURE/OPERATOR INPUT
 - 14.1 LOAD THE PROGRAM VIA THE BINARY LOADER.
 - 14.2 SET THE SWITCHES TO 000002
 - 14.3 PRESS START
 - 14.4 OPERATION WITHOUT THE POWER MONITOR.
 - 14.4.1 THE PROGRAM WILL REQUEST THE OPERATOR TO TURN THE COMPUTER OFF, ON, AND TO RESTART IT.
 - 14.4.2 UPON RESTART THE PROGRAM WILL TYPE: "NO INTERRUPT DETECTED ON POWER SHUT DOWN." THIS IS A NORMAL MESSAGE WITH-OUT A POWER MONITOR. THIS MESSAGE IS TYPED ONCE. SUBSEQUENT RESTARTS WILL NOT GIVE THE MESSAGE.
 - 14.4.3 THE OPERATOR SHOULD REPEATLY PERFORM THE POWER OFF-RESTART SEQUENCE. AFTER EACH RESTART ALLOW 2-3 SECONDS FOR A POSSIABLE ERROR MESSAGE.
 - 14.5 OPERATION WITH THE POWER MONITOR OPTION.
 - 14.5.1 THE PROGRAM WILL REQUEST THE OPERATOR TO TURN THE COMPUTER OFF, ON, AND TO RE-START IT.
 - 14.5.2 UPON RESTART THE PROGRAM WILL REQUEST THE OPERATOR TO LOCK THE CONSOLE AND REMOVE THE POWER.
 - 14.5.3 WHEN COMPUTER POWER IS RESTORED THE PROGRAM WILL BE RESTARTED WITHOUT OPERATOR INTERVENTION. NO ERROR MESS-AGES SHOULD BE TYPED.
 - 14.5.4 THE OPERATOR SHOULD REPEATLY REMOVE AND RESTORE POWER. AT EACH RESTORATION OF POWER ALLOW 2-3 SECONDS FOR POSSIABLE ERROR MESSAGES.

```

000001 .LOC 1
00001 000115 INTR
00002 000150 JMP STEP1
000040 .LOC 40
00040 034315 REST: LDA 3,CKSUM ;PERFORM A SUM CHECK
00041 030316 LDA 2,CKWC ;ON THE PROGRAM.
00042 020317 LDA 0,SUM
00043 025400 LDA 1,0,3
00044 123000 ADD 1,0
00045 151404 INC 2,2,SZR
00046 000043 JMP --3
00047 101004 MOV 0,0,SZR
00050 000066 JMP SUMER ;ERROR
00051 010320 ISZ NDF
00052 102401 SUB 0,0,SKP
00053 000321 JMP NODN ;NO DONE FLAG
00054 040320 STA 0,NDF
00055 020213 LDA 0,IFLAG ;RESTART HERE
00056 101005 MOV 0,0,SNR
00057 000073 JMP REST1
00060 010230 ISZ SUPTYP ;THIS MESSAGE ONLY ONCE.
00061 000165 JMP STEP2
00062 006214 JSR 0,ICRLF ;MESSAGE NO INTERRUPT.
00063 006215 JSR 0,IMESS ;PRINTER
00064 000513 NOINT
00065 000165 JMP STEP2
00066 006214 SUMER: JSR 0,ICRLF
00067 006215 JSR 0,IMESS
00070 000575 MSUM
00071 063077 HALT ;PROGRAM SUM CHECK
00072 000071 JMP --1

00073 020216 REST1: LDA 0,COUNT
00074 101005 MOV 0,0,SNR
00075 000101 JMP REST2
00076 006214 JSR 0,ICRLF ;DIDNOT RUN FOR 2MS
00077 006215 JSR 0,IMESS
00100 000455 MILLI

00101 020217 REST2: LDA 0,CNG ;SET LOC 0
00102 040000 STA 0,0 ;TO POINT AT ERROR.
00103 102000 ADC 0,0
00104 062077 MSKO 0
00105 020220 LDA 0,SAVC
00106 101100 MOVL 0,0
00107 020224 LDA 0,SAV0 ;RESTORE MACHINE STATE
00110 024221 LDA 1,SAV1
00111 030222 LDA 2,SAV2
00112 034223 LDA 3,SAV3
00113 060177 INTEN
00114 002225 JMP 0,SAVPC ;EXIT

```

```

00115 063677 INTR:  SKPDN CPU           ;A INTERRUPT!
00116 000140          JMP INTQ           ;BUT NOT POWER FAIL
00117 040224          STA 0,SAV0
00120 044221          STA 1,SAV1
00121 050222          STA 2,SAV2
00122 054223          STA 3,SAV3
00123 101200          MOVR 0,0
00124 040220          STA 0,SAVC
00125 020000          LDA 0,0
00126 040225          STA 0,SAVPC

00127 102400 INTR1:  SUB 0,0           ;SET A FLAG
00130 040213          STA 0,IFLAG       ;TO INDICATE INTERRUPTS.
00131 020226          LDA 0,CREST
00132 040000          STA 0,0           ;SETUP 0 FOR AUTO RESTART.
00133 020227          LDA 0,CONST
00134 040216          STA 0,COUNT
00135 010216          ISZ COUNT       ;COUNT FOR 2 MS.
00136 000135          JMP -1
00137 063077          HALT
00140 063611 INTQ:   SKPDN TTO           ;CHECK IF INTERRUPT IS
00141 063710          SKPDZ TTI           ;TTO OR TTI
00142 000202          JMP INTC
00143 102000          ADC 0,0
00144 040320          STA 0,NDF
00145 061477          INTA 0
00146 063077          HALT
00147 000146          JMP -1
00150 020217 STEP1:  LDA 0,CNG           ;START HERE
00151 040000          STA 0,0           ;SETUP FOR PHONEY RESTART
00152 040320          STA 0,NDF
00153 062677          IORST
00154 060177          INTEN
00155 102000          ADC 0,0
00156 062077          MSKO 0
00157 040230          STA 0,SUPTYP
00160 040213          STA 0,IFLAG       ;SET INTERRUPTED FLAG
00161 004251          JSR FILL
00162 006214          JSR @ICRLF
00163 006215          JSR @IMESS
00164 000412          ONOFF

00165 004232 STEP2:  JSR CHECK           ;CHECK THE ADDRESS PATTERN
00166 004251          JSR FILL           ;RETURN+2 IF NO ERROR
00167 020213          LDA 0,IFLAG
00170 024231          LDA 1,I2FLAG
00171 040231          STA 0,I2FLAG       ;ONE COMPLETE PASS OCCURED
00172 107014          ADD# 0,1,SER       ;AFTER POWER FAIL INTERRUPT.
00173 000165          JMP STEP2

00174 006214 STEP3:  JSR @ICRLF           ;REMOVE FROM WALL POWER.
00175 006215          JSR @IMESS
00176 000353          UNPLUG
00177 004232          JSR CHECK
00200 004251          JSR FILL
00201 000177          JMP -2

```

```

00202 060211 INTC:  NIOC TTO      ;IF INTERRUPT FROM
00203 060210      NIOC TTI      ;TTI/TTO FORGET IT.
00204 060177      INTEN
00205 002000      JMP 00

00206 006214 NG:    JSR 0ICRLF   ;A RESTART OCCURED
00207 006215      JSR 0IMESS   ;WITHOUT A INTERRUPT.
00210 000540      FUNNE
00211 063077      HALT
00212 000211      JMP .-1

```

```

00213 000000 IFLAG: 0
00214 000753 ICRLF: CRLF
00215 000624 IMESS: MESS
00216 000000 COUNT: 0
00217 000206 CNG:   JMP NG
00220 000000 SAVC:  0
00221 000000 SAV1:  0
00222 000000 SAV2:  0
00223 000000 SAV3:  0
00224 000000 SAV0:  0
00225 000000 SAVPC: 0
00226 000040 CREST: REST
00227 177400 CONST: 177400
00230 000000 SUPTYP: 0
00231 000000 I2FLAG: 0

```

```

00232 020303 CHECK:  LDA 0,FADR      ;CHECK CONTENTS OF MEMORY.
00233 030304      LDA 2,IADR
00234 054305      STA 3,CKRET
00235 126520      SUBZL 1,1
00236 044306      STA 1,ESWT
00237 025000 CK1:   LDA 1,0,2      ;WORD FROM MEMORY
00240 132414      SUB# 1,2,SZR
00241 004260      JSR CKEXX      ;ERROR
00242 151400      INC 2,2
00243 142414      SUB# 2,0,SZR
00244 000237      JMP CK1
00245 030306      LDA 2,ESWT      ;RETURN+2 IF NO ERR
00246 034305      LDA 3,CKRET
00247 157000      ADD 2,3
00250 001400      JMP 0,3

```

```

00251 020303 FILL:  LDA 0,FADR      ;WRITE THE ADDRESS PATTERN.
00252 030304      LDA 2,IADR
00253 051000      STA 2,0,2
00254 151400      INC 2,2
00255 112414      SUB# 0,2,SZR
00256 000253      JMP FILL+2
00257 001400      JMP 0,3

```

```

00260 040311 CKEXX: STA 0,ER0 ;ERROR PRINTER
00261 044312 STA 1,ER1
00262 050313 STA 2,ER2
00263 054314 STA 3,ER3
00264 006214 JSR @ICRLF
00265 006215 JSR @IMESS ;MESSAGE" C( "
00266 000406 CC
00267 024313 LDA 1,ER2 ;MEMORY ADDRESS
00270 006307 JSR @IZOCT
00271 006215 JSR @IMESS
00272 000410 CCX ;MESSAGE " )= "
00273 024312 LDA 1,ER1 ;MEMORY VALUE
00274 006310 JSR @IPOCT
00275 126400 SUB 1,1
00276 044306 STA 1,ESWT
00277 020311 LDA 0,ER0
00300 024312 LDA 1,ER1
00301 030313 LDA 2,ER2
00302 002314 JMP @ER3

```

```

00303 007600 FADR: 7600
00304 001000 IADR: 1000
00305 000000 CKRET: 0
00306 000000 ESWT: 0
00307 000641 IZOCT: ZOCT
00310 000643 IPOCT: POCT
00311 000000 ER0: 0
00312 000000 ER1: 0
00313 000000 ER2: 0
00314 000000 ER3: 0
00315 000232 CKSUM: CHECK
00316 177761 CKWC: -17
00317 012223 SUM: 12223
00320 000000 NDF: 0

```

```

00321 006214 NODN: JSR @ICRLF
00322 006215 JSR @IMESS
00323 000326 NODONE
00324 063077 HALT
00325 000324 JMP .-1

```

```

00326 020101 NODONE: .TXT !A
00327 047111 IN
00330 042524 TE
00331 051122 RR
00332 050125 UP
00333 020124 T
00334 052502 BU
00335 020124 T
00336 047516 NO
00337 050040 P
00340 053517 OW
00341 051105 ER
00342 043040 F
00343 044501 AI
00344 020114 L
00345 047504 DO
00346 042516 NE

```

00347 043040 F
00350 040514 LA
00351 020107 G
00352 000000 I

00353 047514 UNPLUG: .TXT !LO
00354 045503 CK
00355 041440 C
00356 047117 ON
00357 047523 SO
00360 042514 LE
00361 040440 A
00362 042116 ND
00363 050040 P
00364 046125 UL
00365 020114 L
00366 044124 TH
00367 020105 E
00370 046120 PL
00371 043525 UG
00372 020054 .
00373 044124 TH
00374 047105 EN
00375 051040 R
00376 051505 ES
00377 047524 TO
00400 042522 RE
00401 050040 P
00402 053517 OW
00403 051105 ER
00404 020056 .
00405 000000 !

00406 041440 CC: .TXT ! C
00407 000050 (!

00410 036451 CCX: .TXT !)=
00411 000040 !

00412 052524 ONOFF: .TXT !TU
00413 047122 RN
00414 052040 T
00415 042510 HE
00416 020040
00417 047503 CO
00420 050115 MP
00421 052125 UT
00422 051105 ER
00423 047440 O
00424 043106 FF
00425 020056 .
00426 052524 TU
00427 047122 RN
00430 052040 T
00431 042510 HE
00432 041440 C
00433 046517 OM
00434 052520 PU
00435 042524 TE

00436 020122 R
00437 047117 ON
00440 040440 A
00441 042116 ND
00442 051440 S
00443 040524 TA
00444 052122 RT
00445 040440 A
00446 020124 T
00447 047514 LO
00450 040503 CA
00451 044524 TI
00452 047117 ON
00453 032040 A
00454 000060 01

00455 044124 MILLI: .TXT ITH
00456 020105 E
00457 051120 PR
00460 041517 OC
00461 051505 ES
00462 047523 SO
00463 020122 R
00464 044504 DI
00465 020104 D
00466 047516 NO
00467 020124 T
00470 052522 RU
00471 020116 N
00472 047506 FO
00473 020122 R
00474 046462 2M
00475 020123 S
00476 043101 AF
00477 042524 TE
00500 020122 R
00501 044124 TH
00502 020105 E
00503 047520 PO
00504 042527 WE
00505 020122 R
00506 040506 FA
00507 046111 IL
00510 043040 F
00511 040514 LA
00512 000107 GI

00513 047516 NOINT: .TXT INO
00514 044440 I
00515 052116 NT
00516 051105 ER
00517 052522 RU
00520 052120 PT
00521 042040 D
00522 052105 ET
00523 041505 EC
00524 042524 TE
00525 020104 D
00526 047117 ON
00527 050040 P

00530 053517 OW
00531 051105 ER
00532 051440 S
00533 052510 HU
00534 020124 T
00535 047504 DO
00536 047127 WN
00537 000000 !

00540 044124 FUNNE: .TXT !TH
00541 020105 E
00542 040515 MA
00543 044103 CH
00544 047111 IN
00545 020105 E
00546 040527 WA
00547 020123 S
00550 042522 RE
00551 052123 ST
00552 051101 AR
00553 042524 TE
00554 020104 D
00555 044527 WI
00556 044124 TH
00557 052517 OU
00560 020124 T
00561 020101 A
00562 047520 PO
00563 042527 WE
00564 020122 R
00565 040506 FA
00566 046111 IL
00567 044440 I
00570 052116 NT
00571 051105 ER
00572 052522 RU
00573 052120 PT
00574 000056 .!

00575 051120 MSUM: .TXT IPR
00576 043517 OG
00577 040522 RA
00600 020115 M
00601 052523 SU
00602 020115 M
00603 044103 CH
00604 041505 EC
00605 027113 K.
00606 042440 E
00607 040530 XA
00610 044515 MI
00611 042516 NE
00612 052040 T
00613 042510 HE
00614 041440 C
00615 042510 HE
00616 045503 CK
00617 051040 R
00620 052517 OU
00621 044524 TI

```

;TTO NON INTERRUPT PACKAGE
;"MESS" PRINTS ASCII MESSAGES AS SPECIFIED BY ASSEMBLR
;"CHAR" PRINTS ASCII CHARACTER, C(0)R,C(0)L MUST BE 0
;WILL RETURN +2 IF C(0)R=0,CORRECTS THE PARITY,33 SIMUL
;"TYPE" PRINTS C(0)R. MUST HAVE PROPER PARITY. RETURN IS
;TO CALL+1.REPLACE THIS ROUTINE WITH INTERRUPT TYPE IF 0
;"CRLF" PRINTS A CARRIAGE RETURN
;"POCT" PRINTS C(1) IN OCTAL FOLLE\OWED BY A TAB
;"PDEC" PRINTS C(1) IN DECIMAL,LEAD\NG ZEROS SUPPRESSED,
;FOLLOWED BY A TAB.

```

```

00624 054552 MESS: STA 3,MESSR      ;PRINT A TEXT MESSAGE
00625 010551      ISZ MESSR
00626 031400      LDA 2,0,3      ;C(2) POINTS TO MESSAGE
00627 024546      LDA 1,C377     ;A 8 BIT MASK
00630 021000      LDA 0,0,2      ;C(2)=DATA WORD
00631 125112      MOVL# 1,1,5ZC
00632 123701      ANDS 1,0,SKP
00633 123401      AND 1,0,SKP   ;C(0)=DATA CHARACTER RIGHT
00634 151400      INC 2,2      ;INC TO NEXT WORD
00635 124000      COM 1,1      ;FLIP MASK
00636 004461      JSR CHAR      ;PRINT
00637 000771      JMP MESS+4    ;ANOTHER
00640 002536      JMP 0,MESSR    ;LAST

00641 020534 ZOCT: LDA 0,C377
00642 101001      MOV 0,0,SKP

00643 020531 POCT: LDA 0,C60
00644 030432      LDA 2,OCTAB    ;PRINT C(1) IN OCTAL
00645 000403      JMP +3
00646 030440 PDEC: LDA 2,DECTB   ;PRINT C(1) IN DECIMAL
00647 020523      LDA 0,CH240   ;SUPPRESS LEADING ZEROS
00650 054446      STA 3,RADRET   ;BOTH ENTRYS PRINT NUMBER
00651 040444      STA 0,ZSUPP    ;THEN TAB TO NEXT POSITION
00652 050401      STA 2,+.1
00653 000000 DECOCT: 0      ;A"LDA 2,TABLE" INSTRUCTION
00654 010777      ISZ -.1
00655 034441      LDA 3,RADRET   ;SETUP "TAB" AT END
00656 151005      MOV 2,2,SNR    ;IF TABLE ENTRY=0
00657 001400      JMP 0,3        ;EXIT WITH TAB
00660 034435      LDA 3,ZSUPP    ;ZEROS SUPPRESS STUF
00661 102400      SUB 0,0
00662 146512 DECOT: SUBL# 2,1,5ZC
00663 000405      JMP DECP
00664 146400      SUB 2,1      ;FORM THE DIGIT
00665 034507      LDA 3,C60
00666 101400      INC 0,0
00667 000773      JMP DECOT
00670 151235 DECP: MOVZR# 2,2,SNR
00671 034503      LDA 3,C60
00672 054423      STA 3,ZSUPP    ;C(0)=DIGIT
00673 163000      ADD 3,0        ;MAKE ASCII
00674 004423      JSR CHAR      ;PRINT
00675 000756      JMP DECOCT   ;GET NEXT DIGIT

```

```

00676 030424 OCTAB: LDA 2, .+1+.-DECOCT
00677 100000      100000
00700 010000      10000
00701 001000      1000
00702 000100      100
00703 000010      10
00704 000001      1
00705 000000      0

```

```

00706 030434 DECTB: LDA 2, .+1+.-DECOCT
      000012 .RDX 10
00707 023420      10000
00710 001750      1000
00711 000144      100
00712 000012      10
00713 000001      1
00714 000000      0
      000010 .RDX 8

```

```

00715 000000 ZSUPP: 0
00716 000000 RADRET: 0

```

```

00717 054447 CHAR: STA 3, CHRET      ;PRINT C(0) RIGHT
00720 101325      MOVES 0,0,SNR      ;RETURN +2 IF NULL
00721 001401      JMP 1,3
00722 040445      STA 0, CHSAV
00723 176000      ADC 3,3      ;COMPUTE THE PARITY
00724 117000      ADD 0,3
00725 163404      AND 3,0, SZR
00726 000775      JMP .-3
00727 176660      SUBCR 3,3      ;COMBIND PARITY WITH CHAR
00730 020437      LDA 0, CHSAV
00731 163300      ADDS 3,0

```

```

00732 034433 CHARI: LDA 3, CHTAB      ;IS THIS A TAB
00733 116405      SUB 0,3,SNR
00734 000403      JMP .+3      ;YES
00735 004411      JSR TYPE      ;NO PRINT IT
00736 002430      JMP @CHRET      ;EXIT

```

```

00737 020431      LDA 0, CHORZ      ;SIMULATE A TAB
00740 034431      LDA 3, CHAR7      ;VIA 1 TO 8 SPACES
00741 117405      AND 0,3,SNR
00742 002424      JMP @CHRET
00743 020427      LDA 0, CH240
00744 004402      JSR TYPE
00745 000772      JMP .-6

```

```

00746 010422 TYPE: ISZ CHORZ      ;INC HORIZONTAL POSITIONION
00747 063511      SKPBZ TTO      ;TAIT IF TTO BUSY
00750 000777      JMP 0,-1
00751 061111      DOAS 0,TTO     ;SEND CHAR
00752 001400      JMP 0,3       ;EXIT

```

```

00753 054420 CRLF: STA 3,CRLFR   ;SAVE RETURN
00754 020410      LDA 0,C215
00755 004742      JSR CHAR      ;PRINT CARRIAGE AND LF
00756 020405      LDA 0,C212
00757 004740      JSR CHAR
00760 102400      SUB 0,0
00761 040407      STA 0,CHORZ   ;CLEAR HORZ POSITIONION
00762 002411      JMP 0CRLFR   ;EXIT

```

```

00763 000212 C212: 212
00764 000215 C215: 215
00765 000011 CHTAB: 11
00766 000000 CHRET: 0
00767 000000 CHSAV: 0
00770 000000 CHORZ: 0
00771 000007 CHAR7: 7
00772 000240 CH240: 240
00773 000000 CRLFR: 0
00774 000060 C60: 60

```

```

00775 000377 C377: 377
00776 000000 MESSR: 0

```

.END