

HP 82184A

Plotter Module

Quick Reference Card

General Plotting Functions

CLIPUU Specifies plot bounds in user units, regardless of plotting mode. Interprets stack values as:

T	<i>x-minimum</i>
Z	<i>x-maximum</i>
Y	<i>y-minimum</i>
X	<i>y-maximum</i>

CSIZE Sets the character space height in GU's.

CSIZEO Sets the character space height in GU's (X-register), aspect ratio (Y-register), and slant—in current angular mode—(Z-register).

DGTIZE Enters the x- and y-coordinates of the pen's position into the X- and Y-registers when the plotter's ENTER key is pressed.

DRAW Draws a line from last pen position specified by plotter module to position specified by (x,y).

Y	<i>y</i>	} Current Units (UU's or GU's)
X	<i>x</i>	

FRAME Draws a box around the active plotting boundaries (graphic limits or plotting bounds).

GCLEAR Advances page on plotters that have a page feed mechanism.

IDRAW Draws a line from the last pen position specified by a plotter module function to a point x and y units from that position.

- IMOVE** Moves the pen from the position specified by the last plotter module function to a point x and y units from that position.
- LABEL** Prints the contents of the ALPHA register at the last pen position specified by the HP-41.
- LDIR** Sets the angle of rotation from 0° for printing labels. A positive value specifies counterclockwise rotation.
- LIMIT** Sets graphic limits in millimeters, according to values in stack. Interprets values in stack in same way as shown for **CLIPUU**. Also sets same default conditions as are set by **PINIT**.
- LOCATD** Specifies plotting bounds by digitizing the two opposite corners. When **ENTER POINT** is displayed, move pen to lower-left point and press plotter's ENTER key. When **ENTER POINT** reappears, move pen to upper-right point and press ENTER key again.
- LOCATE** Specifies plot bounds in graphic units, regardless of current plotting mode. Interprets values in stack in same way as shown for **CLIPUU**.
- LORG** Sets the label origin position (1 through 9).
- LTYPE** Uses a line type number (integer value 1 through 8) to select one of eight line types.
- LTYPEO** Operates same as **LTYPE** except that the number in the Y-register specifies the length of the repeat pattern as a percentage of the length of the diagonal between P1 and P2.
- LXAXIS** Draws x -axis between specified minimum and maximum x -values and at the specified y -intercept. Labels tic marks below the current plot bounds. A negative tic-spacing parameter specifies horizontal labels.

T	<i>x-maximum</i>
Z	<i>x-minimum</i>
Y	<i>tic spacing</i>
X	<i>y-intercept</i>

LYAXIS Draws y-axis between specified minimum and maximum y-values and at the specified x-intercept. Labels tic marks to the left of the current plot bounds. Labels are always printed horizontally.

T	<i>y-maximum</i>
Z	<i>y-minimum</i>
Y	<i>tic spacing</i>
X	<i>x-intercept</i>

MOVE Moves the pen to specified (x,y) coordinate without drawing a line. Interprets stack in same way as shown for **DRAW**.

PCLBUF Clears I/O buffer created by **PINIT** and returns 26 memory registers to available program memory.

PDIR Rotates the x- and y-axes to the angle specified in the X-register. Used only to rotate plot direction for incremental plotting (**IMOVE**, **IDRAW**, and **IPLLOT**) and relative plotting (**RPLLOT**). Does not affect pen movement specified in absolute coordinates. **PDIR** angles are in reference to the original default **PDIR** angle (0°).

PEN Selects pen specified by integer portion of a value in X-register.

PENDN Lowers pen to plotting surface.

PENUP Lifts pen from plotting surface.

PINIT When I/O buffer does not exist, uses 26 memory registers to create it. Also performs the following:

- Sets plot bounds equal to graphic limits currently maintained by plotter.
- Sets UU's equal to GU's and sets to UU mode.
- Selects pen 1; sets line type 1.
- Sets 3 GU character space height.
- Sets label origin to 1 and label direction to 0°.

- Sets x- and y-axes tic lengths to default values for your plotter.
- Sets plotting rotation to 0° .
- If I/O buffer did not exist before executing **PINIT**, sets bar code plotting parameters to default values. Otherwise does not affect current bar code plotting parameters.

PRCL	Recalls contents of the buffer register specified by a number in the X-register.
RATIO	Calculates for the current graphic limits the ratio of the x-axis length to the y-axis length.
SCALE	Sets user scale for plot bounds and sets plotter module to UU mode. Interprets values in stack in same way as shown for CLIPUU .
SETGU	Switches plotter module to Graphic Units (GU's) mode.
SETUU	Switches plotter module to User Units (UU's) mode.
TICLEN	Sets vertical and horizontal tic lengths to specified percentage of corresponding dimensions of graphic limits (GU's only).
UNCLIP	Resets the plot bounds to the graphic limits without changing the current user scale.
WHERE	Enters in the X- and Y-registers the corresponding coordinates (in current units) of the point specified by the last HP-41 pen movement function. Places current pen status in Z-register.
XAXIS	Draws a horizontal axis at the specified y-intercept (UU's or GU's).
XAXISO	Draws x-axis between the specified minimum and maximum x-values and at the specified y-intercept, with tic marks at specified intervals. Interprets parameters in current units and in same way as shown under LXAXIS .
YAXIS	Draws a vertical axis at the specified x-intercept for current plotting mode.
YAXISO	Draws a y-axis between minimum and maximum y-values at the specified x-intercept, with

tic marks at specified intervals. Interprets parameters in current units and in same way as shown under **LXAXIS**.

Plot-Option Functions

The following four functions: (1) Use values in the X- and Y-registers to define next pen position—in current units (UU's or GU's); (2) move pen from the last position specified by a plotter module function to new position using existing pen status—"up" or "down"; (3) set pen status to "down" when pen reaches new point—except as provided by **PLREGX**.

PLOT Moves pen to or draws a line to the point specified by (x,y) coordinates.

IPLOT Same as **PLOT** except that x and y specify increments from last pen position specified by a plotter module function.

RPLOT Same as **PLOT** except that x and y specify increments from the last pen position specified by a plotter module function *other than* **RPLOT**.

PLREGX Moves pen or draws line to each point specified by the coordinates in the series of data storage registers R_{iii} through R_{fff} , as specified by the number $iii.fff$ in the X-register. R_{iii} specifies x_0 ; R_{iii+1} specifies y_0 , and so on. If **PLREGX** finds an Alpha character in either data register of any pair included in R_{iii} through R_{fff} , the pen status is switched to "up". It remains so until a subsequent pair of data registers containing only numeric data is encountered.

Utility Plotting Program

NEWPLOT Prepares for plotting by prompting for six parameters, automatically assigning six default parameters, and transferring execution to **REPLOT**. Uses R_{00} through R_{11} —which form the *plotting data base*.

REPLOT Prompts you to either automatically generate a complete plot (by pressing **R/S**) or edit contents of any register nn (by pressing nn **R/S**).

- PLINIT** Initializes your plotter according to parameters in plotting data base.
- PLTUXY** Plots a function or data specified by parameters in plotting data base.
- PLANOT** Frames plotting area then annotates plot according to parameters in plotting data base.
- Y?** Prompts you to key in the next y-coordinate.
- X?** Prompts you to key in the next x-coordinate.

Utility Plotting Program User Parameters

Storage	Parameter	Format
R ₀₈	NAME?	<i>label</i> or <i>bbb.eeet</i>
R ₀₀	XMIN	<i>n</i>
R ₀₁	XMAX	<i>n</i>
R ₀₅	XINC	<i>-n, int</i> or <i>label</i>
R ₀₄	YMIN	<i>n</i>
R ₀₇	YMAX	<i>n</i>
R ₀₂	PLTPRM	<i>ccclp.bbbt</i> or <i>label</i>
R ₀₃	ANNOT	$\pm F_xXXxx.F_yYYyy$
R ₀₆	XAXAT	<i>n</i>
R ₀₉	YAXAT	<i>n</i>

Bar Code Functions

- BC** Uses bit pattern in ALPHA register to plot a single row of HP-41 bar code.
- BCA** Converts data in ALPHA register to an Alpha-replace bar code bit pattern. Places value in X-register to indicate number of bytes in bit pattern.
- BCAA** Operates in same way as **BCA** except that bit pattern is for Alpha-Append bar code.
- BCCKSM** Computes checksum of bit pattern in ALPHA register and places checksum in byte specified by **bb** (in X-register), counting from the right. For HP-41 bar code:
- One-Byte Paper Keyboard: **bb** = 1
- Two-Byte Paper Keyboard: **bb** = 2
- Direct Execution: **bb** = no. of bytes in ALPHA + 1

BCO

Plotter Option. Operates the same as **BC** except that (1) HP-41 directional bars are not automatically added to row; (2) you specify how many rightmost bits to plot from first and last bytes; (3) enables you to interpret bit patterns in various ways, depending upon current bar code type. (Refer to **BCSIZE**.) Positive number in X-register specifies plotter option.

Z	<table><tr><td><i>number of bits</i></td></tr></table> (Leftmost Byte)	<i>number of bits</i>
<i>number of bits</i>		
Y	<table><tr><td><i>number of bits</i></td></tr></table> (Rightmost Byte)	<i>number of bits</i>
<i>number of bits</i>		
X	<table><tr><td><i>bb</i></td></tr></table> Bytes in Row (Includes Leading and Trailing Bytes)	<i>bb</i>
<i>bb</i>		

Printer Option. Prints on HP 82162A Thermal Printer a row of HP-41 bar code corresponding to bit pattern in ALPHA register. Negative number ($-bb$) in X-register specifies printer option; $|-bb|$ specifies number of bytes in row. To use after **BCA**, **BCAA**, **BCX**, or **BCXS**, just press **CHS** and execute **BCO**. To use after **BCP** press **RCL** \square **T** **CHS** **BCO**.

BCP

Uses program name in Y-register and row number/bit pattern (*rrr.bb*) in X-register to place in ALPHA register a bit pattern for specified program row. Negative *rrr.bb* specifies “private” bar code. Places following values in stack:








T	<table><tr><td><i>bb</i></td></tr></table>	<i>bb</i>	Number of Bytes in Row
<i>bb</i>			
Z	<table><tr><td><i>fff.fff</i></td></tr></table>	<i>fff.fff</i>	Lines Coded in Row
<i>fff.fff</i>			
Y	<table><tr><td><i>name</i></td></tr></table>	<i>name</i>	Program Name
<i>name</i>			
X	<table><tr><td>$\pm rrr.bb$</td></tr></table>	$\pm rrr.bb$	Next Row Number and Length
$\pm rrr.bb$			

BCREGX

Transforms the decimal values in a block of data registers into a bit pattern in ALPHA register. Each register corresponds to one byte. Uses *fff.fff* in X-register to specify first and last data registers. R_{fff} corresponds to leftmost byte in bit pattern. Does not compute checksum.

BCSIZE

Uses absolute values of numbers in X- and Y-registers to adjust bar/space proportions (in APU's) and to specify bar code type (0 through 3).

Y:	<i>nn</i>	.	<i>t</i>	<i>ww</i>	<i>ss</i>
					
	Narrow Bar Width		Bar Code Type (0 = HP-41)	Wide Bar Width	Space Width
X:	<i>pp</i>	.	<i>hhh</i>	<i>aa</i>	
					
	Pen Width		Bar Height	Alternate Space Width (Non HP-41 Bar Code Only)	