IDENTIFICATION

PRODUCT CODE:	MAINDEC-X8-DIXYA-A-D
PRODUCT NAME:	DEC/X8 MODULE "PLOTER" INCREMENTAL PLOTTER EXERCISER FOR DEC/X8
DATE CREATED:	DECEMBER 28, 1972
MAINTAINER:	DIAGNOSTIC GROUP
AUTHOR:	LEONARD E. BEYERSDORFER

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASS. 01754

1, MODULE DESCRIPTION

"PLOTER" IS A DEC/X8 SOFTWARE MODULE WHICH EXERCISES AN INCREMENTAL PLOTTER CONTROLLED VIA AN XY8-E, VP8/I[8/L] OR XY12 INTERFACE.

THE PLOTTER DISPAYS THE "SIERPINSKY SPACE FILLING CURVE" USING AN ALGORITHM GIVEN IN "SOFTWARE - PRACTICE AND EXPERIENCE" (VOL. 1, PP. 403-410, 1971) AS MODIFIED BY S. RABINOWITZ (D.E.C).

THE INFORMATION PRESENTED IN THIS MODULE DESCRIPTION IS SUFFICIENT FOR THIS MODULE'S USE. HOWEVER, THE USER IS REFERRED TO THE ABOVE ARTICLE IF A MATHEMATICAL INSIGHT INTO THE GENERATION OF THIS CURVE IS DESIRED.

"PLOTER" HAS THE ABILITY TO DISPLAY SEVERAL VARIATIONS OF THE CURVE, ANYONE OF WHICH MAY BE CHOSEN BY THE USER VIA MODULE INITIALIZATION (REF. PARAGRAPH 4.3). THE TWO PARAMETERS WHICH CONTROL THESE VARIATIONS ARE "ITERATION" AND "LINE LENGTH".

THE FIGURES WHICH FOLLOW WERE DRAWN BY A PLOTTER (USING THIS MODULE) BUT HAVE BEEN PHOTO REDUCED FOR PRINTING. THEY SHOW THE EFFECT OF THE TWO VARIABLES ON THE CURVE GENERATED. EACH FIGURE IS NOTED WITH THE FOLLOWING INFORMATION.

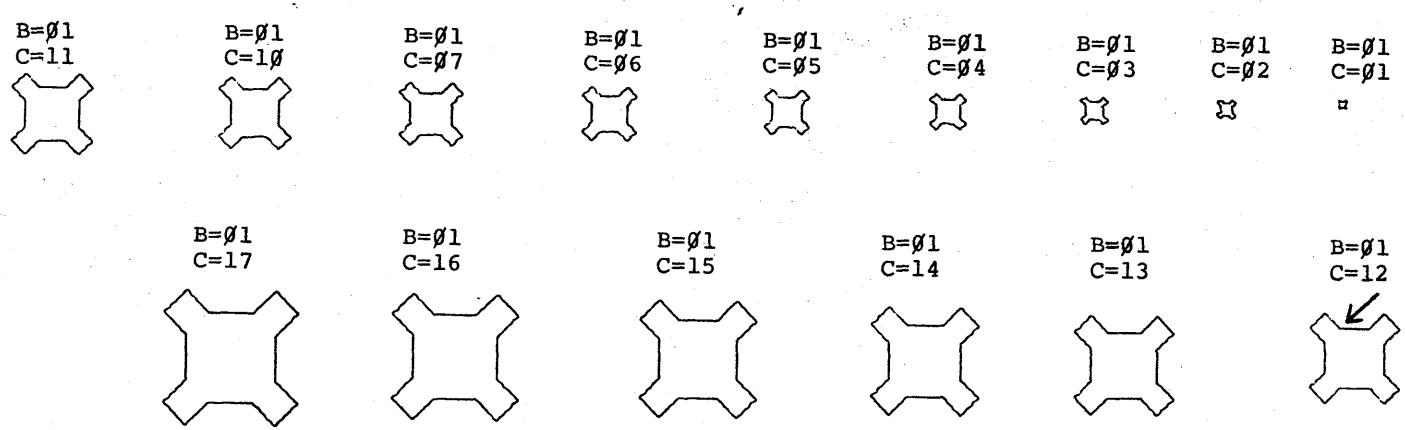
SYMBOL	DEFINITION
B	ITERATION CODE NUMBER - REFERS TO CURVE COMPLEXITY (01 IS SIMPLEST, 13 MOST COMPLEX). UNFORTUNATELY ONLY UP TO A CERTAIN LEVEL OF COMPLEXITY HAS BEEN SHOWN DUE TO THE SIZE OF THE CURVE GENERATED.
C	LINE LENGTH CODE NUMBER - REFERS TO CURVE COMPONENT SIZE (01 IS SMALLEST, 17 IS LARGEST). THIS NUMBER MULTIPLIED BY 2 THEN MULTIPLIED BY INCREMENT SIZE YIELDS THE LENGTH OF EACH HORIZONTAL AND VERTICAL LINE.

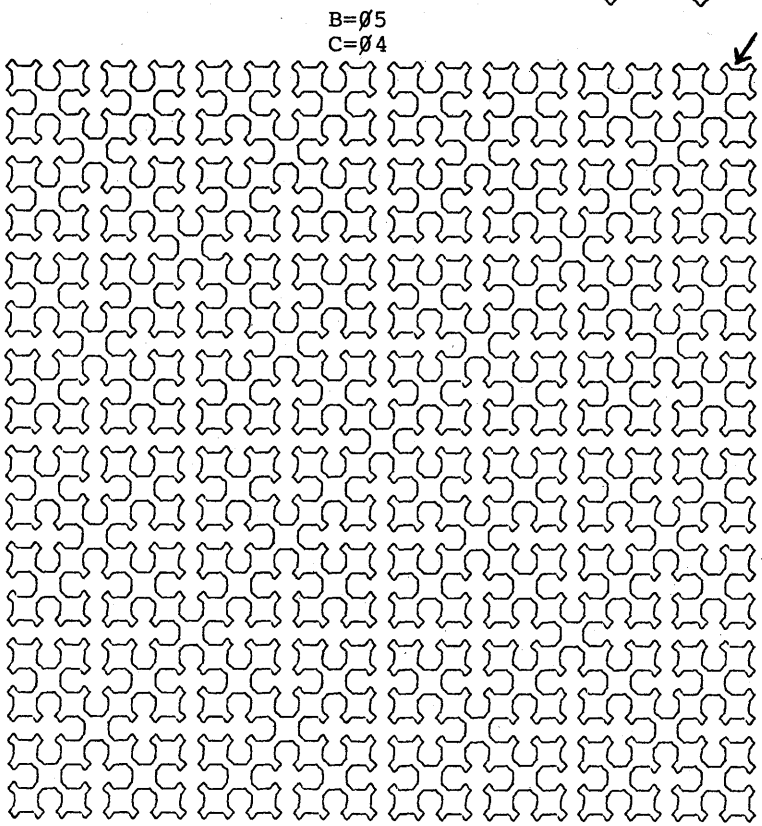
THE CURVE STARTS AT THE POINT INDICATED BY THE ARROW (-) AND CONTINUES FIRST IN THE PEN RIGHT (-Y) DIRECTION. ACTUALLY THE STARTING POINT IS NEAR THE EXTREME PEN RIGHT (-Y), DRUM DOWN (+X) POSITION ON THE CURVE. NOTE THAT ONLY THE FOLLOWING VECTORS ARE USED; (+X), (+Y), (-X), (-Y), (+X,+Y), (+X,-Y), (-X,+Y) AND (-X,-Y). NO 1/2 INCREMENT VECTORS ARE USED.

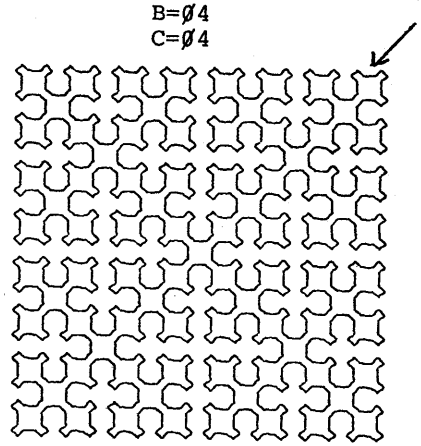
THE ENTIRE CURVE IS DRAWN WITHOUT THE PEN EVER LEAVING THE PAPER. HOWEVER, PERIODICALLY A PEN DOWN COMMAND IS GIVEN TO RECOVER FROM USER INTERVENTION. ONCE THE COMPLETE CURVE HAS BEEN DRAWN IT WILL RETRACE AND CONTINUE UNTIL THE JOB HAS BEEN KILLED.

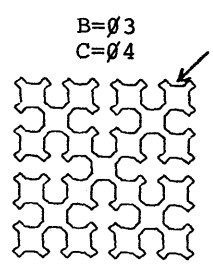
SIERPINSKY SPACE FILLING CURVES

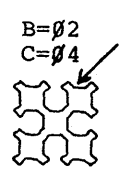
B=ITERATION
C=LINE LENGTH
L=2BI WHERE L=LENGTH OF EACH
HORIZONTAL AND VERTICAL LINE,
AND I=THE PLOTTER INCREMENT SIZE,

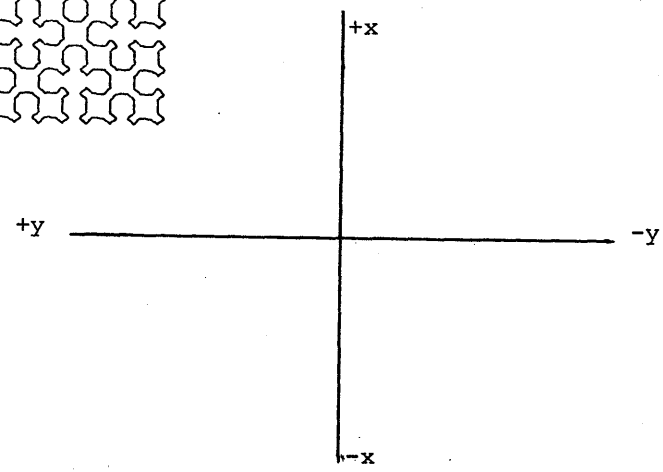












2, REQUIREMENTS

1, PROCESSORS: PDP-8, 8/I, 8/L, 8/E, 8/F, 8/M AND PDP-12

2, OPTIONS: XY8-E (ENCODED OR UNENCODED), VP8/I[8/L]
OR XY12 PLOTTER INTERFACE, AND AN INCREMENTAL PLOTTER,

3, SPECIAL: NONE

3, RESTRICTIONS

IT IS RECOMMENDED NEVER TO USE A LINE LENGTH PARAMETER
OF LESS THAN 3,

4, OPERATING INFORMATION

4,1 SPECIAL CONSIDERATIONS

THE USER SHOULD EXPERIMENT WITH ITERATION AND LINE
LENGTH PARAMETERS SET AT LOWER VALUES TO GET A FEEL
OF HOW LARGE A GIVEN CURVE IS. SELECTING A LARGE
LINE LENGTH AND/OR ITERATION CODE MAY VERY WELL PRODUCE
A CURVE WHICH WILL NOT BE CONTAINED WITHIN THE PLOTTING
AREA, ACTUALLY THE PRESET VALUES FOR THESE PARAMETERS
WOULD BE A GOOD PLACE TO START FOR MOST PLOTTERS, (REF,
PARAGRAPH 4,3),

4,2 BUILDING

1, JOB TYPE: INTERRUPT DRIVEN
2, PRIORITY: ABSOLUTELY NON-CRITICAL,
3, JOB SLOTS: JF1 OR JF2 ONLY; 4 PAGES REQUIRED,
4, STANDARD DEVICE CODES: 0500 (APPLIES TO ALL)
0510 (VP8/I[8/L], XY12 ONLY)
0520 (VP8/I[8/L], XY12 ONLY)

4,3 INITIALIZING

REFER TO THE FIGURES IN PARAGRAPH 1 FOR A VISUAL DESCRIPTION OF THE EFFECTS OF THE VARIOUS PARAMETERS, ALSO REVIEW THE STATEMENTS IN PARAGRAPHS 3 AND 4,1.

AFTER "PLOTER" IS PRINTED, RESPOND TO EACH CODE LETTER AS DEFINED BELOW.

CODE	DESIRED RESULT	RESPONSE	LIMITS	PRESET
A	XY8-E UNENCODED	00	00-02	00
	XY8-E ENCODED	01		
	VP8/I[8/L], XY12	02		
B	ITERATION	NN	01-13	05
C	LINE LENGTH	NN	01-17*	04

*SELECTING A LINE LENGTH OF LESS THAN 03 IS NOT ENCOURAGED.

4,4 DEVICE SETUP

THE PLOTTER MUST BE ON LINE. INITIALLY IT IS RECOMMENDED THAT THE PEN BE PLACED ABOUNT 3/4 INCH FROM THE EXTREME PEN RIGHT (-Y) POSITION AND THAT A PORTION OF THE PLOT AREA AT LEAST AS LONG AS THE PLOT AREA IS WIDE EXIST IN THE DRUM UP (-X) DIRECTION. ON A FLATBED PLOTTER THIS WOULD CORRESPOND TO THE PEN NEAR THE -Y,-X EXTREME.

4,5 RUNNING

1. CNTR: UPDATED BY EVERY PLOTTER INTERRUPT.
2. SR10: NO EFFECT.
3. SR11: NO EFFECT.

5. ERROR INFORMATION

ALL ERROR DETECTION IS VISUAL.

6. LISTING (ATTACHED)

```
/
/DEC/X8 EXTERNAL SYMBOL TABLE "EXTSYM"
/FOR USE IN ASSEMBLING DEC/X8 SOFTWARE MODULES.
/COPYRIGHT 1972, DIGITAL EQUIPMENT CORP., MAYNARD, MASS.
        XLIST
        PAUSE
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/MAINDEC-X8-DIXYA-A-L "DEC/X8" PLOTER
/PLOTTER EXERCISER MODULE FOR DEC/X8
/THE PLOTTER DISPLAYS THE SIERPINSKY SPACE FILLING CURVE USING AN
/ALGORITHM AS MODIFIED BY S. RABINOWITZ (D.E.C.) FROM THE
/ALGORITHM GIVEN IN "SOFTWARE-PRACTICE AND EXPERIENCE" (VOL. 1, PP. 403-410 1971)
/COPYRIGHT 1972, DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASS.
/THIS MODULE OPERATIONAL ON PDP-8,8/I,8/L,8/E,8/M,8/F AND PDP-12
/WITH ANY OF THE FOLLOWING PLOTTER OPTIONS:
        /XY8-E  (ENCODED AND UNENCODED)
        /VP8/I[8/L]
        /XY12
        /PRG:   LEN BEYERSDORFER  (X2537)
/BUILDER INSTRUCTIONS:
        /1,     PRIORITY:  INTERRUPT DRIVEN; NON-CRITICAL
        /2,     JOB SLOT:  4 PAGES (JF1 OR JF2)

/INITIALIZER INSTRUCTIONS
/CODE   DEFINITION      RESPONSE        LIMITS  PRESET
/----   ----------      --------        ------  ------
/A      XY8E UNENCODED  00              00-02   00
/       XY8E ENCODED    01
/       XY12,VP8I[8L]   02
/B      ITERATION       NN              01-13   05
/C      LINE LENGTH     NN              01-17   04
/PLOTTER MOVEMENT INFORMATION
/DIRECTION      XY8-E   XY8-E   XY12,VP8I[8L]
/               ENCODED UNENCOD UNENCOD
/               (6504)  (6004)
/---------      -------- -------- --------
/PL(+Y)         10      20      6521
/PR(-Y)         14      40      6511
/DD(+X)         12      10      6514
/DU(-X)         16      04      6512 OR 6522
/PLDD(+Y+X)     11      30      6501 THEN 6514
/PLDU(+Y-X)     17      24      6523
/PRDD(-Y+X)     13      50      6515
/PRDU(-Y-X)     15      44      6513
/PU(!P)         31      6503    6504
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                    /PD(DOWN P)     32      6505    6524

                    /CLEAR FLAG     6502    6502    6502
                    /SKIP FLAG      6501    6501    6501

                    /MODULE INTERFACE TABLE

            0200    *200
    0200    0000            0
    0201    2014    TEXT1,  TEXT    "PLOTER"
    0202    1724
    0203    0522
    0204    0000
    0205    0411            TEXT    "DIXYA-A"
    0206    3031
    0207    0155
    0210    0100
    0211    0000    HOMEDF, 0
    0212    7402            HLT/CDF
    0213    5611            JMP I   HOMEDF
    0214    6202    INTACK, CIF     00
    0215    4426            JMS I   IHRETP
    0216    7777            -1
    0217    7777    KILL,   -1
    0220    7777    KILLED, -1
    0221    0000    CNTR,   0

                    /END OF MODULE INTERFACE TABLE

                    /INITIALIZER

    0222    4444    INIT,   MESAGE
    0223    0201            TEXT1
    0224    1117            TAD E   K301
    0225    3251            DCA     INT
    0226    4240            JMS     INITA
    0227    7104            CLL RAL                 /A)PLOTTER TYPE 0,2,4(0,1,2)
    0230    3777'           DCA     PLOTER
    0231    4240            JMS     INITA           /B)ITERATION 01-13 2'S COMP IN TEMHLD
    0232    7041            CIA
    0233    3776'           DCA     TEMHLD
    0234    4240            JMS     INITA           /C)LINE LENGTH 01-(7 2'S COMP IN NUM
    0235    7041            CIA
    0236    3775'           DCA     NUM
    0237    5020            INITEX
    0240    0000    INITA,  0
    0241    4454            CRLF
    0242    1251            TAD     INT
    0243    2251            ISZ     INT
    0244    4450            TYPE
    0245    4455            SPACE2
    0246    4441            TWOOCT
    0247    5224            JMP     INIT+2
    0250    5640            JMP I   INITA
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                    /INTERRUPT SERVICE

    0251    0000    INT,    0
    0252    2276            ISZ     RENTRY          /EXPECTED INTERRUPT?
    0253    5264            JMP     NOTMIN          /NO
    0254    4211            JMS     HOMEDF          /YES, DF=IF
    0255    6502    DC50A,  6502                    /CLEAR FALG
    0256    2221            ISZ     CNTR            /+1 TO PLOT COUNTER
    0257    1217            TAD     KILL            /KILL JOB?
    0260    7450            SNA
    0261    5672            JMP I   EXIT            /NO, CONTINUE
    0262    3220            DCA     KILLED          /YES, ACKNOWLEDGE LAST INTERRUPT AND EXIT;
    0263    5214            JMP     INTACK
    0264    6214    NOTMIN, RDF                     /INTERRUPT NOT ACKNOWLEDGED EXIT
    0265    1020            TAD E   KCIFDF
    0266    3270            DCA     .+2
    0267    3276            DCA     RENTRY
    0270    7402            HLT
    0271    5651            JMP I   INT

    0272    0000    EXIT,   0                       /PLOTTER ACTION INITIATED
    0273    7240            STA                     /ALLOW ONE INTERRUPT
    0274    3276            DCA     RENTRY
    0275    5214            JMP     INTACK          /ACKNOWLEDGE PREVIOUS INTERRUPT
    0276    0000    RENTRY, 0

                    /PLOTTER TABLES

                    /NOTE!  IF YOU'RE REALLY INTERESTED, YOU MIGHT TRY MODIFYING
                    /THE PLOTTER TABLES (AND ALSO THE PEN DOWN SECTION IN THE "FILL"
                    /ROUTINE) SO THE OUTPUT WOULD APPEAR ON OTHER THAN
                    /THE DEVICES FOR WHICH THIS MODULE IS INTENDED.

                    /FORMAT
                    /TAG,   + NUMBER OF SERIES
                    /       XYSE PLLR
                    /       XYSE UNENCODED CONSTANT
                    /       XYSE PLLR
                    /       XYSE ENCODED CONSTANT
                    /       VPSIC8L],XY12 UNENCODED INSTRUCTION
                    /       NOTHING OR ANOTHER VPSIC8L],XY12 UNENCODED INSTRUCTION

    0277    0002    XUXU,   2                       /2 SERIES OF PEN RIGHT
    0300    6504    DC50B,  6504
    0301    0040            40
    0302    6504    DC50C,  6504
    0303    0014            14
    0304    6511    DC51A,  6511

    0305    0001    XUYU,   1                       /DRUM DOWN;PEN RIGHT
    0306    6504    DC50D,  6504
    0307    0050            50
    0310    6504    DC50E,  6504
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0311  0013            13
0312  6515    DC51B,  6515

0313  0001    XUYD,   1                       /DRUM UP,PEN RIGHT
0314  6504    DC50F,  6504
0315  0044            44
0316  6504    DC50G,  6504
0317  0015            15
0320  6513    DC51C,  6513

0321  0002    XDXD,   2                       /2 SERIES OF PEN LEFT
0322  6504    DC50H,  6504
0323  0020            20
0324  6504    DC50I,  6504
0325  0010            10
0326  6521    DC52A,  6521

0327  0001    XDYU,   1                       /DRUM DOWN,PEN LEFT
0330  6504    DC50J,  6504
0331  0030            30
0332  6504    DC50K,  6504
0333  0011            11
0334  6521    DC52B,  6521
0335  6514    DC51D,  6514

0336  0001    XDYD,   1                       /DRUM UP,PEN LEFT
0337  6504    DC50L,  6504
0340  0024            24
0341  6504    DC50M,  6504
0342  0017            17
0343  6523    DC52C,  6523

0344  0002    YDYD,   2                       /2 SERIES OF DRUM UP
0345  6504    DC50N,  6504
0346  0004            04
0347  6504    DC50O,  6504
0350  0016            16
0351  6512    DC51E,  6512

0352  0002    YUYU,   2                       /2 SERIES OF DRUM DOWN
0353  6504    DC50P,  6504
0354  0010            10
0355  6504    DC50Q,  6504
0356  0012            12
0357  6514    DC51F,  6514
0360  0000            0/NEVER DELETE THIS "0"

      0361    *,
0361  0563    TW,     TW1;TW2;TW3;TW4         /0 0  N O T  D I S P E R S E
0362  0611
0363  0521
0364  0542
0365  0510    TH,     TH1;TH2;TH3;TH4         /!**********$**********%**********
0366  0531
0367  0552
```



```
0370  0600

      0223    *INIT+1;TEXT1
0223  0201


0375  0797
0376  0476
0377  0616
      0400    *400

              /RUNNER  (ALSO THE START OF THE SCANTILY COMMENTED ALGORITHM)

0400  3777'   RUN,    DCA     CNTR            /0 => PLOT COUNTER
0401  4776'           JMS     CLRBUF          /CLEAR COMMAND BUFFER
0402  1276            TAD     TEMHLD          /SET UP ITERATION
0403  3277            DCA     TEMP
0404  7101            CLL IAC
0405  7004            RAL
0406  2277            ISZ     TEMP
0407  5205            JMP     .-2
0410  3300            DCA     J               /2**I=>J
0411  3301            DCA     THETA
0412  1300            TAD     J
0413  3302            DCA     JX
0414  1300            TAD     J
0415  3303            DCA     JY
0416  1300    LOOP,   TAD     J
0417  3304            DCA     K
0420  1302            TAD     JX
0421  3305            DCA     K1
0422  1303            TAD     JY
0423  3306            DCA     K2
0424  5241            JMP     L2
0425  1304    REDUCE, TAD     K
0426  7041            CIA
0427  1305            TAD     K1
0430  7500            SMA
0431  3305            DCA     K1
0432  7200            CLA
0433  1304            TAD     K
0434  7041            CIA
0435  1306            TAD     K2
0436  7500            SMA
0437  3306            DCA     K2
0440  7200            CLA
0441  7344    L2,     CLL STA RAL
0442  1304            TAD     K
0443  7450            SNA
0444  5267            JMP     JUMPA           /K=2
0445  7710            SPA CLA
0446  7402            HLT                     /K=1
0447  1304            TAD     K
0450  7110            CLL RAR
0451  3304            DCA     K               /K/2=>K
```

```
0452  1304            TAD     K
0453  7041            CIA
0454  1305            TAD     K1
0455  7110            CLL RAR
0456  7640            SZA CLA
0457  5225            JMP     REDUCE
0460  1304            TAD     K
0461  7041            CIA
0462  1306            TAD     K2
0463  7110            CLL RAR
0464  7640            SZA CLA
0465  5225            JMP     REDUCE
0466  7410            SKP
0467  1307    JUMPA,  TAD     KTHMTW
0470  1375            TAD     (TW
0471  1301            TAD     THETA
0472  3277            DCA     TEMP
0473  1677            TAD I   TEMP
0474  3277            DCA     TEMP
0475  5677            JMP I   TEMP
0476  7773    TEMHLD, -5                      /RELATES TO ITERATION; PRESET FOR ITERATION 5
0477  0000    TEMP,   0
0500  0000    J,      0
0501  0000    THETA,  0
0502  0000    JX,     0
0503  0000    JY,     0
0504  0000    K,      0
0505  0000    K1,     0
0506  0000    K2,     0
0507  0004    KTHMTW, TH-TW

0510  4774'   TH1,    JMS     FILL
0511  0277            XUXU
0512  4774'           JMS     FILL
0513  0305            XUYU
0514  4774'           JMS     FILL
0515  0313            XUYD
0516  2301            ISZ     THETA
0517  2301            ISZ     THETA
0520  5323            JMP     .+3
0521  4774'   TW3,    JMS     FILL
0522  0321            XDXD
0523  4774'           JMS     FILL
0524  0336            XDYD
0525  7240            STA
0526  1303            TAD     JY
0527  3303            DCA     JY
0530  5773'           JMP     TEST

0531  4774'   TH2,    JMS     FILL
0532  0344            YDYD
0533  4774'           JMS     FILL
0534  0313            XUYD
0535  4774'           JMS     FILL
0536  0336            XDYD
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0537  2301            ISZ     THETA
0540  2301            ISZ     THETA
0541  5344            JMP     .+3
0542  4774'   TW4,    JMS     FILL
0543  0352            YUYU
0544  4774'           JMS     FILL
0545  0327            XDYU
0546  7240            STA
0547  1302            TAD     JX
0550  3302            DCA     JX
0551  5773'           JMP     TEST

0552  4774'   TH3,    JMS     FILL
0553  0321            XDXD
0554  4774'           JMS     FILL
0555  0336            XDYD
0556  4774'           JMS     FILL
0557  0327            XDYU
0560  2301            ISZ     THETA
0561  2301            ISZ     THETA
0562  5365            JMP     .+3
0563  4774'   TW1,    JMS     FILL
0564  0277            XUXU
0565  4774'           JMS     FILL
0566  0305            XUYU
0567  2303            ISZ     JY
0570  7000            NOP
0571  5773'           JMP     TEST

      0572    *.


0573  0617
0574  0661
0575  0361
0576  0644
0577  0221
      0600    *600

0600  4261    TH4,    JMS     FILL
0601  0352            YUYU
0602  4261            JMS     FILL
0603  0327            XDYU
0604  4261            JMS     FILL
0605  0305            XUYU
0606  2777'           ISZ     THETA
0607  2777'           ISZ     THETA
0610  5213            JMP     .+3
0611  4261    TW2,    JMS     FILL
0612  0344            YDYD
0613  4261            JMS     FILL
0614  0313            XUYD
0615  2776'           ISZ     JX
0616  0000    PLOTER, 0                       /PRESET FOR XY8-E ONENCODED
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0617  1777'  TEST,   TAD     THETA
0620  1072           TAD     K3
0621  0072           AND     K3
0622  3777'          DCA     THETA
0623  1775'          TAD     J
0624  7041           CIA
0625  1776'          TAD     JX
0626  7640           SZA CLA
0627  5774'          JMP     LOOP
0630  1775'          TAD     J
0631  7041           CIA
0632  1773'          TAD     JY
0633  7640           SZA CLA
0634  5774'          JMP     LOOP
0635  1131           TAD I   M200           /ENSURE ALL OF COMMAND BUFFER IS EXECUTED;
0636  3372           DCA     ("A
0637  4261           JMS     FILL
0640  0000           0
0641  2372           ISZ     ("A
0642  5237           JMP     .+3
0643  5771'          JMP     RUN+1

0644  0000  CLRBUF,  0                      /PRESET;CLEAR BUFFER,PRESET
0645  4253           JMS     PRESET
0646  3417  AUA,     DCA I   AUTO
0647  2370           ISZ     ("B
0650  5246           JMP     .+2
0651  4253           JMS     PRESET
0652  5644           JMP I   CLRBUF

0653  0000  PRESET,  0                      /PRESET FOR BUFFER USEAGE
0654  1131           TAD I   M200
0655  3370           DCA     ("B
0656  1367           TAD     (777
0657  3017  AUB,     DCA     AUTO
0660  5653           JMP I   PRESET


0661  0000  FILL,    0                      /FILL BUFFER AND EXECUTE WHEN FULL
0662  1661           TAD I   FILL           /SAVE COMMAND VECTOR
0663  7450           SNA
0664  5267           JMP     .+3
0665  1131           TAD I   M200
0666  1366           TAD     (200
0667  3417  AUC,     DCA I   AUTO
0670  2261           ISZ     FILL
0671  2370           ISZ     ("B
0672  5661           JMP I   FILL           /GET ANOTHER
0673  4253           JMS     PRESET         /BUFFER FULL, PRESET
0674  1365           TAD     (AUD
0675  3764'          DCA     EXIT           /SETUP INTERRUPT RETURN
0676  7240           STA
0677  6002           ION
0700  3763'          DCA     RENTRY         /ALLOW 1 INTERRUPT
0701  1216           TAD     PLOTER         /READY FOR INITIAL PEN DOWN
```



```
0702  7112           CLL RTR
0703  7670           SNA SZL CLA
0704  5307           JMP     .+3
0705  6524  DC52D,   6524                   /XY12;VP8I[8L]
0706  5004           SERVEX
0707  7430           SZL
0710  5313           JMP     .+3
0711  6505  DC50R,   6505                   /XY8E UNENCODED
0712  5004           SERVEX
0713  1067           TAD Z   K32            /XY8E ENCODED
0714  6504  DC50S,   6504
0715  7200           CLA
0716  5004           SERVEX
0717  1417  AUD,     TAD I   AUTO           /INTERRUPT RETURN;  GET
0720  7450           SNA                    /COMMAND VECTOR
0721  5393           JMP     FILLEX
0722  3253           DCA     PRESET
0723  1653           TAD I   PRESET         /GET SERIES COUNTER
0724  7041           CIA
0725  3244           DCA     CLRBUF
0726  7001           IAC                    /COMPUTE POINTER TO PROPER
0727  1253           TAD     PRESET         /INSTRUCTION LEVEL IN
0730  1216           TAD     PLOTER         /PLOTTER TABLE;
0731  3253           DCA     PRESET
0732  1653           TAD I   PRESET         /GET INST
0733  3343           DCA     INST
0734  2253           ISZ     PRESET
0735  1653           TAD I   PRESET         /GET CONSTANT (OR INST)
0736  3341           DCA     CONST
0737  1357           TAD     NUM            /GET LINE LENGTH
0740  3360           DCA     KNT
0741  7402  CONST,   HLT                    /CONSTANT OR INST
0742  1341           TAD     .+1
0743  7402  INST,    HLT                    /INST
0744  4764'          JMS     EXIT           /PLOTTER GO AND WAIT FOR INTERRUPT;
0745  2360           ISZ     KNT            /DONE?
0746  5341           JMP     .+5            /NO
0747  2244           ISZ     CLRBUF         /AGAIN?
0750  5337           JMP     .+11           /YES;
0751  2370           ISZ     ("B            /END OF BUFFER?
0752  5317           JMP     AUD            /NO GET NEXT COMMAND;
0753  1362  FILLEX,  TAD     (;+2           /YES, SWITCH TO DEFERRED SERVICE
0754  5761'          JMP     INTACK         /TO GENERATE MORE COMMANDS;
0755  4253           JMS     PRESET         /ENTER DEFERRED SERVICE, PRESET BUFFER;
0756  5661           JMP I   FILL           /EXIT
0757  7774  NUM,     -4
0760  7774  KNT,     -4
      0761  *.

0761  0214
0762  0755
0763  0276
0764  0272
0765  2717
0766  0200
```

```
0767  0777
0770  0302
0771  0401
0772  0301
0773  0503
0774  0416
0775  0500
0776  0502
0777  0501
      1000    *1000;0/THIS WHOLE PAGE COMPRISES THE COMMAND BUFFER;
1000  0000
      1001    *.
```



```
0000
0100

0200  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0300  11111111  11111111  11111111  11111111  11111111  11111111  11111111  10000111

0400  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0500  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11011111

0600  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111
0700  11111111  11111111  11111111  11111111  11111111  11111111  11111111  11111111

1000  10000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000
1100  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000

1200
1300

1400
1500

1600
1700

2000
2100

2200
2300

2400
2500

2600
2700

3000
3100

3200
3300

3400
3500

3600
3700
```

```
4000
4100

4200
4300

4400
4500

4600
4700


5000
5100

5200
5300

5400
5500

5600
5700


6000
6100

6200
6300

6400
6500

6600
6700


7000
7100

7200
7300

7400
7500

7600
7700
```



```
                0001    FIELD  1
                        /BUILDER CALL

          1001  0222            INIT;RUN;INT
          1002  0400
          1003  0251

          1004  6501            6501;0;1;HLT;HLT;HLT
          1005  2000
          1006  0001
          1007  7402
          1010  7402
          1011  7402

          1012  7774            -4;AUA;AUB;AUC;AUD
          1013  0646
          1014  0657
          1015  0667
          1016  0717

          1017  7775            -3

          1020  0500            0500;-24;1;DC50A;DC50B;DC50C;DC50D;DC50E;DC50F;DC50G
          1021  7754
          1022  0001
          1023  0255
          1024  0300
          1025  0302
          1026  0306
          1027  0310
          1030  0314
          1031  0316
          1032  0322                      DC50H;DC50I;DC50J;DC50K;DC50L;DC50M;DC50N
          1033  0324
          1034  0330
          1035  0332
          1036  0337
          1037  0341
          1040  0345
          1041  0347                      DC50O;DC50P;DC50Q;DC50R;DC50S
          1042  0353
          1043  0355
          1044  0711
          1045  0714

          1046  0510            0510;-6;DC51A;DC51B;DC51C;DC51D;DC51E;DC51F
          1047  7772
          1050  0304
          1051  0312
          1052  0320
          1053  0335
          1054  0351
          1055  0357
```

```
1056  0520            05201,,4100DC92A100DC928100DC92C100DC920
1057  7774
1060  0326
1061  0334
1062  0343
1063  0705

1064  0000            0
1065  0000            0
                $$$$$$$$$$$$$
```



```
0000
0100

0200
0300

0400
0500

0600
0700

1000  01111111  11111111  11111111  11111111  11111111  11111111  11111100  00000000
1100  00000000  00000000  00000000  00000000  00000000  00000000  00000000  00000000

1200
1300

1400
1500

1600
1700


2000
2100

2200
2300

2400
2500

2600
2700


3000
3100

3200
3300

3400
3500

3600
3700
```

```
4000
4100

4200
4300

4400
4500

4600
4700


5000
5100

5200
5300

5400
5500

5600
5700


6000
6100

6200
6300

6400
6500

6600
6700


7000
7100

7200
7300

7400
7500

7600
7700
```



```
ASBUFF  4460        INIT    0222        K7740   0133        SPACE2  4455
ASBUFP  0060        INITA   0240        K7750   0134        SPACEP  0055
AUA     0646        INITEX  0020        K7760   0135        TEMHLO  0476
AUB     0657        INST    0743        K7771   0136        TEMP    0477
AUC     0667        INT     0251        K7773   0137        TEST    0617
AUD     0717        INTACK  0214        K7774   0140        TEXT1   0201
AUTO    0017        IOFMSP  0056        K7775   0141        TH      0365
CLRBUF  0644        J       0500        KCDF    0044        TH1     0510
CNTR    0221        JUMPA   0447        KCIF    0005        TH2     0531
CONST   0741        JX      0502        KCIFDF  0020        TH3     0552
CRLF    4454        JY      0503        KILL    0217        TH4     0600
CRLFP   0054        K       0504        KILLED  0220        THETA   0501
DC50A   0255        K0      0066        KIOF    0004        TH      0361
DC50B   0300        K1      0505        KNT     0760        TW1     0563
DC50C   0302        K10     0076        KTHMTH  0507        TW2     0611
DC50D   0306        K100    0107        LR      0441        TW3     0021
DC50E   0310        K11     0077        LISN    4440        TW4     0542
DC50F   0314        K116    0071        LISNP   0040        TWOOCP  0041
DC50G   0316        K13     0100        LOOP    0416        TWOOCT  4441
DC50H   0322        K17     0101        M20     0135        TYPE    4458
DC50I   0324        K177    0130        M200    0131        TYPEP   0058
DC50J   0330        K2      0506        M240    0127        XDXD    0321
DC50K   0332        K20     0102        M260    0126        XDYD    0336
DC50L   0337        K200    0110        M270    0125        XDYU    0327
DC50M   0341        K2000   0122        M3      0141        XUXU    0277
DC50N   0345        K212    0111        M30     0134        XUYD    0313
DC50O   0347        K215    0112        M4      0140        XUYU    0308
DC50P   0353        K240    0113        M40     0133        YDYD    0344
DC50Q   0355        K280    0114        M43     0132        YUYU    0332
DC50R   0711        K272    0115        M5      0137
DC50S   0714        K277    0116        M7      0136
DC51A   0304        K3      0072        MESAGE  4444
DC51B   0312        K30     0103        MESAGP  0044
DC51C   0320        K301    0117        MULBGP  0065
DC51D   0335        K32     0067        NOTMIN  0244
DC51E   0351        K323    0120        NUM     0757
DC51F   0357        K4      0073        ONEOCP  0042
DC52A   0326        K40     0104        ONEOCT  4442
DC52B   0334        K400    0121        PLOTER  0656
DC52C   0343        K5      0074        PRESET  0053
DC52D   0705        K5000   0123        PRNT1   4451
ERRP    0061        K540    0124        PRNT1P  0051
EXINIT  0020        K5402   0003        PRNT2   4452
EXIT    0272        K64     0070        PRNT2P  0052
EXSERV  0004        K7      0075        PRNT4   4453
EXTMEM  0161        K70     0105        PRNT4P  0053
FILL    0061        K7510   0125        REDUCE  0425
FILLEX  0753        K7520   0126        RENTRY  0276
FOROCP  0043        K7540   0127        RLBUFF  4457
FOROCT  4443        K7600   0131        RLBUFP  0057
HOMEDF  0211        K77     0106        RUN     0400
IHRETP  0026        K7735   0132        SERVEX  5004
```

```
ERRORS DETECTED: 0
LINKS GENERATED: 39
RUN-TIME:  5 SECONDS
3K CORE USED
```