Wallenniger

IDENTIFICATION

OFF-LINE PLOTTER, MU PLOT
704 FORTRAN PROGRAM
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PURPOSE

To plot floating point data as asterisks on the 1403 printer with a mesh size of 60 x 130 (one page).

RESTRICTIONS

This program is intended to be used only as a FORTRAN II subroutine. It is available on the FORTRAN and SAP-FORTRAN tapes at this installation.

USAGE

This subroutine is assembled with a FORTRAN program by the statement

CALL PLOT (NT,X,Y,S,N,I)

where NT is the number of the output tape to receive the BCD plot image. X and Y refer to the values (floating point numbers) to be plotted in the X and Y directions respectively. S is an array of four floating point numbers to indicate the scale of the plot. S_1 is the largest algebraic value to be expected in the X direction (X_{max}). Similarly, S_2, S_3, S_4 are the expected X_{min}, Y_{max}, Y_{min} respectively. Any point whose values of X or Y fall outside this range will not be plotted.

Since it is sometimes desirable to obtain plots of two motions, PLOT is designed to handle two plots. N(an integer) determines which of the two plots is being produced. N may be assigned only the values of 1 or 2.

I is a print indicator. As the image of a plot is being built up with X and Y values, the indicator I must be zero. When it is desired to have the plot printed, PLOT is entered with $I \neq 0$. If I = 1, the image is cleared after printing. If I = 2, the image is saved for further additions of X and Y values. S, of course, must not be changed for the additions unless two plots of differing scales superimposed on each other is desired.

OUTPUT FORMAT

A plot consists of a one page array of asterisks and blanks, 130 columns wide and 60 lines deep. The resolution is 10 columns per inch and 6 lines per inch. Each plot is preceded (on the same page) with a two line heading to indicate the range of values encountered (not the original S values) and the horizontal and vertical scales in inches. An example follows:

XMAX = 1.2345678E-01, XMIN = -1.2345678E-02,
YMAX = 1.2345678E-03, YMIN = -1.2345678E-04
ONE HORIZONTAL INCH = 1.2345678E-05,
ONE VERTICAL INCH = 1.2345678E-06

If within the range of the plot, X and/or Y axes are shown by asterisks across the full width or height of the mesh.

CODING INFORMATION

PLOT requires 1141 words program space. It also requires the presence of three additional subroutines from the FORTRAN permanent library. They are:

(IOH)O	906 words
(LEV)	80 words
(STH)	12 words

If PLOT is obtained from the FORTRAN or SAP-FORTRAN tape during assembly, these additional three subroutines will also be obtained automatically.

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        SUBROUTINE PLOT (NT,X,Y,S,N,I)
        DIMENSION A(240), B(240), M(4), S(4), Z(4), C(23)
SDA     OCT 546001020304
SDB     OCT 050607101100
SDC     OCT 010203040506
SDD     OCT 071011000102
SDE     OCT 030405060710
SDF     OCT 110001020304
SZERO   OCT 0
SONE    OCT 1
SFOUR   OCT 4
SFIVE   OCT 5
STWTW   OCT 26
STHRX   OCT 44000000
SSXTY   OCT 74
STHND   OCT 200
SHNTY   OCT 264
STFTY   OCT 360
SSTAR   OCT 54
SBLNK   OCT 60
SMASK   OCT 000077777777
SFULL   OCT 777777777777
S       CAL NT
S       ARS 18
S       ADD THND
S       STA *620
S       STA *650
        J=129.0*(X-S(2))/(S(1)-S(2))+2.5
        K=59.0*(Y-S(4))/(S(3)-S(4))+1.5
        L=60*(J/36)+K
        IF (J) 70,70,10
 10     IF (J-131) 20,20,70
 20     J=XMODF(J,36)
        IF (K) 70,70,30
 30     IF (K-60) 40,40,70
S40     LXD J,(JJ)
S       LXD L,(LL)
        IF (N-1) 50,50,60
S50     CLA ONE
S       ALS 35,(JJ)
S       ORS A(LL)
        GO TO 70
S60     CLA ONE
S       ALS 35,(JJ)
S       ORS B(LL)
 70     IF (I-1) 710,80,80
 80     IF (N-1) 100,100,110
S100    CAL *160
S       TRA *120
S110    CAL *240
S120    ADD ONE
S       STA *230
S       STA *290
S       STA *330
S       SUB HNTY
S       STA *150
S       CAL *175
S       SUB ONE
S       STA *255
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S       STA *275
S       SUB ONE
S       STA *295
S       STA *315
S       SUB ONE
S       STA *345
S       STA *375
S       LXA FOUR,(II)
S130    LXA ONE,(JJ)
S140    LXA SXTY,(KK)
S150    LDQ C,(KK)
S       RQL 36,(JJ)
S       TQP *180
S160    PXD A,(JJ)
S       CHS
S170    ADD THRX
S       TIX *170,(II),1
S175    STD M
S       TRA *200
S180    TIX *150,(KK),1
S       TXI *190,(JJ),1
S190    TXL *140,(JJ),36
S       CAL *150
S       ADD SXTY
S       STA *150
S       TIX *130,(II),1
        STZ M
S200    LXA ONE,(II)
S210    LXD THRX,(JJ)
S220    LXA SXTY,(KK)
S230    LDQ A(KK)
S       RQL 36,(JJ)
S       TQP *260
S240    PXD B,(JJ)
S       CHS
S250    ADD THRX
S       TIX *250,(II),1
S255    STD M
S       TRA *280
S260    TIX *230,(KK),1
S       TIX *220,(JJ),1
S       CAL *230
S       SUB SXTY
S       STA *230
S       TXI *270,(II),1
S270    TXL *210,(II),4
S275    STZ M
S280    LXA SXTY,(II)
S       LXA TFTY,(JJ)
S290    CAL A(JJ)
S       TZE *300
S295    SXD M,(II)
S       TRA *320
S300    TIX *290,(JJ),60
S       TXI *310,(JJ),179
S310    TIX *290,(II),1
S315    STZ M
S320    LXA SXTY,(II)
S       LXA ONE,(JJ)
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S330  CAL A(JJ)
S     TZE *350
S340  TIX *340,(JJ),60
S345  SXD M,(JJ)
S     TRA *380
S350  TXH *360,(JJ),180
S     TXI *330,(JJ),60
S360  TIX *370,(JJ),179
S370  TIX *330,(II),1
S375  STZ M
 380  DO 390 II=1,4
 390  Z(II)=M(II)
      Z(1)=(Z(1)-2.0)*(S(1)-S(2))/129.0+S(2)
      Z(2)=(Z(2)-2.0)*(S(1)-S(2))/129.0+S(2)
      Z(3)=(Z(3)-1.0)*(S(3)-S(4))/59.0+S(4)
      Z(4)=(Z(4)-1.0)*(S(3)-S(4))/59.0+S(4)
      XX=(S(1)-S(2))/12.9
      YY=6.0*(S(3)-S(4))/59.0
      WRITE OUTPUT TAPE NT, 400, (Z(I), I=1,4), XX, YY
 400  FORMAT (22H2                    XMAX =1PE15.7,8H, XMIN =E15.7,8H, YMAX
     1=E15.7,8H, YMIN =E15.7/46H                                ONE HORIZONTAL
     2INCH =E15.7,21H, ONE VERTICAL INCH =E15.7)
      J=-S(2)*129.0/(S(1)-S(2))+2.5
      K=-S(4)*59.0/(S(3)-S(4))+1.5
      L=60*(J/36+1)
      IF (N-1) 410,410,420
S410  CAL *160
      TRA *430
S420  CAL *240
S430  ADD ONE
S     STA *460
S     STA *510
S     STA *550
      IF (J) 480,480,440
 440  IF (J-131) 450,450,480
 450  J=XMODF(J,36)
S     LXD J,(II)
S     CLA ONE
S     ALS 35,(II)
S     LXD L,(JJ)
S     LXA SXTY,(KK)
S460  CRS A(JJ)
S     TIX *470,(JJ),1
S470  TIX *460,(KK),1
 480  IF (K) 530,530,490
 490  IF (K-60) 500,500,530
S500  LXD K,(II)
S     CLA FULL
S510  STO A(II)
S     TXI *520,(II),60
S520  TXL *510,(II),240
S530  LXA SXTY,(II)
S535  CAL *640
S     SUB TWTW
S     STA *600
S     STA *613
S     STA *617
S     STA *618
S540  LXD THRX,(JJ)
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S550   LDQ A(II)
S560   LXD THRX,(KK)
S      CLA ZERO
S570   ALS 6
S      TQP *580
S      ACL STAR
S      TRA *590
S580   ACL BLNK
S590   RQL 1
S      TIX *570,(KK),6
S600   SLW C
S      CLA *600
S      ADD ONE
S      STA *600
S      SUB *640
S      TZE *605
S      TIX *560,(JJ),6
S605   TXI *610,(II),60
S610   TXL *540,(II),240
S      CLA MASK
S613   ANS C
S      SXD J,(II)
       J=XMODF(J,10)
S      CLA J
S      ALS 6
S617   ORS C
S      CLA STAR
S      ALS 30
S618   ORS C
S620   WTD 9
S      LXA TWTW,(JJ)
S630   CPY C,(JJ)
S      TIX *630,(JJ),1
S      IOD
S640   SLW C
S      TIX *535,(II),241
S      LXA TWTW,(II)
S      CLA DA
S      STO C,(II)
S644   LXA FIVE,(JJ)
S      TRA *646
S645   CLA ZERO,(JJ)
S      STO C,(II)
S      TIX *646,(JJ),1
S      TRA *644
S646   TIX *645,(II),1
S650   WTD 9
S      LXA TWTW,(JJ)
S655   CPY C,(JJ)
S      TIX *655,(JJ),1
S      IOD
       IF (I-1) 710,660,710
 660   IF (N-1) 670,670,680
S670   CAL *160
S      TRA *690
S680   CAL *240
S690   ADD ONE
S      STA *700
S      LXA TFTY,(II)
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S700   STZ A(II)
S      TIX *700,(II),1
 710   RETURN
       END (0,1,1,1,1)
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