IDENTIFICATION

PRODUCT CODE:	MAINDEC-08-DIVTC-A-D
PRODUCT NAME:	VT55 ACCEPTANCE TEST ✓
DATE CREATED:	MAY 21, 1975
MAINTAINER:	DIAGNOSTIC GROUP
AUTHOR:	VERA BREUER

1.0 ABSTRACT

THIS PROGRAM IS AN ACCEPTANCE TEST OF THE VT55 VIDEO TERMINAL. THE PROGRAM CONSISTS OF 13 TEST PATTERNS DISPLAYED ON THE VT55 SCREEN. EACH PATTERN REQUIRES OPERATOR INSPECTION FOR ERROR DETECTION. A DESCRIPTION OF THE CORRECT VISUAL DISPLAY FOR EACH TEST CAN BE FOUND IN SECTION 9.

THE PROGRAM IS CAPABLE OF HANDLING MULTIPLE VT55'S IN A SEQUENTIAL DL-11 FASHION, HOWEVER:

****
ONLY ONE VT55 IS TESTED AT ONE TIME.
****

THE OPERATOR MUST TOGGLE IN THE CORRECT VALUES FOR LOCATIONS "FIRST" AND "LAST" FOUND ON PAGE ZERO. "FIRST" MUST BE THE FIRST RECEIVER IOT TO BE TESTED AND "LAST" MUST BE THE LAST RECEIVER IOT TO BE TESTED. THE VT55'S WILL BE TESTED SEQUENTIALLY BEGINNING WITH "FIRST" AND INCREMENTING UNTIL IT REACHES "LAST". WHEN "LAST" HAS BEEN TESTED, THE PROGRAM THEN REPEATS THE ENTIRE PROCESS OF SEQUENTIAL TESTING BEGINNING WITH "FIRST" AGAIN.

2.0 REQUIREMENTS

2.1 EQUIPMENT

PDP-8 FAMILY COMPUTER WITH 4K OF MEMORY.
VT55 VIDEO TERMINAL
DL-11 INTERFACE

2.2 STORAGE

THIS PROGRAM USES 4K OF MEMORY.

3.0 LOADING PROCEDURE

PROCEDURE FOR NORMAL BINARY TAPES SHOULD BE FOLLOWED.

4.0 STARTING PROCEDURE

4.1 CONTROL SWITCH SETTINGS

SW0 = INHIBIT ERROR HALT
SW1 = LOOP ON ERROR
SW2 = LOOP ON TEST
SW3 = HALT ON COMPLETION OF PROGRAM PASS
SW4 = INHIBIT ERROR PRINTOUT
SW5 = OPERATOR INTERVENTION

4.2 STARTING ADDRESS

200 IS THE STARTING ADDRESS OF THE ACCEPTANCE TEST

5.0 OPERATING PROCEDURE

THE OPERATOR MUST INSERT THE CORRECT INFORMATION IN THE SWITCH REGISTER WHEN REQUIRED BY THE PROGRAM OR AN ERROR WILL OCCUR. ONCE STARTED, THE TEST WILL RUN IN ITS NORMAL MANNER WITHOUT OPERATOR INTERVENTION OR SWITCH CHANGES.

THIS PROGRAM ALLOWS THE OPERATOR TWO MODES OF TEST PATTERN SELECTION. THESE MODES ARE SELECTED BY THE STATE OF SW 05 AT THE BEGINNING OF THE PROGRAM. WHEN SW 05 IS A ZERO, THE PROGRAM IS UNDER SWITCH REGISTER CONTROL FOR TEST PATTERN SELECTION. IF SW 05 IS EQUAL TO A ONE, THE PROGRAM IS UNDER KEYBOARD CONTROL OF THE TEST PATTERN SELECTION.

IN THE KEYBOARD SELECT MODE, TWO CHARACTERS ARE USED TO SELECT THE "STARTING WITH" OR "LOOPING ON" A PARTICULAR TEST PATTERN BY "/" OR "\" RESPECTFULLY.

THE "/" KEY IS USED TO SUSPEND THE CURRENT TEST AND ASK THE OPERATOR AT WHICH TEST PATTERN HE/SHE WISHES TO START. THE OPERATOR NOW DEPRESSES THE LETTER WHICH REPRESENTS THE TEST PATTERN TO BE STARTED WITH. REFER TO THE PROGRAM LISTING FOR THE TEST LETTER OF EACH PATTERN.

THE "\" KEY IS USED TO SUSPEND THE CURRENT TEST AND ASK THE OPERATOR WHICH TEST PATTERN HE/SHE WISHES TO LOOP ON. THE OPERATOR NOW DEPRESSES THE LETTER OF THE TEST TO LOOP ON.

IF DURING THE EXECUTION OF A TEST PATTERN, A KEY IS DEPRESSED AND SW 05 EQUALS A ZERO, AN ERROR WILL BE REPORTED TO THE CONSOLE TTY. IF SW 05 EQUALS A ONE, AND THE CHARACTER RECEIVED WAS NOT A "/" OR "\", AN ERROR WILL BE REPORTED.

6.0 ERRORS

THE PROGRAM PRINTS OUT A DESCRIPTIVE MESSAGE ABOUT WHAT WAS IN ERROR AND THE PC AT THE ERROR LOCATION, AND THEN HALTS. IF IT IS DESIRED TO CONTINUE, THEN HIT CONTINUE KEY.

7.0 MISCELLANEOUS

1. ONLY ONE VT55 CAN BE TESTED AT ONE TIME.

2. THE FIRST TIME AFTER LOADING THE PROGRAM, THE TERMINAL IDENTIFIER MUST BE RUN.

3. EXECUTION TIME

   EXECUTION TIME WILL VARY WITH THE "BAUD" RATE.

4. DEVICE ADDRESS PROGRAM LOCATIONS

   THE LOCATION "FIRST" CONTAINS THE FIRST DL11 ADDRESS IF SEVERAL VT-55'S ARE BEING TESTED. THE LOCATION "LAST" CONTAINS THE LAST DL11 ADDRESS IF SEVERAL VT-55'S ARE BEING TESTED. LOCATION VTNOW CONTAINS THE CURRENT DL11 BASE ADDRESS.

   *NOTE: IF THESE LOCATIONS ARE CHANGED, THE OPERATOR MUST START THE TEST AGAIN AT LOC. 200. THE PROGRAM WILL USE THE VALUES PLACED IN "FIRST" AND "LAST" TO UPDATE THE ACTUAL PROGRAM VALUES.

5. THERE WILL BE A 5 SECOND DELAY BETWEEN TESTS WITH THE PDP-8/A PROCESSOR. DELAY TIME WILL BE LONGER WHEN USING OTHER PDP-8 PROCESSORS.

8.0 PROGRAM DESCRIPTION

8.1 GROWING HORIZONTAL LINE

THE CORRECT VISUAL DISPLAY WILL BE A SINGLE HORIZONTAL LINE EXTENDING THE ENTIRE WIDTH OF THE SCREEN PLACED AT BASE ZERO OF THE SCREEN. ANOTHER HORIZONTAL LINE WILL SUCCESSIVELY APPEAR GIVING THE IMPRESSION OF A GROWING HORIZONTAL LINE, UNTIL THE ENTIRE SCREEN HAS BEEN FILLED. THEN THE FIRST LINE AT THE BASE OF THE SCREEN WILL BE REMOVED, FOLLOWED BY EACH SUCCESSIVE LINE UNTIL THE ENTIRE BLOCK HAS DISAPPEARED.

8.2 GROWING VERTICAL LINE

THE CORRECT VISUAL DISPLAY WILL BE A SINGLE VERTICAL LINE EXTENDING THE ENTIRE HEIGHT OF THE SCREEN AND PLACED AT THE FAR RIGHT SIDE OF THE SCREEN. ANOTHER VERTICAL LINE WILL SUCCESSIVELY APPEAR, GIVING THE IMPRESSION OF A GROWING VERTICAL LINE RIGHT TO LEFT, UNTIL THE ENTIRE SCREEN HAS BEEN FILLED. THEN THE FIRST LINE AT THE RIGHT WILL BE REMOVED, FOLLOWED BY EACH SUCCESSIVE LINE UNTIL THE ENTIRE BLOCK HAS DISAPPEARED.

8.3 STEPPING HORIZONTAL LINE FOR GRAPH 0 AND GRAPH 1

THE CORRECT VISUAL DISPLAY WILL BEGIN WITH A SINGLE HORIZONTAL LINE APPEARING NEAR THE CENTER OF THE SCREEN AND EXTENDING THE ENTIRE WIDTH OF THE SCREEN. THEN A SECOND HORIZONTAL LINE HALFWAY BETWEEN THE FIRST LINE AND THE BASE OF THE SCREEN WILL BEGIN TO GROW FROM THE LEFT SIDE OF THE SCREEN. AS THIS LINE GROWS, THE FIRST LINE DISAPPEARS AND YOU'RE LEFT WITH A SINGLE HORIZONTAL LINE ABOUT ONE FOURTH THE WAY UP THE SCREEN. THEN ANOTHER LINE BEGINS TO GROW FROM THE LEFT, HALFWAY BETWEEN THE PREVIOUS LINE AND THE BASE OF THE SCREEN. AS THIS ONE GROWS THE PREVIOUS LINE IS REMOVED. THIS PROCEDURE CONTINUES FOR A TOTAL OF EIGHT TIMES.

8.4 GRAPH 0 AND 1

THE CORRECT VISUAL DISPLAY WILL BEGIN WITH THE APPEARANCE OF A HORIZONTAL LINE EXTENDING THE ENTIRE WIDTH OF THE SCREEN PLACED AT THE BASE ZERO. AS THIS LINE IS REMOVED FROM THE LEFT TO RIGHT, A DIAGONAL LINE, BEGINNING AT THE LEFT BOTTOM CORNER, BEGINS TO GROW UNTIL IT REACHES THE TOP OF THE SCREEN. AT THIS POINT A SECOND DIAGONAL LINE BEGINS TO GROW UP FROM THE BASE LINE ABOUT IN THE MIDDLE OF THE SCREEN. THIS LINE CONTINUES TO GROW UP UNTIL IT REACHES THE TOP OF THE SCREEN. THEN A HORIZONTAL LINE REAPPEARS AT BASE ZERO OF THE SCREEN EXTENDING THE ENTIRE WIDTH OF THE SCREEN. NOW A DIAGONAL LINE BEGINNING AT THE TOP OF THE LEFT CORNER OF THE SCREEN BEGINS TO DECAY DOWNWARD AS THE BASE HORIZONTAL LINE DISAPPEARS. IT CONTINUES UNTIL IT REACHES THE BASE LINE OF THE SCREEN WHEN A SECOND DIAGONAL LINE BEGINS TO DECAY DOWNWARD FROM THE TOP MIDDLE SECTION OF THE SCREEN AND CONTINUES UNTIL IT REACHES THE BASE LINE OF THE SCREEN. THE END RESULT SHOULD BE TWO LARGE X'S FILLING UP THE ENTIRE SCREEN (XX).

8.5 DISPLAY A STEPPING HISTOGRAM LINE ON GRAPH 0 AND GRAPH 1

THE CORRECT VISUAL DISPLAY WILL BEGIN WITH THE APPEARANCE OF A HORIZONTAL LINE AT BASE ZERO ON THE SCREEN. THEN A LINE HALFWAY UP THE SCREEN WILL BEGIN TO GROW FROM THE LEFT SIDE OF THE SCREEN WITH ALL THE AREA BETWEEN THE TWO LINES SHADED. THIS SHADED AREA WILL CONTINUE TO GROW UNTIL IT REACHES THE FAR RIGHT SIDE OF THE SCREEN. THEN A LINE WHICH BISECTS THE SHADED AREA BEGINS TO GROW FROM THE LEFT SIDE. AS THIS LINE GROWS IT REMOVES THE SHADED AREA ABOVE IT, CONTINUING UNTIL IT REACHES THE RIGHT SIDE OF THE SCREEN. THE SHADED AREA IS THEN CUT IN HALF AGAIN AND AGAIN UNTIL A SINGLE HORIZONTAL LINE REMAINS.

8.6 HISTOGRAM ON GRAPH 0 AND 1

THE CORRECT VISUAL DISPLAY WILL FOLLOW THE SAME PATTERN AS THE VISUAL DISPLAY FOR GRAPH 0 AND 1, EXCEPT THAT AS EACH DIAGONAL LINE GROWS, A TRIANGULAR SHADED AREA GROWS UNDER IT. THE FINAL RESULT SHOULD CONSIST OF FOUR OVERLAPPING RIGHT TRIANGLES, TWO WITH THE RIGHT ANGLE ON THE RIGHT BOTTOM OF THE SCREEN (MADE BY THE DIAGONAL LINES WHICH STARTED FROM THE BOTTOM LEFT) AND TWO WITH THE RIGHT ANGLE ON THE LEFT BOTTOM OF THE SCREEN (MADE BY THE DIAGONAL LINES WHICH STARTED FROM THE TOP LEFT).

8.7 CURSORS ON GRAPH 0

THE CORRECT VISUAL DISPLAY WILL BEGIN WITH A SINGLE HORIZONTAL LINE EXTENDING THE ENTIRE LENGTH OF THE SCREEN PLACED AT BASE ZERO. A DIAGONAL LINE WILL THEN BEGIN TO GROW FROM THE BOTTOM LEFT CORNER AS THE BASE HORIZONTAL LINE IS REMOVED. IT CONTINUES TO GROW UNTIL IT REACHES THE TOP OF THE SCREEN WHEN A SECOND DIAGONAL LINE BEGINS TO GROW FROM THE BOTTOM OF THE MIDDLE OF THE SCREEN. THIS LINE CONTINUES TO GROW AS THE BASE HORIZONTAL LINE CONTINUES TO BE REMOVED. WHEN THE DIAGONAL LINE REACHES THE TOP OF THE SCREEN A SQUARE OF CURSORS GROWS AT THE BASE OF THE FIRST DIAGONAL LINE. IT IS FOLLOWED BY ANOTHER SQUARE, EVENTUALLY GIVING THE APPEARANCE OF A STAIRCASE. THIS PROCEDURE IS REPEATED ON THE SECOND DIAGONAL LINE AND WHEN THE LAST SQUARE IS DONE, THE ENTIRE PROCEDURE IS REVERSED. EACH SQUARE IS SUCCESSIVELY REMOVED STARTING AT THE TOP OF THE SECOND DIAGONAL LINE, CONTINUING DOWN IT, THEN STARTING AT THE TOP OF THE FIRST DIAGONAL LINE AND GOING DOWN IT.

8.8 CURSORS ON GRAPH 1

THE CORRECT VISUAL DISPLAY WILL BE ALMOST IDENTICAL TO THAT OF THE CURSORS ON GRAPH 0. THE ONLY DIFFERENCE IS THAT THE TWO DIAGONAL LINES BEGIN AT THE TOP LEFT OF THE SCREEN AND GO DOWN TOWARDS THE RIGHT.

8.9 STARTING COORDINATE ON GRAPH Ø AND 1

THE CORRECT VISUAL DISPLAY WILL BEGIN WITH A SINGLE HORIZONTAL LINE EXTENDING THE ENTIRE WIDTH OF THE SCREEN PLACED AT BASE ZERO. A DIAGONAL LINE WILL THEN BEGIN TO GROW FROM THE BOTTOM LEFT CORNER AS THE HORIZONTAL LINE DISAPPEARS. IT CONTINUES TO GROW UNTIL IT REACHES THE TOP OF THE SCREEN WHEN A SECOND DIAGONAL LINE BEGINS TO GROW FROM THE BOTTOM OF THE MIDDLE OF THE SCREEN. THIS LINE CONTINUES TO GROW AS THE HORIZONTAL LINE CONTINUES TO DISAPPEAR. WHEN THE SECOND DIAGONAL LINE REACHES THE TOP OF THE SCREEN, A SMALL SECTION OF THE HORIZONTAL LINE SHOULD STILL BE VISIBLE. AT THIS POINT A DOTTED SINE CURVE BEGINS FROM THE RIGHT BOTTOM CORNER. AS IT GROWS UPWARD THE REST OF THE HORIZONTAL LINE IS REMOVED. AS THE SINE CURVE REACHES ITS PEAK THE SECOND DIAGONAL LINE BEGINS TO DISAPPEAR. THE LINE CONTINUES TO DISAPPEAR AS THE SINE CURVE ROUNDS THE PEAK AND STARTS DOWNWARD. THEN THE SINE CURVE GROWS UPWARD AGAIN AND THE FIRST DIAGONAL LINE BEGINS TO DISAPPEAR AS THE CURVE REACHES ITS PEAK. THE SINE CURVE CONTINUES TO GROW UNTIL FOUR PEAKS HAVE BEEN FORMED. THEN AT THE RIGHT SIDE OF THE SCREEN, ABOUT HALFWAY UP, THE SINE CURVE STARTS AGAIN TO COME DOWN AND THE FIRST HALF OF THE ORIGINAL CURVE DISAPPEARS. THE DISPLAY IS FINISHED WHEN THE LAST PIECE OF THE CURVE WHICH STARTED AT THE RIGHT REACHES THE BOTTOM OF THE SCREEN.

8.10 VT55 ADJUSTMENT PATTERN

THE CORRECT VISUAL DISPLAY CONSISTS OF TWELVE ROWS OF THE LETTER "H" WITH A BLANK LINE SEPARATING EACH OF THE ROWS. THEN TWELVE HORIZONTAL LINES ARE DISPLAYED, STARTING AT THE BOTTOM AND OVERLAYING THE ROWS OF H'S TOUCHING THE BOTTOM OF THE H'S. THEN FORTY-ONE VERTICAL LINES ARE DISPLAYED, RESULTING IN A CHECKERBOARD OVER THE TWELVE ROWS OF H'S. THE FIRST VERTICAL LINE IS PLACED THROUGH THE MIDDLE OF THE FIRST ROW OF H'S. EACH SUCCESSIVE VERTICAL LINE IS 15 POINTS TO THE RIGHT OF THE PREVIOUS LINE. THE VERY LAST LINE IS EXACTLY ON TOP OF THE RIGHT SIDE OF THE LAST ROW OF H'S.

```
                        /VT55 - ACCEPTANCE TEST - MAINDEC-08-DIVTC-A
                0000    *0
0000    0000    INTRPT, 0
0001    7402            HLT

                0010    *10
0010    0000    A10,    0
0011    0000    A11,    0

                0020    *20
0020    0000    STARTB, 0
0021    0000    COUNT,  0
0022    7777    M1,     -1
0023    3015    CLEAN,  XCLEAN                  /ROUTINE TO CLEAR SCREEN
0024    3263    INPT,   XINPT                   /ROUTINE TO READ KEYBOARD
0025    3272    LOOPT,  XLOOPT                  /ROUTINE TO LOOP ON TEST
0026    3200    KEYSER, XKEY                    /ROUTINE FOR OPERATOR INTERVENTION
0027    3400    MSG,    XMSG                    /ROUTINE TO PRINT MESSAGE
0030    3102    PRNT,   XPRNT                   /ROUITNE TO DISPLAY CHARACTER
0031    2400    UPDOWN, XUPDON                  /ROUTINE
0032    2237    SHUFF,  XSHUFF                  /ROUITNE TO PUT INTO VT55 FORMAT
0033    3000    DELAY,  XDELAY                  /ROUITNE TO DELAY
0034    2600    CURSOR, XCURSR                  /ROUTINE
0035    3032    STCORD, XSTCRD                  /ROUTINE
0036    2000    ADDLIN, 2000            /NO. OF LINES TO BE ADDED
0037    1000    MAXVRT, 1000                    /MAXIMUM NO. OF VERTICAL LINES
0040    0353    MAXHOZ, 353                     /MAXIMUM NO. OF HORIZONTAL LINES
0041    0057    ANSLF,  57                      /"/" CODE
0042    0134    ANSLB,  134                     /BACK SLASH
                4000    BIT15=  4000
0043    0040    BIT5,   40
0044    0001    BIT0,   1
0045    0002    BIT1,   2
0046    0200    BIT7,   200
0047    0004    BIT2,   4
0050    0060    BIT54,  60
0051    0010    BIT3,   10
0052    0000    BASE,   0
0053    0000    BASE1,  0
0054    0000    PASS,   0
0055    0000    SWR,    0
0056    0000    REG1,   0
0057    0000    REG0,   0
0060    0000    REG3,   0
0061    0000    REG4,   0
0062    0000    REG5,   0
0063    0000    ANESC,  0
0064    0000    WFTEST, 0
0065    0005    SUBTST, 5
                4354    BITMAX= 4354
0066    3526    MESS,   XMESS                   /ROUTINE TO PRINT OCTAL NUMBER
0067    3452    PRINT,  XPRINT
0070    3517    CRLF,   XCRLF
0071    3464    ERR,    XERR
0072    0000    BDDAT,  0
```



```
0073    0000    GDDAT,  0
                0000    ZERO=   0
0074    4011    LD4011, 4011
0075    1033    ESCH,   1033            /HOME CURSOR
0076    1233    ESCJ,   1233            /CLEAR SCREEN OF ASCII
0077    6233    ESCF,   6233
0100    0310    ASCH,   310
0101    4311    LDE510, 4311
0102    0400    LNOLHV, 400
0103    6501    LD5420, 6501
0104    1202    LD0B31, 1202
                3612    LD1836= 3612
                0202    LD081=  0202
                0612    LD1821= 0612
                0403    LDC81=  0403
                1204    LDG124= 1204
                0412    LDG182= 0412
                1013    LDC182= 1013
                2000    XADLIN= 2000
0105    4501    LD320,  4501
0106    1200    LNLDG1, 1200
0107    0400    LHBIT,  0400
0110    4111    LDBIT,  4111
0111    4101    LD50,   4101
0112    4211    LDVBIT, 4211
0113    1400    LHVBIT, 1400
0114    0200    LNLDG0, 0200
0115    4301    LD0510, 4301
0116    1000    LNOLSC, 1000
0117    6133    ESCE,   6133
0120    4001    LDE05,  4001
0121    6011    LDE154, 6011
0122    5301    LD5310, 5301
0123    0000    LOOP,   0
0124    0000    FLAG,   0
0125    0000    KOUNT,  0
0126    0000    TEMP0,  0
0127    0000    TEMP1,  0
0130    0000    TEMP2,  0
0131    0000    TEMP3,  0
0132    0000    TEMPT,  0
0133    0000    TEMPT2, 0
0134    3130    XPT,    XXPT
0135    0000    TEMP,   0
0136    0000    TEMPC,  0
0137    0030    LAST,   0030            /LAST IOT - RECIEVER IOT SHOULD BE PLACED IN BITS 3-8
0140    0030    FIRST,  0030            /FIRST IOT - RECIEVER IOT SHOULD BE PUT IN BITS 3-8
0141    0000    VTNOW,  0000            /CURRENT IOT


        0200    PAGE
        0200    *200
0200    7300    START,  CLA CLL
0201    1140            TAD     FIRST           /GET FIRST RECIEVER IOT
0202    3141            DCA     VTNOW           /PLACE IT CURRENT IOT LOCATION
```

```
                                JMS I   CLEAN           /CLEAR SCREEN
                                DCA     PASS            /CLEAR END OF PASS COUNTER
                                JMS I   MSG             /PRINT HEADING
                                HEAD0
                        START2, JMS I   DELAY           /STALL TIME
                                TAD     (TSTLST         /GET START ADDRESS OF TEST LIST
                                DCA     TEMPT           /SAVE IT
                                DCA     LOOP


                                /CHANGE THE IOT'S
                                TAD     (IOTLST-1               /GET ADDRESS OF IOT LIST
                                DCA     A10
                        BACK,   TAD I   A10             /GET ELEMENT
                                DCA     TEMP
                                TAD I   TEMP                    /GET IOT
                                SNA
                                JMP     OUTB            /START OUTPUT IOTS
                                AND     (7007           /MASK BITS
                                TAD     VTNOW           /GET FIRST IOT
                                DCA I   TEMP            /STORE BACK IN ELEMENT
                                JMP     BACK            /REPEAT
                        OUTB,   NOP
                        BACKA,  TAD I   A10             /GET ELEMENT
                                DCA     TEMP
                                TAD I   TEMP            /GET IOT
                                SNA
                                JMP     OUTA            /FINISHED
                                AND     (7007           /MASK BITS
                                TAD     VTNOW           /GET IOT
                                TAD     (0010           /INCREMENT FOR TRANSMIT IOT
                                DCA I   TEMP            /STORE IT BACK
                                JMP     BACKA
                        OUTA,   NOP

                                /DISPLAY A GROWING HORIZONTAL LINE
                        TST1,   CLA CLL
                                JMS I   CLEAN                   /CLEAR SCREEN
                                JMS I   MSG
                                HEAD1
                                TAD     (BUFF1-1                /GET BEGINNING ADDRESS OF BUFFER
                                DCA     A10
                                TAD     ESCE                    /LOAD "01" ENTER CODE
                                DCA I   A10
                                TAD     LDE05                   /LOAD ENABLE 0
                                DCA I   A10
                                TAD     LDE154                  /LOAD ENALBE 1  + CLEAR GRAPH,LINES,CURSORS
                                DCA I   A10
                                TAD     LD50
                                DCA I   A10
                                TAD     LOBIT
                                DCA I   A10
                                TAD     LHBIT
                                DCA I   A10
```



```
                                TAD     ADDLIN          /LOAD THE STARTING DATA VALUE
                                DCA     BASE
                        TST1A,  JMS I   SHUFF           /GET DATA INTO VT55 FORMAT
                                NOP
                                DCA I   A10
                                ISZ     BASE            /UPDATE THE DATA
                                TAD     ADDLIN          /COMPARE DATA
                                TAD     MAXHOZ          /TO THE
                                CIA                     /LAST DATA
                                TAD     BASE            /LINE
                                SZA                     /LOOP UNTIL DONE
                                JMP     TST1A
                                NOP
                        TST1C,  NOP
                                NOP
                                NOP
                                DCA     BASE            /LOAD STARTING DATA VALUE TO REMOVE THE LINE
                        TST1B,  JMS I   SHUFF           /SHUFFEL THE DATA INTO VT55 FORMAT
                                NOP
                                DCA I   A10
                                ISZ     BASE            /INCREMENT THE DATA
                                TAD     MAXHOZ          /COMPARE THE DATA TO
                                CIA                     /LAST LINE
                                TAD     BASE
                                SZA                     /LOOP UNTIL DONE
                                JMP     TST1B
                                NOP
                                DCA I   A10
                                DCA I   A10
                                NOP
                                NOP
                                NOP
                                JMS I   PRNT            /DISPLAY
                                JMS I   DELAY           /DELAY
                                JMP I   LOOPT
                        4577
                        0010
                        7007
                        2226
                        3310
                PAGE
                /DISPLAY A GROWING VERTICAL LINE
                TST2,   CLA CLL
                        JMS I   CLEAN                   /CLEAR SCREEN
                        JMS I   MSG
                        HEAD2
                        TAD     (BUFF1-1                /GET BEGINNING ADDRESS OF BUFFER
                        DCA     A10
                        TAD     ESCE                    /LOAD "01" ENTER CODE
                        DCA I   A10
                        TAD     LDE05                   /LOAD ENABLE 0
                        DCA I   A10
                        TAD     LDE154                  /LOAD ENABLE 1+CLEAR GRAPH,LINES,CURSORS
                        DCA I   A10
                        TAD     LD50            /LOAD ENABLE 0 + LOAD DISPLAY ENABLE
```

```
                                DCA I   A10
                                TAD     LDVBIT          /LOAD ENABLE 1 + DISPLAY VERTICAL LINE
                                DCA I   A10
                                TAD     LHVBIT          /LOAD NOP AND VERTICAL LINE
                                DCA I   A10
                                TAD     MAXVRT          /LOAD THE
                                TAD     M1              /STARTING
                                TAD     ADDLIN          /DATA VALUE
                                DCA     BASE
                        TST2A,  JMS I   SHUFF           /SHUFFEL DATA INTO VT-55 FORMAT
                                DCA I   A10
                                TAD     BASE            /UPDATE THE DATA
                                TAD     M1
                                DCA     BASE
                                TAD     ADDLIN          /COMPARE DATA
                                CIA                     /TO LAST
                                TAD     BASE            /DATA ITEM
                                SZA                     /LOOP UNTIL DONE
                                JMP     TST2A
                                TAD     MAXVRT          /LOAD STARTING DATA VALUE TO REMOVE THE LINE
                                DCA     BASE
                        TST2B,  JMS I   SHUFF           /SHUFFEL THE DATA INTO VT55 FORMAT
                                DCA I   A10
                                TAD     BASE            /UPDATE THE DATA
                                TAD     M1
                                DCA     BASE
                                TAD     BASE
                                SZA                     /LOOP UNTIL DONE
                                JMP     TST2B
                                DCA I   A10             /LOAD TERMINATOR
                                JMS I   PRNT            /DISPLAY
                                JMS I   DELAY           /DELAY
                                JMP I   LOOPT
```



```
                        /GRAPH 0 DISPLAY A STEPPING HORIZONTAL LINE
0456  7300      TST3,   CLA CLL
0457  4423              JMS I   CLEAN                   /CLEAR SCREEN
0460  4427              JMS I   MSG             /PRINT HEADING
0461  3753              HEAD3
0462  1377              TAD     (BUFF1-1                /GET LIST POINTER
0463  3010              DCA     A10
0464  1117              TAD     ESCE            /LOAD "01" ENTER CODE
0465  3410              DCA I   A10
0466  1120              TAD     LDE05           /LOAD ENABLE 0
0467  3410              DCA I   A10
0470  1121              TAD     LDE154          /LOAD ENABLE 1 + CLEAR GRAPH,LINES,CURSORS
0471  3410              DCA I   A10
0472  3410              DCA I   A10             /LOAD TERMINATOR
0473  4430              JMS I   PRNT            /EXECUTE IT
0474  1376              TAD     (200
0475  3340              DCA     TST3C
0476  1377      TST3A,  TAD     (BUFF1-1        /GET LIST POINTER
0477  3010              DCA     A10
0500  1117              TAD     ESCE            /LOAD "01" ENTER CODE + ENABLE 0
0501  3410              DCA I   A10
0502  1115              TAD     LD0510          /LOAD ENABLE 0 + GRAPH 0 ON
0503  3410              DCA I   A10
0504  1116              TAD     LNOL8C          /LOAD NOP + STARTING COORDINATE
0505  3410              DCA I   A10
0506  3052              DCA     BASE            /GET BASE LINE
0507  4432              JMS I   SHUFF           /SHUFFLE INTO VT55 FORMAT
0510  3410              DCA I   A10
0511  1114              TAD     LNLDG0          /LOAD NOP + LOAD GRAPH
0512  3410              DCA I   A10
0513  1340              TAD     TST3C
0514  3052              DCA     BASE            /LOAD THE STARTING DATA VALUE
0515  1037              TAD     MAXVRT          /LOAD COUNTER
0516  7041              CIA
0517  3341              DCA     TST3D
0520  4432              JMS I   SHUFF           /SHUFFLE INTO VT55 FORMAT
0521  3135              DCA     TEMP            /SAVE THE LSB MSB BYTE
0522  1135      TST3B,  TAD     TEMP
0523  3410              DCA I   A10             /STORE IT IN BUFFER
0524  2341              ISZ     TST3D           /INCREMENT COUNTER
0525  5322              JMP     TST3B
0526  3410              DCA I   A10             /LOAD TERMINATOR
0527  4430              JMS I   PRNT            /EXECUTE IT
0530  1340              TAD     TST3C
0531  7010              RAR
0532  3340              DCA     TST3C           /CHANGE DATA VALUE
0533  1340              TAD     TST3C
0534  7640              SZA CLA
0535  5276              JMP     TST3A
0536  4433              JMS I   DELAY
0537  5425              JMP I   LOOPT
0540  0000      TST3C,  0
0541  0000      TST3D,  0
```

```
                0576  0200
                0577  4577
                      0600    PAGE
                              /GRAPH 1 DISPLAY A STEPPING HORIZONTAL LINE
                0600  7300    TST4,   CLA CLL
                0601  4423            JMS I   CLEAN           /CLEAR SCREEN
                0602  4427            JMS I   MSG             /PRINT HEADING
                0603  4004            HEAD4
                0604  1377            TAD     (BUFF1-1        /GET LIST POINTER
                0605  3010            DCA     A10
                0606  1117            TAD     ESCE            /LOAD "01" ENTER CODE AND ENABLE 0
                0607  3410            DCA I   A10
                0610  1120            TAD     LDE05           /LOAD ENABLE 1 + CLEAR GRAPH, LINES, + CURSORS
                0611  3410            DCA I   A10
                0612  1121            TAD     LDE154
                0613  3410            DCA I   A10
                0614  3410            DCA I   A10             /LOAD TERMINATOR
                0615  4430            JMS I   PRNT            /EXECUTE IT
                0616  1376            TAD     (200
                0617  3262            DCA     TST4C           /LOAD STARTING BASE LINE
                0620  1377    TST4A,  TAD     (BUFF1-1        /GET LIST POINTER
                0621  3010            DCA     A10
                0622  1117            TAD     ESCE            /LOAD "01" ENTER CODE AND ENABLE 0
                0623  3410            DCA I   A10
                0624  1105            TAD     LD520           /LOAD DISPLAY ENABLE + GRAPH 1 ON
                0625  3410            DCA I   A10
                0626  1116            TAD     LNOLSC          /LOAD NOP + STARTING COORDINATE
                0627  3410            DCA I   A10
                0630  3052            DCA     BASE            /GET BASE LINE
                0631  4432            JMS I   SHUFF           /SHUFFLE INTO VT55 FORMAT
                0632  3410            DCA I   A10
                0633  1106            TAD     LNLDG1          /LOAD NOP + LOAD GRAPH
                0634  3410            DCA I   A10
                0635  1262            TAD     TST4C
                0636  3052            DCA     BASE            /LOAD STARTING DATA VALUE
                0637  1037            TAD     MAXVRT
                0640  7041            CIA
                0641  3263            DCA     TST4D           /LOAD COUNTER
                0642  4432            JMS I   SHUFF           /SHUFFLE INTO VT55 FORMAT
                0643  3135            DCA     TEMP            /SAVE THE LSB MSB BYTE
                0644  1135    TST4B,  TAD     TEMP
                0645  3410            DCA I   A10
                0646  2263            ISZ     TST4D           /DONE FULL GRAPH?
                0647  5244            JMP     TST4B           /NO - REPEAT
                0650  3410            DCA I   A10             /YES - LOAD TERMINATOR
                0651  4430            JMS I   PRNT            /EXECUTE IT
                0652  1262            TAD     TST4C
                0653  7010            RAR
                0654  3262            DCA     TST4C
                0655  1262            TAD     TST4C
                0656  7640            SZA CLA
                0657  5220            JMP     TST4A
                0660  4433            JMS I   DELAY
                0661  5425            JMP I   LOOPT
                0662  0000    TST4C,  0
```



```
                0663  0000    TST4D,  0
                              /GRAPH 0 AND 1
                0664  7300    TST5,   CLA CLL
                0665  4423            JMS I   CLEAN           /CLEAR SCREEN
                0666  4427            JMS I   MSG             /PRINT HEADING
                0667  4035            HEAD5
                0670  1377            TAD     (BUFF1-1        /GET STARTING ADDRESS OF BUFFER
                0671  3010            DCA     A10
                0672  1117            TAD     ESCE            /LOAD ESCAPE CODE
                0673  3410            DCA I   A10
                0674  1120            TAD     LDE05           /LOAD ENABLE 0
                0675  3410            DCA I   A10
                0676  1121            TAD     LDE154          /LOAD DISABLE DISPLAY
                0677  3410            DCA I   A10
                0700  3410            DCA I   A10
                0701  4430            JMS I   PRNT            /EXECUTE, DISPLAY
                0702  4431            JMS I   UPDOWN          /LOAD DATA PATTERN
                0703  0202            LD0B1
                0704  0000            ZERO
                0705  4430            JMS I   PRNT            /EXECUTE IT
                0706  4431            JMS I   UPDOWN          /LOAD DATA PATTERN
                0707  0612            LD1B21
                0710  4354            BITMAX
                0711  4430            JMS I   PRNT            /EXECUTE IT
                0712  4433            JMS I   DELAY
                0713  5425            JMP I   LOOPT
                0776  0200
                0777  4577
                      1000    PAGE
                              /GRAPH 0 DISPLAY A STEPPING HISTOGRAM LINE
                1000  7300    TST6,   CLA CLL
                1001  4423            JMS I   CLEAN           /CLEAR SCREEN
                1002  4427            JMS I   MSG             /PRINT HEADING
                1003  4047            HEAD6
                1004  1377            TAD     (BUFF1-1        /GET STARTING ADDRESS OF BUFFER
                1005  3010            DCA     A10
                1006  1117            TAD     ESCE            /LOAD "01" ENTER CODE
                1007  3410            DCA I   A10
                1010  1120            TAD     LDE05           /LOAD ENABLE 0
                1011  3410            DCA I   A10
                1012  1121            TAD     LDE154          /LOAD ENABLE 1 + CLEAR GRAPH, LINES + CURSORS
                1013  3410            DCA I   A10
                1014  3410            DCA I   A10             /LOAD TERMINATOR
                1015  4430            JMS I   PRNT            /EXECUTE IT
                1016  1376            TAD     (200
                1017  3263            DCA     TST6D           /LOAD STARTING BASE LINE
                1020  1377    TST6C,  TAD     (BUFF1-1        /GET STARTING ADDRESS OF BUFFER
                1021  3010            DCA     A10
                1022  1117            TAD     ESCE            /LOAD "01" ENTER CODE
                1023  3410            DCA I   A10
                1024  1122            TAD     LD5310          /LOAD ENABLE 0, GRAPH 0, HISTOGRAM 0
                1025  3410            DCA I   A10
                1026  1116            TAD     LNOLSC          /LOAD NOP + STARTING COORDINATE
                1027  3410            DCA I   A10
```

```
 414   1030  3052            DCA     BASE            /GET BASE LINE
 415   1031  4432            JMS I   SHUFF           /SHUFFLE INTO VT55 FORMAT
 416   1032  3410            DCA I   A10
 417   1033  1114            TAD     LNLDG0          /LOAD NOP AND LOAD GRAPH
 418   1034  3410            DCA I   A10
 419   1035  1263            TAD     TST6D
 420   1036  3052            DCA     BASE            /LOAD THE STARTING DATA VALUE
 421   1037  1037            TAD     MAXVRT
 422   1040  7041            CIA
 423   1041  3262            DCA     TST6E           /LOAD COUNTER
 424   1042  4432            JMS I   SHUFF           /SHUFFLE INTO VT55 FORMAT
 425   1043  3135            DCA     TEMP
 426   1044  1135  TST6F,    TAD     TEMP
 427   1045  3410            DCA I   A10             /SAVE THE LSB MSB BYTE
 428   1046  2262            ISZ     TST6E           /DONE FULL GRAPH?
 429   1047  5244            JMP     TST6F           /NO - REPEAT
 430   1050  3410            DCA I   A10             /YES - LOAD TERMINATOR
 431   1051  4430            JMS I   PRNT            /EXECUTE IT
 432   1052  1263            TAD     TST6D
 433   1053  7010            RAR
 434   1054  3263            DCA     TST6D           /CHANGE DATA VALUE
 435   1055  1263            TAD     TST6D
 436   1056  7440            SZA
 437   1057  5220            JMP     TST6C
 438   1060  4433            JMS I   DELAY
 439   1061  5425            JMP I   LOOPT
 440   1062  0000  TST6E,    0
 441   1063  0000  TST6D,    0
 442
 443                 /GRAPH 1 DISPLAY A STEPPING HISTOGRAM LINE
 444   1064  7300  TST7,     CLA CLL
 445   1065  4423            JMS I   CLEAN           /CLEAR SCREEN
 446   1066  4427            JMS I   MSG             /PRINT HEADING
 447   1067  4077            HEAD7
 448   1070  1377            TAD     (BUFF1-1        /GET STARTING ADDRESS OF FIRST BUFFER
 449   1071  3010            DCA     A10
 450   1072  1117            TAD     ESCE            /LOAD "01" ENTER CODE
 451   1073  3410            DCA I   A10
 452   1074  1120            TAD     LDE05           /LOAD ENABLE 0
 453   1075  3410            DCA I   A10
 454   1076  1121            TAD     LDE154          /LOAD ENABLE 1 + CLEAR GRAPH, LINES + CURSORS
 455   1077  3410            DCA I   A10
 456   1100  3410            DCA I   A10             /LOAD TERMINATOR
 457   1101  4430            JMS I   PRNT            /EXECUTE IT
 458   1102  1376            TAD     (200
 459   1103  3346            DCA     TST7C           /LOAD STARTING BASE LINE
 460   1104  1377  TST7A,    TAD     (BUFF1-1        /GET STARTING ADDRESS OF BUFFER
 461   1105  3010            DCA     A10
 462   1106  1117            TAD     ESCE            /LOAD "01" ENTER CODE
 463   1107  3410            DCA I   A10
 464   1110  1103            TAD     LD5420          /LOAD ENABLE 0, DISPLAY ENABLE + GRAPH 1
 465   1111  3410            DCA I   A10
 466   1112  1116            TAD     LNOLSC          /LOAD NOP + STARTING COORDINATE
 467   1113  3410            DCA I   A10
 468   1114  3052            DCA     BASE            /GET BASE LINE
```



```
 469   1115  4432            JMS I   SHUFF           /SHUFFLE INTO VT55 FORMAT
 470   1116  3410            DCA I   A10
 471   1117  1106            TAD     LNLDG1          /LOAD NOP + LOAD GRAPH
 472   1120  3410            DCA I   A10
 473   1121  1346            TAD     TST7C
 474   1122  3052            DCA     BASE            /LOAD THE STARTING DATA VALUE
 475   1123  1037            TAD     MAXVRT
 476   1124  7041            CIA
 477   1125  3347            DCA     TST7D           /LOAD COUNTER
 478   1126  4432            JMS I   SHUFF           /SHUFFLE INTO VT55 FORMAT
 479   1127  3135            DCA     TEMP
 480   1130  1135  TST7B,    TAD     TEMP
 481   1131  3410            DCA I   A10             /SAVE THE LSB MSB BYTE
 482   1132  2347            ISZ     TST7D           /DONE FULL GRAPH?
 483   1133  5330            JMP     TST7B           /NO - REPEAT
 484   1134  3410            DCA I   A10             /YES - LOAD TERMINATOR
 485   1135  4430            JMS I   PRNT            /EXECUTE IT
 486   1136  1346            TAD     TST7C
 487   1137  7010            RAR
 488   1140  3346            DCA     TST7C           /CHANGE DATA VALUE
 489   1141  1346            TAD     TST7C
 490   1142  7640            SZA CLA
 491   1143  5304            JMP     TST7A
 492   1144  4433            JMS I   DELAY
 493   1145  5425            JMP I   LOOPT
 494   1146  0000  TST7C,    0
 495   1147  0000  TST7D,    0
 496   1176  0200
 497   1177  4577
             1200  PAGE
 498
 499                 /HISTOGRAM ON GRAPH 0 AND 1
 500   1200  7300  TST10,    CLA CLL
 501   1201  4423            JMS I   CLEAN           /CLEAR SCREEN
 502   1202  4427            JMS I   MSG             /PRINT HEADING
 503   1203  4127            HEAD10
 504   1204  1377            TAD     (BUFF1-1        /GET STARTING ADDRESS OF BUFFER
 505   1205  3010            DCA     A10
 506   1206  1117            TAD     ESCE            /LOAD "01" ENTER CODE
 507   1207  3410            DCA I   A10
 508   1210  1120            TAD     LDE05           /LOAD ENABLE 0
 509   1211  3410            DCA I   A10
 510   1212  1121            TAD     LDE154          /LOAD ENABLE 1 + CLEAR GRAPH, LINES + CURSORS
 511   1213  3410            DCA I   A10
 512   1214  3410            DCA I   A10             /LOAD TERMINATOR
 513   1215  4430            JMS I   PRNT            /EXECUTE IT
 514   1216  4431            JMS I   UPDOWN          /LOAD DATA PATTERN
 515   1217  1202            1202
 516   1220  0000            0
 517   1221  4430            JMS I   PRNT            /EXECUTE IT
 518   1222  4431            JMS I   UPDOWN          /LOAD DATA PATTERN
 519   1223  3612            LD1B36
 520   1224  4354            BITMAX
 521   1225  4430            JMS I   PRNT            /EXECUTE IT
 522   1226  4433            JMS I   DELAY
```

```
 523   1227  5425          JMP I   LOOPT
 524
 525                 /CURSORS ON GRAPH 0
 526   1230  7300  TST11,  CLA CLL
 527   1231  4423          JMS I   CLEAN           /CLEAR SCREEN
 528   1232  4427          JMS I   MSG             /PRINT HEADING
 529   1233  4150          HEAD11
 530   1234  1377          TAD     (BUFF1-1        /GET STARTING ADDRESS OF BUFFER
 531   1235  3010          DCA     A10
 532   1236  1117          TAD     ESCE            /LOAD "01" ENTER CODE
 533   1237  3410          DCA I   A10
 534   1240  1120          TAD     LDE05           /LOAD ENABLE 0
 535   1241  3410          DCA I   A10
 536   1242  1121          TAD     LDE154          /LOAD ENABLE 1 + CLEAR GRAPH, LINES + CURSORS
 537   1243  3410          DCA I   A10
 538   1244  3410          DCA I   A10             /LOAD TERMINATOR
 539   1245  4430          JMS I   PRNT            /EXECUTE IT
 540   1246  4431          JMS I   UPDOWN          /LOAD DATA PATTERN
 541   1247  0202          LD081
 542   1250  0000          ZERO
 543   1251  4430          JMS I   PRNT            /EXECUTE IT
 544   1252  4434          JMS I   CURSOR
 545   1253  0403          403
 546   1254  2000          XADLIN
 547   1255  4430          JMS I   PRNT            /EXECUTE IT
 548   1256  4434          JMS I   CURSOR          /ENABLE CURSORS
 549   1257  0403          403
 550   1260  4000          BIT15
 551   1261  4430          JMS I   PRNT            /EXECUTE IT
 552   1262  4433          JMS I   DELAY
 553   1263  5425          JMP I   LOOPT
 554
 555
 556                 /CURSORS ON GRAPH 1
 557   1264  7300  TST12,  CLA CLL
 558   1265  4423          JMS I   CLEAN           /CLEAR SCREEN
 559   1266  4427          JMS I   MSG             /PRINT HEADER
 560   1267  4165          HEAD12
 561   1270  1377          TAD     (BUFF1-1        /GET STARTING ADDRESS OF BUFFER
 562   1271  3010          DCA     A10
 563   1272  1117          TAD     ESCE            /LOAD "01" ENTER CODE
 564   1273  3410          DCA I   A10
 565   1274  1120          TAD     LDE05           /LOAD ENABLE 0
 566   1275  3410          DCA I   A10
 567   1276  1121          TAD     LDE154          /LOAD ENABLE 1 + CLEAR GRAPH, LINES + CURSORS
 568   1277  3410          DCA I   A10
 569   1300  3410          DCA I   A10             /LOAD TERMINATOR
 570   1301  4430          JMS I   PRNT            /EXECUTE IT
 571   1302  4431          JMS I   UPDOWN          /LOAD DATA PATTERN
 572   1303  0412          LDG182
 573   1304  4354          BITMAX
 574   1305  4430          JMS I   PRNT            /EXECUTE IT
 575   1306  4434          JMS I   CURSOR          /ENABLE CURSORS
 576   1307  1013          1013
 577   1310  2000          XADLIN
```



```
 578   1311  4430          JMS I   PRNT            /EXECUTE IT
 579   1312  4434          JMS I   CURSOR          /ENABLE CURSORS
 580   1313  1013          1013
 581   1314  4000          BIT15
 582   1315  4430          JMS I   PRNT            /EXECUTE IT
 583   1316  4433          JMS I   DELAY
 584   1317  5425          JMP I   LOOPT
 585
 586
 587   1377  4577
             1400    PAGE
 588                 /TEST STARTING COORDINATE ON GRAPH 0
 589   1400  7300  TST13,  CLA CLL
 590   1401  4423          JMS I   CLEAN           /CLEAR SCREEN
 591   1402  4427          JMS I   MSG             /PRINT HEADER
 592   1403  4201          HEAD13
 593   1404  1377          TAD     (BUFF1-1        /GET STARTING ADDRESS OF BUFFER
 594   1405  3010          DCA     A10
 595   1406  1117          TAD     ESCE            /LOAD "01" ENTER CODE
 596   1407  3410          DCA I   A10
 597   1410  1120          TAD     LDE05           /LOAD ENABLE 0
 598   1411  3410          DCA I   A10
 599   1412  1121          TAD     LDE154          /LOAD ENABLE 1 + CLEAR GRAPH, LINES + CURSORS
 600   1413  3410          DCA I   A10
 601   1414  3410          DCA I   A10             /LOAD TERMINATOR
 602   1415  4430          JMS I   PRNT            /EXECUTE IT
 603   1416  4431          JMS I   UPDOWN          /LOAD DATA PATTERN
 604   1417  0202          LD081
 605   1420  0000          ZERO
 606   1421  4430          JMS I   PRNT            /EXECUTE IT
 607   1422  1376          TAD     (-4
 608   1423  3060          DCA     REG3            /LOAD SINE COUNTER
 609   1424  1037          TAD     MAXVRT
 610   1425  3061          DCA     REG4            /LOAD STARTING COORDINATE
 611   1426  1377  TST13E, TAD     (SINEND         /LOAD SINE POINTER
 612   1427  3057          DCA     REG0
 613   1430  1057  TST13D, TAD     REG0
 614   1431  1022          TAD     M1
 615   1432  3057          DCA     REG0
 616   1433  1457          TAD I   REG0            /GET VALUE FROM TABLE, SINE DATA WORD
 617   1434  3244          DCA     TST13A
 618   1435  1457          TAD I   REG0
 619   1436  7650          SNA CLA
 620   1437  5253          JMP     TST13C          /BRANCH IF NO MORE DATA
 621   1440  1061          TAD     REG4
 622   1441  3245          DCA     TST13B
 623   1442  4435          JMS I   STCORD          /LOAD DATA INTO BUFFER
 624   1443  0202          LD081
 625   1444  0000  TST13A, ZERO
 626   1445  0000  TST13B, ZERO
 627   1446  4430          JMS I   PRNT            /EXECUTE IT
 628   1447  1061          TAD     REG4
 629   1450  1022          TAD     M1
 630   1451  3061          DCA     REG4
 631   1452  5230          JMP     TST13D          /REPEAT UNTIL FINISHED DATA BUFFER
```

```
 632   1453  2060   TST13C, ISZ     REG3
 633   1454  5226           JMP     TST13E
 634   1455  4433           JMS I   DELAY
 635   1456  5425           JMP I   LOOPT
 636
 637                  /TEST STARTING COORDINATE ON GRAPH 1
 638   1457  7300   TST14,  CLA CLL
 639   1460  4423           JMS I   CLEAN           /CLEAR SCREEN
 640   1461  4427           JMS I   MSG             /PRINT HEADING
 641   1462  4224           HEAD14
 642   1463  1377           TAD     (BUFF1-1        /GET STARTING ADDRESS OF BUFFER
 643   1464  3010           DCA     A10
 644   1465  1117           TAD     ESCE            /LOAD "01" ENTER CODE
 645   1466  3410           DCA I   A10
 646   1467  1120           TAD     LDE05           /LOAD ENABLE 0
 647   1470  3410           DCA I   A10
 648   1471  1121           TAD     LDE154          /LOAD ENABLE 1 + CLEAR GRAPH, LINES + CURSORS
 649   1472  3410           DCA I   A10
 650   1473  3410           DCA I   A10             /LOAD TERMINATOR
 651   1474  4430           JMS I   PRNT            /EXECUTE IT
 652   1475  4431           JMS I   UPDOWN          /LOAD DATA PATTERN
 653   1476  0412           LDG182
 654   1477  0000           ZERO
 655   1500  4430           JMS I   PRNT            /EXECUTE IT
 656   1501  1376           TAD     (-4
 657   1502  3060           DCA     REG3            /LOAD SINE COUNTER
 658   1503  1037           TAD     MAXVRT
 659   1504  3061           DCA     REG4            /LOAD STARTING COORDINATE
 660   1505  1377   TST14E, TAD     (SINEND         /LOAD SINE POINTER
 661   1506  3057           DCA     REG0
 662   1507  1057   TST14D, TAD     REG0
 663   1510  1022           TAD     M1
 664   1511  3057           DCA     REG0
 665   1512  1457           TAD I   REG0            /GET VALUE FROM TABLE, SINE DATA WORD
 666   1513  3323           DCA     TST14A
 667   1514  1457           TAD I   REG0
 668   1515  7650           SNA CLA
 669   1516  5332           JMP     TST14C          /BRANCH IF NO MORE DATA
 670   1517  1061           TAD     REG4
 671   1520  3324           DCA     TST14B
 672   1521  4435           JMS I   STCORD          /LOAD DATA INTO BUFFER
 673   1522  1204           LDG124
 674   1523  0000   TST14A, ZERO
 675   1524  0000   TST14B, ZERO
 676   1525  4430           JMS I   PRNT            /EXECUTE IT
 677   1526  1061           TAD     REG4
 678   1527  1022           TAD     M1
 679   1530  3061           DCA     REG4
 680   1531  5307           JMP     TST14D          /REPEAT UNTIL FINISHED DATA BUFFER
 681   1532  2060   TST14C, ISZ     REG3
 682   1533  5305           JMP     TST14E
 683   1534  4433           JMS I   DELAY
 684   1535  5425           JMP I   LOOPT
 685
 686   1576  7774
```



```
 687   1577  4577
               1600   PAGE
 688
 689                  /VT55 ADJUSTMENT PATTERN
 690   1600  7300   TST15,  CLA CLL
 691   1601  4423           JMS I   CLEAN           /CLEAR SCREEN
 692   1602  4427           JMS I   MSG             /PRINT HEADING
 693   1603  4246           HEAD15
 694                  /FILL SCREEN WIHT H CHARACTER
 695   1604  7200           CLA
 696   1605  1377           TAD     (-14
 697   1606  3061           DCA     REG4
 698   1607  1376           TAD     (BUFF1-1        /GET STARTING ADDRESS OF BUFFER
 699   1610  3010           DCA     A10
 700   1611  1117           TAD     ESCE            /LOAD "01" ENTER CODE
 701   1612  3410           DCA I   A10
 702   1613  1120           TAD     LDE05           /LOAD ENABLE 0
 703   1614  3410           DCA I   A10
 704   1615  1121           TAD     LDE154          /LOAD ENABLE 1 + CLEAR GRAPH, LINES + CURSORS
 705   1616  3410           DCA I   A10
 706   1617  1077           TAD     ESCF            /LOAD "02" EXIT CODE
 707   1620  3410           DCA I   A10
 708   1621  3410           DCA I   A10             /LOAD TERMINATOR
 709   1622  4430           JMS I   PRNT            /EXECUTE IT
 710   1623  4470   TST15B, JMS I   CRLF
 711   1624  4470           JMS I   CRLF
 712   1625  1375           TAD     (-120
 713   1626  3062           DCA     REG5            /LOAD COUNTER
 714   1627  1374   TST15A, TAD     (310            /LOAD ASCII "H"
 715   1630  4467           JMS I   PRINT           /PRINT IT
 716   1631  2062           ISZ     REG5            /FINISHED LINE?
 717   1632  5227           JMP     TST15A          /NO - REPEAT
 718   1633  2061           ISZ     REG4
 719   1634  5223           JMP     TST15B
 720   1635  5773*          JMP     TST15E
 721
 722   1773  2000
 723   1774  0310
 724   1775  7660
 725   1776  4577
 726   1777  7764
               2000   PAGE
 727                  /NOW INSTALL THE HORIZONTAL LINES
 728   2000  7200   TST15E, CLA
 729   2001  1377           TAD     (BUFF1-1        /GET STARTING ADDRESS OF BUFFER
 730   2002  3010           DCA     A10
 731   2003  1117           TAD     ESCE            /LOAD "01" ENTER CODE
 732   2004  3410           DCA I   A10
 733   2005  1120           TAD     LDE05           /LOAD ENABLE 0
 734   2006  3410           DCA I   A10
 735   2007  1121           TAD     LDE154          /LOAD ENABLE 1 + CLEAR GRAPH,LINES,CURSORS
 736   2010  3410           DCA I   A10
 737   2011  1117           TAD     ESCE            /LOAD "01" ENTER CODE
 738   2012  3410           DCA I   A10
 739   2013  1111           TAD     LD50            /LOAD ENABLE 0 + DISPLAY ENABLE
```

```
 740   2014  3410          DCA I   A10
 741   2015  1101          TAD     LDE510          /LOAD ENABLE 1 + HORIZONTAL + VERTICAL LINES
 742   2016  3410          DCA I   A10
 743   2017  1102          TAD     LNOLHV          /LOAD NOP + HORIZONTAL LINES
 744   2020  3410          DCA I   A10
 745   2021  1036          TAD     ADDLIN
 746   2022  1376          TAD     (2
 747   2023  3052          DCA     BASE            /LOAD BASE LINE VALUE
 748   2024  4432  TST15C, JMS I   SHUFF           /SHUFFLE THE DATA INTO VT55 FORMAT
 749   2025  3410          DCA I   A10
 750   2026  1052          TAD     BASE
 751   2027  1375          TAD     (24
 752   2030  3052          DCA     BASE            /UPDATE BASELINE VALUE
 753   2031  1036          TAD     ADDLIN
 754   2032  1374          TAD     (340
 755   2033  7041          CIA
 756   2034  1052          TAD     BASE
 757   2035  7710          SPA  CLA                /TEST FOR GREATER THAN VALID
 758   2036  5224          JMP     TST15C          /BRANCH IF OK,
 759   2037  3410          DCA I   A10             /LOAD TERMINATOR
 760   2040  4430          JMS I   PRNT            /EXECUTE IT
 761
 762                       /NOW LOAD THE VERTICAL LINES
 763   2041  1377          TAD     (BUFF1-1        /GET STARTING ADDRESS OF BUFFER
 764   2042  3010          DCA     A10
 765   2043  1117          TAD     ESCE            /LOAD "01" ENTER CODE
 766   2044  3410          DCA I   A10
 767   2045  1113          TAD     LHVBIT          /LOAD VERTICAL LINE
 768   2046  3410          DCA I   A10
 769   2047  1036          TAD     ADDLIN          /LOAD STARTING LINE
 770   2050  3052          DCA     BASE
 771   2051  4432  TST15D, JMS I   SHUFF           /SHUFFLE INTO VT55 FORMAT
 772   2052  3410          DCA I   A10
 773   2053  1052          TAD     BASE
 774   2054  1373          TAD     (15
 775   2055  3052          DCA     BASE            /UPDATE DATA
 776   2056  1036          TAD     ADDLIN
 777   2057  1372          TAD     (1000
 778   2060  7041          CIA
 779   2061  1052          TAD     BASE
 780   2062  7710          SPA  CLA                /TEST FOR LAST DATA LINE
 781   2063  5251          JMP     TST15D          /NOT FINISHED, REPEAT
 782   2064  1036          TAD     ADDLIN
 783   2065  1371          TAD     (777
 784   2066  3052          DCA     BASE            /LOAD LAST DATA LINE
 785   2067  4432          JMS I   SHUFF           /SHUFFLE INTO VT55 FORMAT
 786   2070  3410          DCA I   A10
 787   2071  3410          DCA I   A10             /LOAD TERMINATOR
 788   2072  4430          JMS I   PRNT            /EXECUTE IT
 789   2073  4433          JMS I   DELAY
 790   2074  5425          JMP I   LOOPT
 791
 792   2171  0777
 793   2172  1000
 794   2173  0015
```



```
 795   2174  0340
 796   2175  0024
 797   2176  0002
 798   2177  4577
               2200    PAGE
 799                   /END OF PASS ROUTINE
 800   2200  4423  TLAST, JMS I   CLEAN           /CLEAR SCREEN
 801   2201  1141          TAD     VTNOW           /GET CURRENT IOT
 802   2202  7041          CIA
 803   2203  1137          TAD     LAST            /IS IR =LAST?
 804   2204  7650          SNA CLA
 805   2205  5212          JMP     TOUT            /YES=REPEAT TEST
 806   2206  1141          TAD     VTNOW           /NO
 807   2207  1377          TAD     (0100           /INCREMENT TO
 808   2210  3141          DCA     VTNOW           /NEXT IOT
 809   2211  5776*         JMP     START2          /REPEAT TEST
 810   2212  1140  TOUT,   TAD     FIRST           /GET FIRST RECIEVER IOT
 811   2213  3141          DCA     VTNOW           /PLAC EIT IN CURRENT IOT LOCATION
 812   2214  4427          JMS I   MSG             /PRINT END OF PASS MESSAGE
 813   2215  4346          EOPASS
 814   2216  2054          ISZ     PASS            /INCREMNENT PASS COUNT NUMBER
 815   2217  1054          TAD     PASS            /GET PASS NUMBER
 816   2220  4466          JMS I   MESS            /PRINT IT
 817   2221  4470          JMS I   CRLF            /PRINT CR, LF
 818   2222  7604          LAS
 819   2223  0375          AND     (400            /HALT ON COMPLETION OF PROGRAM PASS?
 820   2224  7640          SZA CLA
 821   2225  7402          HLT                     /YES
 822   2226  5776*         JMP     START2          /NO=REPEAT TEST
 823
 824   2227  3460  IOTLST, VKSF
 825   2230  3264          VKRB
 826   2231  3224          XKEYA
 827   2232  0000          0
 828   2233  3453          VTLS
 829   2234  3454          VTSF
 830   2235  3456          VTCF
 831   2236  0000          0
 832
 833
 834
 835
 836
 837
 838
 839                   /SHUFFLE DATA INTO VT-55 DATA BYTE FORMAT
 840   2237  0000  XSHUFF, 0
 841   2240  7300          CLA CLL
 842   2241  1052          TAD     BASE            /LOAD VALUE TO BE SHUFFLED
 843   2242  3053          DCA     BASE1
 844   2243  1053          TAD     BASE1
 845   2244  0374          AND     (37             /MARK OUT VALID BITS
 846   2245  1373          TAD     (40
 847   2246  3053          DCA     BASE1           /LOW SIGNIFICANT BITS
 848   2247  7000          NOP
```

```
 849    2250  7000            NOP
 850    2251  7000            NOP
 851    2252  7000            NOP
 852    2253  1052            TAD     BASE
 853    2254  0372            AND     (740            /MASK OUT 4 MSB
 854    2255  7000            NOP
 855    2256  7000            NOP
 856    2257  7000            NOP
 857    2260  7104            RAL CLL                 /ROTATE LEFT
 858    2261  1371            TAD     (4000
 859    2262  1053            TAD     BASE1           /PUT HIGH + LOW BYTES TOGETHER
 860    2263  3130            DCA     TEMP2
 861    2264  1052            TAD     BASE
 862    2265  0370            AND     (2000           /CHECK ADD OR DELETE BIT
 863    2266  7650            SNA CLA
 864    2267  5273            JMP     XSHUFA
 865    2270  1130            TAD     TEMP2
 866    2271  1370            TAD     (2000
 867    2272  3130            DCA     TEMP2
 868    2273  1130  XSHUFA, TAD     TEMP2
 869    2274  5637            JMP I   XSHUFF
 870
 871    2370  2000
 872    2371  4000
 873    2372  0740
 874    2373  0040
 875    2374  0037
 876    2375  0400
 877    2376  0207
 878    2377  0100
               2400    PAGE
 879                   /UP-DOWN SUBROUTINE
 880    2400  0000    XUPDON, 0
 881    2401  1600            TAD I   XUPDON          /GET ADDRESS OF BEGINNING OF LIST
 882    2402  3272            DCA     SAV1
 883    2403  2200            ISZ     XUPDON
 884    2404  1600            TAD I   XUPDON          /GET STARTING COORDINATE
 885    2405  3273            DCA     SAV2
 886    2406  2200            ISZ     XUPDON
 887    2407  1377            TAD     (BUFF1-1
 888    2410  3010            DCA     A10
 889    2411  1117            TAD     ESCE
 890    2412  3410            DCA I   A10
 891    2413  1272            TAD     SAV1
 892    2414  0376            AND     (3700
 893    2415  1111            TAD     LD50
 894    2416  3410            DCA I   A10
 895    2417  1375            TAD     (1
 896    2420  3271            DCA     SAV0
 897    2421  1116            TAD     LNOL8C
 898    2422  3410            DCA I   A10
 899    2423  3052            DCA     BASE
 900    2424  4432            JMS I   SHUFF
 901    2425  3410            DCA I   A10
 902    2426  1272            TAD     SAV1
```



```
 903    2427  7006            RTL
 904    2430  7006            RTL
 905    2431  7006            RTL
 906    2432  0374            AND     (7700
 907    2433  3410            DCA I   A10
 908    2434  1273    UPC,    TAD     SAV2
 909    2435  3052            DCA     BASE
 910    2436  4432    UPB,    JMS I   SHUFF
 911    2437  3410            DCA I   A10
 912    2440  1273            TAD     SAV2
 913    2441  7700            SMA CLA
 914    2442  5253            JMP     UPA
 915    2443  1052            TAD     BASE
 916    2444  1022            TAD     M1
 917    2445  0373            AND     (377
 918    2446  3052            DCA     BASE
 919    2447  1052            TAD     BASE
 920    2450  7650            SNA CLA
 921
 922    2451  5261            JMP     UPD
 923    2452  5236            JMP     UPB
 924    2453  2052    UPA,    ISZ     BASE
 925    2454  1052            TAD     BASE
 926    2455  7041            CIA
 927    2456  1040            TAD     MAXHOZ
 928    2457  7640            SZA CLA
 929    2460  5236            JMP     UPB
 930    2461  1271    UPD,    TAD     SAV0
 931    2462  1022            TAD     M1
 932    2463  3271            DCA     SAV0
 933    2464  1271            TAD     SAV0
 934    2465  7700            SMA  CLA
 935    2466  5234            JMP     UPC
 936    2467  3410            DCA I   A10
 937    2470  5600            JMP I   XUPDON
 938    2471  0000    SAV0,   0
 939    2472  0000    SAV1,   0
 940    2473  0000    SAV2,   0
 941    2573  0377
 942    2574  7700
 943    2575  0001
 944    2576  3700
 945    2577  4577
               2600    PAGE
 946
 947                   /CURSOR SUBROUTINE
 948    2600  0000    XCURSR, 0
 949    2601  7300            CLA CLL
 950    2602  1600            TAD I   XCURSR          /GET ARGUMENT WORD
 951    2603  3265            DCA     CR1
 952    2604  2200            ISZ     XCURSR
 953    2605  1600            TAD I   XCURSR
 954    2606  3266            DCA     CR2
 955    2607  2200            ISZ     XCURSR
 956    2610  1377            TAD     (BUFF1-1
```

```
 957    2611  3010            DCA     A10
 958    2612  1117            TAD     ESCE
 959    2613  3410            DCA I   A10
 960    2614  1265            TAD     CR1
 961    2615  0376            AND     (3700
 962    2616  1074            TAD     LD4011
 963    2617  3410            DCA I   A10
 964    2620  1116            TAD     LNOLSC
 965    2621  3410            DCA I   A10
 966    2622  3052            DCA     BASE
 967    2623  4432            JMS I   SHUFF
 968    2624  3410            DCA I   A10
 969    2625  1265            TAD     CR1
 970    2626  7006            RTL
 971    2627  7006            RTL
 972    2630  7006            RTL
 973    2631  0375            AND     (7700
 974    2632  3410            DCA I   A10
 975    2633  1266            TAD     CR2
 976    2634  3052            DCA     BASE
 977    2635  4432    CRC,    JMS I   SHUFF
 978    2636  3410            DCA I   A10
 979    2637  1266            TAD     CR2
 980    2640  7740            SMA SZA CLA
 981    2641  5254            JMP     CRA
 982    2642  1052            TAD     BASE
 983    2643  1022            TAD     M1
 984    2644  3052            DCA     BASE
 985    2645  1052            TAD     BASE
 986    2646  0374            AND     (777
 987    2647  3052            DCA     BASE
 988    2650  1052            TAD     BASE
 989    2651  7650            SNA CLA
 990    2652  5263            JMP     CRB
 991    2653  5235            JMP     CRC
 992    2654  2052    CRA,    ISZ     BASE
 993    2655  1036            TAD     ADDLIN
 994    2656  1037            TAD     MAXVRT
 995    2657  7041            CIA
 996    2660  1052            TAD     BASE
 997    2661  7640            SZA CLA
 998    2662  5235            JMP     CRC
 999    2663  3410    CRB,    DCA I   A10
1000    2664  5600            JMP I   XCURSR
1001    2665  0000    CR1,    0
1002    2666  0000    CR2,    0
1003
1004    2774  0777
1005    2775  7700
1006    2776  3700
1007    2777  4577
              3000    PAGE
1008                  /PROGRAM DELAY ROUTINE
1009    3000  0000    XDELAY, 0
1010    3001  7604            LAS
```



```
1011    3002  0377            AND     (40             /INHIBIT DELAY?
1012    3003  7640            SZA CLA
1013    3004  5214            JMP     XDELA           /YES-SKIP OVER DELAY
1014    3005  1376            TAD     (-400
1015    3006  3126            DCA     TEMP0
1016    3007  3127            DCA     TEMP1
1017    3010  2127            ISZ     TEMP1           /DELAY
1018    3011  5210            JMP     .-1
1019    3012  2126            ISZ     TEMP0           /DELAY
1020    3013  5210            JMP     .-3
1021    3014  5600    XDELA,  JMP I   XDELAY          /RETURN
1022
1023
1024                  /ROUTINE TO CLEAR SCREEN
1025    3015  0000    XCLEAN, 0
1026    3016  7300            CLA CLL
1027    3017  1375            TAD     (BUFF1-1                /GET STARTING ADDRESS OF BUFFER
1028    3020  3010            DCA     A10
1029    3021  1077            TAD     ESCF                    /GET OUT OF GRAPHIC MODE
1030    3022  3410            DCA I   A10
1031    3023  1075            TAD     ESCH                    /HOME CURSOR
1032    3024  3410            DCA I   A10
1033    3025  1076            TAD     ESCJ                    /CLEAR SCREEN OF ASCII
1034    3026  3410            DCA I   A10
1035    3027  3410            DCA I   A10                     /LOAD TERMINATOR
1036    3030  4430            JMS I   PRNT                    /EXECUTE
1037    3031  5615            JMP I   XCLEAN                  /RETURN
1038
1039
1040                  /STARTING COORDINATE SUBROUTINE
1041    3032  0000    XSTCRD, 0
1042    3033  7300            CLA CLL
1043    3034  1632            TAD I   XSTCRD
1044    3035  3300            DCA     ST1
1045    3036  2232            ISZ     XSTCRD
1046    3037  1632            TAD I   XSTCRD
1047    3040  3301            DCA     ST2
1048    3041  2232            ISZ     XSTCRD
1049    3042  1632            TAD I   XSTCRD
1050    3043  3277            DCA     ST0
1051    3044  2232            ISZ     XSTCRD
1052    3045  1375            TAD     (BUFF1-1
1053    3046  3010            DCA     A10
1054    3047  1117            TAD     ESCE
1055    3050  3410            DCA I   A10
1056    3051  1300            TAD     ST1
1057    3052  7006            RTL
1058    3053  7006            RTL
1059    3054  7006            RTL
1060    3055  0374            AND     (7700
1061    3056  1111            TAD     LD50
1062    3057  3410            DCA I   A10
1063
1064    3060  1116            TAD     LNOLSC
1065    3061  3410            DCA I   A10
```

```
1066    3062  1277            TAD     ST0
1067    3063  3052            DCA     BASE
1068    3064  4432            JMS I   SHUFF
1069    3065  3410            DCA I   A10
1070    3066  1300            TAD     ST1
1071    3067  0374            AND     (7700
1072    3070  3410            DCA I   A10
1073    3071  1301            TAD     ST2
1074    3072  3052            DCA     BASE
1075    3073  4432            JMS I   SHUFF
1076    3074  3410            DCA I   A10
1077    3075  3410            DCA I   A10
1078    3076  5632            JMP I   XSTCRD
1079    3077  0000    ST0,    0
1080    3100  0000    ST1,    0
1081    3101  0000    ST2,    0
1082                    /DISPLAY SUBROUTINE
1083    3102  0000    XPRNT,  0
1084    3103  7300            CLA CLL
1085    3104  1375            TAD     (BUFF1-1
1086    3105  3010            DCA     A10
1087    3106  1410    XPRNTA, TAD I   A10
1088    3107  7450            SNA
1089    3110  5702            JMP I   XPRNT
1090    3111  3056            DCA     REG1
1091    3112  1056            TAD     REG1
1092    3113  0373            AND     (77
1093    3114  3130            DCA     TEMP2           /SAVE IT
1094    3115  1056            TAD     REG1
1095    3116  0374            AND     (7700           /GET UPPER BYTE
1096    3117  7012            RTR
1097    3120  7012            RTR
1098    3121  7012            RTR                     /ROTATE IT OVER
1099    3122  3127            DCA     TEMP1
1100    3123  1130    XPRNTG, TAD     TEMP2
1101    3124  4534            JMS I   XPT
1102    3125  1127            TAD     TEMP1
1103    3126  4534            JMS I   XPT
1104    3127  5306            JMP     XPRNTA
1105
1106                    /ROUTINE TO PRINT CHARACTER
1107    3130  0000    XXPT,   0
1108    3131  3126            DCA     TEMP0
1109    3132  1126            TAD     TEMP0
1110    3133  1372            TAD     (-40
1111    3134  7700            SMA CLA
1112    3135  5346            JMP     XPRNTF
1113    3136  1126            TAD     TEMP0
1114    3137  1371            TAD     (-33
1115    3140  7640            SZA CLA
1116    3141  5344            JMP     XPRNTD
1117    3142  2063            ISZ     ANESC
1118    3143  5346            JMP     XPRNTF
1119    3144  3063    XPRNTD, DCA     ANESC
1120    3145  1370            TAD     (100
```



```
1121    3146  1126    XPRNTF, TAD     TEMP0
1122    3147  4467            JMS I   PRINT
1123    3150  5730            JMP I   XXPT
1124
1125
1126    3170  0100
1127    3171  7745
1128    3172  7740
1129    3173  0077
1130    3174  7700
1131    3175  4577
1132    3176  7400
1133    3177  0040
              3200    PAGE
1134
1135                    /ROUTINE FOR OPERATOR INTERVENTION
1136    3200  4424    XKEY,   JMS I   INPT            /READ KEYBOOARD
1137    3201  7604            LAS
1138    3202  0377            AND     (100            /OPERATOR INTERVENTION?
1139    3203  7650            SNA CLA
1140    3204  5255            JMP     XKERR           /NO=ERROR
1141    3205  3123            DCA     LOOP            /CLEAR LOOP COUNTER
1142    3206  1131            TAD     TEMP3           /GET CHARACTER
1143    3207  0376            AND     (177
1144    3210  1375            TAD     (-57            /IS IT "/"?
1145    3211  7650            SNA CLA
1146    3212  5221            JMP     FSLASH          /YES
1147    3213  1131            TAD     TEMP3           /GET CHARACTER
1148    3214  0376            AND     (177
1149    3215  1374            TAD     (-134           /IS IT BACKSLASH?
1150    3216  7640            SZA CLA
1151    3217  5260            JMP     XKERR2          /NO=WRON RESPONSE
1152    3220  5250            JMP     BSLASH          /GO TO LOOP ON TEST
1153    3221  4423    FSLASH, JMS I   CLEAN           /CLEAR SCREEN
1154    3222  4427            JMS I   M80             /PRINT QUESTION
1155    3223  3632            HEADQ1                  /START AT WHICH TEST?
1156    3224  6031    XKEYA,  KSF
1157    3225  5224            JMP     .-1
1158    3226  4424            JMS I   INPT            /READ ANSWER
1159    3227  1131            TAD     TEMP3           /GET CHARACTER
1160    3230  0376            AND     (177            /MASK OUT BITS
1161    3231  1373            TAD     (-101           /IS IT < A?
1162    3232  7710            SPA CLA
1163    3233  5260            JMP     XKERR2          /INVALID RESPONSE
1164    3234  1131            TAD     TEMP3           /GET CHARACTER
1165    3235  0376            AND     (177            /MASKOUT BITS
1166    3236  1372            TAD     (-115           /IS IT > M?
1167    3237  7740            SMA SZA CLA
1168    3240  5260            JMP     XKERR2          /INVALID RESPONSE
1169    3241  1131            TAD     TEMP3           /GET CHARACTER
1170    3242  0371            AND     (17             /MASK OUT BITS
1171    3243  1370            TAD     (TSTLST-1       /GET BEGINNING ADDRESS OF LIST
1172    3244  3132            DCA     TEMPT           /SAVE IT
1173    3245  1532            TAD I   TEMPT
1174    3246  3133            DCA     TEMPT2
```

```
1175    3247  5533            JMP I   TEMPT2          /GO TO TEST
1176    3250  4423    BSLASH, JMS I   CLEAN           /CLEAR SCREEN
1177    3251  2123            ISZ     LOOP            /INCREMENT LOOP CONTROL
1178    3252  4427            JMS I   MSG             /PRINT QUESTION
1179    3253  3657            HEAD62                  /LOOP ON WHICH TEST?
1180    3254  5224            JMP     XKEYA
1181    3255  4471    XKERR,  JMS I   ERR
1182    3256  4265            HEAD16
1183    3257  5533            JMP I   TEMPT2          /RESTART TEST
1184    3260  4471    XKERR2, JMS I   ERR
1185    3261  4315            HEAD17
1186    3262  5224            JMP     XKEYA           /GET CHARACTER
1187
1188                    /ROUTINE TO READ KEYBOARD
1189    3263  0000    XINPT,  0
1190    3264  6036    VKRB,   KRB                     /READ BUFFER
1191    3265  7000            NOP
1192    3266  3131            DCA     TEMP3           /SAVE IT
1193    3267  1131            TAD     TEMP3           /GET CHARACTER
1194    3270  4467            JMS I   PRINT           /ECHO IT BACK
1195    3271  5663            JMP I   XINPT
1196
1197
1198                    /ROUTINE TO LOOP ON TEST
1199    3272  7604    XLOOPT, LAS
1200    3273  0377            AND     (100            /OPERATOR INTERVENTION?
1201    3274  7640            SZA CLA
1202    3275  5302            JMP     XLOOPA          /YES-GO TO NEXT TEST
1203    3276  7604            LAS
1204    3277  0367            AND     (1000           /LOOP ON TEST?
1205    3300  7650            SNA CLA
1206    3301  5304            JMP     XLOOPB
1207    3302  1123    XLOOPA, TAD     LOOP            /LOOP ON TEST?
1208    3303  7650            SNA CLA
1209    3304  2132    XLOOPB, ISZ     TEMPT           /NO-GET NEXT TEST ADDRESS
1210    3305  1532            TAD I   TEMPT
1211    3306  3133            DCA     TEMPT2
1212    3307  5533            JMP I   TEMPT2          /GO TO APPROPRIATE TEST
1213
1214    3310  0242    TSTLST, TST1
1215    3311  0400            TST2
1216    3312  0456            TST3
1217    3313  0600            TST4
1218    3314  0664            TST5
1219    3315  1000            TST6
1220    3316  1064            TST7
1221    3317  1200            TST10
1222    3320  1230            TST11
1223    3321  1264            TST12
1224    3322  1400            TST13
1225    3323  1457            TST14
1226    3324  1600            TST15
1227    3325  2200            TLAST
1228
1229
```



```
1230    3367  1000
1231    3370  3307
1232    3371  0017
1233    3372  7663
1234    3373  7677
1235    3374  7644
1236    3375  7721
1237    3376  0177
1238    3377  0100
              3400    PAGE
1239                  /MESSAGE PRINTING ROUTINE
1240    3400  0000    XMSG,   0
1241    3401  7200            CLA
1242    3402  3124            DCA     FLAG                    /INITIALIZE FLAG FOR LEFT(0)
1243    3403  1600            TAD I   XMSG                    /GET ADDRESS OF MESSAGE
1244    3404  3251            DCA     MSGADR                  /SAVE IT
1245    3405  2200            ISZ     XMSG                    /RETURN ADDRESS
1246    3406  1124    NEXTL,  TAD     FLAG
1247    3407  7640            SZA CLA
1248    3410  5217            JMP     RITE
1249    3411  2251            ISZ     MSGADR          /GET REAL ADDRESS OF MESSAGE
1250    3412  1651            TAD I   MSGADR          /GET CHARACTER
1251    3413  7012            RTR
1252    3414  7012            RTR
1253    3415  7012            RTR
1254    3416  5221            JMP     OUT
1255    3417  7200    RITE,   CLA
1256    3420  1651            TAD I   MSGADR                  /GET CHARCTER
1257    3421  0377    OUT,    AND     (77
1258    3422  7450            SNA
1259    3423  5600            JMP I   XMSG                    /FINISHED PRINTING MESSAGE
1260    3424  3136            DCA     TEMPC
1261    3425  1136            TAD     TEMPC
1262    3426  0376            AND     (40
1263    3427  7640            SZA CLA
1264    3430  5232            JMP     COD200
1265    3431  1375            TAD     (100
1266    3432  1374    COD200, TAD     (200
1267    3433  1136            TAD     TEMPC
1268    3434  3136            DCA     TEMPC                   /PRINTABLE CHARACTER
1269    3435  1136            TAD     TEMPC
1270    3436  1373            TAD     (-245
1271    3437  7650            SNA CLA
1272    3440  5247            JMP     XMSG1
1273    3441  1136            TAD     TEMPC
1274    3442  4467            JMS I   PRINT                   /PRINT CHARACTER
1275    3443  1124    XMSG2,  TAD     FLAG
1276    3444  7040            CMA
1277    3445  3124            DCA     FLAG
1278    3446  5206            JMP     NEXTL
1279    3447  4470    XMSG1,  JMS I   CRLF
1280    3450  5243            JMP     XMSG2
1281    3451  0000    MSGADR, 0
1282
1283
```

```
1284    3452  0000    XPRINT, 0
1285    3453  6046    VTLS,   TLS
1286    3454  6041    VTSF,   TSF
1287    3455  5254            JMP     .-1
1288    3456  6042    VTCF,   TCF
1289    3457  7300            CLA CLL
1290    3460  6031    VKSF,   KSF                     /SKIP IF KEYBOARD FLAG=1
1291    3461  7410            SKP
1292    3462  5426            JMP I   KEYSER          /READ KEYBOARD INPUT
1293    3463  5652            JMP I   XPRINT
1294
1295
1296    3464  0000     XERR,  0
1297    3465  7300            CLA CLL
1298    3466  1664            TAD I   XERR            /GET ADDRESS OF MESSAGE
1299    3467  3277            DCA     MADR
1300    3470  2264            ISZ     XERR            /GET RETURN ADDRESS
1301    3471  7604            LAS
1302    3472  0374            AND     C200            /INHIBIT ERROR PRINTOUT?
1303    3473  7640            SZA CLA
1304    3474  5301            JMP     ERRA            /YES
1305    3475  4423            JMS I   CLEAN           /CLEAR SCREEN
1306    3476  4427            JMS I   MSG             /PRINT MESSAGE
1307    3477  0000    MADR,   0
1308    3500  4470    JMS I   CRLF
1309    3501  7604    ERRA,   LAS
1310    3502  0372            AND     C4000           /INHIBIT ERROR HALT?
1311    3503  7650            SNA CLA
1312    3504  7402            HLT                     /NO=HALT
1313    3505  7604            LAS
1314    3506  0371            AND     C2000           /LOOP ON ERROR?
1315    3507  7640            SZA CLA
1316    3510  5314            JMP     ERRB            /YES=REPEAT TEST
1317    3511  7410            SKP
1318    3512  0000    ERPC,   0
1319    3513  2132            ISZ     TEMPT           /GET NEXT TEST ADDRESS
1320    3514  1532    ERRB,   TAD I   TEMPT
1321    3515  3133            DCA     TEMPT2
1322    3516  5533            JMP I   TEMPT2          /JUMP TO APPROPRIATE TEST
1323
1324
1325    3517  0000    XCRLF,  0
1326    3520  7200            CLA
1327    3521  1370            TAD     C215
1328    3522  4467            JMS I   PRINT
1329    3523  1367            TAD     C212
1330    3524  4467            JMS I   PRINT
1331    3525  5717            JMP I   XCRLF
1332
1333                    /ROUTINE TO PRINT OCTAL NUMBER
1334    3526  0000    XMESS,  0
1335    3527  3351            DCA     MWORD
1336    3530  1366            TAD     C-4
1337    3531  3352            DCA     MCOUNT
1338    3532  7100            CLL
```



```
1339    3533  1351            TAD     MWORD
1340    3534  7004            RAL
1341    3535  7410            SKP
1342    3536  1351    MESS1,  TAD     MWORD
1343    3537  7006            RTL
1344    3540  7004            RAL
1345    3541  3351            DCA     MWORD
1346    3542  1351            TAD     MWORD
1347    3543  0365            AND     C7
1348    3544  1364            TAD     C260
1349    3545  4467            JMS I   PRINT
1350    3546  2352            ISZ     MCOUNT
1351    3547  5336            JMP     MESS1
1352    3550  5726            JMP I   XMESS
1353    3551  0000    MWORD,  0
1354    3552  0000    MCOUNT, 0
1355
1356
1357    3564  0260
1358    3565  0007
1359    3566  7774
1360    3567  0212
1361    3570  0215
1362    3571  2000
1363    3572  4000
1364    3573  7533
1365    3574  0200
1366    3575  0100
1367    3576  0040
1368    3577  0077
              3600    PAGE
1369    3600  4040    HEAD0,  TEXT    /   VT55 ACCEPTANCE TEST - MAINDEC-08-D1VTC-A%%  /
        3601  4040
        3602  2624
        3603  6565
        3604  4001
        3605  0303
        3606  0520
        3607  2401
        3610  1603
        3611  0540
        3612  2405
        3613  2324
        3614  4055
        3615  4015
        3616  0111
        3617  1604
        3620  0503
        3621  5560
        3622  7055
        3623  0411
        3624  2624
        3625  0355
        3626  0145
        3627  4540
```

```
                3630  4040
                3631  0000
1370            3632  4040    HEAD01, TEXT    /     START AT TEST LETTER (A - M)  :     /
                3633  4040
                3634  4023
                3635  2401
                3636  2224
                3637  4001
                3640  2440
                3641  2405
                3642  2324
                3643  4014
                3644  0524
                3645  2405
                3646  2240
                3647  5001
                3650  4055
                3651  4015
                3652  5140
                3653  4072
                3654  4040
                3655  4040
                3656  4000
1371            3657  4040    HEAD02, TEXT    /    LOOP ON TEST LETTER (A - M) :        /
                3660  4040
                3661  1417
                3662  1720
                3663  4017
                3664  1640
                3665  2405
                3666  2324
                3667  4014
                3670  0524
                3671  2405
                3672  2240
                3673  5001
                3674  4055
                3675  4015
                3676  5140
                3677  7240
                3700  4040
                3701  4040
                3702  4040
                3703  4000
1372            3704  4040    HEAD1,  TEXT    /   DISPLAY A GROWING HORIZONTAL LINE%%/
                3705  4004
                3706  1123
                3707  2014
                3710  0131
                3711  4001
                3712  4007
                3713  2217
                3714  2711
                3715  1607
                3716  4010
```



```
                3717  1722
                3720  1132
                3721  1716
                3722  2401
                3723  1440
                3724  1411
                3725  1605
                3726  4545
                3727  0000
1373            3730  4040    HEAD2,  TEXT    /   DISPLAY A GROWING VERTICAL LINE%%/
                3731  4004
                3732  1123
                3733  2014
                3734  0131
                3735  4001
                3736  4007
                3737  2217
                3740  2711
                3741  1607
                3742  4026
                3743  0522
                3744  2411
                3745  0301
                3746  1440
                3747  1411
                3750  1605
                3751  4545
                3752  0000
1374            3753  4040    HEAD3,  TEXT    /   GRAPH 0: DISPLAY A STEPPING HORIZONTAL LINE%%/
                3754  4007
                3755  2201
                3756  2010
                3757  4060
                3760  7240
                3761  0411
                3762  2320
                3763  1401
                3764  3140
                3765  0140
                3766  2324
                3767  0520
                3770  2011
                3771  1607
                3772  4010
                3773  1722
                3774  1132
                3775  1716
                3776  2401
                3777  1440
                4000  1411
                4001  1605
                4002  4545
                4003  0000
1375            4004  4040    HEAD4,  TEXT    /   GRAPH 1: DISPLAY A STEPPING HORIZONTAL LINE%%/
                4005  4007
```

```
                4006  2201
                4007  2010
                4010  4061
                4011  7240
                4012  0411
                4013  2320
                4014  1401
                4015  3140
                4016  0140
                4017  2324
                4020  0520
                4021  2011
                4022  1607
                4023  4010
                4024  1722
                4025  1132
                4026  1716
                4027  2401
                4030  1440
                4031  1411
                4032  1605
                4033  4545
                4034  0000
1376            4035  4040    HEAD5,  TEXT    /   GRAPH 0 AND 1%%/
                4036  4007
                4037  2201
                4040  2010
                4041  4060
                4042  4001
                4043  1604
                4044  4061
                4045  4545
                4046  0000
1377            4047  4040    HEAD6,  TEXT    /   GRAPH 01 DISPLAY A STEPPING HISTOGRAM LINE%%/
                4050  4007
                4051  2201
                4052  2010
                4053  4060
                4054  7240
                4055  0411
                4056  2320
                4057  1401
                4060  3140
                4061  0140
                4062  2324
                4063  0520
                4064  2011
                4065  1607
                4066  4010
                4067  1123
                4070  2417
                4071  0722
                4072  0115
                4073  4014
                4074  1116
```



```
                4075  0545
                4076  4500
1378            4077  4040    HEAD7,  TEXT    /   GRAPH 1: DISPLAY A STEPPING HISTOGRAM LINE%%/
                4100  4007
                4101  2201
                4102  2010
                4103  4061
                4104  7240
                4105  0411
                4106  2320
                4107  1401
                4110  3140
                4111  0140
                4112  2324
                4113  0520
                4114  2011
                4115  1607
                4116  4010
                4117  1123
                4120  2417
                4121  0722
                4122  0115
                4123  4014
                4124  1116
                4125  0545
                4126  4500
1379            4127  4040    HEAD10, TEXT    /   HISTOGRAM ON GRAPH 0 AND 1 %%/
                4130  4040
                4131  1011
                4132  2324
                4133  1707
                4134  2201
                4135  1540
                4136  1716
                4137  4007
                4140  2201
                4141  2010
                4142  4060
                4143  4001
                4144  1604
                4145  4061
                4146  4045
                4147  4500
1380            4150  4040    HEAD11, TEXT    /   CURSORS ON GRAPH 0 %%/
                4151  4040
                4152  0325
                4153  2223
                4154  1722
                4155  2340
                4156  1716
                4157  4007
                4160  2201
                4161  2010
                4162  4060
                4163  4045
```

```
                4164  4500
1381            4165  4040    HEAD12, TEXT    /   CURSORS ON GRAPH 1%%/
                4166  4003
                4167  2522
                4170  2317
                4171  2223
                4172  4017
                4173  1640
                4174  0722
                4175  0120
                4176  1040
                4177  6145
                4200  4500
1382            4201  4040    HEAD13, TEXT    /   STARTING COORIDINATE ON GRAPH 0%%/
                4202  4023
                4203  2401
                4204  2224
                4205  1116
                4206  0740
                4207  0317
                4210  1722
                4211  1104
                4212  1116
                4213  0124
                4214  0540
                4215  1716
                4216  4007
                4217  2201
                4220  2010
                4221  4060
                4222  4545
                4223  0000
1383            4224  4040    HEAD14, TEXT    /   STARTING COORDINATE ON GRAPH 1%%/
                4225  4023
                4226  2401
                4227  2224
                4230  1116
                4231  0740
                4232  0317
                4233  1722
                4234  0411
                4235  1601
                4236  2405
                4237  4017
                4240  1640
                4241  0722
                4242  0120
                4243  1040
                4244  6145
                4245  4500
1384            4246  4040    HEAD15, TEXT    /    VT55 ADJUSTMENT PATTERN%%/
                4247  4040
                4250  2624
                4251  6565
                4252  4001
```



```
                4253  0412
                4254  2523
                4255  2415
                4256  0516
                4257  2440
                4260  2001
                4261  2424
                4262  0522
                4263  1645
                4264  4500
1385
1386            4265  4040    HEAD16, TEXT    /   SWITCH 5 NOT SET FOR OPERATOR INTERVENTION%%/
                4266  4023
                4267  2711
                4270  2403
                4271  1040
                4272  6540
                4273  1617
                4274  2440
                4275  2305
                4276  2440
                4277  0617
                4300  2240
                4301  1720
                4302  0522
                4303  0124
                4304  1722
                4305  4011
                4306  1624
                4307  0522
                4310  2605
                4311  1624
                4312  1117
                4313  1645
                4314  4500
1387            4315  4040    HEAD17, TEXT    /   INVALID RESPONSE,HIT CONTINUE AND TRY AGAIN%%/
                4316  4011
                4317  1626
                4320  0114
                4321  1104
                4322  4022
                4323  0523
                4324  2017
                4325  1623
                4326  0554
                4327  1011
                4330  2440
                4331  0317
                4332  1624
                4333  1116
                4334  2505
                4335  4001
                4336  1604
                4337  4024
                4340  2231
```

```
                4341  4001
                4342  0701
                4343  1116
                4344  4545
                4345  0000
1388            4346  4040    EOPASS, TEXT    /    %END OF PASS  #          /
                4347  4040
                4350  4505
                4351  1604
                4352  4017
                4353  0640
                4354  2001
                4355  2323
                4356  4040
                4357  4043
                4360  4040
                4361  4040
                4362  4040
                4363  4040
                4364  4040
                4365  0000
1389            4366  0000            0
1390            4367  0003            3
1391            4370  0004            4
1392            4371  0004            4
1393            4372  0005            5
1394            4373  0006            6
1395            4374  0007            7
1396            4375  0010            10
1397            4376  0012            12
1398            4377  0014            14
1399            4400  0015            15
1400            4401  0017            17
1401            4402  0021            21
1402            4403  0024            24
1403            4404  0027            27
1404            4405  0032            32
1405            4406  0035            35
1406            4407  0040            40
1407            4410  0043            43
1408            4411  0047            47
1409            4412  0053            53
1410            4413  0056            56
1411            4414  0062            62
1412            4415  0066            66
1413            4416  0073            73
1414            4417  0077            77
1415            4420  0103            103
1416            4421  0110            110
1417            4422  0115            115
1418            4423  0121            121
1419            4424  0126            126
1420            4425  0133            133
1421            4426  0137            137
1422            4427  0144            144
```



```
1423            4430  0151            151
1424            4431  0156            156
1425            4432  0162            162
1426            4433  0167            167
1427            4434  0174            174
1428            4435  0201            201
1429            4436  0206            206
1430            4437  0213            213
1431            4440  0217            217
1432            4441  0223            223
1433            4442  0230            230
1434            4443  0235            235
1435            4444  0241            241
1436            4445  0245            245
1437            4446  0251            251
1438            4447  0255            255
1439            4450  0261            261
1440            4451  0265            265
1441            4452  0271            271
1442            4453  0274            274
1443            4454  0277            277
1444            4455  0303            303
1445            4456  0305            305
1446            4457  0310            310
1447            4460  0313            313
1448            4461  0316            316
1449            4462  0317            317
1450            4463  0321            321
1451            4464  0323            323
1452            4465  0324            324
1453            4466  0326            326
1454            4467  0327            327
1455            4470  0330            330
1456            4471  0331            331
1457            4472  0331            331
1458            4473  0331            331
1459            4474  0331            331
1460            4475  0331            331
1461            4476  0330            330
1462            4477  0327            327
1463            4500  0326            326
1464            4501  0325            325
1465            4502  0323            323
1466            4503  0322            322
1467            4504  0320            320
1468            4505  0317            317
1469            4506  0314            314
1470            4507  0312            312
1471            4510  0307            307
1472            4511  0304            304
1473            4512  0301            301
1474            4513  0275            275
1475            4514  0272            272
1476            4515  0267            267
1477            4516  0263            263
```

```
1478    4517  0257            257
1479    4520  0253            253
1480    4521  0247            247
1481    4522  0243            243
1482    4523  0237            237
1483    4524  0232            232
1484    4525  0225            225
1485    4526  0221            221
1486    4527  0214            214
1487    4530  0207            207
1488    4531  0203            203
1489    4532  0176            176
1490    4533  0171            171
1491    4534  0164            164
1492    4535  0157            157
1493    4536  0153            153
1494    4537  0145            145
1495    4540  0140            140
1496    4541  0134            134
1497    4542  0127            127
1498    4543  0121            121
1499    4544  0115            115
1500    4545  0111            111
1501    4546  0104            104
1502    4547  0077            77
1503    4550  0073            73
1504    4551  0066            66
1505    4552  0063            63
1506    4553  0057            57
1507    4554  0053            53
1508    4555  0047            47
1509    4556  0043            43
1510    4557  0040            40
1511    4560  0034            34
1512    4561  0031            31
1513    4562  0027            27
1514    4563  0023            23
1515    4564  0021            21
1516    4565  0017            17
1517    4566  0015            15
1518    4567  0013            13
1519    4570  0011            11
1520    4571  0010            10
1521    4572  0007            7
1522    4573  0006            6
1523    4574  0005            5
1524    4575  0004            4
1525    4576  0003            3
1526    4577  0000    SINEND, 0
1527          4600    PAGE
1528    4600  0000    BUFFI,  0                       /BEGINNING OF OUPUT BUFFER
1529
1530
1531                  $
```



```
0000  11000000  11000000  11111111  11111111  11111111  11111111  11111111  11111111
0100  11111111  11111111  11111111  11111111  11000000  00000000  00000000  00000000

0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300  11111111  11111111  11111110  00000000  00000000  00000000  00000000  00011111

0400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0500  11111111  11111111  11111111  11111111  11000000  00000000  00000000  00000011

0600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0700  11111111  11110000  00000000  00000000  00000000  00000000  00000000  00000011


1000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1100  11111111  11111111  11111111  11111111  11111111  00000000  00000000  00000011

1200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1300  11111111  11111111  00000000  00000000  00000000  00000000  00000000  00000001

1400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
1500  11111111  11111111  11111111  11111100  00000000  00000000  00000000  00000011

1600  11111111  11111111  11111111  11111100  00000000  00000000  00000000  00000000
1700  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00011111


2000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111000
2100  00000000  00000000  00000000  00000000  00000000  00000000  00000000  01111111

2200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111000
2300  00000000  00000000  00000000  00000000  00000000  00000000  00000000  11111111

2400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11110000
2500  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00011111

2600  11111111  11111111  11111111  11111111  11111111  11111111  11111110  00000000
2700  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00001111


3000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3100  11111111  11111111  11111111  11111111  11111111  10000000  00000000  11111111

3200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3300  11111111  11111111  11111100  00000000  00000000  00000000  00000001  11111111

3400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3500  11111111  11111111  11111111  11111111  11111111  11100000  00001111  11111111

3600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
3700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
```

```
4000  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4100  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

4200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

4400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
4500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

4600  10000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
4700  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000


5000
5100

5200
5300

5400
5500

5600
5700


6000
6100

6200
6300

6400
6500

6600
6700


7000
7100

7200
7300

7400
7500

7600
7700
```



```
A10       0010        HEAD13   4201        MESS1    3536        TST14A   1523
A11       0011        HEAD14   4224        MSG      0027        TST14B   1524
ADDLIN    0036        HEAD15   4246        MSGADR   3451        TST14C   1532
ANESC     0063        HEAD16   4265        MWORD    3551        TST14D   1507
ANSLB     0042        HEAD17   4315        NEXTL    3406        TST14E   1505
ANSLF     0041        HEAD2    3730        OUT      3421        TST15    1600
ASCH      0100        HEAD3    3753        OUTA     0241        TST15A   1627
BACK      0215        HEAD4    4004        OUTB     0226        TST15B   1623
BACKA     0227        HEAD5    4035        PASS     0054        TST15C   2024
BASE      0052        HEAD6    4047        PRINT    0067        TST15D   2051
BASE1     0053        HEAD7    4077        PRNT     0030        TST15E   2000
BDDAT     0072        HEADQ1   3632        REG0     0057        TST1A    0266
BIT0      0044        HEADQ2   3657        REG1     0056        TST1B    0305
BIT1      0045        INPT     0024        REG3     0060        TST1C    0301
BIT15     4000        INTRPT   0000        REG4     0061        TST2     0400
BIT2      0047        IOTLST   2227        REG5     0062        TST2A    0426
BIT3      0051        KEYSER   0026        RITE     3417        TST2B    0442
BIT5      0043        KOUNT    0125        SAV0     2471        TST3     0456
BIT54     0050        LAST     0137        SAV1     2472        TST3A    0476
BIT7      0046        LDB510   0115        SAV2     2473        TST3B    0522
BITMAX    4354        LDB81    0202        SHUFF    0032        TST3C    0540
BSLASH    3250        LDB831   0104        SINEND   4577        TST3D    0541
BUFF1     4600        LDB921   0612        ST0      3077        TST4     0600
CLEAN     0023        LDB936   3612        ST1      3100        TST4A    0620
COD200    3432        LDB411   0074        ST2      3101        TST4B    0644
COUNT     0021        LDB0     0111        START    0200        TST4C    0662
CR1       2665        LDB20    0105        START2   0207        TST4D    0663
CR2       2666        LDB310   0122        START8   0020        TST5     0664
CRA       2654        LDB420   0103        STCOND   0035        TST6     1000
CRB       2663        LDBIT    0110        SUBTST   0065        TST6C    1020
CRC       2635        LDC182   1013        SWR      0055        TST6D    1063
CRLF      0070        LDCB1    0403        TEMP     0135        TST6E    1062
CURSOR    0034        LDE05    0120        TEMP0    0126        TST6F    1044
DELAY     0033        LDE154   0121        TEMP1    0127        TST7     1064
EOPASS    4346        LDE510   0101        TEMP2    0130        TST7A    1104
ERPC      3512        LDG124   1204        TEMP3    0131        TST7B    1130
ERR       0071        LDG182   0412        TEMPC    0136        TST7C    1146
ERRA      3501        LDVBIT   0112        TEMPT    0132        TST7D    1147
ERRB      3514        LHBIT    0107        TEMPT2   0133        TSTLST   3310
ESCE      0117        LHVBIT   0113        TLAST    2200        UPA      2453
ESCF      0077        LNLDG0   0114        TOUT     2212        UPB      2436
ESCH      0075        LNLDG1   0106        TST1     0242        UPC      2434
ESCJ      0076        LNOLHV   0102        TST10    1200        UPD      2461
FIRST     0140        LNOLSC   0116        TST11    1230        UPDOWN   0031
FLAG      0124        LOOP     0123        TST12    1264        VKRB     3264
FSLASH    3221        LOOPT    0025        TST13    1400        VKSF     3460
GDDAT     0073        M1       0022        TST13A   1444        VTCF     3456
HEAD0     3600        MADR     3477        TST13B   1445        VTLS     3453
HEAD1     3704        MAXHOZ   0040        TST13C   1453        VTNOW    0141
HEAD10    4127        MAXVRT   0037        TST13D   1438        VTSF     3454
HEAD11    4150        MCOUNT   3552        TST13E   1426        WFTEST   0064
HEAD12    4165        MESS     0066        TST14    1457        XADLIN   2000
```

```
XCLEAN  3015
XCRLF   3517
XCURSR  2600
XDELA   3014
XDELAY  3000
XERR    3464
XINPT   3263
XKERR   3255
XKERR2  3260
XKEY    3200
XKEYA   3224
XLOOPA  3302
XLOOPB  3304
XLOOPT  3272
XMESS   3526
XMSG    3400
XMSG1   3447
XMSG2   3443
XPRINT  3452
XPRNT   3102
XPRNTA  3106
XPRNTD  3144
XPRNTF  3146
XPRNTG  3123
XPT     0134
XSHUFA  2273
XSHUFF  2237
XSTCRD  3032
XUPDON  2400
XXPT    3130
ZERO    0000
```

ERRORS DETECTED: 0

LINKS GENERATED: 3

RUN-TIME: 10 SECONDS

2K CORE USED

```
A10          7#   124   125   135   153   155   157   159   161   163   165   170   185   193
           194   212   214   216   218   220   222   224   230   242   249   259   261   263
           265   266   271   273   275   277   280   282   291   294   314   316   318   320
           321   326   328   330   332   335   337   346   349   367   369   371   373   374
           395   397   399   401   402   407   409   411   413   416   418   427   430   449
           451   453   455   456   461   463   465   467   470   472   481   484   505   507
           509   511   512   531   533   535   537   538   562   564   566   568   569   594
           596   598   600   601   643   645   647   649   650   699   701   703   705   707
           708   730   732   734   736   738   740   742   744   749   759   764   766   768
           772   786   787   888   890   894   898   901   907   911   936   957   959   963
           965   968   974   978   999  1028  1030  1032  1034  1035  1053  1055  1062  1065
          1069  1072  1076  1077  1086  1087
A11          8#
ADDLIN      25#   166   172   227   234   745   753   769   776   782   993
ANESC       47#  1117  1119
ANSLB       29#
ANSLF       28#
ASCH        62#
BACK       125#   133
BACKA      135#   144
BASE        38#   167   171   175   182   186   189   228   231   233   236   240   243   245
           246   278   284   333   339   414   420   468   474   747   750   752   756   770
           773   775   779   784   842   852   861   899   909   915   918   919   924   925
           966   976   982   984   985   987   988   992   996  1067  1074
BASE1       39#   843   844   847   859
BDDAT       55#
BIT0        32#
BIT1        33#
BIT15       30#   550   581
BIT2        35#
BIT3        37#
BIT5        31#
BIT54       36#
BIT7        34#
BITMAX      50#   382   520   573
BSLASH    1152  1176#
BUFF1      152   211   258   278   313   325   366   394   406   448   460   504   530   561
           593   642   698   729   763   887   956  1027  1052  1085  1538#
CLEAN       14#   111   149   208   255   310   363   391   445   501   527   558   590   639
           691   800  1153  1176  1305
COD200    1264  1266#
COUNT       12#
CR1        951   960   969  1001#
CR2        954   975   979  1002#
CRA        981   992#
CRB        990   999#
CRC        977#  991   998
CRLF        53#   710   711   817  1279  1308
CURSOR      23#   544   548   575   579
DELAY       22#   115   199   251   302   357   384   438   492   522   552   583   634   683
           789
EOPASS     813  1388#
ERPC      1318#
```

```
.L0374    142    202#
.L0375    130    140     203#
.L0376    123    204#
.L0377    116    205#
.L0576    268    306#
.L0577    211    258     270     307#
.L0776    323    386#
.L0777    313    325     366     387#
.L1176    404    458     496#
.L1177    394    406     448     460     497#
.L1377    504    530     561     587#
.L1576    607    656     686#
.L1577    593    611     642     660     687#
.L1773    720    722#
.L1774    714    723#
.L1775    712    724#
.L1776    698    725#
.L1777    696    726#
.L2171    783    792#
.L2172    777    793#
.L2173    774    794#
.L2174    754    795#
.L2175    751    796#
.L2176    746    797#
.L2177    729    763     798#
.L2370    862    866     871#
.L2371    858    872#
.L2372    853    873#
.L2373    846    874#
.L2374    845    875#
.L2375    819    876#
.L2376    809    822     877#
.L2377    807    878#
.L2573    917    941#
.L2574    906    942#
.L2575    895    943#
.L2576    892    944#
.L2577    887    945#
.L2774    986    1004#
.L2775    973    1005#
.L2776    961    1006#
.L2777    956    1007#
.L3170    1120   1126#
.L3171    1114   1127#
.L3172    1110   1128#
.L3173    1092   1129#
.L3174    1060   1071    1095    1130#
.L3175    1027   1052    1085    1131#
.L3176    1014   1132#
.L3177    1011   1133#
.L3367    1204   1230#
.L3370    1171   1231#
.L3371    1170   1232#

.L3372    1166   1233#
.L3373    1161   1234#
.L3374    1149   1235#
.L3375    1144   1236#
.L3376    1143   1148    1160    1165    1237#
.L3377    1138   1200    1238#
.L3564    1348   1357#
.L3565    1347   1358#
.L3566    1336   1359#
.L3567    1329   1360#
.L3570    1327   1361#
.L3571    1314   1362#
.L3572    1310   1363#
.L3573    1270   1364#
.L3574    1266   1302    1365#
.L3575    1265   1366#
.L3576    1262   1367#
.L3577    1257   1368#
.V0001     895    943#
.V0002     746    797#
.V0007    1347   1358#
.V0010     142    202#
.V0015     774    794#
.V0017    1170   1232#
.V0024     751    796#
.V0037     845    875#
.V0040     846    874#    1011    1133#   1262    1367#
.V0077    1092   1129#   1257    1368#
.V0100     807    878#   1120    1126#   1138    1200    1238#   1265    1366#
.V0177    1143   1148    1160    1165    1237#
.V0200     268    306#    323     386#    404     458     496#    1266    1302    1365#
.V0207     809    822     877#
.V0212    1329   1360#
.V0215    1327   1361#
.V0260    1348   1357#
.V0310     714    723#
.V0340     754    795#
.V0377     917    941#
.V0400     819    876#
.V0740     853    873#
.V0777     783    792#    986     1004#
.V1000     777    793#   1204    1230#
.V2000     720    722#    862     866     871#   1314    1362#
.V2226     123    204#
.V3307    1171   1231#
.V3310     116    205#
.V3700     892    944#    961    1006#
.V4000     858    872#   1310    1363#
.V4577     152    201#    211     258     270     307#    313     325     366     387#    394     406     448     460
           497#   504     530     561     587#    593     611     642     660     687#    698     729#    729     763
           798#   887     945#    956    1007#   1027    1052    1085    1131#
.V7007     130    140     203#
.V7400    1014   1132#
```

V7533	1270	1364@						
V7644	1149	1235@						
V7660	712	724@						
V7663	1166	1233@						
V7677	1161	1234@						
V7700	906	942@	973	1005@	1060	1071	1095	1130@
V7721	1144	1236@						
V7740	1110	1128@						
V7745	1114	1127@						
V7764	696	726@						
V7774	607	656	686@	1336	1339@			