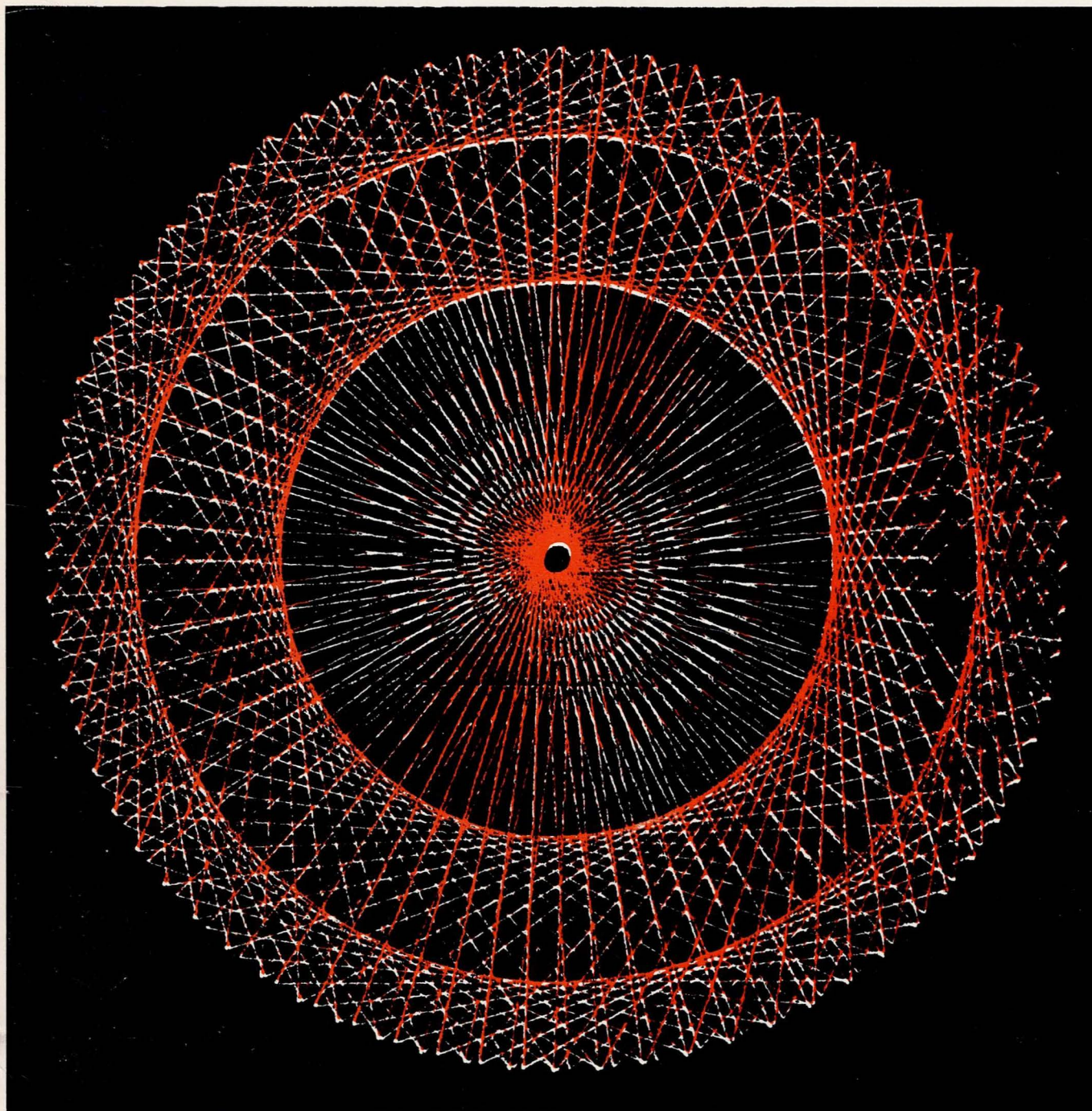


DIGITAL EQUIPMENT CORPORATION

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# education

## BASIC Application Programs—Plotting



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DEC EDUCATIONAL PUBLICATIONS

Other publications in the continuing series of curriculum material published by DEC for use with EduSystems 10 through 80 are listed below. Please inquire directly for prices on classroom quantities.

Additional publications may be obtained from:

Program Library  
Digital Equipment Corporation  
Maynard, Massachusetts 01754

Population: Self-teaching BASIC Workbook	\$2.00
BASIC Application Programs	
Mathematics I	1.00
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## BASIC APPLICATION PROGRAMS

The programs contained in this series are designed to demonstrate how the computer can be applied in a meaningful way to problems of many disciplines. The problems and the corresponding programs are, for the most part, quite simple and are designed to be "jumping off points" for students from the high school level on up.

All of the programs, with very few exceptions, may be run on EduSystems 10 through 80, PDP-8 Family and PDP-11 Family computers. Exceptions are noted in the program descriptions.

DEC welcomes contributions of programs and write-ups for use in this series. Contributors will be credited as program "Source". Please send programs and descriptions to Educational Marketing (5-2).

### PLOTTING

The programs in this set are specifically for use with teletype-compatible plotters. Digital EduSystems can drive virtually any teletype-compatible plotter. In this set of programs are routines for two such plotters:

- 1) TSP-212  
Time-share Peripherals Corporation  
Miry Brook Road  
Danbury, Connecticut 06810
  
- 2) FASLOT 1030  
Omega-T Systems Inc.  
300 Terrace Village  
Richardson, Texas 75080

Many of the programs in this set are too long for EduSystem 10. All will run on EduSystem 20 and above and all PDP-11 configurations.

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### PLOTTING

TPLOTU	Utility Support routine for TSP-212 plotter.
FPLOTU	Utility Support routine for FASPLOT-1030 plotter.
TPLOT1	Plots a family of 10 sine curves.
TPLOT2	Plots random horizontal and vertical lines.
TPLOT3	Plots connected horizontal and vertical lines similar to Etch-a-sketch.
TPLOT4	Plots random length, random direction lines. Looks like electron traces.
TPLOT5	Polygon designer. Plots any polygon given the external angle and number of sides.
TPLOT6	Spiral designer. Plots a spiral of any shape given the external angle.
TPLOT7	Bar chart and point-to-point graph.
TPLOT8	Plots characters 1 to 8 at random locations with size proportionate to their values.
TPLOT9	Plots "3-dimensional" exponential functions.
FPLT10	Plots any function.

## HOW TO USE THE PLOTTER SUBROUTINES

The plotter subroutines reproduced on the following two pages are simple and straightforward to use. The BASIC software package for each plotter consists of four subroutines.

Initialization - (TSP - GOSUB 1100, FASPLOT - GOSUB 1500). Calling this subroutine turns on the plotter and mutes the teletype. All subsequent print commands will go to the plotter and will be ignored by the teletype until a quit plotting command is given. Note: On the FASPLOT, the command to start plotting is "!", hence do not use "!" in print statements when using this plotter.

Quit Plotting - (TSP - GOSUB 1200, FASPLOT - GOSUB 1400). Returns print statements and control to the teletype.

Point Plotter - (TSP - GOSUB 1300, FASPLOT - GOSUB 1600). Points are specified by X,Y coordinates. The plotter will go from one X,Y point to the next each time this subroutine is called. X and Y, of course, are specified in your program between calls to this subroutine. If you wish to go to another point without drawing a line, set L to 1 (pen lifted), to draw a line, set L to 0 (pen down).

You must specify once, before you start plotting, the coordinate boundaries of the paper as X0,X1,Y0, and Y1. For example, you could set X0 = 0, X1 = 1, Y0 = -100, Y1 = 100, or any other set of values. Always allow yourself about a 10% tolerance so your plot does not accidentally run off the paper.

Characters - (TSP - GOSUB 1800, FASPLOT - GOSUB 1800). X and Y specify the lower left hand corner of a character. S is the character size (1 specifies the smallest character, 2 specifies a larger character. Actual size depends upon your scaling). C is the particular character. Only 12 characters are implemented, although with very little effort, you can add more.

<u>C</u>	<u>Character</u>	<u>C</u>	<u>Character</u>
0	0	6	6
1	1	7	7
2	2	8	8
3	3	9	9
4	4	10	X
5	5	11	Y

While programs in this set are written for either the TSP or FASPLOT plotter, they will run on either by simply changing the subroutine calls.

Utility support routine for FASLOT 1030 plotter.

```

1400 ' QUIT PLOTTING
1410 PRINT "Q"
1420 RETURN
1500 ' INITIALIZATION
1510 PRINT "!"
1520 RETURN
1600 ' POINT PLOTTER AT X,Y,L<>0 IS LIFT,X0,X1,Y0,Y1
1610 P1=0
1620 IF L=0 THEN 1660
1630 P2=0
1640 PRINT "L";
1650 GOTO 1690
1660 IF P2<>0 THEN 1690
1670 P2=1
1680 L=P3
1685 GOSUB 1710
1690 L=P3
1700 P3=INT(999*(X-X0)/(X1-X0))*1000+INT(999*(Y-Y0)/(Y1-Y0))+P1
1710 PRINT "00000"P3",";
1720 P4=INT(ABS(L-INT(L/1000))*1000-P3+INT(P3/1000)*1000)/100
1730 P4=P4+INT(ABS(INT(L/1000)-INT(P3/1000))/100)
1735 FOR L=0 TO P4/2
1740 PRINT
1750 NEXT L
1760 L=0
1770 RETURN
1800 ' CHARACTER DRAWER AT X,Y,S=SIZE,C=CHARACTER (+SCALING)
1810 RESTORE
1820 FOR P0=0 TO C
1830 READ P0(0),P0(1),P0(2),P0(3),P0(4),P0(5),P0(6)
1840 NEXT P0
1850 L=1
1860 FOR P0=0 TO 6
1870 IF P0(P0)=-1 THEN 1920
1880 IF P0(P0)=-2 THEN 1940
1890 P1=INT(S)*P0(P0)
1900 GOSUB 1620
1910 NEXT P0
1920 L=1
1930 RETURN
1940 L=1
1950 GO TO 1910
2000 DATA 0,4008,4000,0,8,4008,-1 '0
2003 DATA 6,2008,2000,0,4000,-1,-1 '1
2007 DATA 6,2008,4006,0,4000,-1,-1 '2
2010 DATA 8,4008,2004,4004,4000,0,-1 '3
2013 DATA 3000,3008,4,4004,-1,-1,-1 '4
2017 DATA 4008,8,5,2005,4003,2000,0 '5
2020 DATA 8,0,4000,4004,4,-1,-1 '6
2023 DATA 8,4008,0,-1,-1,-1,-1 '7
2027 DATA 4,4004,4000,0,8,4008,4004 '8
2030 DATA 4000,4008,8,4,4004,-1,-1 '9
2033 DATA 0,4008,-2,8,4000,-1,-1 'X
2037 DATA 2000,2004,4008,-2,8,2004,-1 'Y
2046 END

```

READY

Utility support routine for TSP-212 plotter.

```
1100 ' INITIALIZATION
1110 PRINT
1120 PRINT CHR$(16);
1130 P9=0
1140 RETURN
1200 ' QUIT PLOTTING
1210 PRINT
1220 PRINT " ";
1230 RETURN
1300 ' POINT PLOTTER AT X,Y,L<>0 IS LIFT,X0,X1,Y0,Y1
1303 P8=0
1307 P6=0
1310 X2=INT(510*(X-X0)/(X1-X0))+INT(S)*P8
1320 Y2=INT(510*(Y-Y0)/(Y1-Y0))+INT(S)*P6
1330 IF L=0 THEN 1350
1340 L=64
1350 X3=X2-X3
1360 Y3=Y2-Y3
1370 P0=INT(ABS(X3)/50+ABS(Y3)/50)+1
1380 FOR P1=1 TO P0
1390 X4=X2-(X3/P0)*(P0-P1)
1400 Y4=Y2-(Y3/P0)*(P0-P1)
1410 P3=64+INT(X4/8)
1420 GOSUB 1700
1430 P3=64+INT(Y4/8)
1440 GOSUB 1700
1450 P3=INT(Y4)-INT(Y4/8)*8
1460 P3=P3+8*(INT(X4)-INT(X4/8)*8)+L
1470 IF P3<127 THEN 1490
1480 P3=126
1490 PRINT CHR$(P3);
1500 P9=P9+1
1510 IF P9<20 THEN 1540
1520 GOSUB 1100
1530 P9=0
1540 NEXT P1
1550 L=0
1560 X3=X2
1570 Y3=Y2
1580 RETURN
1700 IF P3<127 THEN 1720
1710 P3=63
1720 PRINT CHR$(P3);
1730 RETURN
```

```

1800 * CHARACTER DRAWER AT X,Y,S=SIZE,C=CHARACTER (+SCALING)
1810 RESTORE
1820 FOR P0=0 TO C*14
1830 READ P8
1840 NEXT P0
1850 L=1
1860 FOR P7=1 TO 7
1870 READ P6
1880 IF P8=-1 THEN 1910
1885 IF P8=-2 THEN 1930
1890 GOSUB 1310
1895 READ P8
1900 NEXT P7
1910 L=1
1920 RETURN
1930 L=1
1940 GOTO 1895
2000 DATA 0,0,4,8,4,0,0,0,0,8,4,8,-1,-1
2003 DATA 0,6,2,8,2,0,0,0,4,0,-1,-1,-1,-1
2007 DATA 0,6,2,8,4,6,0,0,4,0,-1,-1,-1,-1
2010 DATA 0,8,4,8,2,4,4,4,4,0,0,0,-1,-1
2013 DATA 3,0,3,8,0,4,4,4,-1,-1,-1,-1,-1,-1
2017 DATA 4,8,0,8,0,5,2,5,4,3,2,0,0,0
2020 DATA 0,8,0,0,4,0,4,4,0,4,-1,-1,-1,-1
2023 DATA 0,8,4,8,0,0,-1,-1,-1,-1,-1,-1,-1,-1
2027 DATA 0,4,4,4,4,0,0,0,0,8,4,8,4,4
2030 DATA 4,0,4,8,0,8,0,4,4,4,-1,-1,-1,-1
2033 DATA 0,0,4,8,-2,0,0,8,4,0,-1,-1,-1,-1
2037 DATA 2,0,2,4,4,8,-2,0,0,8,2,4,-1,-1
2039 DATA -1,-1
2046 END

```



AREA: Plotting  
SOURCE: Digital Equipment Corp.

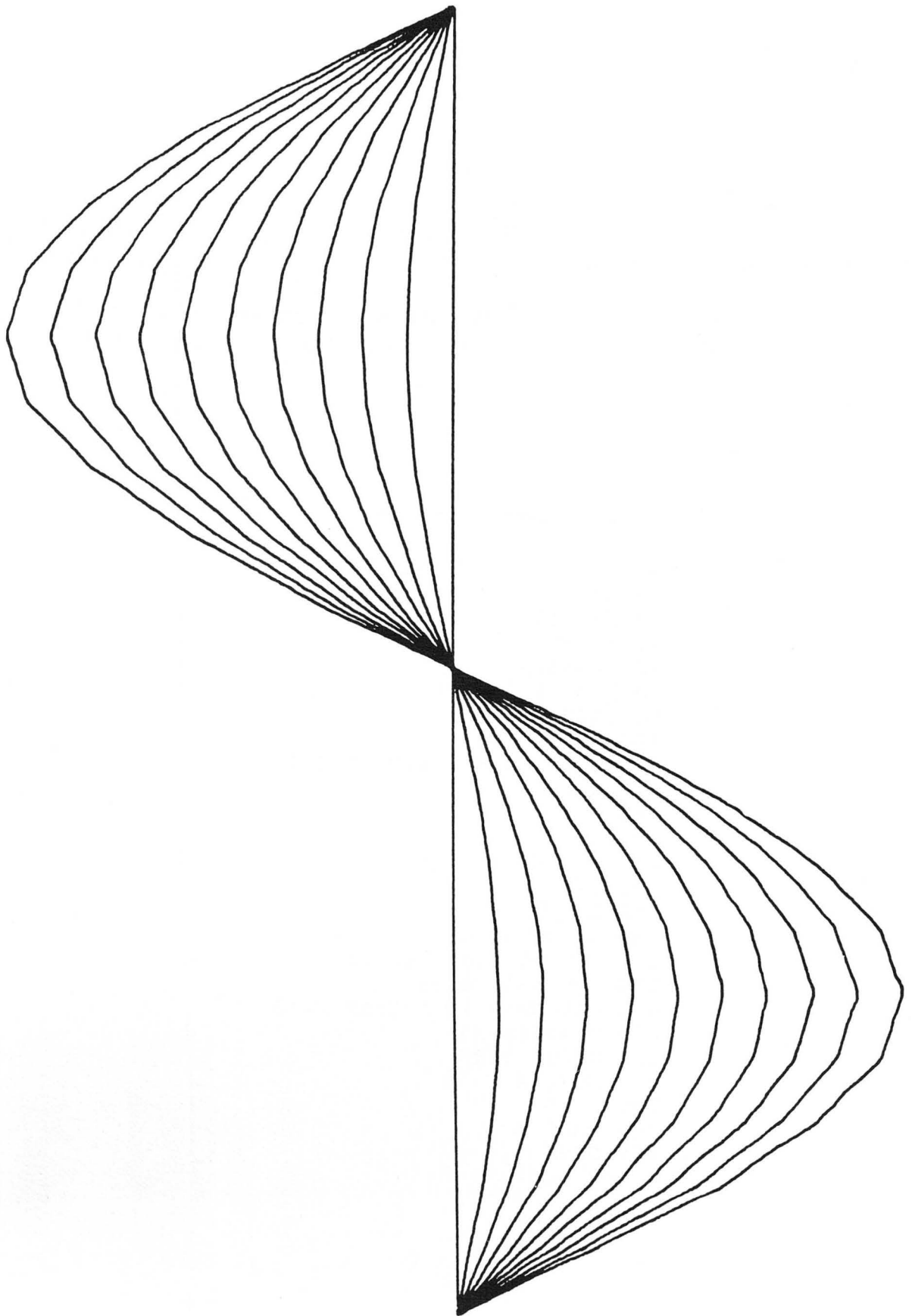
NUMBER: PL-1

NAME: TPLOT1  
LANGUAGE: BASIC

This program plots a family of 10 sine curves from  $-\pi$  to  $\pi$ . For a more precise plot, the user may decrease the step size in statement 210.

```
TPLOT1 EDUSYSTEM 30

5 ' FAMILY OF SINE CURVES
10 L=1
20 Y0=-12
30 Y1=12
40 X0=-3.5
50 X1=3.5
60 GOSUB 1100
100 P=3.14159
105 ' GO TO STARTING POINT
110 X=P
120 Y=0
130 GOSUB 1300
135 ' DRAW X AXIS
140 L=0
150 X=-P
160 GOSUB 1300
195 ' PLOT SINE CURVES
200 FOR A=1 TO 10
210 FOR X=-P TO P STEP P/10
220 Y=A*SIN(X)
230 GOSUB 1300
240 NEXT X
250 P=-P
260 NEXT A
999 STOP
```



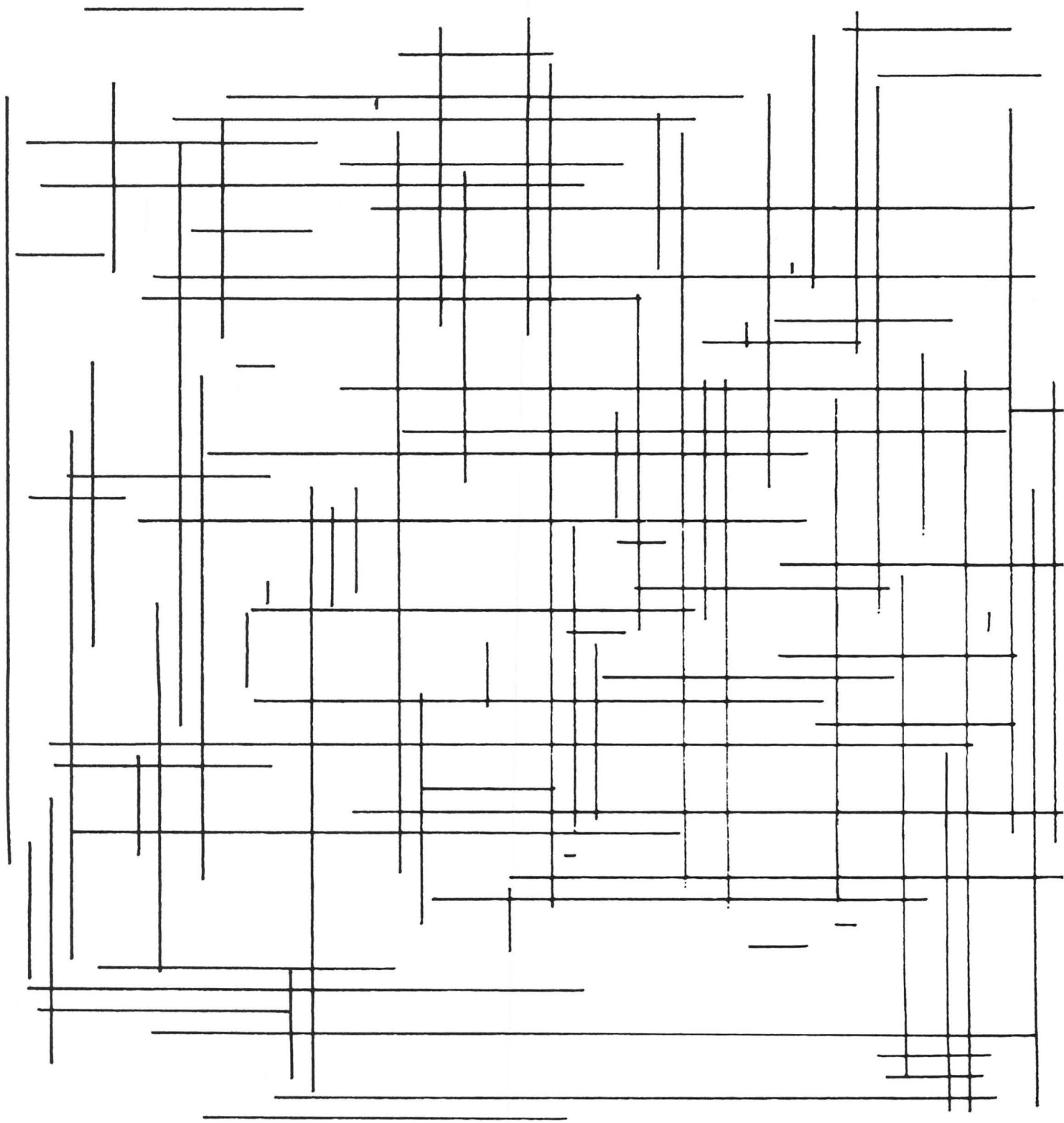
AREA: Plotting                      NUMBER: PL-2  
SOURCE: Digital Equipment Corp.

NAME: TPLOT2  
LANGUAGE: BASIC

This program plots 50 vertical lines each starting and ending at a random point along the vertical axis. It then repeats the plot in the horizontal plane. After watching the plot, can you think of a way to decrease the time required to make the plot? Try your approach--does it work?

```
TPLOT2 EDUSYSTEM 30

5 * RANDOM HORIZ AND VERTICAL LINES
10 L=1
20 Y0=0
30 Y1=1
40 X0=0
50 X1=1
60 GOSUB 1100
70 RANDOMIZE
100 * VERTICAL LINES
110 FOR X=0 TO 1 STEP .02
120 Y=RND(0)
130 L=1
140 GOSUB 1300
150 Y=RND(0)
160 L=0
170 GOSUB 1300
180 NEXT X
200 * HORIZONTAL LINES
210 FOR Y=0 TO 1 STEP .02
220 X=RND(0)
230 L=1
240 GOSUB 1300
250 X=RND(0)
260 L=0
270 GOSUB 1300
280 NEXT Y
285 X=0
287 Y=0
290 L=1
300 GOSUB 1300
999 STOP
```



AREA: Plotting  
SOURCE: Digital Equipment Corp.

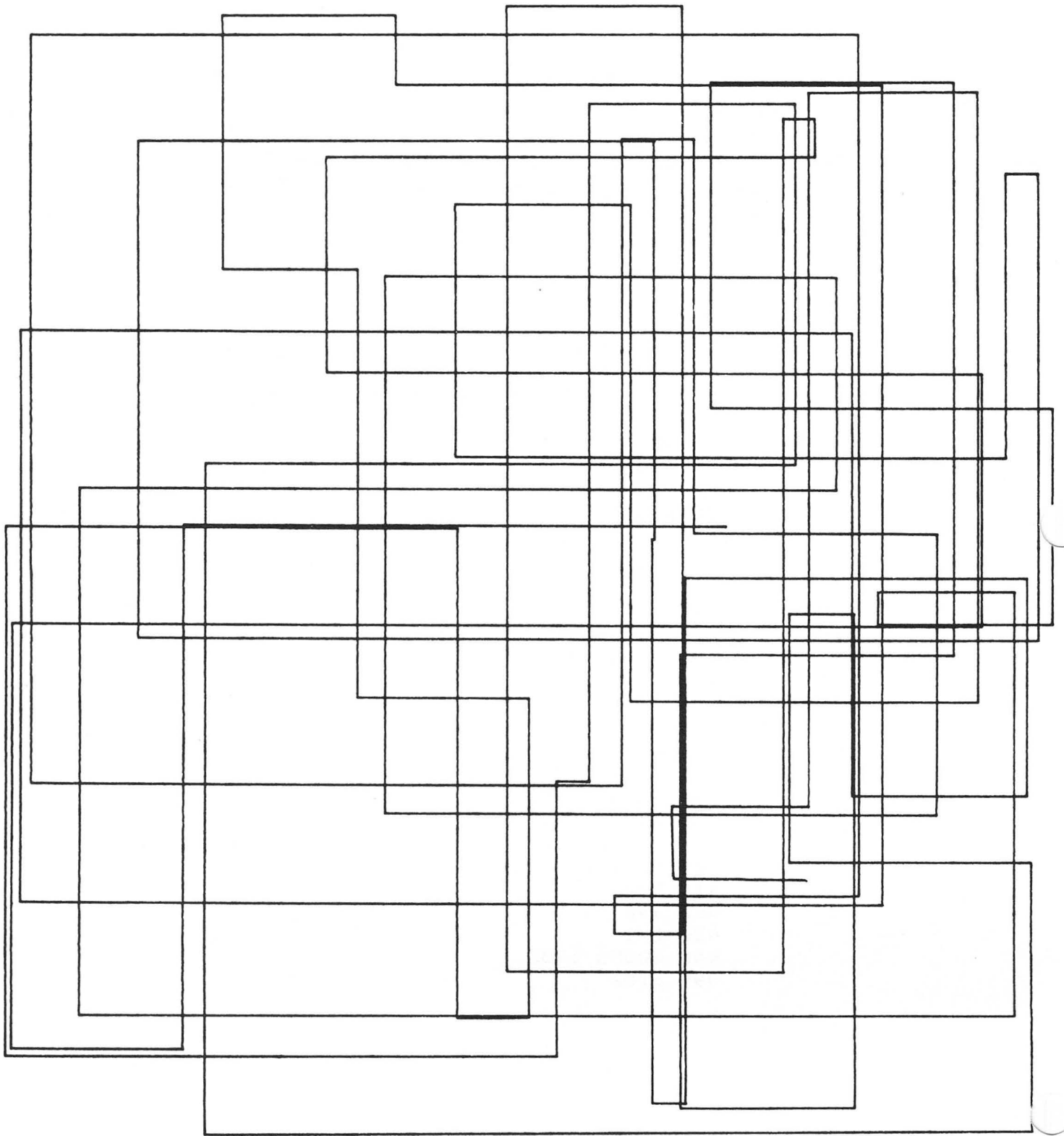
NUMBER: PL-3

NAME: TPLOT3  
LANGUAGE: BASIC

This program plots 100 connected horizontal and vertical lines. Each new line starts at the end of the old so the resultant plot looks something like an "etch-a-sketch."

TPLOT3 EDUSYSTEM 30

```
5 ' CONNECTED HORIZ AND VERT LINES
10 L=1
20 Y0=0
30 Y1=1
40 X0=0
50 X1=1
60 GOSUB 1100
70 RANDOMIZE
285 X=0
287 Y=0
310 X=RND(0)
320 Y=RND(0)
330 L=1
340 GOSUB 1300
350 L=0
355 FOR N=1 TO 50
360 Y=RND(0)
370 GOSUB 1300
380 X=RND(0)
390 GOSUB 1300
400 NEXT N
410 X=0
420 Y=0
430 L=1
440 GOSUB 1300
999 STOP
```



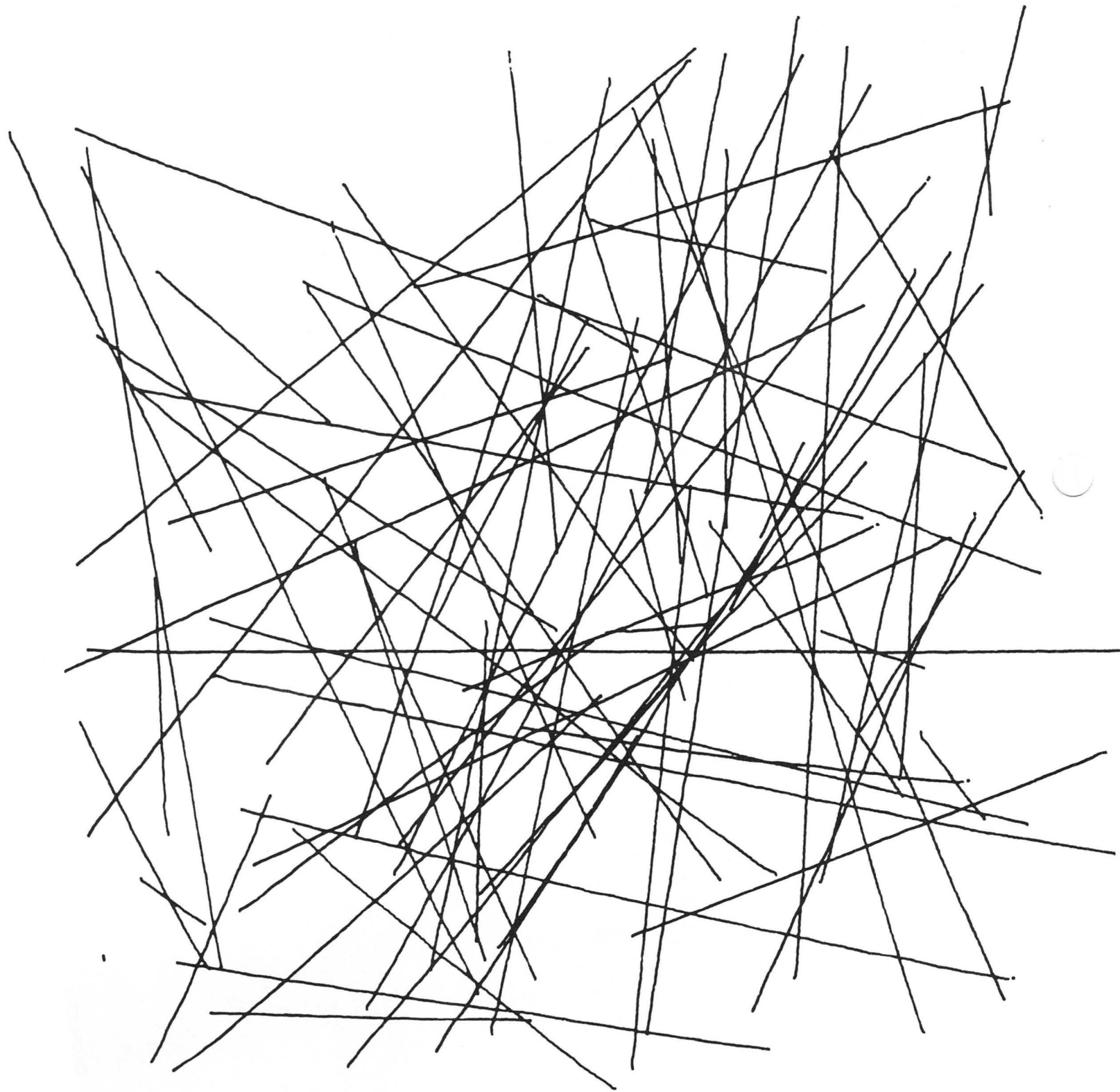
AREA: Plotting                      NUMBER: PL-4  
SOURCE: Digital Equipment Corp.

NAME: TPLOT4  
LANGUAGE: BASIC

This program plots 50 straight lines between pairs of randomly selected points. The resultant plot looks something like random-length pick-up sticks or electron traces in a bubble chamber.

TPLOT4 EDUSYSTEM 30

```
10 L=1
20 Y0=0
30 Y1=1
40 X0=0
50 X1=1
60 GOSUB 1100
70 RANDOMIZE
285 X=0
287 Y=0
400 ' ELECTRON TRACES
405 FOR N=1 TO 50
410 X=RND(0)
420 Y=RND(0)
430 L=1
440 GOSUB 1300
450 X=RND(0)
460 Y=RND(0)
470 L=0
480 GOSUB 1300
490 NEXT N
500 X=0
510 Y=.2
520 L=1
530 GOSUB 1300
999 STOP
```





AREA: Plotting                      NUMBER: PL-5  
SOURCE: Digital Equipment Corp.

NAME: TPLOT5  
LANGUAGE: BASIC

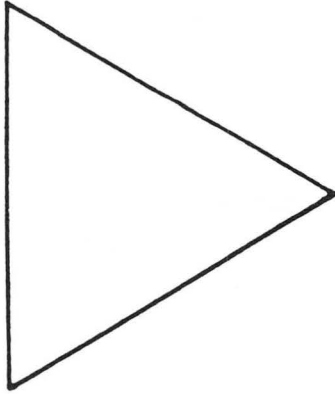
This program and TPLOT6 are adaptations of "turtle plots" done in LOGO.  
For more complete information on LOGO and turtle plotting, write for:

Twenty Things to do with a Computer  
Dr. Seymour Papert  
Artificial Intelligence Laboratory  
Massachusetts Institute of Technology  
Cambridge, Massachusetts

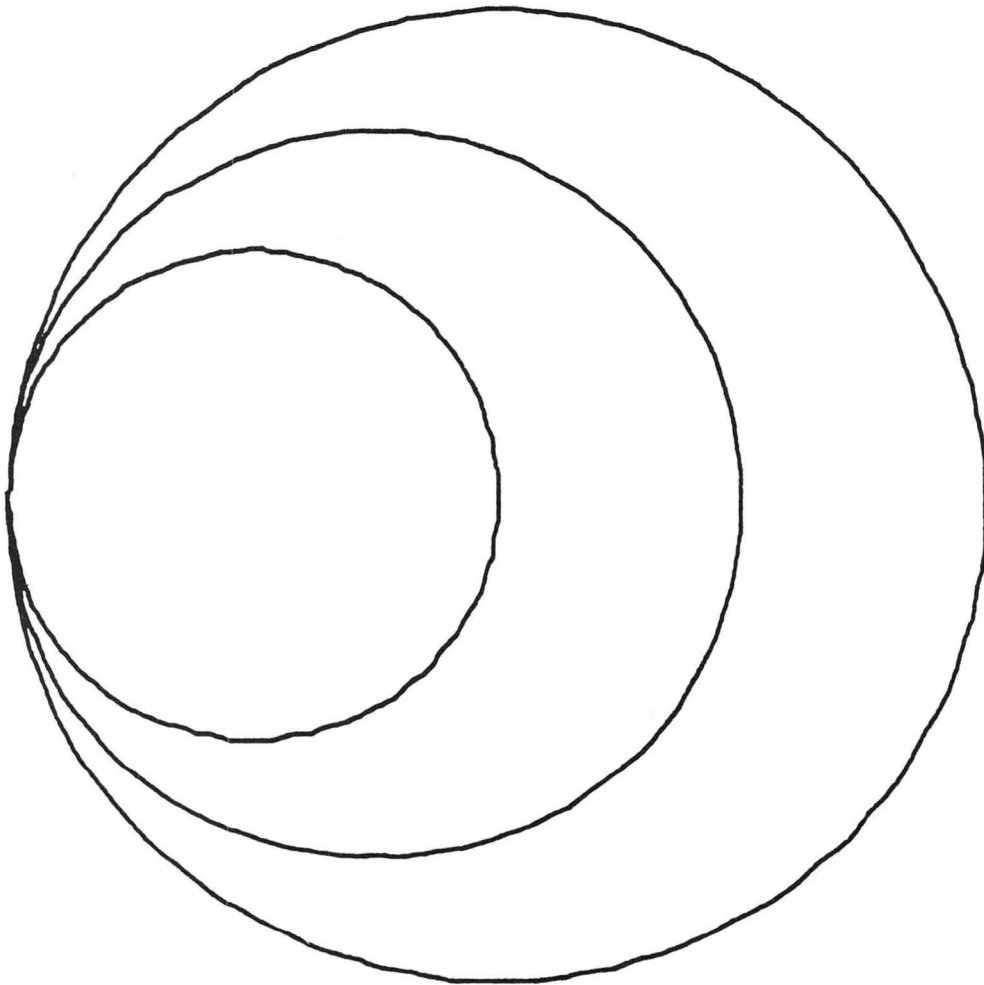
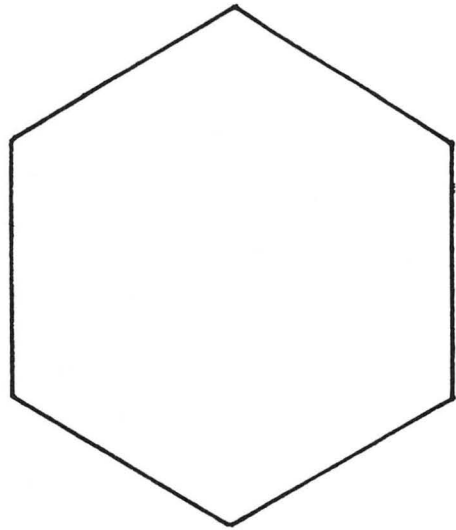
```
5 * POLYGON DESIGNER
6 PRINT "DESIGN YOUR OWN SHAPE"
10 PRINT "EXTERIOR ANGLE";
15 INPUT A1
20 PRINT "LENGTH OF SIDE (MAX=2.0)";
25 INPUT H
30 PRINT "NUMBER OF SIDES";
35 INPUT N1
110 L=1
120 Y0=-4
125 Y1=2
130 X0=-2
140 X1=4
150 GOSUB 1100
160 X=0
170 Y=0
180 GOSUB 1300
190 L=0
200 A=A1*1.74533E-2
210 FOR N=1 TO N1
220 X=H*SIN(N*A)+X
230 Y=H*COS(N*A)+Y
240 GOSUB 1300
250 NEXT N
285 X=0
287 Y=0
300 GOSUB 1200
310 GOTO 10
999 STOP
```

TPLOT5 POLYGON DESIGNER

120 degrees, 3 sides



60 degrees, 6 sides



3 degrees, 120 sides  
Three side lengths (.05, .075, .1)

AREA: Plotting  
SOURCE: Digital Equipment Corp.

NUMBER: PL-6

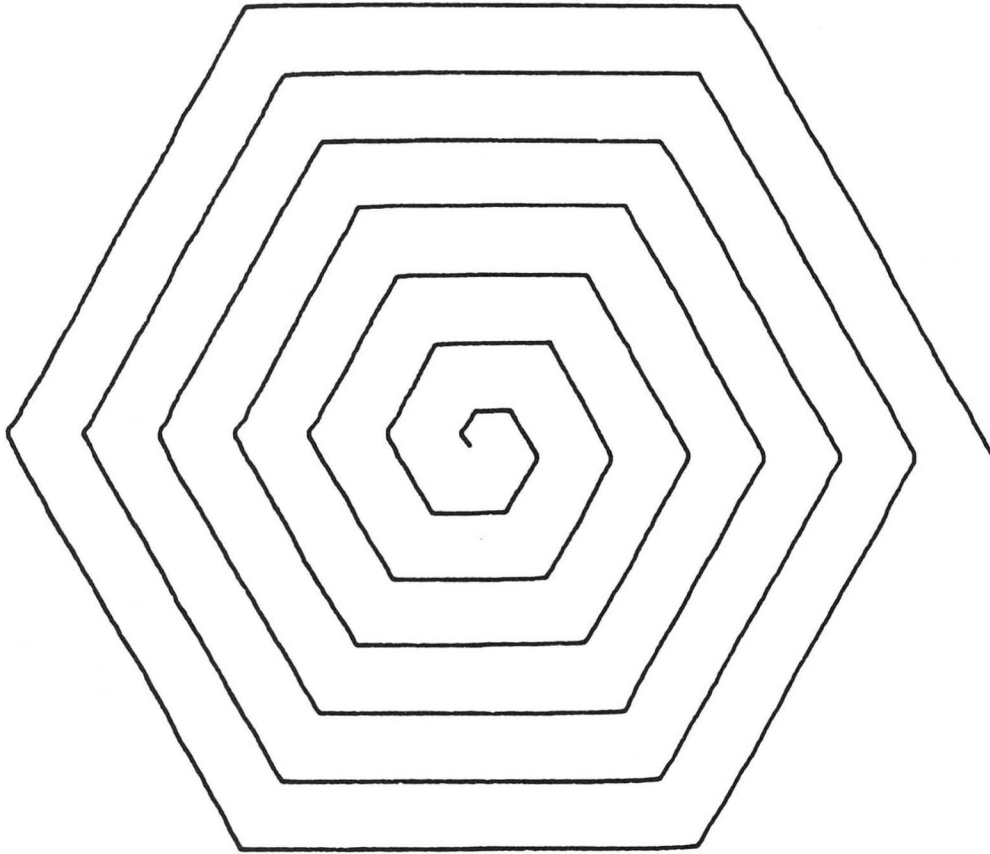
NAME: TPLOT6  
LANGUAGE: BASIC

This program allows the user to design his own spiral pattern. Angles which would form a regular polygon (60, 90, 120, etc.) look like regular figures such as triangles, squares, hexagons, etc. which are growing larger. Using angles close to but slightly larger or smaller than those of a regular polygon lead to figures which appear to be rotating as the spiral grows larger.

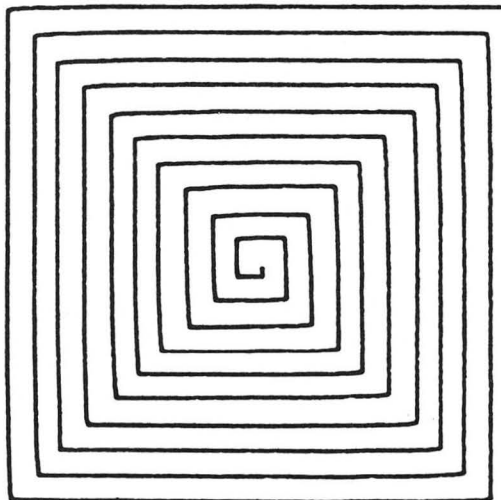
```
5 * SPIRAL DESIGNER
6 PRINT "DESIGN YOUR OWN SPIRAL PATTERN"
7 PRINT
10 PRINT "EXTERIOR ANGLE";
15 INPUT A1
20 H=0
30 PRINT "NUMBER OF SIDES";
35 INPUT N1
110 L=1
120 Y0=-4
125 Y1=2
130 X0=-2
140 X1=4
150 GOSUB 1100
160 X=0
170 Y=0
180 GOSUB 1300
190 L=0
200 A=A1*1.74533E-2
210 FOR N=1 TO N1
215 H=H+.05
220 X=H*SIN(N*A)+X
230 Y=H*COS(N*A)+Y
240 GOSUB 1300
250 NEXT N
285 X=0
287 Y=0
300 GOSUB 1200
310 GOTO 10
999 STOP
```

TPL0T6 SPIRAL DESIGNER

60 degrees, 40 sides

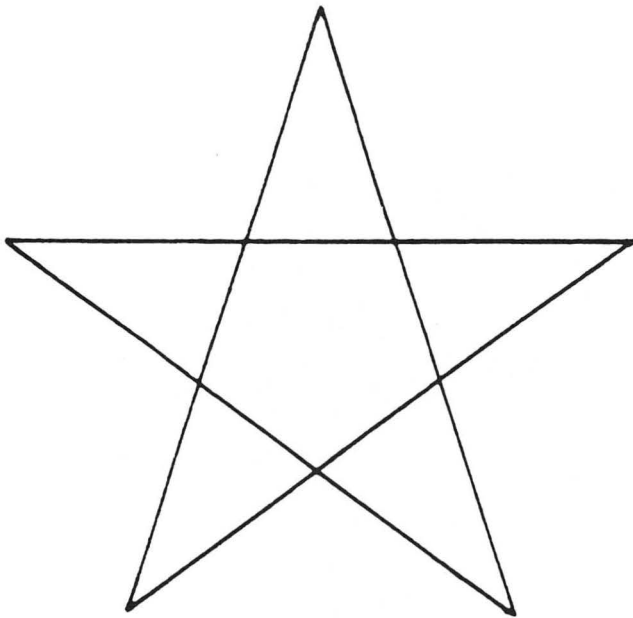


90 degrees, 40 sides

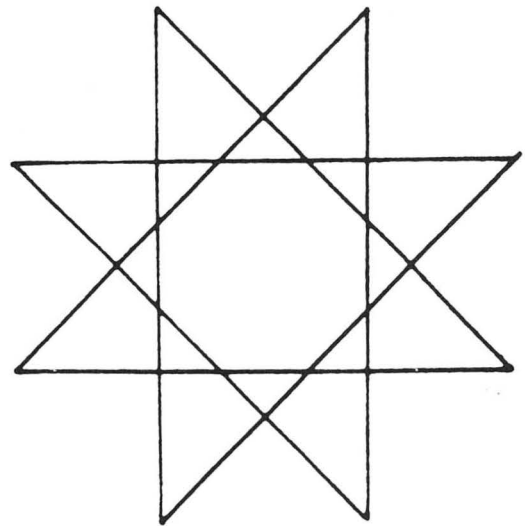


TPL0T5 POLYGON DESIGNER

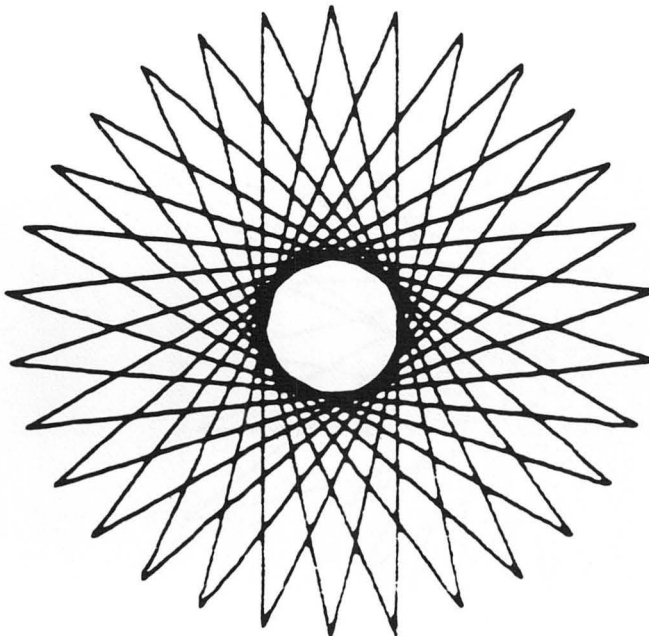
144 degrees, 5 sides



135 degrees, 8 sides

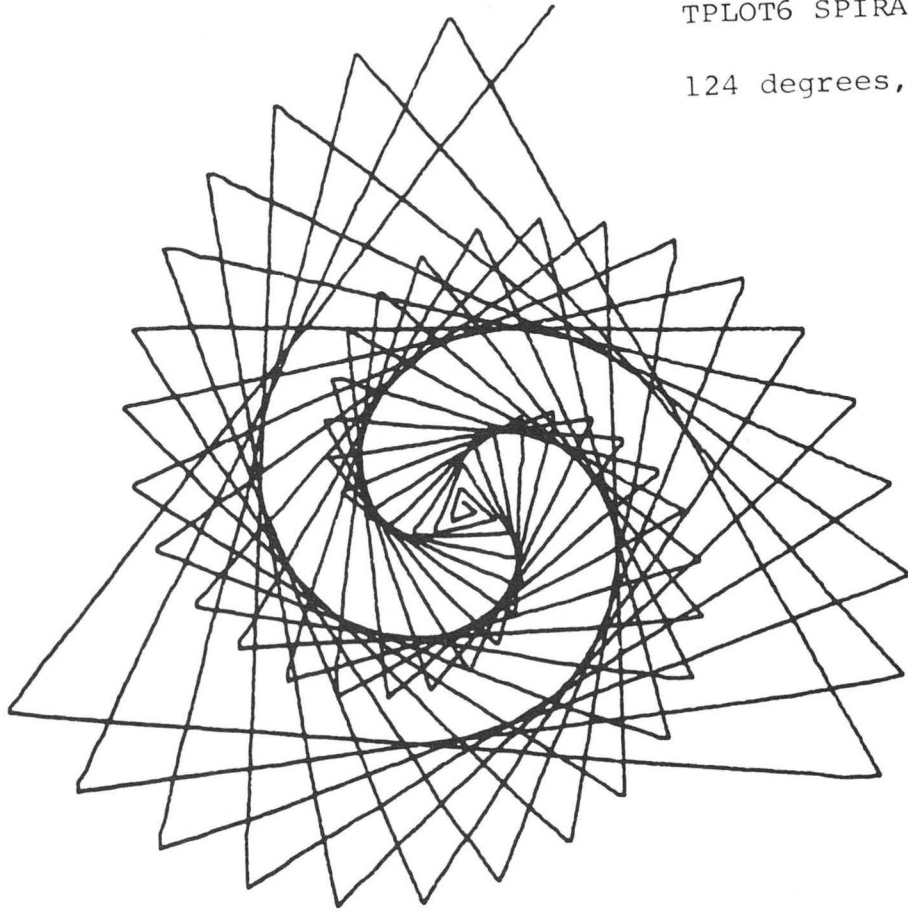


156 degrees, 30 sides

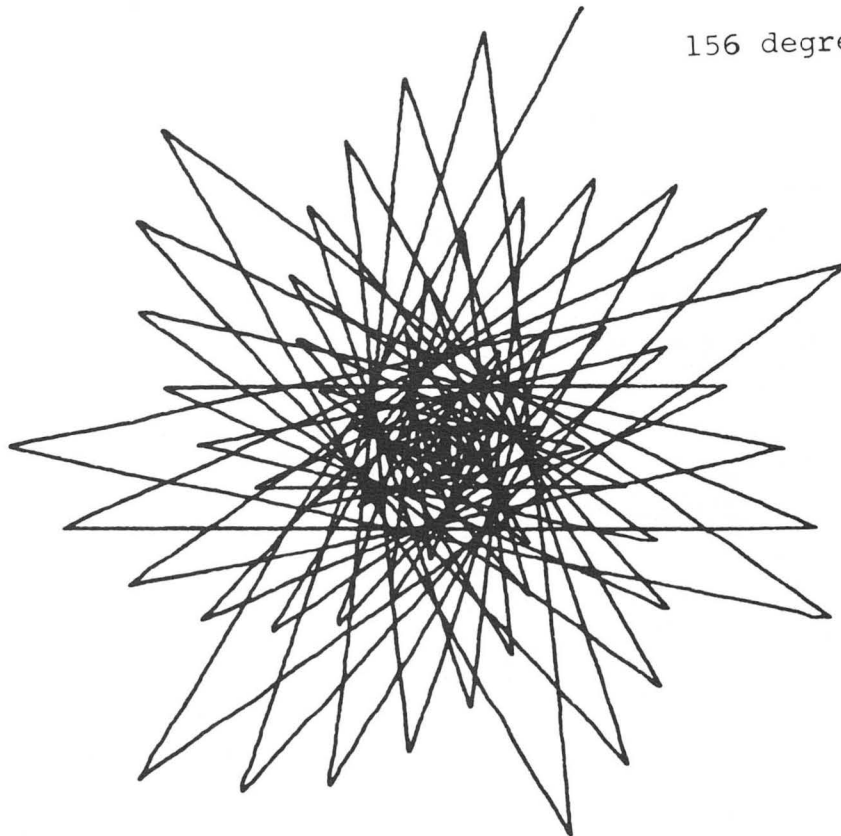


TPLOT6 SPIRAL DESIGNER

124 degrees, 70 sides



156 degrees, 70 sides



AREA: Plotting  
SOURCE: Digital Equipment Corp.

NUMBER: PL-7

NAME: TPLOT7  
LANGUAGE: BASIC

This program plots a bar chart from  $Y = 0$  to 1 and a point to point graph from  $Y=1$  to  $Z$ . The heights of the bars and positions of the points are random. Can you modify the program to accept input data for the Plot?

TPLOT7 EDUSYSTEM 30

```
5 ' BAR CHART AND POINT TO POINT GRAPH
10 L=1
20 Y0=0
30 Y1=2.05
40 X0=0
50 X1=1.05
60 GOSUB 1100
70 RANDOMIZE
100 ' AXIS
110 X=1
120 Y=0
130 GOSUB 1300
140 L=0
150 X=0
160 GOSUB 1300
170 Y=2
180 GOSUB 1300
190 L=1
200 Y=0
210 GOSUB 1300
300 ' BARS
310 X=X+.03
320 IF X>=1 THEN 500
325 L=1
330 GOSUB 1300
335 ' HEIGHT OF BAR IS RANDOM
340 Y=RND(0)
345 L=0
350 GOSUB 1300
360 X=X+.07
370 GOSUB 1300
380 Y=0
390 GOSUB 1300
400 GOTO 310
500 ' POINT TO POINT PLOT
510 L=1
520 Y=RND(0)+1
530 X=.06
540 GOSUB 1300
610 FOR X=.16 TO 1 STEP .1
615 ' EACH POINT IS RANDOM
620 Y=RND(0)+1
625 L=0
630 GOSUB 1300
640 NEXT X
700 L=1
710 X=0
720 Y=0
730 GOSUB 1300
740 GOSUB 1200
999 STOP
```





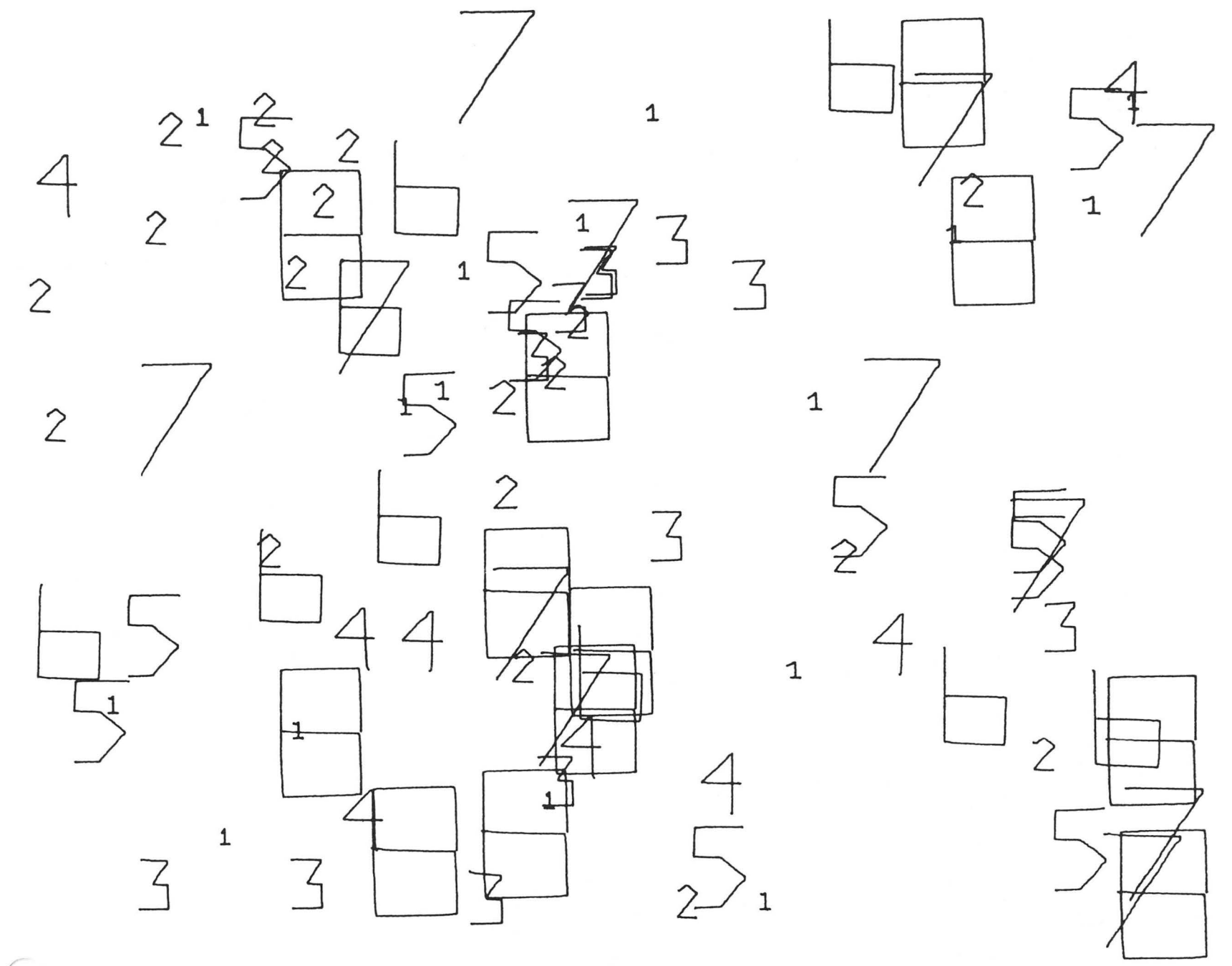
AREA: Plotting  
SOURCE: Digital Equipment Corp.

NUMBER: PL-8

NAME: TPL0T8  
LANGUAGE: BASIC

This program plots the characters 1 to 8 (generated in statement 120) at random positions. The size of each character, S, is proportionate to the numeric value of the character.

```
5 * RANDOM CHARACTER SIZE AND POSITION
8 RANDOMIZE
10 L=1
20 X0=0
30 X1=100
40 Y0=0
50 Y1=100
60 GOSUB 1100
110 L=0
115 FOR N=1 TO 50
120 C=INT(8*RND(0))+1)
130 S=C
160 X=84*RND(0)+1
170 Y=84*RND(0)+1
200 GOSUB 1800
210 NEXT N
220 L=1
230 GOSUB 1200
999 STOP
```



AREA: Plotting                      NUMBER: PL-9  
SOURCE: Digital Equipment Corp.

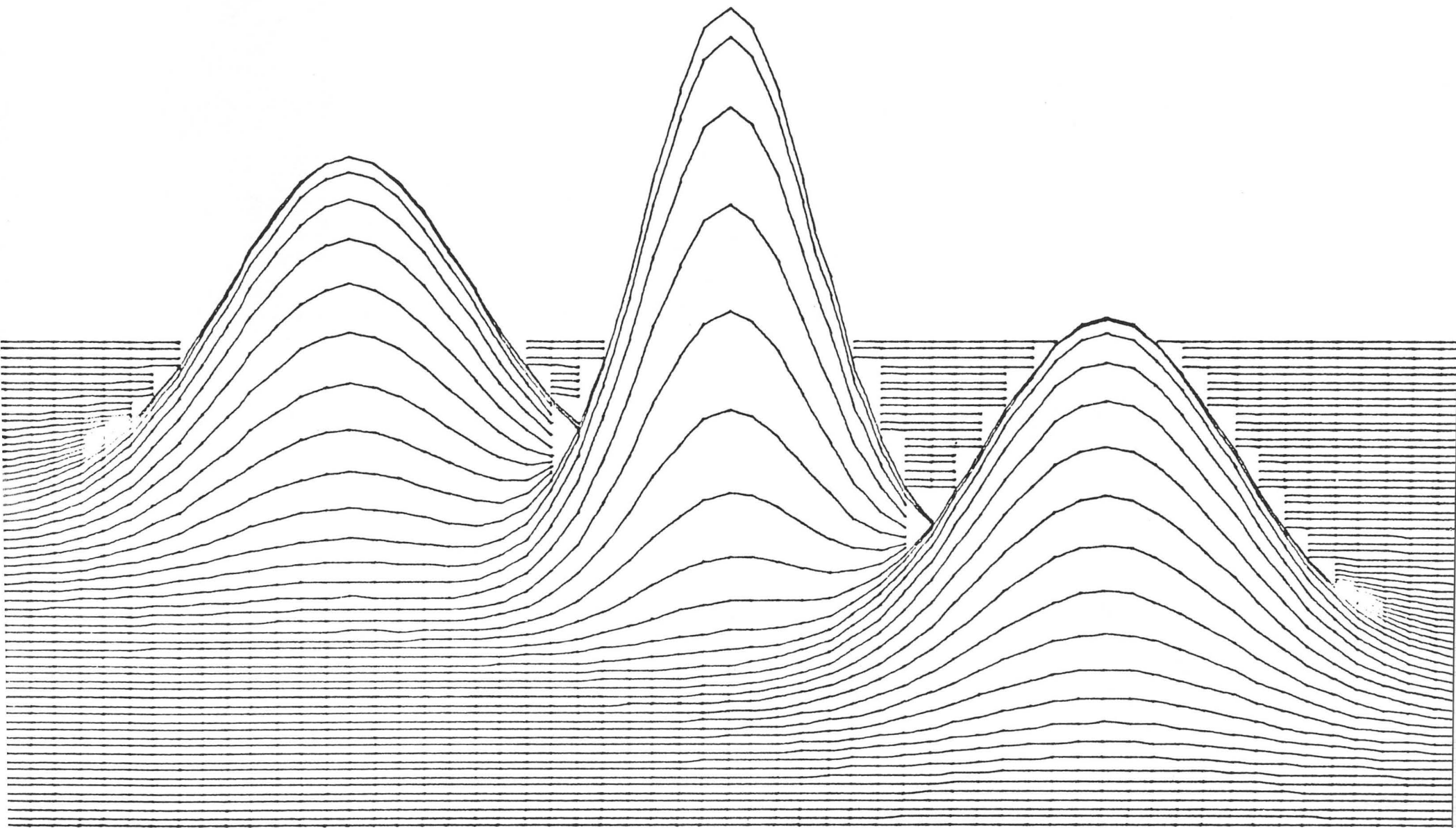
NAME: TPLOT9  
LANGUAGE: BASIC

Program plots three "3-dimensional" functions. It is left as a challenge to the reader to figure out how the program works. The reader might also wish to write a program to reproduce the plot on the front of this booklet.

```
5 DIM A(200),D(3),M0(3),N0(3),O1(3)
10 PRINT "X0,X1,Y0,Y1";
20 INPUT X0,X1,Y0,Y1
30 PRINT "S0,S1,S2";
40 INPUT S0,S1,S2
50 S3=(S1-S0)
55 PRINT "K";
56 INPUT K
57 FOR K1=1 TO K
60 PRINT "FOR"K1"D,M0,N0,O1";
65 INPUT D(K1),M0(K1),N0(K1),O1(K1)
66 NEXT K1
80 PRINT "Q2";
81 INPUT Q2
100 FOR I=0 TO S3
110 A(I)=-1
120 NEXT I
130 GOSUB 1000

200 FOR N=S1 TO S0 STEP -S2
210 L=1
215 I=0
220 FOR M=S0 TO S1 STEP S2
225 Z=0
230 FOR K2=1 TO K
235 GOSUB 900
240 Z=Z+O1(K2)*R
245 NEXT K2
246 Z=Z+O2-.7*N
250 X=M
260 Y=Z
270 IF A(I)=-1 THEN 350
280 IF Y>A(I) THEN 350
290 L=1
300 GOTO 400
350 A(I)=Y
360 GOSUB 1300
400 I=I+1
410 NEXT M
420 NEXT N
500 GOSUB 1200
510 STOP
900 R=(M-M0(K2))*2+(N-N0(K2))*2
910 R=-R/D(K2)
920 R=EXP(R)
930 RETURN
```

EDUSYSTEM PLOTTING



AREA: Plotting                      NUMBER: PL-10  
SOURCE: Digital Equipment Corp.

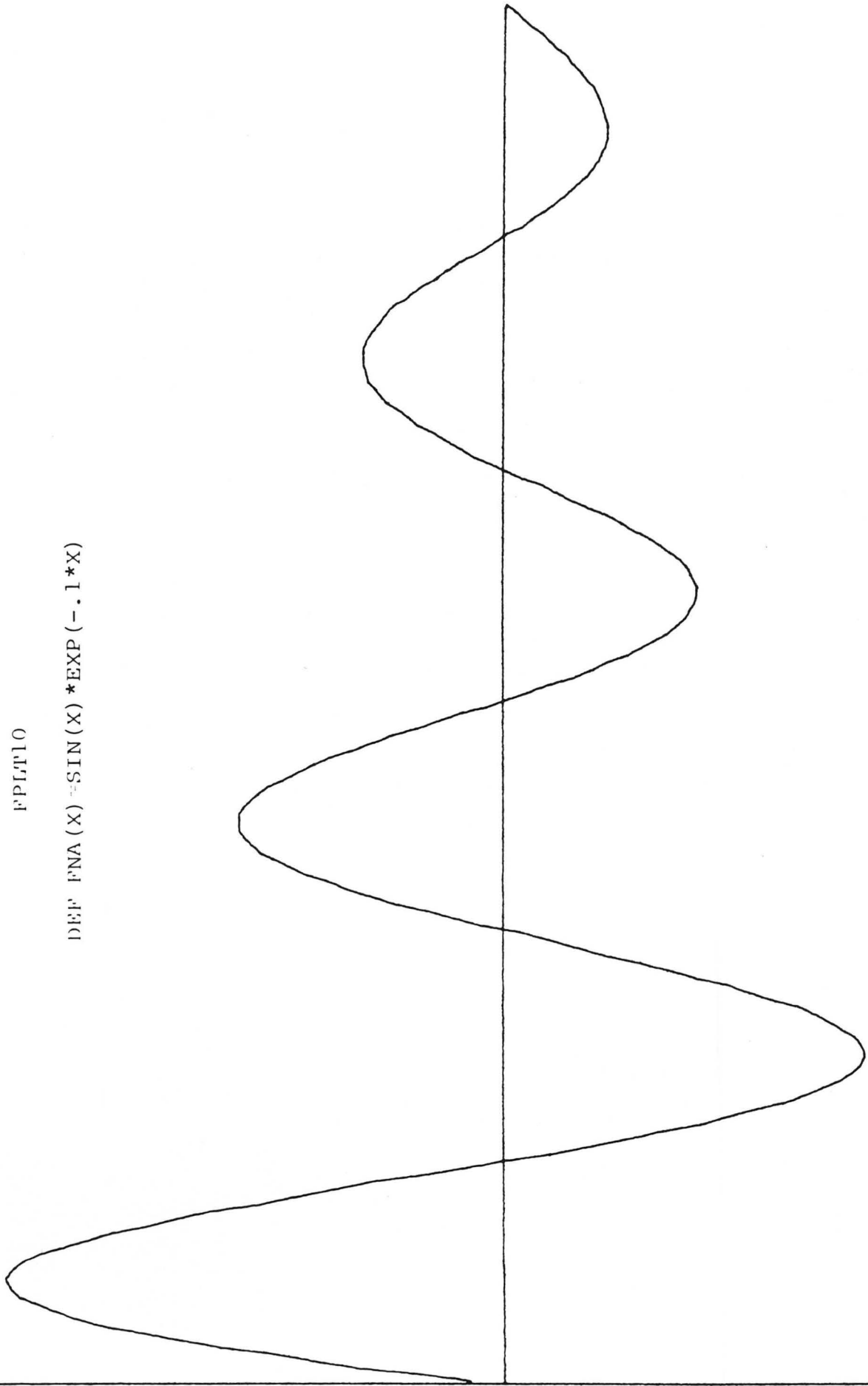
NAME: FPLT10  
LANGUAGE: BASIC

This program plots any function as defined in statement 300.

```
100 DIM P0(20)
110 PRINT "YOU SHOULD HAVE ENTERED YOUR FUNCTION AS:"
120 PRINT
130 PRINT "300 DEF FNA(X)=(YOUR FUNCTION)"
140 PRINT
150 PRINT "HAVE YOU (Y OR N)";
160 INPUT $A\ PRINT
170 IF A=#Y THEN 200
180 PRINT "THEN I'LL WAIT WHILE YOU DO."
190 STOP
200 PRINT
210 PRINT "WHAT ARE THE MINIMUM AND MAXIMUM VALUES OF X";
220 INPUT X0,X1
230 PRINT "WHAT ARE THE MINIMUM AND MAXIMUM VALUES OF Y";
240 INPUT Y0,Y1
250 PRINT "WHAT STEP SIZE DO YOU WISH TO USE FOR THE X-INCREMENT";
260 INPUT I
270 PRINT
280 PRINT "THANK YOU - WATCH YOUR PLOTTER."
290 PRINT
300 DEF FNA(X)=EXP(-X*2/2)
310 S=5
320 GOSUB 1500
330 L=1
340 X=X0
350 Y=Y0\ IF Y0>0 THEN 390\ IF Y1<0 THEN 390
360 GOSUB 1600
370 L=0\ GOSUB 1600
380 X=X1\ GOSUB 1600\ X=X-.05*(X1-X0)\ C=10\ GOSUB 1800
390 L=1\ X=X0\ IF X0>0 THEN 420\ IF X1<0 THEN 420\ Y=Y0\ GOSUB 1600
400 L=0\ GOSUB 1600
410 Y=Y1\ GOSUB 1600\ Y=Y-.05*(Y1-Y0)\ C=11\ GOSUB 1800
420 L=1\ X=X0\ Y=FNA(X0)\ GOSUB 1600
430 L=0\ GOSUB 1600
440 FOR X=X0 TO X1 STEP I
450 Y=FNA(X)
460 GOSUB 1600
470 NEXT X
480 GOSUB 1400
490 STOP
```

FPLT10

DEF FNA(X)=-SIN(X)\*EXP(-.1\*X)



NOTE:

To allow the utility support routine for the TSP-212 plotter to work with BASIC-PLUS on RSTS-11, lines 1490 and 1720 should be changed to read:

```
PRINT CHR$ (P3 + 128);
```

To prevent the system from intercepting some of the characters generated.

In programs TPLOT1, TPLOT2, TPLOT3 and TPLOT4 the following statement is needed:

```
998 GOSUB 1200
```

to turn off the plotter.

In program TPLOT9, statement 130 should be changed to:

```
130 GOSUB 1100
```

Above corrections thanks to:

W. E. Brown  
University Computer Center  
Lawrence University  
Appleton, Wisconsin 54911

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