

SECTION 3

DM/PL COMMAND SPECIFICATIONS

NOTE

If you have purchased a plotting software package, you may skip this section of the manual since that program will correctly handle the plotter's DM/PL inputs and outputs. You only need to read this section if you are developing your own plotting programs.

3.1 INTRODUCTION

This section contains the information necessary to write plotter programs using the DM/PL plotting language. This includes general information for using DM/PL, detailed descriptions of the various DM/PL commands for this plotter, and programming tips.

3.2 COMMAND FORMAT

The general format of the DM/PL commands is:

MNEMONIC(parameter)

- *Mnemonic* is the one or two character mnemonic (or abbreviation) of the command. This is how the command must be sent to the plotter.
- *Parameter* is additional data required for some of the commands. The parameters (if any) are explained with the command.

3.3 COMMAND ORGANIZATION

The DM/PL commands are described fully in the *DM/PL Command Language Manual*, part number MI-1044 (available as an option from your Houston Instrument product dealer, or direct from Houston Instrument by calling toll-free: 1-800-444-3425). The DM/PL manual describes all DM/PL commands used with various Houston Instrument plotters that support this language. Because of technical differences between the plotters, some of the commands require different parameters in order to operate properly with a given plotter. These commands are noted in the DM/PL manual. However, you will find that most of the commands operate exactly the same for all DM/PL-based plotters.

The DM/PL commands that the DMP-60 plotters support are listed in Paragraph 3.4. These commands are listed by related functional groups for ease of reference. Paragraph 3.4 also lists any required parameters when using a given command with these plotters. Unless otherwise noted in the descriptions of the commands, all listed DM/PL commands are fully supported and operate exactly as described in the DM/PL manual. Otherwise, be sure to observe the parameters given for the command to ensure predictable operation of the plotter.

Note that these are the only DM/PL commands supported by the DMP-60 plotters. If the plotters receive a command that they do not support, the results cannot be predicted. Be sure to check this listing before running any software written for another DM/PL-based plotter to ensure predictable operation.

3.4 DMP-60 DM/PL COMMANDS

The DMP-60 DM/PL commands are listed below.

Select Commands:

Mode One Select

::

Mode Two Select

::*lpc d,*

or

::*l(nn nn nn nn)pc d,*

Deselect

@

Plot Setup Commands:

Set Velocity

Vn,

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Pen up velocities are specified in the plotter menu.

English Codes (n)	Velocity (ips)	Metric Codes (n)	Velocity (mm/sec)
1	1	2	25
2	2	6	50
4	4	10	76
6	6	15	127
8	8	20	177
10	10	25	228
12	12	30	279
14	14	35	330
16	16	40	381
18	18	45	431
20	20	50	482
22	22	55	533
24	24	60	584
28*	28	70*	685
32*	32	80*	787

*DMP-61 only. These velocities are mapped to 24 ips/584 mm/s if they are sent to the DMP-62.

Set Window/Viewport Limits

W *wxll, wyll, wxur, wyur, vpxll, vpyll, vpxur, vpyur,*

Frame Advance

Fn,

Small Chart (Left Plot-Origin)

EH

Large Chart (Right Plot-Origin)

EF

Mode Two Prompt Enable

EBnn,

End of Text

ETnn,

Addressing Commands:

Absolute Pen Positioning

A

Relative Pen Positioning

R

Coordinate Addressing

ECn,

Home Position

H

Set Plot Origin

O

Pen Control Commands:

New Pen

P_n,

If the pen changer accessory is installed and used on the plotter, this command causes the pen holder to return the presently used pen to its respective pen stall and retrieve a new pen. The pen that is actually retrieved depends on which command is sent and how many pens are specified as being used in the menu (see Section 2.5.5). The New Pen command mapping chart is provided in Table 3-1.

The *P0* causes the pen holder to return the presently used pen to its respective stall and then park at home position.

TABLE 3-1. DM/PL NEW PEN COMMAND MAPPING CHART

PEN CONTROL (<i>P_n</i>)	FUNCTION
P0	Return Pen/move to home
P1	Select pen one
P2	Select pen two
P3	Select pen three
P4	Select pen four
P5	Select pen five
P6	Select pen six
Mapped DM/PL New Pen Commands:	
P7	Select pen one
P8	Select pen two
P1 +	Select pen two
P2 +	Select pen three
P3 +	Select pen four
P4 +	Select pen five
P5 +	Select pen six
P6 +	Select pen one
P7 +	Select pen two

Pen Down

D

Pen Up

U

Line Type Commands:

Line Type

L*n*,

Vector Move Commands:

Vector Move

x,y,

Increment Move

n

n is a lower case alphabetic letter.

p = one + y increment

q = one + x, + y increment

r = one + x increment

s = one + x, -y increment

t = one -y increment

u = one -x, -y increment

v = one -x increment

w = one -x, + y increment

y = pen up

z = pen down

Text Commands:

Simple Text

Srhh(text)___

Extended Text

S(*Gn, Fn, Sn, Wn, Xn, Yn, Cn, Ln, I/NI, NP/P/V, TD/TR, Dn, Hn*) (text)___

Curve Commands:

Arc Plot

CA x,y,d, or

CA(Pn,Hn,Dn,Xn,Yn,Ln) x,y,d,

Circle Plot

CC x,y,r, or

CC(Pn,Hn,Dn,Xn,Yn,Ln) x,y,r,

Ellipse Plot

CE x,y,x1,y1,x2,y2 or

CE(Pn,Hn,Dn,Xn,Yn,Ln) x,y,x1,y1,x2,y2,

Curved Move

CM x1,y1,x2,y2,d or

CM(Pn,Hn,Dn,Xn,Yn,Ln) x1,y1,x2,y2,d,

Closed Figure

CF border list CS or

CF(Pn,Hn,Dn,Xn,Yn,Ln) border list CS

General Curve Plot

CG $x_1, y_1, x_2, y_2, \dots, x_n, y_n$, CS

Marker Commands:

Marker Plot

*Mh*m,

Extended Marker Plot

M(*Sn*)m,

Inquiry Commands:

Report

ER

Query

Q

Digitize

ED

Elapsed Time

EE

Plotter Control Commands:

Test

T or

T(*n*)

Reset

Z

Plot Pause

EL

UART Setup

EU*nnn*

Pass-Through Port Enable

X

End of Plot

e This command marks the end of a plot file.

3.5 DM/PL PROGRAMMING CONCEPTS AND RULES

The following paragraphs describe various considerations when writing and using DM/PL plotter programs.

- The plotter **MUST** be "on-line" with the host computer (ready or plot mode) in order to respond to DM/PL commands.
- When writing plotting programs, be sure to leave at least one space or comma as a delimiter between coordinate pairs and DM/PL commands, as explained in the DM/PL manual.
- The basic unit of measurement for the plotter is one increment. The size of the increment depends upon the coordinate addressing (EC*n*) command presently in effect. To convert a line length from inches to plotter increments multiply by 200 if 0.005 inch addressing (EC5) is in effect, multiply by 1000 if 0.001 inch addressing (EC1) is in effect, multiply by 254 if 0.1 mm addressing (ECM) is in effect, or multiply by 1016 if 0.025 mm addressing (ECN) is in effect. The actual length of a line is not a factor if programming with the EC0 command as long as a 1:1.5 ratio is maintained for x-,y-axial moves.
- A number with either no sign or with a plus (+) sign is considered to be a positive value (for example, 256 or +128). A negative value must always have a minus (-) sign (for example, -64).

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- The plotter uses the Cartesian coordinate system to locate the plots on the chart. This system consists of three orthogonal (mutually perpendicular) axes known as x, y, and z. The origin of the system varies according to the chart size as shown in Figures 1-6 and 1-7. The x and y values are both zero at the origin.

Movement in the x- or y-axis depends upon the origin location selected with the plotter menu (regardless of actual chart size). With right origin selected, movement in the x-axis is done by moving the chart in and out of the plotter, and y-axis movement is by moving the pen carriage left and right. With left origin size selected, movement in the x-axis is done by moving the pen carriage left and right, and y-axis movement is done by moving the chart in and out of the plotter. (With auto origin selected, the origin location and axes orientation depend on the chart size installed.) Movement in the z-axis is simply moving the pen up or down regardless of chart orientation.

- The deselect (@) command takes the plotter off-line from the host computer, and retains any plotter parameters presently in effect. The reset (Z) command also takes the plotter off-line from the host computer, but resets all plotter parameters to the default values. In general, it is better to use the deselect command to terminate plotter operation, as explained in the DM/PL manual.
- Note that the following commands are not recommended for use in batch plotting since operator intervention is required or the plotter may send a response when the computer is not expecting it: UART Setup *EU*, Report *ER*, Mode Two Plotter Select *:/I*, Query *Q*, or Digitize *ED*.
- After selecting the plotter and before sending any actual drawing data, be sure to first select a resolution, an addressing mode, a pen, a chart size, and define the plotting area to be used.