

# GX

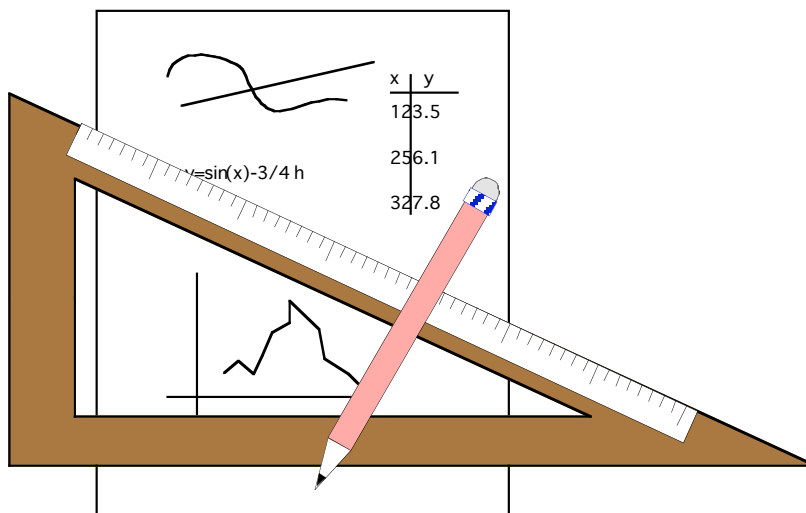
## Graphic Interface

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by CryoSoft

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**CryoSoft**

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## Introduction

The **GraphiX** plot package provides basic primitives for graphic operations (line, text, rgb color handling, polygon drawing and filling, rendering) and higher level routines that allows 2D x-y plotting, 2-D shading, contour and vector field plotting, 3D x-y-z curve and surface plotting. The package is intended as a low level universal interface to existing plot drivers which are device dependent. For interactive driver a mouse locator and a mouse button trap is provided. Presently the graphic output can be a PostScript™ file or interactive on your Macintosh screen. In case of PostScript™ a standard DIN A4 page size is open in landscape (27 cm wide and 18 cm high). For the Macintosh the window opened is dependent on the screen size, but it always has an aspect ration of 1.5 ratio (the same as for the A4 PostScript™ page) and conventional width of 27 units and height of 18 units (note that in this case the units do not correspond to any physical dimension) .

**WARNING:** For a Macintosh computer a large amount of memory is used dependent on the screen resolution, the number of colors available (screen depth). In case of memory problem try to reduce the screen resolution, the number of colors available or to enlarge the memory size of the executable.

A plot session is always beginning calling **InitPlot** and closed by **ClosePlot**, a new page or a new empty graphic window is created by **ClearPlot** while, for interactive plotting, **Show** will show the currently plot status on the screen. The page units can be scaled at wish without affecting the physical dimension of the output using **ScalePlot**.

An error code is returned for each call. However, for severe interactive errors like memory problems the routine will report a message and stop. A list of the error codes is reported at the end of this document.

<i>Library</i>	<i>routine name</i>	<i>description</i>
<b>DIALOGS</b>		
	<b>Dialog_Message</b>	dialog for warning/error messages only
	<b>Dialog_Query</b>	dialog for Yes/No/Cancel questions
	<b>Dialog_Selector</b>	selector
	<b>Dialog_Table</b>	dialog for typing input strings
	<b>IO_Dialog</b>	dialog for opening files
	<b>Menu_Selector</b>	selector, only together with the menu
	<b>Print_Dialog</b>	dialog for printing
	<b>PlotCPU</b>	draw the used time of a process while running

<i>Library</i>	<i>routine name</i>	<i>description</i>
<b>INSTRUMENTS</b>		
	<b>DialFrame</b>	draw a scaled dial
	<b>DialPlot</b>	draw an indicator inside a curved scaled frame
	<b>SliderFrame</b>	draw a scaled frame for a "slider" instrument
	<b>SliderPlot</b>	draw an indicator in a scaled slider frame
	<b>ThermoFrame</b>	draw a scaled frame for a thermometer
	<b>ThermoPlot</b>	draw a thermometer

<i>Library</i>	<i>routine name</i>	<i>description</i>
<b>MAP2D</b>		
	<b>Cont2D</b>	draw contours of a surface
	<b>Cont2D_Legend</b>	draw a legend to <b>Cont2D</b>
	<b>Shad2D</b>	draw a color map of a surface
	<b>Shad2D_Legend</b>	draw a legend to <b>Shad2D</b>
	<b>Vect2D</b>	draw arrows map of a surface

<i>Library</i>	<i>routine name</i>	<i>description</i>
<b>MENUS</b>		
	<b>Activate</b>	activate a button
	<b>ButtonOnOff</b>	return true if a given button of a given menu is on
	<b>ButtonStatus</b>	return true if a given button of a given menu is active
	<b>ChkCurs</b>	change the cursor shape to 'finger' if it is on a button
	<b>Clear_Not_Menu</b>	clear the window outside the menu frame
	<b>ClickOff</b>	set a on/off button to off
	<b>ClickOn</b>	set a on/off button to on
	<b>Deactivate</b>	deactivate a button
	<b>Dehighlight</b>	dehighlight a button
	<b>Draw_CurrentMenu</b>	draw the menu currently active
	<b>Draw_Menu</b>	draw a menu
	<b>Find_Next_Menu</b>	find the next menu of a button
	<b>GetOneItem</b>	return one Item of a menu
	<b>Init_Menu</b>	initialize menu operations
	<b>Highlight</b>	highlight a button
	<b>OnItemsOfMenu</b>	return the Items currently "On" of a menu
	<b>NrItemsOfMenu</b>	return the number of Items of a menu
	<b>Query_MenuFrame</b>	return menu frame boundaries
	<b>Query_MenuStatus</b>	return true if the menu is active
	<b>Read_Menu</b>	find the button pressed
	<b>Set_Button</b>	define a button by name, color, submenu, height
	<b>Set_Menu</b>	define a menu by name
	<b>Set_MenuItem</b>	define the item of a menu
	<b>Set_PopupMenu</b>	define a popup menu by name
	<b>Set_PopupMenuItem</b>	define the item of a popup menu
	<b>SetMenu_Dainty</b>	the on/off buttons of a menu are automatically set off/on when clicked, only one button can be "On"

<i>Library</i>	<i>routine name</i>	<i>description</i>
<b>PLOT2D</b>		
	<b>XYErrBox</b>	draw error boxes at the data points
	<b>XYFrame</b>	draw a x,y frame
	<b>XYMark</b>	draw numbers at the data points
	<b>XYPlot</b>	draw a curve
	<b>XYSymb</b>	draw symbols in color at the data points

<i>Library</i>	<i>routine name</i>	<i>description</i>
<b>PLOT3D</b>		
	<b>Contc_Legend</b>	draw a legend to <b>Shad3D</b>
	<b>HiPlot</b>	hidden lines removals routine
	<b>Shad3D</b>	draw a color map of a surface in 3D view
	<b>XYZFrame</b>	draw a 3-D frame
	<b>XYZPlot</b>	draw a curve in a 3-D frame
	<b>XYZShade</b>	paint a 3-D surface (painter's algorithm)
	<b>XYZSurf</b>	draw a 3-D surface (hidden line algorithm)

<i>Library</i>	<i>routine name</i>	<i>description</i>
<b>PRIMITIVES</b>		
	<b>CheckMouseDown</b>	see whether the mouse is down or not
	<b>ClearPlot</b>	clear the screen or create a new PostScript™ page
	<b>Clipboard</b>	create a clipboard
	<b>ClosePlot</b>	close the plot session
	<b>FillArc</b>	fill an arc with a rgb color
	<b>Filloval</b>	fill an oval with a rgb color
	<b>FillRect</b>	fill a rectangle with a rgb color
	<b>FillRGB</b>	fill a closed polygon with a rgb color
	<b>FillRGCSuts</b>	fill a closed polygon with a rendering rgb colors using cuts
	<b>FillRGBR</b>	fill a closed polygon rendering rgb colors
	<b>GetCrs</b>	get the current mouse position
	<b>GetCursor</b>	get the current cursor shape
	<b>GetEvent</b>	handle an event
	<b>GetMse</b>	get the mouse position when released
	<b>GetPlotIndex</b>	get an index to the frame and store frame data
	<b>GetXYAtMouseDown</b>	get coord. at mousedown event
	<b>GetXYAtMouseUp</b>	get coord. at mouseup event
	<b>GX_Beep</b>	beep
	<b>InitPlot</b>	initialize the plot session
	<b>MakeGIF</b>	draw the whole window to a gif 89a file
	<b>MakeSelectedGIF</b>	draw a selected area of the window to a gif 89a file
	<b>Paste</b>	paste the clipboard
	<b>PenThick</b>	set the thickness of the drawing pen
	<b>PlotArc</b>	draw an arc
	<b>PlotLine</b>	draw a curve
	<b>PlotLiner</b>	draw a rendering curve
	<b>PlotOval</b>	draw an oval
	<b>PlotRect</b>	draw a rectangle
	<b>PlotText</b>	draw a text
	<b>QueryDevice</b>	return the current device dimensions
	<b>QueryFontInfo</b>	return height of a character without leading
	<b>QueryJustifications</b>	return the current horizontal and vertical justifications
	<b>QueryRes</b>	return the pixel resolution
	<b>QueryRGBB</b>	return the background rgb color
	<b>QueryRGBF</b>	return the foreground rgb color
	<b>QueryScale</b>	return the current page dimensions
	<b>QueryScaling</b>	return the current x,y scaling factors
	<b>QueryTextLength</b>	return the length of a text
	<b>ReadGIF</b>	load a gif 89a file to the window
	<b>RGBBackg</b>	set the background rgb color

<b>RGBForeg</b>	set the foreground rgb color
<b>ScalePlot</b>	set new output plot boundaries
<b>ScreenDump</b>	dump the screen contents to a PostScript™ file
<b>SetCursor</b>	set the cursor shape
<b>SetHJustification</b>	set the horizontal justification
<b>SetPlotIndex</b>	restore frame data as the actual one
<b>SetVJustification</b>	set the vertical justification
<b>SetWindowName</b>	set the name of the window
<b>Show</b>	draw the plot on the screen

---

*Library*    *routine name*                      *description*

---

**STACK**


---

<b>MovePlot</b>	move the contents of the stack
<b>PrintPlot</b>	print the contents of the stack to a PS file or to the printer
<b>Screen2GIF</b>	make a GIF file from the screen
<b>Screen2Printer</b>	print the contents of the stack
<b>Screen2PS</b>	make a PS file from the contents of the stack
<b>ShiftPlot</b>	shift the contents of the stack
<b>Stack_Off</b>	set the stack off
<b>Stack_On</b>	set the stack on
<b>ZoomPlot</b>	zoom the contents of the stack

---

*Library*    *routine name*                      *description*

---

**TOOL**


---

<b>AddTool</b>	add a tool to the toolbar
<b>Draw_Toolbar</b>	draw the toolbar
<b>Read_Tool</b>	return the tool pressed

---

*Library*    *routine name*                      *description*

---

**UTILPLOT**


---

<b>GetMaxDisp</b>	return the characters of a text not exiding a given lenght
<b>HSLToRGB</b>	convert hsl to rgb color
<b>Mouse2Frame</b>	convert mouse coordinates to user frame
<b>Page2User</b>	convert page to user coordinates
<b>PlotNumber</b>	write a number
<b>PowerTen</b>	write a number in exponential form
<b>RGBToHSL</b>	convert rgb color to hsl
<b>Select_Area</b>	select a rectangular area on the screen using the mouse
<b>User2Page</b>	convert user to page coordinates

## DIALOGS Library

These routines draw dialog boxes, handling events.

```

C-----#
      SUBROUTINE DIALOG_MESSAGE(MESSAGE,IERR)
C-----#
C  write an alert message within a box in the plot window
C  return at a mousedown in the OK box or at a carriage return
C
C  Parameters:
C  variable      type      I/O      meaning
C  MESSAGE       C         I         message to be written in the box
C  IERR          I         0         error code

C-----#
      SUBROUTINE DIALOG_QUERY(Question,Answer,IERR)
C-----#
C  write a question message within a box in the plot window
C  return Yes/Cancel/No
C
C  Parameters:
C  variable      type      I/O      meaning
C  Question      C         I         message to be written in the box
C  Answer        C         0         'Yes'/'No'/'Cancel'
C  IERR          I         0         error code

C-----#
      SUBROUTINE DIALOG_SELECTOR (NAMES,NNAMES,NCUR,OK,IERR)
C-----#
C  draw a selector dialog box strings inside the plot area, with an "up"
C  and a "down" arrow, loop on the events
C  return the choosen NCUR at a mousedown in the OK/Cancel box (carriage
C  return=OK, Escape=Cancel)
C
C  Parameters:
C  variable      type      I/O      meaning
C  NAMES         C         I         strings to be written
C  NNAMES        I         I         dimension of NAMES
C  NCUR          I         I O      input: start "suggested" NAMES
C                                     if NCUR<=1 the 'up' arrow is gray
C                                     if NCUR>=NNAMES the 'down' arrow is gray
C                                     output: currently choosen NAMES
C  OK            L         0         .true. if the action has been completed
C                                     .false. if it has been cancelled
C  IERR          I         0         error code

C-----#
      SUBROUTINE DIALOG_TABLE(NBOX,MESSAGE,STRINGA,OK,IERR)
C-----#
C  read/edit NBOX strings within a inside the plot area, handle events
C  return STRINGA at a mousedown in the OK/Cancel box
C
C  Parameters:
C  variable      type      I/O      meaning
C  NBOX          I         I         number of lines
C  MESSAGE       C         I         input header for each line
C  STRINGA       C         I O      strings as entered by the user,
C                                     in input can be set to a start value which
C                                     will be overwritten
C  OK            L         0         .true. if the action has been completed
C                                     .false. if it has been cancelled
C  IERR          I         0         error code

```



```

C -----
C      SUBROUTINE IO_Dialog(StartDir,FileStatus,Message,FileName,OK,Ierr)
C -----
C      open a file with a dialog box
C
C      Parameters:
C      variable      type      i/o      meaning
C      StartDir      C          I          starting directory, empty for the current
C      FileStatus    C          I          status: 'new'/'old'/'unknown'
C      Message       C          I          asking message, if empty a standard
C      FileName      C          O          dialog message is printed
C      OK             L          O          file name
C      Ierr           I          O          .true. if the action has been completed
C      Ierr           I          O          .false. if it has been cancelled
C      Ierr           I          O          0 = no error
C
C -----
C      SUBROUTINE MENU_SELECTOR(NAMES,NAMES,NCUR,LOOP,OK,IERR)
C -----
C      draw a selector dialog box within the menu area, with an "up" and a
C      "down" arrow, loop on the events
C      return at every event with the choosen NCUR, to allow actions
C      to be called until LOOP>0
C
C      Parameters:
C      variable      type      I/O      meaning
C      NAMES         C          I          strings to be written
C      NAMES         I          I          dimension of NAMES
C      NCUR          I          I O       input: start "suggested" NAMES
C      NCUR          I          I O       if NCUR<=1 the 'up' arrow is gray
C      NCUR          I          I O       if NCUR>=NAMES the 'down' arrow is gray
C      LOOP          L          I O       output: currently choosen NAMES
C      LOOP          L          I O       action flag: must be 0 the first time,
C      LOOP          L          I O       to initialize the variables,
C      LOOP          L          I O       on finish <0
C      OK            L          O          .true. if the action has been completed
C      OK            L          O          .false. if it has been cancelled
C      IERR          I          O          error code
C
C      Comments:
C      ONLY if a menu is active
C
C -----#
C      SUBROUTINE PRINT_DIALOG(MODE,STRINGA,OK,IERR)
C -----#
C      print dialog box
C      return MODE and STRINGA at a mousedown in the OK/Cancel box
C      (carriage return=OK, Escape=Cancel)
C
C      Parameters:
C      variable      type      I/O      meaning
C      MODE          I          O          1=printer 2=file
C      STRINGA       C          O          file name (if MODE=2)
C      STRINGA       C          O          print command (if MODE=1)
C      OK            L          O          .true. if the action has been accepted
C      OK            L          O          .false. if it has been cancelled
C      IERR          I          O          error code
C
C -----
C      SUBROUTINE PlotCPU(TotalTime,CurrentTime,IERR)
C -----
C      draw the cpu time used as a black bar within a white box
C
C      Parameters:
C      variable      type      I/O      meaning
C      TotalTime     R          I          total expected running time
C      CurrentTime   R          I          curren time reached
C      IERR          I          O          error code
C
C      Comments:
C      ONLY if a menu is active

```

## INSTRUMENTS Library

These routines paint some instruments/indicators.

```

C -----
C      SUBROUTINE DIALFRAME (X0,Y0,AXL,AYL,ILX,CHX,H,XMIN,XMAX,
C      & RED,GREEN,BLUE,IERR)
C -----
C      Draws a scaled dial and store the dial frame definitions
C
C      Parameters:
C      variable      type      I/O      meaning
C      XLO           R         I         x coordinate of lower,left corner of frame
C                                     in plot page unit
C      YLO           R         I         y coordinate of lower,left corner of frame
C                                     in plot page unit
C      AXL           R         I         length of the x frame in plot page units
C      AYL           R         I         length of the y frame in plot page units
C      ILX           I         I         0=linear axis, 1=logarithmic axis
C      CHX           C         I         lable on the axis
C      H             R         I         height of the characters in the lables,
C                                     in the same unit as the output page unit
C      XMIN,XMAX    R         I         min and max values of the axis
C      RED,GREEN,BLUE R         R         I         rgb inner color
C      IERR         I         O         error code (0=no error)

```

```

C -----
C      SUBROUTINE DIALPLOT (VAL,STR,ISTR,IERR)
C -----
C      Draw a indicator inside a curved scaled frame
C
C      Parameters:
C      variable      type      I/O      meaning
C      VAL           R         I         value
C      STR           R         I         dashed line definition: length of solid,
C                                     blank, solid, blank etc. in the same unit
C                                     as the output page
C      ISTR         I         I         dimension of ISTR
C      IERR         I         O         error code (0=no error)

```

```

C -----
C      SUBROUTINE SLIDERFRAME(XLO,YLO,AXL,AYL,ILY,CY,H,YMIN,YMAX,IERR)
C -----
C      Draws a scaled frame for a "slider" instrument and store the
C      frame definitions
C
C      Parameters:
C      variable      type      I/O      meaning
C      XLO           R         I         x coordinate of lower,left corner of frame
C                                     in plot page unit
C      YLO           R         I         y coordinate of lower,left corner of frame
C                                     in plot page unit
C      AXL           R         I         length of the x axis in plot page units
C      AYL           R         I         length of the y axis in plot page units
C      ILY           I         I         0=linear axis, 1=logarithmic axis
C      CY           C         I         label on the axis
C      H             R         I         height of the characters in the labels,
C                                     in the same unit as the output page unit
C      YMIN,YMAX    R         I         min and max values of the axis
C      IERR         I         O         error code (0=no error)

```

```

C -----
C      SUBROUTINE SLIDERPLOT (VAL,R,G,B,IERR)
C -----
C      Plots an indicator in a scaled slider frame
C
C      Parameters:
C      variable      type      I/O      meaning
C      VAL           R         I         value
C      R,G,B        R         I         red,green,blue color

```

C IERR I O error code (0=no error)

```
C -----
C          SUBROUTINE THERMOFRAME(XLO,YLO,AXL,AYL,ILY,CY,H,YMIN,YMAX,IERR)
C -----
C Draws a scaled frame for a thermometer and store the
C frame definitions
C
C Parameters:
C variable      type  I/O  meaning
C XLO           R    I    x coordinate of lower,left corner of frame
C                in plot page unit
C YLO           R    I    y coordinate of lower,left corner of frame
C                in plot page unit
C AXL           R    I    length of the x axis in plot page units
C AYL           R    I    length of the y axis in plot page units
C ILY           I    I    0=linear axis, 1=logarithmic axis
C CY            C    I    label on the axis
C H             R    I    height of the characters in the labels,
C                in the same unit as the output page unit
C YMIN,YMAX     R    I    min and max values of the axis
C IERR          I    O    error code (0=no error)
```

```
C -----
C          SUBROUTINE THERMO PLOT (VAL,R,G,B,IERR)
C -----
C Plots a thermometer
C
C Parameters:
C variable      type  I/O  meaning
C VAL           R    I    value
C R,G,B         R    I    red,green,blue color
C IERR          I    O    error code (0=no error)
```

## MAP2D Library

These routines draw contour line, arrow map or a color map of the input data, only linear scaling is done. A legend of the color/line can be plotted.

```

C -----
C      SUBROUTINE CONT2D(X,Y,F,MX,NX,NY,CUT,STR,MARK,NC,PGC,NAMX,NAMY,
C      & IERR)
C -----
C      Plots contonurs of a scalar function in 2-D including axes
C
C      Parameters:
C      variable      type      I/O      meaning
C      X              R          I          array of x coordinates
C      Y              R          I          array of y coordinates
C      F              R          I          function F(X,Y) stored in a matrix F(I,J)
C      MX             I          I          first (physical) dimension of the matrix F
C      NX             I          I          number of X points (first logical dimens.
C                                     of the matrix F)
C      NY             I          I          number of Y points (second logical dimens.
C                                     of the matrix F)
C      CUT            R          I          array of NC cuts values (returns the
C                                     values set in case of negative NC)
C      STR            R          I          array of 2*NC line definitions
C      MARK           C          I          array of NC charachter markers
C      NC             I          I          number of cuts (if negative auto-cuts)
C      PGC            R          I          array of size 5
C                                     PGC(1) x location of lower left point
C                                     of the axes in the page
C                                     PGC(2) y location of lower left point
C                                     of the axes in the page
C                                     PGC(3) length of the x axis in the page
C                                     PGC(4) length of the y axis in the page
C                                     PGC(5) height of the writings
C      NAMX           C          I          label on the x axis
C      NAMY           C          I          label on the y axis
C      IERR           I          0          error code
C
C -----
C      SUBROUTINE CONT2D_LEGEND(CUT,STR,MARK,NC,PGC,IERR)
C -----
C      Plots legend for contour plot of a scalar function in 2-D
C
C      Parameters:
C      variable      type      I/O      meaning
C      CUT            R          I          array of NC cuts values
C      STR            R          I          array of 2*NC line definitions
C      MARK           C          I          array of NC charachter markers
C      NC             I          I          number of cuts
C      PGC            R          I          array of size 5
C                                     PGC(1) x location of lower left point
C                                     of the axes in the page
C                                     PGC(2) y location of lower left point
C                                     of the axes in the page
C                                     PGC(3) length in x direction in the page
C                                     PGC(4) length in y direction in the page
C                                     PGC(5) height of the writings
C      IERR           I          0          error code
C
C -----
C      SUBROUTINE SHAD2D(X,Y,F,MX,NX,NY,CUT,RGB,NC,PGC,NAMX,NAMY,IERR)
C -----
C      Plots color map of a scalar function in 2-D including axes
C
C      Parameters:
C      variable      type      I/O      meaning
C      X              R          I          array of x coordinates
C      Y              R          I          array of y coordinates
C      F              R          I          function F(X,Y) stored in a matrix F(I,J)
C      MX             I          I          first (physical) dimension of the matrix F
C      NX             I          I          number of X points (first logical dimens.

```

```

C      of the matrix F)
C  NY          I      I      number of Y points (second logical dimens.
C      of the matrix F)
C  CUT          R      I      array of NC cuts values (returns the
C      values set in case of NC<0)
C  RGB          R      I      array of 3,NC values for RGB color ranges
C      (returns the values set in case of NC<0)
C  NC          I      I      number of cuts (if negative auto-cuts)
C  PGC          R      I      array of size 5
C      PGC(1) x location of lower left point
C      of the axes in the page
C      PGC(2) y location of lower left point
C      of the axes in the page
C      PGC(3) length of the x axis in the page
C      PGC(4) length of the y axis in the page
C      PGC(5) height of the writings
C  NAMX         C      I      label on the x axis
C  NAMY         C      I      label on the y axis
C  IERR         I      0      error code

```

```

C -----
C      SUBROUTINE SHAD2D_LEGEND(CUT,RGB,NC,PGC,IERR)
C -----
C      Plots legend for color map of a scalar function in 2-D
C
C      Parameters:
C  variable      type      I/O      meaning
C  CUT           R          I          array of NC cuts values
C  RGB           R          I          array of 3,NC values for RGB color ranges
C  NC            I          I          number of cuts
C  PGC           R          I          array of size 5
C      PGC(1) x location of lower left point
C      of the axes in the page
C      PGC(2) y location of lower left point
C      of the axes in the page
C      PGC(3) length in x direction in the page
C      PGC(4) length in y direction in the page
C      PGC(5) height of the writings
C  IERR         I          0          error code

```

```

C -----
C      SUBROUTINE VECT2D(X,Y,FX,FY,MX,NX,NY,PGC,AL,NAMX,NAMY,IERR)
C -----
C      Plots arrow map of a vector function in 2-D including axes
C
C      Parameters:
C  variable      type      I/O      meaning
C  X             R          I          array of x coordinates
C  Y             R          I          array of y coordinates
C  FX            R          I          function FX(X,Y) stored in a matrix FX(I,J)
C  FY            R          I          function FY(X,Y) stored in a matrix FY(I,J)
C  MX            I          I          first (physical) dimension of the matrix F
C  NX            I          I          number of X points (first logical dimens.
C      of the matrix F)
C  NY            I          I          number of Y points (second logical dimens.
C      of the matrix F)
C  PGC           R          I          array of size 5
C      PGC(1) x location of lower left point
C      of the axes in the page
C      PGC(2) y location of lower left point
C      of the axes in the page
C      PGC(3) length of the x axis in the page
C      PGC(4) length of the y axis in the page
C      PGC(5) height of the writings
C  AL            R          I          length of the longest arrow in page units
C  NAMX         C          I          label on the x axis
C  NAMY         C          I          label on the y axis
C  IERR         I          0          error code

```

## MENUS Library

These routines handle menus with buttons. The menu appears as a vertical bar on the right side of the page. It must always be activated calling **Init\_Menu** first

```

C-----#
C      SUBROUTINE ACTIVATE(MENU,BUTTNAM,IERR)
C-----#
C      activate BUTTNAM of MENU
C
C      variable      type      I/O      meaning
C      MENU          C          I          menu name
C      BUTTNAM       C          I          button name
C      IERR          I          0          error code

C-----#
C      SUBROUTINE BUTTONONOFF(MENU,BUTTON,ONOFF)
C-----#
C      return true if BUTTNAM of MENU is on, meaningless if the button is
C      not of type 'O'
C
C      variable      type      I/O      meaning
C      MENU          C          I          menu name
C      BUTTON        C          I          button name
C      ONOFF         L          0          .true./false.

C-----#
C      SUBROUTINE BUTTONSTATUS(MENU,BUTTON,ACTIVE)
C-----#
C      return true if BUTTNAM of MENU is active
C
C      variable      type      I/O      meaning
C      MENU          C          I          menu name
C      BUTTON        C          I          button name
C      ACTIVE        L          0          .true./false.

C-----#
C      SUBROUTINE CHKCURS(IERR)
C-----#
C      set the cursor shape to "finger" if the cursor is over a button or
C      change it back to the current shape
C
C      variable      type      I/O      meaning
C      IERR          I          0          error code

C-----#
C      SUBROUTINE CLEAR_NOT_MENU(IERR)
C-----#
C      clear the window not containing the menu
C
C      variable      type      I/O      meaning
C      IERR          I          0          error code

C-----#
C      SUBROUTINE CLICKON(MENU,BUTTNAM,IERR)
C-----#
C      set BUTTNAM of MENU on
C
C      variable      type      I/O      meaning
C      MENU          C          I          menu name
C      BUTTNAM       C          I          button name
C      IERR          I          0          error code

```

```
C-----#
C          SUBROUTINE CLICKOFF(MENU,BUTTNAM,IERR)
C-----#
```

```
C set BUTTNAM of MENU off
C
C variable      type  I/O  meaning
C MENU          C     I     menu name
C BUTTNAM       C     I     button name
C IERR          I     0     error code
```

```
C-----#
C          SUBROUTINE DEACTIVATE(MENU,BUTTNAM,IERR)
C-----#
```

```
C deactivate BUTTNAM of MENU
C
C variable      type  I/O  meaning
C MENU          C     I     menu name
C BUTTNAM       C     I     button name
C IERR          I     0     error code
```

```
C-----#
C          SUBROUTINE DEHIGHLIGHT(MENU,BUTTNAM,IERR)
C-----#
```

```
C dehighlight BUTTNAM of MENU
C
C variable      type  I/O  meaning
C MENU          C     I     menu name
C BUTTNAM       C     I     button name
C IERR          I     0     error code
```

```
C-----#
C          SUBROUTINE DRAW_CURRENTMENU(IERR)
C-----#
```

```
C draw the buttons belonging to the menu currently active
C
C variable      type  I/O  meaning
C IERR          I     0     error code
```

```
C-----#
C          SUBROUTINE DRAW_MENU(MENU,IERR)
C-----#
```

```
C draw the buttons belonging to menu
C
C variable      type  I/O  meaning
C MENU          C     I     menu name
C IERR          I     0     error code
```

```
C-----#
C          SUBROUTINE FIND_NEXT_MENU(MENU,BUTTON,MEXTMENU,IERR)
C-----#
```

```
C search for a submenu of this BUTTON of MENU
C
C variable      type  I/O  meaning
C MENU          C     I     menu name
C BUTTON        C     I     button name
C MEXTMENU      C     0     new menu name (if any)
C IERR          I     0     error code
```

```
C-----#
C          subroutine GetOneItem(Menu,I,Item)
C-----#
```

```
C return the I-th item of Menu
C
C variable      type  I/O  meaning
C Menu          C     I     menu name
C I             I     I     index of the item
C Item          C     0     item name
```

```

C-----#
      SUBROUTINE HIGHLIGHT(MENU,BUTTNAM,IERR)
C-----#
C highlight BUTTNAM of MENU
C
C variable      type      I/O      meaning
C MENU          C          I          menu name
C BUTTNAM      C          I          button name
C IERR         I          O          error code

C-----#
      SUBROUTINE Init_Menu
C-----#
C Initialize the menu to the default setting

C-----#
      integer function NrItemsOfMenu(Menu)
C-----#
C return the number of items of Menu
C
C variable      type      I/O      meaning
C Menu          C          I          menu name

C-----#
      SUBROUTINE OnItemsOfMenu(MENU,N,Items)
C-----#
C return the ON buttons of MENU
C
C variable      type      I/O      meaning
C MENU          C          I          menu name
C N              I          O          number of ON buttons of MENU
C Items         C          O          title of the N ON buttons of MENU

C-----#
      SUBROUTINE QUERY_MENUFRAME(XMIN,XMAX,YMIN,YMAX)
C-----#
C return the menu frame boundaries
C
C variable      type      I/O      meaning
C XMIN          R          O          left x position of the menu bar
C XMAX          R          O          right x position of the menu bar
C YMIN          R          O          bottom y position of the menu bar
C YMAX          R          O          top y position of the menu bar

C-----#
      SUBROUTINE QUERY_MENUSTATUS(ON)
C-----#
C return true if a menu is active
C
C variable      type      I/O      meaning
C ON            L          O          .true./.false.

C-----#
      SUBROUTINE READ_MENU(MENU,XPOS,YPOS,BUTTON,IERR)
C-----#
C find out which button has been pressed within MENU
C
C variable      type      I/O      meaning
C MENU          C          I          menu name
C XPOS,YPOS     R          I          pressed coordinates
C BUTTON        C          O          button name
C IERR          I          O          error code

```



```

C-----#
C          SUBROUTINE SET_BUTTON(NAME,TYP,IERR)
C-----#
C store the button data
C
C variable      type      I/O      meaning
C NAME          C          I          name, it is the identifier of the button
C TYP           C          I          'S' for a square button
C              C          I          'C' for a circular button
C IERR          I          0          error code

C-----#
C          SUBROUTINE SET_MENU(NAME,IERR)
C-----#
C store the menu data
C
C variable      type      I/O      meaning
C NAME          C          I          menu name
C IERR          I          0          error code

C-----#
C          SUBROUTINE SET_MENUITEM(MENU,BUTTNAM,FLAG,SUBMENU,IERR)
C-----#
C store the items of the menu
C
C variable      type      I/O      meaning
C MENU          C          I          menu name
C BUTTNAM       C          I          button name
C FLAG          L          I          .t. if the button is active
C              C          I          .f. for a deactivated button
C SUBMENU       C          I          name of the submenu called by the button,
C              C          I          CHAR(0) means that no submenu is set
C IERR          I          0          error code

C-----#
C          SUBROUTINE SET_POPUPMENU(NAME,TITLE,IERR)
C-----#
C store the popup menu data
C
C variable      type      I/O      meaning
C NAME          C          I          menu name
C TITLE         C          I          menu title, written on the screen
C IERR          I          0          error code

C-----#
C          SUBROUTINE SET_POPUPMENUITEM(MENU,BUTTNAM,FLAG,SUBMENU,IERR)
C-----#
C store the items of the popup menu
C
C variable      type      I/O      meaning
C MENU          C          I          menu name
C BUTTNAM       C          I          button name
C FLAG          L          I          .t. if the button is active
C              C          I          .f. for a deactivated button
C SUBMENU       C          I          name of the submenu called by the button,
C              C          I          CHAR(0) means that no submenu is set,
C              C          I          it must be a popupmenu
C IERR          I          0          error code

C-----#
C          SUBROUTINE SetMenu_Dainty(MENU)
C-----#
C define the menu of type 'dainty': only one of its items can be ON
C
C variable      type      I/O      meaning
C MENU          C          I          menu name

```

## PLOT2D Library

These routines draw a frame and curves or symbols inside it. Clipping over the frame is performed. Dashed lines can be defined giving the length of the solid, blank, solid etc.

```

C -----
C      SUBROUTINE XYERRBOX(X,Y,ERX,ERY,NS,NE,IERR)
C -----
C Plots a curve in a scaled frame with symbols on points
C XYERRBOX is called after the definition of a scaled frame (through
C the routine XYFRAME). Plots the data points with error boxes, as
C defined in the coordinate arrays X and Y, using the array locations
C from NS and NE, so that NS-NE is the number of points in the curve.
C The easiest choice is NS=1 and NE=number of points.
C The X and Y coordinates are intended as referred to the
C minimum-maximum intervals in x and y defined in the XYFRAME routine.
C
C Parameters:
C variable      type      I/O      meaning
C X              R         I         array containing the x coordinates of the
C               R         I         points of the curve
C Y              R         I         array containing the y coordinates of the
C               R         I         points of the curve
C ERX            R         I         1-sigma errors of x
C ERY            R         I         1-sigma errors of y
C NS             I         I         starting index for the definition of the
C               I         I         curve in the arrays X and Y. Usually 1
C NE             I         I         end index for the definition of the curve
C               I         I         in the arrays X and Y. Usually the number
C               I         I         of points in the curve
C IERR           I         0         error code (0=no error)
C -----
C
C      SUBROUTINE XYFRAME(XLO,YLO,AXL,AYL,ILX,ILY,CX,CY,H,
C      & XMIN,XMAX,YMIN,YMAX,IERR)
C -----
C Draws a scaled frame and store the frame definitions
C XYFRAME defines a frame for subsequent plotting of curves through
C the routines XYPLOT or XYMARK. The frame has the lower, left corner
C at the point of coordinates (XLO,YLO), in plot page units, and the
C axes have length AXL and AYL, in plot page units. The axes are
C labelled with the characters CX and CY. Characters are plotted with
C height H in the same unit as the output page unit. The logical
C extremes of the axes are defined in XMIN,XMAX,YMIN,YMAX. The
C subsequent calls to XYPLOT and XYMARK are all referred to the above
C logical extremes, until a new call to XYFRAME redefines them.
C XYFRAME needs to be called only once for plots of several curves.
C
C Parameters:
C variable      type      I/O      meaning
C XLO           R         I         x coordinate of lower,left corner of frame
C               R         I         in plot page unit
C YLO           R         I         y coordinate of lower,left corner of frame
C               R         I         in plot page unit
C AXL           R         I         length of the x axis in plot page units
C AYL           R         I         length of the y axis in plot page units
C ILX           I         I         0=linear x-axis, 1=logarithmic x-axis
C ILY           I         I         0=linear y-axis, 1=logarithmic y-axis
C CX            C         I         label on the x axis
C CY            C         I         label on the y axis
C H            R         I         height of the characters in the labels,
C               R         I         in the same unit as the output page unit
C XMIN,XMAX    R         I         min and max values of the x axis
C YMIN,YMAX    R         I         min and max values of the y axis
C IERR         I         0         error code (0=no error)
C -----
C
C      SUBROUTINE XYMARK(X,Y,NS,NE,SYMB,LFREQ,H,IERR)
C -----
C Plots a curve in a scaled frame with symbols on points
C XYMARK is called after the definition of a scaled frame (through the
C routine XYFRAME). Plots the curve, as defined in the coordinate

```

C arrays X and Y, using the array locations from NS and NE, so that  
 C NS-NE is the number of points in the curve. The easiest choice is  
 C NS=1 and NE=number of points. Note that as many calls to XYMARK as  
 C desired can be performed to plot several curves on the same frame.  
 C The X and Y coordinates are intended as referred to the  
 C minimum-maximum intervals in x and y defined in the XYFRAME routine.  
 C The symbol SYMB with height H (in the same unit as the output page  
 C unit) is plotted on the curve for a total of LFREQ times

C  
 C Parameters:  
 C variable      type      I/O      meaning  
 C X                    R      I      array containing the x coordinates of the  
 C                                            points of the curve  
 C Y                    R      I      array containing the y coordinates of the  
 C                                            points of the curve  
 C NS                    I      I      starting index for the definition of the  
 C                                            curve in the arrays X and Y. Usually 1  
 C NE                    I      I      end index for the definition of the curve  
 C                                            in the arrays X and Y. Usually the number  
 C                                            of points in the curve  
 C SYMB                C      I      symbol to be plotted, like letters or  
 C                                            numbers  
 C LFREQ                I      I      number of times the symbol must be plot-  
 C                                            ted on the curve  
 C H                    R      I      height of the symbol (in the same unit as  
 C                                            the output page)  
 C IERR                I      0      error code (0=no error)

C -----  
 C                    SUBROUTINE XYPLOT(X,Y,NS,NE,STR,ISTR,IERR)  
 C -----

C Plots a curve in a scaled frame  
 C XYPLOT is called after the definition of a scaled frame (through the  
 C routine XYFRAME). Plots the curve, as defined in the coordinate  
 C arrays X and Y, using the array locations from NS and NE, so that  
 C NS-NE is the number of points in the curve. The easiest choice is  
 C NS=1 and NE=number of points. Note that as many calls to XYPLOT as  
 C desired can be performed to plot several curves on the same frame.  
 C The X and Y coordinates are intended as referred to the  
 C minimum-maximum intervals in x and y defined in the XYFRAME routine.

C  
 C Parameters:  
 C variable      type      I/O      meaning  
 C X                    R      I      array containing the x coordinates of the  
 C                                            points of the curve  
 C Y                    R      I      array containing the y coordinates of the  
 C                                            points of the curve  
 C NS                    I      I      starting index for the definition of the  
 C                                            curve in the arrays X and Y. Usually 1  
 C NE                    I      I      end index for the definition of the curve  
 C                                            in the arrays X and Y. Usually the number  
 C                                            of points in the curve  
 C STR                R      I      dashed line definition: length of solid,  
 C                                            blank, solid, blank etc. in the same unit  
 C                                            as the output page  
 C ISTR                I      I      dimension of ISTR  
 C IERR                I      0      error code (0=no error)

C -----  
 C                    SUBROUTINE XYSYMB(X,Y,NS,NE,ISYMB,LFREQ,H,RED,GREEN,BLUE,IERR)  
 C -----

C Plots a curve in a scaled frame with symbols on points  
 C XYSYMB is called after the definition of a scaled frame (through the  
 C routine XYFRAME). Plots the curve, as defined in the coordinate  
 C arrays X and Y, using the array locations from NS and NE, so that  
 C NS-NE is the number of points in the curve. The easiest choice is  
 C NS=1 and NE=number of points. Note that as many calls to XYSYMB as  
 C desired can be performed to plot several curves on the same frame.  
 C The X and Y coordinates are intended as referred to the  
 C minimum-maximum intervals in x and y defined in the XYFRAME routine.  
 C The symbol ISYMB with height H (in the same unit as the output page  
 C unit) is plotted on the curve for a total of LFREQ times

C  
 C Parameters:  
 C variable      type      I/O      meaning  
 C X                    R      I      array containing the x coordinates of the  
 C                                            points of the curve

---

C	Y	R	I	array containing the y coordinates of the
C				points of the curve
C	NS	I	I	starting index for the definition of the
C				curve in the arrays X and Y. Usually 1
C	NE	I	I	end index for the definition of the curve
C				in the arrays X and Y. Usually the number
C				of points in the curve
C	ISYMB	I	I	identifier of the symbol to be plotted:
C				> 0 empty, < 0 filled with given color
C				1 = triangle up
C				2 = triangle down
C				3 = square
C				4 = hexagon
C				5 = circle
C				6 = pentagon
C				7 = star
C				8 = radio
C	LFREQ	I	I	number of times the symbol must be plot-
C				ted on the curve
C	H	R	I	height of the symbol (in the same unit as
C				the output page)
C	RED	R	I	red, 0 to 1, used if ISYMB < 0
C	GREEN	R	I	green, 0 to 1, used if ISYMB < 0
C	BLUE	R	I	blue, 0 to 1, used if ISYMB < 0
C	IERR	I	O	error code (0=no error)

## PLOT3D Library

These routines draw a curve or a 3-dimensional surface defined within a 3D linear frame. A parallel or a perspective projection can be chosen, as well as the view direction.

```

C -----
C          SUBROUTINE CONTC_LEGEND(CUT,RGB,NC,PGC,IERR)
C -----
C Plots legend for color contour plot
C
C Parameters:
C variable      type   I/O   meaning
C CUT           R     I     array of NC cuts values
C RGB           R     I     array of 3,NC values for RGB color ranges
C NC            I     I     number of cuts
C PGC           R     I     array of size 5
C                   PGC(1) x location of lower left point
C                   of the axes in the page
C                   PGC(2) y location of lower left point
C                   of the axes in the page
C                   PGC(3) length in x direction in the page
C                   PGC(4) length in y direction in the page
C                   PGC(5) height of the writings
C IERR          I     0     error code
C
C -----
C          subroutine hiplot(nlines,lines,npoly,lpoly,s,t,r,ierr)
C -----
C hidden line removal routine. plots the nlines lines contained in
C the array lines(2,nlines) removing the portions covered by the
C npoly polygons contained in the array lpoly(4,npoly). the nodal
C coordinates s, t and r must be in the screen system.
C
C Parameters:
C variable      type   I/O   meaning
C nlines        I     I     number of lines to be checked and
C                   plotted
C lines         I     I     node couples defining each line
C npoly         I     I     number of polygons
C lpoly         I     I     nodes defining the each polygon.
C                   the polygon i is a triangle if
C                   lpoly(4,i)=0
C s,t,r         R     I     screen x,y,z coordinate of the nodes
C
C -----
C          SUBROUTINE XYZFRAME(IPRJ,PRJD,XLO,YLO,AXL,AYL,ILX,ILY,ILZ,VIEW,
C          & NX,NY,NZ,H,XMIN,XMAX,YMIN,YMAX,
C          & ZMIN,ZMAX,IERR)
C -----
C Draws a scaled frame and store the frame definitions for 3-D plots
C XYZFRAME defines a frame for subsequent plotting of curves or
C surfaces using the routines XYZPLOT, XYZMARK or XYZSURF. The frame
C has the lower, left corner at the point of coordinates (XLO,YLO), and
C the frame has width AXL and AYL, in plot page units. The axes are
C labelled with the characters NX, NY, NZ. Characters are plotted with
C height H (in 1/10 page units). The logical extremes of the axes are
C defined in XMIN,XMAX,YMIN,YMAX,ZMIN,ZMAX. The axes are plotted as
C seen from a view point with coordinates VIEW(1), VIEW(2) and VIEW(3)
C in the reference frame. Subsequent calls to XYZPLOT, XYZMARK or
C XYZSURF are all referred to the above logical extremes, until a new
C call to XYZFRAME redefines them. XYZFRAME needs to be called only
C once for plots of several curves.
C
C Parameters:
C variable      type   I/O   meaning
C IPRJ          I     I     0 = parallel projection
C                   1 = perspective projection
C PRJD          R     I     if IPRJ=1, distance of the projection

```

```

C
C XLO          R   I   centre, in unit of the Z-width of the cube
C              R   I   x coordinate of lower,left corner of frame
C              R   I   in plot page units
C YLO          R   I   y coordinate of lower,left corner of frame
C              R   I   in plot page units
C AXL          R   I   x width of the frame in plot page units
C AYL          R   I   y width of the frame in plot page units
C ILX          I     0/1 = lin/log x axis
C ILY          I     0/1 = lin/log y axis
C ILZ          I     0/1 = lin/log z axis
C VIEW        R   I   array with view vector components
C NX          C   I   label on the x axis
C NY          C   I   label on the y axis
C NZ          C   I   label on the z axis
C H           R   I   height of the characters in the labels
C              R   I   (in 1/10 of page units)
C XMIN,XMAX   R   I   min and max of the x axis
C YMIN,YMAX   R   I   min and max of the y axis
C ZMIN,ZMAX   R   I   min and max of the z axis

```

```

C -----
C          SUBROUTINE XYZPLOT(X,Y,Z,NS,NE,STR,ISTR,IERR)
C -----
C Plots a 3D curve in a scaled frame
C
C Parameters:
C variable      type   I/O   meaning
C X             R     I     array containing the x coordinates of the
C               R     I     points of the curve
C Y             R     I     array containing the y coordinates of the
C               R     I     points of the curve
C Z             R     I     array containing the z coordinates of the
C               R     I     points of the curve
C NS            I     I     starting index for the definition of the
C               I     I     curve in the arrays X,Y,Z. Usually 1
C NE            I     I     end index for the definition of the curve
C               I     I     in the arrays X,Y,Z. Usually the number
C               I     I     of points in the curve
C STR           R     I     dashed line definition: length of solid,
C               R     I     blank, solid, blank etc. in the same unit
C               R     I     as the output page
C ISTR          I     I     dimension of ISTR
C IERR          I     O     error code (0=no error)

```

```

C -----
C          SUBROUTINE XYZSHADE(X,Y,Z,IDIMZ,NX,NY,
C          & XBUF,YBUF,ZBUF,ZGRAVITY,IGRAVITY,IERR)
C -----
C Paint a 3D surface in a scaled frame (painter's algorithm)
C
C Parameters:
C variable      type   I/O   meaning
C X             R     I     array containing the x coordinates of the
C               R     I     points of the curve
C Y             R     I     array containing the y coordinates of the
C               R     I     points of the curve
C Z             R     I     array containing the z coordinates of the
C               R     I     points of the curve
C IDIMZ         I     I     first dimension of Z
C NX            I     I     number of X points
C NY            I     I     number of Y points
C XBUF          R     I     working array of NX*NY elements
C YBUF          R     I     working array of NX*NY elements
C ZBUF          R     I     working array of NX*NY elements
C ZGRAVITY      R     I     working array of (NX-1)*(NY-1) elements
C IGRAVITY      I     I     working array of (NX-1)*(NY-1) elements
C IERR          I     O     error code (0=no error)

```

```

C -----
C          SUBROUTINE XYZSURF(X,Y,Z,IDIMZ,NX,NY,XBUF,YBUF,ZBUF,IERR)
C -----
C Plots a 3D surface in a scaled frame
C
C Parameters:
C variable      type   I/O   meaning

```

---

C	X	R	I	array containing the x coordinates of the
C				points of the curve
C	Y	R	I	array containing the y coordinates of the
C				points of the curve
C	Z	R	I	array containing the z coordinates of the
C				points of the curve
C	IDIMZ	I	I	first dimesnion of Z
C	NX	I	I	number of X points
C	NY	I	I	number of Y points
C	XBUF	R	I	working array of dimension NX*NY
C	YBUF	R	I	working array of dimension NX*NY
C	ZBUF	R	I	working array of dimension NX*NY
C	IERR	I	0	error code (0=no error)

## PRIMITIVES Library

These are the plot primitives, called by the other routines, independent on which output you have chosen. They manage the plot output (page or window screen), draw lines and polygons and set the output characteristics. Some of them can be called independently of any frame.

```

C -----
C      SUBROUTINE CHECKMOUSEDOWN(MOUSEDOWN,IERR)
C -----
C      see if the mouse has been released or if it is still down
C
C      Parameters:
C      variable      type      I/O      meaning
C      MOUSEDOWN     L          0        .f.=mouse up, .t.=mouse down
C      IERR           I          0        error code
C
C      Comments:
C      during the time the mouse is down the mouse movements can be followed,
C      for example to plot
C      example :      CALL GETEVENT(AEVENT,X,Y,CH,IERR)
C                    IF(AEVENT .AND. (X.GE.0.0 .OR. Y.GE.0.0)) THEN
C                      WRITE(6,*) 'PRESSED AT ',X,Y
C                      CALL CHECKMOUSEDOWN(MOUSEDOWN,IERR)
C                      DO WHILE(MOUSEDOWN .AND. IERR.EQ.0)
C                        CALL GETCRS(X,Y,IERR)
C                        do something with X Y
C                      CALL CHECKMOUSEDOWN(MOUSEDOWN,IERR)
C                    ENDDO
C                    CALL GETCRS(X,Y,IERR)
C                    WRITE(6,*) 'RELEASED AT ',X,Y
C      ENDIF

```

```

C -----
C      SUBROUTINE CLEARPLOT (IERR)
C -----
C      Clear the plot window (in the case of interactive graphics) or
C      open a new page
C
C      Parameters:
C      variable      type      I/O      meaning
C      IERR           I          0        error code

```

```

C -----
C      SUBROUTINE CLIPBOARD(XL,YL,XU,YU,IERR)
C -----
C      copy a rectangular area from the window to the clipboard
C
C      Parameters:
C      variable      type      I/O      meaning
C      XL,YL,XU,YU   R          I        coord. of the area
C      IERR           I          0        error code

```

```

C -----
C      SUBROUTINE CLOSEPLOT(IERR)
C -----
C      Close the plot session.
C
C      Parameters:
C      variable      type      I/O      meaning
C      IERR           I          0        error code

```

```

C -----
C      SUBROUTINE FILLARC(XL,YL,XU,YU,PHI_START,PHI_END,R,G,B,IERR)
C -----
C      fill the arc contained inside the given rectangle between the given
C      angles with the input rgb color
C

```



```

C Parameters:
C variable      type  I/O  meaning
C XL            R     I     lower x coord. of the rectangle including
C              the oval
C XU            R     I     upper x coord. of the rectangle including
C              the oval
C YL            R     I     lower y coord. of the rectangle including
C              the oval
C YU            R     I     upper y coord. of the rectangle including
C              the oval
C PHI_START     R     I     start angle of the arc in degrees,
C              0=3 o'clock, 90=12 o'clock, 180=9 o'clock
C PHI_END       R     I     end angle of the arc in degrees
C R,G,B         R     I     R,G,B color
C IERR          I     0     error code

```

```

C -----
C          SUBROUTINE FILLOVAL(XL,YL,XU,YU,R,G,B,IERR)
C -----

```

```

C fill the oval contained inside the given rectangle with the input
C RGB color

```

```

C Parameters:
C variable      type  I/O  meaning
C XL            R     I     lower x coord. of the rectangle including
C              the oval
C XU            R     I     upper x coord. of the rectangle including
C              the oval
C YL            R     I     lower y coord. of the rectangle including
C              the oval
C YU            R     I     upper y coord. of the rectangle including
C              the oval
C R,G,B         R     I     R,G,B color
C IERR          I     0     error code

```

```

C -----
C          SUBROUTINE FILLRECT(XL,YL,XU,YU,R,G,B,IERR)
C -----

```

```

C fill the rectangle with the input RGB color

```

```

C Parameters:
C variable      type  I/O  meaning
C XL            R     I     lower x coord. of the rectangle
C XU            R     I     upper x coord. of the rectangle
C YL            R     I     lower y coord. of the rectangle
C YU            R     I     upper y coord. of the rectangle
C R,G,B         R     I     R,G,B color
C IERR          I     0     error code

```

```

C -----
C          SUBROUTINE FILLRGB(X,Y,N,R,G,B,IERR)
C -----

```

```

C Fills an area with a RGB color
C The polygon is filled with a RGB color. The polygon must be closed
C (i.e. last point equal to the first one). If the polyline is not
C closed, a straight line is used to connect the last and first point
C (and close the polygon).

```

```

C Parameters:
C variable      type  I/O  meaning
C X             R     I     x coordinates of the polygon
C Y             R     I     y coordinates of the polygon
C N             I     I     number of points in the polygon
C R             R     I     red, 0 to 1
C G             R     I     green, 0 to 1
C B             R     I     blue, 0 to 1
C IERR          I     0     error code

```

```

C -----
C          SUBROUTINE FILLCUTS(XIN,YIN,VIN,NIN,FLAG,NCUTS,CUTS,RGB,IERR)
C -----

```

```

C Fills an area with a RGB smoothing color

```

```

C The polygon is filled with smoothing RGB colors. The polygon must be
C closed (i.e. last point equal the first one)
C
C Parameters:
C variable      type      I/O      meaning
C XIN,YIN       R          I          x,y coordinates of the polygon
C VIN           R          I          intensity at each XIN,YIN
C NIN           I          I          number of nodes of the polygon
C FLAG         I          I          0 if the input polygon is certainly
C convex (less computation), 1 if not
C NCUTS        I          I          number of cuts
C CUTS         R          I          cut values
C RGB          R          I          rgb at the cut values
C IERR         I          0          error code

```

```

C -----
C          SUBROUTINE FILLRGBR(XIN,YIN,RIN,GIN,BIN,NIN,FLAG,IERR)
C -----
C Fills an area with a RGB smoothing color
C The polygon is filled with smoothing RGB colors. The polygon must be
C closed (i.e. last point equal to the first one)
C
C Parameters:
C variable      type      I/O      meaning
C XIN           R          I          x coordinates of the polygon
C YIN           R          I          y coordinates of the polygon
C RIN           R          I          red at each XIN,YIN, 0 to 1
C GIN           R          I          green at each XIN,YIN, 0 to 1
C BIN           R          I          blue at each XIN,YIN, 0 to 1
C NIN           I          I          number of nodes of the polygon
C FLAG         I          I          0 if the input polygon is certainly
C convex (less computation), 1 if not
C IERR         I          0          error code

```

```

C -----
C          SUBROUTINE GETCRS(X,Y,IERR)
C -----
C Returns the mouse position
C
C Parameters:
C variable      type      I/O      meaning
C X             R          0          x position in plot page unit
C Y             R          0          y position in plot page unit
C IERR         I          0          error code

```

```

C -----
C          SUBROUTINE GETCURSOR(INDEX)
C -----
C get the current cursor shape
C
C Parameters:
C variable      type      I/O      meaning
C INDEX         I          0          0 = arrow
C              I          1          1 = watch
C              I          2          2 = cross
C              I          3          3 = open hand
C              I          4          4 = closed hand
C              I          5          5 = beam
C              I          6          6 = target
C              I          7          7 = finger
C              I          8          8 = question mark

```

```

C -----
C          SUBROUTINE GETEVENT(AEVENT,X,Y,CH,IERR)
C -----
C examine an event from the queue of the events, handle it and return
C - the coordinates where the mouse was pressed (if in the grafic
C window) in the "page" unit
C - the key pressed (if any)
C
C Parameters:
C variable      type      I/O      meaning
C AEVENT        L          0          .T./.F. in case of an event

```

```

C X,Y          R          0    x,y coord. where the mouse was pressed
C              C          0    (if in the grafic window) in the page unit
C CH           C          0    key pressed
C IERR        I          0    error code

```

```

C -----
C          SUBROUTINE GETMSE(X,Y,KEY,IERR)
C -----
C Returns the mouse position when its button is released after a
C mousedown
C
C Parameters:
C variable      type      I/O    meaning
C X             R          0      x position in plot page unit
C Y             R          0      y position in plot page unit
C KEY           I          0      key number
C IERR         I          0      error code
C
C Comments:
C example :    CALL GETEVENT(AEVENT,X,Y,CH,IERR)
C              IF(AEVENT .AND. (X.NE.0.0 .OR. Y.NE.0.0)) THEN
C                WRITE(6,*) 'PRESSED AT ',X,Y
C                CALL GETMSE(X,Y,KEY,IERR)
C                WRITE(6,*) 'RELEASED AT ',X,Y
C              ENDIF

```

```

C -----
C          SUBROUTINE GETPLOTINDEX(NEW,INDEX,IERR)
C -----
C Returns an index to the current plot, stores its definitions
C
C Parameters:
C variable      type      I/O    meaning
C NEW           I          I      0=need a new index    1=use INDEX
C INDEX        I          I/O    index of the current plot
C IERR         I          0      error code

```

```

C -----
C          SUBROUTINE GETXYTATMOUSEDOWN(X,Y,T,IERR)
C -----
C Returns the mouse position when the button was last pressed
C
C Parameters:
C variable      type      I/O    meaning
C X             R          0      x position in plot page unit at mousedown
C Y             R          0      y position in plot page unit at mousedown
C T             R          0      time at mousedown in millisec
C IERR         I          0      error code

```

```

C -----
C          SUBROUTINE GETXYTATMOUSEUP(X,Y,T,IERR)
C -----
C Returns the mouse position when the button was last released
C
C Parameters:
C variable      type      I/O    meaning
C X             R          0      x position in plot page unit at mouseup
C Y             R          0      y position in plot page unit at mouseup
C T             R          0      time at mouseup in millisec
C IERR         I          0      error code

```

```

C -----
C          SUBROUTINE GX_BEEP
C -----
C beep

```

```

C -----
C          SUBROUTINE INITPLOT(IERR)
C -----
C This is the first call to initialise the plots and open a new page

```

C or window. The page is scaled so that the lower, left corner has  
 C coordinates (0.0,0.0) and the upper, right corner has coordinates  
 C (27.0,18.0).

C  
 C Parameters:  
 C variable      type      I/O      meaning  
 C IERR           I         0         error code

C -----  
 C            subroutine makegif(outfile,comment,ierr)  
 C -----  
 C draw the window to a gif 89a file, ignore the menubar, if any  
 C  
 C Parameters:  
 C variable      type      I/O      meaning  
 C outfile       c         i         output file name  
 C comment       c         i         comment, if empty a type gif87a is created  
 C IERR           I         0         error code  
 C

C -----  
 C            subroutine MakeSelectedGif(outfile,comment,xl,yl,xu,yu,ierr)  
 C -----  
 C draw a selected area of the window to a gif 89a file  
 C  
 C Parameters:  
 C variable      type      I/O      meaning  
 C outfile       c         i         output file name  
 C comment       c         i         comment, if empty a type gif87a is created  
 C xl,yl,xu,yu   r         i         area corners  
 C IERR           I         0         error code

C -----  
 C            SUBROUTINE PASTE(X,Y,XL,YL,XU,YU,IERR)  
 C -----  
 C Paste the input area of the clipboard to the window  
 C  
 C Parameters:  
 C variable      type      I/O      meaning  
 C X,Y           R         I         coord. of the upper left corner of the  
 C                                    window to put the clipboard to  
 C XL,YL,XU,YU   R         I         coord. of the limiting area of the  
 C                                    clipboard to paste  
 C IERR           I         0         error code

C -----  
 C            SUBROUTINE PENTHICK(I,IERR)  
 C -----  
 C Set the line thickness(in black/white) or color  
 C The parameter I selects different line thickness or colors and  
 C depends on the implementation and available facility.  
 C  
 C Parameters:  
 C variable      type      I/O      meaning  
 C I             I         I         flag for line thickness or color  
 C IERR           I         0         error code

C -----  
 C            SUBROUTINE PLOTARC(XL,YL,XU,YU,PHI\_START,PHI\_END,IERR)  
 C -----  
 C draw an arc contained inside the given rectangle between the given  
 C angles  
 C  
 C Parameters:  
 C variable      type      I/O      meaning  
 C XL            R         I         lower x coord. of the rectangle including  
 C                                    the oval  
 C XU            R         I         upper x coord. of the rectangle including  
 C                                    the oval  
 C YL            R         I         lower y coord. of the rectangle including  
 C                                    the oval  
 C

```

C YU          R    I    upper y coord. of the rectangle including
C              the oval
C PHI_START   R    I    start angle of the arc in degrees,
C              0=3 o'clock, 90=12 o'clock, 180=9 o'clock
C PHI_END     R    I    end angle of the arc in degrees
C IERR        I    0    error code

```

```

C -----
C          SUBROUTINE PLOTLINE(X,Y,N,IERR)
C -----
C Plots a line
C The line is defined by points by means of two arrays of coordinates,
C X and Y. The coordinates are in the plot page system as set by the
C last call to the routine INITPLOT or SCALEPLOT
C
C Parameters:
C variable    type  I/O  meaning
C X           R    I    array containing the x coordinates of the
C              points of the line in the same unit as the
C              output page unit
C Y           R    I    array containing the y coordinates of the
C              points of the line in the same unit as the
C              output page unit
C N           I    I    number of points
C IERR        I    0    error code

```

```

C -----
C          SUBROUTINE PLOTLINER(X,Y,R,G,B,N,IERR)
C -----
C Plots a line with given colors, rendering
C The line is defined by points by means of two arrays of coordinates,
C X and Y. The coordinates are in the plot page system as set by the
C last call to the routine INITPLOT or SCALEPLOT. From point i to
C point i+1 the rgb mean color is used
C
C Parameters:
C variable    type  I/O  meaning
C X           R    I    array containing the x coordinates of the
C              points of the line in the same unit as the
C              output page unit
C Y           R    I    array containing the y coordinates of the
C              points of the line in the same unit as the
C              output page unit
C R           R    I    red definition for each point, 0 to 1
C G           R    I    green definition for each point, 0 to 1
C B           R    I    blue definition for each point, 0 to 1
C N           I    I    number of points
C IERR        I    0    error code

```

```

C -----
C          SUBROUTINE PLOTTOVAL(XL,YL,XU,YU,IERR)
C -----
C draw the oval contained inside the given rectangle
C
C Parameters:
C variable    type  I/O  meaning
C XL          R    I    lower x coord. of the rectangle including
C              the oval
C XU          R    I    upper x coord. of the rectangle including
C              the oval
C YL          R    I    lower y coord. of the rectangle including
C              the oval
C YU          R    I    upper y coord. of the rectangle including
C              the oval
C IERR        I    0    error code

```

```

C -----
C          SUBROUTINE PLOTRECT(XL,YL,XU,YU,IERR)
C -----
C draw the rectangle
C
C Parameters:
C variable    type  I/O  meaning

```

```

C XL          R      I      lower x coord. of the rectangle
C XU          R      I      upper x coord. of the rectangle
C YL          R      I      lower y coord. of the rectangle
C YU          R      I      upper y coord. of the rectangle
C IERR       I      O      error code

```

```

C -----
C      SUBROUTINE PLOTTEXT(TEXT,X,Y,H,ANGLE,IERR)
C -----
C      Plot a text
C      The text is plotted at a location (X,Y) where the coordinates are in
C      the plot page system set by INITPLOT or SCALEPLOT.
C
C      Parameters:
C      variable      type      I/O      meaning
C      TEXT          C          I          text defined as a character array.
C      X             R          I          x coordinate for the lower, left corner
C                                     of the text plot
C      Y             R          I          y coordinate for the lower, left corner
C                                     of the text plot
C      H             R          I          height of the characters in the same unit
C                                     as the output page unit
C                                     for the text to be plotted
C      ANGLE         R          I          angle formed by the text and horizontal
C                                     in degree
C      IERR          I          O          error code

```

```

C -----
C      SUBROUTINE QUERYDEVICE(XMIN,YMIN,XMAX,YMAX)
C -----
C      return the current device dimension
C
C      Parameters:
C      variable      type      I/O      meaning
C      XMIN          R          O          x coordinate of the lower, left corner
C      YMIN          R          O          y coordinate of the lower, left corner
C      XMAX          R          O          x coordinate of the upper, right corner
C      YMAX          R          O          y coordinate of the upper, right corner

```

```

C -----
C      SUBROUTINE QUERYFONTINFO(H,HEIGHT,IERR)
C -----
C      return height of a character of the loaded font with height H
C      without leading
C
C      Parameters:
C      variable      type      I/O      meaning
C      H             R          I          font height, in page unit
C      HEIGHT        R          O          height of a character in the font whitout
C                                     leading, in the same unit as H

```

```

C -----
C      SUBROUTINE QUERYJUSTIFICATIONS(JUSTH,JUSTV)
C -----
C      return the vertical justification
C
C      Parameters:
C      variable      type      I/O      meaning
C      JUSTH         I          I          horizonatl justification
C                                     -1 = right
C                                     0 = center
C                                     +1 = left
C      JUSTV         I          I          vertical justification
C                                     -1 = bottom
C                                     0 = center
C                                     +1 = up

```

```

C -----
C      SUBROUTINE QUERYRES (RES)
C -----
C      return the current resolution

```

```

C
C Parameters:
C variable      type  I/O  meaning
C RES           R     O    screen resolution in pixel per inch

C -----
C          SUBROUTINE QUERYRGBB(R,G,B,IERR)
C -----
C returns the rgb background color
C
C Parameters:
C variable      type  I/O  meaning
C R             R     O    red, 0 to 1
C G             R     O    green, 0 to 1
C B             R     O    blue, 0 to 1
C IERR          I     O    error code

C -----
C          SUBROUTINE QUERYRGBF (R,G,B,IERR)
C -----
C returns the rgb foreground color
C
C Parameters:
C variable      type  I/O  meaning
C R             R     O    red, 0 to 1
C G             R     O    green, 0 to 1
C B             R     O    blue, 0 to 1
C IERR          I     O    error code

C -----
C          SUBROUTINE QUERYSCALE(XMIN,YMIN,XMAX,YMAX)
C -----
C return the current page unit
C
C Parameters:
C variable      type  I/O  meaning
C XMIN          R     O    x coordinate of the lower, left corner
C                of the plot page in cm
C YMIN          R     O    y coordinate of the lower, left corner
C                of the plot page in cm
C XMAX          R     O    x coordinate of the upper, right corner
C                of the plot page in cm
C YMAX          R     O    y coordinate of the upper, right corner
C                of the plot page in cm

C -----
C          SUBROUTINE QUERYTEXTLENGTH(TEXT,H,LENGTH,IERR)
C -----
C return the length of TEXT with a font with size H
C
C Parameters:
C variable      type  I/O  meaning
C TEXT          C     I    text
C H             R     I    height of the characters in the same unit
C                as the output page unit
C LENGTH       R     O    length in the same unit as H

C -----
C          subroutine readgif(infile,left,top,ierr)
C -----
C load a gif file to (left,top), do not cover the menubar, if any
C
C Parameters:
C variable      type  I/O  meaning
C infile        c     i    input file name
C left          r     i    left coord. to paste the image to
C top           r     i    top coord. to paste the image to
C IERR          I     O    error code

```

```

C -----
C          SUBROUTINE RGBBACKG(R,G,B,IERR)
C -----
C Set the rgb background color
C
C Parameters:
C variable      type   I/O   meaning
C R              R     I     red, 0 to 1
C G              R     I     green, 0 to 1
C B              R     I     blue, 0 to 1
C IERR           I     O     error code

C -----
C          SUBROUTINE RGBFOREG(R,G,B,IERR)
C -----
C Set the rgb foreground color
C
C Parameters:
C variable      type   I/O   meaning
C R              R     I     red, 0 to 1
C G              R     I     green, 0 to 1
C B              R     I     blue, 0 to 1
C IERR           I     O     error code

C -----
C          SUBROUTINE SCALEPLOT(XMIN,YMIN,XMAX,YMAX)
C -----
C Scales a page (software scaling)
C The plot page is scaled so that the coordinates of the lower, left
C corner become (XMIN,YMIN) and those of the upper, right corner are
C (XMAX,YMAX) after the call. This call modifies the definition of
C the plot page as obtained by a call to the routine INITPLOT
C
C Parameters:
C variable      type   I/O   meaning
C XMIN           R     I     x coordinate of the lower, left corner
C                 of the plot page in cm
C YMIN           R     I     y coordinate of the lower, left corner
C                 of the plot page in cm
C XMAX           R     I     x coordinate of the upper, right corner
C                 of the plot page in cm
C YMAX           R     I     y coordinate of the upper, right corner
C                 of the plot page in cm

C -----
C          SUBROUTINE SCREENDUMP(IERR)
C -----
C dump the screen to a PostScript file
C
C Parameters:
C variable      type   I/O   meaning
C IERR           I     O     error code

C -----
C          SUBROUTINE SETCURSOR(INDEX,IERR)
C -----
C set the cursor shape
C
C Parameters:
C variable      type   I/O   meaning
C INDEX         I     I     0 = arrow
C                 1 = watch
C                 2 = cross
C                 3 = open hand
C                 4 = closed hand
C                 5 = beam
C                 6 = target
C                 7 = finger
C                 8 = question mark
C IERR           I     O     error code

```



```
C -----
C      SUBROUTINE SETHJUSTIFICATION(JUSTH,IERR)
C -----
C set the horizontal justification
C
C Parameters:
C variable      type      I/O      meaning
C JUSTH         I         I         horizonatl justification
C              -1 = right
C              0 = center
C              +1 = left
C IERR          I         0         error code

C -----
C      SUBROUTINE SETPLOTINDEX(INDEX,IERR)
C -----
C Reset the plot with the current index as the current one
C
C Parameters:
C variable      type      I/O      meaning
C INDEX         I         I         index to be reset
C IERR          I         0         error code

C -----
C      SUBROUTINE SETVJUSTIFICATION(JUSTV,IERR)
C -----
C set the vertical justification
C
C Parameters:
C variable      type      I/O      meaning
C JUSTV         I         I         vertical justification
C              -1 = bottom
C              0 = center
C              +1 = up
C IERR          I         0         error code

C -----
C      SUBROUTINE SETWINDOWNAME(WNAME,INAME)
C -----
C set the name of the graphic window
C INAME is not use on Macintosh system
C
C Parameters:
C variable      type      I/O      meaning
C WNAME         C         I         window name
C INAME         C         I         icon name (X11)

C -----
C      SUBROUTINE SHOW(IERR)
C -----
C Show the plot on the screen, it does nothing if PostScript output
C
C Parameters:
C variable      type      I/O      meaning
C IERR          I         0         error code
```

## STACK Library

These routines put the plotting commands to the stack.

```

C-----#
C      SUBROUTINE MOVEPLOT(IERR)
C-----#
C      move the contents of the stack using the mouse while mousedown
C
C      Parameters:
C      variable      type      I/O      meaning
C      IERR          I          0        error code

C-----#
C      subroutine PrintPlot(Ierr)
C-----#
C      print the contents of the stack, display a dialog box to use a PS or
C      the printer driver
C
C      Parameters:
C      variable      type      I/O      meaning
C      IERR          I          0        error code

C -----#
C      SUBROUTINE SCREEN2GIF(FILENAME,COMMENT,IERR)
C -----#
C      convert the contents of the screen into a gif file
C      ignore the menubar, if any
C
C      Parameters:
C      variable      type      I/O      meaning
C      FILENAME      C          I          output file name
C      COMMENT       C          I          comment of the gif header
C      IERR          I          0        error code
C

C -----#
C      SUBROUTINE SCREEN2PRINTER(COMMAND,IERR)
C -----#
C      print the contents of the stack
C
C      Parameters:
C      variable      type      I/O      meaning
C      COMMAND       C          I          print command (UNIX only)
C      IERR          I          0        error code

C -----#
C      SUBROUTINE SCREEN2PS(FILENAME,IERR)
C -----#
C      draw the contents of the stack into a PostScript file
C
C      Parameters:
C      variable      type      I/O      meaning
C      FILENAME      C          I          output file name
C      IERR          I          0        error code

C -----#
C      SUBROUTINE SHIFTPLOT(XSHIFT,YSHIFT,IERR)
C -----#
C      shift the contents of the stack
C
C      Parameters:
C      variable      type      I/O      meaning
C      XSHIFT       R          I          shift factor in x
C      YSHIFT       R          I          shift factor in y

```

---

C IERR            I            0    error code































C -----  
C            SUBROUTINE STACK\_OFF  
C -----  
C    disable the writing to the stack

C -----  
C            SUBROUTINE STACK\_ON  
C -----  
C    enable the writing to the stack

C -----  
C            SUBROUTINE ZOOMPLOT(ZOOM,IERR)  
C -----  
C    zoom in/out the contents of the stack  
C  
C    Parameters:  
C    variable        type    I/O    meaning  
C    ZOOM            R        I        zoom factor  
C    IERR            I        0        error code

## TOOL Library

These routines enable using a toolbar. You can use following tools:

<u>icon</u>	<u>tool_name</u>
	'up'
	'down'
	'left'
	'right'
	'move'
	'zoomin'
	'zoomout'
	'fit'
	'zoomarea'
	'target'
	'?'
	'contour'
	'color'
	'rotU'
	'rotD'
	'rotL'
	'rotR'
	'leanL'
	'leanR'
	'arrow'
	'2D'
	'3D'
	'polar'
	'xSymm+'
	'xSymm-'
	'radSymm+'
	'radSymm-'
	'ySymm+'
	'ySymm-'
	'print'

```
C-----#
      SUBROUTINE ADDTOOL(TOOL)
C-----#
C activate a tool in the toolbar
C
C variable      type      I/O      meaning
C TOOL          C          I          tool identifier (name)

C-----#
      SUBROUTINE DRAW_TOOLBAR(IERR)
C-----#
C draw the toolbar
C
C variable      type      I/O      meaning
C IERR          I          0          error code

C-----#
      SUBROUTINE READ_TOOL(TOOL)
C-----#
C find out which tool has been pressed
C
C variable      type      I/O      meaning
C ITOOL         C          0          tool name
C IERR          I          0          error code
```

## UTILPLOT Library

These routines perform some utilities.

```

C-----#
C      subroutine getmaxdisp(text,ht,d,maxdisp)
C-----#
C      return the maximum number of characters of text contained within d
C      using a loaded font with height ht. If text is empty check a string
C      of "www..."., a large character
C
C      Parameters:
C      variable      type      I/O      meaning
C      TEXT          C          I          text
C      HT            R          I          height of the font
C      D              R          I          length in page unit to be checked
C      MAXDISP       I          O          max number of chars. of text contained
C                                     within D
C
C -----#
C      SUBROUTINE HSLTORGB (H,S,L,R,G,B)
C -----#
C      convert hsl to rgb
C
C      Parameters:
C      variable      type      I/O      meaning
C      H              R          I          hue, [0:360 deg]
C      S              R          I          saturation, [0:1]
C      L              R          I          lightness, [0:1]
C      R              R          O          red, [0:1]
C      G              R          O          green, [0:1]
C      B              R          O          blue, [0:1]
C
C -----#
C      SUBROUTINE MOUSE2FRAME(X,Y,NPT,IPOINT,IERR)
C -----#
C      return the coord. of the point of the input curve (plotted) closer
C      to the pressed mouse position
C
C      Parameters:
C      variable      type      I/O      meaning
C      X,Y           R          I          coord. of the plotted points
C      NPT           I          I          number of plotted points
C      IPOINT        I          O          choosen point among X,Y
C      IERR          I          O          error code
C
C -----#
C      SUBROUTINE PAGE2USER (XSCALE,YSCALE,XUP,YUP,XU,YU,IERR)
C -----#
C      convert from page to user coordinates
C
C      Parameters:
C      variable      type      I/O      meaning
C      XSCALE        R          I          scaling factor in x
C      YSCALE        R          I          scaling factor in y
C      XUP           R          O          x coord in page unit
C      YUP           R          O          y coord in page unit
C      XU            R          I          x coord in user unit
C      YU            R          I          y coord in user unit
C      IERR          I          O          error code

```

```

C -----
C          SUBROUTINE PLOTNUMBER(X,Y,HT,ZN,AL,KD,KF,IERR)
C -----
C Plot a number on the plot page
C
C Parameters:
C variable      type   I/O   meaning
C X              R     I     x-position of central point for plotting
C                  in plot unit
C Y              R     I     y-position of central point for plotting
C                  in plot unit
C HT             R     I     height of the characters in the same unit
C                  as the output page
C ZN             R     I     number to be plotted
C AL             R     I     angle (in degrees) with the horizontal
C KD             I     I     number of digits after decimal point
C KF             I     I     type of format requested:
C                          (1) integer
C                          (2) real in decimal form
C                          (3) real in exponential form
C IERR          I     O     error code (0=no error)
C
C -----
C          SUBROUTINE POWERTEN (X, Y, H, IEXP, ANGLE,IERR)
C -----
C plots a symbol as 10**IEXP
C plots at the given position a symbol 10**IEXP, restriction
C is that 99 >IEXP> -99, size is in the same unit as the output page
C unit, if IEXP=0 the '1' is plotted, if IEXP=1 the '10' is plotted
C
C Parameters:
C variable      type   I/O   meaning
C ANGLE         R4     I     angle with the horizontal to be used for
C                  drawing in degree
C IEXP          I4     I     exponent of 10 to be written
C H             R4     I     size of the number '10' in the same unit
C                  as the output page
C X             R4     I     x position in the same unit as the output
C                  page of the lower left corner of the
C                  symbol
C Y             R4     I     y position in the same unit as the output
C                  page of the lower left corner of the
C                  symbol
C IERR          I     O     error code (0=no error)
C
C Routines called: REAL2STRING, PLOTTEXT
C
C -----
C          SUBROUTINE RGBTOHSL (R,G,B,H,S,L)
C -----
C convert rgb to hsl
C
C Parameters:
C variable      type   I/O   meaning
C R              R     I     red, [0:1]
C G              R     I     green, [0:1]
C B              R     I     blue, [0:1]
C H              R     O     hue, [0:360 deg]
C S              R     O     saturation, [0:1]
C L              R     O     lightness, [0:1]
C
C -----#
C          SUBROUTINE SELECT_AREA(XMINP,XMAXP,YMINP,YMAXP,R,G,B,
C          & XL,YL,XU,YU,IERR)
C -----#
C select a region on the screen moving the mouse while mousedown
C
C Parameters:
C variable      type   I/O   meaning
C XMINP,XMAXP   R     I     x boundaries of the area on the screen to
C                  move the mouse within
C YMINP,YMAXP   R     I     y boundaries of the area on the screen to
C                  move the mouse within
C R,G,B         R     I     rgb of the rectangle (to be draw) defining
C                  the selected area

```

---

```
C XL,YL,XU,YU  R      0  boundaries of the selected area
C IERR        I      0  error code
```

```
C -----
C          SUBROUTINE USER2PAGE (XSCALE,YSCALE,XU,YU,XUP,YUP,IERR)
C -----
C convert from user to page coordinates
C
C Parameters:
C variable      type  I/O  meaning
C XSCALE        R     I    scaling factor in x
C YSCALE        R     I    scaling factor in y
C XU            R     I    x coord in user unit
C YU            R     I    y coord in user unit
C XUP           R     O    x coord in page unit
C YUP           R     O    y coord in page unit
C IERR          I     O    error code
```



## Error codes

---

<i>value</i>	<i>meaning</i>
0	no error
1	general
5	error while opening a file
6	error while reading a file
10	division by zero
11	logarithm of a number $\leq 0$
12	unsufficient dimension
21	plot package has not been opened
22	plot package has not been closed
23	too many frames
51	pointer has not been assigned
52	handle has not been assigned
53	QD error
61	memory location has not been locked/unlocked
62	size of memory block can not been changed
63	memory error