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QPLOT - A Library of FORTRAN Subroutines for Quick Look Data Graphing

H. G. Short

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QPLOT - A LIBRARY OF FORTRAN SUBROUTINES FOR
QUICK LOOK DATA GRAPHING

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ABSTRACT

QPLOT is a set of FORTRAN compatible data plotting subroutines. Its purpose is to provide a simplified method of data representation for those applications that do not require presentation quality graphics. QPLOT is a stand-alone plot package and does not require knowledge of any other graphics software system.

QPLOT

INTRODUCTION

QPLOT is a set of FORTRAN compatible data plotting subroutines. Its purpose is to provide a simplified method of data representation for those applications that do not require presentation quality graphics. QPLOT is a stand-alone plot package and does not require knowledge of any other graphics software system.

To utilize QPLOT the appropriate library (either QPLOTB, ID=QPLOT for batch or QPLOTT, ID=QPLOT for a Tektronix 4014 terminal) must be attached to the users program by use of the LIBRARY or LDSET job control directive. In addition for batch operations a PLOTID directive is required as well as the desired post processor (reference "The 6600 Users Manual," Section 7).

The subroutines currently available through QPLOT are:

- NEWPLT - Drawn an X, Y axis set and display one data curve
- ADDPLT - Add an additional curve to the current plot frame
- TTLPLT - Add a title line at the top of the following plot frame
- LBLPLT - Add labels to the X and Y axis of the following plot frame
- SCLPLT - Apply user supplied data limits to the X and Y axis of the following plot frame
- SIZPLT - Position and size the following plot on the output page
- OLDPGE - Prevent an automatic page advance at the start of the next plot frame
- ENDPLT - Terminate a series of plots

SUBROUTINE DESCRIPTIONS

NEWPLT (XARRAY, YARRAY, NPTS, LNSTYL, MRKR)

Draws an X, Y axis set and displays one data curve.

XARRAY - an array containing the horizontal component of an ordered set of data points

YARRAY - an array containing the vertical component of an ordered set of data points.

NPTS - an integer value defining the number of data points to be plotted.

LNSTYL - an integer value which specifies the line style for the data curve as follows:

- 0 - no line
- 1 - solid line
- 2 - dotted line
- 3 - dashed line
- 4 - chain dot line
- 5 - chain dash line

MRKR - an integer value which specifies a marker type to be drawn at each data point pair as follows:

- 0 - none
- 1 - dot
- 2 - circle
- 3 - triangle
- 4 - square
- 5 - diamond
- 6 - asterisk

ADDPLT (XARRAY, YARRAY, NPTS, LNSTYL, MRKR)

Adds an additional data curve to the existing plot frame. Parameter definitions are the same as for NEWPLT.

TLLPLT ("PLOT TITLE TEXT STRING\

[Note: For punched cards use ≠ for " and ≥ for\].

Adds the text string argument as a title line at the top of the following plot frame - text string will be truncated to 80 characters maximum.

LBLPLT ("X AXIS LABEL\", "Y AXIS LABEL\

[Note: For punched cards use ≠ for " and ≥ for\].

Adds the first text string argument as an X axis label and the second as a Y axis label to the following plot frame - text strings will be truncated to 40 characters maximum.

SCLPT (XMIN, XMAX, YMIN, YMAX)

Apply user supplied data limits to the X and Y axis of the following plot frame.

XMIN - Minimum X axis data value

XMAX - Maximum X axis data value

YMIN - Minimum Y axis data value

YMAX - Maximum Y axis data value

SIZPLT (HMIN, HMAX, VMIN, VMAX)

Position and size the following plot frame on the output page.

HMIN - Location of the left end of the X axis

HMAX - Location of the right end of the X axis

VMIN - Location of the bottom end of the Y axis

VMAX - Location of the top end of the Y axis

[Note: Arguments represent a decimal fraction of the full page and range in value from 0 to 1.0].

OLDPGE

Prevents an automatic page advance at the start of the next plot frame thus allowing multiple frames on a page.

ENDPLT

Terminates a series of plots - required as the last QPLOT call in any program using QPLOT.

EXAMPLES

The following pages provide examples of FORTRAN programs using QPLOT as well as typical job control directives for both batch and Tektronix 4014 terminal usage.

EXAMPLE 1

Plot two data sets on the same axis without any enhancements. (See Figure 1)

- NEWPLT
- ADDPLT
- ENDPLT

..L,A

```
100-      PROGRAM TEST(OUTPUT)
110-C
120-C      TEST AND DEMONSTRATION OF QPLOT
130-C
140-      DIMENSION X(100),Y1(100),Y2(100),Y3(100)
150-C
160-C      COMPUTE PLOT DATA AND STORE IN ARRAYS X,Y1,Y2,Y3
170-C
180-      DO 100 I=1,100
190-          X(I)=FLOAT(I)
200-          Y1(I)=10.XSIN(X(I)/10.)
210-          Y2(I)=EXP(-X(I)/20.)
220-          Y3(I)=Y2(I)*Y1(I)
230-100  CONTINUE
240-C
250-C      PLOT THE VALUES OF Y2 AND Y3 AGAINST X
260-C
270-      CALL NEWPLT(X,Y3,100,4,0)
280-      CALL ADDPLT(X,Y2,100,1,0)
290-      CALL ENDPLT
300-C
310-C      EXIT
320-C
330-      STOP
340-      END
..FETCH,QPLOTT,QPLOT
..LIBRARY,QPLOTT
..RUN,FTM,N
      .155 CP SECONDS COMPILATION TIME
..LGO
```

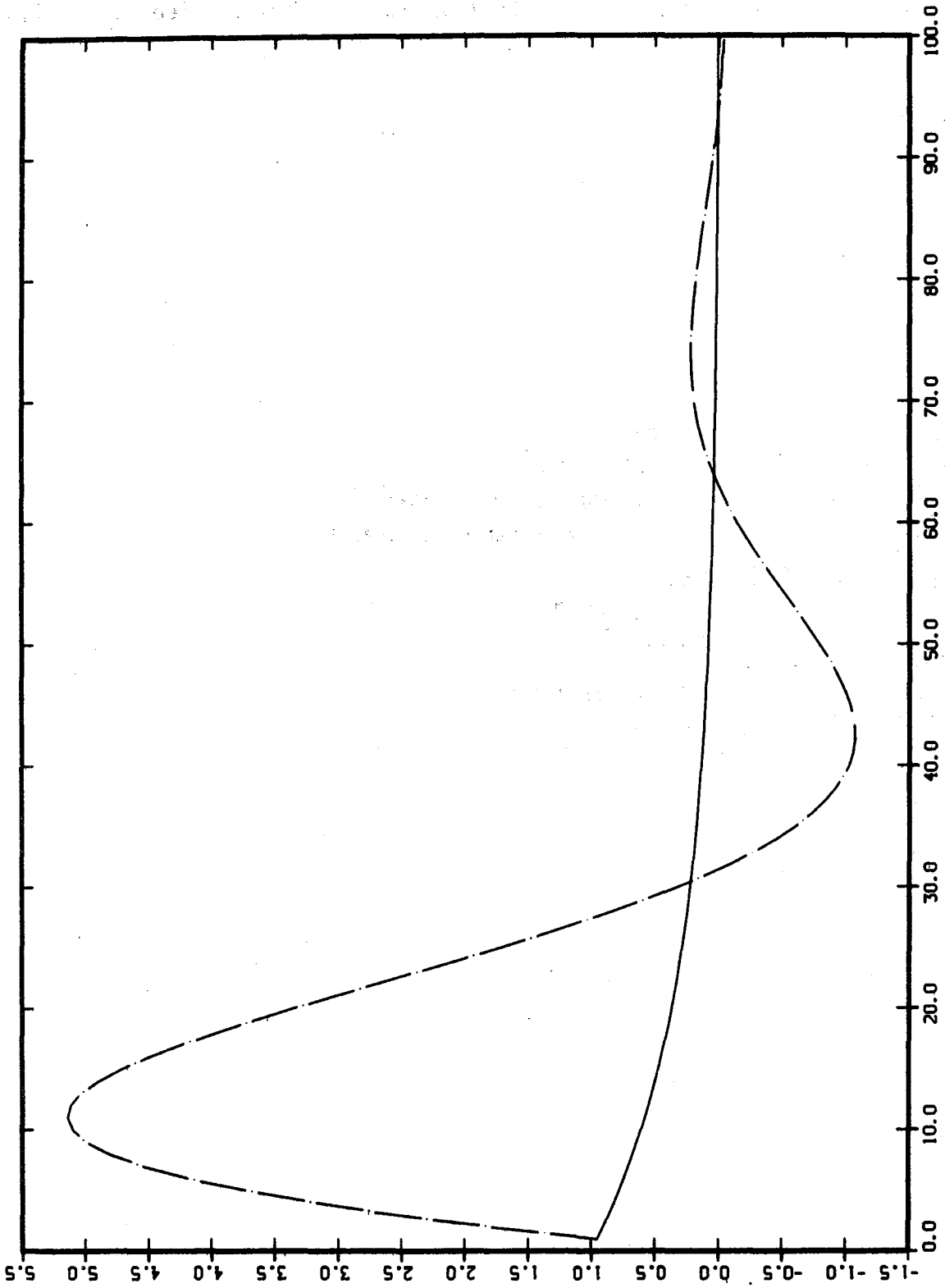



Figure 1

EXAMPLE 2

Add a user defined axis scale, a plot title, and axis labels to the previous example. (See Figure 2)

- SCLPLT
- TTLPLT
- LBLPLT

..L,A

```
100-      PROGRAM TEST(OUTPUT)
110-C
120-C      TEST AND DEMONSTRATION OF QPLOT
130-C
140-C      DIMENSION X(100),Y1(100),Y2(100),Y3(100)
150-C
160-C      COMPUTE PLOT DATA AND STORE IN ARRAYS X,Y1,Y2,Y3
170-C
180-C      DO 100 I=1,100
190-C          X(I)=FLOAT(I)
200-C          Y1(I)=10.*SIN(X(I)/10.)
210-C          Y2(I)=EXP(-X(I)/20.)
220-C          Y3(I)=Y2(I)*Y1(I)
230-100      CONTINUE
240-C
250-C      PLOT THE VALUES OF Y2 AND Y3 AGAINST X
260-C
270-C          CALL SCLPLT(0.,100.,-6.,6.)
280-C          CALL TTLPLT("EXAMPLE PLOT OF A DAMPED SINEWAVE")
290-C          CALL LBLPLT("TIMESCALE IN RADIAN (X-1)",
300-C                      1 "AMPLITUDE IN QUASIKLIKS")
310-C          CALL NEWPLT(X,Y3,100,4,0)
320-C          CALL ADDPLT(X,Y2,100,1,0)
330-C          CALL ENDPLT
340-C
350-C      EXIT
360-C
370-C          STOP
380-C          END
..FETCH,QPLOTT,QPLOT
..LIBRARY,QPLOTT
..RUN,FTN,M
      .189 CP SECONDS COMPILATION TIME
..LGO
```

EXAMPLE PLOT OF A DAMPED SINEWAVE

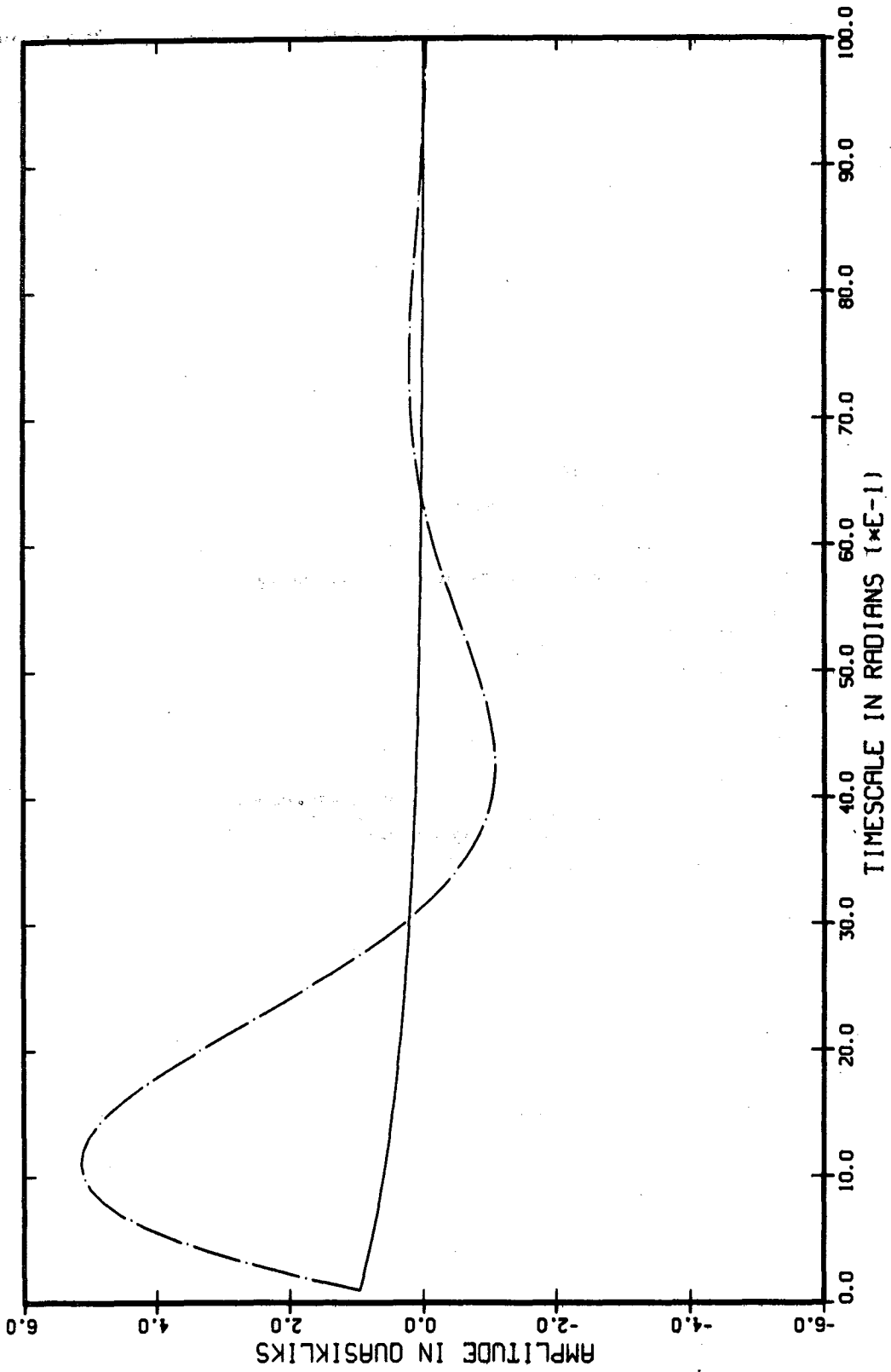


Figure 2

EXAMPLE 3

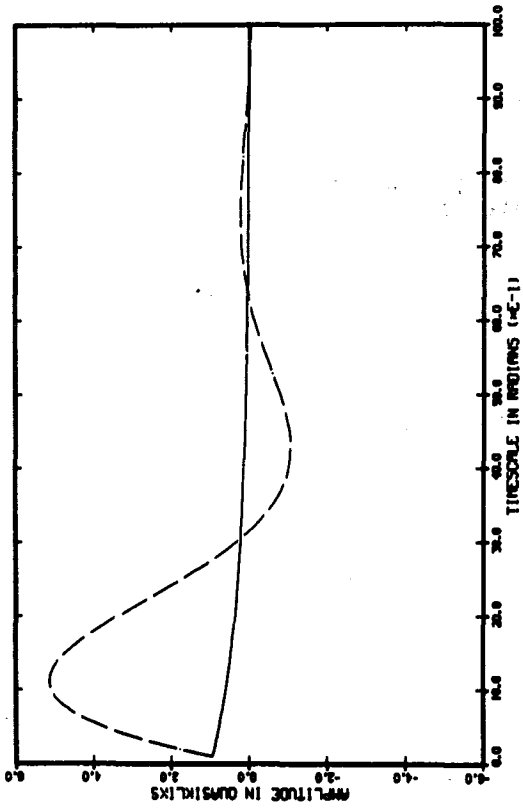
Add a second plot frame to the same page. (See Figure 3)

- SIZPLT
- OLDPGE

..L,A

```
100=      PROGRAM TEST(OUTPUT)
110=C
120=C      TEST AND DEMONSTRATION OF QPLOT
130=C
140=      DIMENSION X(100),Y1(100),Y2(100),Y3(100)
150=C
160=C      COMPUTE PLOT DATA AND STORE IN ARRAYS X,Y1,Y2,Y3
170=C
180=      DO 100 I=1,100
190=          X(I)=FLOAT(I)
200=          Y1(I)=10.*SIN(X(I)/10.)
210=          Y2(I)=EXP(-X(I)/20.)
220=          Y3(I)=Y2(I)*Y1(I)
230=100    CONTINUE
240=C
250=C      PLOT THE VALUES OF Y2 AND Y3 AGAINST X
260=C
270=      CALL SIZPLT(0.,0.5,0.5,1.0)
280=      CALL SCLPLT(0.,100.,-6.,6.)
290=      CALL TTLPLT("EXAMPLE PLOT OF A DAMPED SINEWAVE\")
300=      CALL LBLPLT("TIMESCALE IN RADIANS (X-1)\",
310=          1 "AMPLITUDE IN QUASIKLIKS\")
320=      CALL NEUPLT(X,Y3,100,4,0)
330=      CALL ADDPLT(X,Y2,100,1,0)
340=C
350=C      PLOT THE VALUE OF Y1 AGAINST X
360=C
370=      CALL OLDPGE
380=      CALL SIZPLT(0.5,1.,0.,0.5)
390=      CALL TTLPLT("FORCING FUNCTION\")
400=      CALL LBLPLT("TIMESCALE IN RADIANS (X-1)\",
410=          1 "10XSIN(0.1XX)\")
420=      CALL NEUPLT(X,Y1,100,1,0)
430=      CALL ENDPLT
440=C
450=C      EXIT
460=C
470=      STOP
480=      END
..FETCH,QPLOTT,QPLOT
..LIBRARY,QPLOTT
..RUN,FTN,M
      .225 CP SECONDS COMPILATION TIME
..LGO
```

EXAMPLE PLOT OF A DAMPED SINUSOID



FORCING FUNCTION

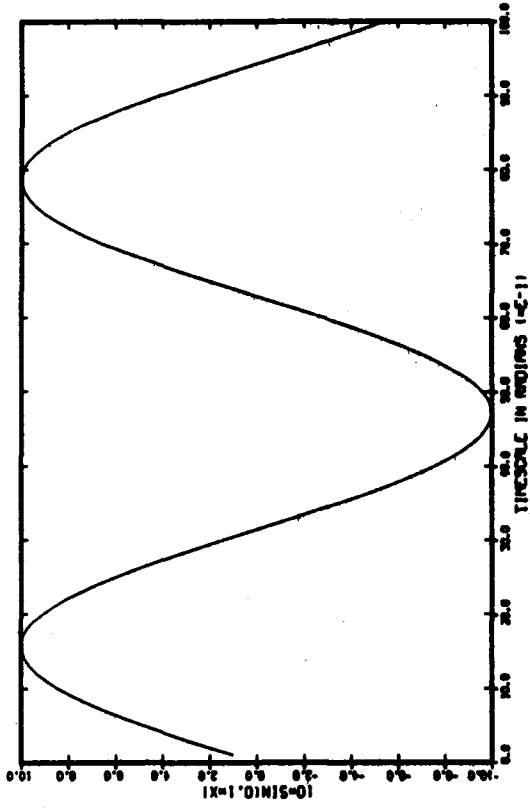


Figure 3

EXAMPLE 4

Submit a batch plot job with output to both microfilm and a plot file.
(See Figure 4)

..L,A

```
100-HGSXX,STMF3,KUNC.    H SHORT   BOX 08
110-ACCOUNT,D8334,E09173,A0221800,RT.
120-FTN.
130-ATTACH,QPLOTS,ID=QPLOT.
140-PLOTID. 08,UNC,H SHORT
150-LDSET,LIB=QPLOTS.
160-LGO.
170-PLT75.
180-DUST,HGSPCU.
190-#EOR
200-      PROGRAM TEST(OUTPUT)
210-C
220-C      TEST AND DEMONSTRATION OF QPLOT
230-C
240-C      DIMENSION X(100),Y1(100),Y2(100),Y3(100)
250-C
260-C      COMPUTE PLOT DATA AND STORE IN ARRAYS X,Y1,Y2,Y3
270-C
280-C      DO 100 I=1,100
290-C          X(I)=FLOAT(I)
300-C          Y1(I)=10.*SIN(X(I)/10.)
310-C          Y2(I)=EXP(-X(I)/20.)
320-C          Y3(I)=Y2(I)*Y1(I)
330-100      CONTINUE
340-C
350-C      PLOT THE VALUES OF Y2 AND Y3 AGAINST X
360-C
370-C          CALL SCLPLT(0.,100.,-6.,6.)
380-C          CALL TTLPLT('EXAMPLE PLOT OF A DAMPED SINEWAVE\'),
390-C          CALL LBLPLT('TIMESCALE IN RADIAN (X-1)\',
400-C          1      'AMPLITUDE IN QUASIKLIKS\')
410-C          CALL NEWPLT(X,Y3,100,4,0)
420-C          CALL ADDPLT(X,Y2,100,1,0)
430-C          CALL ENDPLT
440-C
450-C      EXIT
460-C
470-C          STOP
480-C          END
..SAVE,JOB,N
..BATCH,JOB,INPUT,HERE
..
```

DAYFILE LISTING FOR EXAMPLE 4

14.30.16.HGSXXDO FROM /C2
14.30.16.IP 00000192 WORDS - FILE INPUT , DC 00
14.30.16.HGSXX,STWFB,KUNC. H SHORT BOX 08
14.30.16.ACCOUNT,DB334,E09173,A0221800,RT.
14.30.18.ACT02218008334T09173UNC WFB
14.30.19.FTN.
14.30.22. .168 CP SECONDS COMPILATION TIME
14.30.22.ATTACH,QPLOTB,ID=QPLOT.
14.30.22.PFN IS
14.30.22.QPLOTB
14.30.23.PF CYCLE NO. = 002
14.30.23.PLOTID. 08,UNC,H SHORT
14.30.23. XX FTN PROGRAM XX PLOTID
14.30.23.LDSET,LIB=QPLOTB.
14.30.24.LGO.
14.30.39. XX FTN PROGRAM XX TEST
14.30.39.DISSPLA PLOTTING INITIATED.
14.30.40.END DISSPLA - ONE FRAME GENERATED , , , ,
14.30.41. STOP
14.30.41. .771 CP SECONDS EXECUTION TIME
14.30.41.PLT75.
14.30.41. XX FTN PROGRAM XX PLT75A
14.30.42.(MT 065 ASSIGNED)
14.30.44.MT65 VOLUME SERIAL NUMBER IS 007106
14.30.48.MT65 BLOCKS WRITTEN -000007
14.30.49. 1 FRAMES RECORDED FOR 35MM CAMERA
14.30.49. STOP
14.30.49.DUST,HGSPCU.
14.30.50.REQUEST(DUSTPF,XPF)
14.30.51.CATALOG,DUSTPF,HGSPCU,ID=HGSPCU.
14.30.51.
14.30.52.INITIAL CATALOG
14.30.53.RP = 005 DAYS
14.30.53.CT ID= HGSPCU PFN=HGSPCU
14.30.53.CT CY= 001 00001280 WORDS.
14.30.54.OP 00003328 WORDS - FILE OUTPUT , DC 40
14.30.54.RS 7168 WORDS (17920 MAX USED)
14.30.54. DATE 11/07/79
14.30.54. CH CP PP IO
14.30.54.ST 14.935 3.788 20.827 3.434
14.30.54.EJ END OF JOB, C2
(eor)
Line 390

EXAMPLE PLOT OF A DAMPED SINEWAVE

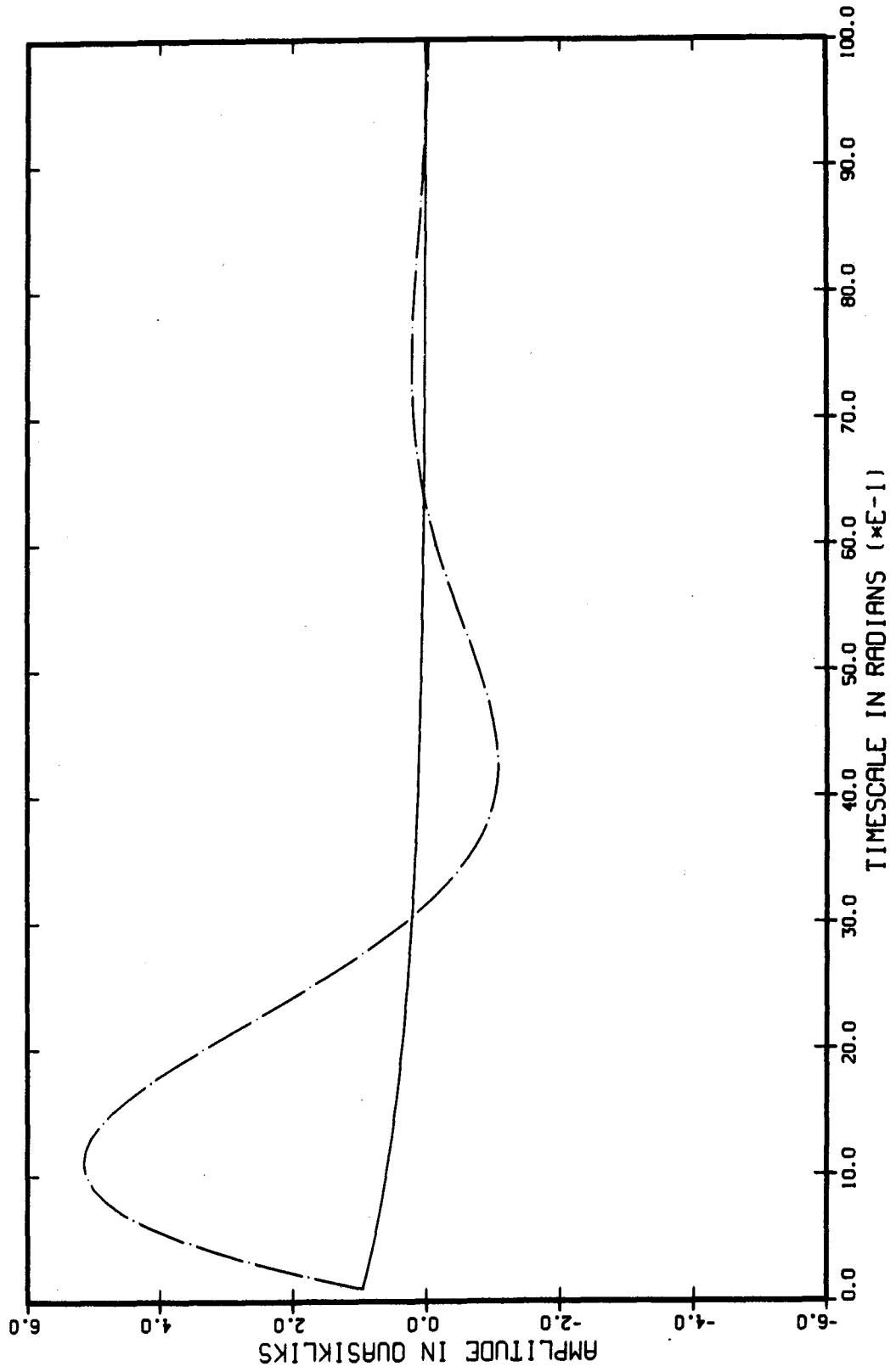


Figure 4

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INITIAL DISTRIBUTION

8000 STORY G COOK
8000 SIEBERS DENNIS L
8111 HAVLIK DAVID J
8111 DIDLAKE JOHN E JR
8111 HALL R MICHAEL
8115 CHILDERS CARL W
8115 WITEK HENRY M
8115 WOODARD JAMES B JR
8115 BECKER JOHN A
8115 HOGAN JAMES R
8116 DEAN DAVID K
8116 MITCHELL KENNETH A
8116 JONES ALFRED T
8116 BOLTON WILLARD R JR
8116 COLL CORNELIUS F III
8116 HENSON DOUGLAS R
8116 PURA CAROLYN A
8121 SCOTT CARLTON A
8121 BENEDETTI GERALD A
8121 CALLABRESI MELVIN L
8121 VOELKER L EUGENE
8121 WEINGARTEN LAWRENCE I
8121 KAN YIH-RENN
8122 HOYLE CHARLES S
8122 ROGERS L ALICE
8122 GRANT JOSEPH E
8122 KEILMAN JOHN C
8122 JONES JOHN F JR
8123 ZINKE WILLIAM D
8123 GRISBY SYLVESTER
8123 JORGENSEN WILBUR E
8123 PERRA MARK W
8124 CHENOWETH DONALD R
8124 ABRAMS MARTIN
8124 GALLAGHER ROBERT J
8124 HILLER CARL C
8124 YANG CHRISTINE L
8124 KRAABEL JOHN S
8124 PAOLUCCI SAMUEL
8124 BELL DIANE M
8150 WIRTH JOHN L
8151 WRIGHT JAMES B
8151 DIGHTON LEONARD E
8151 SKOOG CLIFFORD O
8151 STARKEY DONALD B
8151 TALBOT EDWARD B
8152 NELSON DENNIS B
8152 EVERETT ROGER N
8152 LOLL MARVIN B
8152 DERICKSON LINN W
8161 DOMINGUEZ PAUL G

8161 MARTIN GERTRUDE A
8161 MARTIN JOHN R
8162 FURNBERG CARLTON M
8162 WIEMKEN ALBERT J
8162 RIVENES ARNOLD S
8162 BROWN MELVIN E
8162 ROGERS MICHAEL H
8162 ELLIS RAYMOND W
8162 KNIGHT JUDITH H
8166 ANDERSON JOHN S
8168 HICKS HEARLE G
8212 JOINER EMILY A
8213 BANKS CATHERINE
8213 WACKERLY JERRY A
8215 THOMAS OWEN R
8215 INZERILLA JANET K
8215 CUPPS FRANK J
8215 YANO HESA
8215 HOOD BURTON L
8215 SPRINGER EUGENE B
8261 CROW ROBERT E
8266 AAS EUGENE A
8271 LEE KENNETH L
8271 PRESCOTT GUY H
8272 COOK RICHARD S JR
8272 WILLIAMS GERALD L
8272 FINN RICHARD W
8272 GROSKOPF JOEL I
8272 ASIA LORENZO C
8274 ELSEA ALFRED L
8274 AFFELDT BRUCE E
8274 BYFIELD VERNON E
8274 EICHERT FRED F JR
8275 DEVLIN THOMAS K
8312 SMUGERESKY JOHN E
8313 NICHOLS MONTE C
8313 KRAMER CAROLYN M
8313 BOEHME DALE R
8313 BRADSHAW ROBERT W
8313 CARLING ROBERT W
8314 ESTILL WESLEY B
8314 WEST ANTON J
8314 ROBINSON STEVEN L
8315 WEST LLOYD A
8315 MILLS BERNICE E
8315 EVEN WILLIAM R JR
8316 DAWSON DANIEL B
8320 GOLD THEODORE S
8324 HANKINS JOE D
8324 STRANDIN GERALD E
8324 ROGERS JAMES N
8324 WAGNER NORMAN R
8324 BREAZEAL NORMAN L
8324 GRIESEL M ANN

8324 STRUVE JAMES E
8324 DELAQUILL PASCAL III
8326 IANNUCCI JOSEPH J
8326 EICKER PATRICK J
8326 KERSTEIN ALAN R
8326 FISH MIRIAM JOHN
8328 BRANDT LARRY D
8328 STIMMELL KATHLEEN
8328 PLASTIRAS JOAN K
8328 HOSTETLER LARRY D
8329 DECARLI CHARLES J
8329 CASHEN JERRY J
8330 ANDERSON G W JR
8331 GABRIELSON VERLAN K
8331 BISSON CHARLES L
8331 KEE ROBERT J JR
8331 LEARY PATRICIA L
8331 MITCHELL DONNA L
8331 BERKBIGLER KATHRYN P
8331 MARGOLIS STEPHEN B
8332 MILLER GORDON J
8332 NEIGHBORS PAULA K
8332 LATHROP JAMES F
8332 MANSFIELD JUANITA
8332 HUDDLESTON ROBERT E
8332 JEFFERSON THOMAS H JR
8332 CRAWFORD DONA L
8332 CHANG ROSEMARY E
8332 PETZOLD LINDA R
8333 DRUMMOND G B JR
8333 SCHUKNECHT ARNOLD G
8333 QUOCK HANLOY
8333 WHITHORTH FREDDY L
8333 NERTON GERALDINE S
8333 BARNHOUSE JOHN N JR
8333 WILLYARD HAZEL L
8333 CODY TIMOTHY J
8333 LEONARD CHARLES M JR
8333 HOUK SHANNON P
8333 ANGVICK GENE L
8333 BENAPFL JOHN S
8333 GUMMUS RANDALL G
8333 BROWN CHARLES V
8333 BRAZIL JOSEPH G
8333 CARSON SHIRLEY Y
8333 PIMENTEL BETTY J
8333 BRYAN GAIL M
8333 ISLER RICHARD E
8333 HICKS ANNETTE M
8333 PENDLEY MICHAEL H
8333 STEWART KENNETH D
8333 KOOPMANN BRUCE E
8333 SOMERSETT CAROL L
8333 FORD CARLOS L

8333 LENAY DONNA S
8334 BARKER BERTON E
8334 SHORT HAROLD G
8334 LEE ROY V
8334 JONES HILARY D
8341 WILSON WILLIAM D
8341 THOMAS GEORGE J
8341 HAGGMARK LEROY G
8341 BASKES MICHAEL I
8341 MELIUS CARL F
8341 BROWN LESLIE A
8341 LOOK GEORGE M
8342 VASEY STEPHEN J
8342 MATTERN PETER L
8342 GRAY STEPHEN C
8342 VITKO JOHN JR
8342 RAHN LARRY A
8342 GAY RICHARD D
8342 KOSZYKOWSKI MICHAEL L
8347 SHANSIGER WILLIAM A
8347 MALINOWSKI MICHAEL E
8347 VER BERKMOES ALFRED A
8347 STULEN RICHARD H
8347 BASTASZ ROBERT J
8347 PONTAU ARTHUR E
8351 SCHMIEDER ROBERT W
8351 MILLER JAMES A
8351 CATTOLICA ROBERT J
8351 STEPHENSON DAVID A
8352 ROBINSON CLARENCE W
8352 WITZE PETER O
8352 RORKE WILLIAM S JR
8353 GREEN ROBERT M
8353 DIBBLE ROBERT W
8353 WANG JAMES C F
8354 ASHURST WILLIAM T
8354 CLARK GARY L
8354 SANDERS BILLY R
8354 KEETON STEWART C
8354 MITCHELL REGINALD E
8354 LIBKIND MARCUS A
8354 PARKER LISA J
8354 BARR PAMELA K
8410 BAROODY ROGER A
8411 BENTON JOE D
8411 HOLBROOK ELMOND D
8411 MACMILLAN DOUGLAS C
8411 CONVERSE LOUISE S
8411 MANROW BRITT MARIE
8411 HUMPHREY ROBERT E
8411 POLIAK RALPH S
8411 SWAN HERBERT W
8412 WHITNEY WILLIAM L
8412 CZAPINSKI ROBERT H

8413 GREEN DURHOOD P
8413 DANNENBERG DAVID J
8423 MADSEN JOAN F
8423 REIS HERMANN L
8423 VON STEEG HERMAN J
8423 JACKSON ROBERT W
8423 WACKERLY CARL A
8423 IMHOFF CATHERINE
8423 SIMMONS THEODORE M
8423 SANDOVAL ADAM M
8423 MARINO CATHERINE K
8423 MCMASTER PATRICK L
8424 ALLEN BOBBY G
8424 BARR VERNON C
8424 KEIFER PATRICK
8441 BOLEN JACK L
8441 BAUM SAMUEL
8441 MCDONALD ALFREDO
8442 BIRNBAUM MICHAEL R
8442 NG RAYMOND
8442 HARTWIG CHARLES M
8442 HINCKLEY C MARTIN
8443 GILDEA PATRICK D
8443 HUNT CHARLES T
8443 MINTZ J MARK
8444 WILLIS ALEC R
8444 DOLAN KENNETH W
8444 TICHENOR DANIEL A
8444 DAHLKE LUTZ W
8444 OIEN CHARLES T
8450 TANNER DUNCAN N
8451 MAVIS CLAYTON L
8451 NORRIS HAROLD F JR
8451 WILSON WM G
8451 DELAMETER WILLIAM R
8451 PEGLOW STEVEN G
8452 MOORE C W
8452 CULL EDWARD T
8452 BARTEL JAMES J
8452 GRIFFITH LEE V
8453 SCHAFFER CLIFFORD T
8453 HENDERSON GERALD W
8453 RADOSEVICH LEE G
8453 BRAMLETTE T TAZWELL
8453 WINTERS WILLIAM S JR
8453 FAAS SCOTT E
8460 TAPP CHARLES M
8461 TOCKEY ROBERT J
8461 KELLON ARTHUR W
8461 BRAY DAVID N
8461 SHANSON DONALD H
8461 HUIR JAMES F
8461 FEIL RICHARD D
8461 COOLEY NOEL H
8461 LUCERO L ANTONIO
8463 CLARK RALPH E

8463 COFIELD CURTIS H
8465 POTTHOFF C M
8465 LEEPER JOHN E
8465 ANARAL RONALD J
8465 WATKINS LAURENCE M
8466 HILES LEONARD A
8466 MCALLISTER DAN R
8466 STIMMEL DAVID G

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Technical Library Processes Division, 3141 (2)
Library and Security Classification Division, 8266-2 (3)

**FOLLOWING ARE THE IMAGES
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ATTACHED TO THE BACK OF
THIS DOCUMENT**

```

SUBROUTINE NEWPLT(XARRAY,YARRAY,NPTS,LNSTYL,MRKR)
REAL XARRAY(1),YARRAY(1),XSIZE,YSIZE,XSTART,YSTART
INTEGER NPTS,LNSTYL,MRKR,NLINES
# GLOBAL COMMON
COMMON/GBLPLT/FSTART,FPAGE,FSCALE,FSIZE,
      SCALE(4),SIZE(4),
      TITLE1(8),NTITL1,TITLE2(8),NTITL2,
      XLABEL(8),NXLABL,YLABEL(8),NYLABL
LOGICAL FSTART,FPAGE,FSCALE,FSIZE
REAL SCALE,SIZE
INTEGER TITLE1,NTITL1,TITLE2,NTITL2,
      XLABEL,NXLABL,YLABEL,NYLABL
# INITIALIZE
IF(NPTS.LT.1)NPTS=0
IF(FSTART)<<CALL INIPLT(0)
      CALL STRTPL
      CALL NOBRDR
      CALL PAGE(11.,8.5)
      FSTART=.FALSE.>>
ELSE IF(FPAGE)CALL ENDPL(0)
ELSE<<CALL ENDGR(0)
      FPAGE=.TRUE.>>
# .....DISPLAY LEVEL 1
# SIZE AND LOCATE PLOT ON PAGE
IF(FSIZE)<<XSIZE=SIZE(2)-SIZE(1)
      YSIZE=SIZE(4)-SIZE(3)
      CALL BSCALE(XSIZE,YSIZE)
      XSTART=11.*SIZE(1)+0.75*XSIZE
      YSTART=8.5*SIZE(3)+0.75*YSIZE
      CALL PHYSOR(XSTART,YSTART)
      FSIZE=.FALSE.>>
ELSE <<CALL PHYSOR(0.75,0.75)
      XSIZE=1.
      YSIZE=1.>>
IF(NTITL1.EQ.0)HT=7.5;ELSE HT=6.5
CALL AREA2D(10.,HT)
# .....DISPLAY LEVEL 2
# LABEL AXIS
IF(NXLABL.GT.0)<<CALL XNAME(XLABEL,NXLABL)
      NXLABL=0>>
ELSE CALL XNAME(" ",1)
IF(NYLABL.GT.0)<<CALL YNAME(YLABEL,NYLABL)
      NYLABL=0>>
ELSE CALL YNAME(" ",1)
# TITLE PLOT
IF(NTITL1.EQ.0)<<NLINES=0
      NTITL2=0>>
ELSE NLINES=1
IF(NTITL2.GT.0;NLINES=NLINES+1
IF(NTITL1.GT.0)<<CALL HEADIN(TITLE1,NTITL1,1.,NLINES)
      NTITL1=0>>
IF(NTITL2.GT.0)<<CALL HEADIN(TITLE2,NTITL2,1.,NLINES)
      NTITL2=0>>
# SCALE AXIS
IF(FSCALE)FSCALE=.FALSE.
ELSE CALL AUTRNG(XARRAY,YARRAY,NPTS,SCALE)
CALL GRAF(SCALE(1),"SCALE",SCALE(2),SCALE(3),
      "SCALE",SCALE(4))

```



```
# ..... DISPLAY LEVEL 3
# ADD UPPER AND RIGHT TIC MARKS
  CALL FRAME
  HT=HT-0.1
  CALL BLNK1(0.1*XSIZE,9.9*XSIZE,0.1*YSIZE,HT*YSIZE,0)
  CALL GRID(1,1)
  CALL RESET("BLNKS")
# PLOT CURVE AND EXIT
  CALL ADDPLT(XARRAY,YARRAY,NPTS,LNSTYL,MRKR)
  RETURN
  END
```

```

SUBROUTINE ADDPLT(XARRAY, YARRAY, POINTS, STYLE, MARKR)
REAL XARRAY(1), YARRAY(1), PATRN(2)
INTEGER POINTS, STYLE, MARKR, NPTS, LNSTYL, MRKR, ISYM, IMARK
# GLOBAL COMMON
COMMON/GBLPLT/FSTART, FPAGE, FSCALE, FSIZE,
              SCALE(4), SIZE(4),
              TITLE1(8), NTITL1, TITLE2(8), NTITL2,
              XLABEL(8), NXLABL, YLABEL(8), NYLABL
LOGICAL FSTART, FPAGE, FSCALE, FSIZE
REAL SCALE, SIZE
INTEGER TITLE1, NTITL1, TITLE2, NTITL2,
        XLABEL, NXLABL, YLABEL, NYLABL
DATA PATRN/1.5, 3.5/
# INITIALIZE
IF(POINTS.LT.1)RETURN
NPTS=POINTS
LNSTYL=STYLE
MRKR=MARKR
IF((LNSTYL.LT.0).OR.(LNSTYL.GT.5))LNSTYL=1
IF((MRKR.LT.0).OR.(MRKR.GT.6))MRKR=0
IF((LNSTYL.EQ.0).AND.(MRKR.EQ.0))RETURN
CALL RESET("DOT")
CALL RESET("MARKER")
# ESTABLISH LINE STYLE
CASE<<(LNSTYL.EQ.2)CALL MRSCOD(0.05,2,PATRN)
      (LNSTYL.EQ.3)CALL DASH
      (LNSTYL.EQ.4)CALL CHNDOT
      (LNSTYL.EQ.5)CALL CHNSH>>
# ESTABLISH MARKER SYMBOL
IF(MRKR.GT.0)<<
CALL SCLPIC(0.4)
CASE<<(MRKR.EQ.1)<<ISYM=1;CALL SCLPIC(0.1)>>
      (MRKR.EQ.2)ISYM=1
      (MRKR.EQ.3)ISYM=2
      (MRKR.EQ.4)ISYM=0
      (MRKR.EQ.5)ISYM=5
      (MRKR.EQ.6)ISYM=8>>
CALL MARKER(ISYM)>>
# ESTABLISH MARKER AND LINE OCCURRANCE
CASE<<((LNSTYL.EQ.0).AND.(MRKR.NE.0))IMARK=-1
      ((LNSTYL.NE.0).AND.(MRKR.EQ.0))IMARK=0
      ((LNSTYL.NE.0).AND.(MRKR.NE.0))IMARK=1>>
# PLOT CURVE AND EXIT
CALL CURVE(XARRAY, YARRAY, NPTS, IMARK)
RETURN
END

```

```
      SUBROUTINE SIZPLT(DXMIN,DXMAX,DYMIN,DYMAX)
      REAL DXMIN,DXMAX,DYMIN,DYMAX
# GLOBAL COMMON
      COMMON/G3LPLT/FSTART,FPAGE,FSCALE,Fsize,
                SCALE(4),SIZE(4),
                TITLE1(8),NTITL1,TITLE2(8),NTITL2,
                XLABEL(8),NXLABL,YLABEL(8),NYLABL
      LOGICAL FSTART,FPAGE,FSCALE,Fsize
      REAL SCALE,SIZE
      INTEGER TITLE1,NTITL1,TITLE2,NTITL2,
                XLABEL,NXLABL,YLABEL,NYLABL
#
      SIZE(1)=DXMIN
      SIZE(2)=DXMAX
      SIZE(3)=DYMIN
      SIZE(4)=DYMAX
#
      ITST=0
      IF((DXMIN.LT.0.) .OR. (DYMIN.LT.0.)) ITST=1
      IF((DXMAX.GT.1.) .OR. (DYMAX.GT.1.)) ITST=1
      IF((DXMAX.LE.DXMIN) .OR. (DYMAX.LE.DYMIN)) ITST=1
      FSIZE=(ITST.EQ.0)
#
      RETURN
      END
```

```
SUBROUTINE SCLPLT(XMIN,XMAX,YMIN,YMAX)
REAL XMIN,XMAX,YMIN,YMAX
# GLOBAL COMMON
COMMON/GBLPLT/FSTART,FPAGE,FSCALE,FSIZE,
              SCALE(4),SIZE(4),
              TITLE1(8),NTITL1,TITLE2(8),NTITL2,
              XLABEL(8),NXLABL,YLABEL(8),NYLABL
LOGICAL FSTART,FPAGE,FSCALE,FSIZE
REAL SCALE,SIZE
INTEGER TITLE1,NTITL1,TITLE2,NTITL2,
        XLABEL,NXLABL,YLABEL,NYLABL
#
SCALE(1)=XMIN
SCALE(2)=XMAX
SCALE(3)=YMIN
SCALE(4)=YMAX
FSCALE=.TRUE.
#
RETURN
END
```

BUG

```

SUBROUTINE DLDPGE
# GLOBAL COMMON
COMMON/GBLPLT/FSTART,FPAGE,FSCALE,FSIZE,
              SCALE(4),SIZE(4),
              TITLE1(8),NTITL1,TITLE2(8),NTITL2,
              XLABEL(8),NXLABL,YLABEL(8),NYLABL
LOGICAL FSTART,FPAGE,FSCALE,FSIZE
REAL SCALE,SIZE
INTEGER TITLE1,NTITL1,TITLE2,NTITL2,
         XLABEL,NXLABL,YLABEL,NYLABL
#
FPAGE=.FALSE.
#
RETURN
END
```

B07

SUBROUTINE ENDPLT

#

CALL ENDPL(0)
CALL DONEPL
CALL INIPLT(1)

#

RETURN
END

```
      SUBROUTINE INIPLT(MODE)
      INTEGER MODE,BLANK
#   GLOBAL COMMON
      COMMON/GBLPLT/FSTART,FPAGE,FSCALE,FSIZE,
         SCALE(4),SIZE(4),
         TITLE1(8),NTITL1,TITLE2(8),NTITL2,
         XLABEL(8),NXLABL,YLABEL(8),NYLABL
      LOGICAL FSTART,FPAGE,FSCALE,FSIZE
      REAL SCALE,SIZE
      INTEGER TITLE1,NTITL1,TITLE2,NTITL2,
         XLABEL,NXLABL,YLABEL,NYLABL
#
      DATA FSTART/.TRUE./,
         FPAGE/.TRUE./,
         FSCALE/.FALSE./,
         FSIZE/.FALSE./,
         SCALE/4*0./,
         SIZE/0.,1.,0.,1./,
         TITLE1/4*" "/,
         NTITL1/0/,
         TITLE2/4*" "/,
         NTITL2/0/,
         XLABEL/4*" "/,
         NXLABL/0/,
         YLABEL/4*" "/,
         NYLABL/0/
      DATA BLANK/" "/
#
      IF(MODE.EQ.0)RETURN
#
      FSTART=.TRUE.
      FPAGE=.TRUE.
      FSCALE=.FALSE.
      FSIZE=.FALSE.
      NTITL1=0
      NTITL2=0
      NXLABL=0
      NYLABL=0
      FOR(I=1;(I.LE.4);I=I+1)
         <<SCALE(I)=0.
            SIZE(I)=FLOAT(MOD(I-1,2))
            TITLE1(I)=BLANK
            TITLE2(I)=BLANK
            XLABEL(I)=BLANK
            YLABEL(I)=BLANK>>
#
      RETURN
      END
```

```
# SUBROUTINE AUTRNG(XARRAY,YARRAY,NPTS,SCALE)
# DETERMINE THE MINIMUM AND MAXIMUM VALUES OF DATA
# ARRAYS XARRAY AND YARRAY. STORE VALUES IN SCALE
# AS XMIN,XMAX,YMIN,YMAX
# REAL XARRAY(1),YARRAY(1),SCALE(4),BIGNUM
# INTEGER NPTS
# DATA BIGNUM/1.E293/
#
# IF(NPTS.LT.1)<<SCALE(1)=0.
#           SCALE(2)=1.
#           SCALE(3)=0.
#           SCALE(4)=1.
#           RETURN>>
#
# SCALE(1)=BIGNUM
# SCALE(2)=-BIGNUM
# SCALE(3)=BIGNUM
# SCALE(4)=-BIGNUM
#
# DO( I=1,(1.LE.NPTS); I=I+1)
#   <<SCALE(1)=AMIN1(SCALE(1),XARRAY(I))
#     SCALE(2)=AMAX1(SCALE(2),XARRAY(I))
#     SCALE(3)=AMIN1(SCALE(3),YARRAY(I))
#     SCALE(4)=AMAX1(SCALE(4),YARRAY(I))>>
#
# RETURN
# END
```


C 0

```
      SUBROUTINE TTLPLT(STRNG1)
      INTEGER STRNG1(8)
#     GLOBAL COMMON
      COMMON/GBLPLT/FSTART,FPAGE,FSCALE,FSIZE,
          SCALE(4),SIZE(4),
          TITLE1(8),NTITL1,TITLE2(8),NTITL2,
          XLABEL(8),NXLABL,YLABEL(8),NYLABL
      LOGICAL FSTART,FPAGE,FSCALE,FSIZE
      REAL SCALE,SIZE
      INTEGER TITLE1,NTITL1,TITLE2,NTITL2,
          XLABEL,NXLABL,YLABEL,NYLABL
#     BUILD MAIN PLOT TITLE
      CALL STRDEF(STRNG1,TITLE1,NTITL1)
#     EXIT
      RETURN
      END
```

C02

```
      SUBROUTINE LBLPLT(STRNG1,STRNG2)
      INTEGER STRNG1(8),STRNG2(8)
# GLOBAL COMMON
      COMMON/GBLPLT/FSTART,FPAGE,FSCALE,FSIZE,
          SCALE(4),SIZE(4),
          TITLE1(8),NTITL1,TITLE2(8),NTITL2,
          XLABEL(8),NXLABL,YLABEL(8),NYLABL
      LOGICAL FSTART,FPAGE,FSCALE,FSIZE
      REAL SCALE,SIZE
      INTEGER TITLE1,NTITL1,TITLE2,NTITL2,
          XLABEL,NXLABEL,YLABEL,NYLABL
# BUILD X AXIS LABEL
      CALL STRDEF(STRNG1,XLABEL,NXLABEL)
      IF(NXLABEL.GT.40)NXLABEL=40
# BUILD Y AXIS LABEL
      CALL STRDEF(STRNG2,YLABEL,NYLABL)
      IF(NYLABL.GT.40)NYLABL=40
# EXIT
      RETURN
      END
```

C 0 3

```
      SUBROUTINE STRDEF(INSTR,OUTSTR,NCHAR)
#   CONSTRUCT A STANDARD DISPLA CHARACTER COUNT TEXT
#   STRING FROM INSTR.  LIMIT TO 80 CHARACTERS
#   INTEGER INSTR(8),OUTSTR(8),NCHAR,CNT
#   SCAN INSTR FOR TERMINATOR
#   CALL SCNSTR(INSTR,CNT)
#   DEFINE CHARACTER AND WORD COUNT
#   IF(CNT.GE.80)<<NCHAR=80
#       K=8>>
#   ELSE<<NCHAR=CNT
#       K=(CNT+9)/10>>
#   PLACE STRING IN OUTSTR
#   FOR(I=1;(I.LE.K);I=I+1)OUTSTR(I)=INSTR(I)
#   EXIT
#   RETURN
#   END
```

```

SUBROUTINE SCNSTR(STRNG,CNT)
# SCAN A TEXT STRING FOR A TERMINATOR OR FOR 80
# CHARACTERS. RETURN CHARACTER COUNT UP TO
# BUT NOT INCLUDING TERMINATOR. BLANK FILL
# PARTIAL LAST WORD INCLUDING TERMINATOR
# INTEGER STRNG(I),CNT,CHAR,MASKO,MASK(I),
#   BLKFIL(I),TERM
LOGICAL DONE
DATA TERM/75B/,MASKO/77B/,
  MASK/00000000000000000000B,
    77000000000000000000B,
    77770000000000000000B,
    77777700000000000000B,
    77777777000000000000B,
    77777777770000000000B,
    77777777777700000000B,
    77777777777777000000B,
    77777777777777770000B/,
  BLKFIL/55555555555555555555B,
    0055555555555555555555B,
    0000555555555555555555B,
    0000005555555555555555B,
    0000000055555555555555B,
    0000000000555555555555B,
    0000000000005555555555B,
    0000000000000055555555B,
    0000000000000000555555B/,
    000000000000000000555B/
#
I=1;DONE=.FALSE.;CHAR=0
REPEAT
  IF(STRNG(I).EQ.0)<<CNT=10*(I-1)
    DONE=.TRUE.>>
  ELSE<<FOR(J=1;(J.LE.10).AND.(CHAR.NE.TERM);J=J+1)
    CHAR=AND(SHIFT(STRNG(I),6*J),MASKO)
    J=J-1
    IF(CHAR.EQ.TERM)<<STRNG(I)=OR(AND(STRNG(I),
      MASK(J)),BLKFIL(J))
      CNT=10*(I-1)+J-1
      DONE=.TRUE.>>
  ELSE I=I+1>>
UNTIL(DONE.OR.(I.GT.10))
IF(I.GT.10)CNT=80
#
RETURN
END

```

C 05

