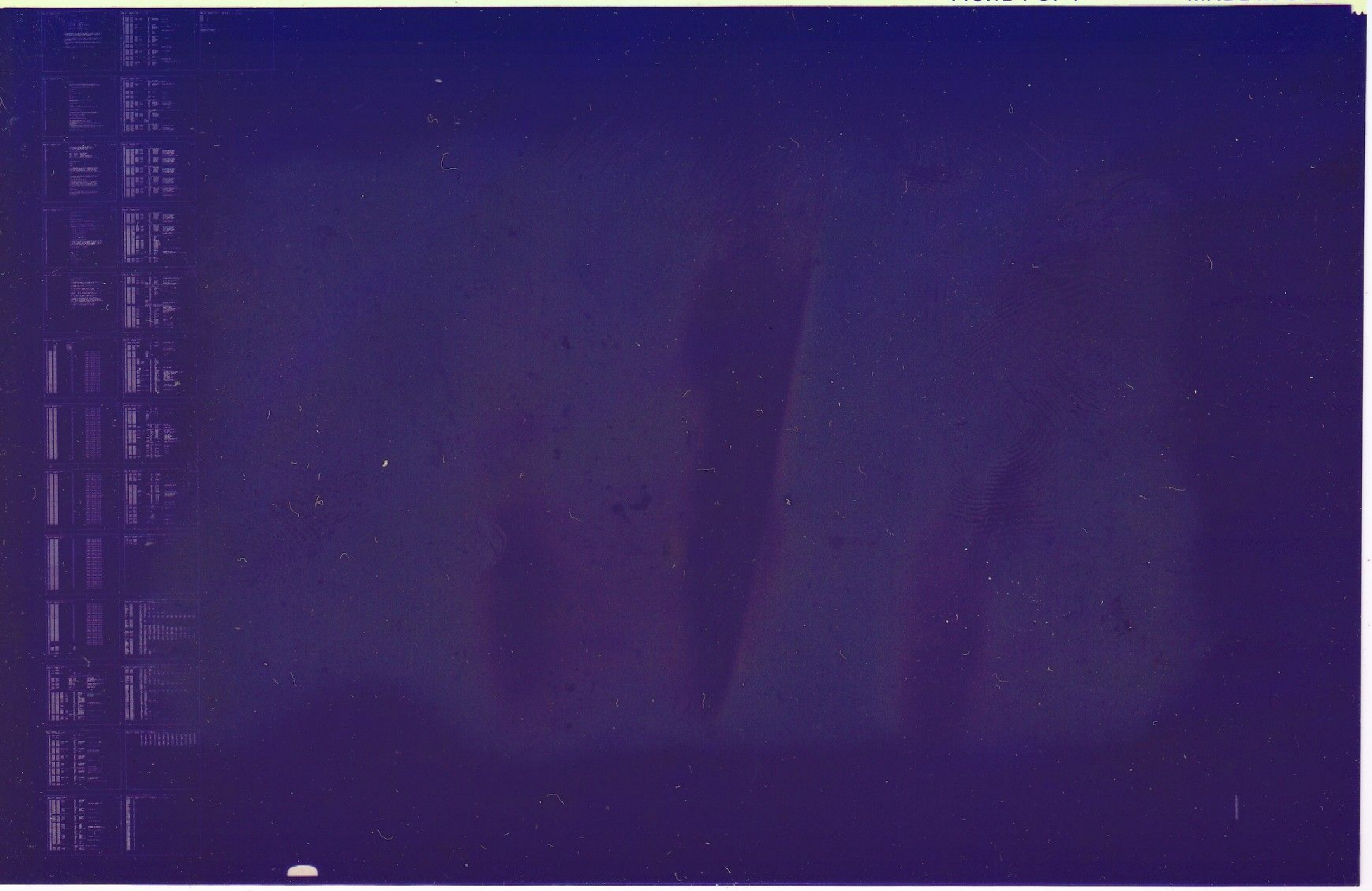
DR11A

DR11A DEV REG TST
CZDRIB0

AH-8669B-MC

FICHE 1 OF 1

SEP 1979
digital
MADE IN USA



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                        .REM  %



                              IDENTIFICATION

                        PRODUCT CODE:    AC-8668B-MC
                        PRODUCT NAME:    CZDRIB0 DR11A DEV REG TEST
                        DATE:            MARCH 1979
                        MAINTAINER:      DIAGNOSTIC GROUP


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                        1.      ABSTRACT

                                THIS IS A LOGIC TEST OF THE DR11A.  FOR THIS TEST
                                TO OPERATE A SPECIAL MAINTENANCE MODULE MUST BE CONNECTED
                                (M980).  THIS TEST WILL CHECK UP TO 32 SEQUENTIAL DR11A'S.

                                THIS PROGRAM HAS BEEN RENAMED FROM D8L TO DZDRI.

                        2.      REQUIREMENTS

                        2.1     EQUIPMENT

                                PDP-11 STANDARD COMPUTER

                                DR11A

                                M980 FOR EACH DR11A

                        2.2     STORAGE

                        2.2.1   PROGRAM STORAGE - THE ROUTINE USES MEMORY
                                FROM 0000 TO 5000.

                        3.      LOADING PROCEDURE

                        3.1     METHOD

                                PROCEDURE FOR NORMAL BINARY TAPES SHOULD BE FOLLOWED.

                        4.      STARTING PROCEDURE

                        4.1     CONTROL SWITCH SETTING

                                STARTING AT SA 200 ALL SWITCHES SHOULD BE DOWN OR ZERO.
                                (IF NOT ZERO, BIT 0 TO 8 WILL BE STARTING VECTOR.)

                        4.2     STARTING ADDRESS OR ADDRESSES

                                (A)  200 = START OF TEST

                        4.3     PROGRAM AND/OR OPERATOR ACTION

                                LOAD PROGRAM INTO MEMORY.
                                SET SWITCH REGISTER TO STARTING ADDRESS.
                                LOAD ADDRESS.
                                SET SWITCH REGISTER EQUAL TO FIRST DR11A INTERRUPT VECTOR.
                                PRESS START.
                                THE PROGRAM WILL STAY IN SECTION AND LOOP.
                                IF SWITCH REGISTER EQUALS ZERO, 300 IS SELECTED AS THE VECTOR.
                                ON A RESTART, THE PREVIOUSLY SELECTED VECTOR WILL BE USED.

                        5.      OPERATING PROCEDURE

                        5.1     OPERATIONAL SWITCH SETTINGS
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                                5.1.1   AT SA 200..THE INSTRUCTION AND LOGIC TEST.
                                        WITH ALL SWITCHES DOWN THE PROGRAM WILL PRINT
                                        OUT ON ERRORS AND CONTINUE IN TEST. (BELL
                                        WILL RING AT COMPLETION OF A PASS)

                                5.1.2   SWITCH SETTINGS ARE

                                        SW15 = 1 OR UP ... HALT ON ERROR
                                        SW14 = 1 OR UP ... SCOPE LOOP
                                        SW13 = 1 OR UP ... INHIBIT PRINTOUT
                                        SW12 = 1 OR UP ... INHIBIT TRACE TRAPPING
                                        SW11 = 1 OR UP ... INHIBIT ITERATION LOOP
                                        SW8 TO 0 WILL BE USED AS VECTOR ADDRESS IF NOT ZERO.

                                5.1.3

                                5.2     SUBROUTINE ABSTRACTS

                                5.2.1   BEGIN SA 200

                                5.2.2   SCOPE
                                        -----

                                        THIS SUBROUTINE CALL IS PLACED BETWEEN EACH SUBTEST
                                        IN THE INSTRUCTION SECTION.  IT RECORDS THE STARTING
                                        ADDRESS OF EACH SUB-TEST AS IT IS BEING ENTERED.
                                        IF A SCOPE LOOP IS REQUESTED, IT WILL JUMP TO THE
                                        START OF THE SUBTEST THAT THE SCOPE LOOP IS REQUESTED FOR.

                                5.2.3   HALT
                                        ----

                                        IS A ROUTINE THAT PRINTS-OUT AN ADDRESS THAT TAGS
                                        THE FAILING SUBTEST, AND THE INCORRECT DATA AT THE
                                        TIME OF THE FAILURE.

                                5.3     PROGRAM AND/OR OPERATOR ACTION

                                5.3.1   LOADING AND STARTING AT 200 WITH ALL SWITCHES DOWN
                                        IS THE INSTRUCTION AND LOGIC TEST.  IF AN ERROR
                                        IS DETECTED HERE, THERE WILL BE A PRINTOUT.  WHEN
                                        AN ERROR IS DETECTED AND IT IS NECESSARY TO SCOPE
                                        ON IT, PLACE SW15 UP TO HALT ON ERROR, THEN SW14
                                        UP TO LOOP ON ERROR, THEN SW13 UP TO DELETE PRINTOUTS.

                                6.      ERRORS

                                6.1     ERROR PRINTOUT

                                        ARE IN A FOUR WORD FORMAT.  THE 1ST IS THE PC+2 OF
                                        THE DETECTED ERROR.  THE 2ND IS THE PROCESSOR STATUS
                                        REGISTER.  THE 3RD IS DEVICE ADDRESS.  THE 4TH IS
                                        VECTOR ADDRESS.

                                6.2     ERROR RECOVERY
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                                        DEPRESS CONTINUE TO RESTART SECTION

                                7.      RESTRICTIONS

                                7.1     STARTING RESTRICTION

                                        NONE

                                7.2     OPERATIONAL RESTRICTION

                                        THE DR11A MUST HAVE THE M980 MAINTENANCE MODULE TO RUN
                                        THIS TEST.

                                        NOTE THAT THE DR11A HAS FLOATING VECTORS:

                                        THE BELOW IS THE ASSIGNMENT OF FLOATING VECTORS, THE ASSIGNED
                                        SEQUENCES ARE:

                                        1.  STARTING AT 300 ALL DC11'S WILL BE ASSIGNED.

                                        2.  THEN ANY KL11 CALLED FOR (VT05, VT06, LC11)

                                        3.  THEN ANY DP11 CALLED FOR.

                                        4.  THEN ANY DM11 CALLED FOR.

                                        5.  THEN ANY DN11 CALLED FOR.

                                        6.  THEN ANY DM11BB CALLED FOR.

                                        7.  THEN ANY DR11A CALLED FOR.

                                        THE DR11A DEVICE ADDRESS WILL BE ASSIGNED IN THE USER AREA
                                        OF 767776 TO 764000.  THE ASSIGNMENT OF ADDRESS WILL START
                                        AT THE HIGH ADDRESS LIMIT AND PROCEED DOWNWARD.  USERS AND
                                        SPECIAL SYSTEMS SHOULD START THEIR ASSIGNMENT OF SPECIAL
                                        DEVICES AT THE LOW ADDRESS LIMIT AND WORK UP.

                                        767776 TO 767770        DR11A #0
                                        767766 TO 767760        DR11A #1
                                              .
                                              .
                                              .
                                        767706 TO 767700        DR11A #7
                                              .
                                              .
                                              .
                                        767606 TO 767600        DR11A #15

                                8.      MISCELLANEOUS

                                8.1     EXECUTION TIME

                                        FOR EACH DR11A ABOUT 2 MINUTES

                                8.2     UNTESTED LOGIC
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                        THERE ARE TWO FUNCTIONS NOT TESTED.

                9.      PROGRAM DESCRIPTION

                        THIS PROGRAM WHEN STARTED AT 200 CHECKS THE SWITCH
                        REGISTER FOR ALL ZEROS, IF NOT ZEROS THE BITS 0-8 ARE USED
                        AS THE FIRST VECTOR ADDRESS OF THE DR11A'S.

                        THE PROGRAM THEN PERFORMS AN INCREMENTAL LOGIC CHECK FOR
                        THE SELECTED DR11A.

                        THE DATA REGISTER IS TESTED TO SEE IF "RESET" CLEARS IT.
                        IF IT WILL HOLD ALL COMBINATIONS OF NUMBERS.

                        THE READ/WRITE BITS OF THE STATUS REGISTER ARE ALSO TESTED.

                        BOTH THE "A" AND "B" INTERRUPTS ARE TESTED TO SEE IF THEY
                        INTERRUPT AT THE CORRECT BUS REQUEST LEVEL BR-5.

                        ONE FULL TEST OF THE DR11A IS MADE WITH THE T BIT OFF.
                        THE SECOND PASS IS MADE WITH THE T BIT ON.

                        AT THE END OF THE SECOND PASS THE DEVICE ADDRESS IS
                        INCREMENTED BY 10, AND THE VECTOR POINTER IS DECREMENTED
                        BY 10.  THEN A TEST IS MADE TO SEE IF THERE ARE ANY MORE
                        DR11A'S AND THE PROGRAM WILL RESTART AND RESET THE VECTOR
                        AND ADDRESS FOR RETESTING THE SERIES OF DK11A.

                        IF A POWER FAIL OCCURS THE PROGRAM WILL REPORT IT
                        AND RESTART AT THE BEGINNING OF THE PROGRAM.

               10.      LISTING

               11.      FLOW CHART(S)

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                                ;GENERAL REGISTER LOGIC TEST

                    177776      STATUS=177776
                    000240      NOP=240
                    104400      SCOPE=104400
                    104000      HLT=104000
                    177776      CC=STATUS
                    177570      SR=177570
                    167770      CSR=167770
000000  000002                      .+2
000002  000000                      HALT                ;TRAPPED TO PREVIOUS LOCATION
000004  000006                      .+2
000006  000000                      HALT                ;TRAPPED TO PREVIOUS LOCATION
000010  000012                      .+2
000012  000000                      HALT                ;TRAPPED TO PREVIOUS LOCATION
000014  000016                      .+2
000016  000000                      HALT                ;TRAPPED TO PREVIOUS LOCATION
000020  000022                      .+2
000022  000000                      HALT                ;TRAPPED TO PREVIOUS LOCATION
000024  000026                      .+2
000026  000000                      HALT                ;TRAPPED TO PREVIOUS LOCATION
000030  000032                      .+2
000032  000000                      HALT                ;TRAPPED TO PREVIOUS LOCATION
000034  000036                      .+2
000036  000000                      HALT                ;TRAPPED TO PREVIOUS LOCATION
000040  000042                      .+2
000042  000000                      HALT                ;TRAPPED TO PREVIOUS LOCATION
000044  000046                      .+2
000046  000000                      HALT                ;TRAPPED TO PREVIOUS LOCATION
000050  000052                      .+2
000052  000000                      HALT                ;TRAPPED TO PREVIOUS LOCATION
000054  000056                      .+2
000056  000000                      HALT                ;TRAPPED TO PREVIOUS LOCATION
000060  000062                      .+2
000062  000000                      HALT                ;TRAPPED TO PREVIOUS LOCATION
000064  000066                      .+2
000066  000000                      HALT                ;TRAPPED TO PREVIOUS LOCATION
000070  000072                      .+2
000072  000000                      HALT                ;TRAPPED TO PREVIOUS LOCATION
000074  000076                      .+2
000076  000000                      HALT                ;TRAPPED TO PREVIOUS LOCATION
000100  000102                      .+2
000102  000000                      HALT                ;TRAPPED TO PREVIOUS LOCATION
000104  000106                      .+2
000106  000000                      HALT                ;TRAPPED TO PREVIOUS LOCATION
000110  000112                      .+2
000112  000000                      HALT                ;TRAPPED TO PREVIOUS LOCATION
000114  000116                      .+2
000116  000000                      HALT                ;TRAPPED TO PREVIOUS LOCATION
000120  000122                      .+2
000122  000000                      HALT                ;TRAPPED TO PREVIOUS LOCATION
000124  000126                      .+2
000126  000000                      HALT                ;TRAPPED TO PREVIOUS LOCATION
000130  000132                      .+2
000132  000000                      HALT                ;TRAPPED TO PREVIOUS LOCATION
000134  000136                      .+2
```

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   298  000136  000000                    HALT                ;TRAPPED TO PREVIOUS LOCATION
   299  000140  000142                    .+2
   300  000142  000000                    HALT                ;TRAPPED TO PREVIOUS LOCATION
   301  000144  000146                    .+2
   302  000146  000000                    HALT                ;TRAPPED TO PREVIOUS LOCATION
   303  000150  000152                    .+2
   304  000152  000000                    HALT                ;TRAPPED TO PREVIOUS LOCATION
   305  000154  000156                    .+2
   306  000156  000000                    HALT                ;TRAPPED TO PREVIOUS LOCATION
   307  000160  000162                    .+2
   308  000162  000000                    HALT                ;TRAPPED TO PREVIOUS LOCATION
   309  000164  000166                    .+2
   310  000166  000000                    HALT                ;TRAPPED TO PREVIOUS LOCATION
   311  000170  000172                    .+2
   312  000172  000000                    HALT                ;TRAPPED TO PREVIOUS LOCATION
   313  000174  000176                    .+2
   314  000176  000000                    HALT                ;TRAPPED TO PREVIOUS LOCATION
   315  000200  000202                    .+2
   316  000202  000000                    HALT                ;TRAPPED TO PREVIOUS LOCATION
   317  000204  000206                    .+2
   318  000206  000000                    HALT                ;TRAPPED TO PREVIOUS LOCATION
   319  000210  000212                    .+2
   320  000212  000000                    HALT                ;TRAPPED TO PREVIOUS LOCATION
   321  000214  000216                    .+2
   322  000216  000000                    HALT                ;TRAPPED TO PREVIOUS LOCATION
   323  000220  000222                    .+2
   324  000222  000000                    HALT                ;TRAPPED TO PREVIOUS LOCATION
   325  000224  000226                    .+2
   326  000226  000000                    HALT                ;TRAPPED TO PREVIOUS LOCATION
   327  000230  000232                    .+2
   328  000232  000000                    HALT                ;TRAPPED TO PREVIOUS LOCATION
   329  000234  000236                    .+2
   330  000236  000000                    HALT                ;TRAPPED TO PREVIOUS LOCATION
   331  000240  000242                    .+2
   332  000242  000000                    HALT                ;TRAPPED TO PREVIOUS LOCATION
   333  000244  000246                    .+2
   334  000246  000000                    HALT                ;TRAPPED TO PREVIOUS LOCATION
   335  000250  000252                    .+2
   336  000252  000000                    HALT                ;TRAPPED TO PREVIOUS LOCATION
   337  000254  000256                    .+2
   338  000256  000000                    HALT                ;TRAPPED TO PREVIOUS LOCATION
   339  000260  000262                    .+2
   340  000262  000000                    HALT                ;TRAPPED TO PREVIOUS LOCATION
   341  000264  000266                    .+2
   342  000266  000000                    HALT                ;TRAPPED TO PREVIOUS LOCATION
   343  000270  000272                    .+2
   344  000272  000000                    HALT                ;TRAPPED TO PREVIOUS LOCATION
   345  000274  000276                    .+2
   346  000276  000000                    HALT                ;TRAPPED TO PREVIOUS LOCATION
   347  000300  000302                    .+2
   348  000302  000000                    HALT                ;TRAPPED TO PREVIOUS LOCATION
   349  000304  000306                    .+2
   350  000306  000000                    HALT                ;TRAPPED TO PREVIOUS LOCATION
   351  000310  000312                    .+2
   352  000312  000000                    HALT                ;TRAPPED TO PREVIOUS LOCATION
   353  000314  000316                    .+2
```

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  354  000316  000000                HALT                ;TRAPPED TO PREVIOUS LOCATION
  355  000320  000322                .+2
  356  000322  000000                HALT                ;TRAPPED TO PREVIOUS LOCATION
  357  000324  000326                .+2
  358  000326  000000                HALT                ;TRAPPED TO PREVIOUS LOCATION
  359  000330  000332                .+2
  360  000332  000000                HALT                ;TRAPPED TO PREVIOUS LOCATION
  361  000334  000336                .+2
  362  000336  000000                HALT                ;TRAPPED TO PREVIOUS LOCATION
  363  000340  000342                .+2
  364  000342  000000                HALT                ;TRAPPED TO PREVIOUS LOCATION
  365  000344  000346                .+2
  366  000346  000000                HALT                ;TRAPPED TO PREVIOUS LOCATION
  367  000350  000352                .+2
  368  000352  000000                HALT                ;TRAPPED TO PREVIOUS LOCATION
  369  000354  000356                .+2
  370  000356  000000                HALT                ;TRAPPED TO PREVIOUS LOCATION
  371  000360  000362                .+2
  372  000362  000000                HALT                ;TRAPPED TO PREVIOUS LOCATION
  373  000364  000366                .+2
  374  000366  000000                HALT                ;TRAPPED TO PREVIOUS LOCATION
  375  000370  000372                .+2
  376  000372  000000                HALT                ;TRAPPED TO PREVIOUS LOCATION
  377  000374  000376                .+2
  378  000376  000000                HALT                ;TRAPPED TO PREVIOUS LOCATION
  379  000400  000402                .+2
  380  000402  000000                HALT                ;TRAPPED TO PREVIOUS LOCATION
  381  000404  000406                .+2
  382  000406  000000                HALT                ;TRAPPED TO PREVIOUS LOCATION
  383  000410  000412                .+2
  384  000412  000000                HALT                ;TRAPPED TO PREVIOUS LOCATION
  385  000414  000416                .+2
  386  000416  000000                HALT                ;TRAPPED TO PREVIOUS LOCATION
  387  000420  000422                .+2
  388  000422  000000                HALT                ;TRAPPED TO PREVIOUS LOCATION
  389  000424  000426                .+2
  390  000426  000000                HALT                ;TRAPPED TO PREVIOUS LOCATION
  391  000430  000432                .+2
  392  000432  000000                HALT                ;TRAPPED TO PREVIOUS LOCATION
  393  000434  000436                .+2
  394  000436  000000                HALT                ;TRAPPED TO PREVIOUS LOCATION
  395  000440  000442                .+2
  396  000442  000000                HALT                ;TRAPPED TO PREVIOUS LOCATION
  397  000444  000446                .+2
  398  000446  000000                HALT                ;TRAPPED TO PREVIOUS LOCATION
  399  000450  000452                .+2
  400  000452  000000                HALT                ;TRAPPED TO PREVIOUS LOCATION
  401  000454  000456                .+2
  402  000456  000000                HALT                ;TRAPPED TO PREVIOUS LOCATION
  403  000460  000462                .+2
  404  000462  000000                HALT                ;TRAPPED TO PREVIOUS LOCATION
  405  000464  000466                .+2
  406  000466  000000                HALT                ;TRAPPED TO PREVIOUS LOCATION
  407  000470  000472                .+2
  408  000472  000000                HALT                ;TRAPPED TO PREVIOUS LOCATION
  409  000474  000476                .+2
```

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  410  000476  000000                HALT            ;TRAPPED TO PREVIOUS LOCATION
  411  000500  000502                .+2
  412  000502  000000                HALT            ;TRAPPED TO PREVIOUS LOCATION
  413  000504  000506                .+2
  414  000506  000000                HALT            ;TRAPPED TO PREVIOUS LOCATION
  415  000510  000512                .+2
  416  000512  000000                HALT            ;TRAPPED TO PREVIOUS LOCATION
  417  000514  000516                .+2
  418  000516  000000                HALT            ;TRAPPED TO PREVIOUS LOCATION
  419  000520  000522                .+2
  420  000522  000000                HALT            ;TRAPPED TO PREVIOUS LOCATION
  421  000524  000526                .+2
  422  000526  000000                HALT            ;TRAPPED TO PREVIOUS LOCATION
  423  000530  000532                .+2
  424  000532  000000                HALT            ;TRAPPED TO PREVIOUS LOCATION
  425  000534  000536                .+2
  426  000536  000000                HALT            ;TRAPPED TO PREVIOUS LOCATION
  427  000540  000542                .+2
  428  000542  000000                HALT            ;TRAPPED TO PREVIOUS LOCATION
  429  000544  000546                .+2
  430  000546  000000                HALT            ;TRAPPED TO PREVIOUS LOCATION
  431  000550  000552                .+2
  432  000552  000000                HALT            ;TRAPPED TO PREVIOUS LOCATION
  433  000554  000556                .+2
  434  000556  000000                HALT            ;TRAPPED TO PREVIOUS LOCATION
  435  000560  000562                .+2
  436  000562  000000                HALT            ;TRAPPED TO PREVIOUS LOCATION
  437  000564  000566                .+2
  438  000566  000000                HALT            ;TRAPPED TO PREVIOUS LOCATION
  439  000570  000572                .+2
  440  000572  000000                HALT            ;TRAPPED TO PREVIOUS LOCATION
  441  000574  000576                .+2
  442  000576  000000                HALT            ;TRAPPED TO PREVIOUS LOCATION
  443  000600  000602                .+2
  444  000602  000000                HALT            ;TRAPPED TO PREVIOUS LOCATION
  445  000604  000606                .+2
  446  000606  000000                HALT            ;TRAPPED TO PREVIOUS LOCATION
  447  000610  000612                .+2
  448  000612  000000                HALT            ;TRAPPED TO PREVIOUS LOCATION
  449  000614  000616                .+2
  450  000616  000000                HALT            ;TRAPPED TO PREVIOUS LOCATION
  451  000620  000622                .+2
  452  000622  000000                HALT            ;TRAPPED TO PREVIOUS LOCATION
  453  000624  000626                .+2
  454  000626  000000                HALT            ;TRAPPED TO PREVIOUS LOCATION
  455  000630  000632                .+2
  456  000632  000000                HALT            ;TRAPPED TO PREVIOUS LOCATION
  457  000634  000636                .+2
  458  000636  000000                HALT            ;TRAPPED TO PREVIOUS LOCATION
  459  000640  000642                .+2
  460  000642  000000                HALT            ;TRAPPED TO PREVIOUS LOCATION
  461  000644  000646                .+2
  462  000646  000000                HALT            ;TRAPPED TO PREVIOUS LOCATION
  463  000650  000652                .+2
  464  000652  000000                HALT            ;TRAPPED TO PREVIOUS LOCATION
  465  000654  000656                .+2
```

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  466  000656  000000                    HALT            ;TRAPPED TO PREVIOUS LOCATION
  467  000660  000662                    .+2
  468  000662  000000                    HALT            ;TRAPPED TO PREVIOUS LOCATION
  469  000664  000666                    .+2
  470  000666  000000                    HALT            ;TRAPPED TO PREVIOUS LOCATION
  471  000670  000672                    .+2
  472  000672  000000                    HALT            ;TRAPPED TO PREVIOUS LOCATION
  473  000674  000676                    .+2
  474  000676  000000                    HALT            ;TRAPPED TO PREVIOUS LOCATION
  475  000700  000702                    .+2
  476  000702  000000                    HALT            ;TRAPPED TO PREVIOUS LOCATION
  477  000704  000706                    .+2
  478  000706  000000                    HALT            ;TRAPPED TO PREVIOUS LOCATION
  479  000710  000712                    .+2
  480  000712  000000                    HALT            ;TRAPPED TO PREVIOUS LOCATION
  481  000714  000716                    .+2
  482  000716  000000                    HALT            ;TRAPPED TO PREVIOUS LOCATION
  483  000720  000722                    .+2
  484  000722  000000                    HALT            ;TRAPPED TO PREVIOUS LOCATION
  485  000724  000726                    .+2
  486  000726  000000                    HALT            ;TRAPPED TO PREVIOUS LOCATION
  487  000730  000732                    .+2
  488  000732  000000                    HALT            ;TRAPPED TO PREVIOUS LOCATION
  489  000734  000736                    .+2
  490  000736  000000                    HALT            ;TRAPPED TO PREVIOUS LOCATION
  491  000740  000742                    .+2
  492  000742  000000                    HALT            ;TRAPPED TO PREVIOUS LOCATION
  493  000744  000746                    .+2
  494  000746  000000                    HALT            ;TRAPPED TO PREVIOUS LOCATION
  495  000750  000752                    .+2
  496  000752  000000                    HALT            ;TRAPPED TO PREVIOUS LOCATION
  497  000754  000756                    .+2
  498  000756  000000                    HALT            ;TRAPPED TO PREVIOUS LOCATION
  499  000760  000762                    .+2
  500  000762  000000                    HALT            ;TRAPPED TO PREVIOUS LOCATION
  501  000764  000766                    .+2
  502  000766  000000                    HALT            ;TRAPPED TO PREVIOUS LOCATION
  503  000770  000772                    .+2
  504  000772  000000                    HALT            ;TRAPPED TO PREVIOUS LOCATION
  505  000774  000776                    .+2
  506  000776  000000                    HALT            ;TRAPPED TO PREVIOUS LOCATION
  507
  508                                                    ;TRAPPED TO PREVIOUS LOCATION
  509                                                    ;TRAPPED TO PREVIOUS LOCATION
  510
  511
  512          000030                    .=30
  513  000030  003510                    PRINT
  514  000032  000340                    340
  515  000034  004220                    SCOPEC
  516  000036  000340                    340
  517
  518
  519          000046                    .=46
  520  000046  003464            $ENDAD
  521
```

```
                    000052                  .=52
000052  040000      040000
                    000200                  .=200
000200  000167  000620                      JMP     BEGINA
                    001000                  .=1000

                                        ;THESE ADDRESSES AND VECTORS ARE MODIFIED BY THE PROGRAM.

001000  167770      GRSTAT: 167770          ;STATUS (DONE)
001002  167772      GRDIO:  167772          ;DATA REGISTER
001004  167774      GRDAI:  167774          ;FROM OUTSIDE WORLD TO DATA REGISTER
001006  167773      GRBHIO: 167773          ;HIGH BYTE OF DATA REGISTER
001010  167772      GRDAIO: 167772          ;DATA REGISTER

001012  000300      GRIVA:  300             ;INTERRUPT VECTOR OF UNIT UNDER TEST
001014  000302      GRIVSA: 302             ;INTERRUPT STATUS ADDRESS
001016  000304      GRIVB:  304             ;INTERRUPT VECTOR

001020  000000      COUNT:  0               ;COUNT LOCATION
001022  000240      PL:     240             ;PRIORITY LEVEL
001024              BEGINA:

                                        ;INITIALIZE ADDRESS AND VECTORS

001024  012706  004650              MOV     #BUFF,%6        ;SET UP STACK
001030  012767  001202  003236      MOV     #BEGIN,RETURN
001036  010667  003404              MOV     %6,SAVR6        ;SAVE OLD STACK ON OVERLAY
001042  012767  000012  176740      MOV     #12,10          ;FOR T TRAP
001050  012767  000006  176726      MOV     #6,4            ;FOR TIME OUT
001056  005067  002420              CLR     TRPB            ;"T" FLAG
001062  012767  167770  177710      MOV     #CSR,GRSTAT
001070  012767  167772  177704      MOV     #CSR+2,GRDIO
001076  012767  167774  177700      MOV     #CSR+4,GRDAI
001104  012767  167773  177674      MOV     #CSR+3,GRBHIO
001112  012767  167772  177670      MOV     #CSR+2,GRDAIO
001120  013700  177570              MOV     @#SR,%0         ;VECTOR ADDRESS FROM SR
001124  105700                      TSTB    %0              ;IF ZERO USE 300 ON PREVIOUS VALUE
001126  001412                      BEQ     DR11B
001130  042700  177000              BIC     #177000,%0      ;USE ONLY BIT 0 TO 8
001134  010067  000016              MOV     %0,DR11B+2
001140  005720                      TST     (0)+
001142  010067  000016              MOV     %0,DR11B+10
001146  005720                      TST     (0)+
001150  010067  000016              MOV     %0,DR11B+16
001154  012767  000300  177630  DR11B: MOV  #300,GRIVA      ;SET UP FROM SWITCH REGISTER
001162  012767  000302  177624      MOV     #302,GRIVSA
001170  012767  000304  177620      MOV     #304,GRIVB
001176  012706  004650          DR11C: MOV  #BUFF,%6        ;SET UP STACK
                            ;DOES RESET CLEAR REGISTER?
001202  104400              BEGIN:  SCOPE
001204  016777  177604  177600      MOV     GRIVSA,@GRIVA   ;SET UP FOR FALSE INTERRUPT
001212  005077  177576              CLR     @GRIVSA
001216  012767  000006  176560      MOV     #6,4
001224  012767  000100  003036      MOV     #100,ICOUNT
001232  000005                      RESET                   ;CLEAR DATA REGISTER
```

```
                                                MOV     @GRDAIO,%0
                                                BEQ     .+4
                                                HLT                             ;DATA REGISTER NOT CLEAR
                                        ;REGISTER NOT ZERO
                                                SCOPE
                                                MOV     #4000,ICOUNT
                                                MOV     #-1,@GRDIO              ;ALL ONES TO REGISTER
                                                MOV     @GRDIO,%0
                                                CMP     #-1,%0
                                                BEQ     .+4
                                                HLT                             ;REG WILL NOT HOLD ONES
                                                SCOPE
                                                MOV     #100,ICOUNT
                                                MOV     #-1,@GRDIO
                                                RESET                           ;SET DATA TO ALL ONES
                                                TST     @GRDAIO                 ;SHOULD CLEAR REGISTER
                                                BEQ     .+4
                                                HLT                             ;REG FAILED TO CLEAR
                                                SCOPE
                                                MOV     #4000,ICOUNT
                                                MOV     #52525,@GRDIO
                                                MOV     @GRDIO,%0
                                                CMP     #52525,%0
                                                BEQ     .+4
                                                HLT                             ;DATA NOT=52525
                                                SCOPE
                                                MOV     #125252,@GRDIO
                                                MOV     @GRDIO,%0
                                                CMP     #125252,%0
                                                BEQ     .+4
                                                HLT                             ;DATA NOT=125252
                                        ;INTERRUPT ENABLE BIT TEST
                                                BIS     #340,STATUS             ;LOCK OUT INTERRUPTS
                                                SCOPE
                                                MOV     #140,@GRSTAT            ;INTERRUPT ENABLE FOR A+B
                                                MOV     @GRSTAT,%0
                                                CMP     #100340,%0              ;ENABLE BITS PLUS READY BITS
                                                BEQ     .+4
                                                HLT
                                                SCOPE
                                                MOV     #10,ICOUNT
                                                MOV     #140,@GRSTAT            ;SET INTERRUPT ENABLE FLOPS
                                                RESET                           ;CLEAR THOSE FLOPS
                                                MOV     @GRSTAT,%0              ;TST % OR
                                                BEQ     .+4
                                                HLT                             ;RESET DID NOT CLEAR INTERRUPT ENABLE BITS
                                                SCOPE
                                                CLR     ICOUNT
                                                CLR     COUNT
```

```
  634  001500  016777  177314  177302  TST1:   MOV     COUNT,@GRDAIO
  635  001506  017700  177270                  MOV     @GRDIO,%0
  636  001512  020067  177302                  CMP     %0,COUNT
  637  001516  001401                          BEQ     .+4                     ;TEST FOR ALL NUMBERS (WORD)
  638  001520  104000                          HLT                             ;GOOD=COUNT, BAD=%0
  639  001522  005267  177272                  INC     COUNT
  640  001526  001401                          BEQ     .+4
  641  001530  000763                          BR      TST1
  642  001532  104400                          SCOPE
  643  001534  012777  177777  177240          MOV     #-1,@GRDIO
  644  001542  105077  177234                  CLRB    @GRDIO                  ;CLEAR LOW BYTE
  645  001546  017700  177230                  MOV     @GRDIO,%0
  646  001552  022700  177400                  CMP     #177400,%0
  647  001556  001401                          BEQ     .+4
  648  001560  104000                          HLT                             ;BYTE LOW FAILED TO CLEAR
  649  001562  012767  004000  002500          MOV     #4000,ICOUNT
  650
  651  001570  104400                          SCOPE
  652  001572  012777  177777  177202          MOV     #-1,@GRDIO
  653  001600  105077  177202                  CLRB    @GRBHIO                 ;CLEAR HIGH BYTE
  654  001604  017700  177172                  MOV     @GRDIO,%0
  655  001610  022700  000377                  CMP     #377,%0
  656  001614  001401                          BEQ     .+4
  657  001616  104000                          HLT                             ;HIGH BYTE CLEAR FAILED
  658
  659  001620  104400                          SCOPE
  660  001622  005067  002442                  CLR     ICOUNT
  661  001626  005067  177166                  CLR     COUNT
  662  001632  005077  177144                  CLR     @GRDIO
  663  001636  105277  177140          TST2:   INCB    @GRDIO                  ;INCREMENT LOW ORDER BYTE
  664  001642  105267  177152                  INCB    COUNT                   ;INCREMENT REFERENCE BYTE COUNT
  665  001646  027767  177130  177144          CMP     @GRDIO,COUNT
  666  001654  001401                          BEQ     .+4
  667  001656  104000                          HLT                             ;BAD DATA IN DATA REGISTER
  668  001660  105767  177134                  TSTB    COUNT
  669  001664  001401                          BEQ     .+4
  670  001666  000763                          BR      TST2
  671  001670  104400                          SCOPE
  672  001672  005067  177122                  CLR     COUNT
  673  001676  105077  177104                  CLRB    @GRBHIO
  674  001702  105277  177100          TST3:   INCB    @GRBHIO                 ;INCREMENT HIGH BYTE
  675  001706  105267  177107                  INCB    COUNT+1
  676  001712  027767  177064  177100          CMP     @GRDIO,COUNT
  677  001720  001401                          BEQ     .+4
  678  001722  104000                          HLT                             ;HIGH BYTE HAS BAD DATA
  679  001724  105767  177071                  TSTB    COUNT+1
  680  001730  001401                          BEQ     .+4
  681  001732  000763                          BR      TST3
  682  001734  052767  000340  176034          BIS     #340,STATUS
  683
  684                                  ;TEST EXTERNAL TRANSFERS - CABLE MUST BE CONNECTED
  685  001742  104400                          SCOPE
  686  001744  012767  004000  002316          MOV     #4000,ICOUNT
  687  001752  005077  177024                  CLR     @GRDIO
  688  001756  017777  177022  177016          MOV     @GRDAI,@GRDIO           ;TEST TRANSFER OF ZERO
  689  001764  001401                          BEQ     .+4
```

```
   690  001766  104000                          HLT                     ;PICKED UP A BIT
   691
   692  001770  104400                          SCOPE
   693  001772  012777  177777  177002          MOV     #-1,@GRDIO
   694  002000  017777  177000  176774          MOV     @GRDAI,@GRDIO   ;MOV ALL ONES
   695  002006  022777  177777  176766          CMP     #-1,@GRDIO
   696  002014  001401                          BEQ     .+4
   697  002016  104000                          HLT                     ;DROPPED A BIT
   698
   699  002020  104400                          SCOPE
   700  002022  005067  002242                  CLR     ICOUNT
   701  002026  005000                          CLR     %0
   702  002030  010077  176746          TST6:   MOV     %0,@GRDIO       ;TEST ALL NUMBERS
   703  002034  017777  176744  176740          MOV     @GRDAI,@GRDIO
   704  002042  020077  176734                  CMP     %0,@GRDIO
   705  002046  001401                          BEQ     .+4
   706  002050  104000                          HLT                     ;ERROR - CHECK %0 FOR GOOD
   707  002052  005200                          INC     %0              ;GRDIO FOR BAD
   708  002054  001407                          BEQ     TST7
   709  002056  005077  176720                  CLR     @GRDIO
   710  002062  000762                          BR      TST6
   711
   712  002064  104400                          SCOPE
   713  002066  012767  004000  002174          MOV     #4000,ICOUNT
   714  002074  005077  176702          TST7:   CLR     @GRDIO
   715  002100  005067  175672                  CLR     STATUS          ;TEST INTERRUPT A
   716  002104  012777  002130  176700          MOV     #ABC,@GRIVA
   717  002112  012777  000100  176660          MOV     #100,@GRSTAT
   718  002120  105277  176656                  INCB    @GRDIO
   719  002124  001375                          BNE     .-4
   720  002126  000407                          BR      TST8
   721
   722  002130  032777  000200  176644  ABC:    BIT     #200,@GRDIO
   723  002136  001001                          BNE     .+4
   724  002140  104000                          HLT                     ;INTERRUPT A FAILED
   725  002142  000002                          RTI                     ;CHECK - WORD OR BYTE
   726
   727  002144  104400                          SCOPE
   728  002146  005077  176630          TST8:   CLR     @GRDIO
   729  002152  012777  002176  176636          MOV     #DEF,@GRIVB     ;TEST INTERRUPT B
   730  002160  012777  000040  176612          MOV     #40,@GRSTAT
   731  002166  105277  176614                  INCB    @GRBHIO
   732  002172  001375                          BNE     .-4
   733  002174  000406                          BR      TST9
   734
   735  002176  005777  176600          DEF:    TST     @GRDIO
   736  002202  100401                          BMI     .+4
   737  002204  104000                          HLT                     ;INTERRUPT B FAILED
   738  002206  000002                          RTI                     ;CHECK WORD OR BYTE
   739
   740  002210  104400                          SCOPE
   741  002212  005077  176564          TST9:   CLR     @GRDIO          ;TEST COMBINED INTERRUPTS
   742  002216  012777  000140  176554          MOV     #140,@GRSTAT
   743  002224  005277  176552                  INC     @GRDIO
   744  002230  001375                          BNE     .-4
   745  002232  005077  176542                  CLR     @GRSTAT
```

```
   746  002236  012777  177777  176536          MOV     #-1,@GRDIO
   747                                  ;TEST DATA FROM BLACK BOX (NOT CONNECTED)
   748  002244  104400                          SCOPE
   749  002246  017777  176532  176534          MOV     @GRDAI,@GRDAIO  ;STATIC LINES EQUAL ONES
   750  002254  017700  176530                  MOV     @GRDAIO,%0      ;DATA REGISTER TO %0
   751  002260  022700  177777                  CMP     #-1,%0
   752  002264  001401                          BEQ     .+4
   753  002266  104000                          HLT                     ;REG 0 SHOULD = ALL ONES
   754
   755                                  ;READY BIT IS IN A ONE STATE
   756
   757  002270  104400                          SCOPE
   758  002272  005777  176502                  TST     @GRSTAT         ;TEST BIT 15
   759  002276  100401                          BMI     .+4
   760  002300  104000                          HLT                     ;NO READY BIT 0
   761
   762  002302  104400                          SCOPE
   763  002304  105777  176470                  TSTB    @GRSTAT         ;TEST BIT 7
   764  002310  100401                          BMI     .+4
   765  002312  104000                          HLT                     ;NO READY BIT A
   766
   767                                  ;CAN WE RAISE INTERRUPT ''A''
   768  002314  104400                          SCOPE
   769  002316  052767  000340  175452          BIS     #340,STATUS     ;LOCK OUT INTERRUPTS
   770  002324  012706  004650                  MOV     #BUFF,%6
   771  002330  012777  002354  176454          MOV     #TST4,@GRIVA    ;INTERRUPT RETURN POINTER
   772  002336  012777  000100  176434          MOV     #100,@GRSTAT    ;INTERRUPT ENABLE
   773  002344  005067  175426                  CLR     STATUS
   774  002350  000240                          NOP
   775  002352  104000                          HLT                     ;NO ''A'' INTERRUPT
   776
   777  002354  005077  176420          TST4:   CLR     @GRSTAT
   778  002360  016777  176430  176424          MOV     GRIVSA,@GRIVA   ;MOV .+2 TO ''A'' INTERRUPT VECTOR
   779                                  ;RAISE INTERRUPT 'B''
   780  002366  104400                          SCOPE
   781  002370  012706  004650                  MOV     #BUFF,%6
   782  002374  052767  000340  175374          BIS     #340,STATUS
   783  002402  012777  002430  176406          MOV     #TST5,@GRIVB
   784  002410  012777  000040  176362          MOV     #40,@GRSTAT
   785  002416  042737  000377  177776          BIC     #377,@#STATUS
   786  002424  000240                          NOP
   787  002426  104000                          HLT                     ;NO B INTERRUPT
   788  002430  005077  176344          TST5:   CLR     @GRSTAT
   789          001012                  IVA=GRIVA
   790          001000                  CSR=GRSTAT
   791          001014                  IVS=GRIVSA
   792
   793                                  ;TEST FOR INTERRUPT FROM DEVICE
   794  002434  016777  176362  176352          MOV     PL,@IVS
   795  002442  042767  000340  175326          BIC     #340,STATUS     ;PROCESSOR LEVEL ZERO
   796  002450  012777  002502  176334          MOV     #TINT1,@IVA
   797  002456  012706  004650                  MOV     #BUFF,%6        ;STACK POINTER
   798  002462  042777  000100  176310          BIC     #100,@CSR       ;CLEAR INTERRUPT ENABLE
   799  002470  052777  000100  176302          BIS     #100,@CSR       ;SET INTERRUPT ENABLE-
   800  002476  000240                          NOP
   801  002500  104000                          HLT                     ;NO DEVICE INTERRUPT OCCURED
```

```
                                TINT1:  SCOPE
                                ;TEST FOR INTERRUPT FROM THE DEVICE
002504  042767  000340  175264            BIC     #340,STATUS
002512  052767  000040  175256            BIS     #040,STATUS     ;SET TO PRIORITY LEVEL 1
002520  012777  002552  176264            MOV     #TINT2,@IVA     ;INTERRUPT VECTOR ADDRESS
002526  012706  004650                    MOV     #BUFF,%6        ;SET UP STACK POINTER
002532  042777  000100  176240            BIC     #100,@CSR       ;CLEAR INTERRUPT ENABLE
002540  052777  000100  176232            BIS     #100,@CSR       ;SET INTERRUPT ENABLE-
002546  000240                            NOP
002550  104000                            HLT                     ;NO DEVICE INTERRUPT OCCURRED
002552  104400                TINT2:  SCOPE
002554  042767  000340  175214            BIC     #340,STATUS
002562  052767  000100  175206            BIS     #100,STATUS     ;SET TO PRIORITY LEVEL 2
002570  012777  002622  176214            MOV     #TINT3,@IVA     ;INTERRUPT VECTOR ADDRESS
002576  012706  004650                    MOV     #BUFF,%6        ;SET UP STACK POINTER
002602  042777  000100  176170            BIC     #100,@CSR       ;CLEAR INTERRUPT ENABLE
002610  052777  000100  176162            BIS     #100,@CSR       ;SET INTERRUPT ENABLE-
002616  000240                            NOP
002620  104000                            HLT                     ;NO DEVICE INTERRUPT OCCURED

002622  104400                TINT3:  SCOPE
                                ;TEST FOR INTERRUPT FROM THE DEVICE
002624  042767  000340  175144            BIC     #340,STATUS
002632  052767  000140  175136            BIS     #140,STATUS     ;SET TO PRIORITY LEVEL 3
002640  012777  002672  176144            MOV     #TINT4,@IVA     ;INTERRUPT VECTOR ADDRESS
002646  012706  004650                    MOV     #BUFF,%6        ;SET UP STACK POINTER
002652  042777  000100  176120            BIC     #100,@CSR       ;CLEAR INTERRUPT ENABLE
002660  052777  000100  176112            BIS     #100,@CSR       ;SET INTERRUPT ENABLE-
002666  000240                            NOP
002670  104000                            HLT                     ;NO DEVICE INTERRUPT OCCURED
002672  104400                TINT4:  SCOPE

                                ;TEST FOR INTERRUPT FROM DEVICE
002674  042767  000340  175074            BIC     #340,STATUS
002702  052767  000200  175066            BIS     #200,STATUS     ;RAISE PROCESSOR PRIORITY TO LEVEL 4
002710  012777  002752  176074            MOV     #TINT5,@IVA     ;IN CASE OF INTERRUPT
002716  012706  004650                    MOV     #BUFF,%6        ;SET STACK POINTER
002722  042777  000100  176050            BIC     #100,@CSR       ;CLEAR INTERRUPT ENABLE
002730  052777  000100  176042            BIS     #100,@CSR       ;SET INTERRUPT ENABLE
002736  000240                            NOP                     ;LET INTERRUPT OCCUR
002740  042777  000100  176032            BIC     #100,@CSR
002746  000240                            NOP
002750  104000                            HLT                     ;NO DEVICE INTERRUPT OCCURED
002752  104400                TINT5:  SCOPE
                                ;TEST FOR NO INTERRUPT FROM DEVICE (HIGHEST PROCESSOR PRIORITY)
002754  052767  000340  175014            BIS     #340,STATUS     ;RAISE PROCESSOR PRIORITY TO HIGHEST LEVEL
002762  012777  003022  176022            MOV     #TINT6,@IVA     ;IN CASE OF INTERRUPT
002770  012706  004650                    MOV     #BUFF,%6        ;SET STACK POINTER
002774  052777  000100  175776            BIS     #100,@CSR       ;CLEAR INTERRUPT ENABLE
003002  042777  000100  175770            BIC     #100,@CSR
003010  042777  000100  175762            BIC     #100,@CSR       ;DON'T LEAVE IT SET
003016  000240                            NOP
003020  000401                            BR      .+4             ;WITH NO INTERRUPT, BRANCH OVER HALT
003022  104000                TINT6:  HLT                     ;INTERRUPT OCCURED
003024  104400                        SCOPE
```

```
                                        ;TEST FOR NO INTERRUPT FROM DEVICE
003026  042767  000340  174742                BIC     #340,STATUS
003034  052767  000240  174734                BIS     #240,STATUS     ;RAISE PROCESSOR PRIORITY TO LEVEL 5
003042  012777  003102  175742                MOV     #TINT7,@IVA     ;IN CASE OF INTERRUPT
003050  012706  004650                        MOV     #BUFF,%6        ;SET STACK POINTER
003054  042777  000100  175716                BIC     #100,@CSR       ;CLEAR INTERRUPT ENABLE
003062  052777  000100  175710                BIS     #100,@CSR       ;SET INTERRUPT ENABLE
003070  042777  000100  175702                BIC     #100,@CSR       ;DON'T LEAVE IT SET
003076  000240                                NOP
003100  000401                                BR      .+4             ;WITH NO INTERRUPT, BRANCH OVER HALT
003102  104000                        TINT7:  HLT                     ;INTERRUPT OCCURED
003104  104400                                SCOPE

                                        ;TEST FOR NO INTERRUPT FROM DEVICE
003106  042767  000340  174662                BIC     #340,STATUS
003114  052767  000300  174654                BIS     #300,STATUS     ;RAISE PROCESSOR PRIORITY TO LEVEL 6
003122  012777  003162  175662                MOV     #TINT8,@IVA     ;IN CASE OF INTERRUPT
003130  012706  004650                        MOV     #BUFF,%6        ;SET STACK POINTER
003134  042777  000100  175636                BIC     #100,@CSR       ;CLEAR INTERRUPT ENABLE
003142  052777  000100  175630                BIS     #100,@CSR       ;SET INTERRUPT ENABLE
003150  042777  000100  175622                BIC     #100,@CSR       ;DON'T LEAVE IT SET
003156  000240                                NOP
003160  000401                                BR      .+4             ;WITH NO INTERRUPT, BRANCH OVER HALT
003162  104000                        TINT8:  HLT                     ;INTERRUPT OCCURED
003164  104400                                SCOPE
003166  016777  175622  175616                MOV     GRIVSA,@GRIVA   ;FOR FALSE INTERRUPT
003174  005077  175612                        CLR     @GRIVA
003200  012767  003504  174606                MOV     #YESRT,14
003206  005767  000270                        TST     TRPB
003212  001452                                BEQ     BELL
003214  012737  001024  000004                MOV     #BEGINA,@#4     ;GO TO BEGIN ON TIME OUT
003222  162767  000010  175550                SUB     #10,GRSTAT
003230  162767  000010  175544                SUB     #10,GRSTAT+2
003236  162767  000010  175540                SUB     #10,GRSTAT+4
003244  162767  000010  175534                SUB     #10,GRSTAT+6
003252  162767  000010  175530                SUB     #10,GRSTAT+10
003260  062767  000010  175524                ADD     #10,GRIVA
003266  062767  000010  175520                ADD     #10,GRIVSA
003274  062767  000010  175514                ADD     #10,GRIVB
003302  026727  175504  000000                CMP     GRIVA,#0        ;CHANGE TO LAST VECTOR FOR OVERLAY
003310  001004                                BNE     .+12
003312  000137  001024                        JMP     @#BEGINA
003316  016706  001124                        MOV     SAVR6,%6        ;RESTORE OLD STACK
003322  000240                                NOP                     ;CHANGE TO RTI ON OVERLAY
003324  005777  175450                        TST     @GRSTAT         ;TIME OUT IF NON EXISTENT-RESTART PROGRAM
003330  012767  004412  174466                MOV     #PFAIL,24       ;FOR POWER FAIL SET UP
003336  000414                                BR      SBELL

003340                                  BELL:
                                        ;BELL ON PASS COMPLETE
003340  012777  000207  000334                MOV     #207,@TDBR
003346  105777  000332                        TSTB    @TCSR
003352  100375                                BPL     .-4
003354  012777  000000  000320                MOV     #0,@TDBR
003362  105777  000316                        TSTB    @TCSR
```

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                                                BPL     .-4
003370  012767  003412  174412  SBELL:  MOV     #BEG20,10       ;SET UP RESERVED INSTRUCTION
003376  006701                          6701                    ;ATTEMPT TO EXECUTE SIGN EXTEND
003400  000240                          NOP
003402  012767  000006  000074          MOV     #6,YESRT        ;NO TRAP, PROCESSOR IS NO =20
003410  000403                          BR      BEGANY
003412  012767  000002  000064  BEG20:  MOV     #2,YESRT        ;TRAP OCCURED
003420  012767  000012  174362  BEGANY: MOV     #12,10          ;RESTORE HALT FOR RESERVED INC
                                ;ROUTINE TO CHECK FOR TRACE TRAP TO BE RUN WITH PROGRAM

                                ;SAVE OLD CONTENTS, SET UP FOR TRACE TRAP
003426  005046                  YESTR:  CLR     -(6)
003430  032767  010000  174132          BIT     #10000,SR
003436  001016                          BNE     YESTR1
003440  005167  000036                  COM     TRPB
003444  100003                          BPL     .+10
003446  012716  000020                  MOV     #20,(6)         ;SET TRACE TRAP
003452  000410                          BR       YESTR1
003454  013700  000042                  MOV     @#42,R0
003460  001405                          BEQ     YESTR1
003462  000005                          RESET
003464  004710                  $ENDAD: JSR     7,(R0)
003466  000240                          NOP
003470  000240                          NOP
003472  000240                          NOP
003474  012746  001202          YESTR1: MOV     #BEGIN,-(6)     ;START OF TEST WITH TRACE ON
003500  000002                  YESTR2: RTI
003502  000000                  TRPB:   0
003504  000002                  YESRT:  RTI                     ;RETURN TO PROGRAM FROM TRAP
003506  000000                          HALT                    ;RTI FAILED
                                ;ENTERED WITH SYSTEM TRAP CALL(HLT)
                                ;PRINT OUT THE ERROR PC AND STATUS REGISTER
003510  036727  174054  020000  PRINT:  BIT     SR,#20000       ;TEST FOR INHIBIT PRINT OUT
003516  001401                          BEQ     .+4             ;BRANCH TO PRINT
003520  000002                          RTI                     ;INHIBIT, RETURN TO MAIN STREAM
003522  012667  000160                  MOV     (6)+,SAVPC      ;PC OF FAILING ROUTINE
003526  012667  000156                  MOV     (6)+,SAVCC      ;CC OF ERROR CONDITION
003532  024646                          CMP     -(6),-(6)       ;REPOSITION THE STACK
003534  105777  000144                  TSTB    @TCSR           ;WAIT FOR FLAG
003540  100375                          BPL     .-4             ;IF NOT UP.
003542  012777  000215  000132          MOV     #215,@TDBR      ;CR
003550  105777  000130                  TSTB    @TCSR
003554  100375                          BPL     .-4
003556  012777  000212  000116          MOV     #212,@TDBR      ;LINE FEED
003564  105777  000114                  TSTB    @TCSR
003570  100375                          BPL     .-4
003572  010267  000076                  MOV     %2,SAVR2        ;SAVE R2
003576  010367  000074                  MOV     %3,SAVR3        ;SAVE R3
003602  010467  000072                  MOV     %4,SAVR4        ;SAVE R4
003606  016702  000074                  MOV     SAVPC,%2
003612  004767  000074                  JSR     %7,PRTAB        ;PRINT OCTAL NUMBER
003616  012777  000240  000056          MOV     #240,@TDBR
003624  105777  000054                  TSTB    @TCSR           ;SPACE BETWEEN WORDS
003630  100375                          BPL     .-4
003632  016702  000052                  MOV     SAVCC,%2
003636  004767  000050                  JSR     %7,PRTAB        ;PRINT OCTAL NUMBER
```

```
  970  003642  004767  000472                      JSR     %7,MOREID       ;DEVICE ADDRESS AND VECTORS
  971  003646  016702  000022                      MOV     SAVR2,%2        ;RESTORE REGISTERS
  972
  973  003652  016703  000020                      MOV     SAVR3,%3
  974  003656  016704  000016                      MOV     SAVR4,%4
  975  003662  005767  173702                      TST     SR              ;TEST FOR HALT SWITCH
  976  003666  100001                              BPL     .+4
  977  003670  000000                              HALT                    ;HALT ON ERROR SET
  978  003672  000002                              RTI                     ;RETURN TO MAIN STREAM
  979
  980  003674  000000                  SAVR2:      0
  981  003676  000000                  SAVR3:      0
  982  003700  000000                  SAVR4:      0
  983  003702  177566                  TDBR:       177566                  ;DATA
  984  003704  177564                  TCSR:       177564                  ;STATUS
  985  003706  000000                  SAVPC:      0
  986  003710  000000                  SAVCC:      0
  987
  988  003712  005067  000252          PRTAB:      CLR     BINCT
  989  003716  005067  000244                      CLR     WGTCT
  990  003722  012704  004174                      MOV     #LIST,%4        ;GET LIST ADDRESS
  991  003726  012767  000005  000236              MOV     #5,ASCNT
  992  003734  012767  000007  000220              MOV     #7,SEVEN
  993  003742  012767  000001  000214              MOV     #1,DECML
  994  003750  105777  177730          WAIT1:      TSTB    @TCSR
  995  003754  100375                              BPL     WAIT1
  996  003756  005702                              TST     %2
  997  003760  100404                              BMI     MINUS           ;NEG SIGN PRINT 1
  998  003762  012777  000260  177712              MOV     #260,@TDBR      ;POS SIGN PRINT 0
  999  003770  000403                              BR      STAR
 1000  003772  012777  000261  177702  MINUS:      MOV     #261,@TDBR
 1001  004000  016703  000156          STAR:       MOV     SEVEN,%3        ;PUT MASK IN R3
 1002  004004  010267  000150                      MOV     %2,TOODLE       ;GET READY TO DOODLE NUMBER IN TOODLE
 1003  004010  005167  000144                      COM     TOODLE          ;COMPENSATES FOR COMPLEMENT DURING BIC
 1004  004014  046703  000140                      BIC     TOODLE,%3       ;AND IN OCTAL CHARACTER
 1005  004020  001410                              BEQ     WRTOC           ;ZERO,WRITE 0 IN LIST
 1006  004022  066767  000136  000136  MKNUM:      ADD     DECML,WGTCT     ;COUNT UP TO
 1007  004030  005267  000134                      INC     BINCT           ;AND RECORD
 1008  004034  026703  000126                      CMP     WGTCT,%3        ;SAME BINARY WEIGHT
 1009  004040  001370                              BNE     MKNUM           ;KEEP COUNTN
 1010  004042  062767  000260  000120  WRTOC:      ADD     #260,BINCT      ;ADD ASCII PREFIX
 1011  004050  016724  000114                      MOV     BINCT,(4)+      ;WRITE ASCII CHAR IN LIST
 1012  004054  066767  000102  000102              ADD     SEVEN,DECML     ;EXPAND BINARY WEIGHT
 1013  004062  005067  000100                      CLR     WGTCT
 1014  004066  005067  000076                      CLR     BINCT
 1015  004072  005367  000074                      DEC     ASCNT
 1016  004076  001410                              BEQ     XLIST           ;5 CHAR IN LIST
 1017  004100  012703  000003                      MOV     #3,%3           ;SET X3 FOR ADD LOOP
 1018  004104  066767  000052  000050  MOADD:      ADD     SEVEN,SEVEN     ;MAKING SEVENTY BY SEVEN
 1019  004112  005303                              DEC     %3
 1020  004114  001373                              BNE     MOADD
 1021  004116  000730                              BR      STAR            ;NX SEVEN SET GET NX OCTAL
 1022  004120  012767  000005  000044  XLIST:      MOV     #5,ASCNT        ;SEND 5 CHAR TO TTY
 1023  004126  105777  177552          WAIT2:      TSTB    @TCSR
 1024  004132  100375                              BPL     WAIT2
 1025  004134  014477  177542                      MOV     -(4),@TDBR
```

```
1026  004140  005367  000026                DEC     ASCNT
1027  004144  001401                        BEQ     HDFHM           ;FINISH PRINTING GET NXT NUM
1028  004146  000767                        BR      WAIT2
1029
1030  004150  105777  177530        HDFHM:  TSTB @TCSR
1031  004154  100375                        BPL     .-4
1032  004156  000207                        RTS     %7              ;HEAD FOR HOME
1033  004160  000000                TOODLE: 0
1034  004162  000000                SEVEN:  0
1035  004164  000000                DECML:  0
1036  004166  000000                WGTCT:  0
1037  004170  000000                BINCT:  0
1038  004172  000000                ASCNT:  0
1039  004174  000000                LIST:   0
1040  004176  000000                        0
1041  004200  000000                        0
1042  004202  000000                        0
1043  004204  000000                        0
1044                                  ;SCOPE LOOP ROUTINE ENTERED BY USER TRAP
1045  004206  022606                SCOPEB: CMP     (6)+,%6         ;REPOSITION THE STACK
1046  004210  012667  173562                MOV     (6)+,CC
1047  004214  000177  000054                JMP     @RETURN         ;SCOPE RETURN
1048
1049                                  ;SCOPE OR/AND ITERATION LOOP FOR EACH TEST 4000 TIMES
1050  004220  032767  040000  173342 SCOPEC: BIT     #40000,SR       ;TEST SR FOR SCOPE
1051  004226  001367                        BNE     SCOPEB          ;YES SCOPE
1052  004230  032767  004000  173332        BIT     #4000,SR        ;NO - TEST FOR ITERATION
1053  004236  001011                        BNE     SCOPEA          ;INHIBIT ITERATION
1054  004240  026767  000026  000022        CMP     SCOPEF,ICOUNT
1055  004246  001403                        BEQ     SCOPEG          ;EXIT - DONE
1056  004250  005267  000016                INC     SCOPEF          ;INCREMENT COUNT
1057  004254  000754                        BR      SCOPEB          ;LOOP SOME MORE
1058  004256  005067  000010        SCOPEG: CLR     SCOPEF          ;CLEAR COUNT
1059  004262  011667  000006        SCOPEA: MOV     @%6,RETURN      ;SAVE SCOPE RETURN POINTER
1060  004266  000002                        RTI                     ;RETURN INLINE-NEXT TEST
1061  004270  004000                ICOUNT: 4000
1062  004272  000000                SCOPEF: 0                       ;COUNT LOCATION FOR ITERATION LOOP
1063  004274  001202                RETURN: BEGIN                   ;ADDRESS OF LAST TEST
1064  004276  000167  173676                JMP     200
1065
1066                                  ;GROUP OF NESTED SUBROUTINES
1067  004302  000207                SUBR1:  RTS     %7              ;ONE INSTRUCTION
1068  004304  000277                SUBR2:  SCC                     ;ONE DEEP
1069  004306  000207                        RTS     %7
1070  004310  004767  177770        SUBR3:  JSR     %7,SUBR2        ;TWO DEEP
1071  004314  000207                        RTS     %7
1072  004316  004767  177766        SUBR4:  JSR     %7,SUBR3        ;THREE DEEP
1073  004322  000207                        RTS     %7
1074  004324  004767  177766        SUBR5:  JSR     %7,SUBR4        ;FOUR DEEP
1075  004330  000207                        RTS     %7
1076  004332  004767  177766        SUBR6:  JSR     %7,SUBR5        ;FIVE DEEP
1077  004336  000207                        RTS     %7
1078                                  ;PRINT DEVICE ADDRESS AND VECTOR
1079  004340  012777  000240  177334 MOREID: MOV     #240,@TDBR
1080  004346  105777  177332                TSTB    @TCSR
1081  004352  100375                        BPL     .-4
```

```
1082  004354  016702  174420                  MOV     GRSTAT,%2
1083  004360  004767  177326                  JSR     %7,PRTAB
1084  004364  012777  000240  177310          MOV     #240,@TDBR
1085
1086  004372  105777  177306                  TSTB    @TCSR
1087  004376  100375                          BPL     .-4
1088  004400  016702  174406                  MOV     GRIVA,%2
1089  004404  004767  177302                  JSR     %7,PRTAB
1090  004410  000207                          RTS     %7              ;BACK TO PRINT
1091
1092                                  ;ENTER HERE OR POWER FAIL
1093
1094  004412  010046                  PFAIL:  MOV     %0,-(6)         ;SAVE REGISTER OR STACK
1095  004414  010146                          MOV     %1,-(6)         ;WHEN POWERING DOWN
1096  004416  010246                          MOV     %2,-(6)
1097  004420  010346                          MOV     %3,-(6)
1098  004422  010446                          MOV     %4,-(6)
1099  004424  010546                          MOV     %5,-(6)
1100  004426  016746  173372                  MOV     24,-(6)
1101  004432  010667  000010                  MOV     %6,SAVR6        ;STORE STACK POSITION
1102  004436  012767  004450  173360          MOV     #RESTART,24
1103  004444  000000                          HALT                    ;HALT ON POWER DOWN NORMAL
1104  004446  000000                  SAVR6:  0                       ;STACK IS SAVED HERE
1105  004450  016706  177772          RESTART:MOV     SAVR6,%6        ;RESTORE REGISTER OFF STACK
1106  004454  012667  173344                  MOV     (6)+,24         ;WHEN POWERING UP
1107  004460  012605                          MOV     (6)+,%5
1108  004462  012604                          MOV     (6)+,%4
1109  004464  012603                          MOV     (6)+,%3
1110  004466  012602                          MOV     (6)+,%2
1111  004470  012601                          MOV     (6)+,%1
1112  004472  012600                          MOV     (6)+,%0
1113  004474  104000                          HLT                     ;POWER FAIL OCCURRED
1114  004476  000167  174500                  JMP     BEGIN
1115  004502  000002                          RTI                     ;RETURN TO MAIN LINE
1116
1117  004504  125252                  B:      125252
1118                                  ;FIXED VALUES FOR USE IN TEST
1119  004506  004504                          B                       ;ADDRESS OF B
1120  004510  052525                          052525
1121
1122          004514                  .=B+10
1123  004514  177777                  A:      -1
1124  004516  004520                          A+4
1125
1126          004520                  .=A+4
1127  004520  125252                          125252
1128  004522  004524                          A+10                    ;ADDRESS OF A+10
1129  004524  052525                          052525
1130                                  ;FOR STORAGE
1131  004526  000000                  C:      0
1132  004530  004526                          C                       ;ADDRESS OF C
1133
1134          004536                  .=C+10
1135  004536  000000                  TEMP:   0
1136  004540  004536                          TEMP                    ;ADDRESS OF TEMP
1137
```

```
 1138            004544                  .=TEMP+6
 1139  004544    004546                          TEMP+10         ;ADDRESS OF TEMP+10 OR 'D'
 1140  004546    000000                  D:      0
 1141            004650                  .=.+100
 1142  004650                            BUFF:
 1143  004650    000000                  FIN:    0               ;BUFFER FOR SP
 1144            000001                          .END
```

```
A       004514          1123# 1124  1126  1128
ABC     002130           716   722#
ASCNT   004172           991*  1015* 1022* 1026* 1038#
B       004504          1117# 1119  1122
BEGANY  003420           919   921#
BEGIN   001202           548   572#  939   1063  1114
BEGINA  001024           526   543#  889   900
BEG20   003412           915   920#
BELL    003340           888   907#
BINCT   004170           988*  1007* 1010* 1011  1014* 1037#
BUFF    004650           547   570   770   781   797   808   817   828   839   850   863   876   1142#
C       004526          1131# 1132  1134
CC    = 177776           248#  1046*
COUNT   001020           541#  633*  634   636   639*  661*  664*  665   668   672*  675*  676   679
CSR   = 001000           250#  553   554   555   556   557   790#  798*  799*  809*  810*  818*  819*
                         829*  830*  840*  841*  843*  851*  852*  853*  864*  865*  866*  877*  878*
                         879*
D       004546          1140#
DECML   004164           993*  1006  1012* 1035#
DEF     002176           729   735#
DR11B   001154           560   562*  564*  566*  567#
DR11C   001176           570#
FIN     004650          1143#
GRBHIO  001006           534#  556*  653*  673*  674*  731*
GRDAI   001004           533#  555*  688   694   703   749
GRDAIO  001010           535#  557*  578   596   634*  749*  750
GRDIO   001002           532#  554*  586*  587   594*  602*  603   609*  610   635   643*  644*  645
                         652*  654   662*  663*  665   676   687*  688*  693*  694*  695   702*  703*
                         704   709*  714*  718*  722   728*  735   741*  743*  746*
GRIVA   001012           537#  567*  573*  716*  771*  778*  789   884*  885*  895*  898   1088
GRIVB   001016           539#  569*  729*  783*  897*
GRIVSA  001014           538#  568*  573   574*  778   791   884   896*
GRSTAT  001000           531#  553*  617*  618   625*  627   717*  730*  742*  745*  758   763   772*
                         777*  784*  788*  790   890*  891*  892*  893*  894*  903   1082
HDFHM   004150          1027  1030#
HLT   = 104000           247#  581   590   598   606   613   621   629   638   648   657   667   678
                         690   697   706   724   737   753   760   765   775   787   801   812   821
                         832   845   856   869   882   1113
ICOUNT  004270           576*  585*  593*  601*  624*  632*  649*  660*  686*  700*  713*  1054  1061#
IVA   = 001012           789#  796*  807*  816*  827*  838*  849*  862*  875*
IVS   = 001014           791#  794*
LIST    004174           990   1039#
MINUS   003772           997   1000#
MKNUM   004022          1006#  1009
MOADD   004104          1018#  1020
MOREID  004340           970   1079#
NOP   = 000240           245#
PFAIL   004412           904   1094#
PL      001022           542#  794
PRINT   003510           513   946#
PRTAB   003712           964   969   988#  1083  1089
RESTAR  004450          1102  1105#
RETURN  004274           548*  1047  1059* 1063#
SAVCC   003710           950*  968   986#
SAVPC   003706           949*  963   985#
SAVR2   003674           960*  971   980#
```

```
SAVR3   003676          961* 973  981#
SAVR4   003700          962* 974  982#
SAVR6   004446          549* 901  1101* 1104# 1105
SBELL   003370          905  915#
SCOPE = 104400          246# 572  584  592  600  608  616  623  631  642  651  659  671
                        685  692  699  712  727  740  748  757  762  768  780  802  813
                        823  833  846  857  870  883
SCOPEA  004262          1053 1059#
SCOPEB  004206          1045# 1051 1057
SCOPEC  004220          515  1050#
SCOPEF  004272          1054 1056* 1058* 1062#
SCOPEG  004256          1055 1058#
SEVEN   004162          992* 1001 1012 1018* 1034#
SR      = 177570        249# 558  926  946  975  1050 1052
STAR    004000          999  1001# 1021
STATUS= 177776          244# 248  615* 682* 715* 769* 773* 782* 785* 795* 805* 806* 814*
                        815* 825* 826* 836* 837* 848* 860* 861* 873* 874*
SUBR1   004302          1067#
SUBR2   004304          1068# 1070
SUBR3   004310          1070# 1072
SUBR4   004316          1072# 1074
SUBR5   004324          1074# 1076
SUBR6   004332          1076#
TCSR    003704          910  913  952  955  958  966  984# 994  1023 1030 1080 1086
TDBR    003702          909* 912* 954* 957* 965* 983# 998* 1000* 1025* 1079* 1084*
TEMP    004536          1135# 1136 1138 1139
TINT1   002502          796  802#
TINT2   002552          807  813#
TINT3   002622          816  823#
TINT4   002672          827  833#
TINT5   002752          838  846#
TINT6   003022          849  856#
TINT7   003102          862  869#
TINT8   003162          875  882#
TOODLE  004160          1002* 1003* 1004 1033#
TRPB    003502          552* 887  928* 941#
TST1    001500          634# 641
TST2    001636          663# 670
TST3    001702          674# 681
TST4    002354          771  777#
TST5    002430          783  788#
TST6    002030          702# 710
TST7    002074          708  714#
TST8    002146          720  728#
TST9    002212          733  741#
WAIT1   003750          994# 995
WAIT2   004126          1023# 1024 1028
WGTCT   004166          989* 1006* 1008 1013* 1036#
WRTOC   004042          1005 1010#
XLIST   004120          1016 1022#
YESRT   003504          886  918* 920* 942#
YESTR   003426          925#
YESTR1  003474          927  931  933  939#
YESTR2  003500          940#
$ENDAD  003464          520  935#
.       = 004652        251  253  255  257  259  261  263  265  267  269  271  273  275
```

277	279	281	283	285	287	289	291	293	295	297	299	301
303	305	307	309	311	313	315	317	319	321	323	325	327
329	331	333	335	337	339	341	343	345	347	349	351	353
355	357	359	361	363	365	367	369	371	373	375	377	379
381	383	385	387	389	391	393	395	397	399	401	403	405
407	409	411	413	415	417	419	421	423	425	427	429	431
433	435	437	439	441	443	445	447	449	451	453	455	457
459	461	463	465	467	469	471	473	475	477	479	481	483
485	487	489	491	493	495	497	499	501	503	505	512#	519#
522#	525#	527#	579	589	597	605	612	620	628	637	640	647
656	666	669	677	680	689	696	705	719	723	732	736	744
752	759	764	855	868	881	899	911	914	929	947	953	956
959	967	976	1031	1081	1087	1122#	1126#	1134#	1138#	1141#		

```
COMMEN      1#
ENDCOM      1#
ESCAPE      1#
GETPRI      1#
GETSWR      1#
MULT        1#
NEWTST      1#
POP         1#
PUSH        1#
REPORT      1#
SETPRI      1#
SETUP       1#
SKIP        1#
SLASH       1#
STARS       1#
SWRSU       1#
TYPBIN      1#
TYPDEC      1#
TYPNAM      1#
TYPNUM      1#
TYPOCS      1#
TYPOCT      1#
TYPTXT      1#
$$ESCA      1#
$$NEWT      1#
$$SKIP      1#
.EQUAT      1#
.HEADE      1#
.KT11       1#
.SETUP      1#
.SWRHI      1#
.$ACT1      1#
.$APTB      1#
.$APTH      1#
.$APTY      1#
.$ASTA      1#
.$CATC      1#
.$CMTA      1#
.$DB2D      1#
.$DB2O      1#
.$DIV       1#
.$EOP       1#
.$ERRO      1#
.$ERRT      1#
.$MULT      1#
.$POWE      1#
.$RAND      1#
.$RDDE      1#
.$RDOC      1#
.$READ      1#
.$R2AZ      1#
.$SAVE      1#
.$SB2D      1#
.$SB2O      1#
.$SCOP      1#
.$SIZE      1#
```

```
.MAIN.  MACY11 30A(1052)  06-MAR-79  14:52  PAGE 30
CZDRIB.P11    06-MAR-79 14:47          CROSS REFERENCE TABLE -- MACRO NAMES                    SEQ 0027

.$SUPR      1#
.$TRAP      1#
.$TYPB      1#
.$TYPD      1#
.$TYPE      1#
.$TYPO      1#
.$40CA      1#
.1170       1#


. ABS.  004652     000


 ERRORS DETECTED:  0

 CZDRIB.BIN,CZDRIB.SEQ/CRF/SOL/NL:TOC=SYSMAC.SML,CZDRIB.P11
 RUN-TIME: 8 9 .4 SECONDS
 RUN-TIME RATIO: 359/18=19.8
 CORE USED:  31K  (61 PAGES)
```