

APPENDIX B MANUFACTURING SETUP MODE (MSM)

B.1 INTRODUCTION

Manufacturing setup mode (MSM) provides you with eight different test and demonstration routines which can be initiated from the control panel. Normal operation of the plotter, such as remote mode, menu mode, and temporary velocity settings, is inhibited while the plotter is operating in MSM.


MSM has two levels of operation—level one and level two. MSM level one (MSM L1) enables you to select one of the eight MSM routines that you want to run. MSM level two (MSM L2) is the actual execution of the selected MSM L1 routine.

Instructions on how to operate the plotter in MSM L1 and MSM L2 are explained in the following paragraphs. A summary of the instructions is listed below.

1. Set the power switch to OFF and install a chart and a pen into the plotter.
2. To initiate MSM L1, press and hold the RESET and the LOAD keys while powering up the plotter. Release the keys after the plotter beeps one time.
3. Use the ◀ and the ▶ keys to select an MSM L1 routine.
4. After selecting a routine, press the ENTER key to initiate MSM L2 to execute the routine.
5. After the routine completes, press the RESET key to return to MSM L1.
6. Press the RESET key once more to return to remote mode for normal operation.

NOTE

This section uses two different graphic symbols to illustrate the status of an LED. The □ symbol means that the LED is off, and the ■ symbol means that the LED is on.



B.2 MSM L1 INITIATION

Before initiating MSM L1, install a chart of any size and a pen.

To initiate MSM L1, first set the power switch to OFF. With the power off, press and hold the RESET and the LOAD keys, and then power up the plotter *while holding* the two keys. After the plotter beeps one time, release the two keys.

The plotter will then find the X and Y limits of the chart as in normal operation; however, the pen will park at plot origin right (large chart) regardless of the chart size installed. After the chart limits are found and the pen parks at plot origin right, all four LED indicators will turn off.

CAUTION

Manufacturing setup mode inhibits the chart sensing of the plotter, therefore you must exercise care when operating your unit in this mode. The plotter sizes the chart that is installed at the initialization of MSM and it expects you to use that chart during MSM routines. If you install a different size chart without pressing either the RESET or the LOAD key, then a pen crash may occur. Lifting the pinch rollers and manually moving a chart with your hands may also cause a pen crash.

B.2.1 Local and Reset Key Functions in MSM L1 and L2

If the LOCAL key is pressed while the plotter is in MSM L1, the plotter enters MSM L1 local mode. MSM L1 local mode enables you to use the ▲, ►, ▼, and ◀ keys to move the pen to any location on the chart. Normal windowing operations can also be performed at the control panel as explained in Paragraph 2.8. To exit MSM L1 local mode and return to MSM L1, press the LOCAL key again.

If the pen is moved while the plotter is in MSM L1 local mode, it will retain that location after MSM L1 local mode is exited. This enables you to execute different routines at different locations on the chart.

If the plotter is in MSM L1 local mode and the RESET key is pressed, the plotter will return to the initial MSM L1. This enables you to reset the plotter in MSM L1 local mode without having to initiate manufacturing setup mode using the power switch again. However, if the RESET key is pressed while the plotter is in the initial MSM L1, the plotter will return to normal remote mode operation.

B.3 MSM L1 ROUTINE SELECT PROCEDURE

The ◀ and ▶ keys are used to select MSM L1 routines. The present MSM L1 routine is displayed in binary code on the control panel LEDs. Use the ◀ key to increment the routine numbers and use the ▶ key to decrement the routine numbers. The binary LED code for each MSM L1 routine is listed in Paragraph B.4.

B.4 MSM L2 ROUTINE EXECUTION PROCEDURE

After the desired MSM L1 routine number is displayed on the control panel LEDs as described in Paragraph B.3, press the ENTER key. This causes the plotter to enter MSM L2 and execute the selected MSM L1 routine. It is important to note that once the plotter enters MSM L2 and is running a routine, the control panel LEDs may or may not display the present MSM L1 routine number. This is because the plotter uses the LEDs in some MSM L2 routines to display information to you. It is your responsibility to keep track of the MSM level in which you place the plotter. To exit MSM, press the RESET key.

The following paragraphs provide the binary MSM L1 code number and describe each corresponding MSM L2 routine.

B.4.1 Service Plot

The service plot provides you with two lines of information about the plotter's configuration.

The first line of information provides the model identification and the revision numbers of the installed ROMs, the present baud rate menu selection, and the present addressing resolution.

The second line of information provides the DM/PL buffer size, whether or not the plotter has the optional extended buffer board or Kanji character set accessory installed, and the actual serial number of the plotter.

B.4.2 Europlot

This routine causes the plotter to draw the Europlot design that is described in Paragraph 2.3.2.

B.4.3 Font Demonstration

The font demonstration routine causes the plotter to draw a demo plot of the fonts that are stored in the plotter's ROM.

B.4.4 Multi-Pen Changer Setup Test

This routine enables you to test the multi-pen changer accessory unit. Execute this routine only after installing the unit as described in its operation manual.

If the ENTER key is pressed, the pen holder will move in front of pen stall one, and then the plotter will beep. If the pen holder favors one side or the other of pen stall one, the rear support screws that secure the pen changer to the plotter can be loosened and the pen unit moved slightly left or right. (This is explained in the unit's operation manual.)

Testing of the optical sensors in the pen changer requires you to manually move the arm assembly forward and backward. To prevent permanent damage to the plotter's beam assembly, grasp the pen changer base unit with one hand and push or pull the arm assembly with the other hand.

To test the optical sensors in the pen changer, manually slide the arm assembly forward until you see the following LED display code on the control panel:

This code indicates that the unit's rear sensor is uncovered and the front sensor is covered.

Manually push the arm assembly backward until it is centered between full out and full in. The control panel LEDs should display the following code:

This code indicates that both the front and rear sensors are uncovered.

Manually slide the the changer arm assembly backward until you see the following LED display code on the control panel:

This code indicates that the front sensor is uncovered and the rear sensor is covered.

If you received the correct LED codes during this test, the optical sensors in the pen changer are operating correctly.

If all of the control panel LEDs turned off during any part of this test, then a hardware error occurred with the pen changer unit. The error condition may be caused by either a faulty cable or a cable that is incorrectly installed, or an optical sensor or control panel LED may be burned out. If the error cannot be corrected at the cable level, then service is required (see Paragraph 5.3).

B.4.5 Lift and Lower Pen Test

If this test is activated, the pen holder can be lowered by pressing the ▲ key and raised by pressing the ▼ key.

The auto-up time is inhibited during this routine, therefore the pen will remain in the down position until it is toggled to the up position.

The pen holder can be moved by placing the plotter in MSM L1 local mode and then using the manual movement keys.

To exit this routine, press the ENTER key.

B.4.6 Plotter Repeatability Test

This routine's MSM L2 is divided into two subroutines. One MSM L2 subroutine tests the repeatability of a single pen and the other MSM L2 subroutine provides a pen-to-pen repeatability test for a multi-pen changer unit.

After you press the ENTER key to place the plotter in this routine's MSM L2, the control panel LEDs will turn off. This indicates that you are presently in the single pen repeatability test. You now have the option to execute the single pen test or to toggle to the multi-pen unit test.

To execute the single pen test, press the ENTER key again and the single pen test will begin. To toggle to the multi-pen test, press either the ◀ key or the ▶ key and the control panel LEDs will display a binary one (0001). The multi-pen test can then be executed by pressing the ENTER key.

If the single pen test is executed, the plotter will:

- draw a border line around the chart size that was detected by its sensors,
- over-plot the four corners of the internal limits,
- draw a cross in the lower right area of the chart,
- draw a cross in the upper left area of the chart,
- draw a series of down vectors one-fifth the length of the chart in the X direction and 0.1 inch in width in the Y direction,
- and then over-plot the two crosses already drawn.

If you want to run the pen-to-pen repeatability subroutine, be sure your plotter has the multi-pen accessory unit installed and is loaded with six pens. To execute this subroutine, press either the ◀ key or the ▶ key to toggle the binary one (0001) pen-to-pen subroutine on the LEDs, and then press the ENTER key.

The pen-to-pen routine causes the plotter to draw a cross in the center of the chart with each pen in the multi-pen changer unit.

B.4.7 RS-232-C Loop-Back Test



This routine verifies that the plotter's handshaking lines are functioning properly.

Before running this routine, pin 2 must be jumpered to pin 3 on the plotter's RS-232-C connector, and pin 4 must be jumpered to pin 5. The routine causes the plotter to transmit and receive data to itself. It automatically repeats the transmission at each available baud rate. After each successful transmission at a given baud rate, the plotter emits a beep. The length of each transmission will vary because of the different baud rates.

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The control panel LEDs do not illuminate during successful tests. If an error is detected, the plotter will display LED error codes, which are listed below. If all of the transmissions are successful, the plotter returns to MSM L1 and the LEDs display the loop-back test MSM L1 routine code.

The RS-232-C loop-back error codes are listed below. (If more than one type of error occurs, multiple errors codes will be displayed.)

This error code indicates that data is received, but does not match the data that was transmitted. This implies that the line drivers are functioning properly, but excessive noise is occurring on the RS-232-C line. Service is therefore required.

This indicates that data is not being received by the logic board microprocessor. This error occurs if pins 2 and 3 are not jumpered or if there is a general UART (Universal Asynchronous Receiver/Transmitter) failure. If this error code (0010) is displayed with the hardware handshake error code (0100), which will produce a (0110) code, and the correct pins are jumpered, then the UART and/or the line drivers require service.

This error occurs if the program cannot toggle the hardware handshake line (RTS/DTR). If pins 4 and 5 are properly jumpered, then the UART and/or the line drivers require service.

This code indicates that a parity, framing, or overrun error has occurred. These errors are usually caused by a UART failure.

B.4.8 Restore Factory-Selected Menu Parameters



This routine restores the menu parameters to the factory-selected values. These values are as follows:

PARAMETER	DM/PL	HPGL
DMP-61 up velocity	32 ips	800 mm/s
DMP-61 up acceleration	4 g	4 g
DMP-61 down velocity	24 ips	600 mm/s
DMP-61 down acceleration	4 g	4 g
DMP-61 down delay	50 msec	50 msec
DMP-62 up velocity	24 ips	600 mm/s
DMP-62 up acceleration	4 g	4 g
DMP-62 down velocity	24 ips	600 mm/s
DMP-62 down acceleration	4 g	4 g
DMP-62 down delay	70 msec	70 msec
Up delay	30 msec	30 msec
Pen change	ignore	ignore
Plot origin	auto	right
Constant velocity	on	on
Addressing	0.001 inch	—
Menu units	English	—
Text font	F0	—
Character set	G0	—
Auto-pen capping	120 sec	120 sec
Baud rate	9600 baud	9600 baud
UART parity	bit 8=0	bit 8=0
Handshake RTS/DTR	toggle	toggle
Pass-through port	toggle	—
Line status	—	standalone
Outlined fonts	filled	—
Number of pens	6	6
Zero character	plain	plain
Comm errors	ignored	—
Option board	on	on

