

## TABLE OF CONTENTS

SECTION	DESCRIPTION	PAGE
0	QUICK START .....	0-1
0.1	Introduction .....	0-1
0.2	What You Will Do .....	0-1
0.3	Assembly and Installation .....	0-2
0.4	Chart Size Setting .....	0-3
0.5	Chart Loading .....	0-4
0.6	Pen Installation .....	0-6
0.7	Data Cable Connection .....	0-6
0.8	Operational Check .....	0-6
0.9	Using Menu Mode .....	0-8
0.9.1	Configuring DM/PL .....	0-9
0.9.2	Configuring HPGL .....	0-10
0.10	AutoCAD and VersaCAD Setup Instructions .....	0-12
0.11	Done .....	0-14
0.12	Houston Instrument Product Support .....	0-14
0.13	Houston Instrument Products .....	0-15
0.14	Warranty Registration .....	0-15
1	GENERAL INFORMATION .....	1-1
1.1	Introduction .....	1-1
1.2	Specifications .....	1-2
1.2.1	Supplies .....	1-8
1.2.1.1	Plotter Supply Compatibility .....	1-15
1.3	Floor Stand Assembly .....	1-16
1.4	Rear and Bottom Panel Components .....	1-16
1.5	Front Panel Components .....	1-18
1.6	Powering Up the Plotter .....	1-20
1.7	Media Loading .....	1-23

## TABLE OF CONTENTS (Continued)

SECTION	DESCRIPTION	PAGE
1.8	Pens .....	1-37
1.8.1	Pen Care .....	1-39
1.8.1.1	Hard Nib and Roller Ball Pens .....	1-39
1.8.1.2	Disposable Stainless Steel and Tungsten Drafting Pens .....	1-39
1.8.1.3	Refillable Tungsten Pen .....	1-40
1.9	Serial RS-232-C Interface .....	1-41
1.9.1	(RS-232-C) Pass-Through Port Feature .....	1-45
1.10	DM/PL Digitize Mode .....	1-48
1.11	The One-Megabyte Extended Buffer Board Accessory .....	1-50
2	OPERATION .....	2-1
2.1	The Control Panel .....	2-1
2.1.1	The Reset Key .....	2-4
2.1.2	The Load Key .....	2-4
2.1.3	Resets .....	2-5
2.1.4	The Local and Enter Keys .....	2-12
2.2	Remote Mode .....	2-12
2.3	Local Mode .....	2-13
2.3.1	Local Operation .....	2-13
2.3.2	Customer Confidence Test .....	2-15
2.4	Selecting DM/PL or HPGL Plotting Language .....	2-19
2.5	DM/PL Menu Mode .....	2-20
2.5.1	Entering DM/PL Menu Mode .....	2-22
2.5.2	The DM/PL Menu Option Select Line .....	2-23
2.5.3	The DM/PL Menu Help Option .....	2-24
2.5.4	The DM/PL Parameter List Option .....	2-26
2.5.5	The DM/PL Numeric Menu Parameter Designators .....	2-28
2.5.6	Exiting DM/PL Menu Mode .....	2-35

**TABLE OF CONTENTS (Continued)**

SECTION	DESCRIPTION	PAGE
2.6	HPGL Menu Mode .....	2-36
2.6.1	Entering HPGL Menu Mode .....	2-38
2.6.2	The HPGL Menu Option Select Line .....	2-38
2.6.3	The HPGL Menu Help Option .....	2-38
2.6.4	The HPGL Parameter List Option .....	2-41
2.6.5	The HPGL Numeric Menu Parameter Designators .....	2-42
2.6.6	Exiting HPGL Menu Mode .....	2-48
2.7	Temporary Velocity Settings .....	2-49
2.8	Window Mode .....	2-52
2.8.1	Window, Scale Box, and Viewport Functions .....	2-53
2.8.2	Auto Clipping .....	2-59
2.8.3	Scaling .....	2-64
2.8.4	Auto Aspect .....	2-68
2.8.5	Mirror Image Plots .....	2-76
3	DM/PL COMMAND SPECIFICATIONS .....	3-1
3.1	Introduction .....	3-1
3.2	Command Format .....	3-1
3.3	Command Organization .....	3-2
3.4	DMP-60 DM/PL Commands .....	3-3
3.5	DM/PL Programming Concepts and Rules .....	3-11
4	HPGL 758X EMULATION LANGUAGE COMMANDS .....	4-1
4.1	Introduction .....	4-1
4.2	Command Format .....	4-2
4.3	Command Organization .....	4-4
4.4	HPGL Exceptions .....	4-11
4.4.1	Output Identification .....	4-11
4.4.2	Not Ready .....	4-11
4.4.3	Output Actual Position .....	4-11
4.4.4	Automatic Pen Pickup .....	4-12

## TABLE OF CONTENTS (Continued)

SECTION	DESCRIPTION	PAGE
4.4.5	Circle .....	4-12
4.4.6	Arc Absolute .....	4-12
4.4.7	Arc Relative .....	4-13
4.4.8	Designate Standard Character Set .....	4-13
4.4.9	Designate Alternate Character Set .....	4-15
4.4.10	Digitize Point .....	4-15
4.4.11	Output Identification .....	4-16
4.4.12	Output Status .....	4-16
4.4.13	Edge Wedge .....	4-16
4.4.14	Fill Wedge .....	4-16
4.4.15	Polygon Mode .....	4-17
4.4.16	Input Masks .....	4-17
4.4.17	Chord Tolerance .....	4-17
4.4.18	Select Pen Group .....	4-17
4.4.19	Output Carousel Type .....	4-18
4.4.20	Output Character Box Dimensions .....	4-18
4.4.21	Output Key .....	4-18
4.4.22	Group Pen .....	4-18
4.4.23	Set Monitor Mode .....	4-19
4.5	Controls and Indicators .....	4-19
4.6	HPGL Chart Orientation .....	4-22
4.7	HPGL Errors .....	4-23
4.8	Character Sets .....	4-25
5	OPERATOR MAINTENANCE AND CLEANING .....	5-1
5.1	Operator Maintenance .....	5-1
5.1.1	Cleaning Friction Drive Wheels .....	5-2
5.2	Operating Voltage Conversion .....	5-4
5.3	Product Service Support .....	5-9

**TABLE OF CONTENTS (Continued)**

<b>SECTION</b>	<b>DESCRIPTION</b>	<b>PAGE</b>
<b>APPENDIX A CONTROL PANEL LED OPERATING AND ERROR</b>		
	<b>CONDITIONS</b> .....	A-1
A.1	Introduction .....	A-1
A.2	Normal Operation LED displays .....	A-3
A.3	Nonfatal Operating Conditions .....	A-4
A.3.1	Nonfatal Chart Media Operating Conditions .....	A-4
A.3.2	Window Error Code .....	A-6
A.3.3	Multi-Pen Changer Accessory LED Condition Codes .....	A-7
A.3.3.1	Multi-Pen Changer Pen Error Codes .....	A-7
A.4	Fatal LED Error Codes .....	A-11
A.4.1	EEPROM Errors .....	A-11
A.4.2	Fatal ROM Error .....	A-11
A.4.3	Fatal RAM Error .....	A-12
A.5	Communication Error Codes .....	A-12
A.6	Voltage/Current Error Codes .....	A-15
A.6.1	Line Voltage Too High or Low .....	A-15
A.6.2	High Current Detected .....	A-15
A.7	Extended Buffer Report Condition .....	A-17
A.8	RS-232-C Loopback Test Condition .....	A-17
A.9	Plot Code Program Error .....	A-17
A.10	Plot Command Condition Codes .....	A-18

**TABLE OF CONTENTS (Continued)**

<b>SECTION</b>	<b>DESCRIPTION</b>	<b>PAGE</b>
<b>APPENDIX B</b>	<b>MANUFACTURING SETUP MODE (MSM)</b> .....	<b>B-1</b>
B.1	Introduction .....	B-1
B.2	MSM L1 Initiation .....	B-2
B.2.1	Local and Reset Key Functions in MSM L1 and L2 .....	B-2
B.3	MSM L1 Routine Select Procedure .....	B-3
B.4	MSM L2 Routine Execution Procedure .....	B-3
B.4.1	Service Plot .....	B-3
B.4.2	Europlot .....	B-4
B.4.3	Font Demonstration .....	B-4
B.4.4	Multi-Pen Changer Setup Test .....	B-4
B.4.5	Lift and Lower Pen Test .....	B-6
B.4.6	Plotter Repeatability Test .....	B-6
B.4.7	RS-232-C Loop-Back Test .....	B-7
B.4.8	Restore Factory-Selected Menu Parameters .....	B-9
<b>APPENDIX C</b>	<b>OPTION BOARDS</b> .....	<b>C-1</b>
C.1	Introduction .....	C-1
C.2	Option Board Installation Instructions .....	C-1
<b>APPENDIX D</b>	<b>OPERATING CONDITIONS FOR PLOTTING MEDIA</b> .....	<b>D-1</b>
<b>APPENDIX E</b>	<b>INTERFACE NOTES FOR DMP-60 SERIES PLOTTERS</b>	<b>E-1</b>
E.1	Apple Macintosh 512K Enhanced with a 9-Pin Serial Port .....	E-2
E.2	Apple Macintosh Plus, Macintosh SE, or Macintosh II with an 8-Pin Serial Port .....	E-2
E.3	IBM AT or Compatible Computer with a 9-Pin Serial Port .....	E-3
E.4	IBM PC, IBM PC/XT, IBM PS/2, or Compatible Computer with a 25-Pin Serial Port .....	E-5
<b>INDEX</b>		

## LIST OF ILLUSTRATIONS

FIGURE	TITLE	PAGE
0-1	Example 120 Volt Setting .....	0-2
0-2	Left Pinch Roller Assembly and Thumbscrew .....	0-3
0-3	Threaded Holes on Platen .....	0-4
0-4	Loading Small Charts .....	0-5
0-5	Loading Large Charts .....	0-5
0-6	Customer Confidence Test Plot .....	0-7
1-1	Rear and Bottom View of Plotter .....	1-17
1-2	Front View of Plotter .....	1-18
1-3	Ground Connection .....	1-21
1-4	Left Pinch Roller Assembly Thumbscrew .....	1-29
1-5	Threaded Holes on Platen .....	1-30
1-6	Loading Small Charts .....	1-31
1-7	Loading Large Charts .....	1-31
1-8	Chart Margins .....	1-36
1-9	Disposable Stainless Steel or Tungsten Drafting Pen .....	1-38
1-10	Refillable Tungsten Pen .....	1-41
1-11	Rear Panel RS-232-C Connector .....	1-41
1-12	Pass-Through Port Configuration .....	1-47
2-1	The Control Panel .....	2-1
2-2	Complete and Partial Resets .....	2-6
2-3	The Customer Confidence Test Plot Design .....	2-16
2-4	The Europlot Design .....	2-18
2-5	Temporary Control Panel Entries .....	2-50
2-6	Window Limits Around a Subpart of a Plot Design .....	2-54
2-7	A Scale Box Three Times the Height of the Window .....	2-56
2-8	A Scale Box Three Times the Length of the Window .....	2-56
2-9	A Scale Box Three Times the Height/Length of the Window .....	2-57
2-10	Lower Left/Upper Right Window Markers .....	2-62
2-11	Viewport Marker .....	2-63

## LIST OF ILLUSTRATIONS (Continued)

FIGURE	TITLE	PAGE
2-12	Lower Left/Upper Right Scale Box Markers .....	2-67
2-13	The Scaled Customer Confidence Test Plot Design .....	2-68
2-14	Lower Left/Upper Right Window Markers .....	2-71
2-15	Lower Left/Upper Right Scale Box Markers for Auto Aspect .....	2-74
2-16	Lower Left/Upper Right (Y-Axis) Scale Box Markers .....	2-75
2-17	Scale Box Markers to Create Mirror Image Plots .....	2-78
2-18	Mirror Image of the Customer Confidence Test Plot .....	2-79
4-1	HPGL Chart Orientation .....	4-22
4-2	HPGL ANSI ASCII Character Sets (0, 10, 20) .....	4-26
4-3	HPGL HP 9825 Plotter (1, 11, 21), French/German (2, 12, 22), Scandinavian (3, 13, 23), Spanish/Latin American (4, 14, 24), JIS ASCII (6, 16, 26), ISO International Reference Version (9, 19, 29), ISO Swedish (30, 40, 50), ISO Swedish for Names (31, 41, 51), ISO Norway Version 1 (32, 42, 52), ISO German (33, 43, 53), ISO French (34, 44, 54), ISO United Kingdom (35, 45, 55), ISO Italian (36, 46, 56), ISO Spanish (37, 47, 57), ISO Portuguese (38, 48, 58), ISO Norway Version 2 (39, 49, 59), and Drafting (99) Character Sets .....	4-27
4-4	HPGL Special Symbols Character Sets (5, 15, 25) .....	4-28
4-5	HPGL Roman Extensions Character Sets (7, 17, 27) .....	4-29
4-6	HPGL Katakana Character Sets (8, 18, 28) .....	4-30
5-1	Cleaning Friction Drive Wheels .....	5-3
5-2	Example 120 Vac Setting .....	5-4
5-3	Power Entry Module .....	5-6
5-4	Example 120 Vac Conversion (AC Fuse Cavity) .....	5-8
C-1	Bottom View of Plotter .....	C-3
C-2	Option Board .....	C-4

**LIST OF ILLUSTRATIONS (Continued)**

<b>FIGURE</b>	<b>TITLE</b>	<b>PAGE</b>
D-1	Operating Range for all Film and Small Chart Paper .....	D-2
D-2	Operating Range for Large Chart Paper and Vellum .....	D-2

## LIST OF TABLES

TABLE	TITLE	PAGE
1-1	DMP-60 Series Specifications .....	1-3
1-2	DMP-60 Plotter Accessories .....	1-8
1-3	DMP-60 Plotter Documentation .....	1-8
1-4	DMP-60 Plotting Media .....	1-9
1-5	Pens and Pen Accessories .....	1-11
1-6	Plotter Supply Compatibility Chart .....	1-15
1-7	DMP-61 Standard Chart Sizes .....	1-25
1-8	DMP-62 Standard Chart Sizes .....	1-26
1-9	Maximum Plotting Areas .....	1-33
1-10	Plotter's RS-232-C Connector Signals (DTE) .....	1-43
1-11	RS-232-C Pass-Through Port Signal Connections .....	1-46
2-1	LED Indicator Code Summary .....	2-2
2-2	Complete Reset Parameters .....	2-7
2-3	Partial Reset Parameters .....	2-8
2-4	HPGL Initialize Reset Parameters .....	2-10
2-5	HPGL Default Reset Parameters .....	2-11
2-6	Non-reset Items .....	2-12
3-1	DM/PL New Pen Command Mapping Chart .....	3-6
4-1	HPGL Function Listing .....	4-5
4-2	HPGL Command Listing .....	4-7
4-3	Identification Response .....	4-11
4-4	HPGL Character Sets .....	4-14
4-5	Indicator and Control Equivalents .....	4-20
4-6	HPGL Errors .....	4-24
A-1	LED Indicator Code Summary .....	A-1
A-2	Pen Recovery Instructions .....	A-10