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DECUS NO.	8-169G
TITLE	PLOPRM
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DATE	
SOURCE LANGUAGE	

1. IDENTIFICATION

1.1 Number: OCDA-8-7 (P-07-01)
1.2 Title: PLOPRM
1.3 Date: May 1968
1.4 Computer: PDP-8
1.5 Language: PAL III

2. ABSTRACT

The program is used to plot the points of (a) the temperature-pressure parameters from the O/T from OCDA-8-3 and (b) the salinity-depth parameters from the O/T from OCDA-8-5. It contains many useful subroutines to operate the Calcomp plotter.

3. REQUIREMENTS

3.1 Storage: 0 - 677, 1000 - 1577, 2200 - 2477, 3000 - 3347, 5400 - 7777
3.2 Subprograms and/or Subroutines:
3.2.1 F.P. Package (Digital-8-5B-5)
3.3 Equipment: H.S. paper tape reader, Calcomp plotter.

4. USAGE

4.1 Loading: The binary loader (Digital-8-2-U) is used to load F.P. Package followed by the program.
4.2 Calling Sequence: N/A
4.3 Switch Settings: N/A
4.4 Start up and/or Entry:
4.4.1 To draw the outline, load address 1200_8, set pen near left edge of plotter drum press 'START'.
4.4.2 To plot temperature vs pressure place data tape in H.S. paper tape reader and position the pen at the lower left corner of outline drawn by 4.4.1. This is the position of the pen after completing the outline. Alternately the pen may be positioned by manually setting the viewing cross-hairs at point A, in Fig.1 load address 2440g and press 'START'. The computer will halt with the pen correctly positioned. To plot the profile load address 3230 and press 'START'.
4.4.3 To plot salinity vs depth place data tape in H.S. paper tape and position the pen at point A in Figure 1. This may be accomplished by manually setting the viewing cross-hairs at point A, load address 2434g and press 'START'. The computer will halt with the pen correctly positioned. To plot the profile load address 1445_8 and press 'START'.

5. RESTRICTIONS N/A

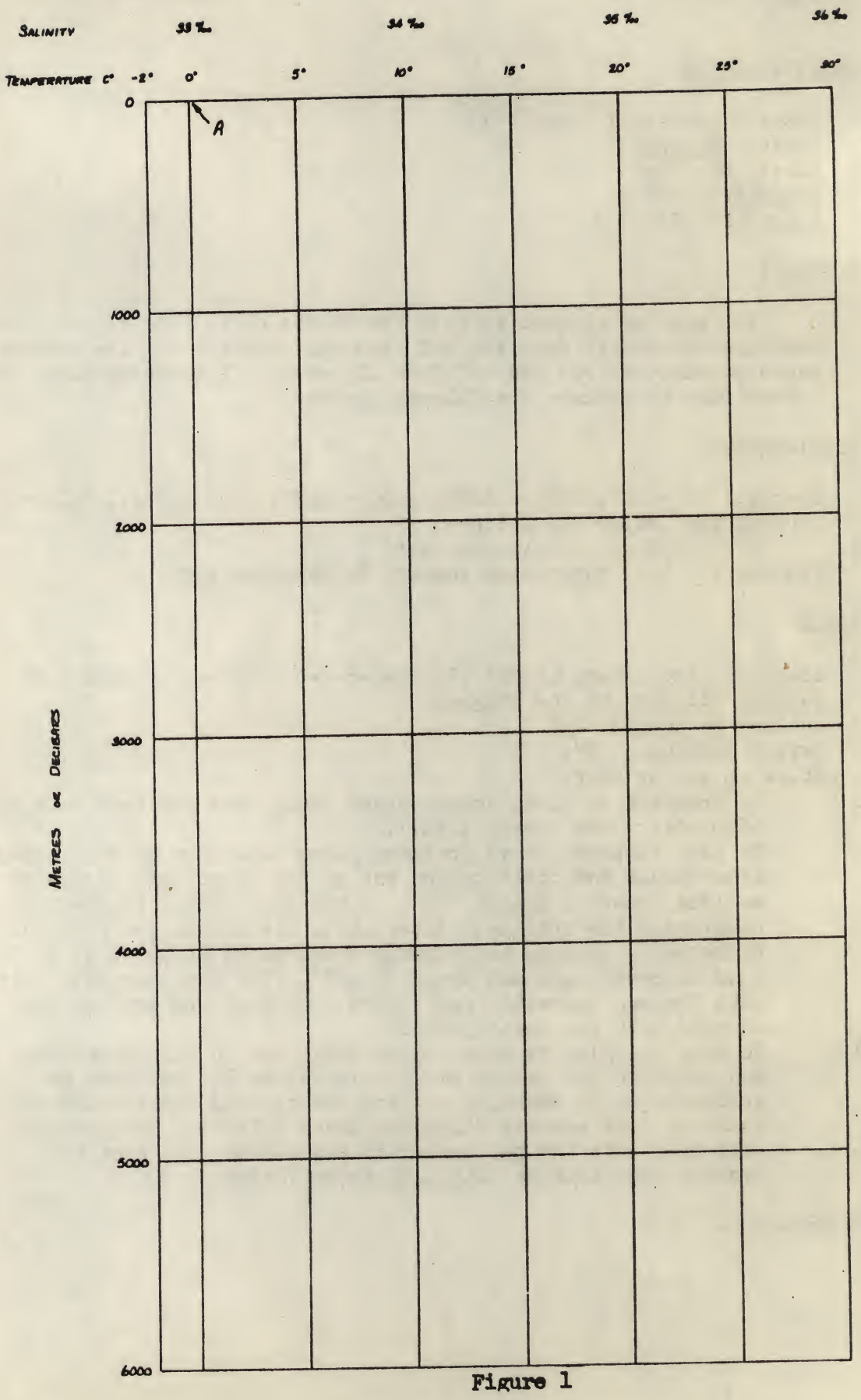

SALINITY
33 ‰
34 ‰
35 ‰
36 ‰
TEMPERATURE C°
-2°
0°
5°
10°
15°
20°
25°
30°
0
1000
2000
3000
4000
5000
6000
METRES or DECIBARS
A

Figure 1

6. DESCRIPTION

6.1 Discussion: The program was intended for use at sea in order to plot graphs of ocean data as soon as possible after the observations. It can be modified to plot under program control any two parameters in the XY axis and at various scales. Labelling was not included in this program. The values of the scale lines are shown in Fig. 1. The program halts at the end of each station plot. The subprograms "PLOTX" and "PNUM" are incorporated directly into the program. No attempt was made to adjust the scale of the plots to compensate for paper instability. Plain paper should be used and individual graphs drawn just prior to plotting.

6.2 Examples and/or Applications: Shown in Fig. 2.

7. METHOD

7.1 Discussion: The subroutines 'PLOTX' and 'PNUM' are used to control the plotting. Movement of pen drawing the outline and between data points uses differences in coordinates with the plotter initialized after each movement. Thus the size of the plot is limited only by that of the paper.
Many useful subroutines other than those included in 'PNUM' are given in Table 1.

8. FORMAT

8.1 Input Data:
8.1.1 Pressure versus Temp. plot: O/T from OCDA-8-4
8.1.2 Depth versus Salinity plot: O/T from OCDA-8-5

9. EXECUTION TIME N/A

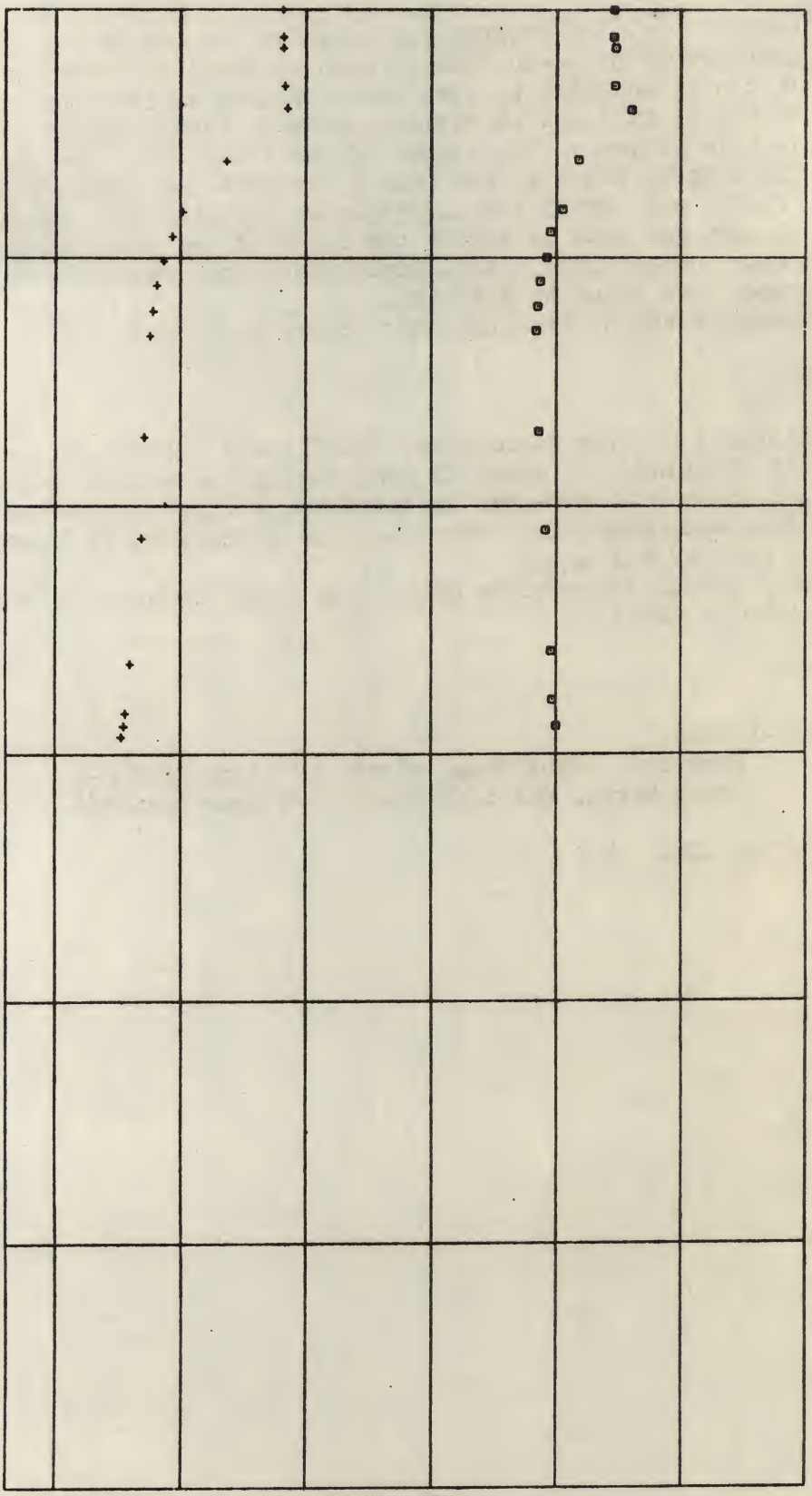
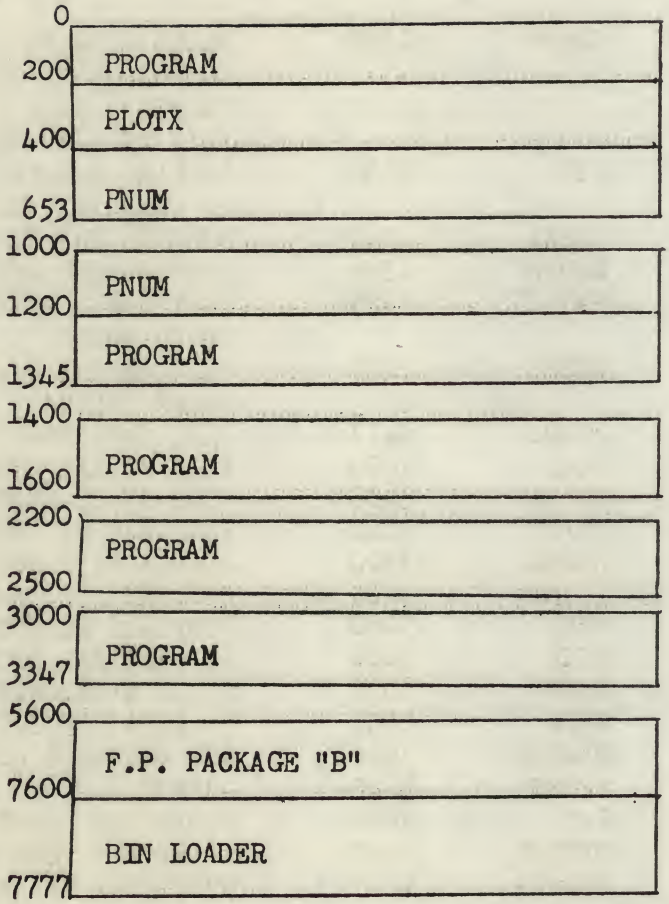


Figure 2

10. PROGRAM

10.1 Core Map:



10.2 Dimension List: N/A
10.3 Marco, Parameter and Variable List: Included with the program listing.
10.4 Program Listing: Attached at end of write-up.

11. DIAGRAMS

11.1 Flow Chart: Shown in Fig. 3

12. REFERENCES

12.1 Other Library Programs:
12.1.1 PLOTX (Digital 8-12-U)
12.1.2 F.P. Package (Digital 8-5B-S)
12.1.3 PNUM (OCDA-8-6)

Table 1: LIST OF SUBROUTINES CONTAINED IN PROGRAM 'PLOPRM'

CALL	NAME	ADDR	FUNCTION
JMS I GRAPHL	GRAPH	1200	PLOTS A GRAPH, 32 cm in X, 60 cm, In Y, 5X10 cm. rectangles, plus 2 cm. - X HLTS AT -2°, PRS.
JMS I BY2L	BY2	1330	DOUBLES THE PLOTTING SCALE OF TEMP/PRS GRAPH (HLTS)
JMS I DBSALL	DBSAL	1547	DOUBLES THE SALINITY SCALE (HLTS)
JMS I DBDPHL	DBDPH	1556	DOUBLES THE DPH SCALE (HLTS)
JMS I SMIL	SMI	3223	PLOT SMALL 1/10" SYMBOLS ON GRAPH (HLTS)
JMS I MEDML	MEDM	1425	PLOT MEDIUM 2/10" SYMBOLS ON GRAPH (HLTS)
JMS I PLUSSL	PLUSS	1413	PLOT PLUS SYMBOLS ON GRAPH (HLTS)
JMS I SQQL	SQQ	1400	PLOT SQUARE SYMBOLS ON GRAPH (HLTS)
JMS I SMALLL	SMALL	1435	PLOT SMALL SYMBOLS ON GRAPH
JMS I INPUTL	INPUT	7142	READ A CHAR FROM DATA TAPE
JMS I RDNUML	RDNUM	3300	READ A F.P. NUMBER DATA TAPE
JMS I FPINTL	FPINT	3105	CONVERT F.P. NUMBER TO INTEGER
JMS I NOUTL	NOUT	3260	PLOT BUT NO OUTLINE
JMS I BGINL	BGIN	3010	SET INITIAL COORDS TO START
JMS I DEPYL	DEPY	3020	SCALE & DEPOSIT Y COORD
JMS I DEPXL	DEPX	3032	SCALE & DEPOSIT X COORD
JMS I NEWPRL	NEWPRE	3044	SET PREVIOUS COORDS TO START
JMS I FPINTL	FPINT	3105	CHANGE F.P. TO INT.
JMS I PLTL	PLT	3200	PLOTS THE POINT AND SYMBOL
FROM S.R.	DYTYPY	3230	START THE TEMP Vs PRESS PLOT
FROM S.R.	DPSALH	1445	START THE SAL Vs DPH PLOT (MIN 33°/oo)

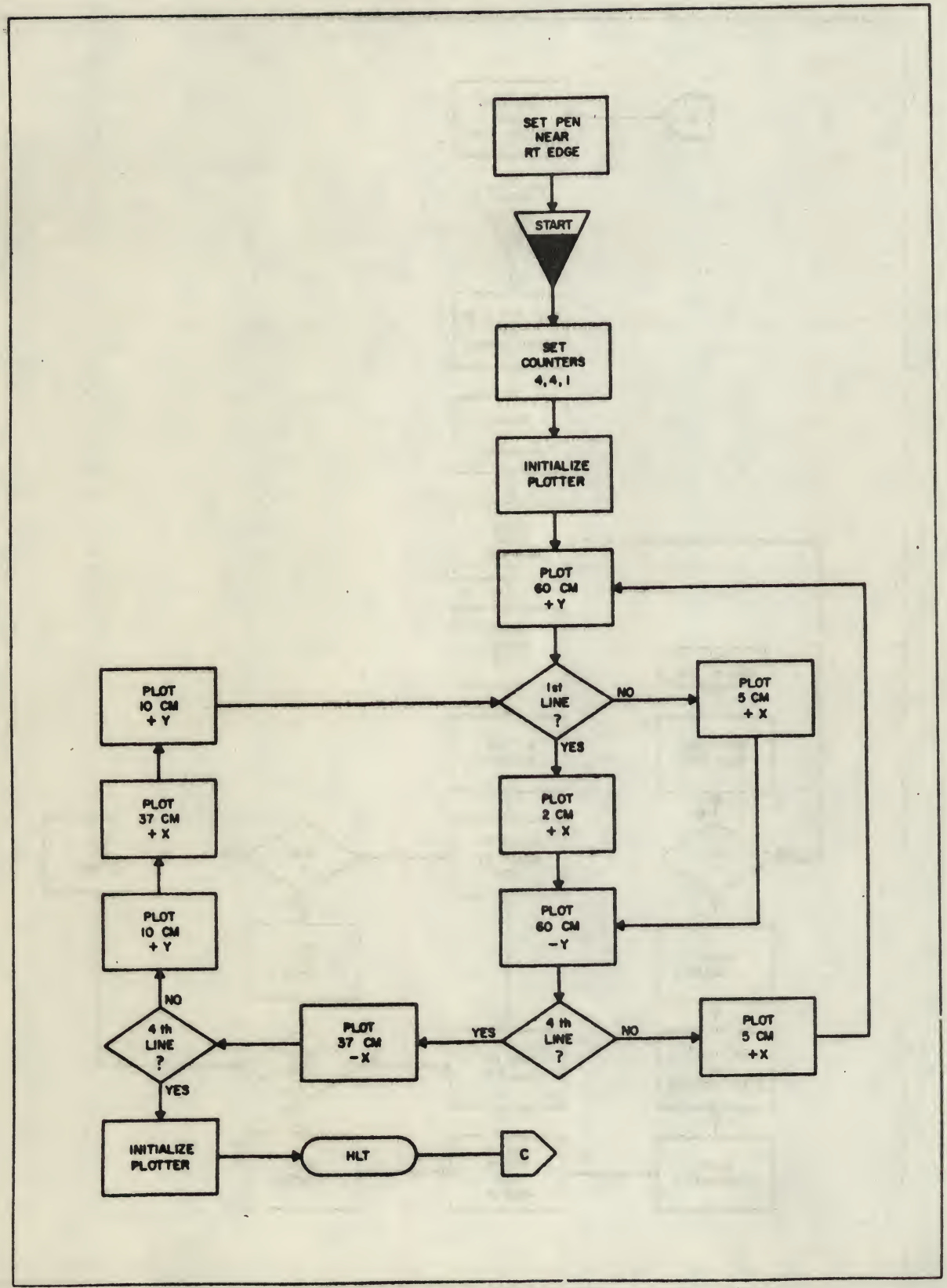

SET PEN NEAR RT EDGE
START
SET COUNTERS 4,4,1
INITIALIZE PLOTTER
PLOT 60 CM +Y
1st LINE ?
NO
YES
PLOT 5 CM +X
PLOT 2 CM +X
PLOT 60 CM -Y
4 th LINE ?
NO
YES
PLOT 5 CM +X
PLOT 37 CM -X
4 th LINE ?
NO
YES
PLOT 10 CM +Y
PLOT 37 CM +X
PLOT 10 CM +Y
INITIALIZE PLOTTER
HLT
C

Figure 3a

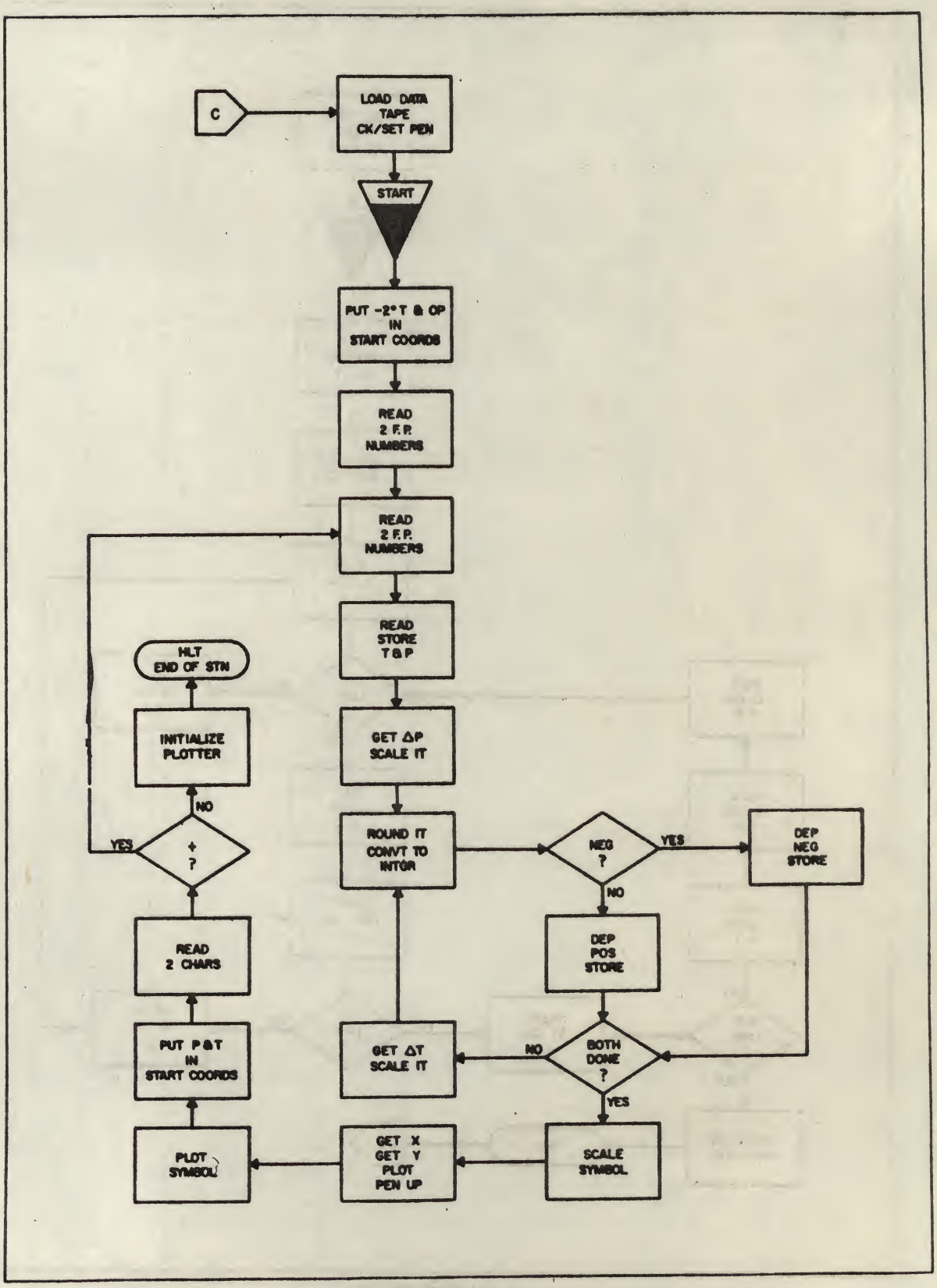

C
LOAD DATA TAPE CK/SET PEN
START
PUT -2*T & OP IN START COORDS
READ 2 F.P. NUMBERS
READ 2 F.P. NUMBERS
READ STORE T&P
GET ΔP SCALE IT
ROUND IT CONVT TO INTGR
NEG ?
YES
DEP NEG STORE
NO
DEP POS STORE
BOTH DONE ?
NO
YES
GET ΔT SCALE IT
SCALE SYMBOL
GET X GET Y PLOT PEN UP
PLOT SYMBOL
PUT P&T IN START COORDS
READ 2 CHARS
+ ?
YES
NO
INITIALIZE PLOTTER
HLT END OF STN

Figure 3b

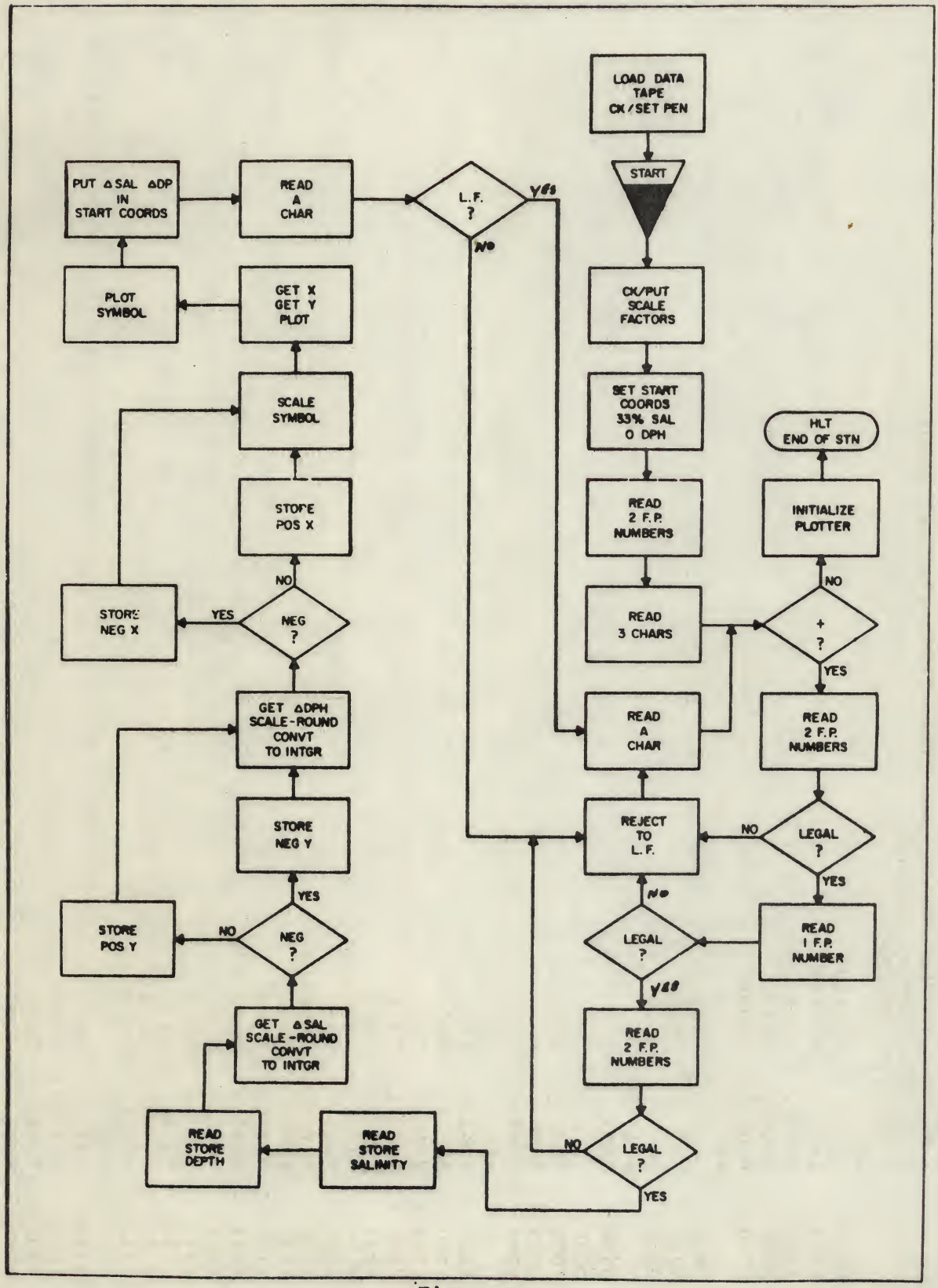

LOAD DATA TAPE CK/SET PEN
START
CK/PUT SCALE FACTORS
SET START COORDS 33% SAL 0 DPH
READ 2 F.P. NUMBERS
READ 3 CHARS
+ ?
NO
YES
READ 2 F.P. NUMBERS
LEGAL ?
NO
YES
READ 1 F.P. NUMBER
LEGAL ?
NO
YES
READ 2 F.P. NUMBERS
LEGAL ?
NO
YES
READ STORE SALINITY
READ STORE DEPTH
GET ΔSAL SCALE-ROUND CONVT TO INTGR
NEG ?
NO
YES
STORE POS Y
STORE NEG Y
GET ΔDPH SCALE-ROUND CONVT TO INTGR
NEG ?
NO
YES
STORE NEG X
STORE POS X
SCALE SYMBOL
GET X GET Y PLOT
PLOT SYMBOL
PUT ΔSAL ΔDP IN START COORDS
READ A CHAR
L.F. ?
YES
NO
READ A CHAR
REJECT TO L.F.
INITIALIZE PLOTTER
HLT END OF STN

Figure 3c

```
                    /**** DCDA-8-7 **** P-07-01 ****
                    /PLOPRM
                    / PROGRAM TO PLOT OCEAN PARAMETERS FROM H.S. TAPE READER
                    / IN SITU TEMP VS PRESSURE
                    / SALINITY VS DEPTH
0000                *0
0000    0362        AX,         PLOTNX
0001    0363        AY,         PLOTNY
0002    2455        NEGXL,      NEGX
0003    2464        NEGYL,      NEGY
0004    0200        PLOT,       PLOTX
0005                *5
0005    7400                    7400
0006    7200                    7200
0007    5600                    5600
0010                *10
0010    0000        SETX,       0
0011    0000                    0
0012    0000        CNT5,       0
0013    0000        CNT6,       0
0014    0000        CNT7,       0
0020                *20
0020    2200        ITL,        IT
0021    1000        ONEL,       ONE
0022    1011        TWOL,       TWO
0023    1022        THREEL,     THREE
0024    1033        FOURL,      FOUR
0025    1044        FIVEL,      FIVE
0026    1055        SIXL,       SIX
0027    1066        SEVENL,     SEVEN
0030    1077        EIGHTL,     EIGHT
0031    1110        NINEL,      NINE
0032    1121        ZEROL,      ZERO
0033    1132        SQRL,       SQR
0034    1143        RECTL,      RECT
0035    1154        MINL,       MIN
0036    1165        SQRSTL,     SQRST
0037    1176        PNUML,      PNUM
0063                *63
0063    2422        DOTL,       DOT
0064    1200        GRAPHL,     GRAPH
0065    1330        BY2L,       BY2
0066    1544        SCLL,       SCL
```

```
0067    1547.   DBSALL,  DBSAL
0070    1556    DBDPHL,  DBDPH
0071    3223    SMIL,    SMI
0072    1425    MEDML,   MEDM
0073    1413    PLUSSL,  PLUSS
0074    1400    SQQL,    SQQ
0075    1435    SMALLL,  SMALL
0076    3032    DEPXL,   DEPX
0077    3020    DEPYL,   DEPY
0100            *100
0100    0000    XYO,     0
0101    0612    LIN1,    612
0102    0117    LIN2,    117
0103    0305    LIN3,    305
0104    0024    LIN4,    24
0105    0050    LIN5,    50
0106    0000    STOR1,   0
0107    0000    STOR2,   0
0110    7777    M2,      0-1
0111    7776    M1,      0-2
0112    7772    M5,      0-6
0113    0002    TOO,     2
0114    3077    SCALIL,  SCAL1
0115    3102    SCAL2L,  SCAL2
0116    7000    SM,      7000
0117    7004    ME,      7004
0120    7006    LG,      7006
0121    3055    PRSL,    PRS
0122    3060    TEML,    TEM
0123    0000    STORE1,  0
0124    0000    STORE2,  0
0125    7142    INPUTL,  INPUT
0126    3300    RDNUML,  RDNUM
0127    3105    FPINTL,  FPINT
0130    0000    EXIT,    0
0131    0000    PX,      0
0132    0000    PY,      0
0133    0000    XDN,     0
0134    0000    YDN,     0
0135    0000    XUP,     0
0136    0000    YUP,     0
0137    7000    SIZ,     7000
0140    0000    STORX,   0
```

/10 CM
/ 2CM
/5 CM
/ 1/2 CM
/ 1 CM
/ X PLOTCO
/ Y PLOTCO

/COUNTERS

/FOR SCALE OF NUMBERS

/X PNUM
/Y PNUM

```
0141    0000    STORY,   0
0142    0000    STORX2,  0
0143    0000    STORY2,  0
0144    2204    PENDNL,  PENDN
0145    2217    PENUPL,  PENUP
0146    2232    SMLL,    SML
0147    2237    MEDL,    MED
0150             *150
0150    3260    NOUTL,   NOUT
0151    3044    NEWPRL,  NEWPRE
0152    3066    TEMML,   TEMM
0153    3063    PRSSL,   PRSS
0154    3226    MINIL,   MINI
0155    3225    ONEIL,   ONEI
0156    3074    PRETML,  PRETM
0157    3071    PREPSL,  PREPS
0160    3200    PLTL,    PLT
0163             *163
0163    2244    LGEL,    LGE
0164    2251    LINYL,   LINY
0165    2263    RT2L,    RT2
0166    2274    LT2L,    LT2
0167    2307    RT2DL,   RT2D
0170    2320    LT2DL,   LT2D
0171    2333    UY2L,    UY2
0172    2344    DY2L,    DY2
0173    2357    LTI2L,   LTI2
0174    2400    RTI2L,   RTI2
0175    2411    RT5DL,   RT5D
0176    3010    BGINL,   BGIN
                /DIGITAL 8-12-U
                /PLOT SUBROUTINE
                /CALLING SEQUENCE
                /   C(AC)=-1      INITIALIZE
                /   C(AC)= 0      PLOT WITH PEN DOWN
                /   C(AC)= 1      PLOT WITH PEN UP
                /         JMS PLOTX
                /         X CO-ORDINATE  (IN STEPS)  (RETURN IF AC=-1)
                /         Y CO-ORDINATE   (IN STEPS)
0200             *200
0200    0000    PLOTX,   0
0201    7510             SPA                          /MOVE THE PEN
0202    5220             JMP PLOTA    /NO   CONTINUE
```

```
0203  1361            TAD PLOTPN              /ADD PEN STATUS
0204  7112            CLL RTR
0205  7710            SPA CLA                 /ANY CHANGE
0206  5227            JMP PLOTI    /NO   CONTINUE
0207  7620            SNL CLA
0210  5214            JMP .+4                 /LOWER THE PEN
0211  3361            DCA PLOTPN              /RAISE THE PEN
0212  6504            PLPU
0213  5215            JMP .+3
0214  2361            ISZ PLOTPN              /LOWER THE PEN
0215  6524            PLPD
0216  4370            JMS PLOTWT              /WAIT FOR FLAG
0217  5227            JMP PLOTI    /CONTINUE
0220  7200  PLOTA,     CLA
0221  6504            PLPU                    /RAISE THE PEN
0222  3361            DCA PLOTPN
0223  3362            DCA PLOTNX              / 0 TO X CO-ORDINATE
0224  3363            DCA PLOTNY              /0 TO Y CO-ORDINATE
0225  4370            JMS PLOTWT
0226  5600            JMP I PLOTX
                /DIGITAL 8-12-U
                /PAGE 2
                /PICK UP ARGUMENTS
0227  1362  PLOTI,    TAD PLOTNX              /FETCH PREVIOUS X CO-ORDINATE
0230  7141            CIA CLL
0231  1600            TAD I PLOTX             /FORM NX-NPX
0232  7420            SNL                     /L=0   NX LESS THAN NPX
0233  7041            CIA
0234  3364            DCA PLOTDX              /ABSOLUTE VALUE OF DIFFERENCE
0235  7004            RAL
0236  3367            DCA PLOTMV              /SAVE SIGN BIT
0237  1600            TAD I PLOTX             /SET NEW
0240  3362            DCA PLOTNX              /PREVIOUS X
0241  2200            ISZ PLOTX    /INCREMENT POINTER
0242  1363            TAD PLOTNY              /FETCH PREVIOUS Y CO-ORDINATE
0243  7141            CIA CLL
0244  1600            TAD I PLOTX             /FORM NY-NPY
0245  7420            SNL                     / LESS THAN =0   NPY LESS THAN NY
0246  7041            CIA
0247  3365            DCA PLOTDY              /ABSOLUTE VALUE OF DIFFERENCE
0250  1367            TAD PLOTMV              /SAVE SIGN BIT
0251  7004            RAL                     /BIT 10(1)= DRUM-DOWN(POSITIVE)
0252  3367            DCA PLOTMV              /BIT 11(1)=PEN-LEFT (POSITIVE)
```

```
0253  1600          TAD I PLOTX              /SET NEW
0254  3363          DCA PLOTNY               /PREVIOUS Y
0255  2200          ISZ PLOTX    /INCREMENT POINTER
0256  1364          TAD PLOTDX
0257  7141          CIA CLL
0260  1365          TAD PLOTDY
0261  7620          SNL CLA                  /L=0  DELTA Y  LESS THAN  DELTA X
0262  5275          JMP PLOT2
0263  1364          TAD PLOTDX               /REVERSE NUMBERS
0264  3366          DCA PLOTNA
0265  1365          TAD PLOTDY
0266  3364          DCA PLOTDX
0267  1366          TAD PLOTNA
0270  3365          DCA PLOTDY
0271  7001          IAC                      /SET MAJOR MOTION
0272  0367          AND PLOTMV               /INSTRUCTION
0273  1342          TAD PLOTT1
0274  5300          JMP .+4
                /DIGITAL  6-12-U
                /PAGE 3
0275  1367    PLOT2,  TAD PLOTMV
0276  7110          CLL RAR
0277  1345          TAD PLOTT2
0300  3366          DCA PLOTNA
0301  1766          TAD I PLOTNA
0302  3340          DCA PLOT4
0303  1365          TAD   PLOTDY
0304  7640          SZA  CLA
0305  5310          JMP   .+3
0306  1766          TAD I PLOTNA
0307  5314          JMP   .+5
0310  1367          TAD PLOTMV               /SET COMBINED MOTION
0311  1350          TAD PLOTT3
0312  3367          DCA PLOTMV
0313  1767          TAD I PLOTMV
0314  3334          DCA PLOTD3
0315  1365          TAD PLOTDY
0316  7041          CIA
0317  3365          DCA PLOTDY
0320  1364          TAD PLOTDX
0321  7040          CMA
0322  3367          DCA PLOTMV
0323  1364          TAD PLOTDX
```

```
0324  7110            CLL RAR
0325  2367  PLOT3,    ISZ PLOTMV
0326  7410            SKP
0327  5600            JMP I PLOTX             /ALL DONE
0330  7100            CLL
0331  1365            TAD PLOTDY
0332  7430            SZL
0333  5340            JMP PLOT4               /SINGLE MOTION
0334  0000  PLOTDR,   .                       /COMBINED MOTION
0335  1364            TAD PLOTDX
0336  4370            JMS PLOTWT
0337  5325            JMP PLOT3
0340  0000  PLOT4,    0
0341  5336            JMP .-3
0342  0343  PLOTT1,    .+1
0343  6511            PLPR                    /PEN-RIGHT
0344  6521            PLPL                    /PEN-LEFT
0345  0346  PLOTT2,    .+1
0346  6512            PLDU                    /DRUM-UP
0347  6514            PLDD                    /DRUM-DOWN
0350  0351  PLOTT3,    .+1
0351  6513            PLDU PLPR               /UP-RIGHT
0352  6523            PLDU PLPL               /UP-LEFT
0353  6515            PLDD PLPR               /DOWN-RIGHT
0354  4355            JMS .+1                 /DOWN LEFT
0355  0000            .
0356  6514            PLDD
0357  6521            PLPL
0360  5755            JMP I .-3
                /DIGITAL 8-12-U
                /PAGE 4
0361  0000  PLOTPN,   0
0362  0000  PLOTNX,   0
0363  0000  PLOTNY,   0
0364  0000  PLOTDX,   0
0365  0000  PLOTDY,   0
0366  0000  PLOTNA,   0
0367  0000  PLOTMV,   0
0370  0000  PLOTWT,   0
0371  6501            PLSF                    /WAIT FOR DONE FLAG
0372  5371            JMP .-1                 /NOT YET
0373  6502            PLCF                    /CLEAR FLAG
0374  5770            JMP I PLOTWT            /EXIT
```

```
0400            *400
0400    0000    PNUMA,  .
0401    7300    SAVE,   CLA CLL
0402    1113            TAD Z 113
0403    7041            CIA
0404    1200            TAD PNUMA
0405    3130            DCA EXIT
0406    1530            TAD I EXIT
0407    3130            DCA EXIT                /ESTABLISH EXIT LOCATION
0410    1400            TAD I AX
0411    3131            DCA PX
0412    1401            TAD I AY
0413    3132            DCA PY                  /STORE PREVIOUS COORDS
0414    7240            CLA CMA
0415    4404            JMS I PLOT
0416    7000            NOP
0417    7300            CLA CLL                 /CLEAR PLOTTER
0420    1137            TAD SIZ                 /ENTERED BY SUBR.  SML, MED, LGE
0421    3223            DCA MPY2
0422    1764            TAD I LOC20
0423    7000    MPY2,   NOP
0424    3400            DCA I AX                /PUT CENTRE POINT IN PLOTTER
0425    1137            TAD SIZ
0426    3235            DCA MPY3
0427    1137            TAD SIZ
0430    3251            DCA MPY
0431    1354            TAD LOC20
0432    3367            DCA LOC
0433    2367            ISZ LOC
0434    1767            TAD I LOC
0435    7000    MPY3,   NOP
0436    3401            DCA I AY
0437    1112            TAD Z 112
0440    3013            DCA CNT6                /SET UP COUNTERS
0441    1110            TAD Z 110
0442    3014            DCA CNT7
0443    7300    READE,  CLA CLL
0444    1111            TAD Z 111
0445    3012            DCA CNT5
0446    1600            TAD I PNUMA
0447    7041            CIA
0450    3366            DCA B
0451    1365            TAD STLOC
```

```
0452  2366  D,      ISZ B
0453  5256          JMP C
0454  3366          DCA B
0455  5260          JMP .+3
0456  1113  C,      TAD Z 113          /SEARCH FOR X VALUES
0457  5252          JMP D
0460  1766          TAD I B
0461  7000  MPY,     NOP
0462  2012          ISZ CNT5           /MPY BY TWO IF REQD
0463  5271          JMP .+5            /IS IT 2ND COORD
0464  3124          DCA STORE2         /NO IT IS 1ST
0465  2200          ISZ PNUMA          /YES
0466  2014          ISZ CNT7           /IS IT 1ST POINT
0467  5350          JMP XXXX           /NO PEN DOWN
0470  5307          JMP XXX            /YES PEN UP2
0471  3123          DCA STORE1
0472  7300  READE2,  CLA CLL
0473  1600          TAD I PNUMA
0474  7041          CIA
0475  3372          DCA E
0476  1371          TAD STLOC1
0477  2372  G,      ISZ E
0500  5303          JMP F
0501  3372          DCA E
0502  5305          JMP .+3
0503  1113  F,      TAD Z 113          /SEARCH FOR Y VALUES
0504  5277          JMP G
0505  1772          TAD I E
0506  5261          JMP MPY
0507  1123  XXX,     TAD STORE1
0510  3315          DCA XX1
0511  1124          TAD STORE2
0512  3316          DCA YY1
0513  7201          CLA IAC
0514  4404          JMS I PLOT         /PLOT PEN UP
0515  7000  XX1,     NOP
0516  7000  YY1,     NOP
0517  5243          JMP READE
0520  7300  FIN,     CLA CLL
0521  1261          TAD MPY
0522  3324          DCA MPY4
0523  1764          TAD I LOC2
0524  7000  MPY4,    NOP
```

```
0525    3340            DCA XX3
0526    1261            TAD MPY
0527    3334            DCA MPY5
0530    1364            TAD LOC20
0531    3370            DCA LOCK
0532    2370            ISZ LOCK
0533    1770            TAD I LOCK
0534    7000    MPY5,   NOP
0535    3341            DCA YY3
0536    7201            CLA IAC                 /BACK TO CENTRE POINT PEN UP
0537    4404            JMS I PLOT
0540    7000    XX3,    NOP
0541    7000    YY3,    NOP
0542    7300            CLA CLL
0543    1131            TAD PX                  /RESTORE PREV COORDS
0544    3400            DCA I AX
0545    1132            TAD PY
0546    3401            DCA I AY
0547    5530            JMP I EXIT              /BACK TO MAIN PROGRAM
0550    1123    XXX,    TAD STORE1
0551    3356            DCA XX2
0552    1124            TAD STORE2
0553    3357            DCA YY2
0554    7200            CLA
0555    4404            JMS I PLOT              /PLOT 7 PTS PEN DOWN
0556    7000    XX2,    NOP
0557    7000    YY2,    NOP
0560    7300            CLA CLL
0561    2013            ISZ CNT5
0562    5243            JMP READE
0563    5320            JMP FIN
0564    0646    LOC20,  646
0565    0600    STLOC,  600
0566    0000    X,      0
0567    0000    LOC,    0
0570    0000    LOCK,   0
0571    0601    STLOC1, 601
0572    0000    Y,      0
0600                    *600
0600    0006    L1,     6
0601    0012            12
0602    0006            6
0603    0000
```

```
0604  0000          0
0605  0000          0
0606  0000          0
0607  0006          6
0610  0006          6
0611  0006          6
0612  0000          0
0613  0012          12
0614  0003          3
0615  0012          12
0616  0001          1
0617  0010          10          /LIST OF COORDS
0620  0000          0
0621  0010          10
0622  0006          6
0623  0010          10
0624  0000          0
0625  0004          4
0626  0006          6
0627  0004          4
0630  0001          1
0631  0000          0
0632  0003          3
0633  0000          0
0634  0005          5
0635  0000          0
0636  0000          0
0637  0002          2
0640  0006          6
0641  0002          2
0642  0001          1
0643  0012          12
0644  0005          5
0645  0012          12
0646  0003          3
0647  0005          5
0650  0006          6
0651  0005          5
0652  0000          0
0653  0005          5
1000              +1000
1000  0000  ONE.    0
1001  4773          JMS I [illegible]
```

```
1002    0007            7
1003    0016            16
1004    0007            7
1005    0016            16
1006    0016            16
1007    0016            16
1010    0016            16
1011            *1011
1011    0000    TWO,    0
1012    4776            JMS I PNUM
1013    0002            2
1014    0003            3
1015    0020            20
1016    0005            5
1017    0001            1
1020    0006            6
1021    0011            11
1022            *1022
1022    0000    THREE,  0
1023    4776            JMS I PNUM
1024    0006            6
1025    0001            1
1026    0004            4
1027    0005            5
1030    0002            2
1031    0003            3
1032    0020            20
1033            *1033
1033    0000    FOUR,   0
1034    4776            JMS I PNUM
1035    0017            17
1036    0023            23
1037    0013            13
1040    0014            14
1041    0014            14
1042    0014            14
1043    0014            14
1044            *1044
1044    0000    FIVE,   0
1045    4776            JMS I PNUM
1046    0001            1
1047    0006            6
1050    0004            4
```

```
1051    0005                5
1052    0002                2
1053    0003                3
1054    0020                20
1055                *1055
1055    0000    SIX,        0
1056    4776                JMS I PNUM
1057    0001                1
1060    0006                6
1061    0003                3
1062    0002                2
1063    0005                5
1064    0004                4
1065    0004                4
1066                *1066
1066    0000    SEVEN,      0
1067    4776                JMS I PNUM
1070    0006                6
1071    0001                1
1072    0012                12
1073    0016                16
1074    0016                16
1075    0016                16
1076    0016                16
1077                *1077
1077    0000    EIGHT,      0
1100    4776                JMS I PNUM
1101    0004                4
1102    0006                6
1103    0001                1
1104    0002                2
1105    0003                3
1106    0004                4
1107    0005                5
1110                *1110
1110    0000    NINE,       0
1111    4776                JMS I PNUM
1112    0005                5
1113    0004                4
1114    0006                6
1115    0001                1
1116    0002                2
1117    0003                3
```

```
1120  0020              20
1121              *1121
1121  0000  ZERO,      0
1122  4776              JMS I PNUM
1123  0001              1
1124  0002              2
1125  0003              3
1126  0006              6
1127  0001              1
1130  0001              1
1131  0001              1
1132              *1132
1132  0000  SQR,       0
1133  4776              JMS I PNUM
1134  0011              11
1135  0012              12
1136  0021              21
1137  0020              20
1140  0011              11
1141  0011              11
1142  0011              11
1143              *1143
1143  0000  RECT,      0
1144  4776              JMS I PNUM
1145  0015              15
1146  0017              17
1147  0023              23
1150  0022              22
1151  0015              15
1152  0015              15
1153  0015              15
1154              *1154
1154  0000  MIN,       0
1155  4776              JMS I PNUM
1156  0026              26
1157  0025              25
1160  0026              26
1161  0025              25
1162  0025              25
1163  0025              25
1164  0025              25
1165              *1165
1165  0000  SQRST,     0
```

```
1166  4776              JMS I PNUM
1167  0011              11
1170  0012              12
1171  0021              21
1172  0020              20
1173  0011              11
1174  0021              21
1175  0021              21
1176  0400  PNUM,       400
1200        *1200
1200  0000  GRAPH,      0
1201  7300              CLA CLL                 /SUBR TO DRAW T VS P GRAPH
1202  7000              NOP
1203  7000              NOP
1204  1270              TAD MM4
1205  3271              DCA DN4
1206  1270              TAD MM4                 /4 DN/UP LINES
1207  3272              DCA LT4
1210  1273              TAD MM1                 /4 LT/RT LINES
1211  3274              DCA UP1
1212  4420  UPLIN,      JMS I ITL               /1 2 CM GRID
1213  7300              CLA CLL                 /INITIALIZE
1214  1275              TAD LIN60
1215  3134              DCA YDN                 /60 CM
1216  3133              DCA XDN
1217  4544              JMS I PENDNL
1220  2274              ISZ UP1                 /PLOT PEN DN
1221  5224              JMP .+3
1222  4567              JMS I RT2DL
1223  5225              JMP .+2                 /2 CM RT
1224  4575              JMS I RT5DL
1225  4420  DNLINE,     JMS I ITL               /5 CM RT
1226  7300              CLA CLL
1227  1275              TAD LIN60
1230  3143              DCA STORY2
1231  3133              DCA XDN
1232  4403              JMS I NEGYL
1233  4544              JMS I PENDNL            /PLOT Y IN NEG DIR
1234  2271              ISZ DN4
1235  5237              JMP .+2
1236  5241              JMP LTLIN
1237  4575              JMS I RT5DL
1240  5212              JMP UPLIN
```

```
1241    7000    LTLIN,  NOP
1242    4420            JMS I ITL
1243    7300            CLA CLL
1244    1276            TAD LIN37       /37 CM
1245    3142            DCA STORX2
1246    3134            DCA YDN
1247    4402            JMS I NEGXL     /PLOT X NEG DIR
1250    4544            JMS I PENDNL
1251    2272            ISZ LT4
1252    5256            JMP .+4
1253    4420            JMS I ITL
1254    7300            CLA CLL
1255    7402            HLT
1256    4564            JMS I LINYL     /5 CM IN Y PLUS
1257    7000    RTLIN,  NOP
1260    4420            JMS I ITL
1261    7300            CLA CLL
1262    1276            TAD LIN37
1263    3133            DCA XDN
1264    3134            DCA YDN
1265    4544            JMS I PENDNL
1266    4564            JMS I LINYL
1267    5241            JMP LTLIN
1270    7774    MM4,    -4
1271    0000    DN4,    0
1272    0000    LT4,    0
1273    7777    MM1,    -1
1274    0000    JP1,    0
1275    4473    LIN60,  4473
1276    2355    LIN37,  2355
1330            *1330
1330    0000    BY2,    0               /DOUBLE SCALE OF T.P. PLOT
1331    7300            CLA CLL
1332    1514            TAD I SCALIL
1333    7001            IAC
1334    3514            DCA I SCALIL
1335    1515            TAD I SCAL2L
1336    7001            IAC
1337    3515            DCA I SCAL2L
1340    7000            NOP
1341    7040            CMA
1342    1556            TAD I PRETML
1343    3556            DCA I PRETML
```

```
1344    7402        HLT
1345    5730        JMP I BY2
```

```
1400            *1400
1400    0000    SQQ,    0                       /CHANGE SYMBOL TO
1401    7300            CLA CLL                 /SQUARE WITH DOT
1402    1210            TAD SQQI
1403    3555            DCA I ONEIL
1404    1211            TAD DOTT
1405    3554            DCA I MINIL
1406    7402            HLT
1407    5600            JMP I SQQ
1410    4433    SQQI,   4433
1411    4463    DOTT,   4463
1413            *1413
1413    0000    PLUSS,  0                       /CHANGE SYMBOL BACK TO PLUS
1414    7300            CLA CLL
1415    1223            TAD PLUSI
1416    3555            DCA I ONEIL
1417    1224            TAD PLUS2
1420    3554            DCA I MINIL
1421    7402            HLT
1422    5613            JMP I PLUSS
1423    4421    PLUSI,  4421
1424    4435    PLUS2,  4435
1425            *1425
1425    0000    MEDM,   0                       /CHANGE TO MED SIZE SYMBOL
1426    7300            CLA CLL
1427    1233            TAD MEDMI
1430    3471            DCA I SMIL
1431    7402            HLT
1432    5625            JMP I MEDM
1433    4547    MEDMI,  4547
1435            *1435
1435    0000    SMALL,  0                       /CHANGE BACK TO SMALL SYMBOL
1436    7300            CLA CLL
1437    1243            TAD SMALLI
1440    3471            DCA I SMIL
1441    7402            HLT
1442    5635            JMP I SMALL
1443    4546    SMALLI, 4546
1445            *1445
1445    0000    DPSALH, 0                       /PLOT DPH/SAL MINM33 0/00
1446    7000            NOP
1447    7300            CLA CLL
1450    4407            JMS I 7
```

```
1451  5334          FGET HI
1452  6556          FPUT I PRETML          /SET 33 AS ORG
1453  5344          FGET SCL
1454  6515          FPUT I SCAL2L
1455  0000          FEXT
1456  4576          JMS I BGINL
1457  4526          JMS I RDNUML
1460  0044          44
1461  4526          JMS I RDNUML
1462  0044          44
1463  7000          NOP
1464  4525          JMS I INPUTL
1465  4525          JMS I INPUTL
1466  4525    GMT,  JMS I INPUTL
1467  1343          TAD MPLUSS
1470  7640          SZA CLA
1471  7402          HLT
1472  4405          JMS I 5                /NO PLUSS READ TIME
1473  4405          JMS I 5                /RD PRESS
1474  4405          JMS I 5                /RD TEMP
1475  1060          TAD 60
1476  7650          SNA CLA                /LEGAL INPUT
1477  5325          JMP CRTN               //NO RD TO LINE FEED
1500  4405          JMS I 5                /RD 0/2
1501  1060          TAD 60
1502  7650          SNA CLA                /LEGAL INPUT
1503  5325          JMP CRTN               /LOOK FOR L F
1504  4405          JMS I 5                /RD SILICATE
1505  4405          JMS I 5                /RD SAL
1506  1060          TAD 60
1507  7650          SNA CLA                /LEGAL INPUT
1510  5325          JMP CRTN               /LOOK FOR L F
1511  4407          JMS I 7                /YES
1512  6522          FPUT I TEML
1513  0000          FEXT
1514  4526          JMS I RDNUML
1515  3055          DRS
1516  7000          NOP                    /STORE DPH
1517  4477          JMS I DEPYL
1520  4476          JMS I DEPXL            /SCALE + DEPOSIT DPH
1521  4420          JMS I ITL              /DITTO SAL
1522  7300          CLA CLL                /INITIALIZE PLOTTER
1523  4560          JMS I PLTL
```

```
1524  4551          JMS I NEWPRL
1525  4525  CRTN,   JMS I INPUTL
1526  1333          TAD MLF
1527  7640          SZA CLA
1530  5325          JMP CRTN
1531  7000          NOP
1532  5266          JMP GMT
1533  7566  MLF,    -212
1534  0006  HI,     6                    /33.000
1535  2040          2040
1536  0000          0
1537  7774  M4M,    -4
1540  7773  M5M,    -5
1541  0000  CT4,    0
1542  0000  CT5,    0
1543  7525  MPLUSS, -253
1544  0011  SCL,    11                   /SCALE 393.70113
1545  3046          3046
1546  6315          6315
1547  0000  DBSAL,  0                    /DOUBLL THE SAL SCALE
1550  7300          CLA CLL
1551  1466          TAD I SCLL
1552  7001          IAC
1553  3466          DCA I SCLL
1554  7402          HLT
1555  5747          JMP I DBSAL
1556  0000  DBDPH,  0                    /DOUBLE THE DPH SCALE
1557  7300          CLA CLL
1560  1514          TAD I SCALIL
1561  7001          IAC
1562  3514          DCA I SCALIL
1563  7402          HLT
1564  5756          JMP I DBDPH
2200        *2200
2200  0000  IT,     0                    /SUBR TO INITIALIZE PLOTTER
2201  7240          CLA CMA
2202  4404          JMS I PLOT
2203  5600          JMP I IT
2204  0000  PENDN,  0                    /SUBR TO PLOT PEN DOWM
2205  7300          CLA CLL
2206  1133          TAD XDN
2207  3214          DCA XDN1
2210  1134          TAD YDN
```

```
2211  3215          DCA YDNI
2212  7200          CLA
2213  4404          JMS I PLOT
2214  7000  XDNI,   NOP
2215  7000  YDNI,   NOP
2216  5604          JMP I PENDN
2217  0000  PENUP,  0                    /SUBR TO PLOT PEN UP
2220  7300          CLA CLL
2221  1135          TAD XUP
2222  3227          DCA XUPI
2223  1136          TAD YUP
2224  3230          DCA YUPI
2225  7201          CLA IAC
2226  4404          JMS I PLOT
2227  7000  XUPI,   NOP
2230  7000  YUPI,   NOP
2231  5617          JMP I PENUP
2232  0000  SML,    0                    /SUBR TO SCALE SMALL NUMBERS
2233  7300          CLA CLL
2234  1116          TAD SM
2235  3137          DCA SIZ
2236  5632          JMP I SML
2237  0000  MED,    0                    /SUBR TO SCALE MEDUIM NUMBERS
2240  7300          CLA CLL
2241  1117          TAD ME
2242  3137          DCA SIZ
2243  5637          JMP I MED
2244  0000  LGE,    0                    /SUBR TO SCALE LARGE NUMBERS
2245  7300          CLA CLL
2246  1120          TAD LG
2247  3137          DCA SIZ
2250  5644          JMP I LGE
2251  0000  LINY,   0                    /SUBR TO DRAW 10CM LINE IN Y
2252  7300          CLA CLL
2253  4420          JMS I ITL
2254  7300          CLA CLL
2255  1100          TAD XYO
2256  3133          DCA XDN
2257  1101          TAD LINI
2260  3134          DCA YDN
2261  4544          JMS I PENDNL
2262  5651          JMP I LINY
2263  0000  RT2,    0                    /SUBR TO MOVE RT 1CM PEN UP
```

```
2264  4420          JMS I ITL
2265  7300          CLA CLL
2266  1105          TAD LIN5
2267  3135          DCA XUP
2270  1100          TAD XY0
2271  3136          DCA YUP
2272  4545          JMS I PENUPL
2273  5663          JMP I RT2
2274  0000  LT2,     0                    /SUBR TO MOVE LT 1CM PEN UP
2275  4420          JMS I ITL
2276  7300          CLA CLL
2277  1105          TAD LIN5
2300  3400          DCA I AX
2301  1100          TAD XY0
2302  3135          DCA XUP
2303  1100          TAD XY0
2304  3136          DCA YUP
2305  4545          JMS I PENUPL
2306  5674          JMP I LT2
2307  0000  RT2D,    0                    /SUBR TO MOVE 2CM RT PEN DN
2310  4420          JMS I ITL
2311  7300          CLA CLL
2312  1102          TAD LIN2
2313  3133          DCA XDN
2314  1100          TAD XY0
2315  3134          DCA YDN
2316  4544          JMS I PENDNL
2317  5707          JMP I RT2D
2320  0000  LT2D,    0                    /SSUBR TO MOVE 2CM LT PEN DN
2321  4420          JMS I ITL
2322  7300          CLA CLL
2323  1102          TAD LIN2
2324  3400          DCA I AX
2325  1100          TAD XY0
2326  3133          DCA XDN
2327  1100          TAD XY0
2330  3134          DCA YDN
2331  4544          JMS I PENDNL
2332  5720          JMP I LT2D
2333  0000  UY2,     0                    /SUBR TO MOVE 1CM UP PEN UP
2334  4420          JMS I ITL
2335  7300          CLA CLL
2336  1100          TAD XY0
```

```
2337  3135          DCA XUP
2340  1105          TAD LIN5
2341  3136          DCA YUP
2342  4545          JMS I PENUPL
2343  5733          JMP I UY2
2344  0000  DY2,     0                    /SUBR TO MOVE 1CM DN PEN UP
2345  4420          JMS I ITL
2346  7300          CLA CLL
2347  1100          TAD XY0
2350  3135          DCA XUP
2351  1105          TAD LIN5
2352  3401          DCA I AY
2353  1100          TAD XY0
2354  3136          DCA YUP
2355  4545          JMS I PENUPL
2356  5744          JMP I DY2
2357  0000  LT12,    0                    /SUBR TO MOVE LT 1/2 CM PEN UP
2360  4420          JMS I ITL
2361  7300          CLA CLL
2362  1104          TAD LIN4
2363  3400          DCA I AX
2364  1100          TAD XY0
2365  3135          DCA XUP
2366  1100          TAD XY0
2367  3136          DCA YUP
2370  4545          JMS I PENUPL
2371  5757          JMP I LT12
```

```
2400                *2400
2400    0000    RT12,   0                       /SUBR TO MOVE RT 1/2CM PENUP
2401    4420            JMS I ITL
2402    7300            CLA CLL
2403    1104            TAD LIN4
2404    3135            DCA XUP
2405    110C            TAD XYO
2406    3136            DCA YUP
2407    4545            JMS I PENUPL
2410    5600            JMP I RT12
2411    0000    RT5D,   0                       /SUBR TO MOVE RT 5 CM PEN DN
2412    4420            JMS I ITL
2413    7300            CLA CLL
2414    1103            TAD LIN3
2415    3133            DCA XDN
2416    1100            TAD XYO
2417    3134            DCA YDN
2420    4544            JMS I PENDNL
2421    5611            JMP I RT5D
2422    0000    DOT,    0                       /SUBR TO MAKE DOT
2423    4420            JMS I ITL
2424    7300            CLA CLL
2425    3135            DCA XUP
2426    3136            DCA YUP
2427    3133            DCA XDN
2430    3134            DCA YDN
2431    4544            JMS I PENDNL
2432    4545            JMS I PENUPL
2433    5622            JMP I DOT
2434    7300    STNCH,  CLA CLL                 /MOVE PEN TO START
2435    1253            TAD INCH
2436    3252            DCA AMT
2437    5243            JMP SET
2440    7300    STGM2,  CLA CLL                 /MOVE PEN TO START -2 CM
2441    1254            TAD CM2
2442    3252            DCA AMT
2443    4420    SET,    JMS I ITL
2444    7300            CLA CLL
2445    1252            TAD AMT
2446    3135            DCA XUP
2447    3136            DCA YUP
2450    4545            JMS I PENUPL
2451    7402            HLT
```

```
2452  0000  AMT,    0
2453  0144  INCH,   144
2454  0025  CM2,    25
2455  0000  NEGX,   0
2456  7300          CLA CLL                 /SUBR TO NEG X IN PLOTNX
2457  1142          TAD STORX2              /AND CLEAR POS STOR
2460  3400          DCA I AX
2461  3135          DCA XUP
2462  3133          DCA XDN
2463  5655          JMP I NEGX
2464  0000  NEGY,   0                       /SAME FOR NEG Y
2465  7300          CLA CLL
2466  1143          TAD STORY2
2467  3401          DCA I AY
2470  3136          DCA YUP
2471  3134          DCA YDN
2472  5664          JMP I NEGY
3010        *3010
3010  0000  BGIN,   0
3011  4407          JMS I 7
3012  5271          FGET PREPS              /SET INITIAL COORDS
3013  6263          FPUT PRSS               /TO START COORDS
3014  5274          FGET PRETM
3015  6266          FPUT TEMM
3016  0000          FEXT
3017  5610          JMP I BGIN
3020  0000  DEPY,   0                       /DEPOSIT Y COORD
3021  4407          JMS I 7
3022  5255          FGET PRS
3023  2253          FSUB PRSS
3024  3277          FMPY SCAL1
3025  0000          FEXT
3026  4305          JMS FPINT               /CONVERT F.P. TO INTEGER
3027  5340          JMP CKRD                /CK ROUNDING OF INTEGER
3030  7000  RC,     NOP
3031  5620          JMP I DEPY
3032  0000  DEPX,   0                       /DEPOSIT X COORD
3033  4407          JMS I 7
3034  5260          FGET TEM
3035  2266          FSUB TEMM
3036  3302          FMPY SCAL2
3037  0000          FEXT
3040  4305          JMS FPINT               /AS ABOVE
```

```
3041  5346          JMP CKRDX
3042  7000  RD,     NOP
3043  5632          JMP I DEPX
3044  0000  NEWPRE,  0
3045  4407          JMS I 7
3046  5255          FGET PRS          /SET PREVIOUS COORDS
3047  6263          FPUT PRSS         /AS START COORDS
3050  5260          FGET TEM
3051  6266          FPUT TEMM
3052  0000          FEXT
3053  7000          NOP
3054  5644          JMP I NEWPRE
3055  0000  PRS,     0                 /NEW COORDS
3056  0000          0
3057  0000          0
3060  0000  TEM,     0
3061  0000          0
3062  0000          0
3063  0000  PRSS,    0                 /PREVIOUS COORDS
3064  0000          0
3065  0000          0
3066  0000  TEMM,    0
3067  0000          0
3070  0000          0
3071  0000  PREPS,   0                 /INITIAL COORDS
3072  0000          0
3073  0000          0
3074  0002  PRETM,   2
3075  6000          6000
3076  0000          0
3077  7777  SCAL1,   7777              /SCALE FOR Y
3100  3114          3114
3101  4606          4606
3102  0006  SCAL2,   6                 /SCALE FOR X
3103  2353          2353
3104  6561          6561
3105  0000  FPINT,   0                 /CHANGE F.P. TO INT
3106  7300          CLA CLL
3107  1044          TAD 44
3110  7510          SPA
3111  5327          JMP AB2
3112  1331          TAD M14
3113  7500          SMA
```

```
3114  7402            HLT
3115  3332            DCA CNTI
3116  1045            TAD 45
3117  2332  AB1,      ISZ CNTI
3120  5322            JMP .+2
3121  5705            JMP I FPINT
3122  7100            CLL
3123  7510            SPA
3124  7120            STL
3125  7010            RAR
3126  5317            JMP AB1
3127  7300  AB2,      CLA CLL
3130  5705            JMP I FPINT
3131  7764  M14,      -14
3132  0000  CNTI,     0
3140                  *3140
3140  3135  CKRD,     DCA YUP                 /CK ROUNDING OF Y
3141  7420            SNL
3142  5345            JMP .+3
3143  2136            ISZ YUP                 /INCREMENT IF LINK SET
3144  7000            NOP
3145  5230            JMP BC
3146  3135  CKRDX,    DCA XUP
3147  7420            SNL
3150  5353            JMP .+3
3151  2135            ISZ XUP
3152  7000            NOP
3153  5242            JMP BD
```

```
3200            *3200
3200    0000    PLT,    0
3201    7300            CLA CLL
3202    1136            TAD YUP
3203    7004            RAL
3204    7430            SZL                     /IS Y POS
3205    5325            JMP ERR                 /NO DPH-PRS ERROR
3206    7010            RAR                     /YES
3207    3143            DCA STORY2
3210    4403            JMS I NEGYL             /CONVERT TO NEG TO PLOT
3211    7300    AB4,    CLA CLL
3212    1135            TAD XUP
3213    7004            RAL
3214    7420            SNL                     /IS X POS
3215    5223            JMP .+6                 /YES
3216    7010            RAR                     /NO
3217    7041            CIA
3220    3142            DCA STORX2
3221    7000            NOP
3222    4402            JMS I NEGXL
3223    4546    SMI,    JMS I SMLL              /VARIABLE BY PROGRAM
3224    4545            JMS I PENUPL
3225    4421    ONEI,   JMS I ONEL              /VARIABLE BY PROGRAM
3226    4435    MINI,   JMS I MINL              /VARIABLE BY PROGRAM
3227    5600            JMP I PLT
3230    7300    STRTPT, CLA CLL
3231    4576            JMS I BGINL             /SET START COORDS
3232    4300            JMS RDNUM               /READ THE CRN
3233    0044            44
3234    4300            JMS RDNUM               /READ STN NO
3235    0044            44
3236    4300    NTIME,  JMS RDNUM               /READ TIME
3237    0044            44
3240    4300            JMS RDNUM               /READ NOM DPH
3241    0044            44
3242    4300            JMS RDNUM               /READ PRESS
3243    3055            3055
3244    4300            JMS RDNUM               /READ TEMP
3245    3060            3060
3246    4476            JMS I DEPXL             /SCALE AND STORE X
3247    4477            JMS I DEPYL             /SCALE AND STORE Y
3250    5320            JMP AB3
3251    4551    KNEW,   JMS I NEWPRL            /SET NEW PRECOORDS
```

```
3252  4525            JMS I INPUTL        /RD A CHAR (LF)
3253  4525            JMS I INPUTL        /RD A CHAR
3254  1265            TAD MPLUS
3255  7650            SNA CLA             /IS IT A PLUS
3256  5236            JMP NTIME           /YES PLOT ANOTHER POINT
3257  7402            HLT                 /NO END OF STN
3260  0000  NOUT,     0                   /PLOT A STN
3261  7000            NOP                 /WITHOUT A GRAPH
3262  4420            JMS I ITL
3263  7300            CLA CLL
3264  5230            JMP STRTPT
3265  7525  MPLUS,    7525
3300        *3300
3300  0000  RDNUM,    0                   /READ IN A NUMBER
3301  4405            JMS I 5
3302  7300            CLA CLL
3303  1060            TAD 60
3304  7650            SNA CLA             /WAS IT READ
3305  5301            JMP RDNUM+1         /TRY AGAIN
3306  1700            TAD I RDNUM
3307  3315            DCA TEMP2           /STORE ADDRS
3310  4407            JMS I 7
3311  6715            FPUT I TEMP2
3312  0000            FEXT
3313  2300            ISZ RDNUM           /SET RETN ADDRS
3314  5700            JMP I RDNUM
3315  0000  TEMP2,    0
3320        *3320
3320  4420  AR3,      JMS I ITL
3321  7300            CLA CLL
3322  4200            JMS PLT
3323  5251            JMP KNEW
3325        *3325
3325  7300  ERR,      CLA CLL
3326  1135            TAD YUP
3327  7041            CIA
3330  3135            DCA YUP
3331  5211            JMP AR4
7142        *7142
7142  0000  INPUT,    0
7143  6014            FEC
7144  6011            FSF
7145  5344            JMP .-1
```

```
7146    7200            CLA
7147    6012            RRR
7150    3057            DCA 57
7151    7000            NOP
7152    1057            TAD 57
7153    7450            SNA
7154    5343            JMP INPUT+1
7155    1370            TAD 7170
7156    7650            SNA CLA
7157    5343            JMP INPUT+1
7160    1057            TAD 57
7161    5742            JMP I INPUT
```

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AB1	3117
AB2	3127
AB3	3320
AB4	3211
AMT	2452
AX	0000
AY	0001
BC	3030
BD	3042
BGINL	0176
BGIN	3010
B	0566
BY2L	0065
BY2	1330
CKRD	3140
CKRDX	3146
CM2	2454
CNT1	3132
CNT5	0012
CNT6	0013
CNT7	0014
CRTN	1525
C	0456
CT4	1541
CT5	1542
DBDPHL	0070
DBDPH	1556
DBSALL	0067
DBSAL	1547
DEPXL	0076
DEPX	3032
DEPYL	0077
DEPY	3020
DN4	1271
DNLINE	1225
DOTL	0063
DOT	2422
DOTT	1411
DPSALH	1445
D	0452
DY2L	0172
DY2	2344
EIGHTL	0030
EIGHT	1077
ERR	3325
E	0572
EXIT	0130
FIN	0520
FIVEL	0025
FIVE	1044
FOURL	0024
FOUR	1033
FPINTL	0127
FPINT	3105
F	0503
GMT	1466
GRAPHL	0064
GRAPH	1200
G	0477
HI	1534
INCH	2453
INPUTL	0125
INPUT	7142
ITL	0020
IT	2200
KNEW	3251
LI	0600
LGEL	0163
LGE	2244
LG	0120
LIN1	0101
LIN2	0102
LIN37	1276
LIN3	0103
LIN4	0104
LIN5	0105
LIN60	1275
LINYL	0164
LINY	2251
LOC20	0564
LOCK	0570
LOC	0567
LT12L	0173
LT12	2357
LT20L	0170
LT20	2320
LT2L	0166
LT2	2274
LT4	1272
LTLIN	1241
M14	3131
M1	0111
M2	0110
M4M	1537
M5M	1540
M6	0112
MEDL	0147
MEDM1	1433
MEDML	0072
MEDM	1425
MED	2237
ME	0117
MINIL	0154
MINI	3226
MINL	0035
MIN	1154
MLF	1533
MM1	1273
MM4	1270
MPLUS	3265
MPLUSS	1543
MPY2	0423
MPY3	0435
MPY4	0524
MPY5	0534
MPY	0461
NEGXL	0002
NEGX	2455
NEGYL	0003
NEGY	2464
NEWPRE	3044
NEWPRL	0151
NINEL	0031
NINE	1110
NOUTL	0150
NOUT	3260
NTIME	3236
ONEIL	0155
ONEI	3225

ONEL	0021	PY	0132	SQRSTL	0036
ONE	1000	RDNUML	0126	SQRST	1165
PENDNL	0144	RDNUM	3300	STGM2	2440
PENDN	2204	READE2	0472	STLOC1	0571
PENUPL	0145	READE	0443	STLOC	0565
PENUP	2217	RECTL	0034	STNCH	2434
PLOT1	0227	RECT	1143	STOR1	0106
PLOT2	0275	RT12L	0174	STOR2	0107
PLOT3	0325	RT12	2400	STORE1	0123
PLOT4	0340	RT2DL	0167	STORE2	0124
PLOTA	0220	RT2D	2307	STORX2	0142
PLOTDR	0334	RT2L	0165	STORX	0140
PLOTDX	0364	RT2	2263	STORY2	0143
PLOTDY	0365	RT5DL	0175	STORY	0141
PLOTMV	0367	RT5D	2411	STRTPT	3230
PLOTNA	0366	RTLIN	1257	TEML	0122
PLOTNX	0362	SAVE	0401	TEMML	0152
PLOTNY	0363	SCALIL	0114	TEMM	3066
PLOTPN	0361	SCAL1	3077	TEMP2	3315
PLOT	0004	SCAL2L	0115	TEM	3060
PLOTT1	0342	SCAL2	3102	THREEL	0023
PLOTT2	0345	SCLL	0066	THREE	1022
PLOTT3	0350	SCL	1544	TOO	0113
PLOTWT	0370	SET	2443	TWOL	0022
PLOTX	0200	SETX	0010	TWO	1011
PLTL	0160	SEVENL	0027	UP1	1274
PLT	3200	SEVEN	1065	UPLIN	1212
PLUS1	1423	SIXL	0026	UY2L	0171
PLUS2	1424	SIX	1055	UY2	2333
PLUSSL	0073	SIZ	0137	XDN1	2214
PLUSS	1413	SMIL	0071	XDN	0133
PNUMA	0400	SMI	3223	XUP1	2227
PNUML	0037	SMALL1	1443	XUP	0135
PNUM	1176	SMALLL	0075	XX1	0515
PREPSL	0157	SMALL	1435	XX2	0556
PREPS	3071	SMLL	0146	XX3	0540
PRETML	0156	SML	2232	XXX	0507
PRETM	3074	SM	0116	XXXX	0550
PRSL	0121	SQQ1	1410	XYO	0100
PRS	3055	SQQL	0074	YDN1	2215
PRSSL	0153	SQQ	1400	YDN	0134
PRSS	3063	SQRL	0033	YUP1	2230
PX	0131	SQR	1132	YUP	0136

YY1	0516
YY2	0557
YY3	0541
ZEROL	0032
ZERO	1121