

## CHAPTER 3 OPERATOR INFORMATION

### 3.1 GENERAL

This chapter is a summary of the controls, indicators, operator selectable and jumper selectable features, self-tests, and basic troubleshooting information for the printer. Details on selecting and using these features and operator procedures are in the user documentation.

### 3.2 CONTROLS AND INDICATORS

The controls and indicators are used to set up, monitor, and control printer operation. This section covers the following topics.

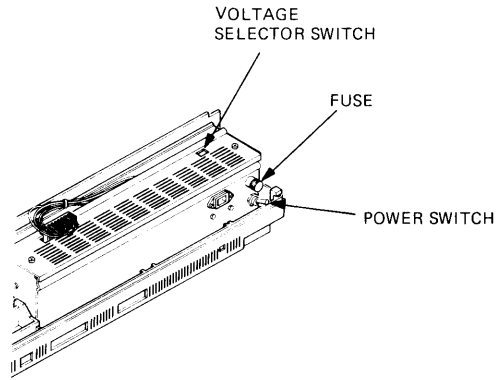
- Printer controls
- LA210 operator control panel
- Indicators

#### 3.2.1 Printer Controls

The following table describes the function of the printer controls.

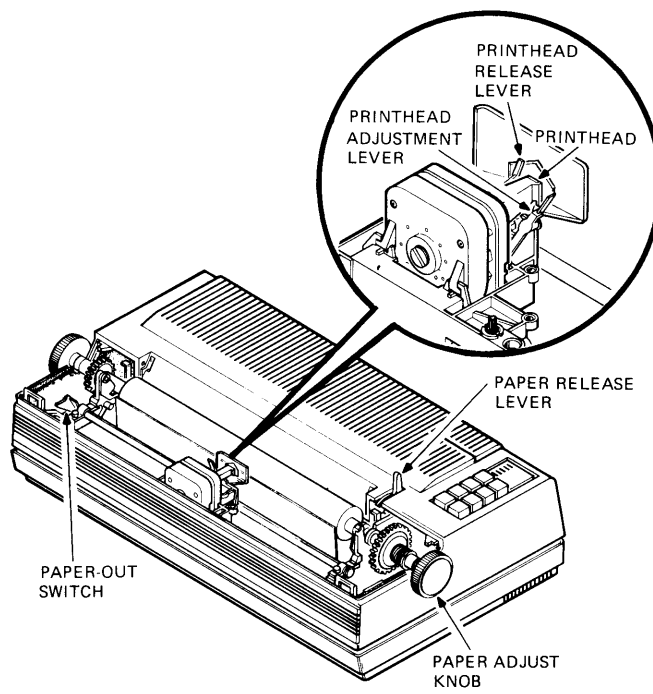
Table 3-1 Printer Controls

Control	Figure	Function
Voltage selector switch	3-1	Selects terminal input power (115 or 220 Vac).
Power switch	3-1	Turns power on or off.
Paper adjust knobs	3-2	Advance paper 1/48 inch at a time. Turning the knobs lets paper roll freely in either direction for precise vertical positioning.
Paper release lever	3-2	Controls paper holding tension. In the back position, the paper is held tightly against the platen. In the forward position, the paper is free for positioning or removal.
Printhead release lever	3-2	Used to remove or install printhead. Moving it toward the rear of the terminal releases the printhead. Moving it toward the front of the terminal locks the printhead in place.
Printhead adjustment lever	3-2	Adjusts space between the printhead and platen for correct print impression.
Ribbon adjust knob	3-3	Removes slack from the ribbon.
Paper out manual override lever	3-4	Disables paper out detection.
Tractor release levers	3-5	Used to install or remove tractor.
Tractor adjustment levers	3-5	Used to adjust tractor for different margins and paper sizes.



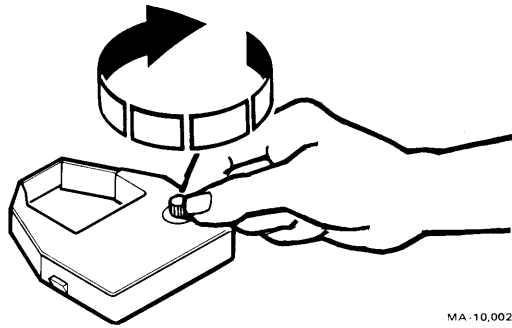
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Figure 3-1 Power Supply



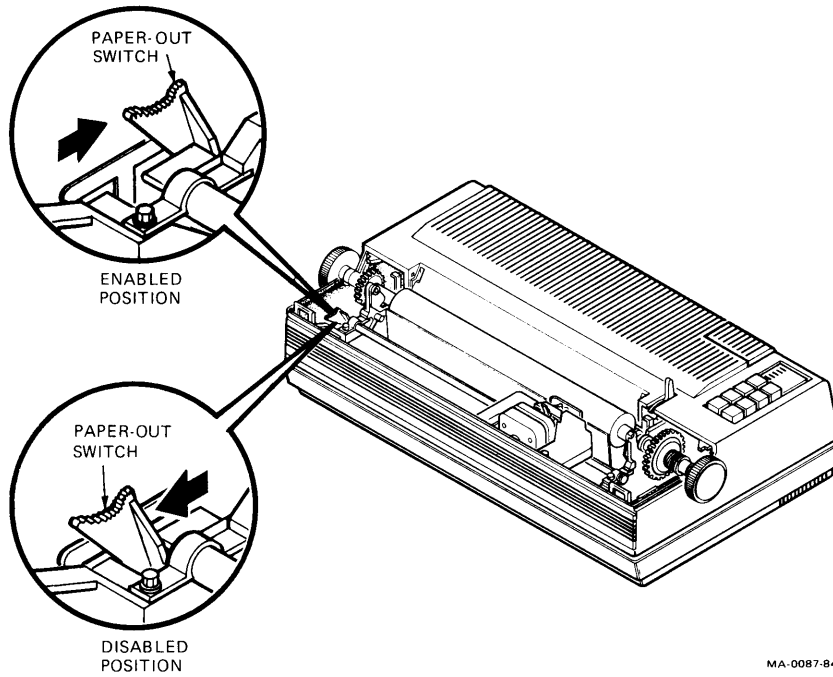
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Figure 3-2 Printer Controls



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Figure 3-3 Ribbon Adjust Knob



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Figure 3-4 Paper-Out Switch

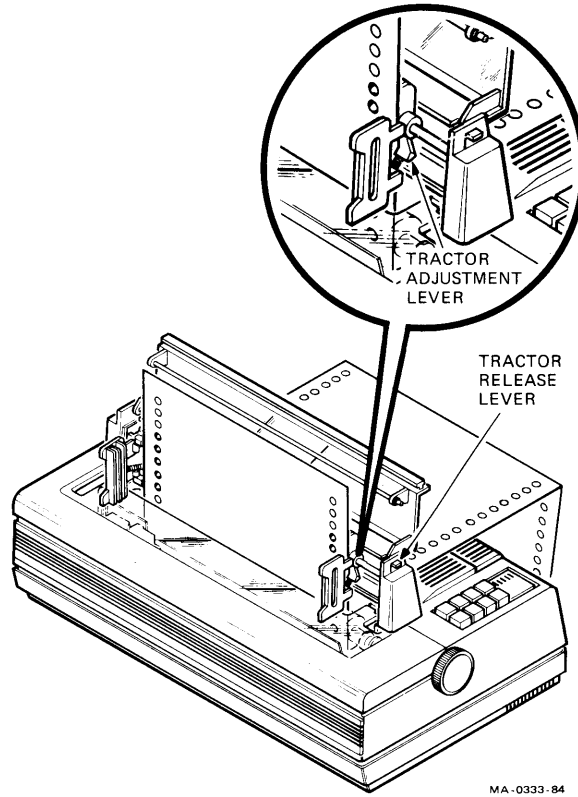


Figure 3-5 Tractor Release and Adjustment Levers

### 3.2.2 Control Panel

The control panel has the switches that control routine printer operation. Figure 3-6 shows the operator control panel. The following table lists the switches on the control panel and their functions.

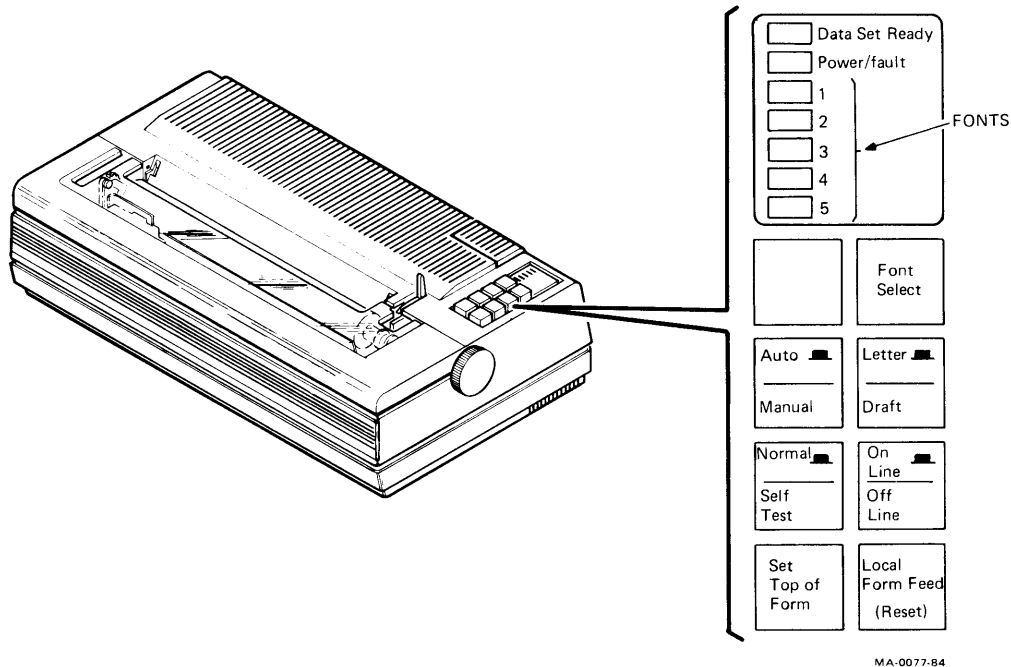


Figure 3-6 Control Panel

Table 3-2 Control Panel Switches

Switch	Function
<b>Auto/Manual</b>	
Auto (up position)	Disables the Letter/Draft switch. Printing mode is selected with control escape sequences from the computer.
Manual (down position)	Enables the Letter/Draft switch. Control escape sequences from the computer are processed but not executed.
<b>Letter/Draft</b>	
Letter (up position)	Prints characters in letter quality mode (medium or high density, depending on character ROM).
Draft (down position)	Prints characters in draft mode (low density).

Table 3-2 Control Panel Switches (Cont)

Switch	Function
On Line/Off Line	
On Line (up position)	Lets the printer receive and process data. The local form feed, set top of form, and self test functions are not active.
Off Line (down position)	If enabled, signals the computer to temporarily stop sending data. The local form feed, set top of form and self test functions are active.
Normal/Self Test	When the printer is off-line, this switch selects self-test and prints the status message. It disconnects the communication line, exits graphic mode, and clears the input buffer.
Set Top of Form	When the printer is off-line, defines the current line as line 1 (top of form). During self-test, starts the loopback test.
Local Form Feed (Reset)	
Local Form Feed	When the printer is off-line, advances the paper to top margin on the next page. During self-test, selects printer self-tests.
(Reset)	Resumes printing after a fault condition such as access cover open, paper fault, or printhead jam is corrected.

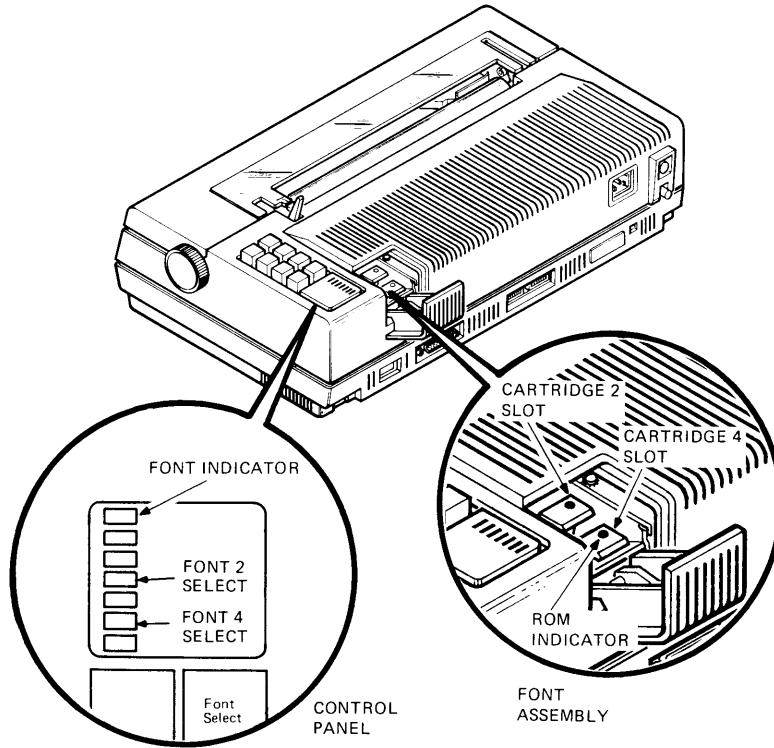
### 3.2.3 Indicators

This section describes the printer's visual and audible indicators.

**3.2.3.1 Visual Indicators** -- The following table describes the function of the visual indicators.

Table 3-3 Visual Indicators

Indicator	Figure	Function
Power/fault	3-6	Lights when power is turned on. Used with data set ready indicator in power-up self-test. Flashes when terminal is not ready to print for any of the following reasons: paper out or low, access cover open, printhead jammed (also indicated by multiple bell tones).
Data set ready	3-6	Lights when terminal detects data set ready (DSR) signal. Used with Power/fault indicator in power-up self-test.
Font indicators	3-7	Show currently selected DPS. One light on indicates that the DPS shown is forced. One light off indicates that no DPS is forced. The indicator that is off also shows the current computer-selected DPS.
ROM cartridge (ROM cartridge options)	3-7	Lights when ROM cartridge is seated correctly in ROM cartridge socket.



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Figure 3-7 Font Indicators and Font Assembly

3.2.3.2 Audible Indicators -- The following table describes the conditions that cause a bell tone.

Table 3-4 Audible Indicators

Condition	Description
Input buffer overflow	If the terminal cannot process characters from the input buffer before the buffer fills, an input buffer overflow can occur. During overflow, a bell tone sounds and each character is discarded.
Bell code	Each bell code the terminal receives sounds the bell tone.
Printhead jam	The Power/fault indicator flashes and there are multiple bell tones.

### 3.3 OPERATOR SELECTABLE FEATURES

The LA210 Letterprinter operates in three emulation modes in addition to standard Digital (DEC) mode. In the emulation modes, the printer operates as an IBM/Epson MX80 printer, an IBM/Epson MX80 printer with Graftrax, or an IBM Graphics printer. In back of the printer, there are switches for setting the different modes. The factory setting of the switches is for DEC mode (Mode 0). Mode 1 is IBM/Epson MX80 emulation. Mode 2 is IBM/Epson MX80 plus Graftrax emulation. Mode 3 is IBM Graphics emulation. For parallel communication applications, the parallel interface adapter option (PN LA10X-EP) must be installed (Figure 3-8). The status message shows which mode the printer is using.

#### CAUTION

Always use a small slotted screwdriver, scribe, or the equivalent to set the configuration switches. Never use a lead pencil. Broken lead can cause a short on the printed circuit board.

#### NOTE

In emulation mode, most configuration switches are only activated at power-up. Always power down the printer before changing the switch settings.

In standard DEC mode, the switches are monitored all the time. You do not have to power down the printer first.

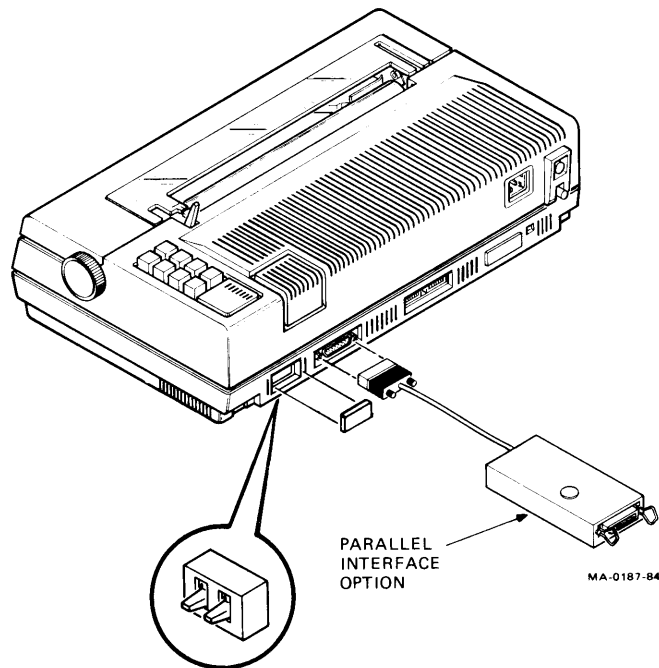


Figure 3-8 Parallel Interface Adapter

After you change the logic board, make sure to set the switches on the new board to match the settings on the old logic board. Print the status message to check that the desired features are selected.

### 3.3.1 Mode 0 -- Standard DEC

Figure 3-9 shows the location of the configuration switches and their factory settings. Table 3-5 lists the features that can be selected with these switches.

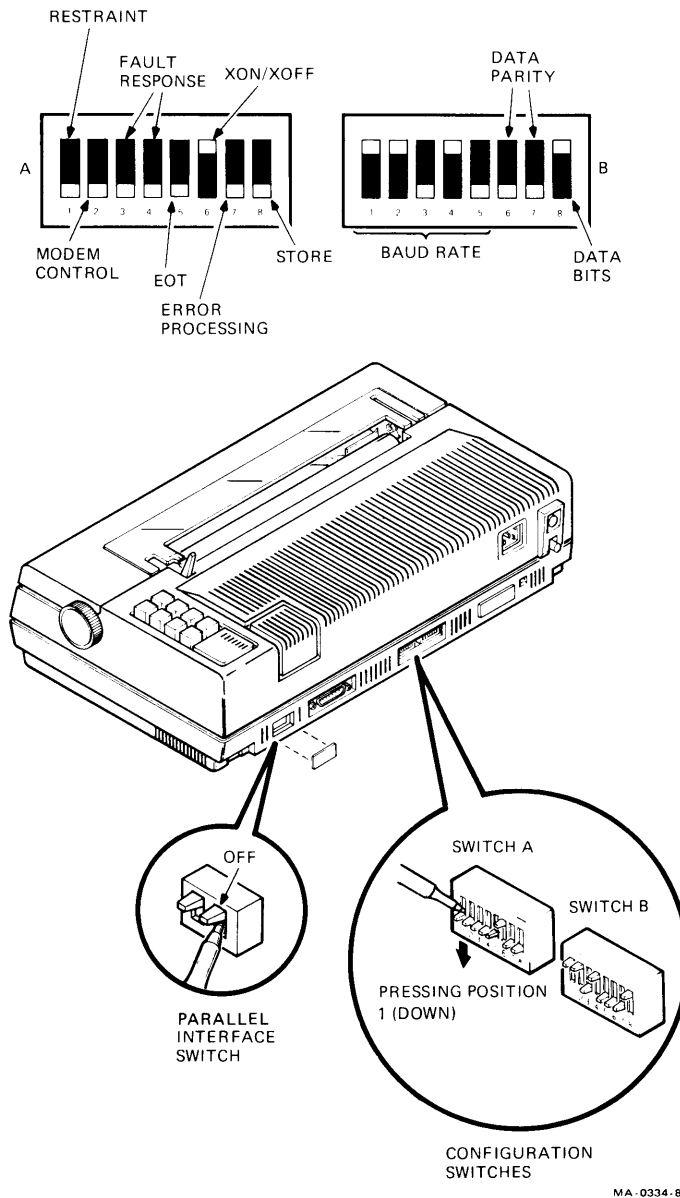


Figure 3-9 Configuration Switches

Table 3-5 Communication Features

Switch A Features	Switch Setting
<b>Speed Control/Restraint</b>	A-1
Restraint mode	Down (factory setting)
Speed control mode	Up
<b>Modem Control</b>	A-2
No modem control	Down (factory setting)
Modem control	Up
<b>Fault Response</b>	A-3    A-4
No action (XOFF is sent if enabled).	Down    Down
Send break signal.	Up        Down
Disconnect (drop DTR).	Down    Up
Do not connect.	Up        Up
<b>End Of Transmission</b>	A-5
Disables coded disconnect. (Ignore EOT.)	Down (factory setting)
Enables coded disconnect (Disconnect upon receiving EOT.)	Up
<b>XON/XOFF Protocol</b>	A-6
Enable auto XON/XOFF.	Up (factory setting)
Disable auto XON/XOFF.	Down
<b>Error Processing</b>	A-7
Sets receiver processing to print substitute character.	Down (factory setting)
Sets receiver error processing to print characters as received.	Up
<b>Store Features</b>	A-8
Store features from operating memory to user permanent memory.	Move switch from down to up.

Table 3-5 Communication Features (Cont)

Switch B Features		Switch Setting				
<b>Data Parity Switches</b>						
7 bit	8 bit	B-6	B-7			
Space	no parity	Down	Down (factory setting)			
Mark	no parity	Up	Down			
Even	Even	Down	Up			
Odd	Odd	Up	Up			
<b>Data Format</b>		B-8				
8 bits		Up (factory setting)				
7 bits		Down				
<b>Parallel Interface</b>						
Parallel interface clock and power off.		Both up (factory setting)				
Parallel interface clock and power on.		Both down				
<b>Baud Rate</b>		<b>Switch Setting</b>				
Baud Rate	B-1	B-2	B-3	B-4	B-5	
50	Down	Down	Down	Down	Down	
75	Up	Down	Down	Down	Down	
110	Down	Up	Down	Down	Down	
134.5	Up	Up	Down	Down	Down	
150	Down	Down	Up	Down	Down	
200	Up	Down	Up	Down	Down	
300	Down	Up	Up	Down	Down	
600	Up	Up	Up	Down	Down	
1200	Down	Down	Down	Up	Down	
1800	Up	Down	Down	Up	Down	
2400	Down	Up	Down	Up	Down	
4800	Up	Up	Down	Up	Down (factory setting)	
7200	Down	Down	Up	Up	Down	
9600	Up	Down	Up	Up	Down	

**Table 3-5 Communication Features (Cont)**

Switch B Features	Switch Setting				
Split Rate Transmit/Receive	B-1	B-2	B-3	B-4	B-5
75/600	Down	Down	Down	Down	Up
75/1200	Up	Down	Down	Down	Up
150/600	Down	Up	Down	Down	Up
150/1200	Up	Up	Down	Down	Up
300/2400	Down	Down	Up	Down	Up
300/4800	Up	Down	Up	Down	Up
600/2400	Down	Up	Up	Down	Up
600/4800	Up	Up	Up	Down	Up

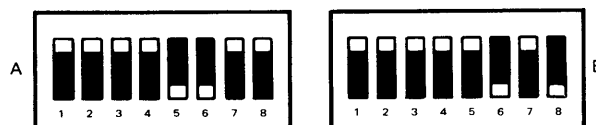
### 3.3.2 Mode 1 -- IBM/Epson MX80

This mode emulates a basic dot matrix lineprinter. It provides single and double-width characters, four horizontal pitches, 1/6-inch high characters with two-pass printing, and bar charting. To operate in this mode, install font cartridge LA10X-LB (Mosaic, ID 137) in either slot 2 or 4 of the font option assembly (Figure 3-7). The remaining slot can hold any other font cartridge. Figure 3-10 shows the standard switch settings. Table 3-6 lists the settings to change the operating features.

#### NOTE

Some applications set a time limit for the printer to empty its input buffer. If the printer exceeds this limit, the applications abort.

In emulation mode, the LA210 Letterprinter gives you a choice of two input buffers -- a 2 Kbyte buffer and a 0.13 Kbyte buffer. If your application displays a timeout message, use the 0.13 Kbyte buffer. Otherwise, use the 2 Kbyte buffer to reduce the number of data requests from the printer to the host.



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Figure 3-10 Mode 1 Standard Switch Settings

Table 3-6 Mode 1 Switch Settings -- IBM/Epson MX80 Emulation

Switch A	Setting	Function
A1, A2	Either	Not used.
A3	Up	When the line buffer is full, printer prints line and advances to next line.
	Down	When line buffer is full, printer drops characters.
A4	Up	Cancel (CAN) character clears line buffer.
	Down	CAN character is ignored.
A5	Up	Delete (DEL) character clears line buffer.
	Down	DELeTe character is ignored.
A6	Up	Printer performs an automatic line feed when it receives a carriage return (CR) character.
	Down	Printer only performs a carriage return.
A7	Up	When printer receives BELL character, error bell sounds.
	Down	BELL character is ignored.
A8	Up	Selects standard 8-inch paper width at power-up.
	Down	Selects 13-inch paper width.
Switch B	Setting	Function
B1 to B4	All up	Enables emulation mode.
B5	Up	Selects Epson/IBM MX80 emulation mode.
B6	Down	Selects Epson/IBM MX80 emulation mode.
B7	Up or down	Not used.
B8	UP	Enables 2K buffer.
	Down	Enables 0.13K buffer.

### 3.3.3 Mode 2 -- IBM/Epson MX80 Plus Graftrax

Mode 2 expands mode 1 to include graphics and character processing capabilities. This mode emulates the basic printer and adds italics, graphics, 1/16-inch high script characters, and bolding. To operate in mode 2, install the primary font cartridge LA10X-AP (Italics 10, ID 011) in slot 2 and font cartridge LA10X-LC (Graftrax, ID 143) in slot 4 of the font option assembly (Figure 3-7). For print styles other than the standard Courier or Italic 10, install the alternate primary font cartridge in slot 2.

Figure 3-11 shows the standard switch settings. Table 3-7 lists the settings to change the operating features.

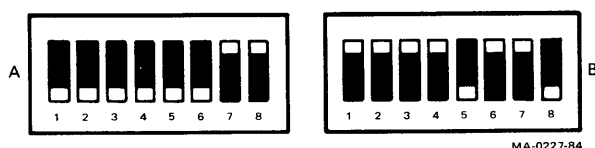


Figure 3-11 Mode 2 Standard Switch Settings

Table 3-7 Mode 2 Switch Settings -- IBM/Epson MX80 Plus Graftrax Emulation

Switch A	Setting	Function
A1	Down	Printer is set to standard horizontal pitch at power-up.
	Up	Printer operates at compressed horizontal pitch.
A2	Up	Sets bottom margin to 1 inch at power-up.
A3	Up	Enables bold printing at power-up.
	Down	Disables bold printing at power-up.
A4	Up	Enables italic printing at power-up.
	Down	Disables italic printing at power-up.
A5	Up	Enables slashed zero (0) printing at power-up.
	Down	Disables slashed zero (0) printing at power-up.

Table 3-7 Mode 2 Switch Settings -- IBM/Epson MX80 Plus Graftrax Emulation (Cont)

Switch A	Setting	Function
A6	Up	Printer performs an automatic line feed when it receives a carriage return (CR) character.
	Down	Printer only performs a carriage return.
A7	Up	When printer receives BELL character, error bell sounds.
	Down	BELL character is ignored.
A8	Up	Selects standard 8-inch paper width at power-up.
	Down	Selects 13-inch paper width.
Switch B	Setting	Function
B1 to B4	All up	Enables emulation mode.
B5	Down	Selects Epson/IBM MX80 plus Graftrax mode.
B6	Up	Selects Epson/IBM MX80 plus Graftrax mode.
B7	Up or down	Not used.
B8	UP	Enables 2K buffer.
	Down	Enables 0.13K buffer.

### 3.3.4 Mode 3 -- IBM Graphics Printer

This mode increases the capabilities of the basic MX lineprinter to include an extended character set, 1/16-inch high characters, bolding, underlining, subscripting and superscripting, four graphics modes, and bottom margin control.

To operate in this mode, install font cartridge LA10X-LA (Line Drawing, ID 139) and LA10X-LD (Foreign Style, ID 141) in slots 2 and 4 of the font option assembly (Figure 3-7). They may be installed in either slot.

Figure 3-12 shows the standard switch settings. Table 3-8 lists the settings to change the operating features.

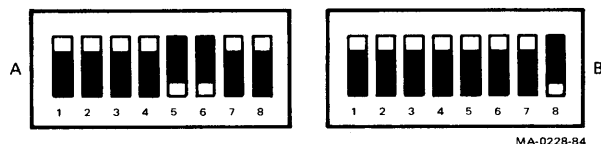


Figure 3-12 Mode 3 Standard Switch Settings

Table 3-8 Mode 3 Switch Settings -- IBM Graphics Printer Emulation

Switch A	Setting	Function
A1, A2	Up or down	Not used.
A3	Up	When line buffer is full, printer prints line and advances to next line.
	Down	When line buffer is full, printer drops characters.
A4	Up	Cancel (CAN) character clears line buffer.
	Down	CAN character is ignored.
A5	Up	Delete (DEL) character clears line buffer.
	Down	DEL character is ignored.
A6	Up	Printer performs an automatic line feed when it receives a carriage return (CR) character.
	Down	Printer only performs a carriage return.
A7	Up	When printer receives BELL character, bell sounds.
	Down	BELL character is ignored.
A8	Up	Selects 8-inch paper width at power-up.
	Down	Selects 13-inch paper width.

Table 3-8 Mode 3 Switch Settings -- IBM Graphics Printer Emulation (Cont)

Switch B	Setting	Function
B1 to B4	All up	Enables emulation mode.
B5, B6	Up	Selects IBM Graphics printer emulation mode.
B7	Up or down	Not used.
B8	Up	Enables 2K buffer.
	Down	Enables 0.13K buffer.

### 3.4 JUMPER SELECTABLE FEATURES

The printer has jumpers on the logic board for selecting or changing some features, including BUSY, AUTO ANSWERBACK, and ANSWERBACK PROTECT. For details on using these jumpers, refer to Paragraph 5.5.10.

### 3.5 OPERATOR TESTS

The LA210 performs a power-up self-test and several printing self-tests.

#### 3.5.1 Power-Up Self-Test

The printer performs a power-up self-test when power is turned on. A successful power-up self-test is indicated when the printhead moves to the left margin and the Power/fault indicator is on. If the printer fails to power up correctly, refer to Table 1-1.

To perform the power-up self-test, turn on the power switch (Figure 3-1). If power is already on, turn the switch off, then turn it on again.

### 3.5.2 Printer Self-Tests

The printer self-tests provide a visual indication of how the printer is working. The following printer self-tests help determine whether a problem exists.

- Status message
- Character pattern
- Horizontal registration
- Nonprinting
- Loopback

There are three types of printer self-tests: printing, nonprinting, and loopback. The following paragraphs describe these tests.

**3.5.2.1 Printing Self-Tests** -- The three printing self-tests are the status message, character registration and horizontal registration self-tests. Figure 3-13 shows examples of these three tests.

When you troubleshoot the printer, print the status message and perform the character pattern test to ensure correct printing. The status message shows whether the printer can print and gives a list of selectable features.

The status message shows the current microcode version, dot pattern sets (DPSs) installed, and which features are set in operating memory. Every LA210 has a ROM in slot 1, so the status message always has a 3-digit code for DPS 1. If there is a cartridge in another slot, the message has a 3-digit code for that slot. If there is no cartridge, or if it is incorrectly installed, the status message shows three periods for that slot (Figure 3-14).

The character pattern test lets you check print quality and observe other printer functions. The character pattern test continuously prints 94 characters within the currently selected margins.

The horizontal registration self-test prints four characters in multiple passes on the same line to check overstrike alignment. In draft mode, the printer makes four passes. In letter quality mode, the printer makes eight passes and prints in seven of the eight passes.





6. Press and release the Local Form Feed switch again. The nonprinting test starts.

NOTE

The printer repeats the tests in the same order each time you press the Local Form Feed switch.

To stop any test, set the Normal/Self Test switch to Normal.

### 3.6 OPERATOR TROUBLESHOOTING

If the power does not turn on or the printer does not work properly, refer to Table 3-9. This table describes the checks you should make before turning to Chapter 7, "Troubleshooting."

Table 3-9 Troubleshooting Checklist

Indication	Possible Cause	Action
Printer does not turn on when power switch is set to 1 (on).	AC power cord is not plugged into wall receptacle or printer.	Plug in cord.
	No power from wall receptacle.	Check receptacle with a known working electrical device (lamp).
	Blown ac line fuse.	Turn printer off and replace fuse (Figure 3-1).
Characters do not print. Power/fault indicator flashes.	Printer is out of paper.	Install paper and press Reset key.
	Access cover is open.	Replace access cover and press Reset.
Characters do not print. Carriage moves.	Printhead is too far from paper.	Readjust printhead.

Table 3-9 Troubleshooting Checklist (Cont)

Indication	Possible Cause	Action
Characters do not print or are garbled.	Data set (modem) is unplugged.	Plug in data set.
	Communication set-up is incorrect.	Make sure data communication features are set to match the host.
Characters are light.	Printhead is too far from paper.	Readjust printhead.
	No ink on ribbon.	Replace ribbon cartridge.
Ink smudges during printing.	Paper is not firmly wrapped around platen.	Smooth paper over surface of platen.
	Printhead is too close to paper.	Readjust printhead.
Paper does not advance.	Paper is not loaded correctly.	Reload paper.
	Feed holes are torn.	Reload paper.
Multipart paper tears.	Printhead is too close to paper.	Readjust printhead.
	Paper is not straight in printer.	Realign paper stack within 1 cm (1/2 in) of tractors.
	Tractors are incorrectly adjusted.	Readjust right tractor.
	Paper or printhead is jammed.	Remove access cover and clear jam. Replace cover and press <b>Reset</b> key.
Characters are garbled or double.	Communication switches are set up incorrectly.	Make sure data communication switches are set to match host computer.