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**COMPUTER GRAPHICS
(Microcomputer Programs)**

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Training Department
Southeast Asian Fisheries Development Center

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PREFACE

The computer is capable of not only displaying various kinds of graphs on screen, but it can also draw them on paper when an X-Y plotter is connected to its main body. Some examples of the computer graphics are shown in this booklet. The computer used here is a SHARP PC-1500 (CPU), with an additional 8K-bytes module, and a cassette-recorder interface with a mini X-Y plotter. Even this small computer which does not have many commands for graphics, can draw various patterns shown in this booklet.

The technique of graphic programing is somewhat different from numerical computation. It is hoped that the reader who is beginning to study programing will get some hints from close examination of program lists and pictures included in this booklet.

If the reader has little knowledge of programing, the instruction manual of the microcomputer must be studied first. The programs contained here are applications of the technique explained in the manual. The language used here is expanded BASIC.

S. Shindo

May 1984

1. Drawing Aid (1) - PROG.-G20

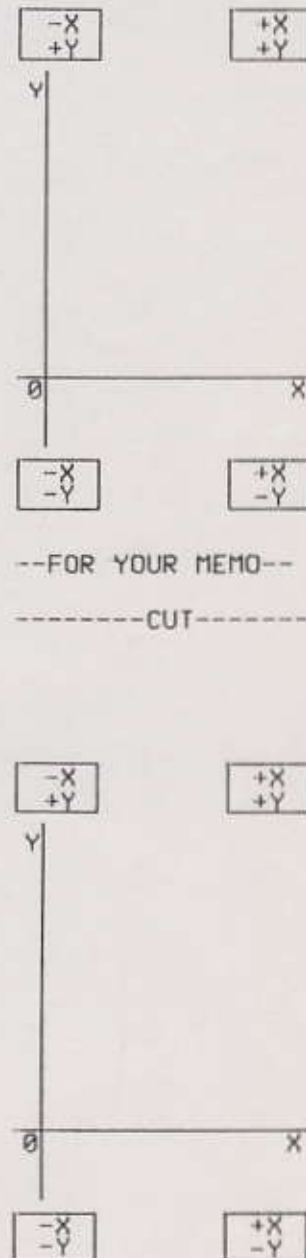
```

5:REM PROG.-G20
6:REM DEF -A-
7:REM *****
  * DRAWING AID*
  *****
10:"A":CLEAR :
  GRAPH :
  GLCURSOR (0,0)
12:FOR I=0 TO 1
15:TEXT :LF 15:
  GRAPH
20:GLCURSOR (0,0)
  :SORGN
30:GLCURSOR (8,20)
  :LPRINT "Y"
40:LINE (20,220)-(
  (20,-50):LINE
  (0,0)-(220,0)
50:GLCURSOR (200,
  -15):LPRINT "X
  ":GLCURSOR (8,
  -15):LPRINT "0
  "
60:LINE (0,264)-(<
  60,229),,,B:
  GLCURSOR (22,2
  48):LPRINT "-X
  "
70:GLCURSOR (22,2
  31):LPRINT "+Y
  ":LINE (154,26
  4)-(214,229),,
  ,B
80:GLCURSOR (174,
  248):LPRINT "+
  X":GLCURSOR (1
  74,231):LPRINT
  "+Y"
90:LINE (0,-60)-(<
  60,-95),,,B
100:GLCURSOR (20,-
  75):LPRINT "-X
  ":GLCURSOR (20
  ,-90):LPRINT "
  -Y"
110:LINE (154,-60)
  -(214,-95),,,B
  :GLCURSOR (174
  ,-75):LPRINT "
  +X"
120:GLCURSOR (174,
  -92):LPRINT "-
  Y":GLCURSOR (2
  0,0):SORGN
122:IF 1)=1GOTO 14
  0
123:TEXT :LF 7:
  LPRINT "--FOR
  YOUR MEMO--":
  LF 1:LPRINT "--
  -----CUT-----
  ----":LF 2:
  GRAPH
125:NEXT I
130:BEEP 5:
  GLCURSOR (0,0)
  :SORGN
140:INPUT "X1= ";X
  1
150:INPUT "Y1= ";Y
  1
160:BEEP 3
170:INPUT "X2= ";X
  2
180:INPUT "Y2= ";Y
  2
190:LINE (X1,Y1)-(<
  X2,Y2)
195:GLCURSOR (20,0
  )
200:GOTO 130
210:END

STATUS (1)
729

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  FEB.1984 SEAFDEC
  *****

```



2. Drawing Aid (2) - PROG.- G25

```

5:REM PROG.-G25
6:REM DEF -A-
7:REM *****
  * DRAWING *
  *AID(REVICED)*
  *****
8:"A":CLEAR :
  TEXT :BEEP 5:
  WAIT 100:PRINT
  "SET BLACK PEN
  EXCEPT No.3":
  BEEP 2:WAIT
9:LPRINT " CHAR
  T OF"
10:LPRINT "PEN(Co
  lor)No.":LF -3
11:BEEP 3:TEST :
  CSIZE 1:LF -9:
  LPRINT " 0
    1 2
    3":CSIZE 2:
  LF 4:BEEP 3
12:INPUT "PEN SEL
  ECT(0-2)=?":C:
  IF C>=3GOTO 12
13:COLOR C:CLS
14:FOR J=0TO 1
18:TEXT :LF 13:
  GRAPH
20:GLCURSOR (0,0)
  :SORGN
30:GLCURSOR (13,2
  07):LPRINT "Y"
40:LINE (25,220)-
  (25,-50):LINE
  (0,0)-(220,0)
50:GLCURSOR (200,
  -15):LPRINT "X
  ":GLCURSOR (0,
  -15):LPRINT "0
  "
60:LINE (0,264)-
  (60,229),,B:
  GLCURSOR (22,2
  48):LPRINT "-X
  "
70:GLCURSOR (22,2
  31):LPRINT "+Y
  ":LINE (154,26
  4)-(214,229),,
  ,B
80:GLCURSOR (174,
  248):LPRINT "+
  X":GLCURSOR (1
  74,231):LPRINT
  "+Y"
90:LINE (0,-60)-
  (60,-95),,B
100:GLCURSOR (20,-
  75):LPRINT "-X
  ":GLCURSOR (20
  ,-90):LPRINT "
  -Y"
110:LINE (154,-60)
  -(214,-95),,B
  :GLCURSOR (174
  ,-75):LPRINT "
  +X"
120:GLCURSOR (174,
  -92):LPRINT "-
  Y":GLCURSOR (2
  0,0):SORGN
130:BEEP 5:
  GLCURSOR (0,0)
135:YY=10
140:FOR I=1TO 20
142:S=1:S=I*10
149:COLOR 3
150:LINE (5,YY)-(2
  10,YY)
160:CSIZE 1
170:GLCURSOR (-20,
  YY-3):LPRINT S
175:YY=YY+10
180:NEXT I
183:XX=15
185:FOR I=1TO 18
190:T=1:T=I*10
200:LINE (XX,0)-(X
  X,210)
205:CSIZE 1
210:GLCURSOR (XX-4
  ,-1):ROTATE 1:
  LPRINT T:
  ROTATE 0
212:CSIZE 2
215:XX=XX+10
220:NEXT I:BEEP 5
230:IF J=0COLOR C:
  TEXT :LF 5:
  LPRINT "***FOR
  YOUR DRAFT**":
  LF 2:LPRINT "-
  -----CUT-----
  ---":LF 3
232:IF J=0BEEP 10:
  PRINT "*CUT PA
  PER & Stroke E
  NTER*"
235:COLOR C
240:NEXT J
250:GLCURSOR (0,0)
  :SORGN
252:BEEP 10:WAIT 1
  50:PRINT "*X=0
  & Y=0 can not
  KEYIN*":WAIT
255:CLEAR :GRAPH
260:DIM A(100),B(1
  00),C(100),D(1
  00),E(100),F(1
  00),G(100),H(1
  00)
270:FOR I=0TO 99
280:INPUT "X1= ";A
  (I)
281:INPUT "Y1= ";B
  (I)
282:INPUT "X2= ";C
  (I)
283:INPUT "Y2= ";D
  (I)
284:GLCURSOR (25,0
  ):SORGN
285:LINE (A(I),B(I)
  )-(C(I),D(I)):
  GLCURSOR (25,
  0)
286:BEEP 2:INPUT "
  * Record=1,Ne
  glect=0 ? *":Q
287:IF Q=1LET E(I)
  =A(I)
288:IF Q=1LET F(I)
  =B(I)
289:IF Q=1LET G(I)
  =C(I)

```

```
290: IF Q=1 LET H(I)
      =D(I)
295: Q=0
300: GRAPH :
      GLCURSOR (25, 0
      )
315: BEEP 3: INPUT "
      Continue=1,
      Finish=0 ? "; P
316: IF P=0 THEN 327
320: NEXT I
325: REM *****
327: TEXT : GRAPH :
      GLCURSOR (0, 0)
      : TEXT : LF 8
330: LPRINT " ** ED
      ITING **": TEXT
      : LF 1
340: FOR I=0 TO 99
342: IF E(I)=0 GOTO
      370
345: WAIT 10: PRINT
      " ** EDITI
      NG **"
350: LPRINT "("+
      STR$ E(I)+"", "+
      STR$ F(I)+"")-(
      "+STR$ G(I)+"",
      "+STR$ H(I)+"")
      "
360: NEXT I
370: LF 1: LPRINT "
      ---END---":
      LF 4
380: END
```

STATUS (1) 1782

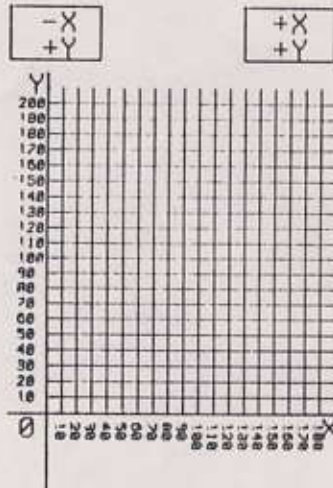
XX

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XX

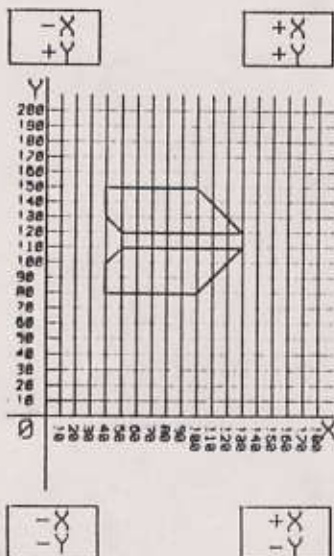
CHART OF PEN(Color)No.

0 1 2 3



FOR YOUR DRAFT

-----CUT-----



** EDITING **

(50, 120)-(40, 130)
(40, 130)-(40, 150)
(40, 150)-(100, 150)
(100, 150)-(130, 120)
)
(130, 120)-(50, 120)
(50, 110)-(40, 100)
(40, 100)-(40, 80)
(40, 80)-(100, 80)
(100, 80)-(130, 110)
(130, 110)-(50, 110)

---END---

3. Example of PROG.-G25

```

10:REM -RUN-
20:REM APPLICATION OF PROGRAMS
   G20 AND G25
30:REM WHEN STOP PRESS KEY MARK
   ED BREAK
40:REM *****
50: CLEAR :GRAPH
60: LINE (50,120)-(
   (40,130)-(40,1
   50)-(100,150)-
   (130,120)-(50,
   120)
70: LINE (50,110)-
   (40,100)-(40,8
   0)-(100,80)-(1
   30,110)-(50,11
   0)
80: TEXT :LF 9:
   GRAPH
90: GOTO 50
100: END

```



```

80: TEXT :LF 8:
   GRAPH

```



```

80: TEXT :CSIZE 1:
   LF 12: GRAPH

```



4. Arrow, etc. - PROG.-G01

```

10:REM PROG.-G01
12:REM ARROW, KEY-
  STROKES & SIGM
  A: -A-, -B-, -C-
15:REM *****
  * ARROW (1) *
  *****
20:"A" CLEAR :
  GRAPH
22:BEEP 3:WAIT 80
  :PRINT " **
  ARROW (1) **"
  :WAIT
23:INPUT "No. of A
  RROWS=";A:A=
  INT (A/2+0.5)
24:FOR H=0TO A-1
26:SORGN :X=0
27:FOR J=0TO A-1:
  FOR J=0TO 1
30:LINE (X+20,0)-
  (X+60,0)-(X+60
  ,-20)-(X+76,-2
  0)-(X+40,-50)-
  (X+0,-20)-(X+2
  0,-20)
40:LINE (X+20,-20
  )-(X+20,0)
47:NEXT J:X=125:
  NEXT J
48:TEXT :LF 5:
  GRAPH
50:NEXT H
60:TEXT :LF 3
70:END
79:REM *****
  * KEY STROKE *
  * PROCEDURE *
  *****
80:"B":CLEAR
82:REM ***STROKE
  "ENTER" KEY
  ONLY = PRINT
  BOX ONLY*****
90:BEEP 3:WAIT 10
  0:PRINT " * KE
  Y STROKE PROCE
  DURE *
95:BEEP 3:INPUT "

No. of ITEMS (J-
12)=?" ;A:WAIT
  0
96:IF A>=13GOTO 9
  5
100:DIM A$(A-1)*2
110:FOR J=0TO A-1:
  BEEP 1
120:B$="":CLS
122:B$="A$("+STR$
  (J+1)+")="
124:PRINT B$;
126:INPUT A$(J)
128:NEXT J
130:LF 2:GRAPH :
  SORGN
135:X=20:Y=0
140:FOR J=0TO A-1
150:IF X>181LET X=
  20:Y=-50
160:GLCURSOR (X,Y)
170:LPRINT A$(J):
  GOSUB 230
180:X=X+30
190:NEXT J
200:TEXT :LF 5
210:END
220:REM *****
  **SUB-PROG.***
230:LINE (X-8,Y-8)
  -(X+12,Y+18),,
  ,B
240:RETURN
250:END
299:REM *****
  * THREE TYPES*
  * OF SIGMAS *
  *****
300:"C":CLEAR :
  TEXT :LF 2:
  GRAPH :SORGN
305:X=0
310:FOR J=0TO 2
312:IF X>66AND X<1
  48GLCURSOR (68
  ,44):LPRINT "
  N":GLCURSOR
  (68,-14):

LPRINT " 1"
:GOTO 340
320:GLCURSOR (2,44
  ):LPRINT " i=
  N"
330:GLCURSOR (2,-1
  4):LPRINT " i
  =1"
340:GOSUB 400
350:X=X+70:NEXT J
358:TEXT :LF 5
360:END
400:REM SUB-PROG.*
  *****
410:FOR J=0TO 3
420:LINE (X+65,30)
  -(X+60,40)
430:LINE (X+60,40)
  -(X+20,40)
435:LINE (X+20,40)
  -(X+35,20)-(X+
  20,0)-(X+60,0)
440:LINE (X+60,0)-
  (X+65,7)
450:X=X+1:NEXT J
460:RETURN
470:END

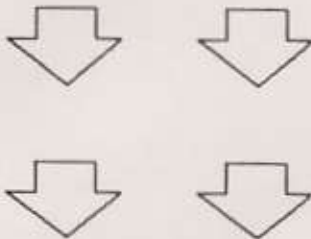
STATUS (1)
1337

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*****

```

PRINTOUT

DEF --A--



DEF --B--

☐ ☐ * F J S

H * ☐ E N D

A (2 , 5)

= 9 0

DEF --C--

$$\sum_{i=1}^{i=N} \sum_1^N \Sigma$$

WEST MALLAYSIA
WEST MALLAYSIA

5. Circle Graphics - PROG.-501

```

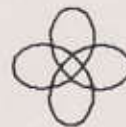
2:REM PRG.-501
3:REM DEF -A, B-
4:REM *****
  *CIRCLE GRAPH*
  *ROUND & ROUND
  *****
5:"A":CLEAR :
  GRAPH :
  GLCURSOR (100,
    -200):BEEP 3
7:INPUT "PEN SEL
  ECT=?";M:COLOR
  M:BEEP 3
8:WAIT 150:PRINT
  " *Print r & L
  , Pres KEY B*"
  :WAIT :BEEP 2
10:INPUT "r=";RR,
  "L=";L:R=100:H
  =20
12:P=10000:WAIT 1
  0:PRINT "OPERA
  TION":WAIT
15:D=0:GOSUB "CAL
  ":ZX=X2:ZY=Y2:
  OX=X2:OY=Y2
20:FOR I=HTO P
  STEP H
30:D=1:GOSUB "CAL
  ":WX=X2:WY=Y2
50:LINE (ZX+100,Z
  Y-100)-(WX+100,
  WY-100)
55:ZX=WX:ZY=WY
56:IF OX=ZYAND OY
  =ZY:END
60:NEXT I:END
100:"CAL"DD=R/RR*D
  :RX=(R-RR)*COS
  D:RY=(R-RR)*
  SIN D:X1=L*COS
  (90-DD):Y1=L*
  SIN (90-DD)
110:D1=D-90
120:X2=X1*COS D1-
  SIN D1*Y1+RX:Y
  2=X1*SIN D1+
  COS D1*Y1+RY

```

```

130:RETURN
135:REM *****
140:"B":TEXT :LF 9
  :CSIZE 2:COLOR
  M:LPRINT "r=";
  RR:LPRINT "L="
  ;L
150:END

```



STATUS (1)

626

r= 75
L= 18

XX

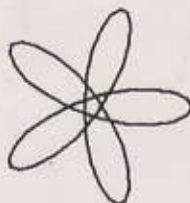
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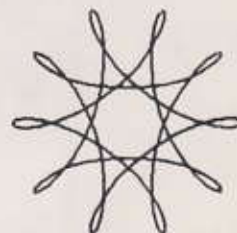
XX



r= 90
L= 17



r= 60
L= 34



r= 70
L= 55

6. Ball of Polygons - PROG.-G06

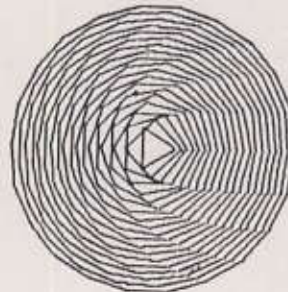
```
5:REM PROG.-G06
6:REM DEF -B-
7:REM *****
  * A BALL OF *
  * POLYGONES *
  *****
10:"B":CLEAR :
  GRAPH :
  GLCURSOR (107,
    -107):SORGN
20:N=3:A=30:CJ=1
30:FOR K=1TO 20
40:R=A/(2*SIN (18
  0/N)):X=R*COS
  C:Y=R*SIN C:C=
  360/N
50:FOR J=1TO N
60:XJ=R*COS C:YJ=
  R*SIN C
70:LINE (X,Y)-(XJ
  ,YJ)
80:X=XJ:Y=YJ:C=C+
  (360/N)
90:NEXT J
100:N=N+1
110:C=0:NEXT K
120:GLCURSOR (0,-1
  50)
130:END
```

STATUS (1)

315

```
*****
REARRANGED BY
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*****
```

```
*****
RESULT OF PRINTOUT
*****
```



7. Four Polygons - PROG.-G40

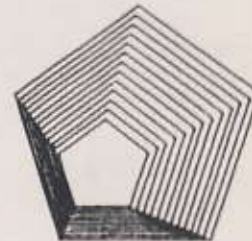
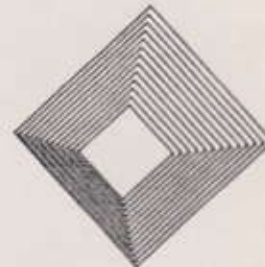
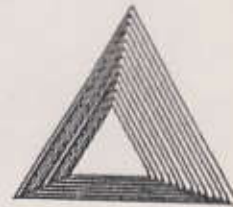
```

4:REM PROG.-G40
5:REM DEF -Z-
6:REM *****
  * ISOSCELES *
  * 4 POLYGONES*
7:REM -----*
  * A SENSE OF *
  *PERSPECTIVE *
  *****
10:"Z":CLEAR :
  TEXT
13:BEEP 2:LPRINT
  " POLYGON N
  o.":LF 1:
  LPRINT "TRIANG
  LE=1":LPRINT "
  SQUARE=2"
14:LPRINT "PENTAG
  ON=3":LPRINT "
  HEXAGONE=4"
15:DIM X(40),Y(40)
20:GRAPH :
  GLCURSOR (107,
  -107):SORGN
25:BEEP 5:INPUT "
  No. of POLYGON
  (on PAPER)?":P
  :IF P>=5GOTO 2
  5
40:IF P=1LET A=90
41:IF P=2LET A=0
42:IF P=3LET A=18
43:IF P=4LET A=30
50:C=0
60:IF P=1LET D=12
  0
61:IF P=2LET D=90
62:IF P=3LET D=72
63:IF P=4LET D=60
70:R1=100
72:FOR K=1TO 13
74:IF P<=2
  GLCURSOR (-1,-
  1):SORGN
75:IF P>=3
  GLCURSOR (-2,-
  2):SORGN
76:R1=R1-5
80:X=R1*COS (C+A)
90:Y=R1*SIN (C+A)
100:IF P=1GOTO 105
101:IF P=2GOTO 106
102:IF P=3GOTO 107
103:IF P=4GOTO 108
105:FOR J=1TO 4:
  GOTO 110
106:FOR J=1TO 5:
  GOTO 110
107:FOR J=1TO 6:
  GOTO 110
108:FOR J=1TO 7:
  GOTO 110
110:X1=R1*COS (C+A
  )
120:Y1=R1*SIN (C+A
  )
130:LINE (X,Y)-(X1
  ,Y1)
140:X=X1:Y=Y1
150:C=C+D
160:NEXT J
162:C=C+D
164:IF P=1LET A=90
165:IF P=2LET A=0
166:IF P=3LET A=18
167:IF P=4LET A=30
169:NEXT K
170:GRAPH :
  GLCURSOR (0,-2
  50)
175:TEXT
180:END

```

POLYGON No.

TRIANGLE=1
SQUARE=2
PENTAGON=3
HEXAGONE=4



STATUS (1)

876

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8. Graphic Patterns (1) - PROG.-G02

```

5:REM PROG.-G02
6:REM DEF -Z-
7:REM *****
  * GRAPHIC *
  * PATTERNS *
  *****
9:"Z":TEXT :
  LPRINT "KEYSTR
  OKE= DEF -?-":
  LF 1
10:LPRINT "A=TOP"
  :LPRINT "S=CUR
  VED TRIANGLE":
  LPRINT "D=FLYI
  NG CARPET":
  LPRINT "F=ONIO
  N"
12:LPRINT "G=5 LA
  YER BLOCK(1)":
  LPRINT "H=5 LA
  YER BLOCK(2)":
  LPRINT "J=TOP
  SHELL"
18:TEXT :LF 4:END
19:REM *****
20:"A":CLEAR :LF
  7:GRAPH :
  GLCURSOR (0,0)
22:BEEP 3:WAIT 10
  0:PRINT "
  *GRAPHIC TO
  P*":WAIT
25:GLCURSOR (120,
  0):SORGN
30:FOR X=2TO 27
40:Y=100*(1/X)
50:IF X=28THEN 11
  0
60:LINE (4*X,4*Y)
  -(-4*X,-4*Y),,
  ,B
70:NEXT X
80:GLCURSOR (0,-1
  50)
90:END
99:REM *****
100:"S":CLEAR :
  GRAPH :
  GLCURSOR (0,0)
101:BEEP 3:WAIT 15
  0:PRINT "
  *CURVED TRIANG
  LE*":BEEP 3:
  WAIT
102:INPUT "DEGREE=
  1 GRADIAN=2 ?"
  :Q:IF Q<=0OR Q
  >=3GOTO 102
104:IF Q=1DEGREE
105:IF Q=20RAD
106:BEEP 2:WAIT 10
  0:PRINT " *WA
  IT ABOUT 45 SE
  CONDS*":WAIT
107:DIM X(160),Y(1
  60),O(160),P(1
  60)
110:GLCURSOR (120,
  0):SORGN :N=1
120:FOR A=0TO 360
  STEP 4
130:X(N)=50*SIN A
132:Y(N)=-A
136:N=N+1
138:NEXT A
140:N=1
145:FOR A=0TO 300
  STEP 4
150:O(N)=50*SIN A
152:P(N)=220-A
153:N=N+1:NEXT A
154:BEEP 3:WAIT 10
  :PRINT " *
  CURVED TRIANGL
  E*":BEEP 3:
  WAIT
155:FOR N=1TO 51
160:LINE (O(45+N),
  P(45+N))- (X(92
  -N),Y(92-N))
170:NEXT N
175:GLCURSOR (0,-3
  00)
180:END
198:REM *****
200:"D":CLEAR :
  GRAPH :
  GLCURSOR (0,0)
  :DEGREE
201:BEEP 3:WAIT 10
  0:PRINT "
  *FLYING CARPET
  *"
202:WAIT 100:PRINT
  " *WAIT ABOUT
  30 SECONDS*":
  BEEP 3:WAIT
205:DIM X(160),Y(1
  60),O(160),P(1
  60)
210:GLCURSOR (107,
  -10):SORGN :N=
  0
220:FOR A=180TO 43
  0STEP 4
225:N=N+1:X(N)=INT
  (50*SIN A):Y(N
  -)=-A
230:NEXT A
235:N=0
240:FOR A=-40TO 21
  0STEP 4
245:N=N+1
250:O(N)=INT (50*
  COS (A-180)):P
  (N)=-A
255:NEXT A
257:WAIT 100:PRINT
  " *FLYING
  CARPET*"
260:FOR N=1TO 110
265:LINE (X(N),Y(N
  ))-(O(N),P(N))
270:NEXT N
275:GLCURSOR (0,-2
  00)
280:END
299:REM *****
300:"F":CLEAR :
  GRAPH :
  GLCURSOR (0,0)
  :BEEP 3
301:WAIT 100:PRINT
  " *** ONI
  ON ***":BEEP 2
  :WAIT
310:GLCURSOR (107,

```

```

-200):SORGN
315:C=0:D=10:R=100
320:X=R*COS C:Y=R*
SIN C
330:FOR A=-80TO 16
0STEP 20
340:FOR J=1TO 36
345:X1=R*COS C
350:Y1=(R+A)*SIN C
360:LINE (X,Y)-(X1
,Y1)
365:X=X1:Y=Y1:C=C+
D
370:NEXT J
375:C=0
380:NEXT A
385:GRAPH :
GLCURSOR (0,-1
00)
390:END
399:REM *****
400:"G":CLEAR :
GRAPH :
GLCURSOR (0,0)
:BEEP 3
401:WAIT 150:PRINT
" *FIVE LAYER
BLOCK (1)*":
WAIT
405:GLCURSOR (22,-
200):SORGN
410:C=90:P=-1:R1=2
1:D=60
420:FOR N=1TO 5
425:FOR K=1TO 8
430:X=R1*COS C:Y=R
1*SIN C
440:FOR J=1TO 7
445:X1=R1*COS C:Y1
=R1*SIN C
450:LINE (X,Y)-(X1
,Y1)
460:X=X1:Y=Y1:C=C+
D
470:NEXT J
475:A1=R1:Y=0
480:GLCURSOR (X+A1
,Y):SORGN
482:C=90:NEXT K

```

```

484:B=R1/2+R1:P=-1
*P:M=7
486:IF P<0LET M=9
488:GLCURSOR (X-M*
R1,Y+B):SORGN
490:C1=C1+1
492:IF C1>3LET C1=
1
494:NEXT N
496:GLCURSOR (0,-1
50)
498:END
499:REM *****
500:"H":CLEAR :
GRAPH :
GLCURSOR (0,0)
:BEEP 3
501:WAIT 150:PRINT
" *FIVE LAYER
BLOCK (2)*":
WAIT
505:GLCURSOR (22,-
200):SORGN
510:C=90:P=-1:R1=2
1:D=90
520:FOR N=1TO 5
525:FOR K=1TO 8
530:X=R1*COS C:Y=R
1*SIN C
540:FOR J=1TO 5
545:X1=R1*COS C:Y1
=R1*SIN C
550:LINE (X,Y)-(X1
,Y1)
560:X=X1:Y=Y1:C=C+
D
570:NEXT J
575:A1=R1:Y=0
580:GLCURSOR (X+A1
,Y):SORGN
582:C=90:NEXT K
584:B=R1/2+R1:P=-1
*P:M=7
586:IF P<0LET M=9
588:GLCURSOR (X-M*
R1,Y+B):SORGN
590:C1=C1+1
592:IF C1>3LET C1=
1

```

```

594:NEXT N
596:GLCURSOR (0,-1
50)
598:END
599:REM *****
600:"J":CLEAR :
GRAPH :
GLCURSOR (0,0)
601:BEEP 3:WAIT 15
0:PRINT "
** TOP SHELL
**":BEEP 2:
WAIT
610:DIM X(40),Y(40
)
620:GLCURSOR (107,
-107):SORGN :C
=0:D=12:R1=105
630:FOR K=1TO 20
635:GLCURSOR (5,0)
:SORGN
640:R1=R1-5:X=R1*
COS C:Y=R1*SIN
C
650:FOR J=1TO 31
655:X1=R1*COS C:Y1
=R1*SIN C
660:LINE (X,Y)-(X1
,Y1)
665:X=X1,Y=Y1
670:C=C+D:NEXT J
675:C=0:NEXT K
680:GLCURSOR (0,-1
00)
690:END
699:REM *****
* - END - *
*****
700:END

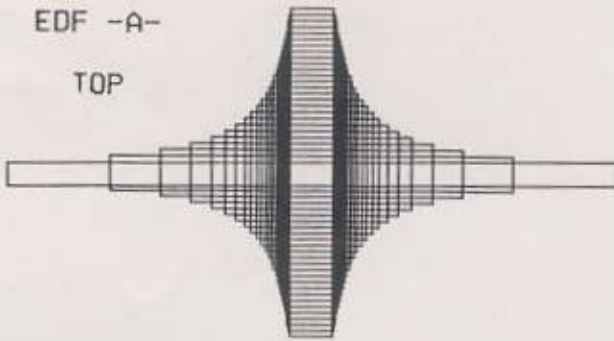
```

STATUS(1)=2831

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EDF -A-

TOP



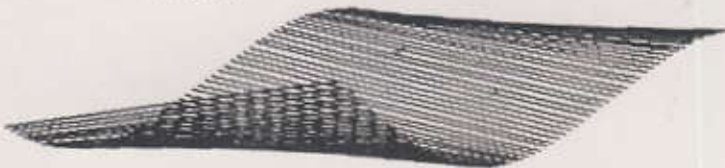
DEF -S-, GRADIAN
CURVED TRIANGLE



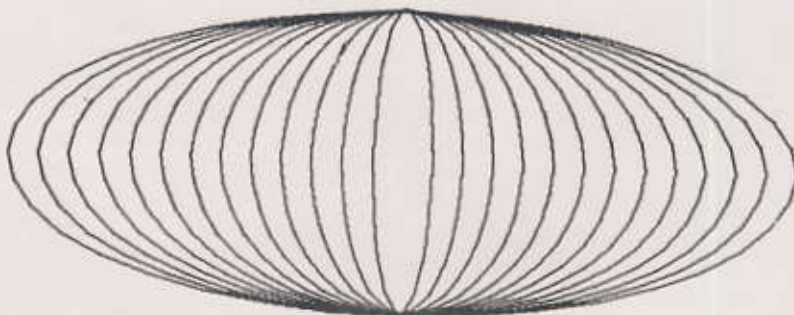
DEF -S-, DEGREE
CURVED TRIANGLE



DEF -D-
FLYING CARPET



DEF -F-, ONION

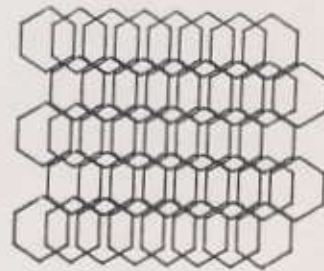


COMPUTER GRAPHIC

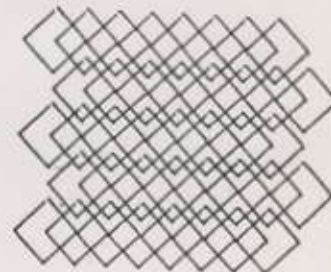
PROG. -G02

By CP-1500

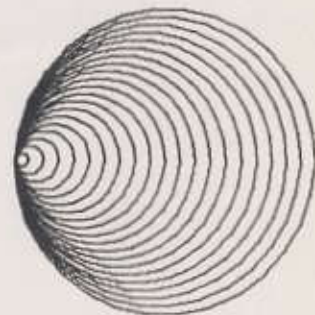
DEF -G-
5 LAYER BLOCK(1)



DEF -H-
5 LAYER BLOCK(2)



DEF -I-, TOP SHELL



9. Graphic Patterns (2) - PROG.-G03

```

5:REM PROG.-G03
6:REM DEF -Z-
7:REM *****
  * GRAPHIC *
  * PATTERNS(2)*
  *****
8:"Z":LPRINT "A=
  ARROW(2)":
  LPRINT "S=TRIT
  RI ANGLE":
  LPRINT "D=BIUVA
  LUE":LPRINT "F
  =WAVING PAPER"
11:TEXT :LF 4:END
12:REM *****
13:"A":CLEAR :
  GRAPH :
  GLCURSOR (0,0)
  :SORGN :BEEP 3
14:X=0:WAIT 2:
  PRINT " **
  ARROW (2) *
  *":WAIT :BEEP
  2
15:FOR J=0TO 1
20:A=0:B=0
30:FOR J=1TO 11
40:LINE (X+0,B)-(
  X+50+A,B)
50:IF J>5THEN 75
60:A=A+4:B=B-4
70:NEXT J
75:A=A-4:B=B-4
80:NEXT J
85:LINE (X,0)-(X,
  -40)-(X+50,-40
  )-(X+70,-20)-(
  X+50,0)-(X,0)
90:X=X+130:NEXT J
94:GRAPH :
  GLCURSOR (0,-1
  00):TEXT
95:END
99:REM *****
100:"S":CLEAR :
  GRAPH :
  GLCURSOR (0,0)
105:DIM X(100),Y(1
  00)
110:GLCURSOR (107,
  -60):SORGN
115:C=0:N=3:RI=20:
  B=30
120:FOR J=1TO 20
125:A=360/N:D=A/B:
  M=A/D:P=360/D
130:FOR K=1TO P
132:WAIT 0:PRINT "
  * WORKING (K=
  90) K=";K;" *"
135:X(K)=RI*COS (C
  +E):Y(K)=RI*
  SIN (C+E)
140:C=C+D:NEXT K
150:LINE (X(J),Y(J
  ))-(X(J+M),Y(J
  +M))-(X(J+2*M)
  ,Y(J+2*M))-(X(
  J),Y(J))
160:RI=RI+3:E=E+5
170:NEXT J
180:GLCURSOR (0,-1
  50)
190:END
199:REM *****
200:"D":CLEAR :
  GRAPH :
  GLCURSOR (0,0)
  :SORGN :BEEP 3
202:WAIT 100:PRINT
  " *** BIU
  ALUE ***":
  WAIT :CLS
203:BEEP 2:WAIT 10
  0:PRINT " *WA
  IT ABOUT 25 SE
  CONDS*":BEEP 2
  :WAIT
205:DIM X(160),Y(1
  60),O(160),P(1
  60)
210:GLCURSOR (107,
  -10):SORGN :N=
  0
215:FOR A=180TO 40
  0STEP 4
220:N=N+1:X(N)=INT
  (50*SIN A):Y(N
  )=-A:NEXT A
225:N=0
230:FOR A=-40TO 18
  0STEP 4:N=N+1:
  O(N)=INT (50*
  SIN (180-A)):P
  (N)=-A:NEXT A
232:WAIT 2:PRINT "
  *** BIUALU
  E ***"
235:FOR N=1TO 55
240:LINE (X(N),Y(N
  ))-(O(56-N),Y(
  56-N))
245:NEXT N
250:GLCURSOR (0,-2
  00)
255:TEXT
260:END
299:REM *****
300:"F":CLEAR :
  GRAPH :
  GLCURSOR (0,0)
  :BEEP 3
302:WAIT 100:PRINT
  " ** WAVING
  PAPER **":WAIT
  :BEEP 2
303:WAIT 2:PRINT "
  *WAIT ABOUT 2
  3 SECONDS*":
  TEXT :LF 10:
  GRAPH
304:DIM X(200),Y(2
  00)
305:GLCURSOR (30,0
  ):SORGN :N=0,W
  X=80,WY=150
307:FOR A=30TO 450
  STEP 10
310:N=N+1:Y(N)=A:Y
  =Y(N):P=-A/540
  :X(N)=EXP P*
  COS Y
315:IF N=1THEN "Q"
320:IF X1>X(N)
  THEN 330
325:X1=X(N)

```

```

330: IF X2<X(N) THEN
340
335: X2=X(N)
340: IF Y1>=Y(N)
345: THEN 345
342: Y1=Y(N)
345: IF Y2<Y(N) THEN
352
350: Y2=Y(N)
352: NEXT A
355: X3=X1-X2, Y3=Y1
-Y2: K1=WX/X3: K
2=WY/Y3
360: FOR J=1 TO N: X(
J)=X(J)-X2: Y(J
)=Y(J)-Y2: NEXT
J
363: WAIT 2: PRINT "
** WAITING
PAPER **"
365: FOR J=1 TO N: XL
=JNT (X(J)*K1)
: YL=JNT (Y(J)*
K2)
370: LINE (0, YL)-(X
L, YL), 9
375: RL LINE (0, 0)-(6
0, -70), 0
380: GLCURSOR (0, -1
00)
381: NEXT J
382: END
384: LINE (0, YY)-(X
X, YY), 9
386: RL LINE (0, 0)-(6
0, -70), 0
388: GLCURSOR (0, 0)
390: "Q": X1=X(1), X2
=X1: Y1=Y(1), Y2
=Y1
392: NEXT A
394: END
399: REM *****

```

STATUS(1)=1977

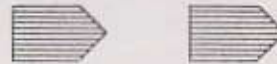
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

By S. SHINDO

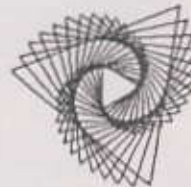
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XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

DEF -A-



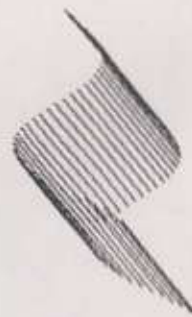
DEF -S-



DEF -D-



DEF -F-



10. Graphic Patterns (3) - PROG.-G30

```

5:REM PROG.-G30
7:REM DEF -M-
10:REM *****
  * GRAPHIC *
  * PATTERNS(3)*
  *****
12:"M":CLEAR :
  TEXT :LPRINT "
  GRAPHIC PATT
  NS-3":LF 1
14:LPRINT "A=CIRC
  ULAR CONE A":
  LPRINT "B=CIRC
  ULAR CONE B":
  LPRINT "C=PENT
  AGON TOWER"
15:LPRINT "D=S of
  BOXES":LPRINT
  "F(1)=STAR":
  LPRINT "F(2)=A
  STEROID":
  LPRINT "F(3)=T
  WINING LINE":
  LF 4
19:END
20:"A":CLEAR :
  GRAPH :
  GLCURSOR (0,0)
25:DIM X(20),Y(20)
35:C1=1:C=0:D=12:
  R=100
40:FOR N=1TO 18
42:WAIT 0:PRINT N
45:X(N)=R*COS (C+
  168):Y(N)=R*0.
  4*SIN (C+168)-
  150
50:C=C+D:NEXT N:
  CLS
52:GRAPH :
  GLCURSOR (107,
  0):SORGN
55:FOR N=1TO 17
60:LINE (X(N),Y(N)
  )-(X(N+1),Y(N
  +1))
65:NEXT N
70:FOR N=1TO 17
75:LINE (0,0)-(X(
  N),Y(N))
80:NEXT N
85:GLCURSOR (0,-1
  00):TEXT :LF 1
  0
90:END
95:REM *****
100:"B":CLEAR :
  GRAPH :
  GLCURSOR (0,0)
105:GRAPH :
  GLCURSOR (107,
  0):SORGN
110:C1=1:C=0:D=16:
  R=0
115:FOR N=1TO 50
120:X=R*COS (C+150
  ):Y=R*0.4*SIN
  (C+150)+K
125:FOR J=1TO 16
127:WAIT 1:PRINT "
  N=";N:PRINT "
  J=";J:
  WAIT
130:X1=R*COS (C+15
  0):Y1=R*0.4*
  SIN (C+150)+K
135:LINE (X,Y)-(X1
  ,Y1)
140:X=X1:Y=Y1:C=C+
  D
145:NEXT J
150:C=0:K=K-3:R=R+
  2
155:NEXT N
160:GRAPH :
  GLCURSOR (0,-1
  00):TEXT :LF 3
170:END
180:REM *****
200:"C":CLEAR :
  GRAPH :
  GLCURSOR (0,0)
205:DIM X(40),Y(40)
210:GRAPH :
  GLCURSOR (107,
  -107):SORGN
215:C1=1:C=18:D=72
  :R1=105
220:FOR K=1TO 13
225:GLCURSOR (-2,-
  2):SORGN
230:R1=R1-5:X=R1*
  COS C:Y=R1*SIN
  C
235:FOR J=1TO 6
240:X1=R1*COS C:Y1
  =R1*SIN C
245:LINE (X,Y)-(X1
  ,Y1)
250:X=X1:Y=Y1:C=C+
  D
255:NEXT J
260:C=18
265:NEXT K
270:GLCURSOR (0,-1
  00)
280:TEXT :LF 3
290:END
295:REM *****
300:"D":CLEAR :
  GRAPH :
  GLCURSOR (0,0)
305:DIM X(200),Y(2
  00)
310:GRAPH :
  GLCURSOR (0,-3
  50):SORGN
315:B=180:C1=2:N=0
  ,WX=150:WY=160
320:FOR A=-BTO 300
  STEP 20
322:WAIT 0:PRINT A
325:N=N+1:Y(N)=A:Y
  =Y(N):P=-A/540
  :X(N)=EXP P*
  COS Y
330:IF N=1THEN "Z"
335:IF X1>X(N)
  THEN 345
340:X1=X(N)
345:IF X2<X(N)THEN
  355
350:X2=X(N)
355:IF Y1>Y(N)
  THEN 365
360:Y1=Y(N)

```

```

365: IF Y2<Y(N) THEN
  375
370: Y2=Y(N)
375: NEXT A
380: X3=X1-X2, Y3=Y1
  -Y2
385: K1=WX/X3: K2=WY
  /Y3
390: FOR J=1 TO N
395: X(J)=X(J)-X2: Y
  (J)=Y(J)-Y2
400: NEXT J
405: A=70: B=25
410: FOR J=1 TO N
415: XL=INT (X(J)*K
  1): YL=INT (Y(J)
  )*K2)
420: LINE (0, YL)-(X
  L, YL), 9
425: RLINE (0, 0)-(A
  , -B), 0, , B
430: GLCURSOR (0, 0)
  : A=A-1: B=B-1
435: NEXT J
440: GLCURSOR (0, -1
  00): TEXT :LF 3
450: END
550: B=B-1
560: "Z": X1=X(1), X2
  =X1
570: Y1=Y(1), Y2=Y1
580: NEXT A
590: END
595: REM *****
600: "F": CLEAR :
  GRAPH :
  GLCURSOR (0, 0)
610: DIM X(100), Y(1
  00), O1(100), O2
  (100), P1(100),
  P2(100)
620: GRAPH :
  GLCURSOR (0, 0)
  : SORG
622: BEEP 5: INPUT "
  STAR/ASTER.=1,
  ROUND X2=2?": U
  : IF U>=3 GOTO 6
  22

```

```

624: IF U=1 LET C1=1
626: IF U=2 LET C1=2
630: N=0, WX=210, WY=
  210
635: BEEP 5: INPUT "
  STAR=1, ASTER.=
  2, WM=ENTER?": U
  : IF U>=3 GOTO 6
  35
640: FOR A=0 TO 360
  STEP 5
642: WAIT 0: PRINT A
643: N=N+1
650: IF U=1 LET X(N)
  =COS A^5: Y(N)=
  SIN A^5: GOTO 6
  60
651: IF U=2 LET X(N)
  =40*COS A*(1-
  COS (90*A)): Y(
  N)=40*SIN A*(1
  +COS (90*A)):
  GOTO 660
653: IF U=2 LET X(N)
  =50*COS (3*A):
  Y(N)=50*SIN (2
  *A)
660: IF N=1 THEN "Q"
670: IF X1>X(N)
  THEN 690
680: X1=X(N)
690: IF X2<X(N) THEN
  710
700: X2=X(N)
710: IF Y1>Y(N)
  THEN 730
720: Y1=Y(N)
730: IF Y2<Y(N) THEN
  750
740: Y2=Y(N)
750: NEXT A
760: X3=X1-X2, Y3=Y1
  -Y2
770: K1=WX/X3: K2=WY
  /Y3
780: FOR J=1 TO N
790: X(J)=X(J)-X2: Y
  (J)=Y(J)-Y2
800: NEXT J

```

```

810: FOR J=1 TO N-1
820: O1(J)=Y(J)*K2:
  P1(J)=-X(J)*K1
  : O2(J)=Y(J+1)*
  K2: P2(J)=-X(J+
  1)*K1
830: LINE (O1(J), P1
  (J))-(O2(J), P2
  (J))
840: O1(J)=O1(J)
850: P1(J)=P2(J)
860: NEXT J
870: TEXT :GRAPH :
  GLCURSOR (0, -1
  00): TEXT :LF 2
880: END
890: "Q": X1=X(1), X2
  =X1
900: Y1=Y(1), Y2=Y1
910: NEXT A
920: END

```

STATUS (1) 2699

 By S. SHINDO
 MAR. 1984 SEAFDEC

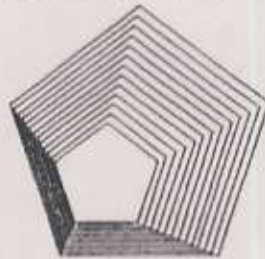
RESULT of PRINTOUT

DEF -W- (START)

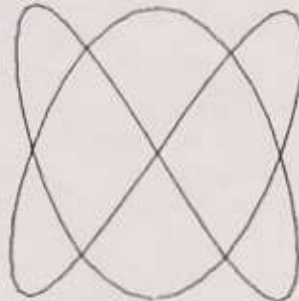
GRAPHIC PATTERNS-3

A=CIRCULAR CONE A
B=CIRCULAR CONE B
C=PENTAGON TOWER
D=S of BOXES
F(1)=STAR
F(2)=ASTEROID
F(3)=TWINING LINE

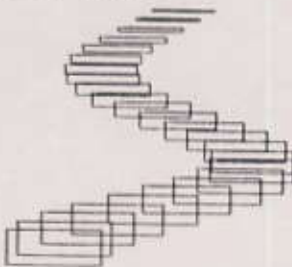
DEF -C- (DEGREE)
PENTAGON TOWER



DEF -F(3)- (DEGREE)
TWINING LINE



DEF -D- (DEGREE)
S of BOXES



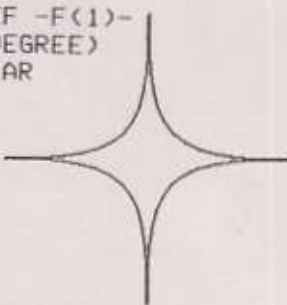
DEF -A- (DEGREE)
CIRCULAR CONE A



DEF -D- (RADIAN)



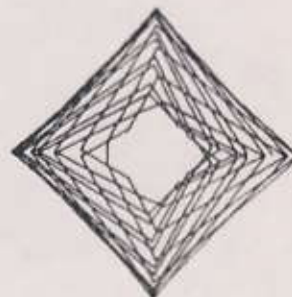
DEF -F(1)- (DEGREE)
STAR



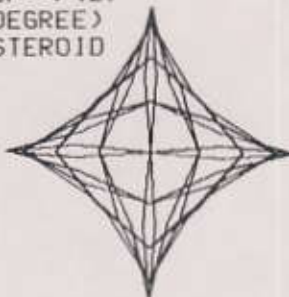
DEF -B- (DEGREE)
CIRCULAR CONE B



DEF -F(1)- (RADIAN)



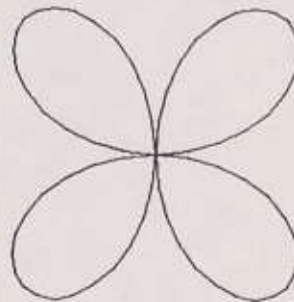
DEF -F(2)- (DEGREE)
ASTEROID



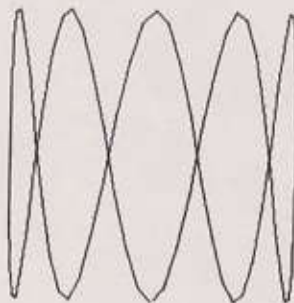
11. Modification of PROG.-G30

```
650: IF U=1 LET X(N)
      =40*COS A-40*
      COS (3*A):Y(N)
      =40*SIN A+40*
      SIN (3*A):GOTO
      660
651: IF U=2 LET R=10
      *J(ABS (COS (2
      *A))) :X(N)=R*
      COS A:Y(N)=R*
      SIN A:GOTO 660
653: IF U=2 LET X(N)
      =50*COS (5*A):
      Y(N)=70*SIN A
```

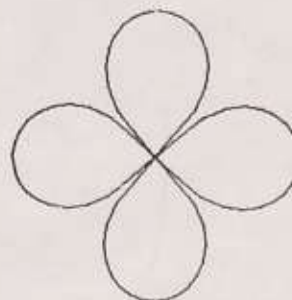
U=2



U=1



U=2



12. Graphic Patterns (4) - PROG.-G35

```

5:REM PROG.-G35
7:REM DEF -K-
10:REM *****
* GRAPHJC *
* PATTERNS(4)*
*****
11:"K":CLEAR :
GRAPH :
GLCURSOR (0,0)
:TEXT :LPRINT
"-----"
----":LF 1
12:LPRINT " PROG
G.-G35":LPRINT
"GRAPHJC PATTE
RNS-4":LPRINT
" DEF -K- (ST
ART)":LF 1
13:LPRINT " -----
-INDEX-----":
LF 1:LPRINT "J
TWO BAMBOO BO
XES":LPRINT "
DEF -A-, 1"
14:LPRINT "2 A TW
IN BOX":LPRINT
" DEF -A-, 2
15:LPRINT "3 TWO
BAMBOO BALLS":
LPRINT " DE
F -A-, 3
16:LPRINT "4 BOX
SPIRAL":LPRINT
" DEF -B-
17:LPRINT "5 PYRA
MID":LPRINT "
DEF -B-, BRE
AK
18:LPRINT "6 A WH
EEL TYPE A":
LPRINT " DE
F -C-, DEG, A"
19:LPRINT "7 A WH
EEL TYPE B":
LPRINT " DE
F -C-, RAD, A"
20:LPRINT "8 A WH
EEL TYPE C":
LPRINT " D
EF-C-, GRAD, A"
21:LPRINT "9 A WH
EEL TYPE D":
LPRINT " DE
F-C-, DEG, B"
22:LPRINT "10 A W
HEEL TYPE E":
LPRINT " D
EF-C-, RAD, B"
23:LPRINT "11 A W
HEEL TYPE F":
LPRINT " D
EF-C-, GRAD, B"
24:LPRINT "12 SPI
RAL OF MESH":
LPRINT " D
EF -D-"
25:LPRINT "13 MOO
N AND BOXES":
LPRINT " DE
F -F-, DEG"
26:LPRINT "14 NAM
ELESS":LPRINT
" DEF -F-,
RAD"
27:LPRINT " -----
-----":
LF 4
28:END
29:REM *****
30:"A":CLEAR :
TEXT :LF 11:
DEGREE :GRAPH
32:BEEP 3:INPUT "
SINGLE=1, TWIN=
2, BALL=3 ?":Z:
IF Z>=4GOTO 32
35:IF Z=3GOTO 40
40:FOR J=0TO 1
41:IF Z=1GOTO 43
42:IF Z=2GOTO 46
43:IF J=1GLCURSOR
(115,0):SORGN
:GOTO 50
46:IF J=1GLCURSOR
(100,0):SORGN
:GOTO 50
48:GLCURSOR (0,10
0):SORGN :GOTO
50
50:IF Z=3FOR I=29
TO 70STEP 5:
GOTO 55
53:FOR J=0TO 85
STEP 5
55:LINE (1,0)-(10
0,1)-(100-1,10
0)-(0,100-1)-(
1,0)
60:NEXT J
61:IF Z=0GOTO 65
62:NEXT J
65:TEXT :LF 4
70:END
99:REM *****
100:"B":CLEAR :
TEXT :LF 6:
DEGREE
105:GRAPH :SORGN
110:BEEP 5:INPUT "
* INTERVAL(
3-10)=?" :X
120:LINE (0,0)-(10
0,0)
130:FOR I=100TO 50
STEP -X
140:LINE (1,1-100)
-(1,-1)
150:LINE (1,-1)-(1
00-1,-1)
160:LINE (100-1,-1
)-(100-1,1-100
-X)
170:LINE (100-1,1-
100-X)-(1-X,1-
100-X)
180:NEXT J
185:TEXT :LF 8
190:END
199:REM *****
200:"C":CLEAR :
TEXT :DEGREE
202:BEEP 2:INPUT "
DEG.=1, RAD=2, G
RAD=3 ?":L:ON
LGOTO 203, 204,
205
203:DEGREE :GOTO 2
06

```

```

204:RADIANT :GOTO 2
      06
205:GRAD :GOTO 206
206:GRAPH :
      GLCURSOR (100,
      -100):SORGN
207:BEEP 5:INPUT "
      * PATTERN A=1
      ,B=2 ? *";Q:IF
      Q>=360TO 207
208:IF L<>360TO 21
      3
209:IF L=360TO 210
210:FOR J=0TO 390
      STEP 10:GOTO 2
      15
213:FOR J=0TO 350
      STEP 10
215:X1=80*COS (J):
      Y1=80*SIN (J)
220:X2=80*COS (J+9
      0):Y2=80*SIN (
      J+90)
225:X3=80*COS (J+1
      80):Y3=80*SIN
      (J+180)
230:IF Q=1LINE (X1
      ,Y1)-(X2,Y2)-(
      X3,Y3)-(X1,Y1)
232:IF Q=2LINE (X1
      ,Y1)-(X2,Y2)-(
      X3,Y3)
235:NEXT J
240:TEXT :LF 9
245:END
249:REM *****
250:"D":CLEAR :
      DEGREE
255:GRAPH :
      GLCURSOR (125,
      -100):SORGN
260:FOR J=0TO 630
      STEP 5
265:X=J/5*COS (J)
270:Y=J/5*SIN (J)
275:LINE (0,0)-(X,
      Y),,B
280:NEXT J
285:TEXT :LF 10

```

```

290:END
299:REM *****
300:"F":CLEAR
302:BEEP 3:INPUT "
      DEGREE=1,RADIA
      N=2 ?";P:IF P>
      =360TO 302
304:ON P GOTO 305,3
      06
305:DEGREE :GOTO 3
      10
306:RADIANT :GOTO 3
      10
310:DIM X1(30),Y1(
      30),X2(30),Y2(
      30)
320:GRAPH :
      GLCURSOR (107,
      -107):SORGN
330:C1=3:R1=100:R2
      =40:C=0:D=12
340:FOR N=1TO 30
345:WAIT 0:PRINT "
      (N=UP TO 30)
      N=";N
350:X1(N)=R1*COS C
      :Y1(N)=R1*SIN
      C
360:X2(N)=R2*COS C
      :Y2(N)=R2*SIN
      C
370:C=C+D
380:NEXT N
390:FOR N=1TO 30
400:LINE (X1(N),Y1
      (N))-(X2(N)+20
      ,Y2(N)+20),,B
410:NEXT N
420:GRAPH :
      GLCURSOR (0,-1
      00):DEGREE :
      TEXT :LF 5
430:END

```

STATUS (1)

2477

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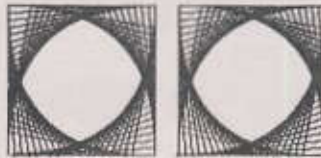
XXXXXXXXXXXXXXXXXXXX
 RESULT OF PRINTOUT
 PROG.-G35
 XXXXXXXXXXXXXXXXXXXX

 PROG.-G35
 GRAPHIC PATTERNS-4
 DEF -K- (START)

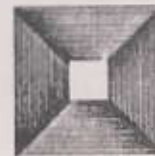
-----INDEX-----

- 1 TWO BAMBOO BOXES
DEF -A-, 1
- 2 A TWIN BOX
DEF -A-, 2
- 3 TWO BAMBOO BALLS
DEF -A-, 3
- 4 BOX SPIRAL
DEF -B-
- 5 PYRAMID
DEF -B-, BREAK
- 6 A WHEEL TYPE A
DEF -C-, DEG, A
- 7 A WHEEL TYPE B
DEF -C-, RAD, A
- 8 A WHEEL TYPE C
DEF -C-, GRAD, A
- 9 A WHEEL TYPE D
DEF -C-, DEG, B
- 10 A WHEEL TYPE E
DEF -C-, RAD, B
- 11 A WHEEL TYPE F
DEF -C-, GRAD, B
- 12 SPIRAL OF MESH
DEF -D-
- 13 MOON AND BOXES
DEF -F-, DEG
- 14 NAMELESS
DEF -F-, RAD

1 TWO BAMBOO BOXES
DEF -A-, 1



5 PYRAMID
DEF -B-, BREAK

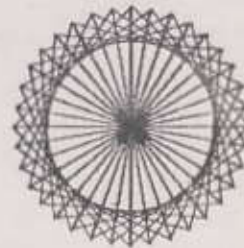


INTERVAL=2

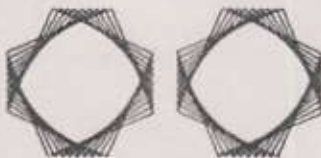
2 A TWIN BOX
DEF -A-, 2



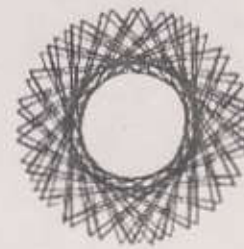
6 A WHEEL TYPE A
DEF -C-, DEG, A



3 TWO BAMBOO BALLS
DEF -A-, 3



7 A WHEEL TYPE B
DEF -C-, RAD, A

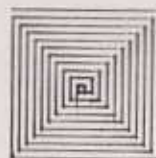
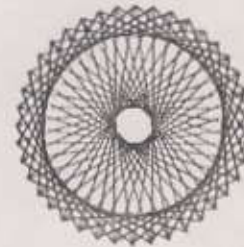


4 BOX SPIRAL
DEF -B-



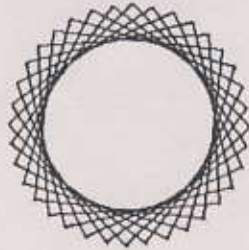
INTERVAL=3

8 A WHEEL TYPE C
DEF -C-, GRAD, A

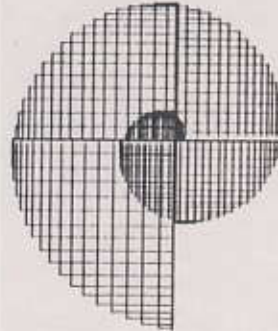


INTERVAL=5

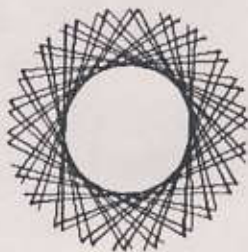
9 A WHEEL TYPE D
DEF-C-, DEG, B



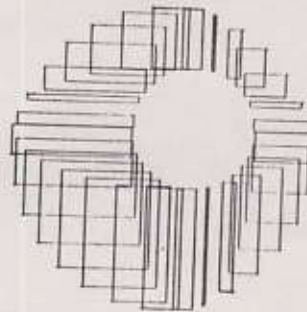
12 SPIRAL OF MESH
DEF --D-



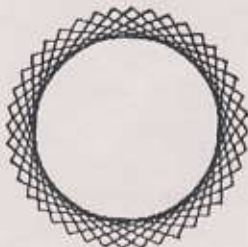
10 A WHEEL TYPE E
DEF-C-, RAD, B



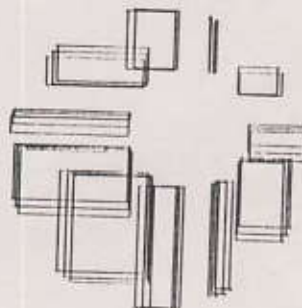
13 MOON AND BOXES
DEF -F-, DEG



11 A WHEEL TYPE F
DEF-C-, GRAD, B



14 NAMELESS
DEF -F-, RAD



13. Graphic Patterns (5) - PROG.-G45

```

5:REM PROG.-G45
6:REM DEF -L-
8:REM *****
* GRAPHIC *
* PATTERNS(5)*
*****
10:"L":CLEAR :
GRAPH :
GLCURSOR (0,0)
:TEXT
12:LPRINT "PROG.-
G45":LPRINT "G
RAPHIC PATERNS
-5"
13:LPRINT " ---J
NDEX---":LF J
14:LPRINT "J DOUB
LE WAVES (1)":
LPRINT " DEF
-A-,1":LPRINT
"2 DOUBLE WAVE
S (2)"
15:LPRINT " DEF
-A-,2":LPRINT
"3 WAVES (SHOR
T)":LPRINT "
DEF -B-,1":
LPRINT "4 WAVE
S (LONG)"
16:LPRINT " DEF
-B-,2":LPRINT
"5 CROSS OF ME
SH":LPRINT "
DEF -C-":
LPRINT "6 FENC
E"
17:LPRINT " DEF
-D-":LF 4
18:END
19:REM *****
20:"A":CLEAR :
GRAPH
21:GLCURSOR (00,0
):SORGN
25:BEEP 5:INPUT "
A CYCLE=J, TWO
CYCLES=2 ?":Q:
IF Q>=3GOTO 25
27:IF Q=1GOTO 30
28:IF Q=2GOTO 32
30:FOR J=0TO 360
STEP 5:GOTO 40
32:FOR J=0TO 720
STEP 5:GOTO 40
40:X=SIN (J)*40
50:Y=COS (J)*40
60:LINE (X,-1)-(X
+70,-1+70)
65:LINE (Y,-1)-(Y
+70,-1+70)
70:NEXT J
80:TEXT :LF 9
90:END
99:REM *****
100:"B":CLEAR :
GRAPH :
GLCURSOR (105,
0):SORGN :
GLCURSOR (0,0)
105:BEEP 5:INPUT "
SHORT=J, LONG=2
?":Q:IF Q>=3
GOTO 105
106:IF Q=1GOTO 110
107:IF Q=2GOTO 112
110:FOR J=0TO 1440
STEP 10:GOTO 1
20
112:FOR J=0TO 2880
STEP 10:GOTO 1
20
120:X=COS (J)*40
130:LINE (X,-1/4)-
(X+70,-1/4+70)
140:NEXT J
150:TEXT :LF 9
160:END
199:REM *****
200:"C":CLEAR :
GRAPH :
GLCURSOR (107,
-107):SORGN
210:C=0:D=12:R=60
220:FOR A=-45TO 45
STEP 5
230:X=(R-A)*COS C:
Y=(R+A)*SIN C
240:FOR J=1TO 31
250:X1=(R-A)*COS C
:Y1=(R+A)*SIN
C
260:LINE (X,Y)-(X1
,Y1)
270:X=X1:Y=Y1:C=C+
D
280:NEXT J
285:NEXT A
290:GRAPH :
GLCURSOR (0,-2
00)
295:END
299:REM *****
300:"D":CLEAR :
GRAPH :
GLCURSOR (0,0)
:SORGN
310:A=0:B=0:F=10
315:BEEP 5:INPUT "
No of PEAKS=?"
:Q
320:FOR K=1TO Q
325:IF K=QLET F=11
330:FOR J=1TO F
340:LINE (0,B)-(50
+A,B+7),,,B
345:IF J>5THEN 370
350:A=A+10:B=B-10
360:NEXT J
370:A=A-10:B=B-10
380:NEXT J
385:NEXT K
390:GRAPH :
GLCURSOR (0,-1
00)
395:END

STATUS (1)
1377

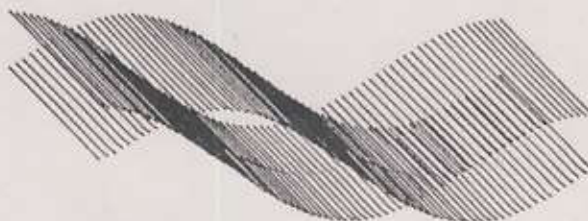
*****
By S.SHINDO
MAR.1984 SEAFDEC
*****

```

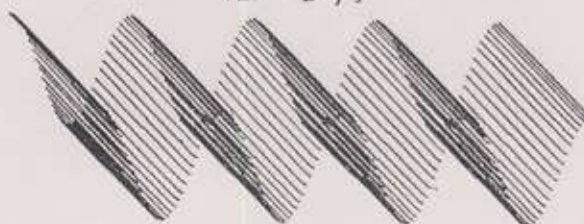
PROG.-G45
GRAPHIC PATTERNS-5
---INDEX----

- 1 DOUBLE WAVES (1)
DEF -A-, 1
- 2 DOUBLE WAVES (2)
DEF -A-, 2
- 3 WAVES (SHORT)
DEF -B-, 1
- 4 WAVES (LONG)
DEF -B-, 2
- 5 CROSS OF MESH
DEF -C-
- 6 FENCE
DEF -D-

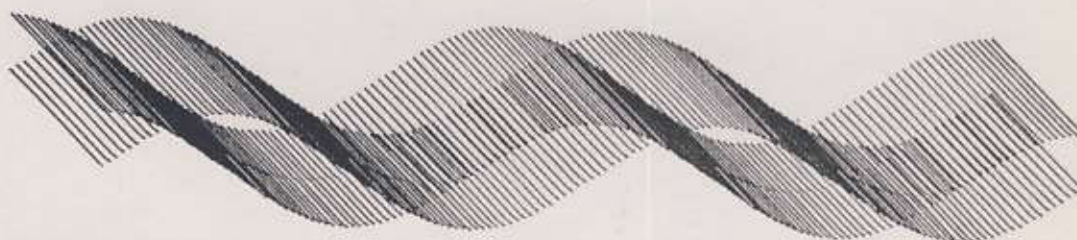
1 DOUBLE WAVES (1)
DEF -A-, 1



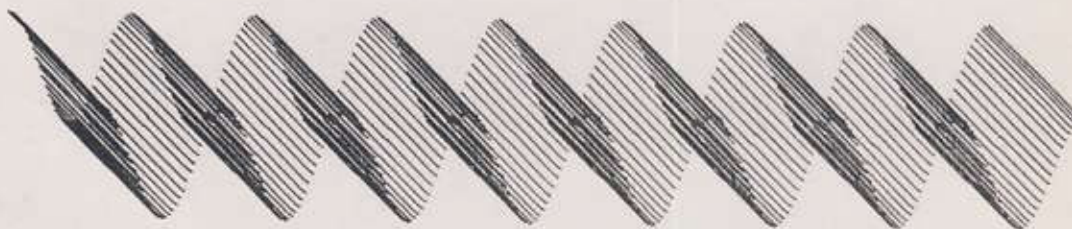
3 WAVES (SHORT)
DEF -B-, 1



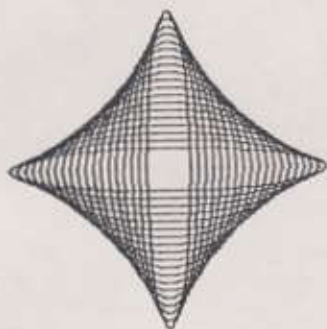
2 DOUBLE WAVES (2)
DEF -A-, 2



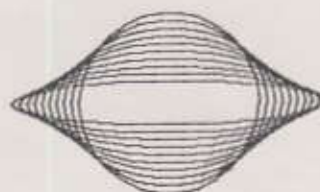
4 WAVES (LONG)
DEF -B-, 2



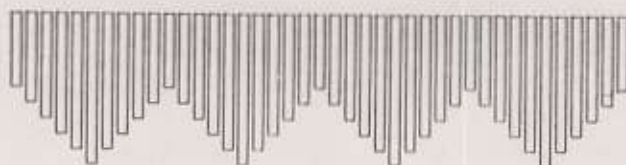
5 STAR OF MESH
DEF -C-



5-MODIFICATION
AN EYE OF CYCLOPES
DEF -C-, BREAK



6 FENCE: PEAK=4
(UPSIDE DOWN)



6 FENCE: PEAK=6



14. Graphic Patterns (6) - PROG.-G50

```

5:REM PROG.-G50
6:REM DEF -M-
7:REM *****
  * GRAPHIC *
  *PATTERNS-(6)*
  *****
10:"M":CLEAR:
  LPRINT "PROG.-
  G50":LPRINT "G
  RAPHIC PATTERN
  S-6"
12:LPRINT " ---
  INDEX---":LF 1
14:LPRINT "1 JSQS
  CELES GRID":
  LPRINT " DE
  F -A-"
15:LPRINT "2 CROO
  KED WAY":
  LPRINT " DE
  F -B-"
16:LPRINT "3 SING
  LE SPIRAL":
  LPRINT " DE
  F -C-,1"
17:LPRINT "4 DOUB
  LE SPIRAL":
  LPRINT " DE
  F -C-,2":LF 4
18:END
19:REM *****
20:"A":CLEAR:
  TEXT:LF 20:
  GRAPH:
  GLCURSOR (0,0)
  :SORGN
25:A=-80:B=0
30:FOR J=1TO 25
35:LINE (0,5+A)-(
  210,70+B)
40:A=A+20:B=B+8
45:NEXT J
50:A=70:B=262
55:X=210
60:FOR J=2TO 50
  STEP 2
62:IF J=32THEN 90
65:LINE (X,A)-(X,
  B)
70:X=X-1
75:A=(A-1)+J*0.3
80:B=(B+1)-J*0.3
85:NEXT J
90:GLCURSOR (0,-2
  0):TEXT
95:END
99:REM *****
100:"B":CLEAR
110:DIM X(200),Y(2
  00)
115:GRAPH:
  GLCURSOR (20,0
  ):SORGN
120:B=180:N=0,WX=1
  70,WY=350
130:FOR A=-BTO 9*B
  STEP 20
135:WAIT 0:PRINT "
  A:(-180 to +
  1620)=";A
140:N=N+1:Y(N)=A:Y
  =Y(N):P=-A/720
145:X(N)=EXP P*COS
  Y
150:IF N=1THEN 320
155:IF X1>X(N)
  THEN 162
160:X1=X(N)
162:IF X2<X(N)THEN
  165
163:X2=X(N)
165:IF Y1>Y(N)
  THEN 175
170:Y1=Y(N)
175:IF Y2<Y(N)THEN
  190
180:Y2=Y(N)
190:NEXT A
200:X3=X1-X2,Y3=Y1
  -Y2
210:K1=WX/X3:K2=WY
  /Y3
220:FOR J=1TO N
230:X(J)=X(J)-X2
235:Y(J)=Y(J)-Y2
240:NEXT J
242:XX=70:YY=20
256:FOR J=1TO N
260:XL=INT (X(J)*K
  1):YL=-INT (Y(
  J)*K2)
265:BEEP 1:WAIT 0:
  PRINT "PEN:SKJ
  D(21),DRAW(91)
  ";J:IF J=21CLS
270:IF J<=20LINE (
  0,YL)-(XL,YL),
  9:GOTO 285
272:IF J=21LINE (
  0,YL)-(XL,YL),
  9
280:LINE (XL-XX,YL
  +YY)-(XL-XX,YL
  -YY)-(XL+XX,YL
  -YY)-(XL+XX,YL
  +YY)-(XL-XX,YL
  +YY),0
285:XX=XX-0.7:YY=Y
  Y-0.1
290:NEXT J
300:GRAPH:
  GLCURSOR (0,-9
  0)
310:END
320:X1=X(1),X2=X1
330:Y1=Y(1),Y2=Y1
340:NEXT A
345:END
349:REM *****
350:"C":CLEAR:
  GRAPH:
  GLCURSOR (00,1
  5):SORGN
360:X=0:Y=0
365:BEEP 3:INPUT "
  SINGLE=1,BOUBL
  E=2 ?":M:IF M>
  =3GOTO 395
370:FOR A=0TO 1440
  STEP 4
380:X1=75*SIN A
390:Y1=-A/3
400:LINE (X,Y)-(X+
  50,Y+50)
402:IF M=1GOTO 410
405:LINE (X,Y-32)-
  (X+60,Y-32+60)
410:X=X1:Y=Y1
420:NEXT A
430:GLCURSOR (0,-6
  00)
435:TEXT
440:END
STATUS (1)
1616
*****
By S.SHINDO
MAR.1984 SEAFDEC
*****

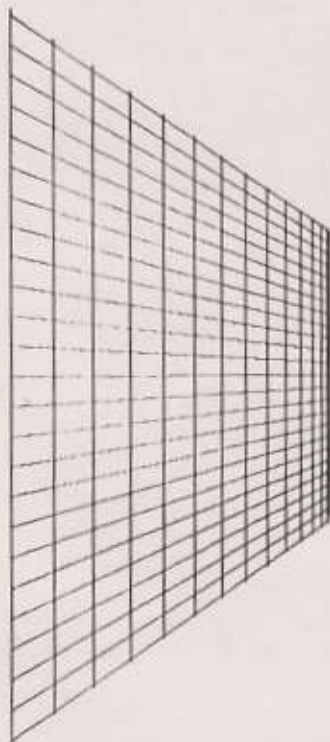
```

RESULT OF PRINTOUT

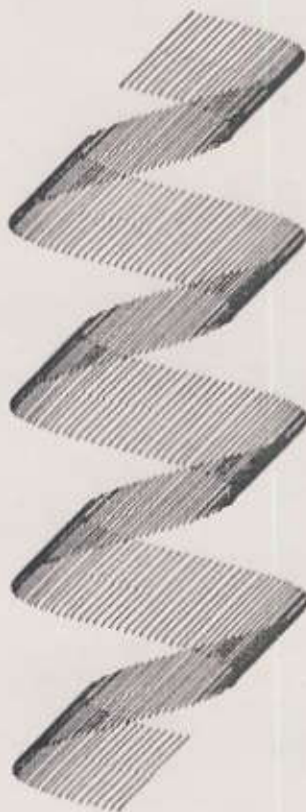
PROG. -G50
GRAPHIC PATTERNS-6
----INDEX----

- 1 ISOSCELES GRID
DEF -A-
- 2 CROOKED WAY
DEF -B-
- 3 SINGLE SPIRAL
DEF -C-, 1
- 4 DOUBLE SPIRAL
DEF -C-, 2

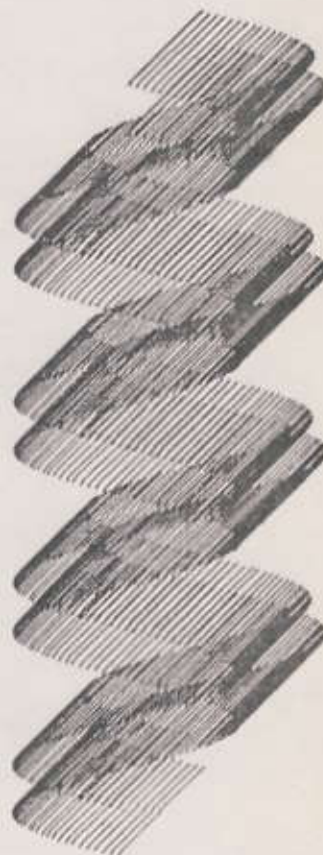
- 1 ISOSCELES GRID
DEF -A-



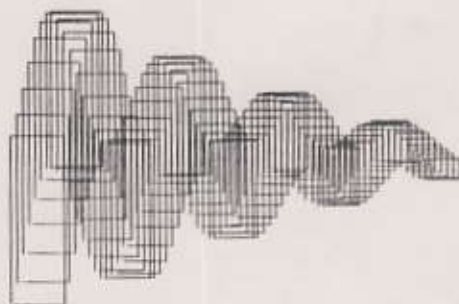
- 3 SINGLE SPIRAL
DEF -C-, 1



- 4 DOUBLE SPIRAL
DEF -C-, 2



- 2 CROOKED WAY
DEF -B-



15. Graphic Patterns (7) - PROG.-G05

```

5:REM PROG.-G05
6:REM DEF -A-
7:REM *****
  * GRAPHIC *
  * PATTERNS(7)*
8:REM -----*
  * RANDOMLY *
  * SCATTERED *
  * BOXES *
  *****
10:"A":CLEAR :
  CSIZE 2:GRAPH
20:GLCURSOR (0,-2
  00):SORGN
30:C1=1
35:BEEP 5:INPUT "
  SQUARE=J, RECTA
  NGL=2 ?";U:IF
  U>=36GOTO 35
40:FOR J=1TO 15
44:IF U=16GOTO 50
50:X1=RND 100:Y1=
  RND 150
52:IF U=16GOTO 60
56:X2=X1+RND 120
58:Y2=Y1+RND 120:
  GOTO 65
60:X2=X1+50:Y2=Y1
  -50
65:FOR I=0TO 1
70:LINE (X1,Y1)-(
  X2,Y2),,B
75:NEXT I
80:NEXT J
90:GLCURSOR (0,0)
  :GLCURSOR (0,-
  100)
100:END
STATUS(1)=420

```

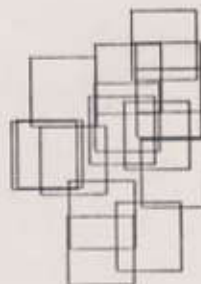
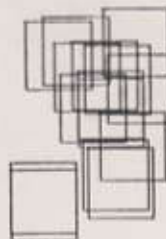
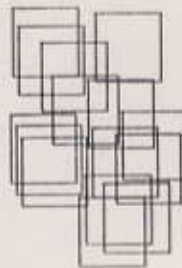
```

*****
REARRANGED BY
S. SHINDO
MAR. 1984 DEAFDEC
*****

```

 RESULT OF PRINTOUT

DEF -A-, 1



DEF -A-, 2

