

EK-LA210-UG-002

# LA210 Letterprinter

User Guide

Prepared by Educational Services  
of  
Digital Equipment Corporation

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- Reorient the receiving antenna.
- Relocate the computer with respect to the receiver.
- Move the computer away from the receiver.
- Plug the computer into a different outlet so that computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the booklet *How to Identify and Resolve Radio/TV Interference Problems*, prepared by the Federal Communications Commission, helpful. This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

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# INTRODUCTION

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This user guide shows you how to operate and maintain the LA210 Letterprinter. It describes ribbon and paper installation, operating controls and indicators, data communications, printer adjustments and maintenance, and troubleshooting.

The user guide is part of the LA210 Letterprinter user documentation package. There are four other documents in this package.

Installing the LA210 Letterprinter	EK-LA210-IN
LA210 Letterprinter Programmer Reference Manual	EK-LA210-RM
LA210 Letterprinter Operator and Programmer Reference Guide	EK-LA210-RC
LA210 Letterprinter Emulation Modes Reference Guide	EK-LA210-RG

The information in these documents is for three different audiences.

- the hardware installer who needs specific instructions and checkout information
- the operator who needs general operating information
- the applications programmer who needs interface and control function descriptions

## **Warnings, Cautions, and Notes**

The warnings, cautions, and notes in this user guide have specific purposes.

WARNINGS	Contain important information that relates to personal safety.
CAUTIONS	Contain information to prevent damage to the equipment.
NOTES	Contain general information.

# FEATURES

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The LA210 Letterprinter is a dot matrix, receive only (RO) printer. You can use this compact desktop printer in personal computer systems, office workstations, and small business computer systems.

The LA210 Letterprinter operates in text or graphics mode. In text mode, you can select letter quality or draft quality printing. In graphics mode, the computer controls the dot printing elements.

Letter quality mode provides medium or high density printing at low speed (40 characters per second maximum). Draft mode provides low density printing at high speed (240 characters per second maximum).

The printer contains the courier 10 USASCII, courier 10 multinational, and VT100 line drawing character sets. You can plug in up to two optional fonts in the font assembly.

A paper tractor comes with the printer. This tractor can handle wide paper and 4-part paper (original plus three copies). You can feed paper from the back of the printer (single-part only) or through a slot in the bottom of the printer. The ribbon comes in a disposable cartridge.

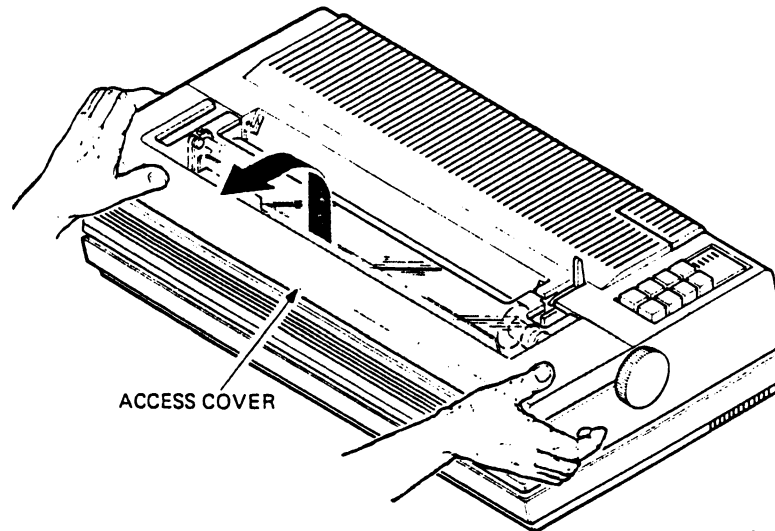
The printer can also emulate the IBM/Epson MX80 printer, the IBM/Epson MX80 printer with Grafrax, and the IBM Graphics printer.

You can select emulation modes by changing the configuration switch settings and the plug-in font cartridges. To operate the printer in the emulation modes, see the major sections on "Configuration Switches," "Fonts," and "Printer Emulation Modes."

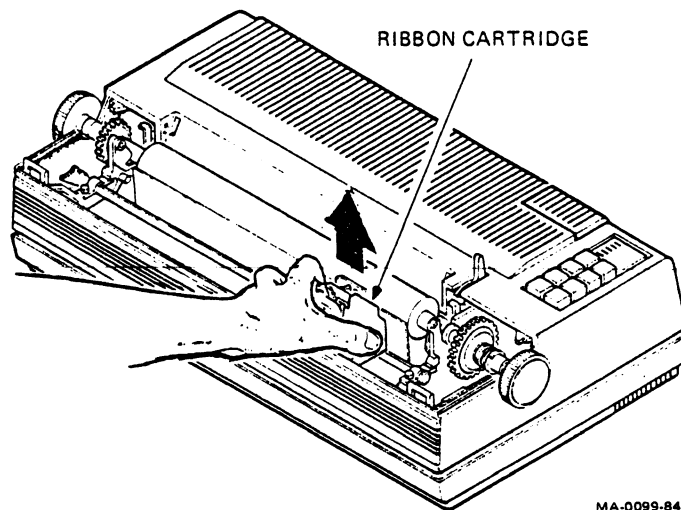
# INSTALLING RIBBON AND PAPER

## Replacing the Ribbon Cartridge

1. Remove the access cover by pulling up and out.



2. Remove and discard the old ribbon cartridge.

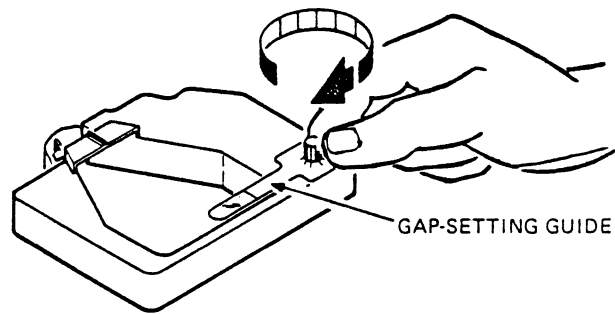


**CAUTION:** Digital recommends the LA10R ribbon cartridge for replacement. Using other ribbon cartridges may damage the print-head and void the warranty.



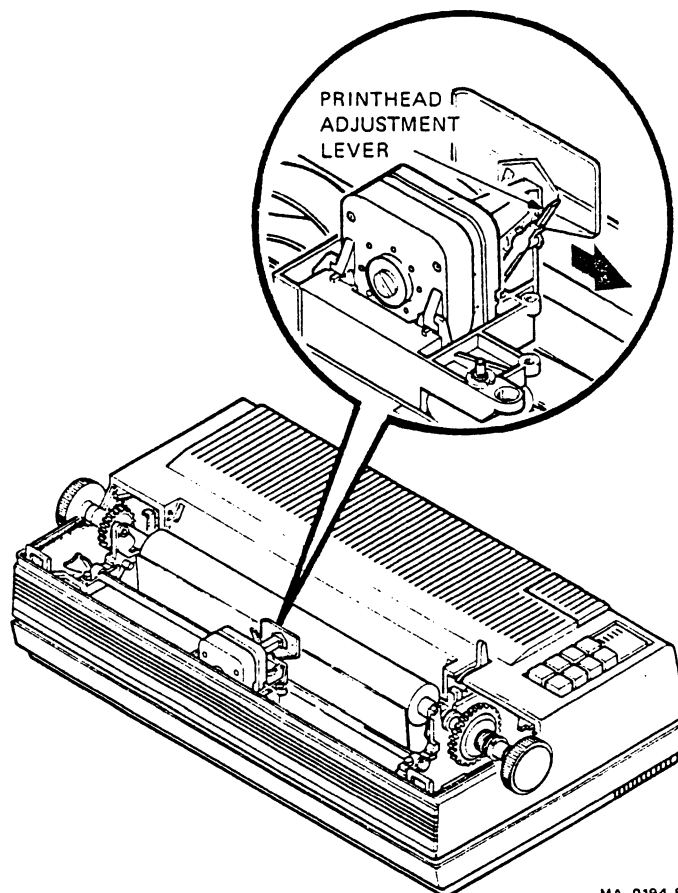
- 
3. Remove and save the gap-setting guide from the new cartridge. (You need this guide to adjust the printhead.)

Turn the ribbon adjustment knob on the new cartridge clockwise to tighten the ribbon.



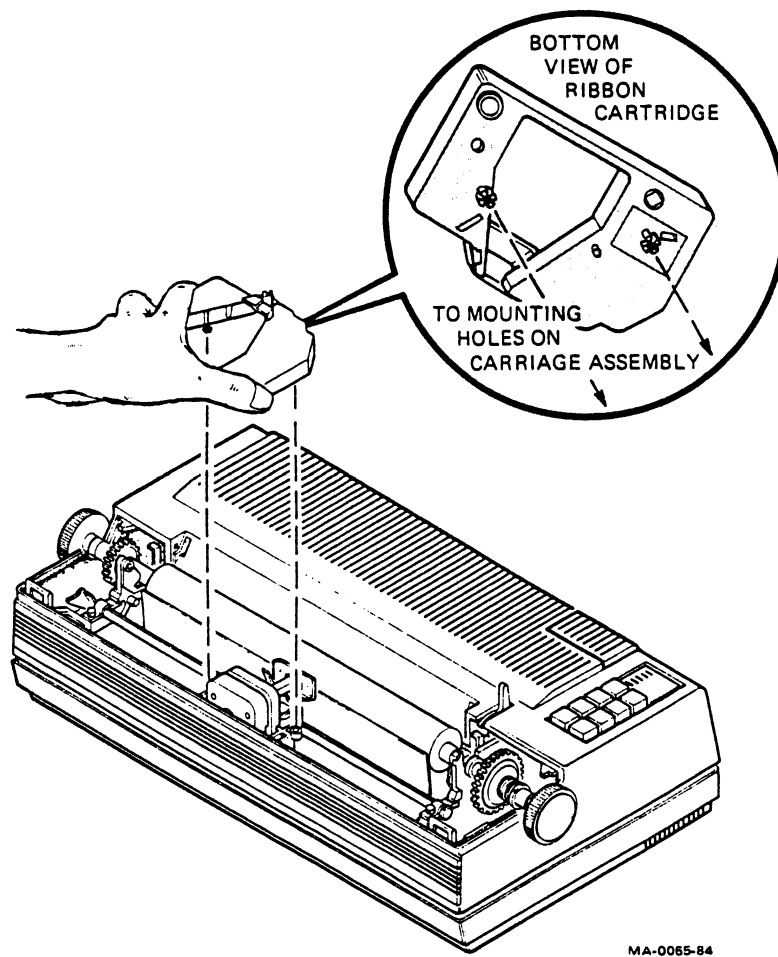
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4. Move the printhead adjustment lever to the right.

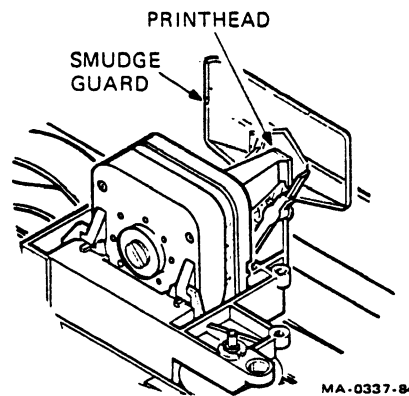


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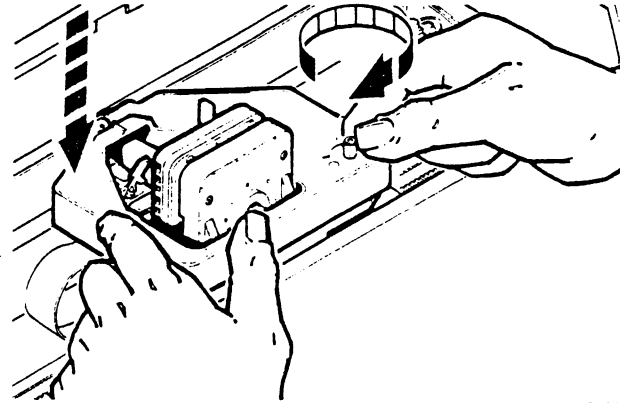
5. Fit the cartridge over the mounting holes and push into place.



Make sure the ribbon fits between the printhead and smudge guard.



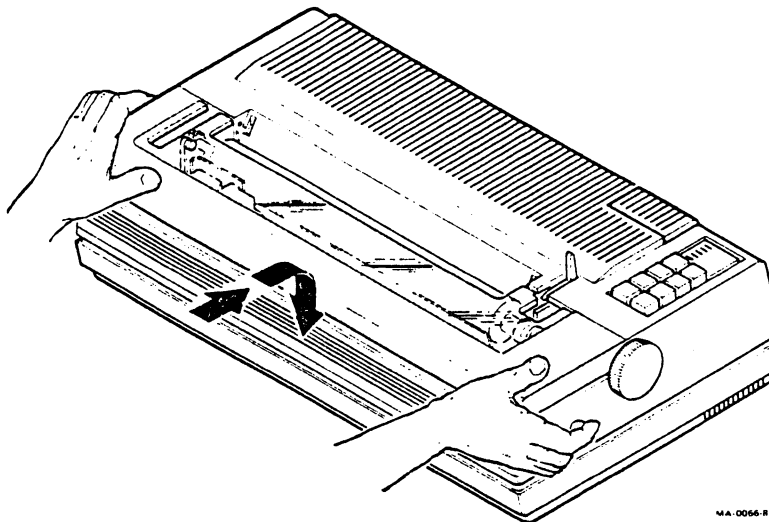
- 
6. Press the cartridge into place and tighten the ribbon with the ribbon adjustment knob.



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*NOTE: If you need to adjust the printhead, see the "Adjusting the Printhead" section.*

7. Replace the access cover by sliding in and down.

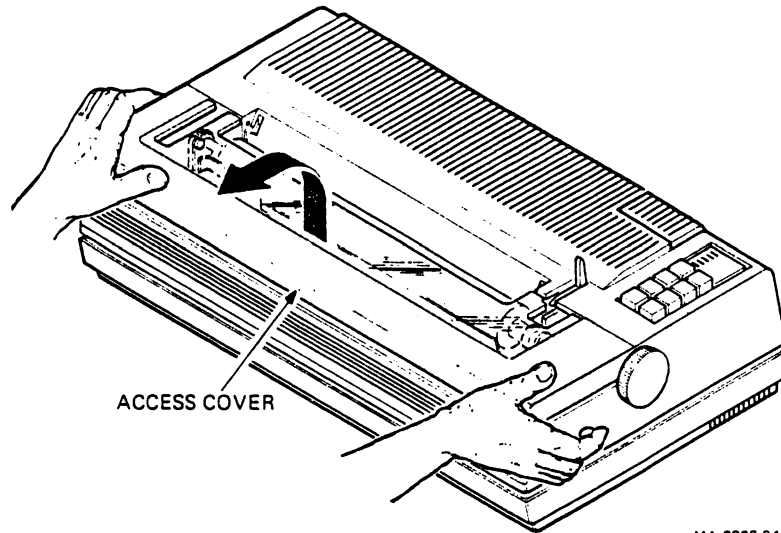


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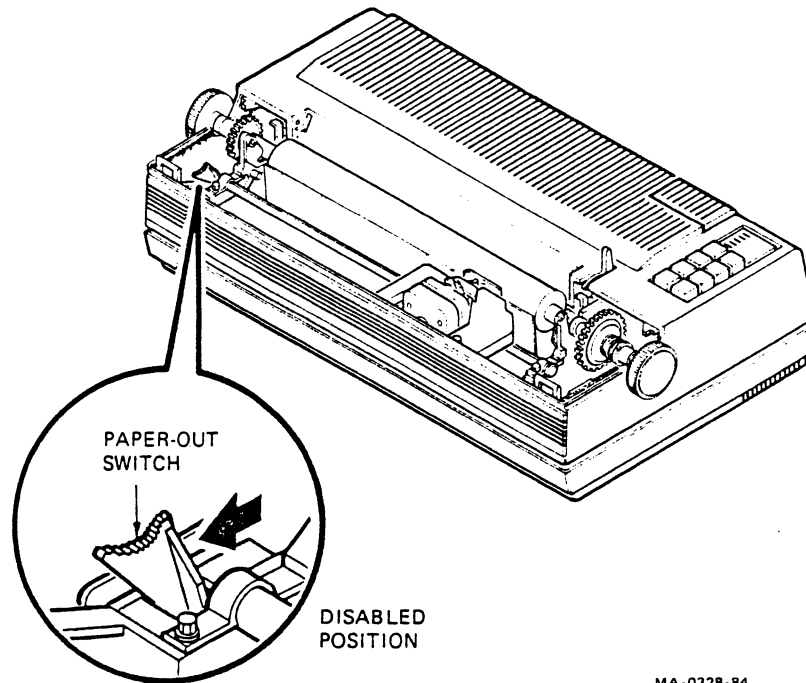
## Inserting Paper

1. Remove the access cover by pulling up and out.



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- 
- 2. Move the paper-out switch left and toward you (disabled position).

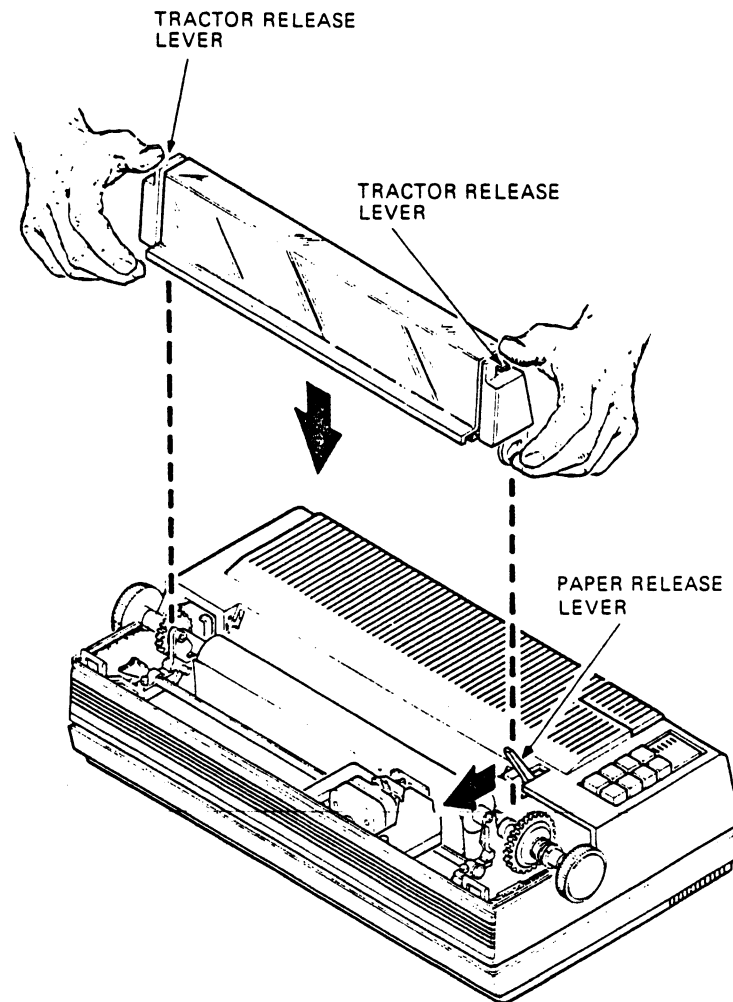


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*CAUTION: Make sure the paper-out switch is disabled before you feed or remove paper through the bottom slot. If not, the switch may be damaged.*

*NOTE: Make sure the paper-out switch is disabled before you feed paper through the back and around the platen. If not, the Power/fault indicator turns on and the printer will not feed paper.*

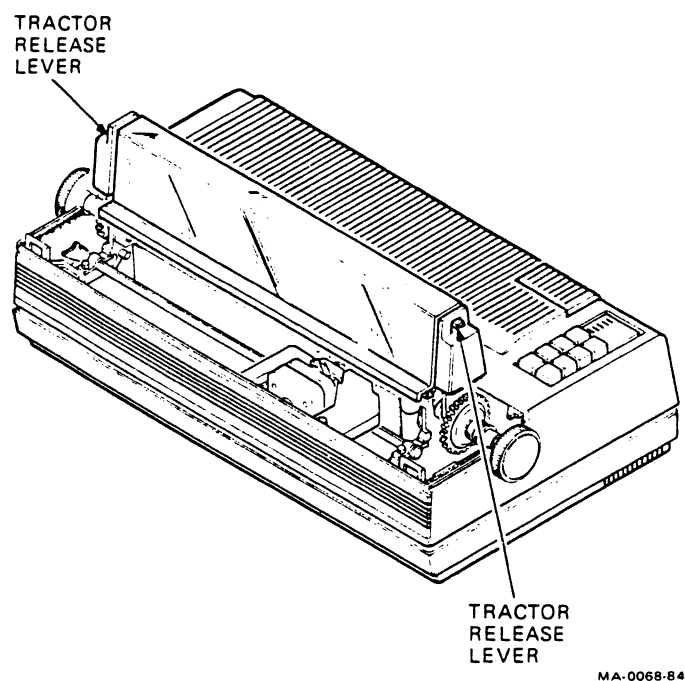
3. Pull the paper release lever toward you.
4. Hold the tractor assembly with both hands and press down on the tractor release levers.
5. Line up the tractor assembly with the two slots in the top of the printer. Lower the assembly into place.



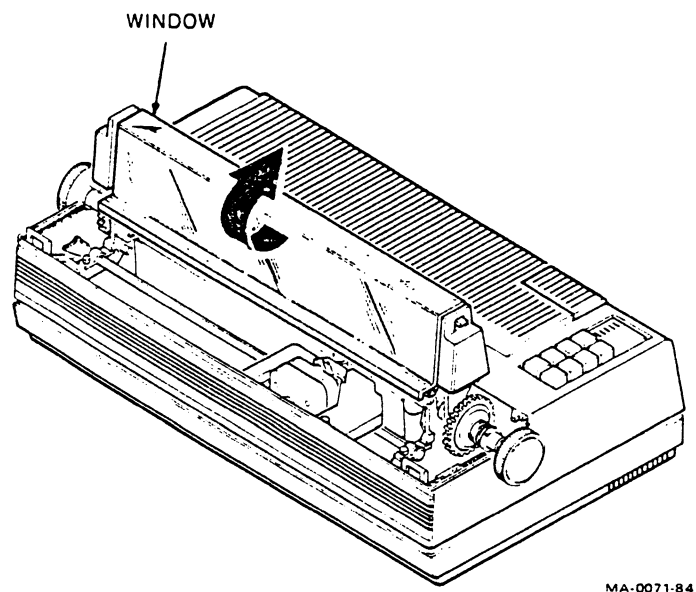
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6. Release the tractor release levers.

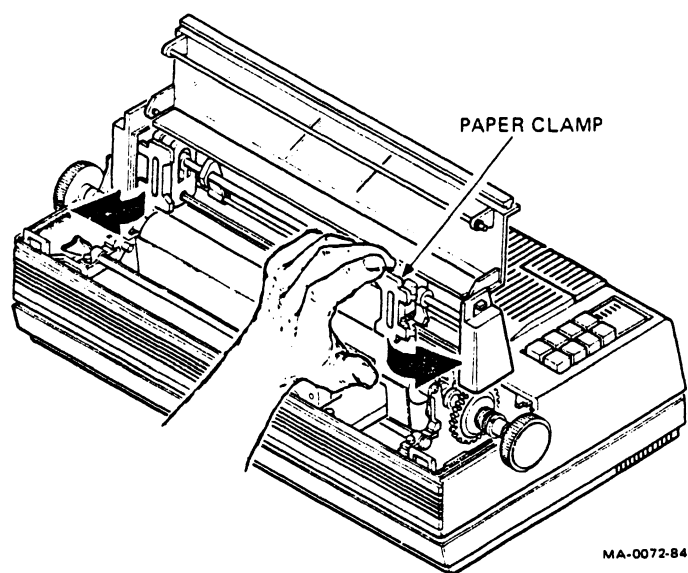


7. Open the window.



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8. Open the paper clamps.



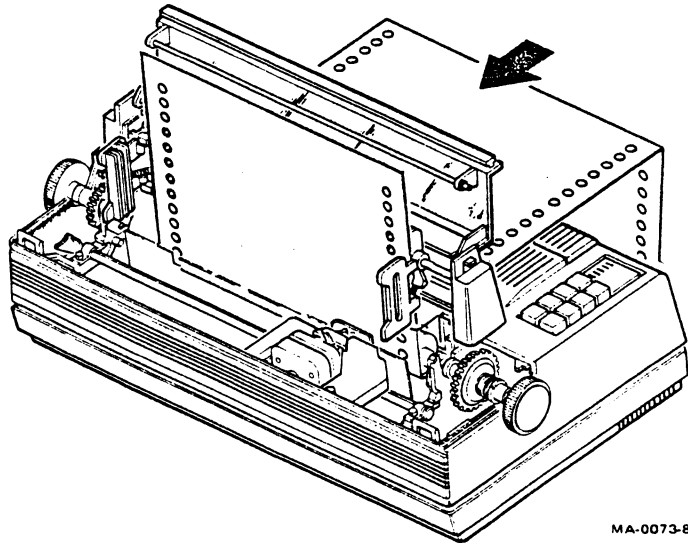


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9. This step depends on the printer's location.

**Printer on Table or Desk**

Guide the paper under the back of the tractor assembly, around the platen, and up onto the tractors.



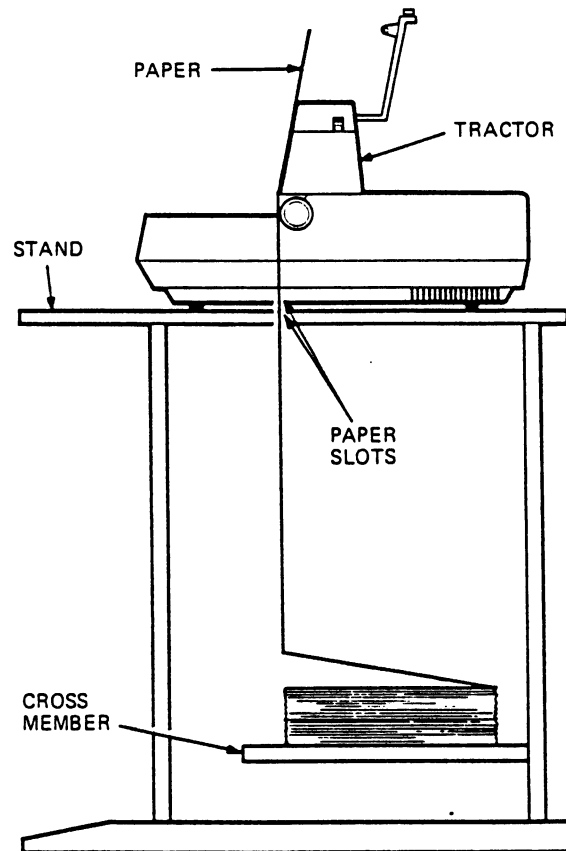
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*NOTE: Use only single-part paper when feeding paper from the back of the printer. If you use multipart paper, you must feed paper through the bottom of the printer as follows.*

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## Printer on Stand

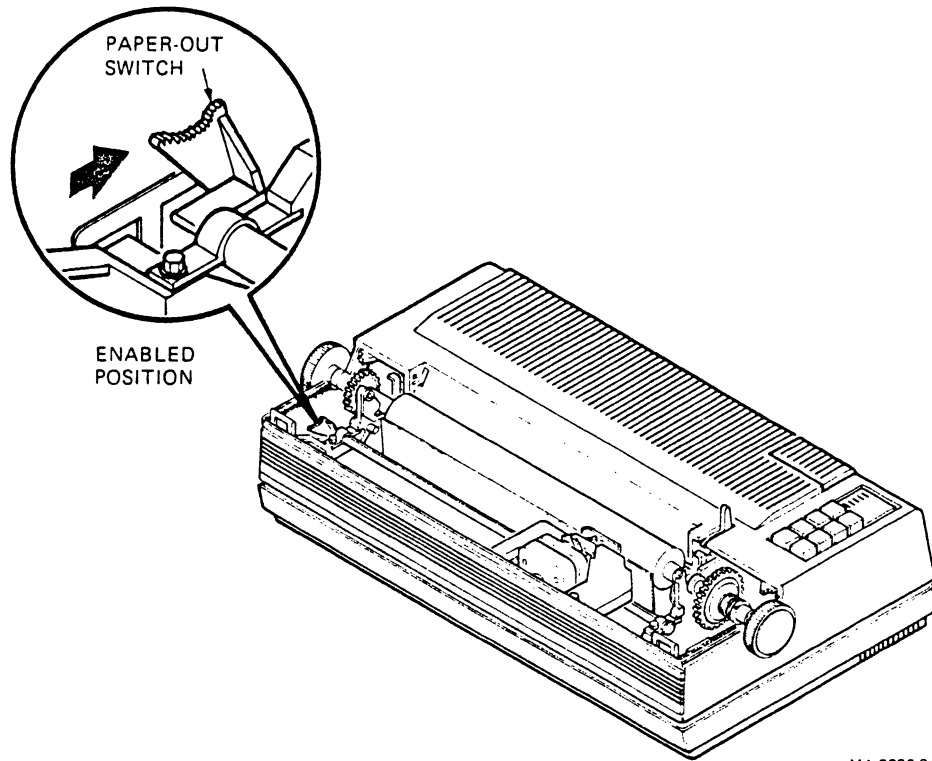
Feed paper through the slot in the bottom of the printer and onto the tractors.



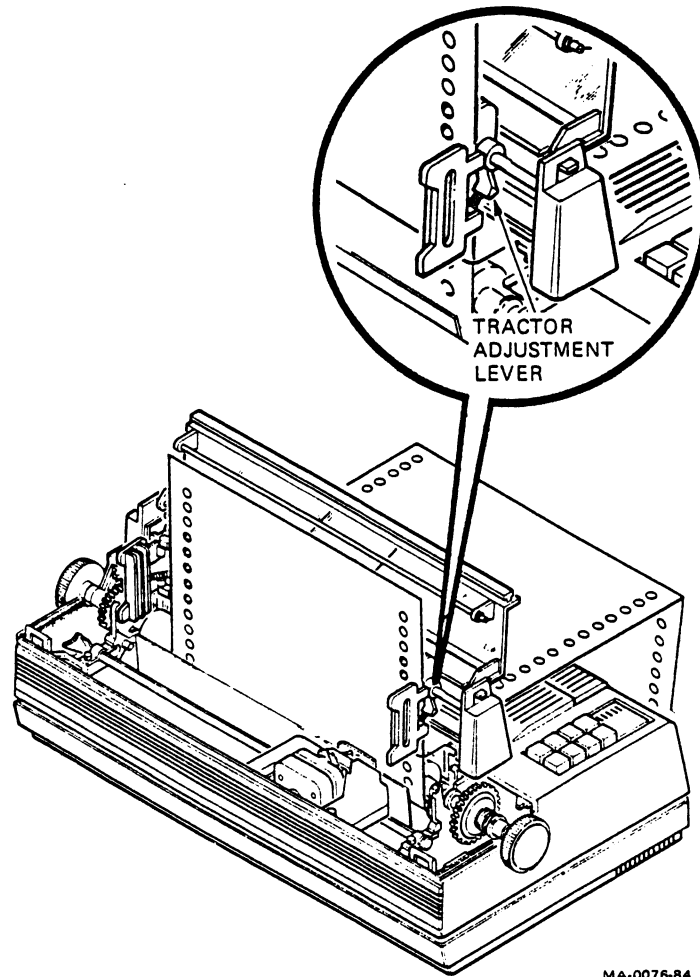
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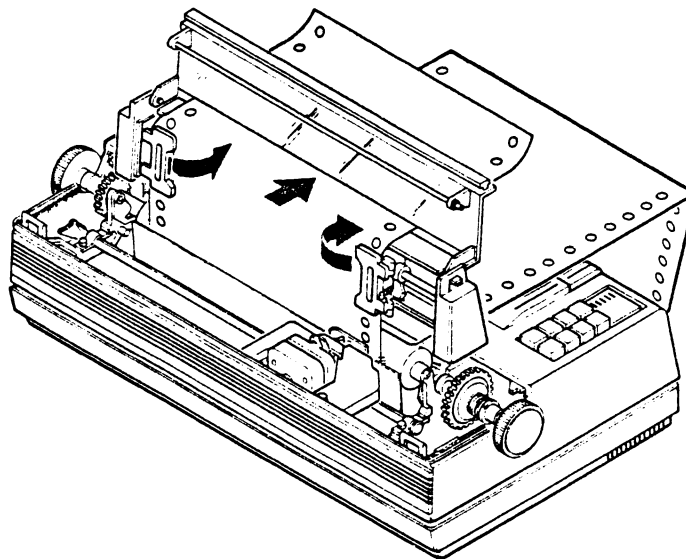
*NOTE: You can enable the paper-out function when feeding paper from the bottom. First load the paper. Then return the paper-out switch to the enabled position. (Move switch to left and away from you.)*



- 
10. Fit the paper on the tractors. If the paper does not fit correctly, use the tractor adjustment levers to move the tractors.

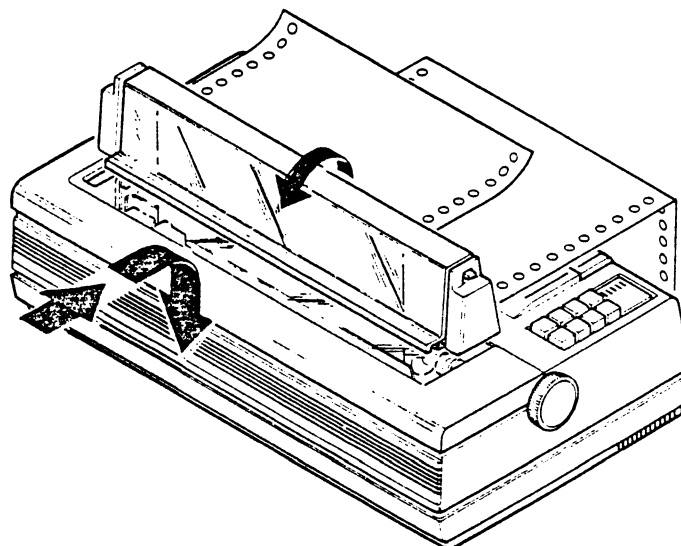


- 
11. Feed the paper through the window slot and close the tractor clamps.



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12. Replace the access cover by sliding in and down. Then close the window.

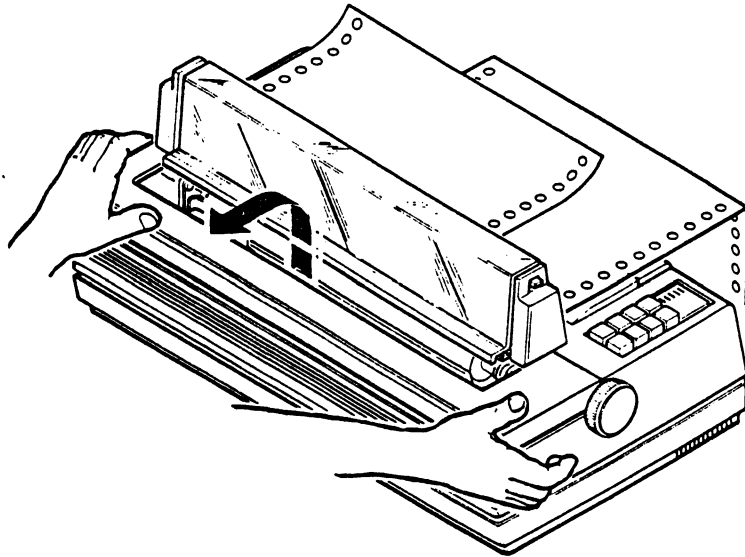


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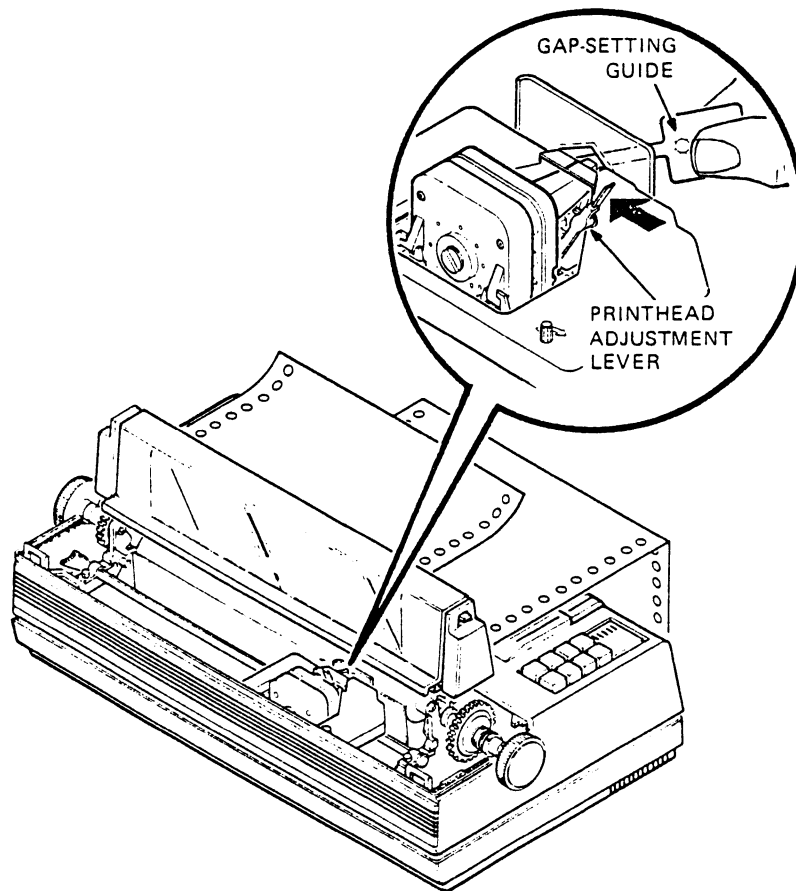
## Adjusting the Printhead

1. Remove the access cover by pulling up and out.



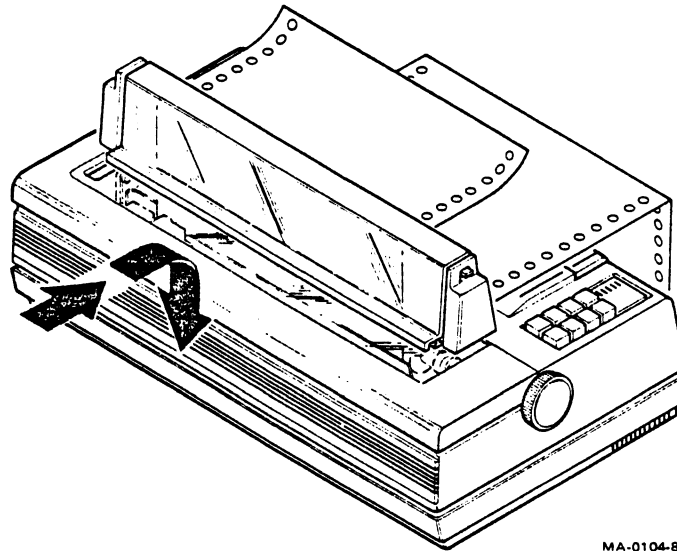
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2. You need the gap-setting guide that came with your ribbon cartridge. Slide the narrow end of the guide between the printer and the paper.
3. Move the printhead adjustment lever to the left, until you feel a slight resistance when you slide the gap-setting guide between the printhead and paper. The printhead is now adjusted correctly.



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- 
4. Replace the access cover by sliding in and down.



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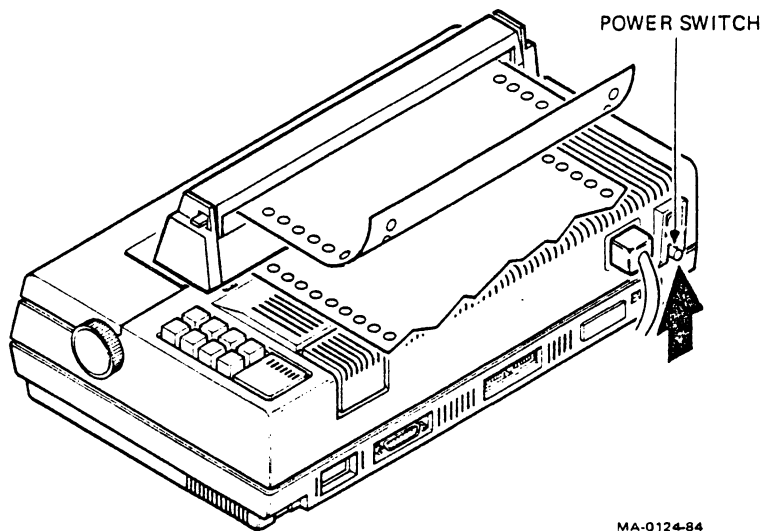


# SWITCHES AND INDICATORS

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## Power Switch

The power switch is on the rear of the printer. To turn power on, you set the switch to the up (1) position.



## Control Panel

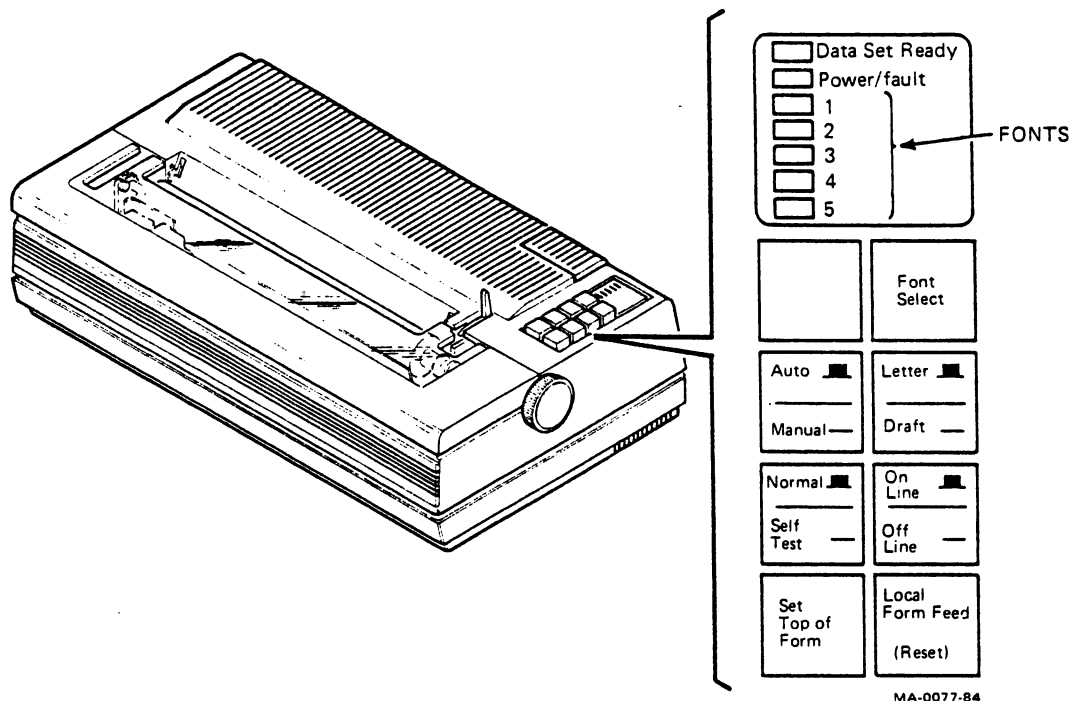
The operator's control panel is on the top right of the printer. The control panel includes the following switches and indicators.

### Auto/Manual Switch

This switch specifies whether the computer or the operator has control over letter quality and draft printing. In the **Auto** (up) position, the computer has control. In the **Manual** (down) position, the operator has control and uses the **Letter/Draft** switch to select print quality.

### Letter/Draft Switch

This switch only works when the **Auto/Manual** switch is set to **Manual**. Set the **Letter/Draft** switch up for letter quality, and down for draft printing.



### On Line/Off Line Switch

This switch controls whether the printer is available for printing (on-line) or in local mode (off-line). Set the switch up for printing and down for local mode. The **Off Line** position is used for such functions as running self-tests, and setting top of form and local form feed.

*NOTE: Normally, data is not lost when you switch the printer off-line (unless the printer is in self-test mode). When you switch the printer back on-line, the printer resumes printing where it left off.*

### Normal/Self Test Switch

This switch is used to put the printer in self-test mode. To use self-test mode, first set the **On Line/Off Line** switch to **Off Line** (down). Next set the **Normal/Self Test** switch to **Self Test** (down). For normal print mode operation, both switches should be up.

---

## Set Top of Form Switch

This switch controls the position of the top of the sheet of paper or form used. To set a new top of form, first set the **On Line/Off Line** switch to **Off Line**. Next, fit the top of the paper on the tractors. Then press the momentary-contact **Top of Form** switch. Reset the **On Line/Off Line** switch to **On Line** to continue printing.

*NOTE: The printer starts printing at the top margin, not the top of form (unless the top margin is the same position). See the LA210 Letterprinter Programmer Reference Manual for details.*

## Local Form Feed (Reset) Switch

When the printer is off-line, this switch advances the paper to the next top-of-form position each time you press it. If you hold down this switch while turning power on, it does not advance paper, but resets the printer to the factory default settings. This switch also resets certain faults (such as cover open) after the fault is cleared.

## Font Select Switch

This switch lets you select which font the printer uses, or have the computer control font selection. When the system is first turned on, the computer has font control. When you first press the **Font Select** switch, it selects font 1. Pressing this switch again selects font 2, and so on. The font indicators show the selected font. After you select font 5 and press the switch again, font selection control returns to the computer.

*NOTE: You can only select font positions that contain fonts. You cannot select font 2 and font 4 unless optional external fonts are installed.*

---

## Indicators

### Data Set Ready Indicator

This indicator is on whenever the DSR (data set ready) signal is present. DSR is sent by the computer (or modem) to indicate that the system is ready and able to send and receive data.

### Power/fault Indicator

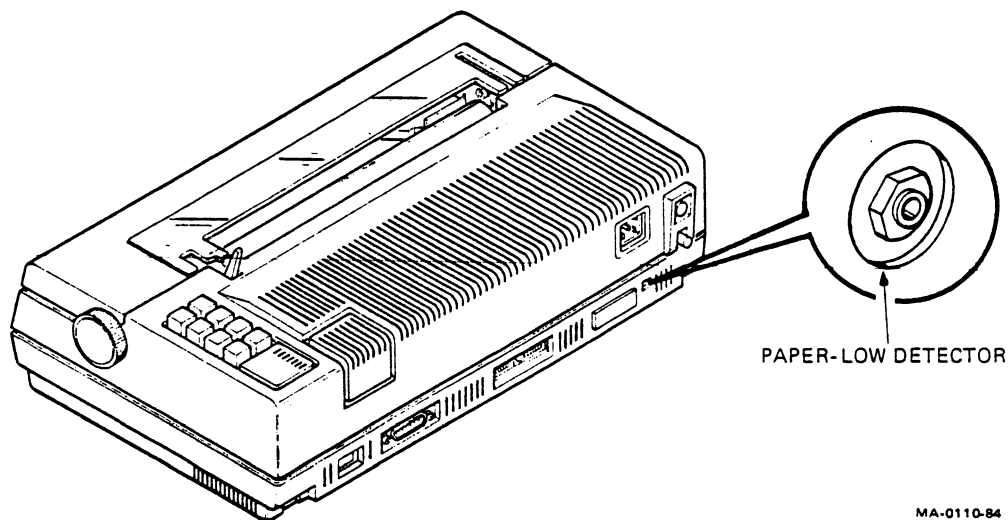
This indicator is a combination power/ready indicator. If the indicator is on, the power is on and the printer is ready. Intermittent flashing indicates a fault in the system.

### Font Indicators

These five indicators show which font is currently selected for printing. If you are selecting fonts manually, the indicator that is on represents the selected font. If the computer selects the font, the indicator that is off represents the selected font; in this case, all other indicators are on.

### Paper-Low Detector

This connector is for the paper-low detector when you use an optional sheet feeder.



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## **Printer Controls**

### **Paper Adjust Knobs**

Use either knob on the platen to adjust the paper vertically. Once the top of form is set, rotating the paper adjust knobs will change the top of form setting.

### **Paper Release Lever**

This lever controls paper-holding tension. Put the lever in the forward (released) position for tractor operation.

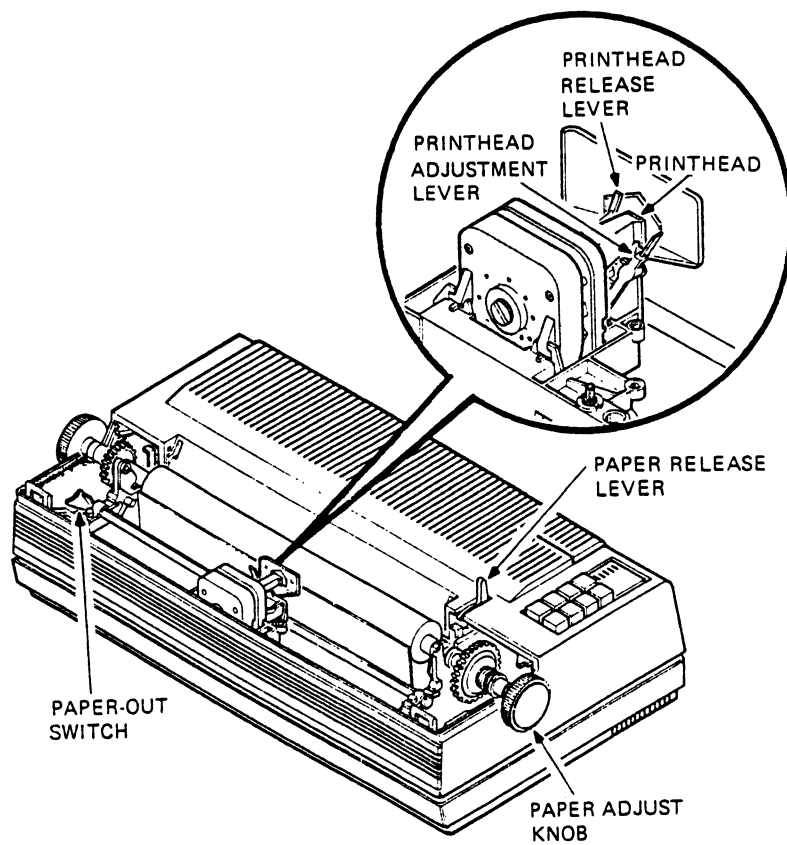
### **Printhead Release Lever**

Use this lever only to replace the printhead, if necessary. Move the lever toward the rear of the printer to unlock the printhead. Move the lever toward the front of the printer to lock the printhead in place.

### **Printhead Adjustment Lever**

Move this lever to the left for single-part paper (one sheet thick). The printhead will move toward the platen. Move the lever to the right for multipart forms or heavy forms. The printhead will move away from the platen. You can also use this lever to move the printhead away from the platen and change the ribbon.

For the best print quality, see the “Adjusting the Printhead” section.



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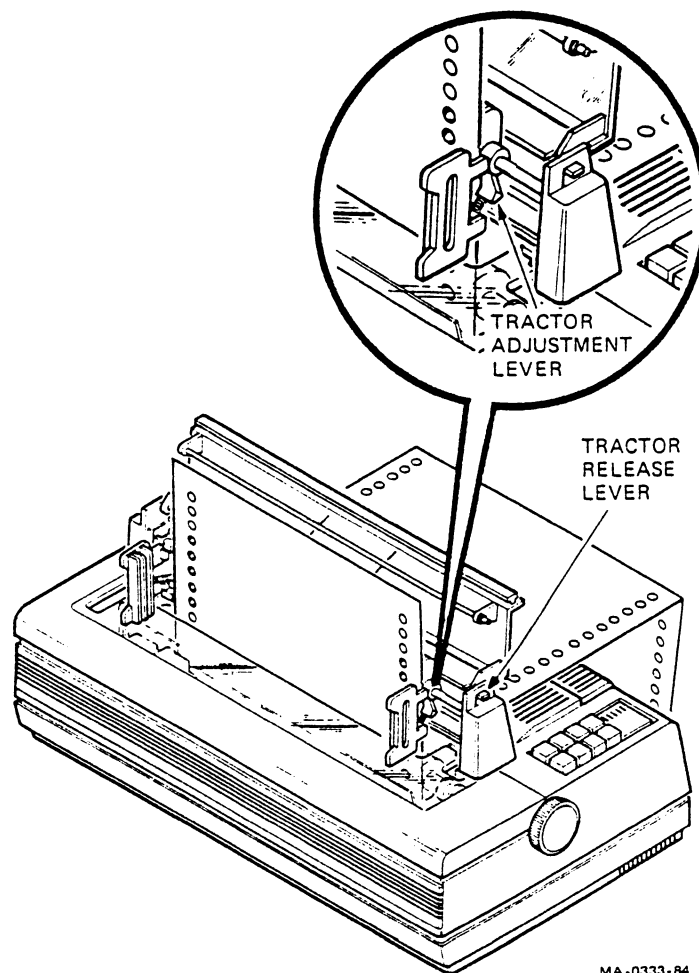
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## Tractor Release Levers

These levers let you remove the tractor assembly. To remove the tractor, push both release levers down while lifting the assembly.

## Tractor Adjustment Levers

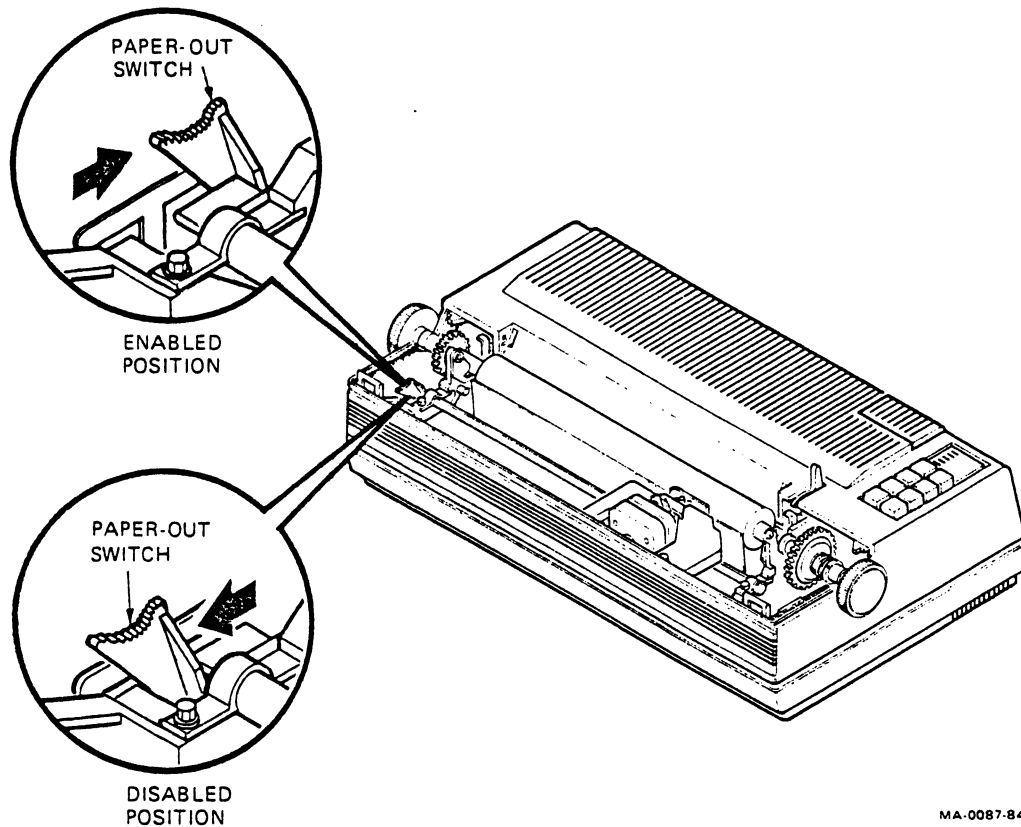
These levers control margin location and paper width. Pull the adjustment levers forward to release the tractors. Adjust the horizontal space between the tractors for different-size paper. After adjusting a tractor, push the lever to the rear to lock in place.



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## Paper-Out Switch

This switch is under the access cover. You use this switch for paper loading, and to disable paper-out detection when paper is loaded from the back of the printer. Pull the switch forward to override paper-out detection, or to load paper. Push the switch back to enable paper-out detection when paper is loaded through the bottom of the printer.



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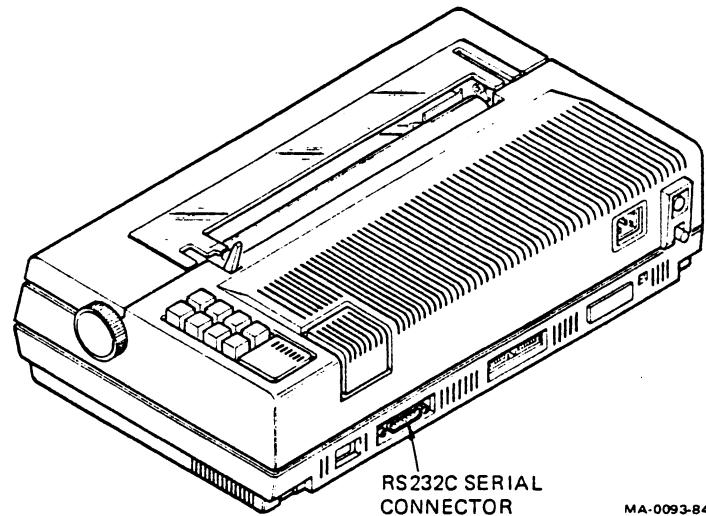


# COMMUNICATION

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## Interface Signals

The LA210 Letterprinter has a standard RS232C serial interface.



The printer supports the following RS232C interface signals.

Pin	Source	Name	Function
1	–	GND	Protective ground
2	Printer	TXD	Transmitted data
3	User	RXD	Received data
4	Printer	RTS	Request to send
5	User	CTS	Clear to send
6	User	DSR	Data set ready
7	–	GND	Signal ground
8	User	RLSD	Carrier detect
9*	Printer	RXC	Clock baud rate signal
11	Printer	BUSY	Restraint
12	User	SPDI	Speed indicator
19	Printer	SRTS	Secondary request to send
20	Printer	DTR	Data terminal ready
22	User	RI	Ring indicator
23	Printer	SPDS	Speed select
25*	Printer	OP PWR	+5 volts

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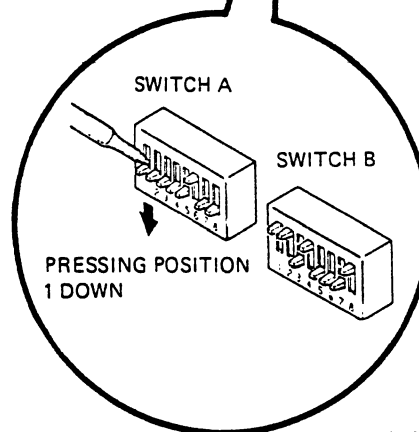
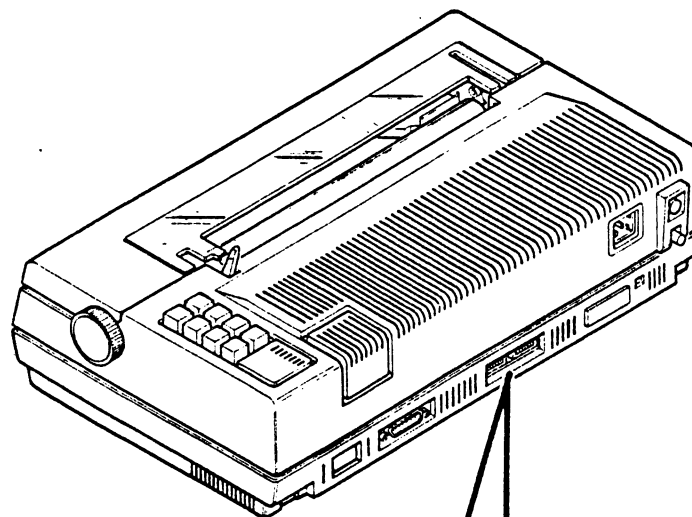
\* For external parallel interface adapter option.

# CONFIGURATION SWITCHES

## Setup Adjustments

The configuration switches are factory-set so you can use the printer with most Digital systems. All the figures in this section show the factory settings. Check your system requirements to see if any changes are necessary. After you set these switches, you normally do not change the settings unless you make a change to the communication system or computer.

**CAUTION:** *Never use a lead pencil to change the switch positions. Use a ball point pen or similar item.*



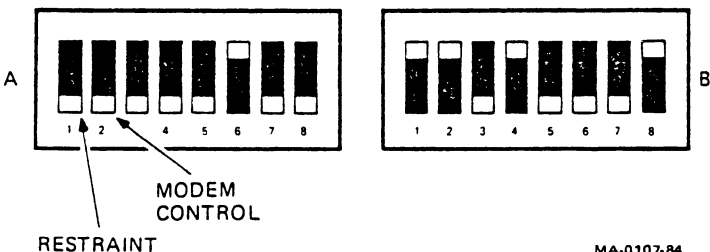
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### Speed Control/Restraint Protocol Switch (A1)

Set switch **A1** down for transmission restraint using the EIA BUSY control line. Set the switch up for speed control using the EIA SPDI (speed indicator) and SPDS (speed select) control lines.

Function	Switch Setting
Restraint mode	Down (factory setting)
Speed control mode	Up



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### Modem Control Switch (A2)

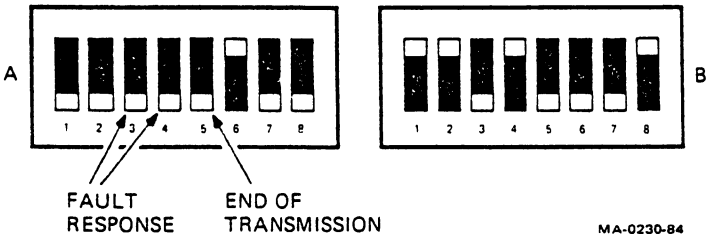
Switch **A2** controls access to modem control.

Function	Switch Setting
No modem control	Down (factory setting)
Modem control	Up

**Fault Response Switches (A3 and A4)**

Switches **A3** and **A4** select the response to a paper fault when it occurs.

Function	Switch Settings	
	3	4
Select no action. (XOFF is sent if enabled.)	Down	Down (factory setting)
Select to send break signal.	Up	Down
Select disconnect. (Drop DTR.)	Down	Up
Select do not connect.	Up	Up



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**End of Transmission Switch (A5)**

Switch **A5** controls the EOT (end of transmission) characters.

Function	Switch Setting
Disable coded disconnect. (Ignore EOT.)	Down (factory setting)
Enable coded disconnect. (Disconnect upon receiving EOT.)	Up

---

## XON/XOFF Protocol Switch (A6)

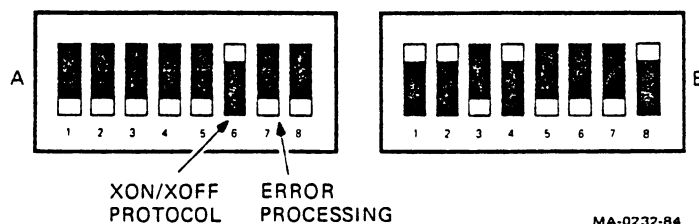
Switch **A6** controls XON/XOFF.

### Function

Enable auto XON/XOFF.  
Disable auto XON/XOFF.

### Switch Setting

Up (factory setting)  
Down



## Error Processing Switch (A7)

Switch **A7** controls receiver error processing.

### Function

Set receiver processing to  
print substitute character.

Set receiver error processing  
to print characters as received.

### Switch Setting

Down (factory setting)

Up

---

## Store Features Switch (A8)

Switch **A8** stores the computer-selectable features in user permanent memory. These features are as follows.

Horizontal tab	Paper width
Vertical tab	Answerback message
Form length	Character set selection and mapping
Horizontal pitch	Pitch mode
Vertical pitch	End of line control
Horizontal margins	New Line request
Vertical margins	C1 receive
Paper alignment	C1 transmit

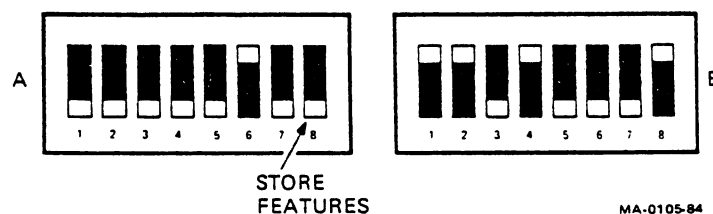
You can verify that these features are stored as follows.

1. Set the printer off-line.
2. Turn printer power off and on.
3. Print the status message.

The computer cannot change the features stored in user permanent memory. To store or change these features, reset the desired configuration switches. Then move switch **A8** from down to up. Moving switch **A8** from up to down has no function.

The factory default settings for some features are listed in the status message. The default settings that are not listed are as follows.

Feature	Setting
Left margin	Column 1
Right margin	Paper width = 132 columns
Top margin	Line 1
Bottom margin	Form length = 66 lines
Paper alignment	Offset = 0
Paper width	13.2 inches

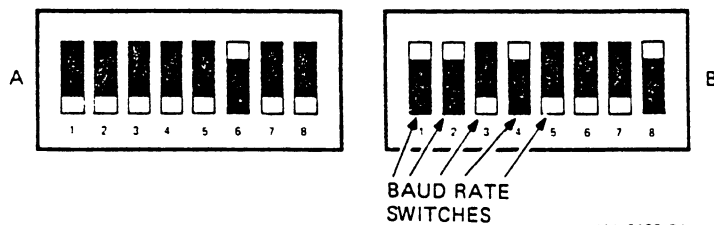


MA-0105-84

## Baud Rate Select Switches (B1 Through B5)

These switches select the speed at which the printer communicates with the computer.

Baud Rate	Switch Settings				
	1	2	3	4	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 (factory setting)	Up	Up	Down	Up	Down
7200	Down	Down	Up	Up	Down
9600	Up	Down	Up	Up	Down



MA-0106-84

## Split Baud Rate Select Switches (B1 Through B5)

The following settings are for split transmission speed baud rates. Set switch position **B5** up to select split speed mode.

Split Rate Transmit/Receive	Switch Settings				
	1	2	3	4	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

**Split Rate  
Transmit/Receive**

**Switch Settings**

**1      2      3      4      5**

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

**Data Parity Switches (B6 and B7)**

These switches select the data parity to match communication requirements with the computer.

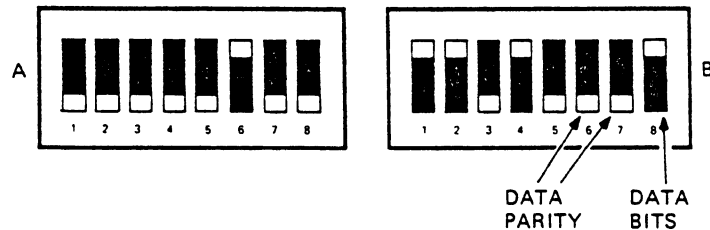
**Parity**

**7-Bit    8-Bit**

**Switch Settings**

**6      7**

Space	No parity	Down	Down (factory setting)
Mark	No parity	Up	Down
Even	Even	Down	Up
Odd	Odd	Up	Up



MA-0231-84

**Data Format Switch (B8)**

The printer may send and receive data in either 7-bit or 8-bit ASCII mode. Switch B8 selects the character processing mode.

**Data Bits**

**Switch Settings**

8	Up (factory setting)
7	Down

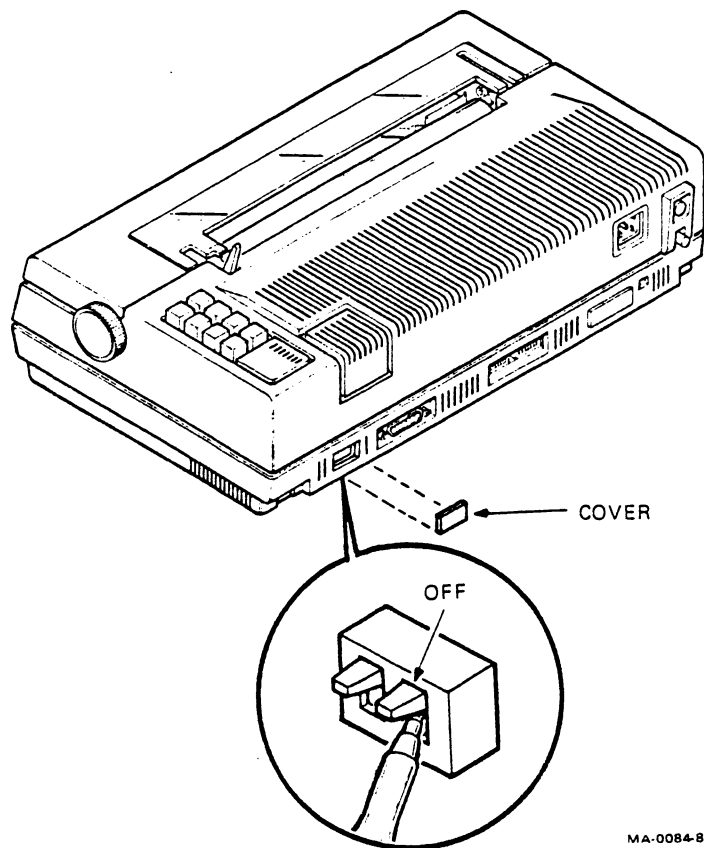


---

## Parallel Interface Switches (Optional)

These switches control the clock (pin 9) and power (pin 25) at the EIA connector for the parallel interface adapter option (LA10X-EP).

Function	Switch Settings
Parallel interface clock and power off	Both up (factory setting)
Parallel interface clock and power on	Both down



MA-0084-84

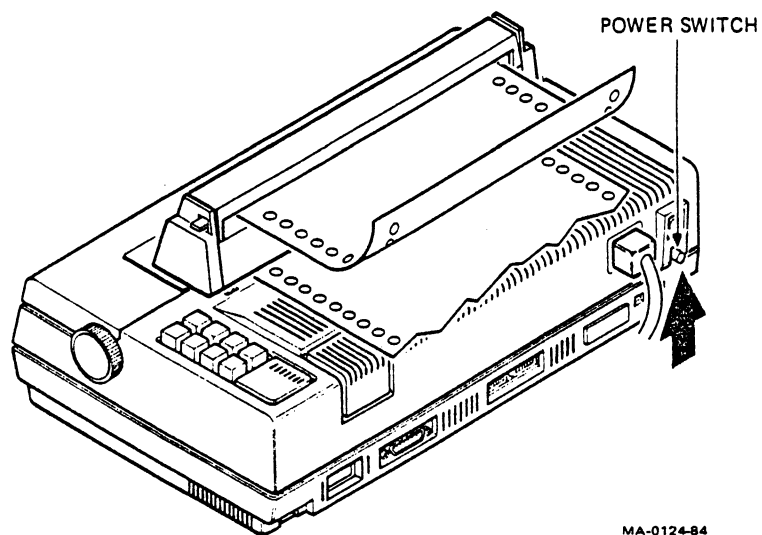
# SELF-TESTS

---

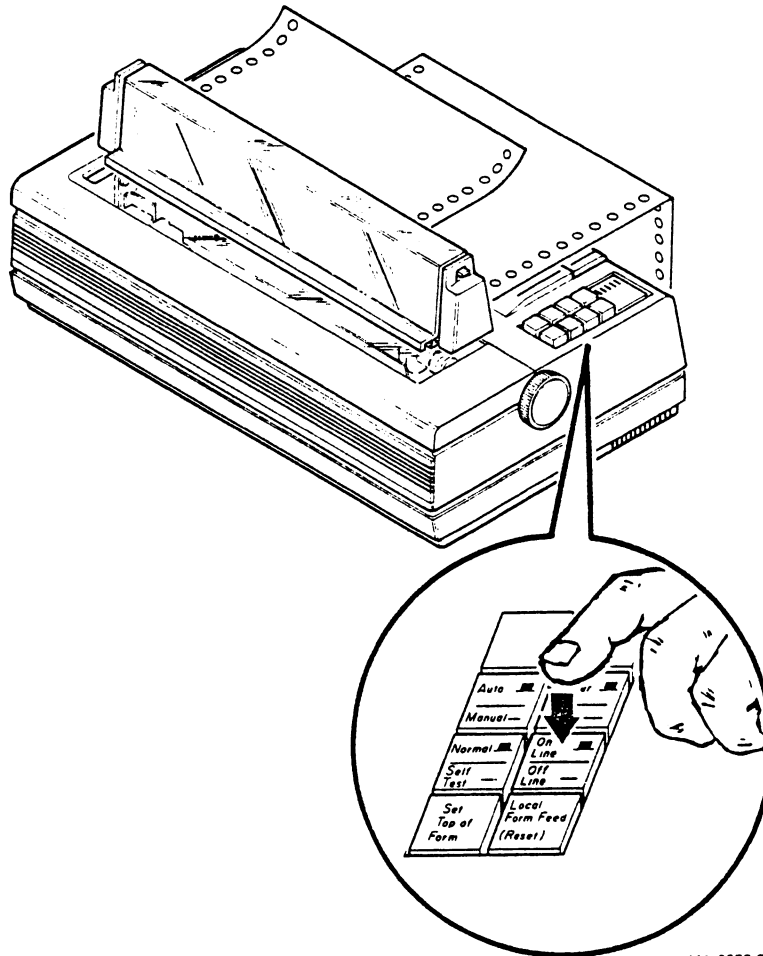
The access cover must be on to run the self-tests. If the printer does not pass the tests, see the "Troubleshooting Checklist."

## Internal Self-Test

1. Turn the printer power switch on.

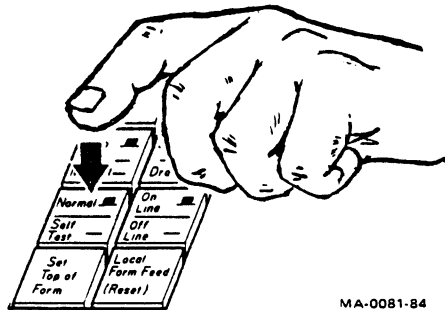


- 
2. Press the **On Line/Off Line** switch down to the **Off Line** position.



MA-0078-84

3. Press the **Normal/Self Test** switch down to the **Self Test** position.



MA-0081-84

You should see the following status message. This message shows the firmware version number, configuration switch settings, and computer selectable features. If the message smudges, see the "Adjusting the Printhead" section.

```
LA210 V2.1 R0
Emulation mode 0
2K Buffer
DPSS: 006...131.....
```

\*Printer Settings

```
Form Length (1/24):264
G0 Character set:United States
G1 Character set:Line drawing
G2 Character set:DEC Multinational
G3 Character set:United States
GL Set mapping:G0
GR Set mapping:G2
Pitch Mode:All Pitches
Horiz pitch (cpi):10
Vert pitch (lpi):6
End of line control:wrap mode
New Line request char.:none
```

\*Communication Settings

```
Auto-answerback:Disabled
Disconnect on EOT:Disabled
Paper fault processing:XOFF (if enabled)
Parity:8/N
Receiver error:Print error block
Speed(bps):4800
Auto XON/XOFF:Enabled
Modem Control:No Modem Control-Restraint Mode
C1 receive:Disabled
C1 transmit:Disabled
```

MA - 0085 -84

- 
- A hand is shown pressing the 'Normal' button on the control panel. The panel includes buttons for 'Auto', 'Manual', 'Normal', 'Self Test', 'Set Top of Form', and 'Local Form Feed (Reset)'. A downward arrow points to the 'Normal' button.

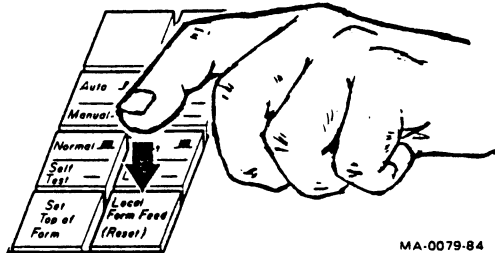
[illegible]

MA-0079-B4

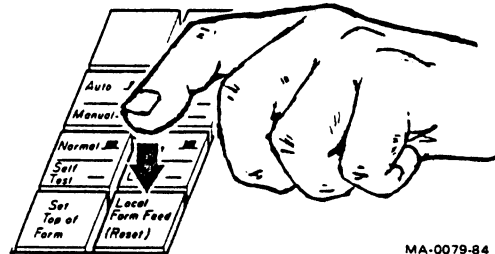
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 104

40

6. Press and release the **Local Form Feed** switch to stop this test and start self-test 3. This test moves the carriage to each character position, advances lines, but does not print. Check for smooth carriage and paper feed motion.

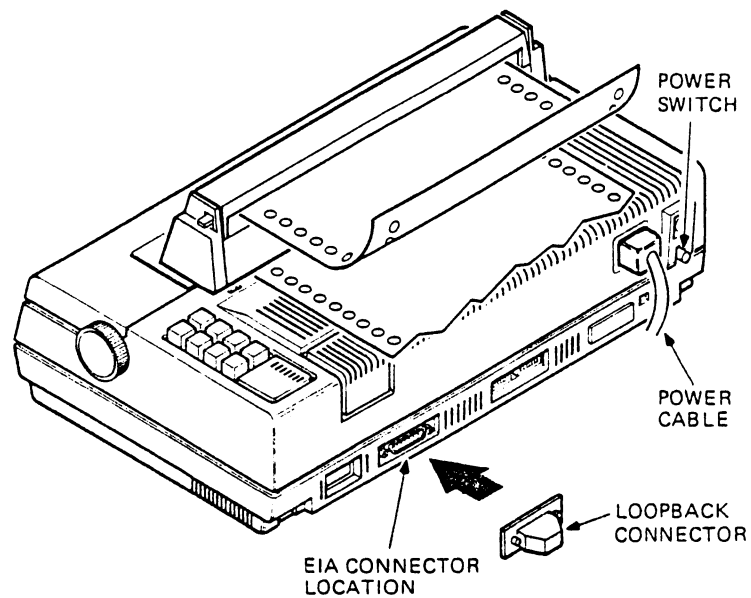


7. Press and release the **Local Form Feed** switch to stop this test and reprint the status message. After the status message prints out again, the printer stops.



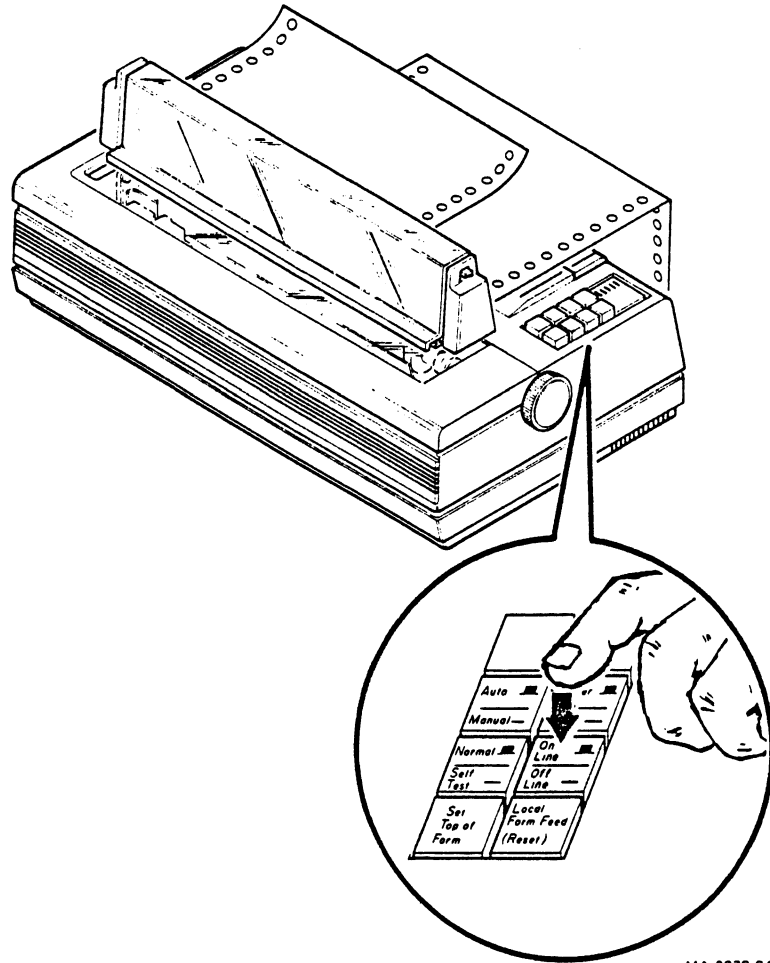
## I/O Loopback Tests

1. Turn the printer power switch off.
2. Plug in the loopback connector.
3. Turn on the power.



MA-0083-B4

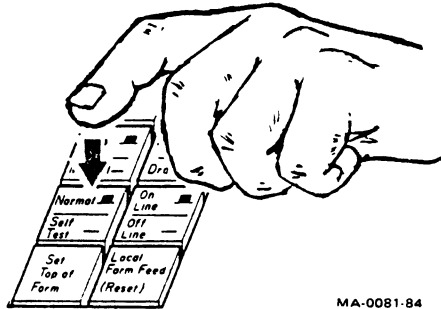
- 
4. Press the **On Line/Off Line** switch down to the **Off Line** position.



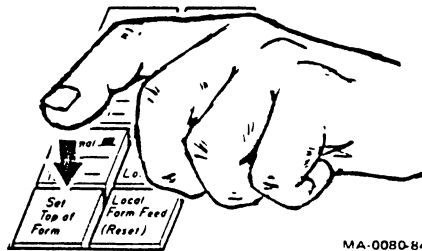
MA-0078-84



- 
5. Press the **Normal/Self Test** switch down to the **Self Test** position. You should see the status message print, as shown in step 3 of the "Internal Self-Test" section.



6. Press the **Set Top of Form** switch.



The printer runs a baud rate test and prints a pass or fail message. Here is a sample message.

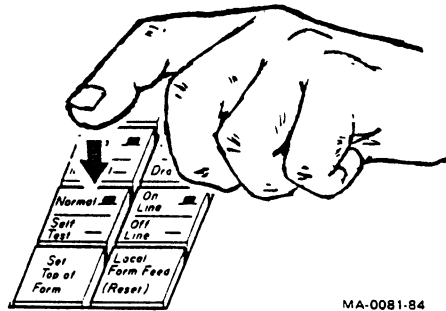
Control lines OK

*NOTE: There is a delay of about 1 minute before the printer completes the test message.*

Data path OK  
Printing loopback

Next, the printer runs a data communications test. This test prints out all characters (similar to self-test 1).

- 
7. Press and release the **Normal/Self Test** switch to stop the test.



MA-0081-84

The printer prints

Stopped

# MAINTENANCE

---

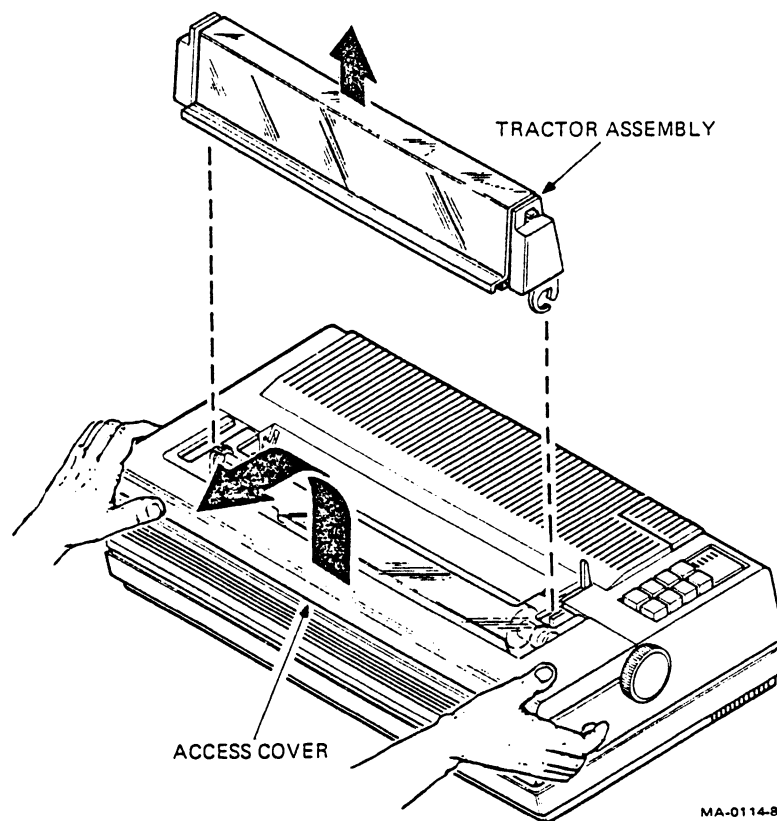
This section includes information you need to keep your printer in good operating condition.

The printer does not require preventive maintenance. Clean the outer surfaces and platen with a damp cloth only. Do not use solvents of any kind.

*CAUTION: Always turn off printer power before performing any maintenance.*

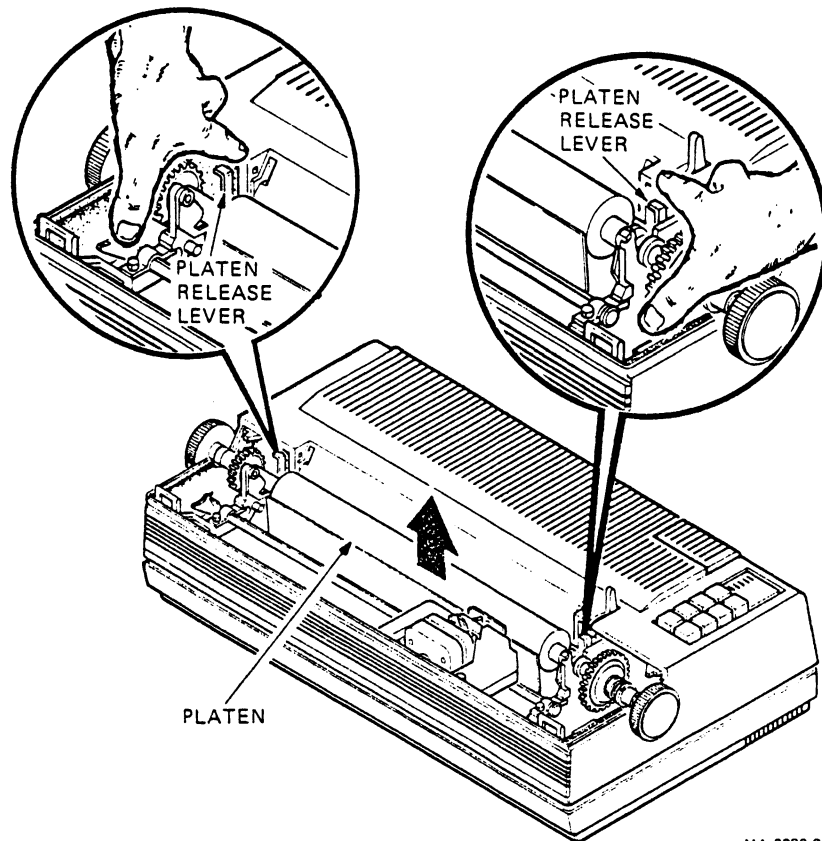
## Cleaning the Platen

1. Remove the tractor assembly and access cover.



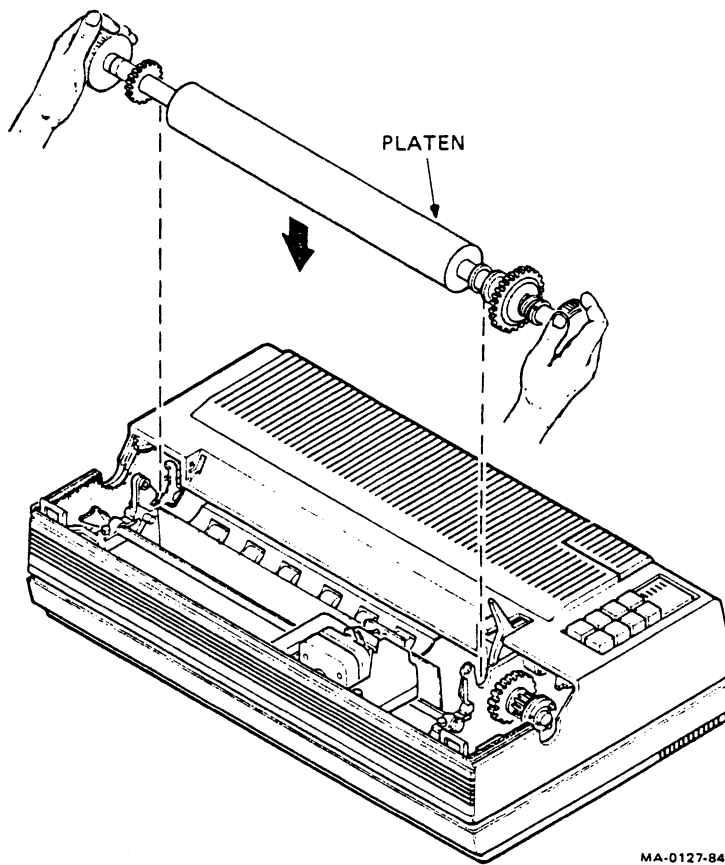
MA-0114-84

- 
2. Press the platen release levers down and lift the platen straight out.

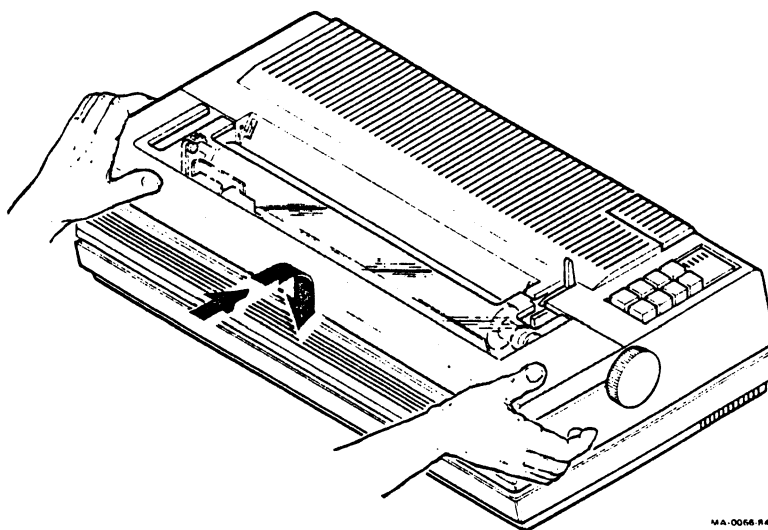


MA-0089-84

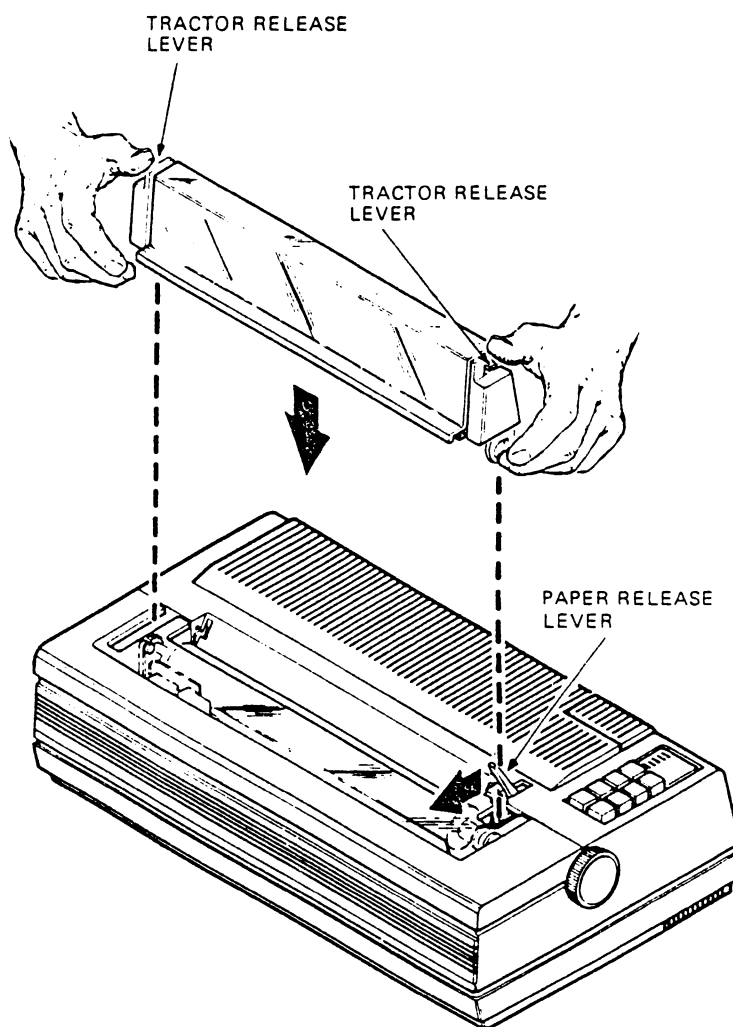
- 
3. Clean the platen with a damp cloth.
  4. Install the platen in its original position. The platen will click in place.



- 
5. Install the access cover.



- 
6. Pull the paper release lever toward you. Then install the tractor assembly.

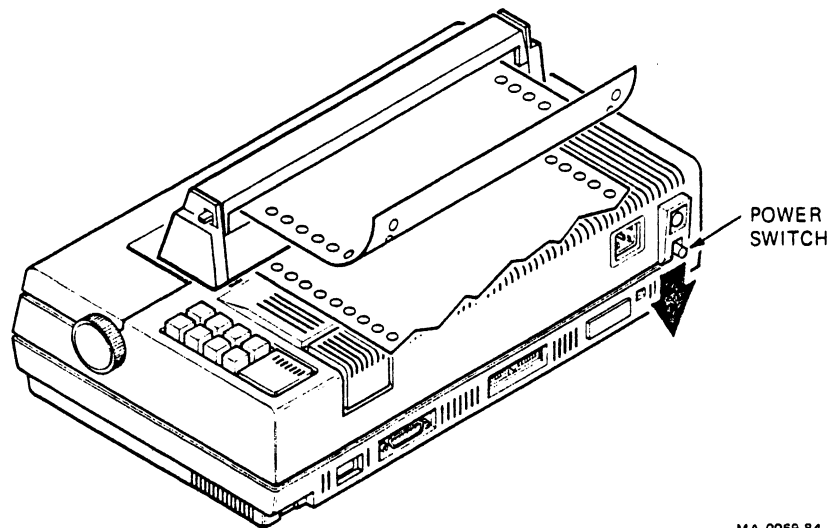


MA-0067-84A

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## Replacing the Printhead

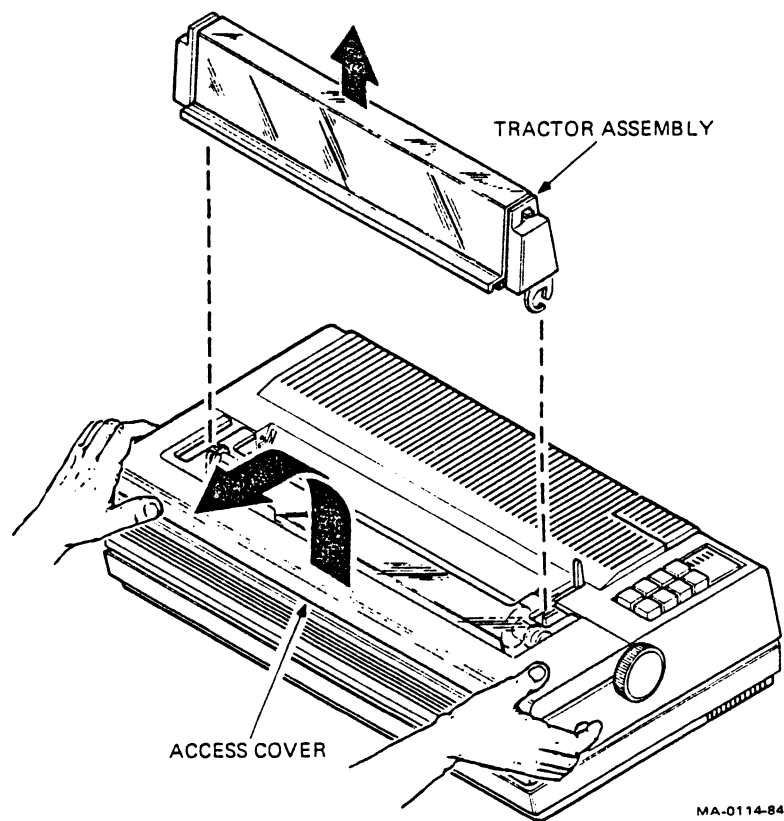
1. Turn the printer power switch off.



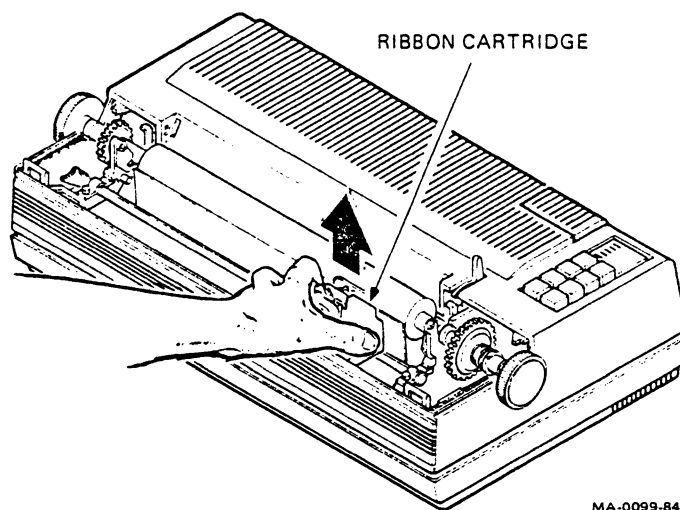
MA-0069-84



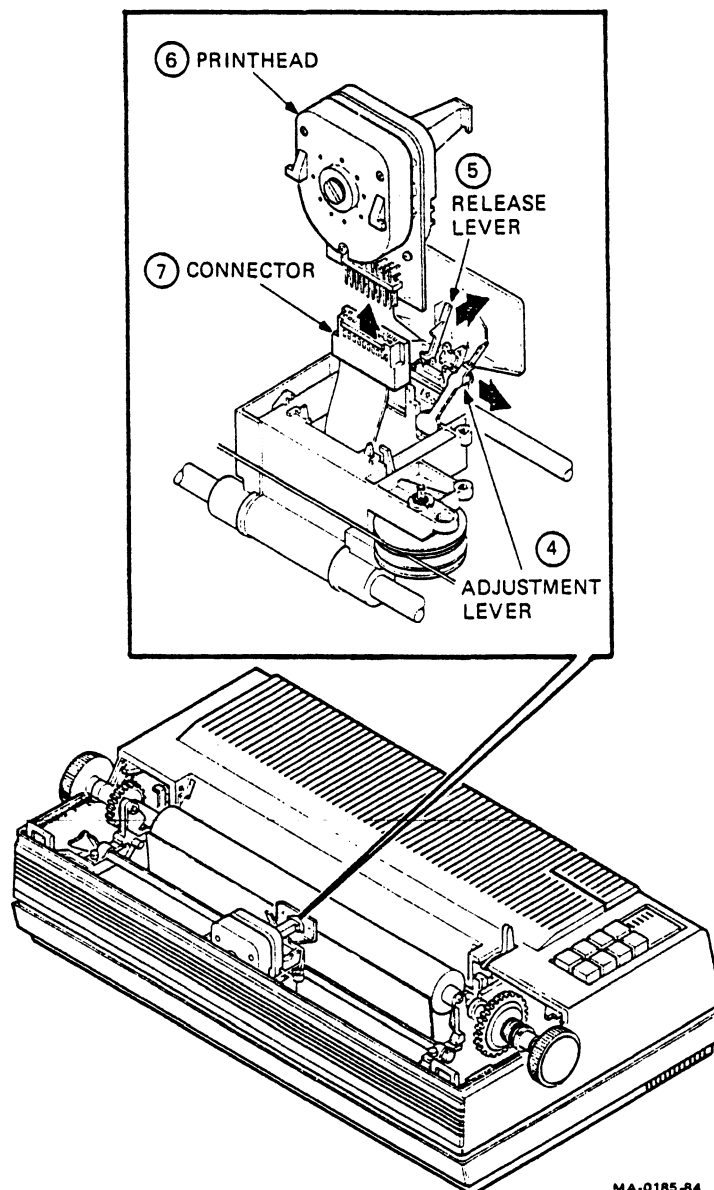
2. Remove the tractor assembly and access cover.



3. Remove the ribbon cartridge.

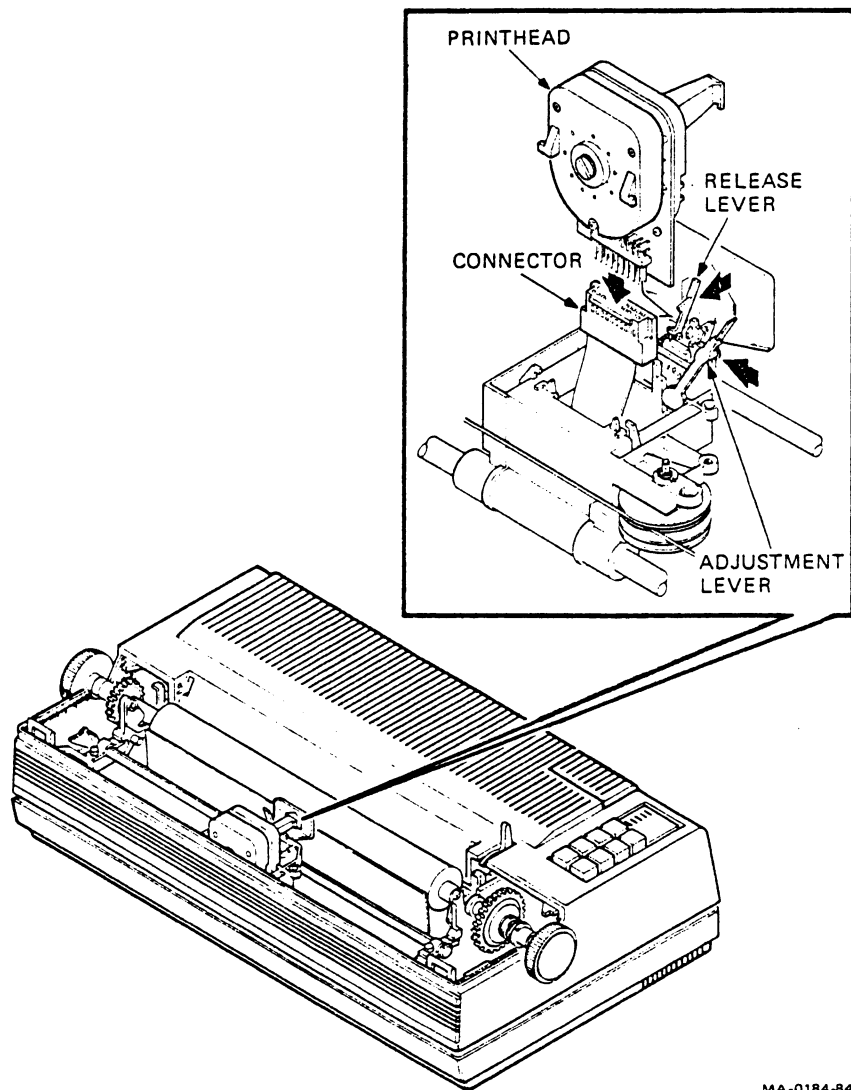


4. Move the printhead adjustment lever to the right.
5. Push the printhead release lever away from you.
6. Firmly grasp the printhead. Tilt it toward you and pull up.
7. Disconnect the printhead from the connector.



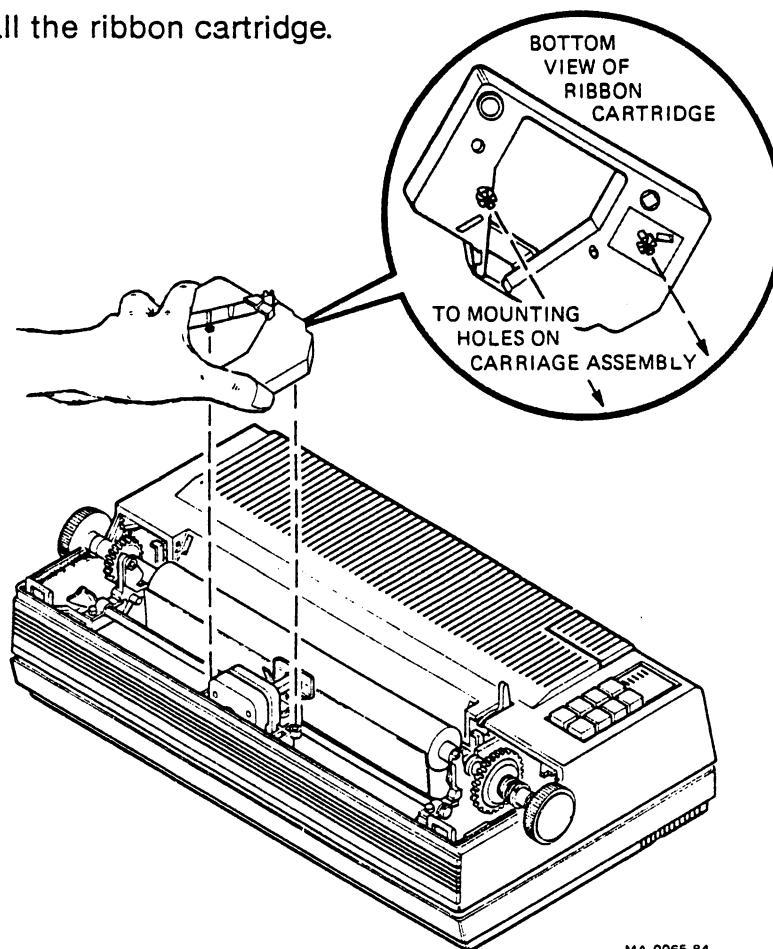
MA-0185-84

8. Plug in the new printhead and place it in position.
9. Pull the release lever toward you.

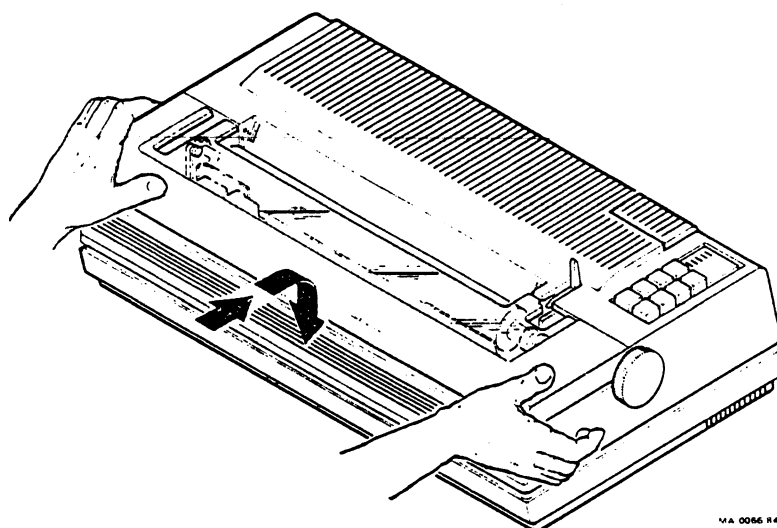


MA-0184-84

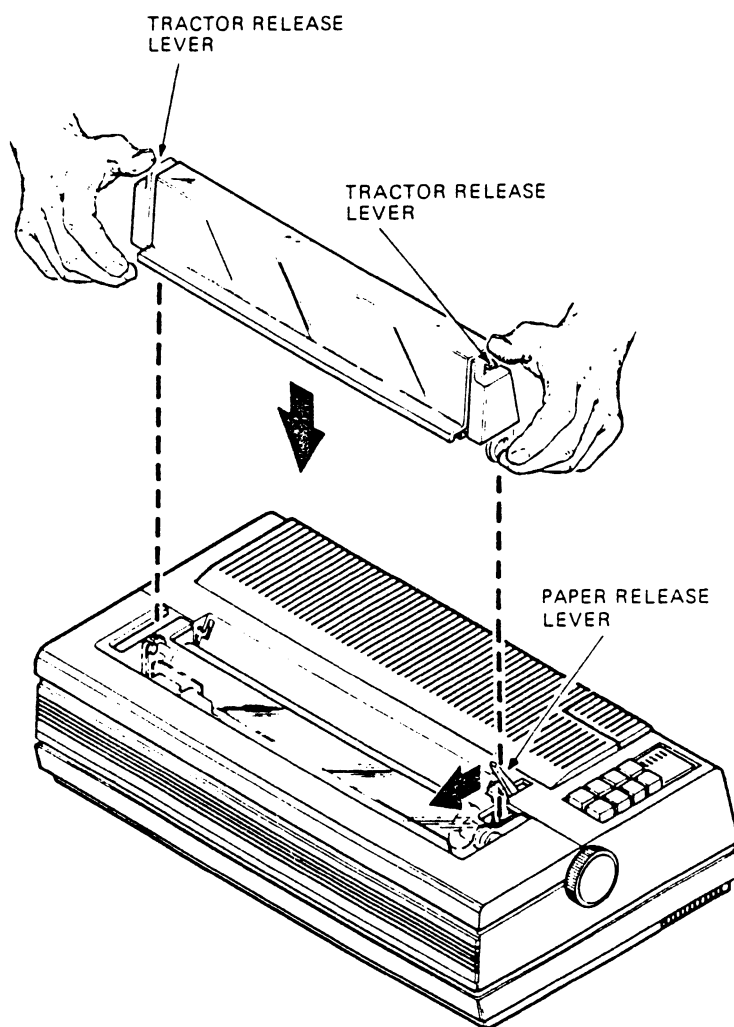
10. Install the ribbon cartridge.



11. Install the access cover.

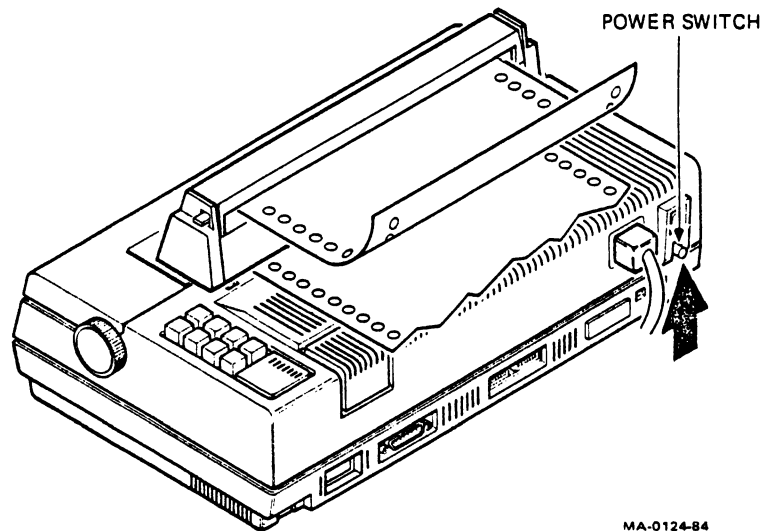


- 
12. Pull the paper release lever toward you. Then install the tractor assembly.



MA-0067-84A

- 
13. Turn on the printer power switch.

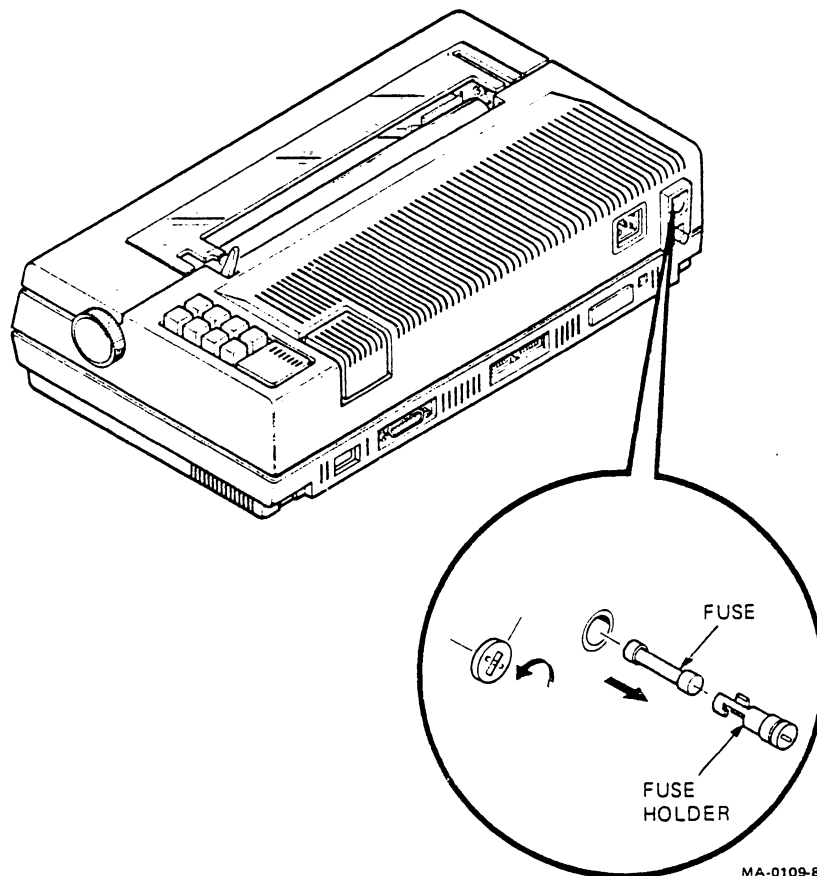


14. Install paper and adjust the printhead as described in the "Adjusting the Printhead" section.

---

## Replacing the Fuse

1. Turn the printer power switch off and disconnect the ac power cord.
2. Push in on the fuse cap, rotate 1/4 turn counterclockwise, and remove the fuse holder.
3. Remove the old fuse and insert a new fuse of equal value in the fuse holder.
4. Insert the fuse holder into the printer and rotate 1/4 turn clockwise to lock into place.



# TROUBLESHOOTING

---

*CAUTION: Always turn off the printer power switch before you try to correct a problem.*

If you have a problem, use the following checklist. If you cannot correct it, turn off the printer and contact your dealer or the nearest Digital service center. (See Appendix.)

## Troubleshooting Checklist

Symptom	Possible Cause	Remedy
Printer does not turn on when power switch is turned on.	The ac power cord is not plugged into wall receptacle or printer.	Plug in cord.
	Power is not coming from wall receptacle.	Check receptacle with a known working device.
	The ac line fuse is blown.	Turn power switch off and replace fuse.
Characters do not print. Power/fault indicator flashes.	Printer is out of paper.	Install paper and turn power switch off and on to reset the printer.
	Access cover is open.	Close access cover and set power switch off and on to reset the printer.



---

## Troubleshooting Checklist (Cont)

Symptom	Possible Cause	Remedy
Characters do not print. Carriage moves across paper.	Printhead is too far from paper.	Readjust printhead. (See the "Adjusting the Printhead" section.)
	Ribbon is not installed properly.	Reinstall ribbon.
Characters do not print or are garbled.	Data set (modem) is disconnected.	Plug in data set.
	Baud rate is incorrect.	Make sure baud rate matches computer.
	Communication setup is incorrect.	Make sure other communication features are set to match computer.
Character printing is too light.	Printhead is too far from paper.	Readjust printhead. (See the "Adjusting the Printhead" section.)
	Ribbon is out of ink.	Replace ribbon.
Characters smudge during printing.	Printhead is too close to paper.	Readjust printhead. (See the "Adjusting the Printhead" section.)

---

### Troubleshooting Checklist (Cont)

Symptom	Possible Cause	Remedy
Paper does not advance.	Paper is not loaded correctly.	Reload paper.
	Feed holes are torn.	Reload paper.
	Friction feed is not released.	Move paper release lever forward.
Multipart paper tears.	Printhead is too close to paper.	Readjust printhead. (See the "Adjusting the Printhead" section.)
	Paper is not straight in printer.	Realign paper.
	Tractors are incorrectly adjusted.	Readjust right tractor.
	Paper or printhead jam occurs.	Open access cover and clear jam. Close cover and turn the power switch off and on to reset the printer.
Printer prints "NVM ERR" at power-up.	Nonvolatile memory (NVM) content is invalid.	Turn printer power switch off. Press the <b>Local Form Feed (Reset)</b> switch and turn power on. Refer to Page 33 to store factory settings in memory.

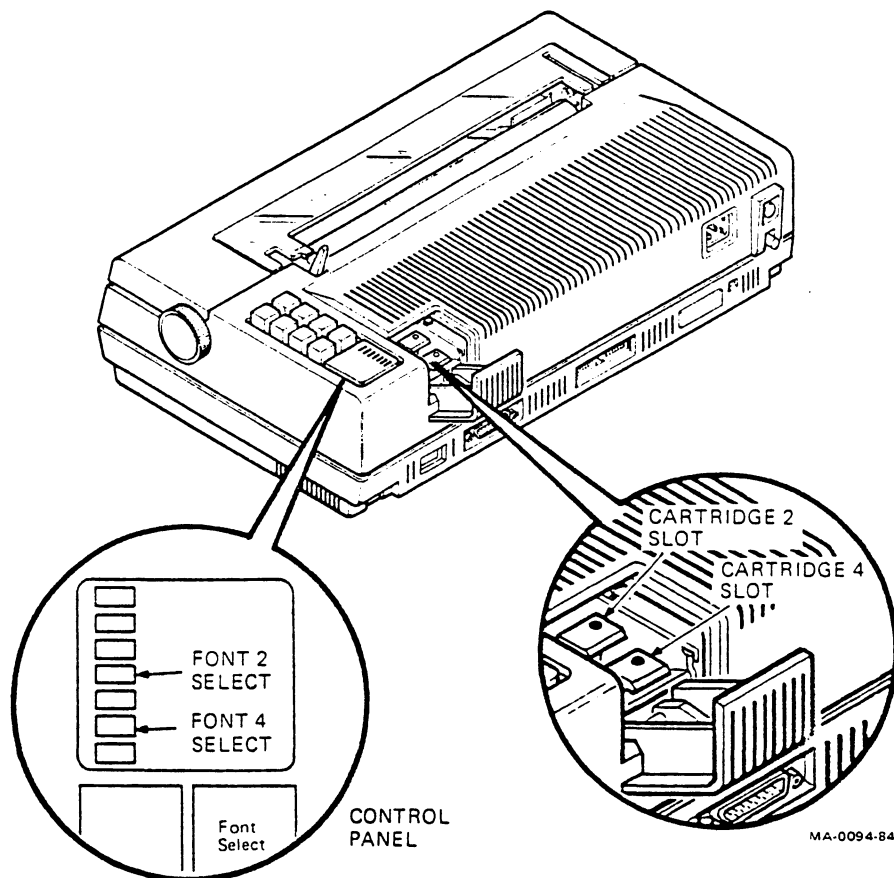
# FONTS

## General

The LA210 Letterprinter uses dot pattern sets stored in read only memory (ROM) to form the characters in different type styles (type fonts), different character sets, or different horizontal pitches. Internal ROM slots in the printer let you store up to three dot pattern sets. The sets supplied with the printer are the courier 10 USASCII, courier 10 multinational, and VT100 line drawing character sets.

You can also install two external fonts in the font assembly next to the control panel. The door next to the control panel provides access to the font assembly. Font cartridges fit into the slots in this assembly.

*NOTE: When you install an overlay cartridge, install the primary cartridge in slot 2 and the overlay cartridge in slot 4.*



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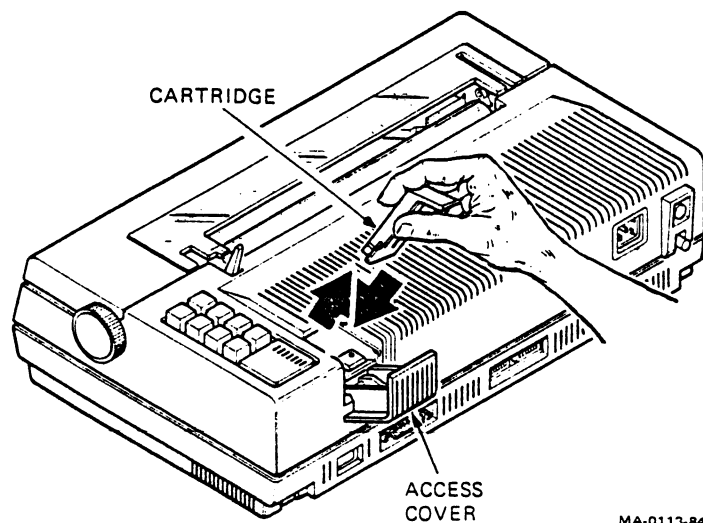
The two cartridge slots correspond to the second and fourth font indicators on the control panel, as shown in the figure. The exception is when an overlay cartridge is installed; in this case, only the primary font set indicator turns on.

After you install a font cartridge, you can use the **Font Select** switch to select that font for printing. See the next section.

## Changing Character Sets

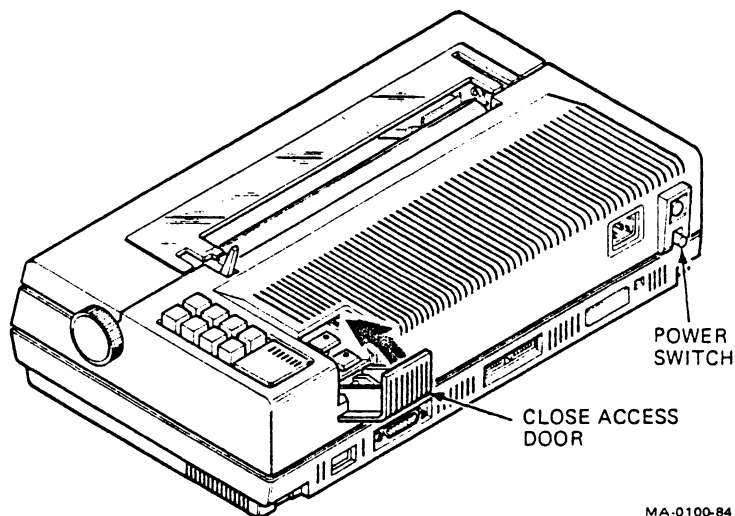
*NOTE: Do not remove or insert a font cartridge while the printer is printing. You may lose one or two lines of print. However, you can change your font by pressing the **Font Select** switch any time during operation.*

1. Open the access door and remove the currently installed cartridge.
2. Insert the new character font cartridge.



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- 
3. Close the access door.



When the system is first turned on, the computer has font control. When you first press the **Font Select** switch, it selects font 1. Pressing this switch again selects font 2, and so on. The font indicators show the selected font. After you select the last installed font and press the switch again, font selection control returns to the computer.

If you are selecting fonts manually, the indicator that is on represents the selected font. If the computer selects the font, the indicator that is off represents the selected font.

# PRINTER EMULATION MODES

---

## General

Normally, the LA210 Letterprinter operates in standard Digital (DEC) mode. The printer also has three optional printer emulation modes. These optional modes let the LA210 Letterprinter operate like the following printers.

DEC	(mode 0)	Standard Digital mode.
MX	(mode 1)	Emulates IBM/Epson MX80 printer.
GT	(mode 2)	Emulates IBM/Epson MX80 printer with Grafrax Plus.
GP	(mode 3)	Emulates IBM Graphics printer.

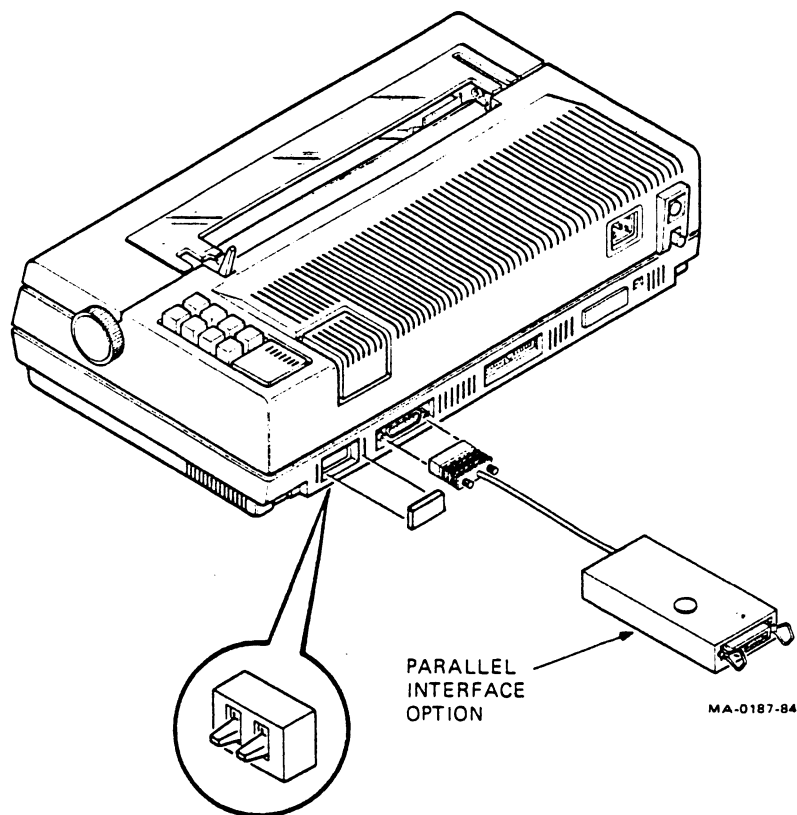
This section describes how you can select the three optional printer emulation modes. To use the three optional modes (1, 2, and 3), you must reset configuration switches A and B, and insert optional plug-in cartridges.

When you use parallel printer communication lines, you must use the optional parallel interface adapter (LA10X-EP) and reset the parallel interface switches. The printer's status message shows printer microcode information and the emulation mode in use.

---

## Setup Procedures

1. Turn off the printer power switch.
2. Plug the parallel interface adapter option (LA10X-EP) into the printer EIA connector.
3. Set the parallel interface switches down.



**NOTE:** You must set the switches on the parallel interface. See the LA10X-EP External Parallel Interface User Guide (EK-L10EP-UG).

- 
4. Select the plug-in cartridge(s) for the desired emulation from the following list and plug the cartridge(s) into the font option assembly.

Mode 1  
(IBM/Epson MX80)      Uses one cartridge, the LA10X-LB (mosaic). Install it in either slot 2 or 4. The remaining slot can hold any other font cartridge.

Font	ID
LA10X-LB	137

Mode 2  
(IBM/Epson MX80 with Grafrax Plus)      Uses two cartridges, the LA10X-AP (italic 10 – primary font) and LA10X-LC (Grafrax). You must use both cartridges to fully emulate GT mode. Install the italic font in slot 2 and the Grafrax font in slot 4.

If you want to print in any style other than the standard courier or italic 10, install the alternate primary font cartridge in slot 2.

Font	ID
LA10X-AP	011
LA10X-LC	143

Mode 3  
(IBM Graphics Printer)      Uses two cartridges, the LA10X-LA (line drawing) and LA10X-LD (foreign style). The cartridges can be installed in either slot 2 or 4. You must use both to fully emulate GP mode.

Font	ID
LA10X-LA	139
LA10X-LD	141

5. Set the configuration switches for the desired emulation according to the following tables.

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

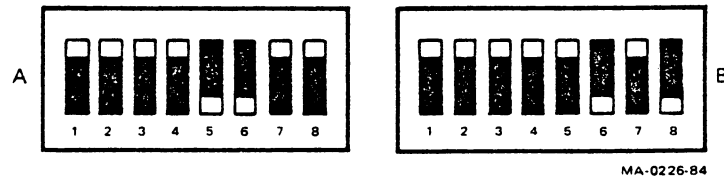
*In standard (DEC) mode, the switches are monitored all the time. You do not have to power down the printer first.*



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## IBM/Epson MX80 Mode

This mode emulates a basic dot matrix line printer. It provides single and double-width characters, four horizontal pitches, 1/6-inch high characters with two-pass printing, and bar charting.



*NOTE: Switches are shown in standard settings.*

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	Down	DEL character is ignored.
	Up	Delete (DEL) character clears line buffer.
A6	Down	Printer only performs a carriage return.
	Up	Printer performs an automatic line feed when it receives a carriage return (CR) character.

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Switch A	Setting	Function
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 MX emulation mode.
B6	Down	Selects MX emulation mode.
B7	Up or down	Not used.
B8	Down	Enables 0.13K buffer.
	Up	Enables 2K buffer.

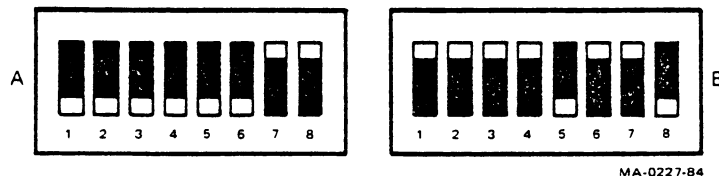
**NOTE:** Some applications set a time limit for the printer to empty its input buffer. If the printer exceeds this limit, printing stops.

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

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## IBM/Epson MX80 with Grafrax Plus Mode

This mode expands the MX80 mode to include new graphics and character processing capabilities. This mode emulates the basic printer and adds italics, graphics, 1/16-inch high script characters, bolding, and more.



*NOTE: Switches are shown in standard position.*

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

---

Switch A	Setting	Function
A6	Down	Printer only performs a carriage return.
	Up	Printer performs an automatic line feed when it receives a carriage return (CR) character.
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 GT emulation mode.
B6	Up	Selects GT emulation mode.
B7	Up or down	Not used.
B8	Down	Enables 0.13K buffer.
	Up	Enables 2K buffer.

**NOTE:** Some applications set a time limit for the printer to empty its input buffer. If the printer exceeds this limit, printing stops.

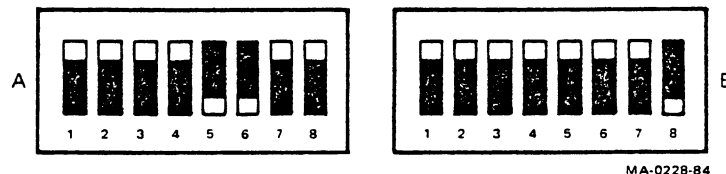
*In emulation mode, the LA210 Letterprinter gives you a choice of two input buffers — a 2K buffer and a 0.13K buffer. If your application displays a time-out message, use the 0.13K buffer. Otherwise, use the 2K buffer to reduce the number of data requests from the printer to the host.*

*Sending a reset escape sequence causes the printer to reset to the **A1** through **A5** configuration switch settings.*

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## IBM Graphics Printer Mode

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



*NOTE: Switches are shown in standard position.*

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	Down	DEL character is ignored.
	Up	Delete (DEL) character clears line buffer.
A6	Down	Printer only performs a carriage return.
	Up	Printer performs an automatic line feed when it receives a carriage return (CR) character.

---

Switch A	Setting	Function
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, B6	Up	Selects GP emulation mode.
B7	Up or down	Not used.
B8	Down	Enables 0.13K.
	Up	Enables 2K buffer.

**NOTE:** Some applications set a time limit for the printer to empty its input buffer. If the printer exceeds this limit, printing stops.

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

# SPECIFICATIONS

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Weight	11.3 kg (25 lb)
Dimensions	
Height	12.7 cm (5 in) without tractor 22.8 cm (9 in) with tractor
Width	54.6 cm (21.5 in)
Depth	34.3 cm (13.5 in)
Environment	
Temperature	10° to 40° C (50° to 104° F)
Relative humidity	10% to 90%
Input voltage	90 to 128 Vac or 180 to 256 Vac 47 to 63 Hz
Power consumption	154 watts maximum
Power receptacle	Nonswitched, 3-prong, grounded receptacle
Data interface	Serial RS232C EIA Parallel optional
System cables (not supplied)	
PC	BCC04
EIA	BC22D
Ribbon	Cartridge (part number LA10R)

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Paper	
Types	
Single Part	Single cut sheet when using sheet feeder Fanfold pin-feed forms
Multipart	4-part carbon (bottom feed only) Fanfold pin-feed forms  3- or 4-prong crimped margins are recommended. Stapled, dot, or line-glued margins are not recommended. Split forms with each side containing a different thickness or number of sheets are not recommended.
Width	8.89 cm to 37.77 cm 3½ in to 14⅞ in
Weight	
Single Part	56.25 grams/m <sup>2</sup> (15 lb) paper minimum 90.00 grams/m <sup>2</sup> (24 lb) paper maximum
Thickness	0.0381 cm (0.015 in) maximum (multipart 4 parts)
Printhead	9-pin dot matrix (part number 70-19655-00)
Printing method	Dot matrix using a 9-pin printhead with 1/144-inch head lift
Bidirectional	Text mode (draft printing)
Left to right	Text mode (letter quality) Graphics mode
Input buffer capacity	2K



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Print speed	240 characters/second maximum (7 × 9 matrix, draft printing) 185 characters/second throughput (10 characters/inch, 132 columns)  80 characters/second maximum (33 × 9 matrix, letter quality medium density) 62 characters/second throughput (10 characters/inch, 132 columns)  40 characters/second maximum (33 × 18 matrix, letter quality high density) 30 characters/second throughput (10 characters/inch, 132 columns)
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#### Print matrix

Draft quality	7 × 9 dots/character
Letter quality (high density)	330 × 144 dots/inch (33 × 18 dots/character at 10 characters/inch) (28 × 18 dots/character at 12 characters/inch)
Letter quality (medium density)	330 × 72 dots/inch (33 × 9 dots/character at 10 characters/inch) (28 × 9 dots/character at 12 characters/inch)

*NOTE: In emulation mode, vertical resolution is 144 dots/inch, with an algorithm to approximate 216 dots/inch.*

Graphics	73.33 × 72 dots/inch 82.5 × 72 dots/inch 94.29 × 72 dots/inch 110 × 72 dots/inch 132 × 72 dots/inch 165 × 72 dots/inch 220 × 72 dots/inch 330 × 72 dots/inch
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#### Fonts

Standard	Courier 10 US/UK draft/near letter quality Courier 10 multinational draft/near letter quality VT100 line drawing 10 draft/near letter quality
Other	Optional and custom fonts available

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## Horizontal pitch

Draft	5, 6, 6.6, 8.25, 10, 12, 13.2, 16.5 characters/inch (10 or 12 pitch fonts)
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High resolution	5 and 10 characters/inch (10 pitch) 6 and 12 characters/inch (12 pitch)
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Vertical pitch	2, 3, 4, 6, 8, 12 lines/inch
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## Character sets

Standard	USASCII VT100 line drawing Digital multinational  Digital Finnish Digital French Canadian Digital Norwegian/Danish Digital Spanish  ISO French ISO German ISO Italian ISO Spanish ISO United Kingdom
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Optional	APL DEC Technical Katakana JIS Roman
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*NOTE: Other optional and custom character sets are available.*

Emulation <u>m</u> odes	EPSON MX80 EPSON MX80 with Grafrax Plus IBM graphics printer
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# APPENDIX

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## Digital Services

Digital provides a wide range of maintenance programs that cover small systems and terminals. These include on-site, carry-in and mail-in maintenance services. You can use these programs to select a plan that suits your service needs, from complete Digital support to self-maintenance.

### On-Site Service

Digital offers fast, low cost, quality maintenance performed at your site by Digital-trained Service Specialists. Whether you take advantage of our DECservice or basic service agreements, or choose our time and materials service, you can be sure that your small system or terminal is getting the best possible maintenance.

### Carry-In Service

There are several hundred Digital service centers in major cities worldwide. Digital service centers offer convenient, fast, and dependable carry-in maintenance. This lets you save over on-site service.

### DECmailer

If you can perform self-maintenance, you should use our fast turnaround module and subassembly repair service – DECmailer.

For more information on any of Digital's maintenance services, call the Digital Field Service information number in your area during normal business hours.

U.S.A.	(800) 554-3333	Italy	(02) 617961
Australia	(02) 4125555	Japan	(03) 9897161
Austria	(222) 6776410	New Zealand	(09) 595914
Belgium	(02) 2425095	Norway	(2) 160290
Canada	(800) 267-5251	Portugal	(1) 725402
Denmark	(2) 889666	Spain	(1) 7331900
Finland	(0) 423511	Sweden	(08) 7338000
France	(6) 077-8292	Switzerland	(01) 8169111
Holland	(30) 631222	United Kingdom	(734) 868711
Ireland	(1) 308433	West Germany	(089) 95910

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## **Accessories and Supplies**

A wide variety of accessories and supplies (including manuals) are available to enhance printer versatility and make operation easier. To place an order or request a catalog, call one of these numbers during regular business hours.

Continental United States	(800) 258-1710
New Hampshire	(603) 884-6660
Alaska or Hawaii	(408) 734-4915
Canada	(800) 267-6146
	(TWX) 610-562-8732