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From:   TURTLE::WIENER          20-OCT-1983 10:41
To:     METOO::BRADLEY,METOO::YARBROUGH
Subj:   Here it is.

C               SIZE-TIME-EFFORT Curve Generation Program
C               -----------------------------------------
C
C       The brunt of this code was written by TOPCAT::HOFFMAN circa 1982,
C I have added the ability to generate VT125 plots of the feasibility and
C 5 effort plots, along with adding more precise arithmetic calculations.
C The graphics display is generated by using some of Rich Reichert's GRA$
C routines:
C               [REICHERT.GRAPHICS.OBJ]GRAPHICS/LIB.
C
C To compile and run any changes to this program follow these steps:
C               $ for mgt
C               $ link/nosysshr mgt,[reichert.graphics.obj]graphics/lib
C
C       To run this program the following steps should be followed:
C               1. $ ASSIGN FOR.LST FOR$PRINT  -- this will permit you to keep
C                  a record of both your interactive session and your generated
C                  output.
C               2. $ RUN MGT
C               3. $ GRAF filename  -- to create a file 'filename.GHD' which
C                  contains your VT125 graphics plot. This plot is in a format
C                  that can be sent directly to an LA34 graphics printer.
C               4. $ PRINT FOR.LST  -- to print the numeric data generated by
C                  this program on a line printer. The plot generated by Hoffma
C                  is still contained in this file.
C
C       Note that Hoffman has scaled down the Development Time to < 2 years,
C and the Program Size to < 40K lines. I have not changed these restrictions.
C A plot that violates these requirements will run off the screen.
C
C                                  Jeff Wiener
C                                  VAX-11 Common Run-Time-Library
C                                  ZK02-3K06
C                                  July 5, 1983
C
C*******************************************************************************
C* DEFINE VARIABLES
C*******************************************************************************

        REAL*4 X_TICK,Y_TICK
        CHARACTER*12 LABEL
        CHARACTER*27 LABEL2
        REAL EEX(6,211),TDD(211),EED(6)
        INTEGER*4 sub
        REAL P,K,Td,a,Ck,D,b
        REAL C,Ss,Ef,Ed
        REAL X,Z
        CHARACTER*1 CHAR,R(6)
        CHARACTER*2 AA
        CHARACTER*3 BB
        DIMENSION LINE(120)
        DIMENSION FEASX(21),FEASY(21)
        DIMENSION AX(21)
        DIMENSION BX(21)
        DIMENSION CX(21)
        DIMENSION DX(21)
        DIMENSION EX(21)
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      DIMENSION EFFRT(5)


      TYPE *,' '
      TYPE *,' '
      TYPE *,'     ****************************************************'
      TYPE *,'     *                - C U R V E -                     *'
      TYPE *,'     *   PROGRAM TO GENERATE SIZE-TIME-EFFORT CURVES     *'
      TYPE *,'     *        FOR SOFTWARE DEVELOPMENT PROJECTS          *'
      TYPE *,'     ****************************************************'
      TYPE *,' '
      TYPE *,' '
C ASK IF OPERATOR WANTS HELP INFORMATION
3     TYPE *,'DO YOU WANT HELP INFORMATON ? (Y OR N) :'
      ACCEPT 5,CHAR
5     FORMAT (1A1)
C IF OPERATOR DOESN'T WANT HELP, SKIP IT
      IF (CHAR .EQ. 'N' .OR. CHAR .EQ. 'n') GOTO 10
      IF (CHAR .NE. 'Y' .AND. CHAR .NE. 'y') GOTO 3


      TYPE *,' '
      TYPE *,'*************************************************************'
      TYPE *,'                                                             '
      TYPE *,'                PROGRAM TO CALCULATE AND PLOT                '
      TYPE *,'             FEASIBILITY AND SIZE-TIME-EFFORT CURVES         '
      TYPE *,'                                                             '
      TYPE *,'  This program will perform the following operations :       '
      TYPE *,'  - Ask the operator for the Figure of Merit Ck, or calculate'
      TYPE *,'    it using the following parameters (supplied by the oper- '
      TYPE *,'    ator) : Organizational Productivity (P) in source state- '
      TYPE *,'    ments/man year, Total Life-Cycle Effort (K) in man-years, '
      TYPE *,'    Total Development Time (Td) in years, and Program Size   '
      TYPE *,'    Parameter (a). (For Size < 18000 lines, use a = 6. For   '
      TYPE *,'    Size > 70000 lines, use a = 1. In between, a is linear.) '
      TYPE *,'  - Ask the operator for the Productivity Constraint C,       '
      TYPE *,'    (C ranges from 1 [for difficult] to 30 [for easy programs])'
      TYPE *,'  - Calculate 21 coordinates of the Feasibility Curve, with  '
      TYPE *,'    Program Size (No. of Source Statements) on the horizontal'
      TYPE *,'    axis, and Development Time (weeks) on the vertical axis. '
      TYPE *,'    The Development Time is varied from 2.5 weeks to 102.5   '
      TYPE *,'    weeks, in 5 week increments.                             '
      TYPE *,'  - Calculate the Maximum Effort Ef.  (continued...)         '
      TYPE *,' '
      TYPE *,'TYPE CARRIAGE RETURN TO CONTINUE HELP :'
      ACCEPT 5,CHAR
      TYPE *,' '
      TYPE *,'  - Ask the operator for each of 5 Effort Sizes (Man-Years), '
      TYPE *,'    and for each one it will calculate 21 coordinates of the '
      TYPE *,'    Size-Time-Effort Curve for that effort size. Development '
      TYPE *,'    Time is on the vertical axis, and Program Size is on the '
      TYPE *,'    horizontal axis. The Development Time is varied from 2.5 '
      TYPE *,'    weeks to 102.5 weeks, in 5 week increments.              '
      TYPE *,'  - Output to the default Print File all of the above        '
      TYPE *,'    inputted and calculated values, in an 80-column format.  '
      TYPE *,'  - Output all six curves to the default Print File, in a    '
      TYPE *,'    132-column plotted format, with Program Size values      '
      TYPE *,'    ranging from 0 to 40,000 Lines of Source Code, and Devel-'
      TYPE *,'    opment Time ranging from 0 to 105 weeks.                 '
      TYPE *,'                                                             '
      TYPE *,'  The operator should then type or print the Print File for  '
```

```
      TYPE *,'  display. The region above the Feasibility Curve is the
      TYPE *,'  Region of Feasibility. Below it is the Region of Infeasi-
      TYPE *,'  bility. It is helpful to manually connect the plotted
      TYPE *,'  points of the curves, using different-colored pens, before
      TYPE *,'  analyzing the curves.
      TYPE *,'                          (end of HELP)
      TYPE *,'*************************************************************
      TYPE *,'


C ASK IF OPERATOR WANTS TO CALCULATE Ck, OR SPECIFY IT
10    TYPE *,'DO YOU WANT THIS PROGRAM TO CALCULATE Ck ? (Y OR N) :'
      ACCEPT 20,CHAR
20    FORMAT (1A1)
C IF OPERATOR WANTS TO SPECIFY Ck, SKIP CALCULATION
      IF (CHAR .EQ. 'N' .OR. CHAR .EQ. 'n') GOTO 90
      IF (CHAR .NE. 'Y' .AND. CHAR .NE. 'y') GOTO 10
C OPERATOR WANTS TO CALCULATE Ck, SO ASK FOR PARAMETERS
      TYPE *,'PLEASE ENTER ORG. PRODUCTIVITY P (SOURCE LINES/MAN-YEAR) :'
      READ *,P
      PRINT 30,P
30    FORMAT ('0ORG. PRODUCTIVITY P (SOURCE LINES/MAN-YEAR) = ',F7.0)
      TYPE *,'PLEASE ENTER TOTAL EFFORT K (MAN-YEARS) :'
      READ *,K
      PRINT 40,K
40    FORMAT ('0TOTAL EFFORT K (MAN-YEARS) = ',F5.2)
      TYPE *,'PLEASE ENTER TOTAL DEVELOPMENT TIME Td (YEARS) :'
      READ *,Td
      PRINT 50,Td
50    FORMAT ('0TOTAL DEVELOPMENT TIME Td (YEARS) = ',F5.2)
      TYPE *,'PLEASE ENTER PROGRAM SIZE PARAMETER a :'
      READ *,a
      PRINT 60,a
60    FORMAT ('0PROGRAM SIZE PARAMETER  a = ',F3.1)

C PERFORM CALCULATION OF Ck
      D=K/(Td*Td)
      b=1.0-(exp(-a/2.0))
      Ck=b*P*(D**0.67)

C TYPE AND PRINT CALCULATED VALUE OF Ck
      PRINT 70
70    FORMAT (' ********************************
     M*******************************************')
      TYPE 80,Ck
80    FORMAT (' FIGURE OF MERIT Ck = ',F7.0)
      PRINT 80,CK

C USE CALCULATED VALUE OF Ck, SKIP OPERATOR INPUT OF Ck
      GO TO 100


C OPERATOR DOESN'T WANT TO CALCULATE Ck, SO ASK FOR IT
90    TYPE *,'PLEASE ENTER FIGURE OF MERIT Ck :'
      READ *,Ck
C ASK FOR PRODUCTIVITY CONSTRAINT C
100   TYPE *,'PLEASE ENTER PRODUCTIVITY CONSTRAINT C :'
      READ *,C
C PRINT HEADING FOR FEASIBILITY CURVE COORDINATES
      PRINT 70
      PRINT 110,Ck,C
```

```
110      FORMAT (' FEASIBILITY CURVE "*" FOR  Ck =',F7.0,'
     M, C = ',F4.1,'   -')
         Td=2.5/52.0
         PRINT 120
120      FORMAT('0','TIME (WEEKS)    SIZE (NO. OF LINES)')

C CALCULATE AND PRINT COORDINATES OF FEASIBILITY CURVE
         DO 140 I=1,21
         Ss=Ck*(C**0.33)*(Td**2.33)
         FEASX(I)=Ss
         FEASY(I)=Td
         Z=Td*52.0
         PRINT 130,Z,Ss
130      FORMAT(' ',F9.1,F16.0)
         Td=Td+(5.0/52.0)
140      CONTINUE

C*************************************************************************
C*              Calculate Maximum Effort Ef (Man-Years)
C*************************************************************************

         PRINT 70
C IF Ck WAS CALCULATED, WE ALREADY HAVE PARAMETER a, SO DON'T ASK FOR IT
         IF (CHAR .EQ. 'Y' .OR. CHAR .EQ. 'y') GOTO 160
         TYPE *,'PLEASE ENTER PROGRAM SIZE PARAMETER a :'
         READ *,a
         PRINT 150,a
150      FORMAT (' PROGRAM SIZE PARAMETER  a = ',F3.1)
C CALCULATE AND PRINT MAXIMUM EFFORT Ef
160      Td=Td-(5.0/52.0)
         b=1.0-(exp(-a/2.0))
         Ef=(b*(Ss**3.0))/((Ck**3.0)*(Td**4.0))
         PRINT 170,Ef
170      FORMAT ('0MAXIMUM EFFORT Ef (MAN-YEARS) = ',F5.1)


C*************************************************************************
C*              Calculate Curve "A" for a  Certain Effort Size
C*************************************************************************

         PRINT 70
C ASK FOR AN EFFORT SIZE
         TYPE *,'PLEASE ENTER EFFORT SIZE Ed (MAN-YEARS) :'
         READ *,Ed
         EFFRT(1)=Ed
C PRINT HEADING FOR COORDINATES OF CURVE
         PRINT 180,Ed
180      FORMAT (' SIZE-TIME-EFFORT CURVE "A" FOR EFFORT  Ed =',F6.2,' MAN
     M-YEARS   -')
         PRINT 120

C CALCULATE AND PRINT COORDINATES OF CURVE
         Td=2.5/52.0
         DO 190 I=1,21
         Ss=((1/b)**0.3333333)*Ck*(Ed**0.33333333)*(Td**1.3333333)
         AX(I)=Ss
         Z=Td*52.0
         PRINT 130,Z,Ss
         Td=Td+(5.0/52.0)
190      CONTINUE
```

```
C*************************************************************************
C*              Calculate Curve "B" for a  Certain Effort Size
C*************************************************************************

        PRINT 70
C ASK FOR AN EFFORT SIZE
        TYPE *,'PLEASE ENTER EFFORT SIZE Ed (MAN-YEARS) :'
        READ *,Ed
        EFFRT(2)=Ed
C PRINT HEADING FOR COORDINATES OF CURVE
        PRINT 200,Ed
200     FORMAT (' SIZE-TIME-EFFORT CURVE "B" FOR EFFORT  Ed =',F6.2,' MAN
     M-YEARS   -')
        PRINT 120

C CALCULATE AND PRINT COORDINATES OF CURVE
        Td=2.5/52.0
        DO 210 I=1,21
        Ss=((1/b)**0.33333333)*Ck*(Ed**0.33333333)*(Td**1.3333333)
        BX(I)=Ss
        Z=Td*52.0
        PRINT 130,Z,Ss
        Td=Td+(5.0/52.0)
210     CONTINUE


C*************************************************************************
C*              Calculate Curve "C" for a  Certain Effort Size
C*************************************************************************

        PRINT 70
C ASK FOR AN EFFORT SIZE
        TYPE *,'PLEASE ENTER EFFORT SIZE Ed (MAN-YEARS) :'
        READ *,Ed
        EFFRT(3)=Ed
C PRINT HEADING FOR COORDINATES OF CURVE
        PRINT 220,Ed
220     FORMAT (' SIZE-TIME-EFFORT CURVE "C" FOR EFFORT  Ed =',F6.2,' MAN
     M-YEARS   -')
        PRINT 120

C CALCULATE AND PRINT COORDINATES OF CURVE
        Td=2.5/52.0
        DO 230 I=1,21
        Ss=((1/b)**0.33333333)*Ck*(Ed**0.33333333)*(Td**1.3333333)
        CX(I)=Ss
        Z=Td*52.0
        PRINT 130,Z,Ss
        Td=Td+(5.0/52.0)
230     CONTINUE


C*************************************************************************
C*              Calculate Curve "D" for a  Certain Effort Size
C*************************************************************************

        PRINT 70
C ASK FOR AN EFFORT SIZE
        TYPE *,'PLEASE ENTER EFFORT SIZE Ed (MAN-YEARS) :'
```

```
      READ *,Ed
      EFFRT(4)=Ed
C PRINT HEADING FOR COORDINATES OF CURVE
      PRINT 240,Ed
240   FORMAT (' SIZE-TIME-EFFORT CURVE "D" FOR EFFORT  Ed =',F6.2,' MAN
     M-YEARS   -')
      PRINT 120

C CALCULATE AND PRINT COORDINATES OF CURVE
      Td=2.5/52.0
      DO 250 I=1,21
      Ss=((1/b)**0.33333333)*Ck*(Ed**0.33333333)*(Td**1.3333333)
      DX(I)=Ss
      Z=Td*52.0
      PRINT 130,Z,Ss
      Td=Td+(5.0/52.0)
250   CONTINUE


C*************************************************************************
C*              Calculate Curve "E" for a  Certain Effort Size
C*************************************************************************

      PRINT 70
C ASK FOR AN EFFORT SIZE
      TYPE *,'PLEASE ENTER EFFORT SIZE Ed (MAN-YEARS) :'
      READ *,Ed
      EFFRT(5)=Ed
C PRINT HEADING FOR COORDINATES OF CURVE
      PRINT 260,Ed
260   FORMAT (' SIZE-TIME-EFFORT CURVE "E" FOR EFFORT  Ed =',F6.2,' MAN
     M-YEARS   -')
      PRINT 120

C CALCULATE AND PRINT COORDINATES OF CURVE
      Td=2.5/52.0
      DO 270 I=1,21
      Ss=((1/b)**0.33333333)*Ck*(Ed**0.33333333)*(Td**1.3333333)
      EX(I)=Ss
      Z=Td*52.0
      PRINT 130,Z,Ss
      Td=Td+(5.0/52.0)
270   CONTINUE


C*************************************************************************
C*      PRINT HEADINGS FOR SIZE-TIME-EFFORT CHART
C*************************************************************************

      I=21
      PRINT 280
280   FORMAT ('1')
      PRINT 290
290   FORMAT ('0
     M            SIZE-TIME-EFFORT CHART')
      PRINT 300,Ck,C,a
300   FORMAT ('
     M     FOR Ck = ',F6.0,',   C = ',F3.0,',   a = ',F3.1)
      PRINT 310,EFFRT(1),EFFRT(2),EFFRT(3),EFFRT(4),EFFRT(5)
310   FORMAT ('0          * = FEASIBILITY CURVE,  A =',
     MF6.2,' MAN-YEARS,   B =',F6.2,' MY,   C =',F6.2,' MY,
```

```
     M  D =',F6.2,' MY,   E =',F6.2,' MY')
        PRINT 320
320     FORMAT ('0 DEVEL')
        PRINT 330
330     FORMAT ('   TIME')
        PRINT 340
340     FORMAT (' ')

C BLANK OUT THE 120-CHARACTER LINE BUFFER
350     DO 360 K=1,120
        LINE(K)=' '
360     CONTINUE

C*************************************************************************
C*      Plot the Curves
C*************************************************************************

C CONVERT A FEASIBILITY CURVE COORDINATE TO A PRINT LINE COLUMN NUMBER
        X=(FEASX(I))*120./40000.
        J=IFIX(X)
        IF (J.EQ.0) J=1
C PUT COORDINATE INTO PRINT LINE BUFFER
        IF (J.LE.120) LINE(J)='*'

C CONVERT A CURVE "A" COORDINATE TO A PRINT LINE COLUMN NUMBER
        X=(AX(I))*120./40000.
        J=IFIX(X)
        IF (J.EQ.0) J=1
C PUT COORDINATE INTO PRINT LINE BUFFER
        IF (J.LE.120) LINE(J)='A'

C CONVERT A CURVE "B" COORDINATE TO A PRINT LINE COLUMN NUMBER
        X=(BX(I))*120./40000.
        J=IFIX(X)
        IF (J.EQ.0) J=1
C PUT COORDINATE INTO PRINT LINE BUFFER
        IF (J.LE.120) LINE(J)='B'

C CONVERT A CURVE "C" COORDINATE TO A PRINT LINE COLUMN NUMBER
        X=(CX(I))*120./40000.
        J=IFIX(X)
        IF (J.EQ.0) J=1
C PUT COORDINATE INTO PRINT LINE BUFFER
        IF (J.LE.120) LINE(J)='C'

C CONVERT A CURVE "D" COORDINATE TO A PRINT LINE COLUMN NUMBER
        X=(DX(I))*120./40000.
        J=IFIX(X)
        IF (J.EQ.0) J=1
C PUT COORDINATE INTO PRINT LINE BUFFER
        IF (J.LE.120) LINE(J)='D'

C CONVERT A CURVE "E" COORDINATE TO A PRINT LINE COLUMN NUMBER
        X=(EX(I))*120./40000.
        J=IFIX(X)
        IF (J.EQ.0) J=1
C PUT COORDINATE INTO PRINT LINE BUFFER
        IF (J.LE.120) LINE(J)='E'

C PRINT A TIME AXIS VALUE AND A GRID LINE
        Z=((FEASY(I))*52.0)+2.50
```

```
      PRINT 370,Z
370   FORMAT (' ',F5.0,' WKS +  -  -  -  -  +  -  -  -  -
     M+  -  -  -  -  +  -  -  -  -  +  -  -  -  -
     M+  -  -  -  -  +  -  -  -  -  +  -  -  -  -  +')
C PRINT OUT THE PRINT BUFFER LINE
      PRINT 380,LINE
380   FORMAT ('            +',120A1)
      I=I-1
      IF (I.GT.0) GOTO 350

C PRINT THE FINAL TIME AXIS VALUE AND GRID LINE
      PRINT 390
390   FORMAT ('    0. WKS +  -  -  -  -  +  -  -  -  -
     M+  -  -  -  -  +  -  -  -  -  +  -  -  -  -
     M+  -  -  -  -  +  -  -  -  -  +  -  -  -  -  +')
      PRINT 400
C PRINT PROGRAM SIZE AXIS LABELS
400   FORMAT ('            0                5K              10K
     M         15K             20K               25K             3
     M0K             35K             40K')
      PRINT 410
410   FORMAT ('0
     M          PROGRAM SIZE (SOURCE LINES)')

C
C Generate the data.
C
      TDD(1) = 0.0
      DO 1400 I = 1,21
      s = 10 * (I-1)
      DO 1410 J = 1,9
      sub = J+s+1
      Tdd(sub)=Tdd(sub-1)+9.6153846E-3
      Ss=Ck*(C**0.33)*(Tdd(sub)**2.33)
      EEX(1,sub)=Ss
1410  CONTINUE
      Tdd(11+s) = (I*5.0) / 52.0
      Ss=Ck*(C**0.33)*(Tdd(11+s)**2.33)
      EEX(1,11+s)=Ss
1400  CONTINUE

      DO 8888 L=2,6
      EEX(L,1) = 0.0
      DO 1900 I=1,21
      s = 10 * (I-1)
      DO 1910 J=1,10
      sub = J+1+s
      temp = Tdd(sub)**1.3333333
      Ss=((1/b)**0.3333333)*Ck*(EFFRT(L-1)**0.33333333)*temp
1910  EEX(L,sub)=Ss
1900  CONTINUE
8888  CONTINUE
c     do 1111 l=1,6
c     print *,'L = ',l
c     do 1111 i = 6,210,10
c     a = tdd(I)*52.0
c     print *,i,a,'   ',eex(1,i)
c     print *,'  '
c1111 continue

C ***************************************************************************
```

```
C
C Initialize the graphics variables and then do the graphics plot.
C
C ***************************************************************************
      X_TICK = 5.0
      Y_TICK = 10.0
      XMAX = 40.0
      XMIN = 0.0
      YMAX = 110.0
      YMIN = 0.0
C
C   Initialize plotting sequence
C
C       make the window a little bigger than the plot area.
        RNG   = .09 * (XMAX-XMIN)
        XXS   = XMIN - RNG
        XXL   = XMAX + RNG
        RRNG  = .20 * (YMAX-YMIN)
        YYS   = YMIN - RRNG
        YYL   = YMAX + RRNG
      CALL GRA$SET_WINDOW(XXS,XXL,YYS,YYL)
C
C   Draw "x-axis"
C
      CALL GRA$DRAW_X_AXIS(YMIN,XMIN,X_TICK,XMAX)
      CALL GRA$SET_CENTERING(.5,1.0)
      RNG = .05 *(YMAX - YMIN)
      YRNG = YMIN - RNG
      DO 599 XI = XMIN,XMAX,X_TICK
     CALL GRA$CVT_OUT_F_F(XI,%VAL(0),%VAL(0),%VAL(33),LAB_LEN,AA)
C LAB_LEN = 2.
      BB = AA//'K'
     CALL GRA$WRITE_TEXT_ABS_POSITION(XI,YRNG,BB)
 599  CONTINUE
      LABEL2 = 'PROGRAM SIZE (SOURCE LINES)'
     CALL GRA$WRITE_TEXT_ABS_POSITION(17.0,YRNG-10,LABEL2(1:27))
C
C   Draw "y-axis"
C
        CALL GRA$DRAW_Y_AXIS(XMIN,YMIN,Y_TICK,YMAX)
        CALL GRA$SET_CENTERING(1.0,.5)
        RRNG = .025 * (XMAX - XMIN)
      DO 600 YI = YMIN,YMAX,Y_TICK
      CALL GRA$CVT_OUT_F_F(YI,%VAL(0),%VAL(0),%VAL(33),LAB_LEN,LABEL)
      CALL GRA$WRITE_TEXT_ABS_POSITION(XMIN-RRNG,YI,LABEL(1:LAB_LEN))
600     CONTINUE
      LABEL2 = 'WKS'
      CALL GRA$WRITE_TEXT_ABS_POSITION(XMIN-RRNG,YMAX+10,LABEL2(1:3))
C
C   Draw each of the six curves. R(1)=F, the feasible curve, R(2)=A,
C        R(3)=B, R(4)=C, R(5)=D, and R(6)=E.
C
      R(1) = 'F'
      R(2) = 'A'
      R(3) = 'B'
      R(4) = 'C'
      R(5) = 'D'
      R(6) = 'E'
      CALL GRA$MOVE_ABS_2D(0.0 , 0.0)
      DO 900 I = 1,211
900   TDD(I) = TDD(I) * 52.0
```

```
          DO 1000  L = 1,6
          DO 950 I = 1,211
          EEX(L,I) = EEX(L,I) / 1000
          CALL GRA$LINE_ABS_2D(EEX(L,I) ,TDD(I))
950       CONTINUE
          Call gra$write_text_abs_position(EEX(L,211),110.0, R(L))
          CALL GRA$MOVE_ABS_2D(0.0 , 0.0)
1000      CONTINUE

C
C   Wrap up plot file generation
C
          Call gra$move_abs_2d(xmin,ymax)
          LABEL2 = ' Size-Time-Effort Chart'
          Call gra$write_text_abs_position(xmax,ymax+15,LABEL2(1:23))
          LABEL2 = 'F is the Feasible Curve'
          Call gra$write_text_abs_position(xmax,ymax+10,LABEL2(1:23))
          CALL GRA$EXIT_GRAPHICS_MODE ()
          CALL GRA$FLUSH_BUFFER ()
C
C
C
C
        END
```