HEWLETT PACKARD

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HP 7550A GRAPHICS PLOTTER POCKET GUIDE

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How To Use This Guide

This pocket guide is divided into two sections. The first section lists each HP-GL instruction in alphabetic order of the instruction's mnemonic. Also included are tables of default conditions, HP-GL errors, and device-control errors. If you know what the instruction does, but don't know the mnemonic, the index on the following pages groups the HP-GL instructions according to function. Refer to this index to find the instruction you need as well as its page number.

The second section of this guide lists each device-control instruction in alphabetic order of the escape sequence.

Syntax and parameter ranges are provided for each HP-GL and device-control instruction. The semicolon is included as the terminator for all HP-GL instructions. (However, a semicolon or the next mnemonic are each valid terminators. In an HP-IB configuration, a line feed character is also a valid terminator.) [TERM] means the terminator sent by the plotter at the end of an output response. It is CR LF in an HP-IB configuration, and CR or as set by an ESC.M instruction in an RS-232-C/CCITT V.24 configuration.

HP-GL Instruction Summary

AA, ARC ABSOLUTE

AA X, Y, arc angle (, chord tolerance);

Parameter	Format	Range	Default
X- and Y-coordinates	decimal	-2^{23} to $2^{23}-1$ current units	none
arc angle	decimal	-2^{23} to $2^{23}-1$ degrees	none
chord tolerance	decimal	-2^{23} to $2^{23}-1$ current mode	5 degrees

AF or AH, ADVANCE PAGE

AF; or *AH*;

Parameter	Format	Range	Default
n	integer	-2^{23} to $2^{23}-1$	none

AP, AUTOMATIC PEN OPERATIONS

AP n; or *AP*;

Parameter	Format	Range	Default
n	integer	0–15	7

AR, ARC RELATIVE

AR X, Y, arc angle (, chord tolerance);

Parameter	Format	Range	Default
X- and Y-increments	decimal	-2^{23} to $2^{23}-1$ current units	none
arc angle	decimal	-2^{23} to $2^{23}-1$ degrees	none
chord tolerance	decimal	-2^{23} to $2^{23}-1$ current mode	5 degrees

AS, ACCELERATION SELECT

AS pen acceleration (, pen number); or *AS*;

Parameter	Format	Range	Default
pen acceleration	integer	1–6	6
pen number	integer	1–8	all pens

BF, BUFFER PLOT

BF;

BL, BUFFER LABEL

BL c . . . c *term* or *BL term* (where *term* is the label terminator defined by the DT instruction)

Parameter	Format	Range	Default
c . . . c (up to 150 characters are buffered)	label	any character	none

CA, DESIGNATE ALTERNATE CHARACTER SET

CA set; or *CA*;

Parameter	Format	Range	Default
set	integer	−1, 0–19, 30–49	0

CC, CHARACTER CHORD ANGLE

CC chord angle; or *CC*;

Parameter	Format	Range	Default
chord angle	decimal	-2^{23} to $2^{23}-1$	5 degrees

CI, CIRCLE

CI radius (, chord tolerance);

Parameter	Format	Range	Default
radius	decimal	-2^{23} to $2^{23}-1$ current units	none
chord tolerance	decimal	-2^{23} to $2^{23}-1$ current mode	5 degrees

CM, CHARACTER SELECTION MODE

CM switch mode (, fallback mode); or *CM*;

Parameter	Format	Range	Default
switch mode	integer	0–3	0
fallback mode	integer	0–1	0

CP, CHARACTER PLOT

CP spaces, lines; or *CP*;

Parameter	Format	Range	Default
spaces	decimal	-2^{23} to $2^{23}-1$	none
lines	decimal	-2^{23} to $2^{23}-1$	none

CS, DESIGNATE STANDARD CHARACTER SET

CS set; or *CS*;

Parameter	Format	Range	Default
set	integer	−1, 0–19, 30–49	0

CT, CHORD TOLERANCE

CT n; or *CT*;

Parameter	Format	Range	Default
n	integer	0 or 1	0

CV, CURVED LINE GENERATOR

CV n (, input delay); or *CV*;

Parameter	Format	Range	Default
n	integer	0 or 1	0
input delay	integer	-2^{23} to $2^{23}-1$ milliseconds	100 ms

DC, DIGITIZE CLEAR

DC;

DF, DEFAULT

DF;

See table on Page 28.

DI, ABSOLUTE DIRECTION

DI run, rise; or *DI*;

Parameter	Format	Range	Default
run (cos θ)	decimal	-2^{23} to $2^{23}-1$	1
rise (sin θ)	decimal	-2^{23} to $2^{23}-1$	0

DL, DEFINE DOWNLOADABLE CHARACTER

DL character number (, pen control), X,Y (, . . .) (, pen control) (, . . .); or *DL* character number; or *DL*;

Parameter	Format	Range	Default
character number	integer	33–126	none
pen control	integer	−128	none
X,Y coordinates	integer	−127–127	none

DP, DIGITIZE POINT

DP;

DR, RELATIVE DIRECTION

DR run, rise; or *DR*;

Parameter	Format	Range	Default
run (cos θ)	decimal	-2^{23} to $2^{23}-1$	1% of $\lvert P2_X - P1_X \rvert$
rise (sin θ)	decimal	-2^{23} to $2^{23}-1$	0% of $\lvert P2_Y - P1_Y \rvert$

DS, DESIGNATE CHARACTER SET INTO SLOT

DS slot, set; or *DS*;

Parameter	Format	Range	Default
slot	integer	0–1 (HP modes) 0–3 (ISO modes)	0
set	integer	−1, 0–19, 30–49	0

DT, DEFINE LABEL TERMINATOR

DT label terminator; or *DT*;

Parameter	Format	Range	Default
label terminator	label	any character except **NULL, LF, ESC,** and ; (decimal equivalents 0, 10, 27, and 59, respectively)	**ETX** (decimal equivalent 3)

EA, EDGE RECTANGLE ABSOLUTE

EA X-coordinate, Y-coordinate;

Parameter	Format	Range	Default
X- and Y-coordinates	decimal	-2^{23} to $2^{23}-1$ current units	none

EP, EDGE POLYGON

EP;

ER, EDGE RECTANGLE RELATIVE

ER X-increment, Y-increment;

Parameter	Format	Range	Default
X- and Y-increments	decimal	-2^{23} to $2^{23}-1$ current units	none

ES, EXTRA SPACE

ES spaces (, lines); or *ES*;

Parameter	Format	Range	Default
spaces	decimal	-2^{23} to $2^{23}-1$	0
lines	decimal	-2^{23} to $2^{23}-1$	0

EW, EDGE WEDGE

EW radius, start angle, sweep angle (, chord tolerance);

Parameter	Format	Range	Default
radius	decimal	-2^{23} to $2^{23}-1$ current units	none
start angle	decimal	-2^{23} to $2^{23}-1$ degrees, modulo 360	none
sweep angle	decimal	-2^{23} to $2^{23}-1$ degrees, truncated at ±360	none
chord tolerance	decimal	-2^{23} to $2^{23}-1$ current mode	5 degrees

FP, FILL POLYGON

FP;

FS, FORCE SELECT

FS pen force (, pen number); or *FS*;

Parameter	Format	Range	Default
pen force	integer	1–8	depends on carousel type
pen number	integer	1–8	all pens

FT, FILL TYPE

FT type(, spacing(, angle)); or *FT*;

Parameter	Format	Range	Default
fill type	integer	1–6	1
spacing	decimal	0 to $2^{23}-1$ current units	depends on fill type
angle	decimal	-2^{23} to $2^{23}-1$ degrees, modulo 360	0 degrees

GC, GROUP COUNT

GC count number; or *GC*;

Parameter	Format	Range	Default
count number	integer	-2^{23} to $2^{23}-1$	0

IM, INPUT MASK

IM E-mask value (, S-mask value(, P-mask value)); or *IM*;

Parameter	Format	Range	Default
E-mask value	integer	0–255	223
S-mask value	integer	0–255	0
P-mask value	integer	0–255	0

IN, INITIALIZE

IN;

IP, INPUT P1 AND P2

IP $P1_X$, $P1_Y$(, $P2_X$, $P2_Y$); or *IP*;

Parameter	Format	Range	Default
X- and Y-coordinates	integer	-2^{23} to $2^{23}-1$ plotter units	depends on paper size

IV, INVOKE CHARACTER SLOT

IV slot,(left); or *IV*;

Parameter	Format	Range	Default
slot	integer	0–1 (HP modes) 0–3 (ISO modes)	0
left	integer	0–1	0

IW, INPUT WINDOW

IW X_1, Y_1, X_2, Y_2; or *IW*;

Parameter	Format	Range	Default
X- and Y-coordinates	integer	-2^{23} to $2^{23}-1$ current units if **ENHANCED** function key is on; plotter units if **STANDARD** function key is on	current hard-clip limits (depends on paper size)

KY, DEFINE KEY

KY key (, function); or *KY*;

Parameter	Format	Range	Default
key	integer	1–4	none
function	integer	0–12	none

LB, LABEL

LB c . . . c *term* (where *term* is the label terminator defined by the DT instruction)

Parameter	Format	Range	Default
c . . . c	label	any character	none

LO, LABEL ORIGIN

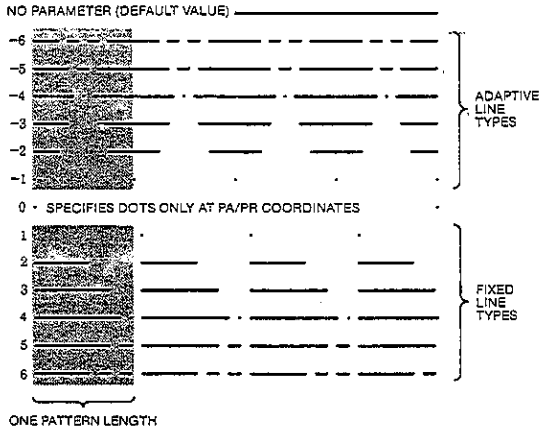
LO position number; or *LO*;

LO3	LO6	LO9
LO2	LO5	LO8
LO1	LO4	LO7
LO13	LO16	LO19
LO12	LO15	LO18
LO11	LO14	LO17

LT, LINE TYPE

LT pattern number (, pattern length); or *LT*;

Parameter	Format	Range	Default
pattern number	integer	−6–6	no parameter (solid line)
pattern length	decimal	0 to $2^{23}-1$ percentage	4% of the diagonal distance between P1 and P2



NR, NOT-READY

NR;

OA, OUTPUT ACTUAL POSITION AND PEN STATUS

OA;

Response: X,Y,P [TERM] — integers, in ASCII.
X,Y — in plotter units within current hard-clip limits.
P — 0, pen up or 1, pen down.

OC, OUTPUT COMMANDED POSITION AND PEN STATUS

OC;

Response: X,Y,P [TERM] — two decimals and one integer, in ASCII.
X,Y — in current units, -2^{23} to $2^{23}-1$.
P — 0, pen up or 1, pen down.

OD, OUTPUT DIGITIZED POINT AND PEN STATUS

OD;

Response: X,Y,P [TERM] — integers, in ASCII.
X,Y — in **STANDARD** mode represent plotter units.
in **ENHANCED** mode represent current units.
P — 0, pen up or 1, pen down.

OE, OUTPUT ERROR

OE;

Response: Error number [TERM] — a positive ASCII integer, 0–7.

OF, OUTPUT FACTORS

OF;

Response: 40,40 [TERM] — integers, in ASCII.

OG, OUTPUT GROUP COUNT

OG;

Response: Count number, escape status [TERM] — integers, in ASCII.
Count number — -2^{23} to $2^{23}-1$.
Escape status — 0 or −1.

OH, OUTPUT HARD-CLIP LIMITS

OH;

Response: X_{LL}, Y_{LL}, X_{UR}, Y_{UR} [TERM] — ASCII integers representing plotter units.

OI, OUTPUT IDENTIFICATION

OI;

Response: 7550 firmware revision letter [TERM] — ASCII string, five characters.

OK, OUTPUT KEY

OK;

Response: Function key pressed [TERM] — integer in ASCII from 0–4.

OL, OUTPUT LABEL LENGTH

OL;

Response: Length, characters, line feeds [TERM] — in ASCII.
Length — longest line in the buffered label as decimal number with three places to the left and four places to the right of the decimal. In terms of the space dimension of CP cell.
Characters — integer, the number of printing characters and spaces in the longest line of the buffered label.
Line feeds — integer, net number of line feeds.

OO, OUTPUT OPTIONS

OO;

Response: c,1,0,0,1,1,0,1 [TERM] — integers in ASCII.
c — 0 to 3.

OP, OUTPUT P1 AND P2

OP;

Response: $P1_X$, $P1_Y$, $P2_X$, $P2_Y$ [TERM] — ASCII integers representing plotter units.

OS, OUTPUT STATUS

OS;

Response: Status [TERM] — integer in ASCII in the range 0 to 255. Power-on status, 26.

OT, OUTPUT CAROUSEL TYPE

OT;

Response: Type, map [TERM] — integers in ASCII.
Type — −1 to 4.
Map — 0 to 255.

OW, OUTPUT WINDOW

OW;

Response: X_{LL}, Y_{LL}, X_{UR}, Y_{UR} [TERM] — integers, in ASCII.
X,Y — in current units if ENHANCED function key is on.
in plotter units if STANDARD function key is on.

PA, PLOT ABSOLUTE

PA X,Y (,...); or *PA*;

Parameter	Format	Range	Default
X- and Y-coordinates	decimal	-2^{23} to $2^{23}-1$ current units	none

PB, PRINT BUFFERED LABEL

PB;

PD, PEN DOWN

PD X,Y (,...); or *PD*;

Parameter	Format	Range	Default
X- and Y-coordinates	decimal	-2^{23} to $2^{23}-1$ current units	none

PG, PAGE FEED

PG n; or *PG*;

Parameter	Format	Range	Default
n	integer	-2^{23} to $2^{23}-1$	none

PM, POLYGON MODE

PM n;

Parameter	Format	Range	Default
n	integer	0–2	0

PR, PLOT RELATIVE

PR X,Y (,...); or *PR*;

Parameter	Format	Range	Default
X- and Y-increments	decimal	-2^{23} to $2^{23}-1$ current units	none

PT, PEN THICKNESS

PT pen thickness; or *PT*;

Parameter	Format	Range	Default
pen thickness	decimal	0.1–5.0 millimetres	.3

PU, PEN UP

PU X,Y (,...); or *PU*;

Parameter	Format	Range	Default
X- and Y-coordinates	decimal	-2^{23} to $2^{23}-1$ current units	none

RA, FILL RECTANGLE ABSOLUTE

RA X-coordinate, Y-coordinate;

Parameter	Format	Range	Default
X- and Y-coordinates	decimal	-2^{23} to $2^{23}-1$ current units	none

RO, ROTATE COORDINATE SYSTEM

RO n; or *RO*;

Parameter	Format	Range	Default
n	integer	0 or 90 degrees	0

RP, REPLOT

RP n;

Parameter	Format	Range	Default
n	integer	1–99	1

RR, FILL RECTANGLE RELATIVE

RR X-increment, Y-increment;

Parameter	Format	Range	Default
X- and Y-increments	decimal	-2^{23} to $2^{23}-1$ current units	none

SA, SELECT ALTERNATE CHARACTER SET

SA;

SC, SCALE

SC X_{min}, X_{max}, Y_{min}, Y_{max}; or *SC*;

Parameter	Format	Range	Default
X- and Y-ranges	integer	-2^{23} to $2^{23}-1$ user units	none

SI, ABSOLUTE CHARACTER SIZE

SI width, height; or *SI*;

Parameter	Format	Range	Default
width	decimal	-2^{23} to $2^{23}-1$ centimetres*	0.285 cm (A3/B-size paper) 0.187 cm (A4/A-size paper)
height	decimal	-2^{23} to $2^{23}-1$ centimetres*	0.375 cm (A3/B-size paper) 0.269 cm (A4/A-size paper)

*excluding zero (0) and values approaching zero

SL, CHARACTER SLANT

SL tan θ; or *SL*;

Parameter	Format	Range	Default
tangent θ	decimal	± 0.05 to ± 2 for default characters ± 0.05 to ± 3.5 for large characters	0 (no slant)

SM, SYMBOL MODE

SM character; or *SM*;

Parameter	Format	Range	Default
character	label	any printing character (decimal equivalents 33–126)	none

SP, SELECT PEN

SP pen number; or *SP*;

Parameter	Format	Range	Default
pen number	integer	0–8	0

SR, RELATIVE CHARACTER SIZE

SR width, height; or *SR*;

Parameter	Format	Range	Default
width	decimal	-2^{23} to $2^{23}-1$ percentage*	0.75% of $\lvert P2_X - P1_X \rvert$
height	decimal	-2^{23} to $2^{23}-1$ percentage*	1.5% of $\lvert P2_Y - P1_Y \rvert$

*excluding zero (0) and values approaching zero

SS, SELECT STANDARD CHARACTER SET

SS;

TL, TICK LENGTH

TL tp (, tn); or *TL*;

Parameter	Format	Range	Default
tp and tn	decimal	0 to $2^{23}-1$ percentage	0.5% of $\lvert P2_X - P1_X \rvert$ and of $\lvert P2_Y - P1_Y \rvert$

UC, USER-DEFINED CHARACTER

UC (pen control,) X-increment, Y-increment (, pen control) (, . . .); or *UC*;

Parameter	Format	Range	Default
pen control	integer	STANDARD:* ⩽99 = pen up ⩾99 = pen down ENHANCED:* ⩽9999 = pen up ⩾9999 = pen down	pen up
X- and Y-increments	integer	STANDARD:* −98 to 98 ENHANCED:* −9998 to 9998 (both in primitive grid units)	none

*The ranges depend on the setting of the front-panel STANDARD/ENHANCED function key, as shown. The pen control parameters cannot exceed the plotter's range of -2^{23} to $2^{23}-1$.

UF, USER-DEFINED FILL TYPE

UF gap_1 (, gap_2, . . . gap_{20}); or *UF*;

Parameter	Format	Range	Default
gap	integer	0 to $2^{23}-1$	none

VS, VELOCITY SELECT

VS pen speed (, pen number); or *VS*;

Parameter	Format	Range	Default
pen speed	integer	1–80	depends on carousel type
pen number	integer	1–8	all pens

WD, WRITE TO DISPLAY

WD c . . . c *term* or *WD* *term* (where *term* is the label terminator defined by the DT instruction)

Parameter	Format	Range	Default
c . . . c (up to 32)	label	any character from decimal equiv. 32 to 95	none

WG, FILL WEDGE

WG radius, start angle, sweep angle (, chord tolerance);

Parameter	Format	Range	Default
radius	decimal	-2^{23} to $2^{23}-1$ current units	none
start angle	decimal	-2^{23} to $2^{23}-1$ degrees, modulo 360	none
sweep angle	decimal	-2^{23} to $2^{23}-1$ degrees, truncated at ±360	none
chord tolerance	decimal	-2^{23} to $2^{23}-1$ current mode	5 degrees

XT, X-TICK

XT;

YT, Y-TICK

YT;

Device-Control Instruction Summary

This section lists the formal syntax for device-control instructions in alphabetical order of the escape sequence. All instructions apply to both the HP-IB and RS-232-C/CCITT V.24 configurations unless otherwise noted in the title.

SET PLOTTER CONFIGURATION

ESC . @ [(<DEC>);(<DEC>)]:

Parameters: <DEC> — Specifies logical I/O buffer size (0–12 800 bytes).

<DEC> — Decimal value 0–127. Bits 0, 1, and 4 apply to RS-232-C only.

Bit 0. Logic state 0: Disable hardwire handshake (ignore DTR line, pin 20). Logic state 1: Enable hardwire handshake (utilize DTR line, pin 20).

Bit 1. Logic state 0: Computer holds off data from the plotter using the CTS and DSR lines (pins 5 and 6). Logic state 1: Computer does not hold off data from the plotter using the CTS and DSR lines (pins 5 and 6).

Bit 2. Logic state 0: Select parse monitor mode. Logic state 1: Select receive monitor mode.

Bit 3. Logic state 0: Disable monitor mode. Logic state 1: Enable the monitor mode selected by bit 2.

Bit 4. Logic state 0: Disable block I/O error checking. Logic state 1: Enable block I/O error checking.

OUTPUT IDENTIFICATION

ESC . A

Response: <ASC>,<ASC>[TERM] — 7550A, firmware revision level (ASCII strings).

OUTPUT BUFFER SPACE

ESC . B

Response: <DEC>[TERM] — 0 to 12 800 bytes.

OUTPUT EXTENDED ERROR

ESC . E

Response: <DEC>[TERM] — 0 (no error) or 10–18.

SET HANDSHAKE MODE 1 (RS-232-C only)

ESC . H [(<DEC>);(<ASC>);
(<ASC>(;...<ASC>))]:

Parameters: <DEC> — Data block size.

<ASC> — Enquiry character.

<ASC>...<ASC> — Acknowledgment string of 1 to 10 characters.

SET HANDSHAKE MODE 2 (RS-232-C only)

ESC . I [(<DEC>);(<ASC>);
(<ASC>(;...<ASC>))]:

Parameters: <DEC> — Data block size or Xoff threshold level.

<ASC> — Enquiry character or omitted for Xon-Xoff.

<ASC>...<ASC> — Xon trigger character or acknowledgment string of 1 to 10 characters.

Independent of Set Output Mode, ESC . M.

ABORT DEVICE CONTROL (RS-232-C only)

ESC . J

ABORT GRAPHICS

ESC . K

OUTPUT BUFFER SIZE WHEN EMPTY

ESC . L

Response: <DEC>[TERM] — 0–12800 bytes, or as set by ESC . @. Not output until the buffer is empty.

SET OUTPUT MODE (RS-232-C only)

ESC . M [(<DEC>);(<ASC>);(<ASC>);
(<ASC>(;(<ASC>));(<ASC>)]:

Parameters: <DEC> — Turnaround delay, 0–9999 milliseconds.
<ASC> — Output trigger character, ASCII 0–126.
<ASC> — Echo terminate character, ASCII 0–126.
<ASC>;<ASC> — 1 or 2 output terminators. ASCII 0–127, 0 terminates string.
<ASC> — Output initiator character, ASCII 0–127.

SET EXTENDED OUTPUT AND HANDSHAKE MODE (RS-232-C only)

ESC . N [(<DEC>);(<ASC>(; . . . <ASC>))]:

Parameters: <DEC> — Intercharacter delay, 0–9999 milliseconds.
<ASC> . . . <ASC> — Xoff trigger characters or immediate response string of 1 to 10 characters, ASCII 0–127, 0 terminates string.

OUTPUT EXTENDED STATUS

ESC . O

Response: <DEC>[TERM] — Status, decimal value 0–1775.

SET HANDSHAKE MODE (RS-232-C only)

ESC . P (<DEC>):

Parameter: <DEC> — Selects standard handshake:
0 none
1 Xon-Xoff
2 ENQ/ACK
3 hardwire

SET MONITOR MODE

ESC . Q (<DEC>):

Parameter: <DEC> — 0 disables monitor mode
1 enables parse monitor mode
2 enables receive monitor mode

RESET

ESC . R

Note: Should be followed by ESC . L.

OUTPUT CONFIGURABLE MEMORY SIZE

ESC . S <DEC>:

Parameter: <DEC> — 0 requests total memory available
1 requests current I/O buffer size
2 requests current polygon buffer size
3 requests current downloadable character buffer size
4 requests current replot buffer size
5 requests current vector buffer size

Response: <DEC>[TERM] — 0 to 12800 bytes.

ALLOCATE CONFIGURABLE MEMORY

ESC . T [(<DEC>);(<DEC>);(<DEC>);
(<DEC>);(<DEC>)]:

Parameters: <DEC> — I/O buffer size: 2 to 12752
<DEC> — polygon buffer size: 4 to 12754
<DEC> — downloadable character buffer size: 0 to 12750
<DEC> — replot buffer size: 0 to 12750
<DEC> — vector buffer size: 44 to 12794

Note: Should be followed by ESC . L.

END FLUSH MODE

ESC . U

PLOTTER-ON

ESC . (or ESC . Y

PLOTTER-OFF

ESC .) or ESC . Z

HP-GL ERRORS

Error Number	Displayed Message
1	Command not recognized
2	Wrong number of parameters
3	Bad parameter
5	Unknown character set
6	Position overflow
7	Buffer overflow

DEVICE-CONTROL ERRORS

Error Number	Displayed Message
10	Invalid I/O output request
11	Invalid byte following ESC .
12	Invalid byte in device-control instruction
13	Out-of-range parameter
14	Too many parameters
15	Error in transmission
16	I/O buffer overflow
17	Baud Rate mismatch
18	Indeterminate I/O error

DEFAULT CONDITIONS

Function	Equivalent Instruction	Default Condition
Pen control	AP;	Automatic as follows: • Lift or store a motionless pen after 15 seconds for transparency fiber-tip pens or drafting pens, or after 65 seconds for paper fiber-tip pens and roller-ball pens • Select pen only when required to draw
Label buffer	BL ETX	Cleared
Alternate set	CA 0;	Character set 0
Character selection mode	CM;	HP 7-bit mode
Standard set	CS 0;	Character set 0
Chord tolerance	CT;	Set to angle mode for AA, AR, CI, and WG instructions
Character chord	CC;	Set variable-space font chord angle to 5 degrees
Digitize clear	DC;	Clear DP instruction and return to current display
Downloadable character buffer	DL;	Cleared
Relative direction	DR 1,0;	Horizontal characters
Label terminator	DT;	ETX (decimal equivalent 3)
Extra space	ES 0,0;	No extra space between characters
Fill type, spacing, and angle	FT;	• Type 1, solid bidirectional fill • 1% of the diagonal distance between P1 and P2 • 0 degrees
Mask value	IM 223,0,0;	Recognizes all defined errors
Input window	IW;	Set to hard-clip limits
Label origin	LO 1;	Standard labeling starting at current position
Line type and pattern length	LT;	• Type 1, solid line • 4% of the diagonal distance between P1 and P2
Plotting mode	PA;	Absolute
Polygon mode	PM0;PM2;	Polygon buffer cleared
Pen thickness	PT;	Thickness based on current carousel
Scaling	SC;	User-unit scaling off
Character slant	SL 0;	0 degrees
Symbol mode	SM;	Off
Relative size	SR;	• Character width = 0.75% of $\lvert P2_X - P1_X \rvert$ • Character height = 1.5% of $\lvert P2_Y - P1_Y \rvert$
Select set	SS;	Select standard character set
Tick length	TL;	tp = tn = 0.5% of $\lvert P2_X - P1_X \rvert$ for Y-tick and 0.5% of $\lvert P2_Y - P1_Y \rvert$ for X-tick
User-defined fill type	UF;	Solid bidirectional fill

Additional Default Conditions:

- The carriage-return point for labeling instructions is updated to the current pen position.
- PD and PU instructions with parameters are defaulted to be forms of the PA instruction.
- Although character size is defaulted as if "SI;" were executed, subsequent changes to the scaling points P1 and P2 will cause the character size to vary as if "SR;" were executed.

Conditions Not Affected by DF

- Locations of P1 and P2
- Current pen and its position
- Pen speed, force, and acceleration
- 90-degree rotation or axis alignment
- Curved line generator (CV instruction)
- Setting of these front-panel conditions: **AUTO FEED** key, standard/enhanced, HP-IB address, eavesdrop/standalone, handshake, modem/direct, full/half duplex, parity, 7-bit/8-bit, and baud rate
- Function key definitions established by the KY and WD instructions

Conditions You Can Store in the Plotter's Nonvolatile Memory	Factory-Set Default Conditions
HP-IB Address	05
Standard/Enhanced Mode	Standard
Eavesdrop/Stand Alone Mode	Eavesdrop
Handshake: None/Xon-Xoff/ Enq-Ack/Hardwire	None
Direct/Modem Mode	Direct
Duplex: Full/Half	Full
Parity: 7 Bits/8 Bits Off/Even/Odd	8 Bits Off
Baud Rate	2400
Manual/Automatic Paper Load	Manual