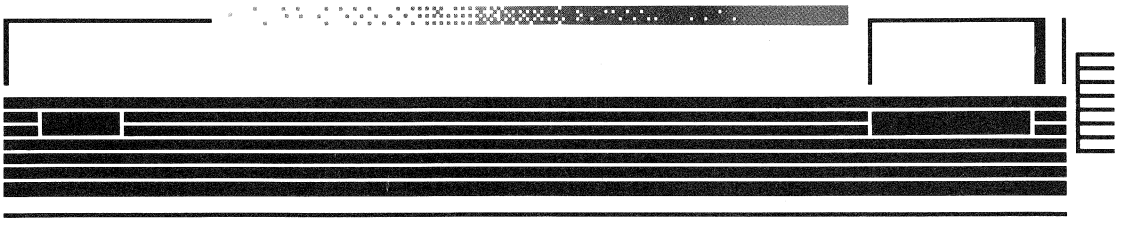
EK-LJ250-UG-001

LJ250/LJ252 Companion Color Printer

User's Guide



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DEVELOPMENT AND PUBLISHING
UPDATE NOTICE

LJ250/LJ252 Companion Color Printer User's Guide

EK-LJ250-UG-CN1

September 1987

The original *LJ250/LJ252 Companion Color Printer User's Guide* is wire-o bound and cannot accommodate inserted update pages. This update notice directs the document user in the changes that must be made to correct errors. This update should be pasted on the reverse of the front cover in order to maintain a record of changes to the document.

CORRECTIONS

Make the following pen and ink corrections to the *LJ250/LJ252 Companion Color Printer User's Guide.*

- Page 1-17, "INSTALLING THE OPTIONAL PAPER BASKET", when installing the optional paper basket, use the instructions shipped with the basket instead of the instructions listed on this page.
- Page 3-21, at the end of the first paragraph add the note, "The paper backing that extends one inch past the film on one end is being phased in and may not be available at this time. "
- Page 3-25, "Using Transparency Mode", under Using the control panel, the second step should be "Enter the Transparency Mode by pressing and holding the DEC/PCL switch ...", the third step should be "After approximately 2 seconds, release the DEC/PCL switch."
- Page 4-6, "Printing Self-Test", under Procedure, the second step should be "With power OFF, press and hold the FORM FEED switch ...", the third step should be "After approximately 2 seconds, release the FORM FEED switch."
- Page 4-7, "Color Palette Display (Used as a Self-Test)", under Procedure, the second step should be "With the power OFF, press and hold the READY and DEC/PCL switches ...", the third step should be "After approximately 2 seconds, release the READY and DEC/PCL switches."
- Page A-2, Table A-3, change column heading "25-Pin Connector" to "Non-DECconnect RS-232 Standard".
- Page A-2, Table A-3, make the following changes to the table:

System	Non-DECconnect RS-232 Standard	or	DECconnect DEC423 Standard
VT200	BCC20-10		BC16E and H8571-B
Rainbow	BCC19-15		BC16E and H8571-D
Professional	BCC20-10		BC16E and H8571-B
DECmate	BCC20-10		BC16E and H8571-B
MicroVAX	BCC20-10		BC16E and H8571-B
VAXstation	BCC20-10		BC16E and H8571-B

EK-LJ250-UG-001

LJ250/LJ252 Companion Color Printer

User's Guide

Prepared by Educational Services
of Digital Equipment Corporation

1st Edition, August 1987

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This equipment generates and uses radio frequency energy and if not installed properly, that is in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures.

- Reorient the receiving antenna.
- Relocate the receiver with respect to the printer.
- Move the printer away from the receiver.
- Plug the printer into a different outlet so that the printer 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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DECmate	DECwriter	Professional	VAX
DECnet	DIBOL	Rainbow	VMS
DECsystem-10	LA	RSTS	VT
DECSYSTEM-20	MASSBUS	RSX	Work Processor
	PDP		VAXmate

CONTENTS

Page

INTRODUCTION

ABOUT THIS MANUAL vii
Chapter 1 – Installing the Printer vii
Chapter 2 – Configuring the Printer vii
Chapter 3 – Using the Printer vii
Chapter 4 – Solving Problems vii
Appendices viii
Warnings, Cautions, and Notes viii
ABOUT THE DOCUMENTATION PACKAGE viii
SOFTWARE REQUIREMENTS ix
The Companion Color Printer in DEC Mode ix
The Companion Color Printer in HP PCL Mode x

1 INSTALLING THE PRINTER

CHECKING THE CONTENTS OF THE BOX 1-2
A LOOK AT THE PRINTER 1-3
SITE CONSIDERATIONS 1-4
Environmental Considerations 1-4
Work Location 1-4
Power Requirements 1-4
INSTALLING THE HELP CARD 1-5
INSTALLING THE INK CARTRIDGES FOR THE FIRST TIME 1-6
Step 1 – Priming the Ink Cartridge 1-7
Step 2 – Wiping the Ink Cartridge 1-11
Step 3 – Loading the Ink Cartridge 1-13
CONNECTING THE CABLES 1-14
INSTALLING THE OPTIONAL PAPER BASKET 1-17
VERIFYING PRINTER OPERATION 1-18
Printing a File 1-25
If You Have Difficulties Printing a File 1-25

CONTENTS (Cont)

Page

2 CONFIGURING THE PRINTER

GENERAL 2-2
WHAT IS PROTOCOL? 2-2
WHAT IS CONFIGURATION? 2-2
CONFIGURATION FUNCTION DESCRIPTIONS 2-3
GETTING A CONFIGURATION PRINTOUT 2-4
FACTORY CONFIGURATION 2-5
CHANGING THE PRINTER'S CONFIGURATION 2-6
LJ250 Configuration Switches (Rear Panel) 2-7
LJ252 Configuration Switches (Rear Panel) 2-8
CHANGING PRINT SETTINGS 2-8
PRINT SETTINGS DESCRIPTION 2-9
CONNECTION AND SETUP FOR SOME COLOR SYSTEMS 2-12
VT241 2-12
VT340 2-14
VAXstation 2000 2-15

3 USING THE PRINTER

ABOUT INK-JET TECHNOLOGY 3-3
Ink-Jet Notes 3-3
PRINT MEDIA CONTROLS 3-4
LOADING PRINT MEDIA 3-5
Loading Pinfeed Paper 3-6
Setting Top-of-Form 3-12
Hand-Feeding Single Sheet Paper 3-13
ABOUT THE CONTROL PANEL 3-16
PRINTING TEXT FILES 3-18
PRINTING COLOR SIXEL GRAPHICS 3-19
PRINTING TRANSPARENCIES 3-20
About Transparencies 3-20
Hand-Feeding Transparencies 3-21
Using Transparency Mode 3-25
GETTING A COLOR PALETTE DISPLAY 3-26

CONTENTS (Cont)

Page

4 SOLVING PROBLEMS

GENERAL MAINTENANCE 4-3
Office Area 4-3
Print Media 4-3
Ink Cartridges 4-3
USING THE HELP CARD 4-4
THE HELP CARD 4-5
SELF-TESTS 4-6
Power-Up Self-Test 4-6
Printing Self-Test 4-6
Remote Self-Test (PCL Mode Only) 4-7
Color Palette Display (Used as a Self-Test) 4-7
CORRECTING SIMPLE PROBLEMS 4-10
CORRECTING PRINT PROBLEMS 4-16
Step 1 – Priming the Ink Cartridge 4-17
Step 2 – Wiping the Ink Cartridge 4-20
Step 3 – Brushing the Leadframe 4-22
REPLACING THE INK CARTRIDGES 4-24
When to Replace an Ink Cartridge 4-24
Step 1 – Remove the Expended or Defective Ink Cartridge 4-25
Step 2 – Prime and Wipe the Fresh Ink Cartridge 4-26
Step 3 – Load the Fresh Ink Cartridge 4-26

APPENDIX A ACCESSORIES AND SUPPLIES

APPENDIX B FIELD SERVICE INFORMATION

APPENDIX C OPERATING SPECIFICATIONS

APPENDIX D SAMPLE PRINTOUTS

APPENDIX E RETOS SOFTWARE

TABLES

2-1 LJ250 Factory-Set Configuration Switches (Rear Panel)....2-5
2-2 LJ252 Factory-Set Configuration Switches (Rear Panel)....2-5
2-3 DEC Mode Default Print Settings (Power-Up)....2-10
2-4 PCL Mode Default Print Settings (Power-Up)....2-11
3-1 Printer Operating Controls and Indicators....3-16
4-1 Self-Test Summary....4-8
4-2 Flashing PROTOCOL/READY Analysis....4-9
4-3 Troubleshooting Checklist....4-11
A-1 Accessories....A-1
A-2 Supplies....A-1
A-3 Printer Cables....A-2

INTRODUCTION

ABOUT THIS MANUAL

The *LJ250/LJ252 Companion Color Printer User's Guide* is part of the LJ250 printer documentation package. This manual is written for someone with little or no computer experience. The Guide teaches you how to install and use the printer.

This guide is divided into four chapters and has five appendices.

Chapter 1 Installing the Printer
This chapter describes how to install the printer. It names the printer parts, shows how to test the printer, and how to connect the printer to your computer system or video terminal. **Read this chapter completely before you begin the installation.**

Chapter 2 Configuring the Printer
This chapter explains how to configure the printer so that it can communicate with your computer system.

Chapter 3 Using the Printer
This chapter describes ink-jet technology, how to load paper, how to use the printer's operating controls to print your files, and describes the techniques required to print transparencies.

Chapter 4 Solving Problems
This chapter describes how to keep the printer clean, how to prevent ink cartridge problems, and how to resolve print quality problems. The troubleshooting checklist in this chapter can help you correct simple problems and possibly save you a service call. This chapter also explains how to replace print cartridges.

Appendices

Appendix A has information for ordering accessories and supplies.

Appendix B has information on repairs and calling Field Service.

Appendix C has technical specifications and paper specifications.

Appendix D has sample test printouts.

Appendix E has information about the RETOS software.

Warnings, Cautions, and Notes

WARNING:	Contains information about preventing personal injury.
CAUTION:	Contains information about preventing damage to equipment.
NOTE:	Contains general information.

ABOUT THE DOCUMENTATION PACKAGE

Three technical documents are shipped with the printer. They are intended for the user and the experienced applications programmer who needs interface and control function descriptions.

LJ250/LJ252 Companion Color Printer User's Guide	EK-LJ250-UG
LJ250/LJ252 Companion Color Printer Programmer Reference Manual	EK-LJ250-RM
LJ250/LJ252 Companion Color Printer Programmer Reference Card	EK-LJ250-RC

Available for the service personnel are the following documents:

LJ250/LJ252 Companion Color Printer Pocket Service Guide	EK-LJ250-PS
LJ250/LJ252 Companion Color Printer Technical Manual	EK-LJ250-TM

The Programmer Reference Manual and Card are intended for the user with programming experience. A programmer uses the information to design application software programs or to update existing programs.

The pocket service guide and technical manual are intended for trained service personnel.

SOFTWARE REQUIREMENTS

The LJ250 and LJ252 Companion Color Printers have many features you can use depending on the following conditions:

- The computer system (also known as the host) that the printer is connected to.
- The operating system that your computer system uses.
- The application software you are using.

Check the documentation for the software you are using to learn what printer features you can access.

The Companion Color Printer's capability and functionality are enhanced by the fact that the user may access many software applications using either DEC (Digital Equipment Corporation) or HP PCL (Hewlett-Packard's Printer Command Language) protocol.

The Companion Color Printer in DEC Mode

- DEC mode is the protocol most compatible with DIGITAL software applications and graphics languages, such as UIS, HC-UIS, GKS, and ULTRIX. Check with your DIGITAL sales representative to find the latest releases of these applications that support the color functionality of the LJ250 and LJ252 printers.
- RETOS, a VMS utility, can also be used. RETOS translates ReGIS color files to sixel formated color files that can be printed on the LJ250 and LJ252 printers.

- The Print Screen Key on the VT240, VT241, VT330, and VT340 terminals can be used to print video graphic displays on the attached LJ250/LJ252 printer. Because of the different resolution between the printer and the terminals, the output on the Companion Color Printer using this procedure will be reduced in size from that seen on the terminal screen. The colors on the printout may vary from what is seen on the screen. The Print Screen feature allows a user a quick and easy method of previewing the proposed output.

  In addition, the Print Screen feature allows the user to get color output on the LJ250/LJ252 printer even if the user's software does not specifically support the Companion Color Printer.

The Companion Color Printer in HP PCL Mode

- Third party applications packages that support HP PCL protocol can be used in this mode.

- HP PCL protocol software application packages allows the user to connect with either Digital Equipment Corporation's VAXmate PC, IBM PC, or IBM compatible PCs. You should check with your DIGITAL sales representative for a list of HP PCL supported software packages.

If you are not a programmer and need help choosing the right software package for your application needs, contact your DIGITAL sales representative.

INSTALLING THE PRINTER 1

NOTE: Read this chapter completely before you begin the installation procedure.

This chapter describes how to install the printer, names the printer parts, shows how to test the printer, and how to connect the printer to your computer system or video terminal. Complete information on using the printer is found in Chapter 3.

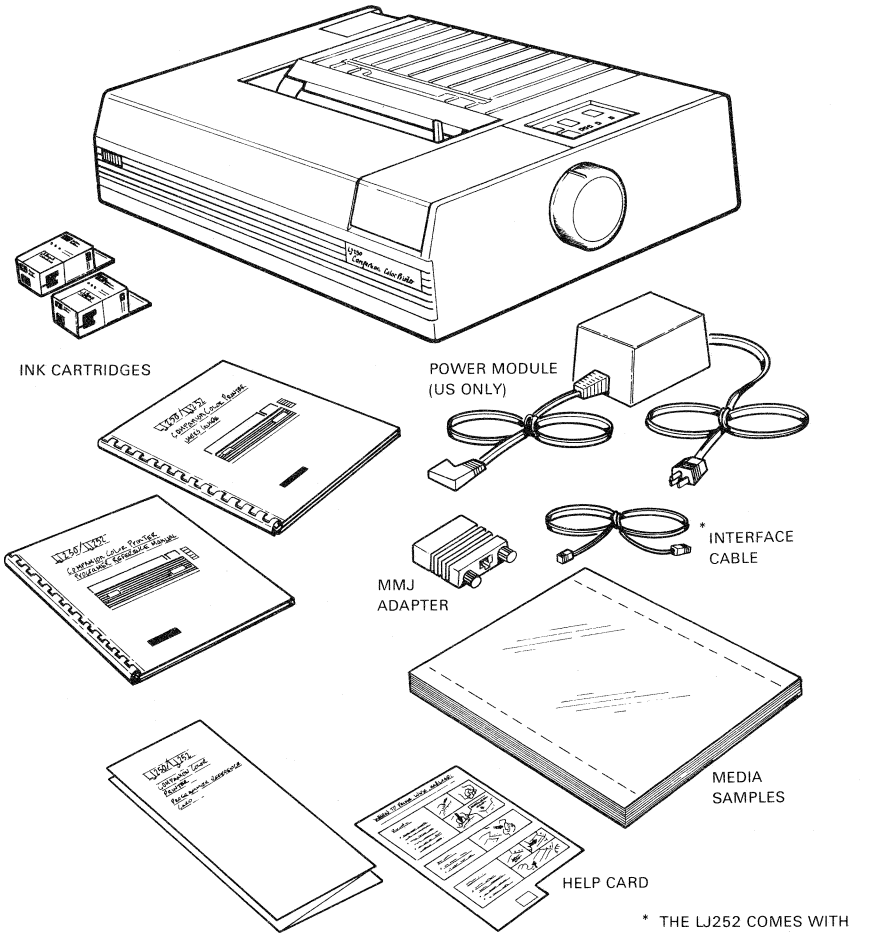
CHECKING THE CONTENTS OF THE BOX 1-2
A LOOK AT THE PRINTER 1-3
SITE CONSIDERATIONS 1-4
- Environmental Conditions 1-4
- Work Location 1-4
- Power Requirements 1-4

INSTALLING THE HELP CARD 1-5
INSTALLING THE INK CARTRIDGES FOR THE FIRST TIME 1-6
- Step 1 – Priming the Ink Cartridge 1-7
- Step 2 – Wiping the Ink Cartridge 1-11
- Step 3 – Loading the Ink Cartridge 1-13

CONNECTING THE CABLES 1-14
INSTALLING THE OPTIONAL PAPER BASKET 1-17
VERIFYING PRINTER OPERATION 1-18
- Printing a File 1-25
- If You Have Difficulties Printing a File 1-25

CHECKING THE CONTENTS OF THE BOX

Unpack the Companion Color Printer and make sure you have all the items shown below. If any items are missing or damaged, immediately contact your sales representative and delivery agent.



* THE LJ252 COMES WITH A PARALLEL CABLE IN PLACE OF THE SERIAL CABLE AND MMJ ADAPTER.

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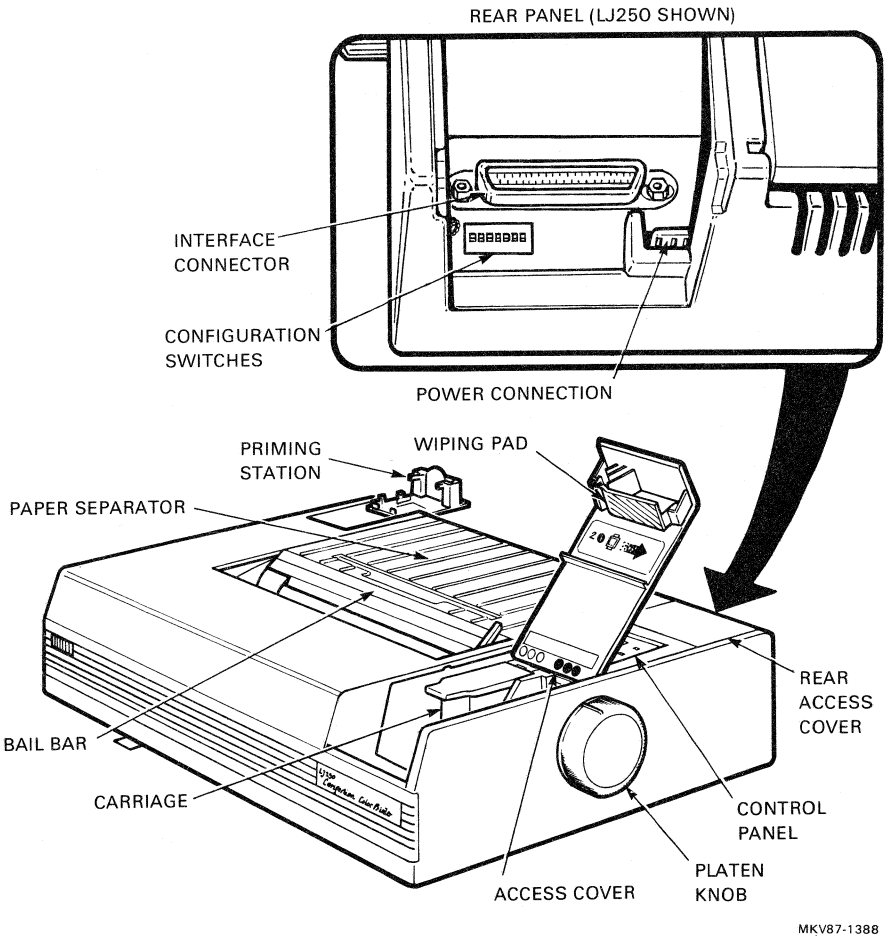
Complete the installation procedures in sequence. After you install the Companion Color Printer, keep this Guide near the printer for easy reference.

A LOOK AT THE PRINTER

Before installing the Companion Color Printer, take some time to familiarize yourself with the printer.



SITE CONSIDERATIONS

The Companion Color Printer can be installed in an office, school, or home environment.

NOTE: Use of the optional dust cover is recommended.

Environmental Conditions

- Install the printer in an area away from a heater, direct sunlight, or other heat source. Also keep the printer away from air conditioners or strong drafts.
- Avoid installing the printer in a dusty or humid environment.

Work Location

- Place the printer on a flat, solid, level area such as a desk or printer stand.
- Allow enough space around the printer to ensure proper ventilation and easy access to all sides of the printer.

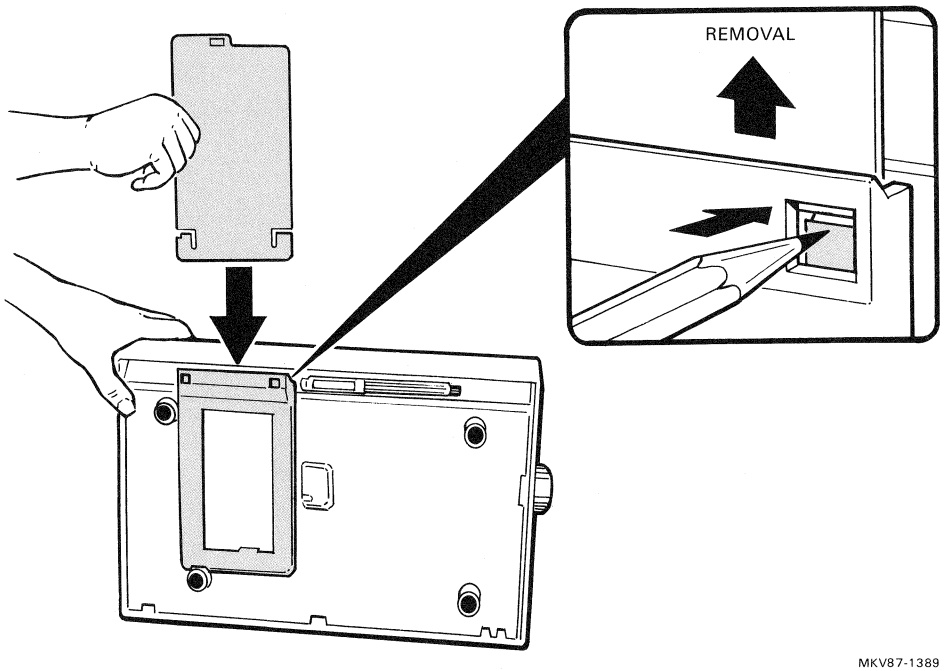
Power Requirements

- No special wiring is required. A typical 3-prong grounded household or office wall outlet is sufficient.
- Do not plug other equipment such as coffee pots, office copiers, or air conditioners into the same wall outlet or circuit.

NOTE: See Appendix C for more detailed specifications.

INSTALLING THE HELP CARD

The Companion Color Printer is supplied with a HELP card which is installed by the user. Insert the card in the tray under the printer.



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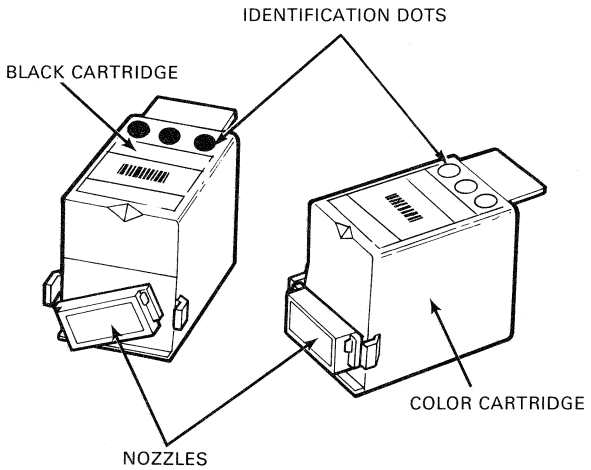
To remove the HELP card, pull the card out until it stops, then depress the tabs on the card with a pen or pencil.

See **USING THE HELP CARD** in the **PROBLEM SOLVING** chapter of this manual for more details.

INSTALLING THE INK CARTRIDGES FOR THE FIRST TIME

WARNING: The black ink is toxic if swallowed. Wash immediately with soap and water if you get ink on your hands.

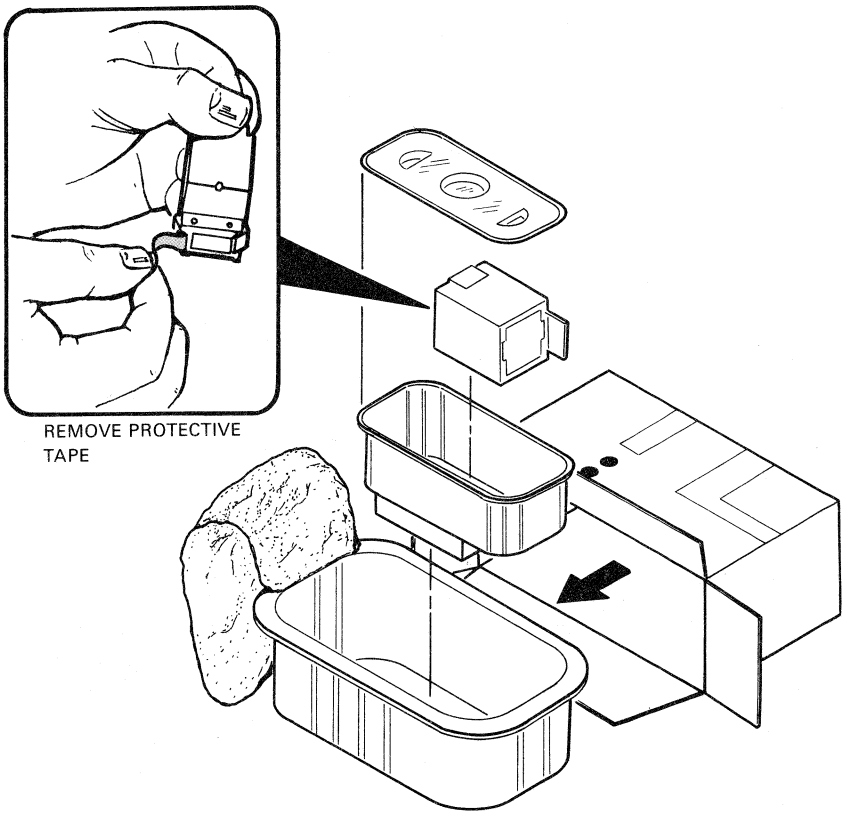
The Companion Color Printer uses two ink cartridges simultaneously. One cartridge has black ink (identified by three black dots) and the other cartridge has colored ink (identified by three colored dots). Before the printer can be used, both ink cartridges must be primed, wiped, and loaded into the printer. Load the black cartridge first.



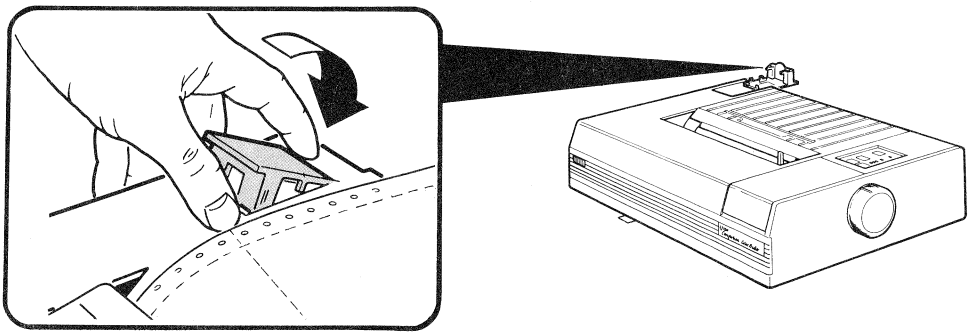
Step 1 – Priming the Ink Cartridge

Before using the printer, the ink cartridges must be primed to remove air bubbles and to ensure that the ink is present at the nozzles. You will install one ink cartridge at a time. Prime as follows:

1. Remove the first ink cartridge (black first) from the packaging and remove the protective tape from the nozzles.



2. Open the priming station lid at the left-rear corner of the printer by pressing down on the rear of the lid.



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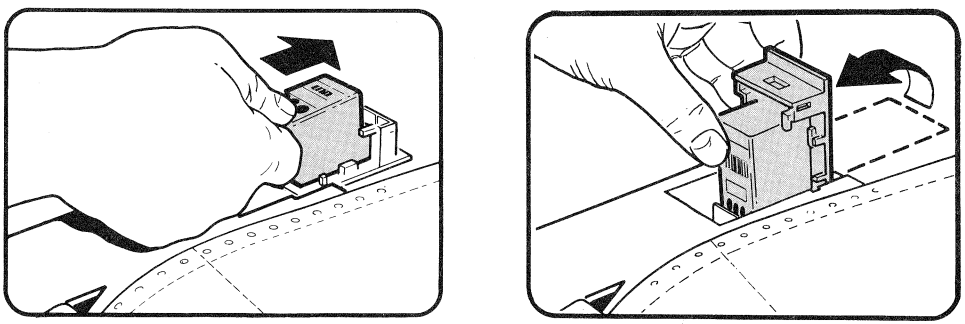
3. Slide the ink cartridge into the priming station's lid. The ink cartridge fits snugly into place and lies flat.

4. Rotate the priming station lid with the inserted ink cartridge to the upright position.



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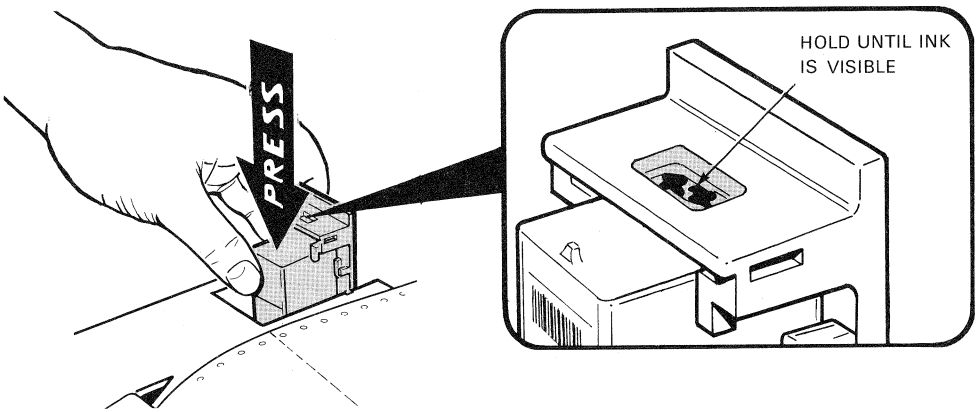
5. Press the priming station lid (with the ink cartridge attached) down once. Hold down the lid until some ink is visible through the window in the lid. It is not necessary to fill the window; holding about one second is usually sufficient.



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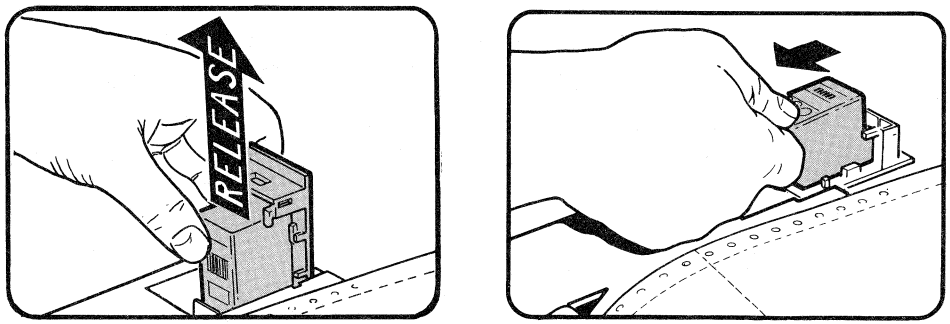
6. Slowly release the priming station lid and cartridge, waiting for the ink to recede from the window.

7. Remove the cartridge from the priming station and close the priming station lid.

CAUTION: DO NOT wipe ink from the nozzles with anything but the wiping pad.



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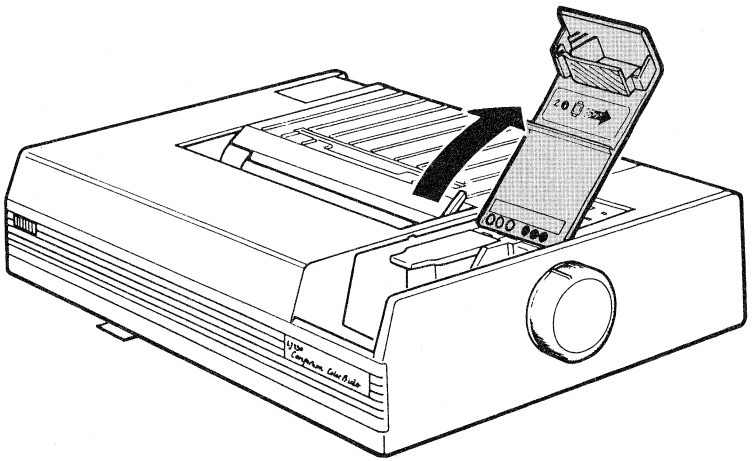
Step 2 – Wiping the Ink Cartridge

After priming, the cartridge will have ink on the nozzles. The cartridge must be passed through the wiping station on the inside of the carriage access cover to remove the excess ink from the nozzles.

1. Open the carriage access cover on the right-front corner of the printer.



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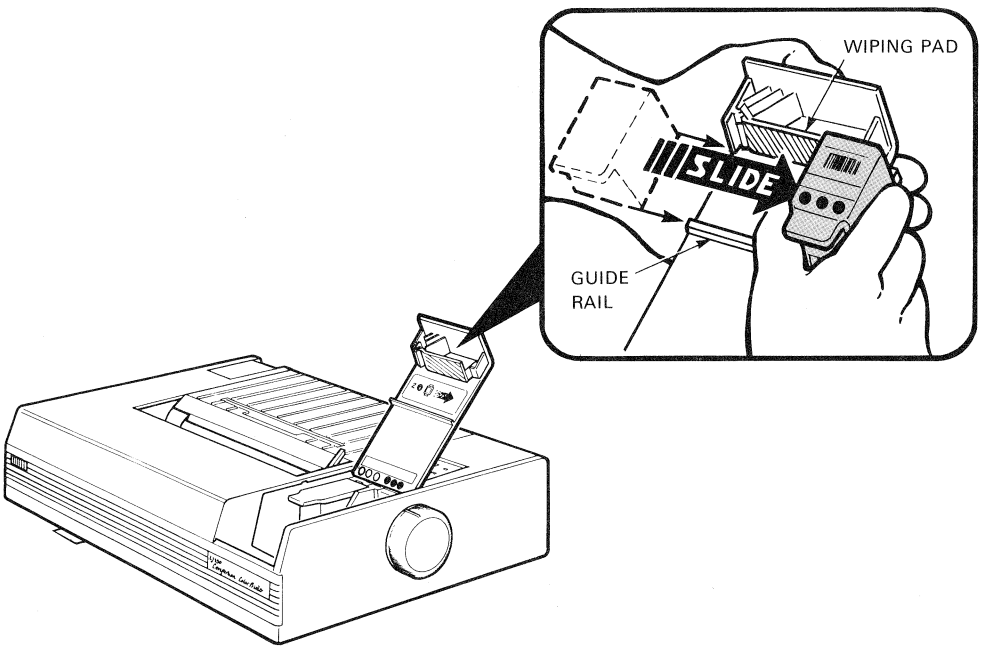
2. Insert the cartridge between the wiping pad and guide rail.

3. While supporting the cover with one hand, slide the cartridge horizontally across the pad with a brisk stroke so that the nozzles are wiped clean of ink.



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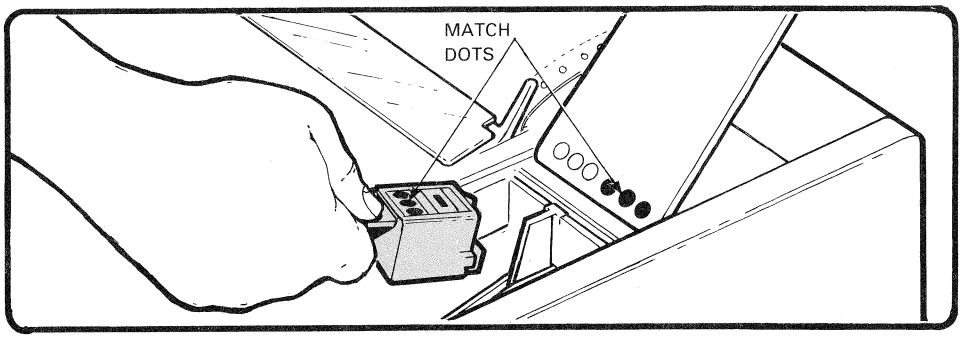
Step 3 – Loading the Ink Cartridge

After priming and wiping, the cartridge is loaded into its appropriate slot on the carriage. Both black and color cartridges are installed at all times.

1. Determine the correct location for the cartridge by matching the dots on the cartridge to the dots on the bottom of the carriage access lid. The black cartridge is installed in the right slot.



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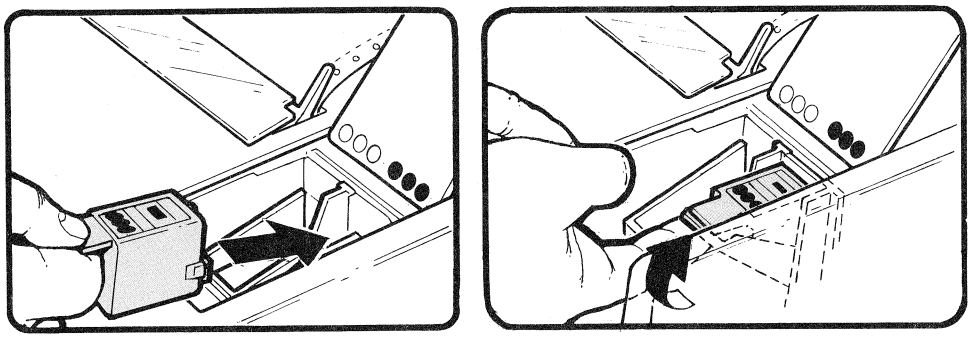
2. Gently place the cartridge into the appropriate slot.

3. Snap the green latch up into place to secure the cartridge.



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To prime, wipe, and load the second ink cartridge (color), repeat Steps 1, 2, and 3.

CONNECTING THE CABLES

There are two cables that attach to your Companion Color Printer; the interface cable and the external power module cable.

1. Unsnap and lift off the rear panel cover.

2. Attach the interface cable to the printer as follows:

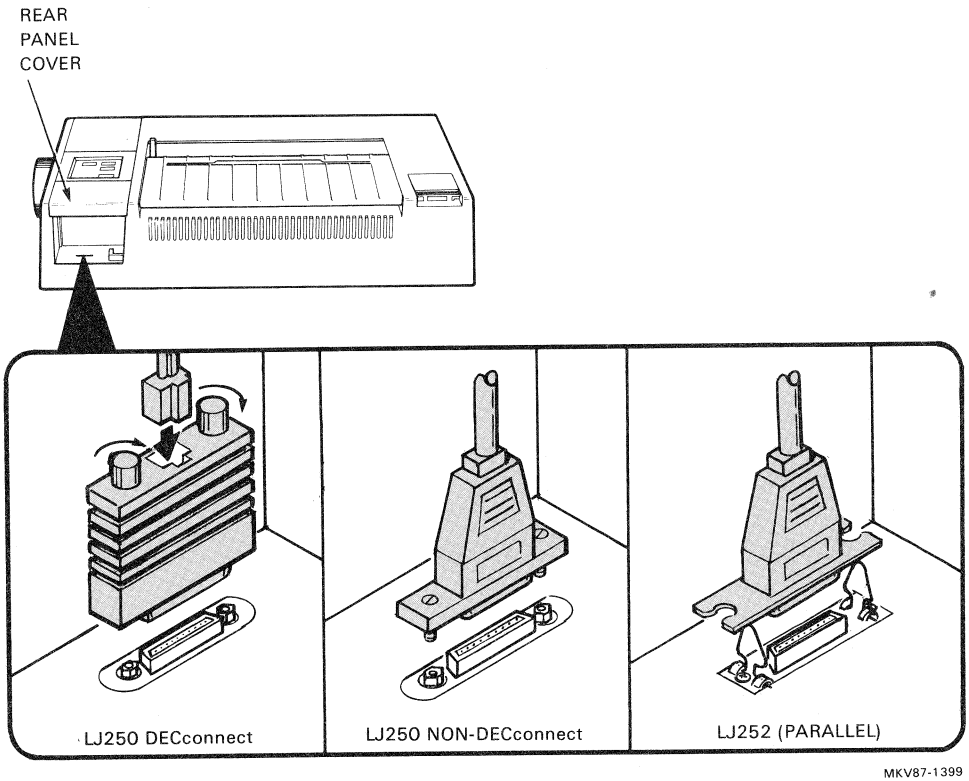
   a. **LJ250 DECconnect** – Devices using the DECconnect standard require the included MMJ adapter. The MMJ adapts the printer's 25-pin connector to the standard DIGITAL Modified Modular Jack (MMJ). Install the MMJ adapter to the interface connector on the printer rear panel. Tighten the mounting screws and insert the flatwire connector.

   or

   b. **LJ250 Non-DECconnect** – If DECconnect cabling is not being utilized, connect the serial cable directly to the 25-pin D-subminiature connector and tighten the mounting screws. Refer to Appendix A for a list of cables.

   or

   c. **LJ252** – Connect the parallel interface cable (included) to the interface connector on the printer's rear panel.


REAR
PANEL
COVER
LJ250 DECconnect
LJ250 NON-DECconnect
LJ252 (PARALLEL)
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3. Place the power module on the floor near the printer. To avoid electrical interference, do not place the module near your video terminal.

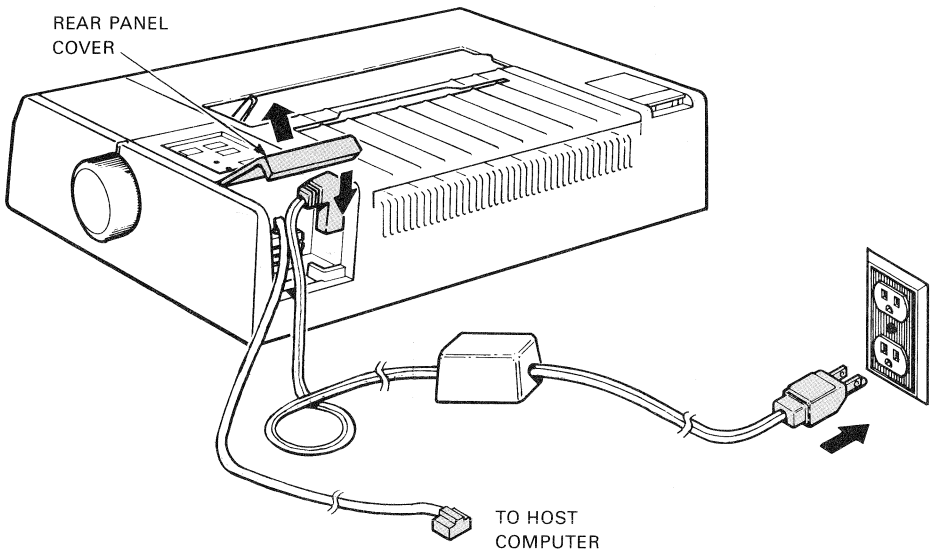
4. Insert the 90° connector of the power module cable firmly into the power socket on the back of the printer.

NOTE: The power module is active even when the printer is OFF. To avoid electrical interference, do not install the power module near your video terminal. The power module is included with the printer and is configured for the country to which the printer is shipped. If your wall plug is the wrong voltage or configuration, call your sales representative for assistance.

5. Plug the other end of the interface cable into your host computer. If you use an adapter on your system, plug the interface cable into the adapter and then into your host computer or video terminal (with printer port).

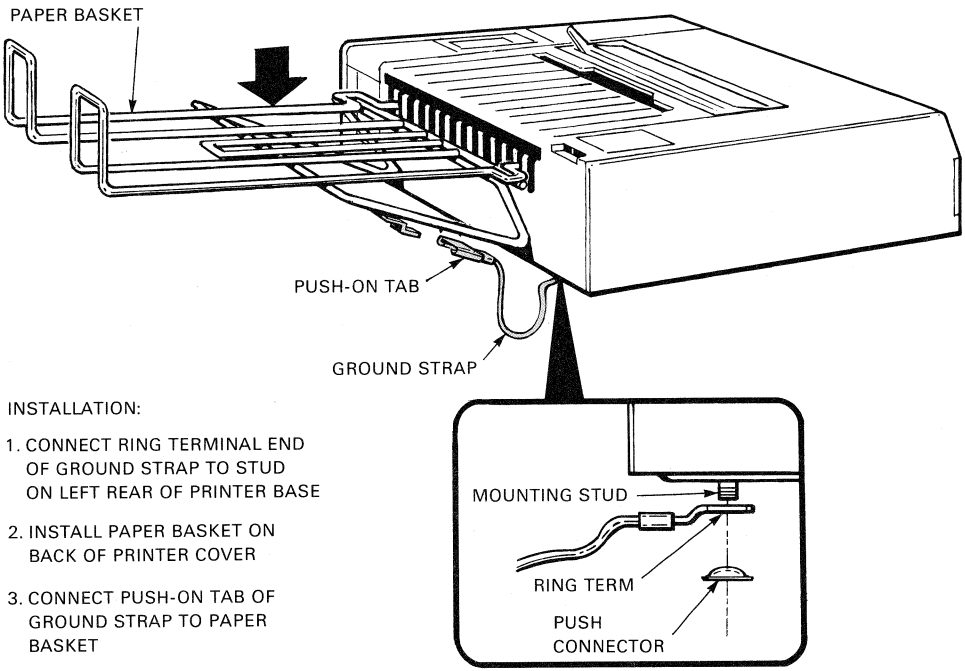
NOTE: Information on configuration for some systems is available in Chapter 2.

6. Plug the power module's ac plug into a grounded electrical outlet.



INSTALLING THE OPTIONAL PAPER BASKET

If you are using the optional paper basket (P/N: LJ25X-SW) on your Companion Color Printer, install as shown in the following figure.



INSTALLATION:

1. CONNECT RING TERMINAL END OF GROUND STRAP TO STUD ON LEFT REAR OF PRINTER BASE
2. INSTALL PAPER BASKET ON BACK OF PRINTER COVER
3. CONNECT PUSH-ON TAB OF GROUND STRAP TO PAPER BASKET

MKV87-1401

VERIFYING PRINTER OPERATION

The Printing Self-Test and the Color Palette Display allow the user to verify printer operation independently of the host system.

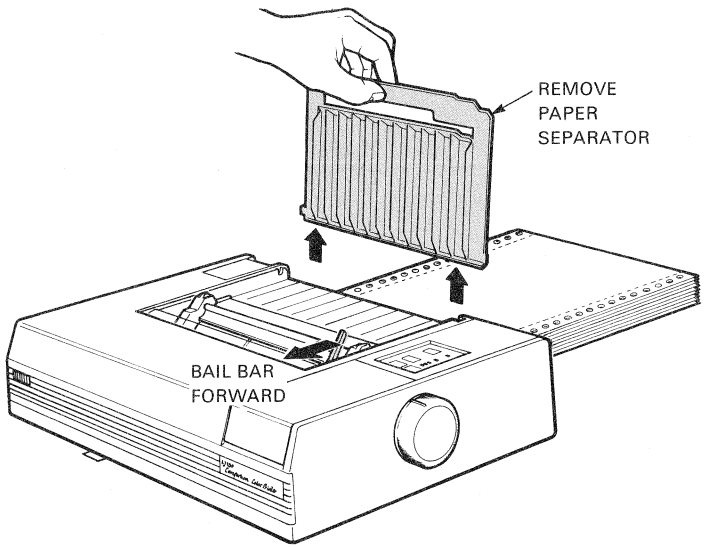
1. Locate the sample package of print media, unwrap, and place the pinfeed paper behind the printer.

   Load the paper so that the dull side, marked "Print This Side," faces the printhead when the paper is in the printer.

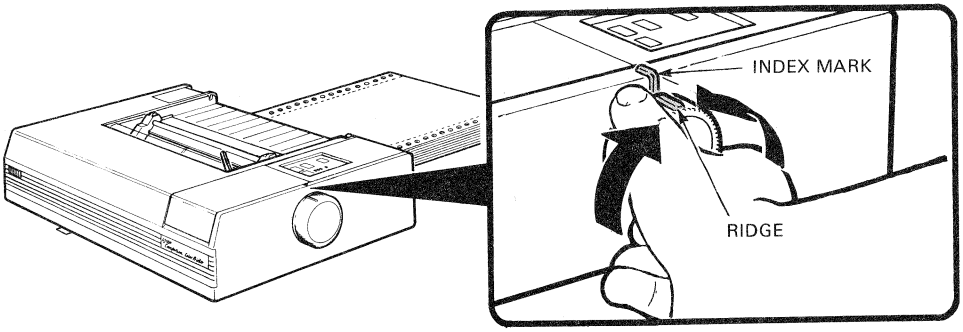
NOTE: For the best print quality and truest colors, use the recommended ink-jet paper (see Appendix A for supplies). Other papers can cause the ink to be absorbed incorrectly resulting in poor print quality when printing text, and faint or incorrect colors when printing colors.

2. Remove the paper separator.

3. Move the bail bar to the open (toward the front of the printer) position.

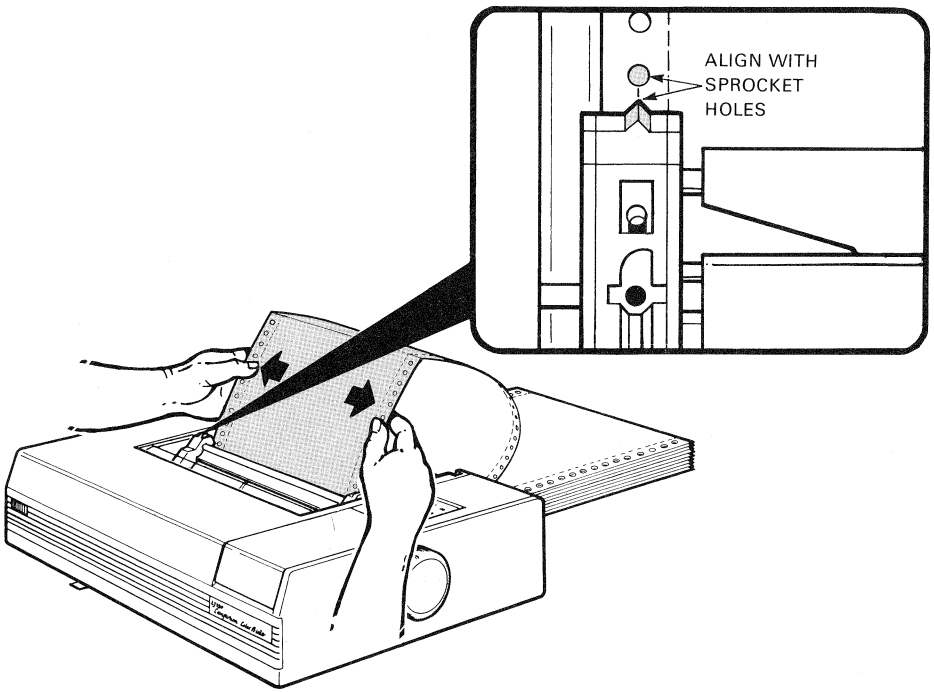


4. Turn the platen knob until one of the ridges on the knob lines up with the index mark on the printer's edge.



MKV87-1403

5. Insert the paper along the metal shield behind the tractors until it stops. Position the paper so the raised arrow on the left tractor is directly over the sprocket holes in the paper.



MKV87-1404

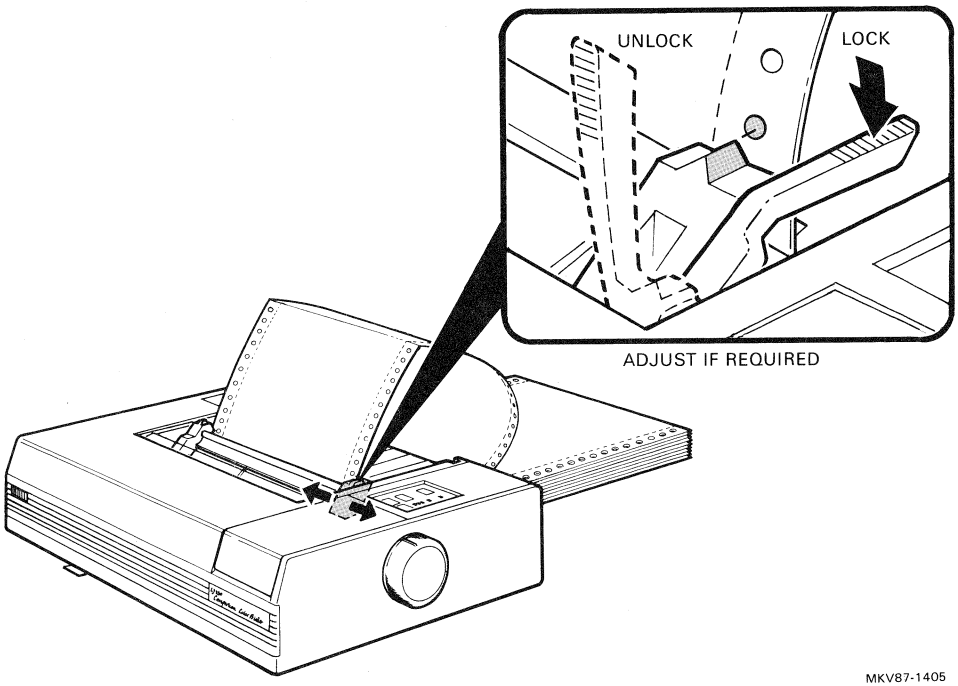
6. Hold the left side of the paper in position (Step 5). If the raised arrow on the right tractor is not directly over the sprocket holes, left-to-right adjustment is required.

NOTE: *Adjust the right tractor only if changing paper size.*

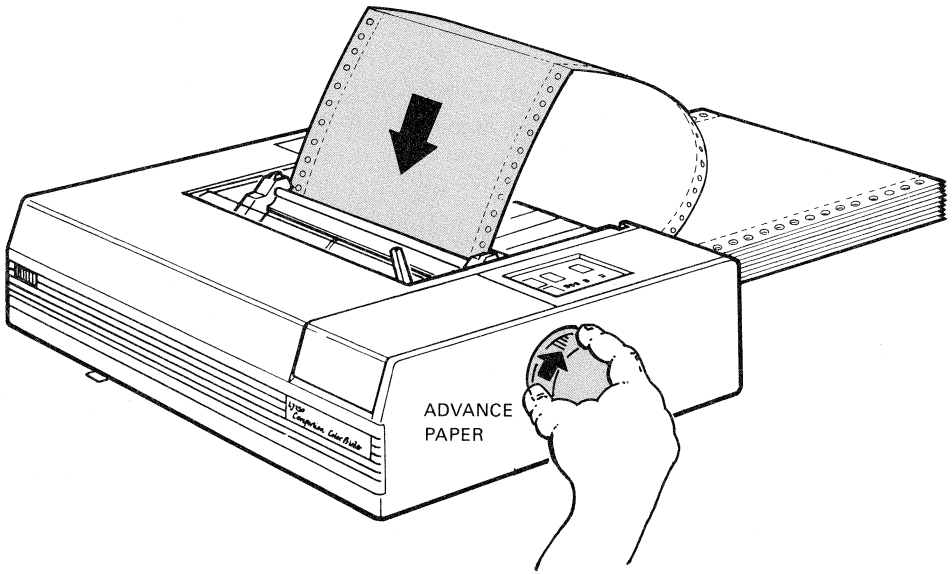
a. Adjust the right tractor by lifting the locking lever and moving the tractor left or right until the raised arrow on the tractor is directly over the sprocket holes in the paper.

b. Lower the locking lever to lock the right tractor in place.

NOTE: *The paper is not held in place by the locking lever.*

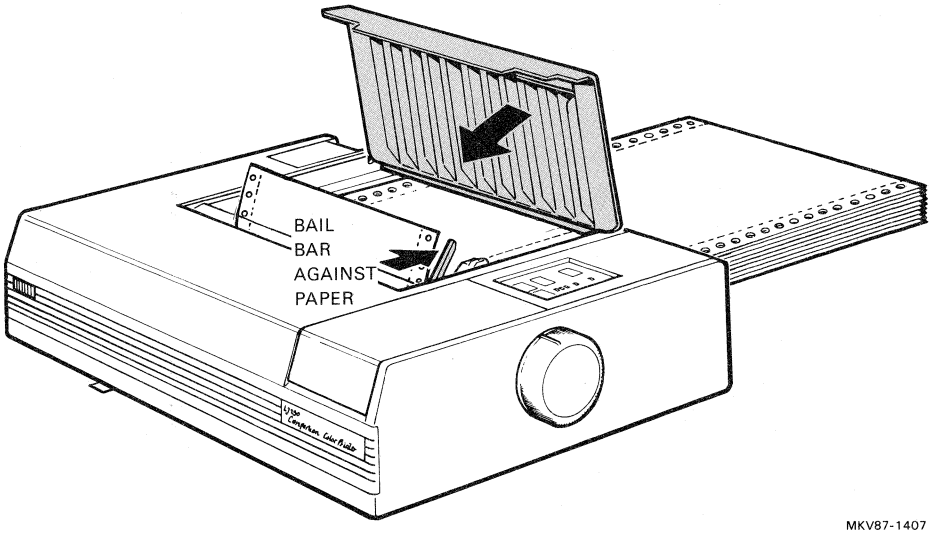


7. Turn the platen knob, advancing the paper, until the paper extends from the tractors.



8. Position the bail bar against the paper.

9. Replace the paper separator, making sure the paper exiting the printer passes over the separator.



MKV87-1407

10. The printer is ready for Printing Self-Test.

NOTE: The control panel switches are membrane-type switches and require only light pressure in the center of the switch area.

a. With the power OFF, press and hold down the FORM FEED switch while momentarily depressing the POWER switch.

b. Release the FORM FEED switch.

c. When you have printed several lines of text and are satisfied that the printout is correct, stop the Printing Self-Test by momentarily pressing the POWER switch.

d. The printout pattern should match the sample in Appendix D.

11. Print a Color Palette Display.

a. With the power OFF, press the READY and DEC/PCL switches while momentarily depressing the POWER switch.

b. Release the READY and DEC/PCL switches.

c. The Color Palette Display will print the Companion Color Printer's 256 colors. Several minutes is required for this test. Keep the Color Palette Display for future reference.

NOTE: If the printer does not operate properly, refer to Chapter 4.

Printing A File

Refer to your computer system documentation for information about operating the printer with your computer. Your computer or terminal may require printer setup before it can operate with the Companion Color Printer (see Chapter 2).

If your computer does not require printer setup, you can print a file by following these steps.

1. Ensure that there is paper in the printer and that you have advanced the paper to the print position.

2. Press the POWER switch on the printer control panel. The printer is ready to print.

3. Follow the instructions in your computer system's documentation for printing a file.

If You Have Difficulties Printing a File

Here are some suggestions if your file does not print, or if the file prints incorrectly.

1. Check the printer and the host computer configuration. The printer's baud rate, data bits and parity, and protocol should match those of the host computer. Table 2-1 (LJ250) or Table 2-2 (LJ252) will help you with the settings. Also check your computer system's documentation for these settings.

2. Read and follow the directions in Chapter 2 if you must change the printer's configuration to match your host computer's configuration.

3. If your printer still does not print your files correctly, see Table 4-3 (Troubleshooting Checklist).

4. If you are not sure of how to correct the problem, call DIGITAL Field Service. See Appendix B for more service information.

CONFIGURING THE PRINTER 2

This chapter explains how to configure the printer so that it can communicate with your computer system.

GENERAL 2-2
WHAT IS PROTOCOL? 2-2
WHAT IS CONFIGURATION? 2-2
CONFIGURATION FUNCTION DESCRIPTIONS 2-3
GETTING A CONFIGURATION PRINTOUT 2-4
FACTORY CONFIGURATION 2-5
Table 2-1 LJ250 Factory-Set Configuration Switches (Rear Panel) 2-5
Table 2-2 LJ252 Factory-Set Configuration Switches (Rear Panel) 2-5
CHANGING THE PRINTER'S CONFIGURATION 2-6
LJ250 Configuration Switches (Rear Panel) 2-7
LJ252 Configuration Switches (Rear Panel) 2-8
CHANGING PRINT SETTINGS 2-8
PRINT SETTINGS DESCRIPTION 2-9
Table 2-3 DEC Mode Default Print Settings (Power-Up) 2-10
Table 2-4 PCL Mode Default Print Settings (Power-Up) 2-11
CONNECTION AND SETUP FOR SOME COLOR SYSTEMS 2-12
VT241 2-12
VT340 2-14
VAXstation 2000 2-15

GENERAL

The Companion Color Printer is available in serial (LJ250) and parallel (LJ252) versions. Other than the interface portion (including the connectors and configuration switches) of the logic module, the serial and parallel printers are the same.

WHAT IS PROTOCOL?

Protocol determines with what data format the Companion Color Printer is compatible. *DEC protocol* sets the printer to communicate and be compatible with most of Digital Equipment Corporation's computers. *PCL protocol* sets the printer to receive data in Hewlett-Packard's Printer Command Language (PCL) format.

The protocol is changed by the control panel PROTOCOL switch, DEC/PCL. The LJ250 printer can be set to power-up in either DEC or PCL protocol by using the rear panel default settings, while the LJ252 printer will power-up in PCL protocol. If you are not sure which protocol to use, ask your system manager.

WHAT IS CONFIGURATION?

This chapter will help you configure the printer so that your printer and computer can communicate with each other correctly.

Communication between the computer and the printer requires that both the computer operating system and the printer have the same communication settings or features. The most important of these are baud rate, data bits and parity, and protocol. You may also need to change some of the printer's print settings depending on your hardware and software requirements. (See Tables 2-3 and 2-4 for a complete list of print settings.)

CONFIGURATION FUNCTION DESCRIPTIONS

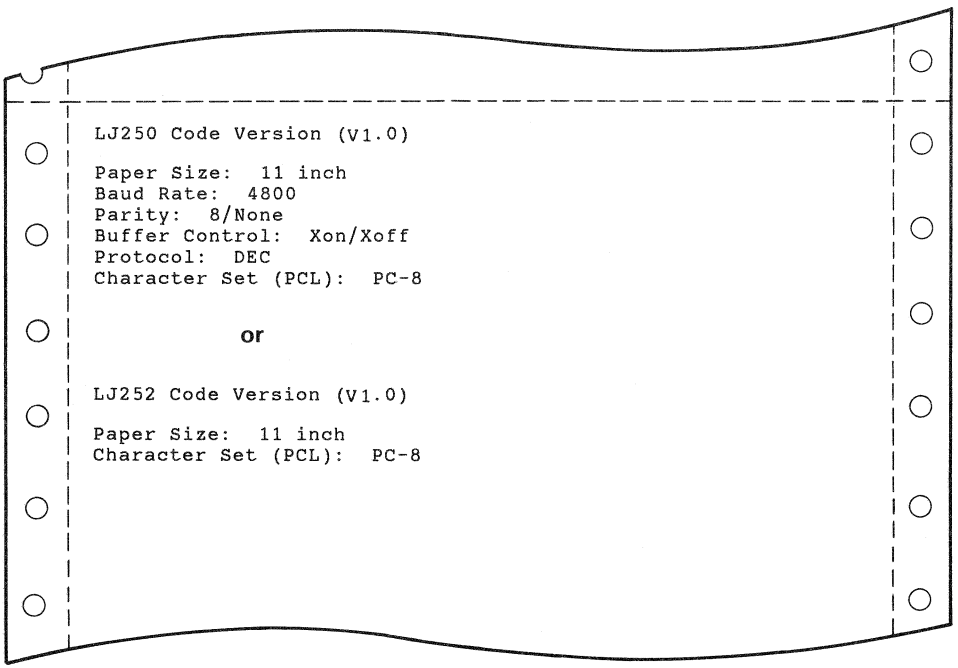
Forms Length	Forms length selects the default forms length.
Baud Rate	Baud rate is the speed (bits per second) at which the computer and the printer communicate.
Word Length and Parity	Word length and parity determine the format that the printer uses to communicate with the host computer.
Buffer Control	Buffer control is the method used to synchronize the data transfer to the printer thus preventing overflow or lost data.
Protocol	Protocol determines the data format for the Companion Color Printer. DEC protocol sets the printer to communicate and be compatible with most of Digital Equipment Corporation's computers. PCL protocol sets the printer to receive data in Hewlett-Packard's Printer Command Language (PCL) format.
Character Set	Character set selects the default character set to be used in the PCL mode.

GETTING A CONFIGURATION PRINTOUT

The LJ250 and LJ252 will print its current configuration. The printout is obtained as follows:

1. Ensure there is paper in the printer and the printer is OFF.
2. Press the READY and FORM FEED switches while momentarily pressing the POWER switch.
3. Release the READY and FORM FEED switches.

   The Companion Color Printer prints the configuration switch settings as set on the rear panel switches.



MKV87-1408

FACTORY CONFIGURATION

Table 2-1 LJ250 Factory-Set Configuration Switches (Rear Panel)

Feature	Value	Description
Forms Length	11 inch	Selects the default forms length to 11 inches.
Baud Rate	4800	Establishes the communications rate at 4800 baud with the host computer.
Word Length/ Parity	8 bits/None	Establishes an 8-bit word length and determines that no parity checking of received characters is performed.
Buffer Control	XON/XOFF	Printer sends the XON serial character to start transmission of a printable message and the XOFF character to stop transmission.
Protocol	DEC	Configures the printer to communicate with DIGITAL computers.
Character Set (PCL only)	PC-8	Selects the default character set in the PCL mode only.

Table 2-2 LJ252 Factory-Set Configuration Switches (Rear Panel)

Feature	Value	Description
Forms Length	11 inch	Selects the default forms length to 11 inches.
Character Set (PCL only)	PC-8	Selects the default character set in the PCL mode only.

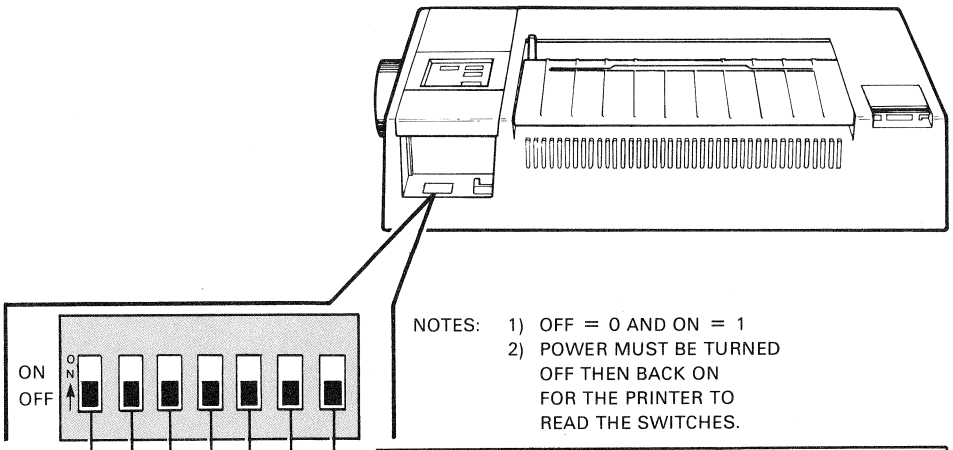
CHANGING THE PRINTER'S CONFIGURATION

To change the printer's configuration to match your computer's configuration, follow these steps:

NOTE: The rear panel switches are READ ONLY on power-up.

1. Turn the printer OFF.
2. Refer to Tables 2-1 or 2-2 for the configuration switch settings.
3. Change the desired configuration switches on the rear panel by using your thumbnail.
4. Turn the printer ON.

LJ250 Configuration Switches (Rear Panel)



NOTES: 1) OFF = 0 AND ON = 1
2) POWER MUST BE TURNED OFF THEN BACK ON FOR THE PRINTER TO READ THE SWITCHES.

S1	FORMS LENGTH
OFF	11 INCH (FACTORY SETTING)
ON	12 INCH

S2	BAUD RATE
OFF	4800 (FACTORY SETTING)
ON	9600

S3	S4	WORD LENGTH/PARITY
OFF	OFF	8 BITS/NONE (FACTORY SETTING)
OFF	ON	7 BITS/ODD
ON	OFF	7 BITS/EVEN
ON	ON	7 BITS/MARK

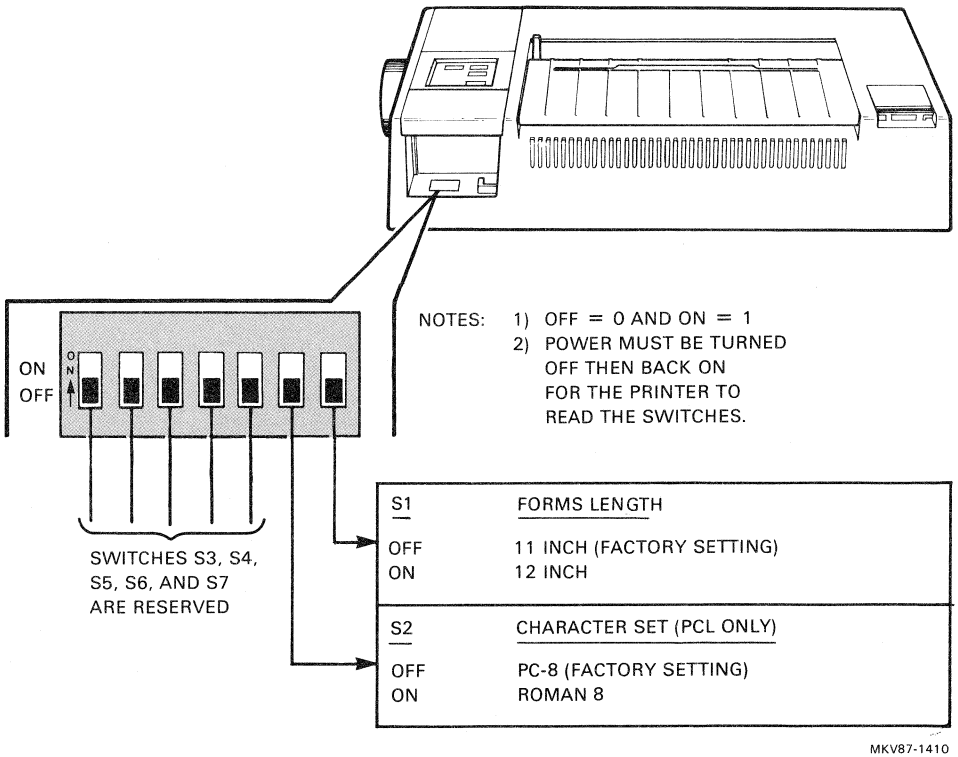
S5	BUFFER CONTROL
OFF	XON/XOFF (FACTORY SETTING)
ON	DTR HANDSHAKE

S6	PROTOCOL
OFF	DEC (FACTORY SETTING)
ON	HP PCL

S7	CHARACTER SET (PCL ONLY)
OFF	PC-8 (FACTORY SETTING)
ON	ROMAN 8

MKV87-1409

LJ252 Configuration Switches (Rear Panel)



CHANGING PRINT SETTINGS

Your printer has the ability to use various print settings. The print settings are software selectable from the host system. See your system or application software documentation for instructions on how to change the settings. The *LJ250/LJ252 Companion Color Printer Programmer Reference Manual*, EK-LJ250-RM, has a complete list and description of the print settings.

PRINT SETTINGS DESCRIPTION

The following are the print settings available in DEC mode. For a description of settings in PCL mode, refer to the *LJ250/LJ252 Companion Color Printer Programmer Reference Manual.*

Text Color can be set to print the text in color.

Character Set defines 1 of 7 alphanumeric character sets in which your files are printed.

Pitch defines the number of characters per inch. Selectable pitches are 10, 12, and 18 characters per inch.

Line Length can be set at 80, 96, or 144 characters for 10, 12, or 18 characters per inch.

Page Length can be set from 1 to 252 lines, not to exceed 21 inches.

Vertical Line Spacing can be set at 2, 3, 4, 6, 8, or 12 lines per inch.

Margins set the start and end-point of each printed line.

Right Margin Text Mode controls the processing of characters that go beyond the right margin. Truncate ignores the characters in a line that exceed the right margin. Wrap prints the characters that exceed the right margin on the next line.

Perforation Skip is the number of lines automatically skipped on each form.

Line Termination –

- **Auto Line Feed (LF) on Carriage Return (CR)** determines whether the printer automatically advances the paper one line when the carriage return control character is received.

- **Auto Carriage Return (CR) on Line Feed (LF)** determines whether the printer automatically performs a carriage return when the line feed control character is received.

Resolution may be set to 180 dots per inch for graphics.

Table 2-3 DEC Mode Default Print Settings (Power-Up)

Print Feature	Setting
Text Color	Text characters printed black
Character Set	US ASCII standard 96 character set
Pitch (Width)	10 characters per inch
Line Length	80 column (8 inch) line
Page Length	66 line form
Vertical Line Spacing	6 lines per inch
Margins	Left and right margins = 1/4 inch
Right Margin Text Mode	Truncate – Printer ignores characters beyond 80 in the right margin
Perforation Skip	No top or bottom margin selected
Line Termination	No Auto CR – An LF code does not terminate the line
	No Auto LF – a CR code terminates the line, but does not cause a Line Feed
Resolution	Graphics resolution at 90 dots per inch

Table 2-4 PCL Mode Default Print Settings (Power-Up)

Print Feature	Setting
Perforation Skip	OFF
Line Spacing	6 lines per inch
Line Length	80 column @ 10 characters per inch
Horizontal Pitch	10 characters per inch
Text Length	60 lines
Active Position	Column 1, line 1
Text Color	Black
Underlining	OFF
Bold Mode	
Primary Symbol Set	Normal Print
Secondary Symbol Set	Bold Print
Line Termination	CR and LF codes terminate the line and cause printing
Direction of Print	Bidirectional text printing
Resolution	Raster Graphics – 90 dots per inch
Right Margin Text Mode	Characters beyond 80 columns are wrapped around to the next line

CONNECTION AND SETUP FOR SOME COLOR SYSTEMS

The print parameters can be changed from the print menu of your system. See the application software documentation for instructions on how to change the settings on systems not listed here.

NOTE: If you are a VAX/VMS user and are printing color sixel files through your terminal in Printer Controller Mode, set your VMS terminal to NOBROADCAST. Setting your terminal to NOBROADCAST prevents messages from interfering with the sixel output. Use the following VMS command:

$ SET TERMINAL/NOBROADCAST

VT241

Use the following steps to connect and set up the VT241:

1. Attach the printer cable (P/N BCC20-10) using one of the two following methods:

   a. Connect the 25-pin connector end of the printer cable to the printer interface connector and tighten the connector attaching screws.

   b. Connect the 9-pin connector end of the printer cable to the printer port (marked PR) on the VT241 and tighten the connector screws.

   or

   a. Connect the supplied MMJ adapter (H8571-E) to the printer interface connector and tighten the attaching screws.

   b. Connect a 9-pin MMJ adapter (H8571-B) to the printer port of the VT241 and tighten the attaching screws.

   c. Connect the printer and terminal using a BC16E flatwire cable.

2. Power up the VT241 monitor and system unit.

3. Go to the Printer Set-up Screen on the VT241 and ensure that the baud rate, number of data bits and parity, and XON/XOFF match the configuration switches on the printer rear panel.

4. Go to the Graphics Set-up Screen on the VT241 and set the following:

Set-up Choices		**Select**
Color Print/Mono Print	=	Color Print
HLS Print/RGB Print	=	(User's preference)
Print/No Print Background	=	No Print Background

5. Exit set-up screens and print a color file to verify configuration.

For further information on changing print parameters and setup, see the *VT240 Owner's Manual*, (EK-VT240-UG), Chapter 4, Terminal Setup.

VT340

The DEConnect printer cable (P/N BC16E) and the MMJ adapter (P/N H8571-E) supplied with the printer are used to connect the LJ250 printer to the VT340.

Use the following steps to connect and set up the VT340:

1. Install the MMJ adapter to the interface connector and tighten the screws.

2. Insert one end of the printer cable into the MMJ adapter.

3. Insert the other end of the printer cable into the printer port (marked with the printer logo) on the VT340.

4. Power up the VT340.

5. Go to the Printer Set-up Menu on the VT340. Ensure that the print speed (baud rate), character format (number of data bits and parity), and flow control (XON/XOFF) match the configuration switches on the printer rear panel.

6. While still in the Printer Set-up Menu on the VT340, set the following:

Set-up Choices		**Select**
Graphics Printing	=	Enabled
Background Printing	=	Disabled
Sixel Graphics Level	=	Level 2
Sixel Print Option	=	(User's preference)
Color Printing	=	Color
Color Specification	=	(User's preference)

7. Exit the Printer Set-up Menu and print a color file to verify configuration.

For further information on changing print parameters and setup, see the *Installing and Using the VT300 Series Video Terminal User's Guide*, (EK-VT3XX-UG), Chapter 11, Printers and Modems.

VAXstation 2000

To obtain color hardcopy output from a VAXstation, VAX Workstation Software (VWS) Version 3.2 must be loaded.

1. Display the Workstation Options Menu.

2. Choose "Setup The Workstation" from the "Workstation Options" Menu.

3. Choose "Printer Setup" from the "Workstation Setup" Menu.

4. Under "Color Conversions Method", choose "8-colors".

5. You can now use the Print Screen Key to print.

To obtain color hardcopy output with Hardcopy UIS V3.2 bundled into VAX Workstation Software (VWS) Version 3.2, use the RENDER command with the /DEVICE_TYPE=LJ250 qualifier. A color sixel file is created that can be sent to the printer.

Example:

```
$ RENDER CLOWN/DEV=LJ250
```

USING THE PRINTER 3

This chapter describes ink-jet technology; printer controls and indicators; and gives a detailed explanation of the different ways to load print media, print files, print graphics, and print transparencies.

NOTE: The user should purchase at least one set of spare ink cartridges and have them on hand. The cartridges are consumable items and are not available from service personnel.

ABOUT INK-JET TECHNOLOGY 3-3
Ink-Jet Notes 3-3
PRINT MEDIA CONTROLS 3-4
LOADING PRINT MEDIA 3-5
Loading Pinfeed Paper 3-6
Setting Top-of-Form 3-12
Hand-Feeding Single Sheet Paper 3-13
ABOUT THE CONTROL PANEL 3-16
Table 3-1 Printer Operating Controls and Indicators 3-16
PRINTING TEXT FILES 3-18
PRINTING COLOR SIXEL GRAPHICS 3-19
PRINTING TRANSPARENCIES 3-20
About Transparencies 3-20
Hand-Feeding Transparencies 3-21
Using Transparency Mode 3-25
GETTING A COLOR PALETTE DISPLAY 3-26

ABOUT INK-JET TECHNOLOGY

The Companion Color Printer prints characters in a cell size of 30 × 30 dots at a density of up to 180 dots per inch. The ink is squirted on demand from the ink cartridge to the paper. In the Transparency Mode, each dot is overprinted twice to increase the intensity of the colors.

Ink-Jet Notes:

- **MEDIA** – The Companion Color Printer media is designed specifically for use in this printer. For the best print quality and truest colors, use the recommended ink-jet paper (see Appendix A for supplies). Other papers can cause the ink to be absorbed incorrectly resulting in poor print quality when printing text, and faint or incorrect colors when printing colors.

- **OUT OF INK** – The ink-jet printers do not provide an "out of ink" indication. When the ink is exhausted, either the printed text *or* the colors will degrade from normal to unacceptable quality in about one page of printing.

- **CLOGGED NOZZLES** – If the printer is unused for very long periods of time, the ink-jet nozzles can begin to clog due to the ink drying. Running Printing Self-Test ensures that all nozzles are functioning properly. If the printer does not print the self-test properly, then prime and wipe the ink cartridges. A capping station in the mechanism minimizes clogging problems.

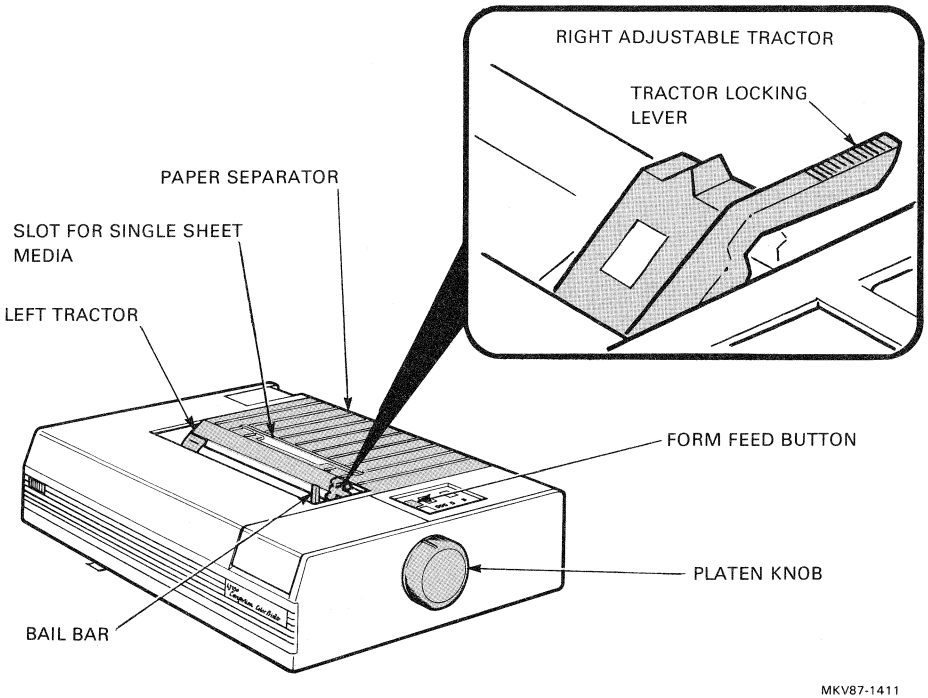
- **PRIMING CARTRIDGES** – Each time you prime an ink cartridge a small amount of ink is used. Excessive priming reduces the number of printable characters available from a cartridge.

PRINT MEDIA CONTROLS

The controls described in this section are used for loading and positioning paper or transparency film in the printer.

FORM FEED Switch	The FORM FEED switch advances the paper to the top-of-form. The switch ejects the form when using single sheets or transparencies.
Bail Bar	The bail bar holds the paper against the platen.
Platen Knob	The platen knob allows manual control of the platen for inserting print media and for changing the media's vertical position.
Paper Separator	The paper separator keeps the pinfeed paper in the correct position as the paper feeds into and out of the printer. The slot in the paper separator aligns the paper when using single sheets.
Tractor Locking Lever	The tractor locking lever is used to change the position of the right-hand tractor for different paper sizes. The tractor position should be changed only when the paper size is changed. Pull the lever toward the front of the printer to release, then push the lever toward the back of the printer to lock the tractor in place.

PRINT MEDIA CONTROLS



LOADING PRINT MEDIA

There are three types of forms that can be used with the printer:

- Pinfeed paper – Load at the back of the printer.
- Single sheet paper – Hand-feed at the top of the printer.
- Single sheet transparencies – Hand-feed at the top of the printer.

CAUTION: Self-adhesive labels CANNOT be used in this printer. See Appendix C for recommended paper and transparency film.

Loading Pinfeed Paper

For the best print quality and truest colors, use the recommended ink-jet paper (see Appendix A for supplies). Other papers can cause the ink to be absorbed incorrectly resulting in poor print quality when printing text, and faint or incorrect colors when printing color.

NOTE: If you are a VAX/VMS user and are printing color sixel files through your terminal in Printer Controller Mode, set your VMS terminal to NOBROADCAST. Setting your terminal to NOBROADCAST prevents messages from interfering with the sixel output. Use the following VMS command:

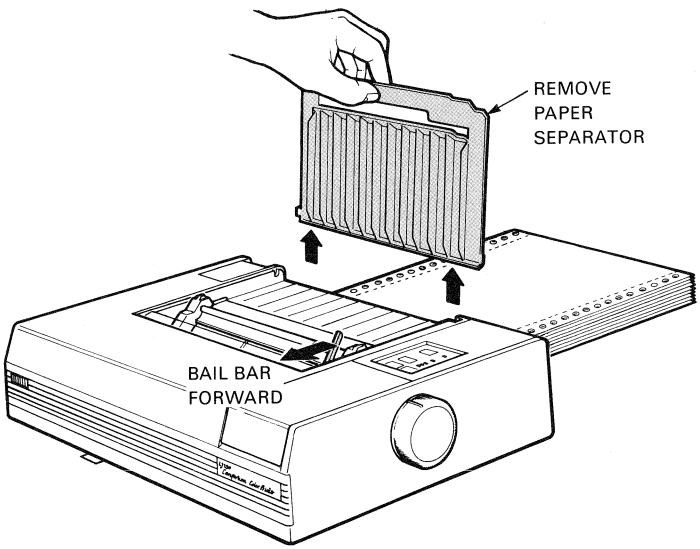
$ SET TERMINAL/NOBROADCAST

1. Place the pinfeed paper behind the printer.

   Place the paper so that the dull side, marked "Print This Side," faces the printhead when the paper is in the printer.

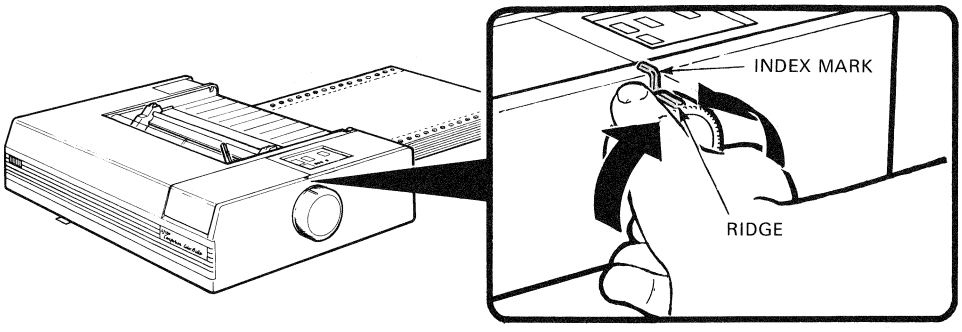
2. Remove the paper separator.

3. Move the bail bar to the open (toward the front of the printer) position.



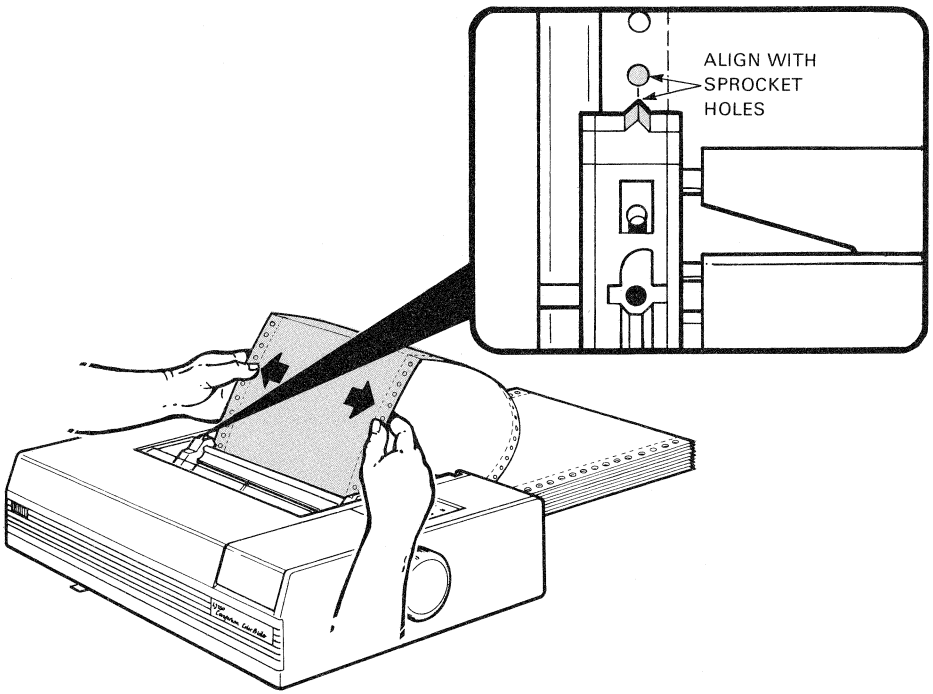
MKV87-1402

4. Turn the platen knob until one of the ridges on the knob lines up with the index mark on the printer's edge.



MKV87-1403

5. Insert the pinfeed paper along the metal shield behind the tractors until the paper stops. Position the paper so the raised arrow on the left tractor is directly over the sprocket holes in the paper.



MKV87-1404

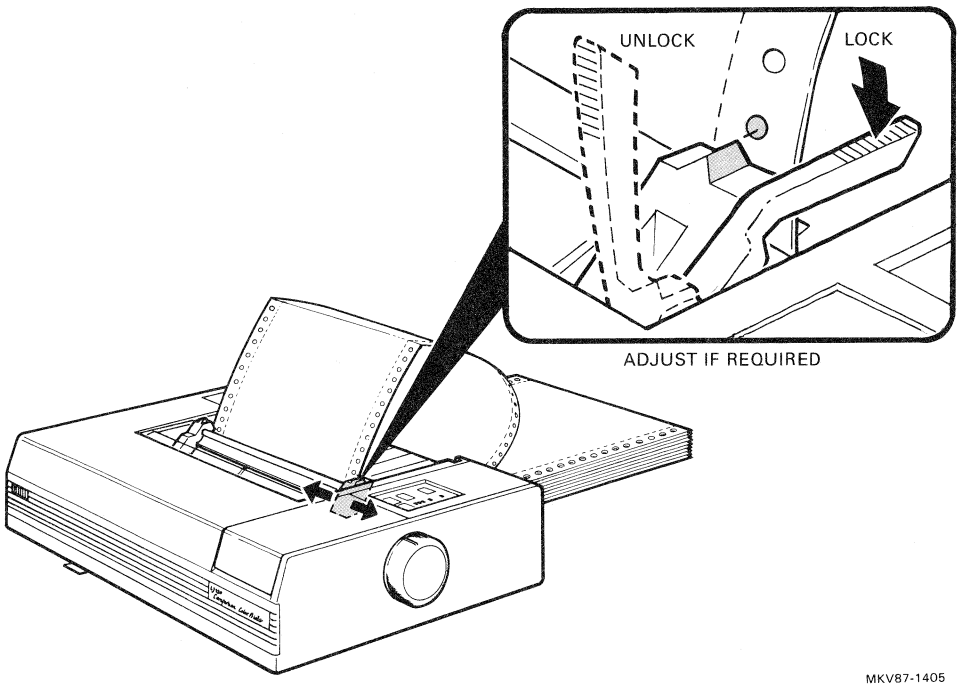
6. Hold the left side of the pinfeed paper in position (Step 5). If the raised arrow on the right tractor is not directly over the sprocket holes, left-to-right adjustment is required.

NOTE: *Adjust the right tractor only if changing paper sizes.*

a. Adjust the right tractor by lifting the locking lever and moving the tractor left or right until the raised arrow on the tractor is directly over the sprocket holes in the paper.

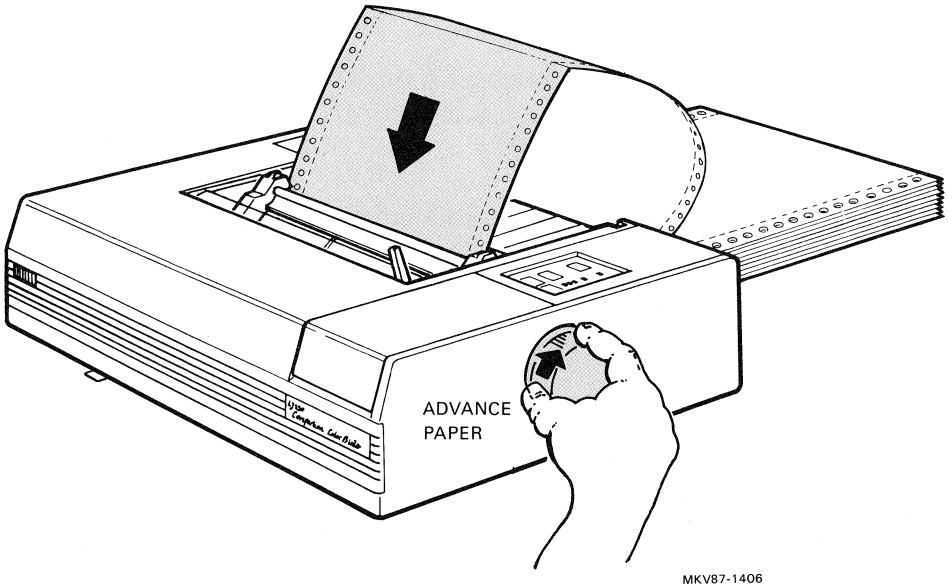
b. Lower the locking lever to lock the right tractor in place.

NOTE: *The paper is not held in place by the locking lever.*



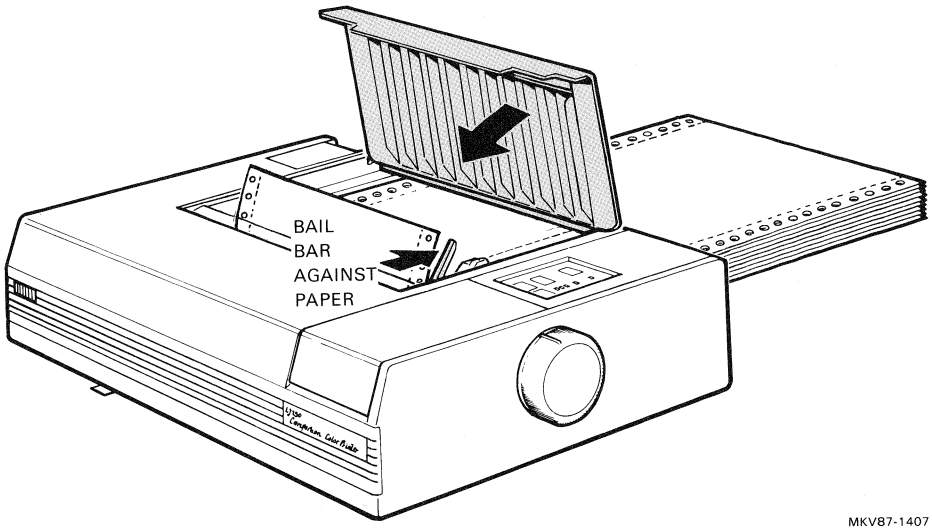
MKV87-1405

7. Turn the platen knob, advancing the paper, until the paper extends from the tractors.



8. Position the bail bar against the paper.

9. Replace the paper separator, making sure the paper exiting the printer passes over the separator.



MKV87-1407

10. Set the paper to the first printable line on the paper. See **Setting Top-of-Form** section.

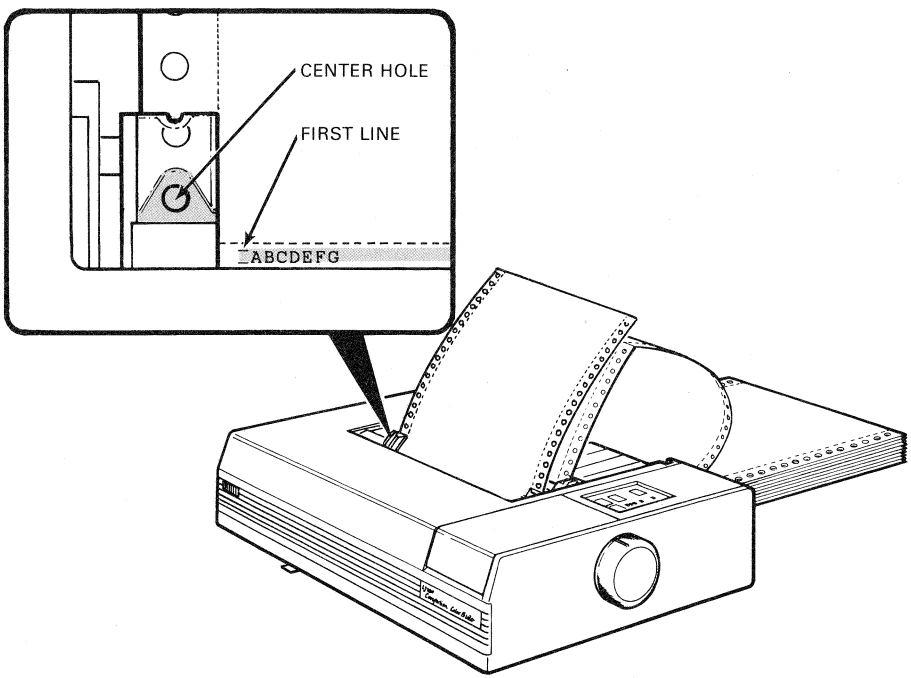
Setting Top-of-Form

The top-of-form is the first printable line at the top of the form.

Set top-of-form as follows:

1. Position the paper at the desired top of form.

2. Turn the printer power ON.



MKV87-1412

Pressing the FORM FEED switch will now advance the paper to the same position on each form. If you move the paper with the platen knob, top-of-form will change.

Hand-Feeding Single Sheet Paper

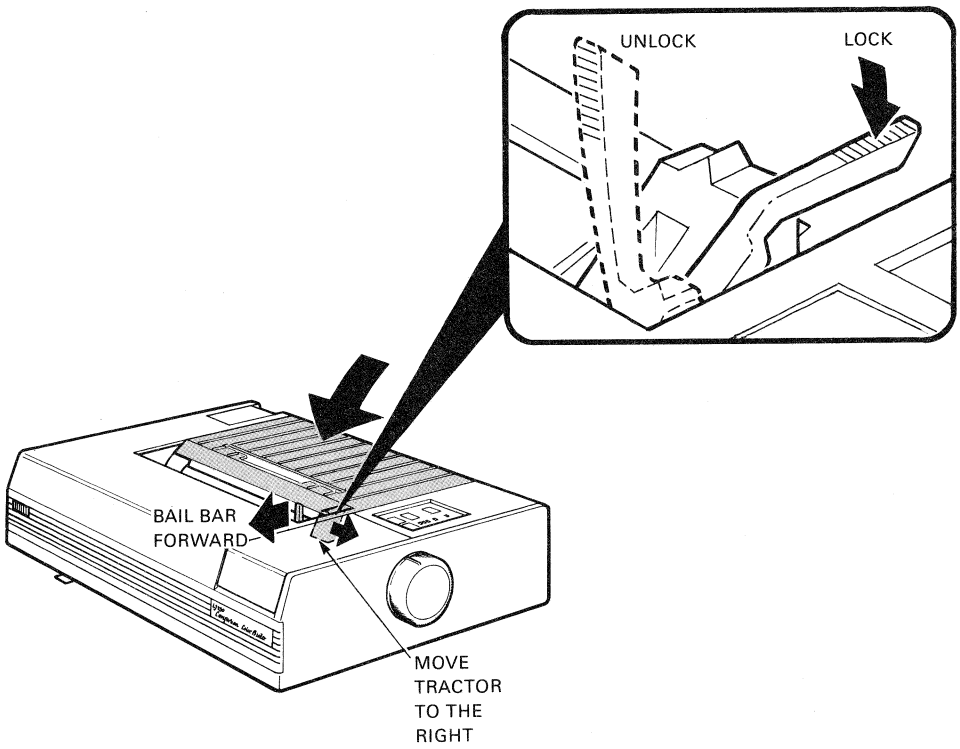
For the best print quality and truest colors, use the recommended ink-jet paper (see Appendix A for supplies). Other papers can cause the ink to be absorbed incorrectly resulting in poor print quality when printing text, and faint or incorrect colors when printing color.

The LJ250 and LJ252 color printers can print single sheets by hand-feeding. Single sheets are loaded as follows:

1. Move the bail bar to the open (toward the front of the printer) position.

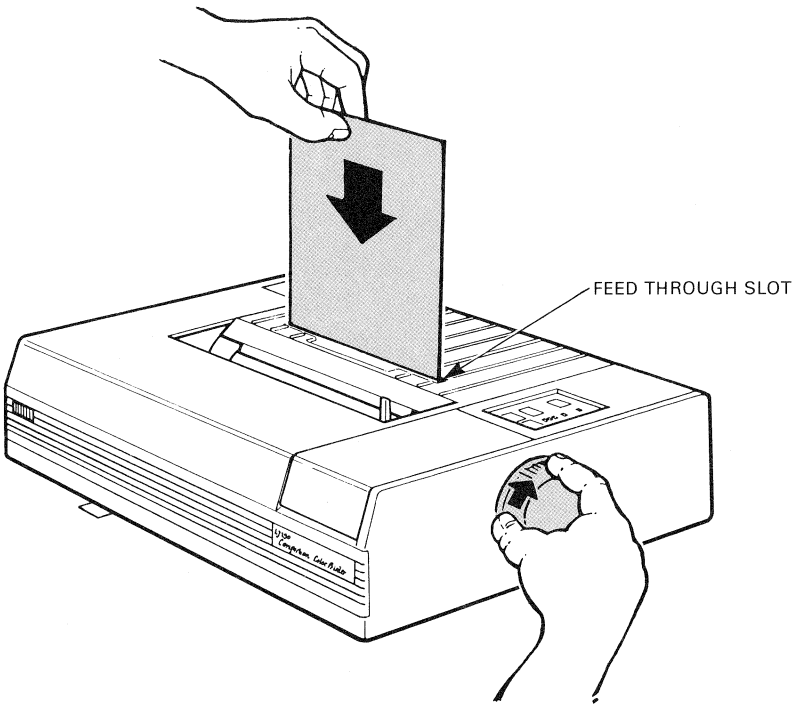
2. Move the right tractor all the way to the right and lock in place.

3. Ensure that the paper separator is installed.



4. Hold the paper so that the dull side, marked "Print This Side," faces the printhead when the paper is in position.

5. Insert the paper through the slot in the paper separator, turning the platen knob to advance the paper. Guide the paper with your other hand.



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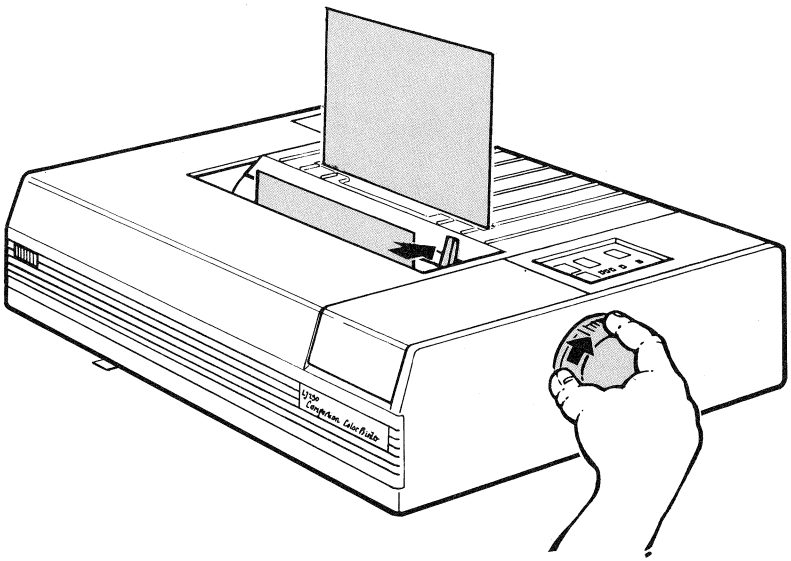
6. Turn the platen knob, advancing the paper, until the paper extends from the tractors.

7. Position the bail bar against the paper.



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8. You can now advance the paper to the print position by turning the platen knob toward the back of the printer until the paper is in the print position.

NOTE: Your computer may have the top margin already set. Adjust the paper for this.

ABOUT THE CONTROL PANEL

In this section you will learn how to use the printer's operating controls and how to print your files. The control panel switches are membrane-type and require only light pressure when pressed.

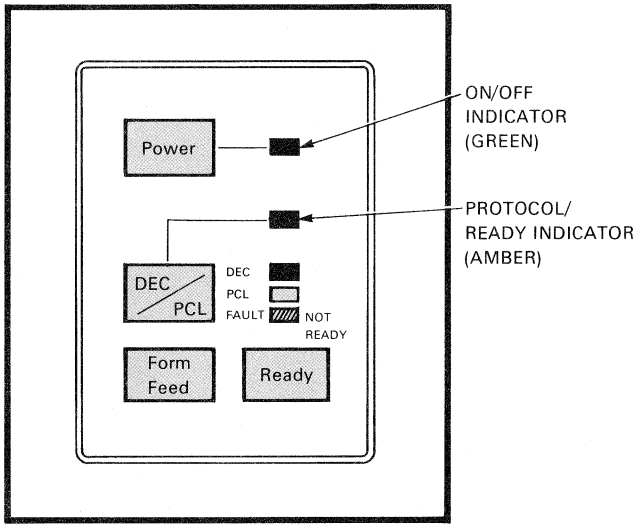

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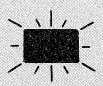
Table 3-1 Printer Operating Controls and Indicators

Symbol	Name	Description
Power	POWER switch	Activates the printer. Whenever the power module is attached, power is applied to the printer.
	ON/OFF indicator (green)	When ON, indicates that the printer is activated.

Table 3-1 Printer Operating Controls and Indicators (Cont)

Symbol	Name	Description
Ready	READY switch	The printer powers up in the READY state. Pressing the READY switch deselects the printer. (A flashing PROTOCOL/READY indicator can indicate that the printer is off-line.) Ensure that the bail bar is closed (against the print media) before pressing READY to place the printer back on-line.
DEC / PCL	PROTOCOL switch	Selects the printer protocol (the way the printer communicates with your computer system). To change between DEC and PCL protocol, press the switch once. The PROTOCOL/READY indicator indicates the selected protocol.
	PROTOCOL/READY indicator (amber)	The PROTOCOL/READY indications are: ON – Printer ready (DEC Protocol) OFF – Printer ready (PCL Protocol) FLASHING – Out of paper, printer is deselected, or a hardware error has occurred.*
Form Feed	FORM FEED switch	Advances the paper in the printer one form length at a time.

*See Chapter 4 for hardware error conditions.

PRINTING TEXT FILES

Make sure that there is paper loaded in the printer. Use the platen knob to advance the paper to the print position. Print position is usually just below the perforation on continuous pinfeed paper.

1. Load the appropriate print media.

NOTE: The bail bar must be closed (against the print media) before applying power.

2. Press the POWER switch on the control panel. The green POWER indicator lights.

3. Choose protocol, if necessary. The PROTOCOL/READY indicator indicates your choice.

   a. PROTOCOL/READY Indicator ON – DEC Protocol

   b. PROTOCOL/READY Indicator OFF – PCL Protocol

You are now ready to print text files.

NOTE: The Companion Color Printer configuration is factory set for use with Digital Equipment Corporation's computer systems in the United States. If you have trouble printing your files, you may need to change the printer's configuration. Follow the steps outlined in Chapter 2 to make these changes.

PRINTING COLOR SIXEL GRAPHICS

The Color Companion Printer configuration is factory set for use with Digital Equipment Corporation's computer systems in the United States. No special operator procedures for the printer are required to print color graphics. There are no special preparations or setup required to print color files.

1. Load the appropriate print media.

NOTE: The bail bar must be closed (against the print media) before applying power.

2. Press the POWER switch on the control panel. The green POWER indicator lights.

3. Choose protocol, if necessary. The PROTOCOL/READY indicator indicates your choice.

   a. PROTOCOL/READY Indicator ON – DEC Protocol

   b. PROTOCOL/READY Indicator OFF – PCL Protocol

You are now ready to print color graphics.

NOTE: If you have trouble printing your files, you may need to change the printer's configuration. Follow the steps outlined in Chapter 2 to make these changes.

PRINTING TRANSPARENCIES

Your Companion Color Printer can be used to print color transparencies for use with an overhead projector.

About Transparencies

- Only Digital Equipment Corporation's LJ25X series transparency film gives satisfactory results. The film is specially formulated to absorb the ink. See Appendix A for ordering information.
- Each transparency comes with a jacket which is used to control the drying of the ink. By slowing the drying process, more vibrant colors can be obtained.
- You can project transparencies 5 minutes after printing, but avoid touching the images.
- For the brightest colors, let the transparency dry for 5 minutes, then place the transparency in its jacket for 24 hours.
- Insert a sheet of paper between the transparencies if stacking them.
- Store unused transparency film in its packaging. Observe the environmental specifications on the film package.

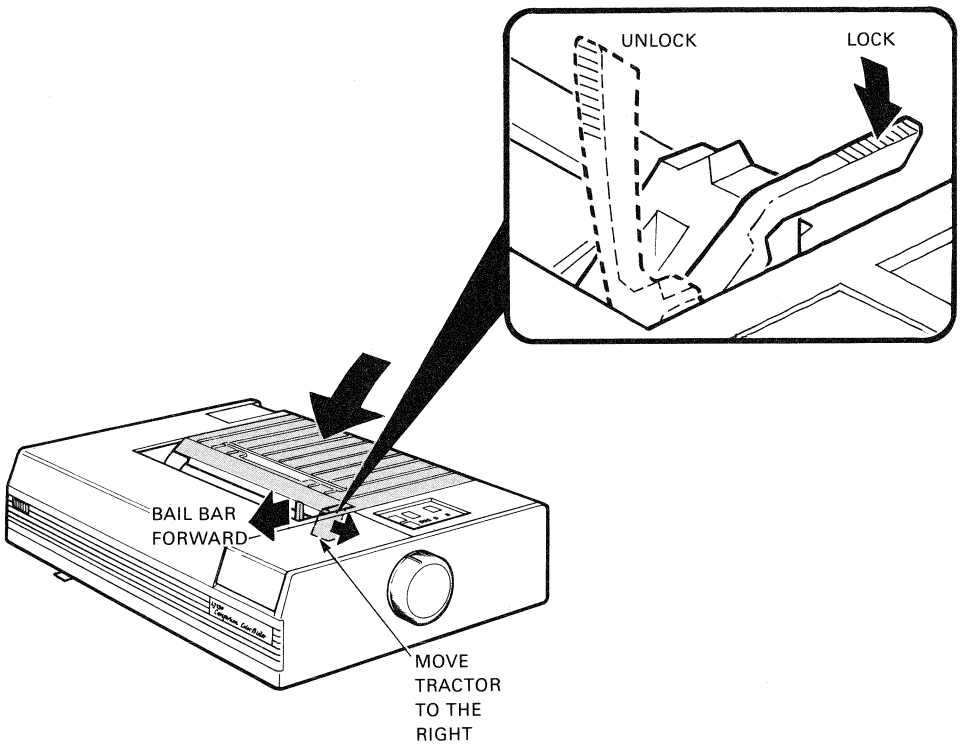
Hand-Feeding Transparencies

The Companion Color Printer prints on single sheets of LA25X series transparency film that has a paper backing. The paper backing extends one inch past the film on one end. This allows the transparency to be held longer by the friction rollers, thus allowing more lines to be printed on the film.

The film is loaded as follows:

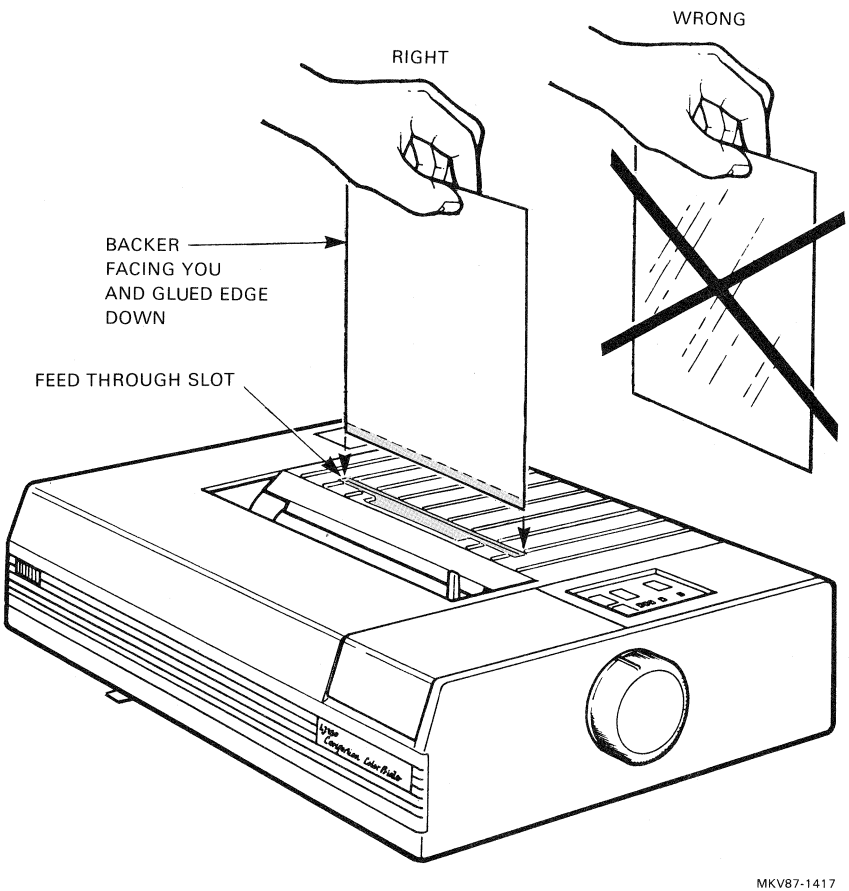
NOTE: Pinfeed paper must be removed from the printer before transparencies can be printed.

1. Move the right tractor to the far right and lock into position.
2. Move the paper bail to the open (toward the front of the printer) position.
3. Ensure that the paper separator is installed.

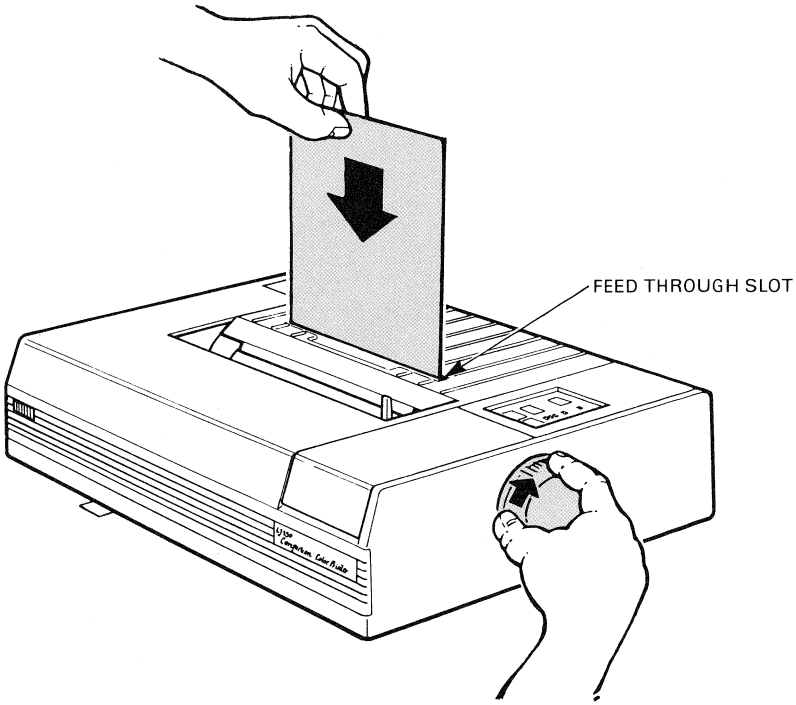


MKV87-1413

4. Hold the transparency with the paper backer facing you.

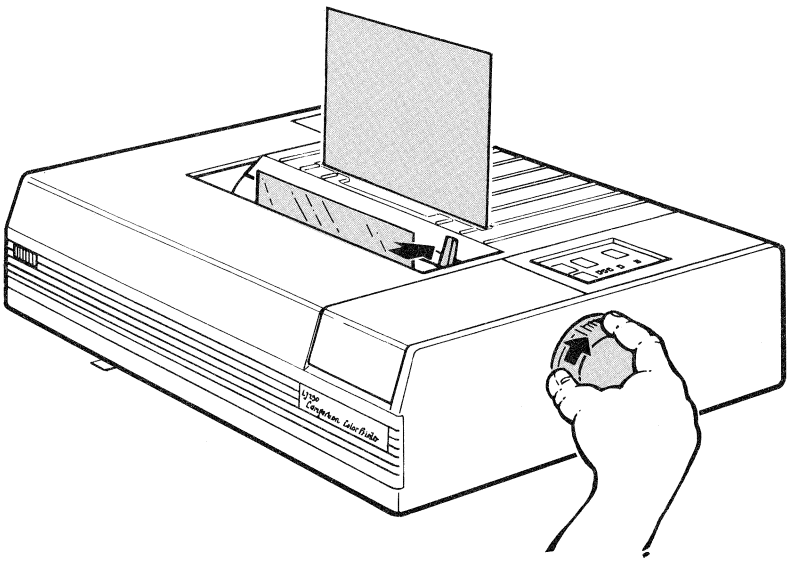


5. Insert the transparency through the slot in the paper separator, turning the platen knob to advance the film. Guide the transparency with your other hand.



6. Turn the platen knob, advancing the transparency until the paper extension can be picked up by the bail bar.

7. Position the bail bar against the transparency.



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8. You can now advance the transparency to the print position by turning the platen knob.

NOTES: Set the top of the transparency film so that the printing is completed before the transparency's bottom edge is released.

To manually remove the transparency, press the FORM FEED switch on the control panel or rotate the platen knob until the transparency is released from the friction rollers.

Using Transparency Mode

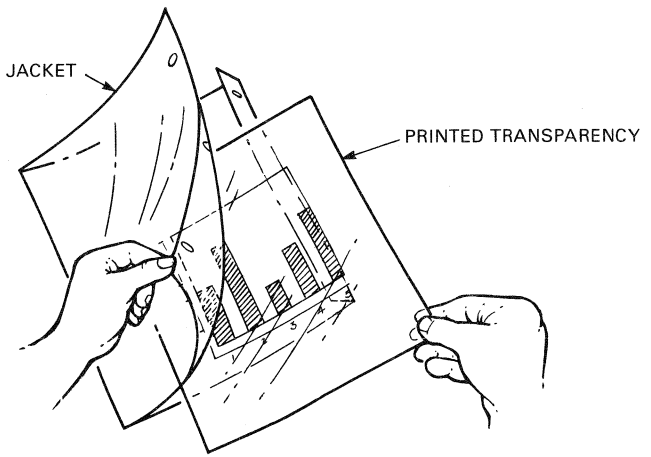
To obtain the color intensity needed for overhead transparencies, the Companion Color Printer must be in the Transparency Mode. The Transparency Mode allows two passes of the printhead, increasing the intensity and uniformity of the colors.

Select the Transparency Mode in one of the following ways:

- From your computer, select and deselect the Transparency Mode with escape sequences as described in the *LJ250/LJ252 Companion Color Printer Programmer Reference Manual*, EK-LJ250-RM.

or

- Using the control panel:
  - Turn the printer power OFF.
  - Enter the Transparency Mode by pressing the DEC/PCL switch while momentarily pressing the POWER switch.
  - Release the DEC/PCL switch.
  - Send a file you want to print from your system to the printer.
  - Allow the printed transparency to dry for 5 minutes. Place the transparency in its jacket for 24 hours.



MKV87-1419

- Exit the Transparency Mode by turning the printer power OFF and back ON.

NOTES: Self-tests are not available in Transparency Mode.

There is no control panel indication that the printer is in Transparency Mode. Observe carriage motion to ensure that two passes of the printhead for each line are being made.

GETTING A COLOR PALETTE DISPLAY

The Companion Color Printer can print its 256 color palette. The palette is used by programmers to choose the color they wish to use, and can also be used to verify proper printer operation. Print a Color Palette Display and keep it with your printer documentation for reference.

To print a Color Palette Display:

1. With the power OFF, press the READY and DEC/PCL switches, while momentarily depressing the POWER switch.

2. Release the READY and DEC/PCL switches.

3. The Color Palette Display is a one page printout and requires several minutes to print.

SOLVING PROBLEMS 4

This chapter describes how to keep the printer clean, correct simple problems, and change and maintain the ink cartridges. Table 4-3 is a troubleshooting checklist that can help you identify and correct simple problems and possibly save you a service call.

GENERAL MAINTENANCE 4-3
- Office Area 4-3
- Print Media 4-3
- Ink Cartridges 4-3

USING THE HELP CARD 4-4
THE HELP CARD 4-5
SELF-TESTS 4-6
- Power-Up Self-Test 4-6
- Printing Self-Test 4-6
- Remote Self-Test (PCL Mode Only) 4-7
- Color Palette Display 4-7
- Table 4-1 Self-Test Summary 4-8
- Table 4-2 Flashing PROTOCOL/READY Analysis 4-9

CORRECTING SIMPLE PROBLEMS 4-10
- Table 4-3 Troubleshooting Checklist 4-11

CORRECTING PRINT PROBLEMS 4-16
- Step 1 - Priming the Ink Cartridge 4-17
- Step 2 - Wiping the Ink Cartridge 4-20
- Step 3 - Brushing the Leadframe 4-22

REPLACING THE INK CARTRIDGES 4-24
- When to Replace an Ink Cartridge 4-24
- Step 1 - Remove the Expended or Defective Ink Cartridge 4-25
- Step 2 - Prime and Wipe the Fresh Ink Cartridge 4-26
- Step 3 - Load the Fresh Ink Cartridge 4-26

GENERAL MAINTENANCE

Clean the printer's surface with a damp cloth only. Because the printer uses a friction paper-feed system, the platen must be keep very clean.

CAUTION: DO NOT use isopropyl alcohol as damage to the platen may result. Do not use excessive water or cleaners with solvents.

Clean the platen regularly using a soft cloth dampened with water or with a low residue cleaner, such as desk cleaner. Wipe across the platen while turning the platen knob.

Office Area

To maintain correct operating temperatures, keep the printer away from extreme temperatures; such as direct sunlight, room heaters, and air conditioners. Keep paper clips, matches, and drinks away from the printer.

NOTE: The use of the dust cover for this printer is recommended.

Print Media

The Companion Color Printer media is designed specifically for use in this printer. For the best print quality and truest colors, use the recommended ink-jet paper (see Appendix A for supplies). Other papers can cause the ink to be absorbed incorrectly resulting in poor print quality when printing text, and faint or incorrect colors when printing colors. To remove paper from the printer, use the FORM FEED switch or the platen knob. DO NOT pull the paper out of the printer.

Ink Cartridges

WARNING: The black ink is toxic if swallowed. Wash immediately with soap and water if you get ink on your hands.

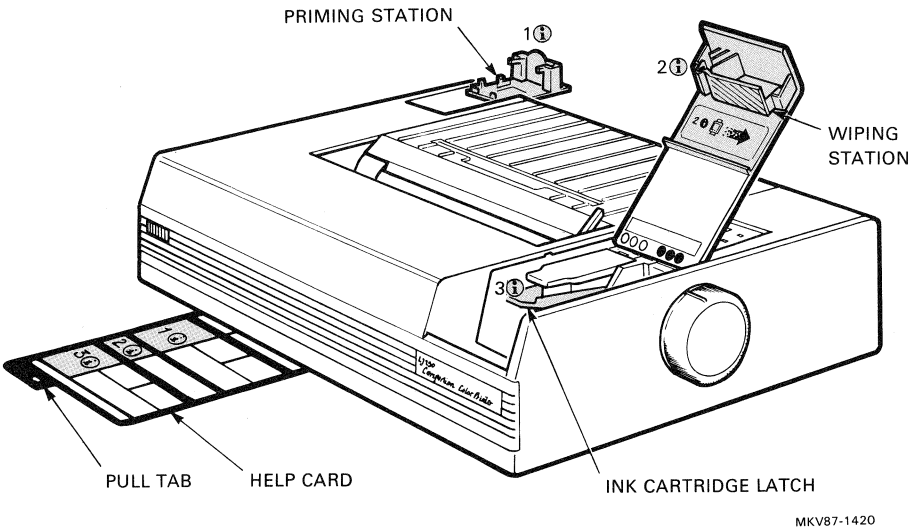
The ink cartridges are supply items; keep at least one extra set on hand.

See the **REPLACING THE INK CARTRIDGES** section in this chapter for information on how to perform this procedure. See Table 4-3 for tips on how to know when to replace the ink cartridge or when to contact your service representative.

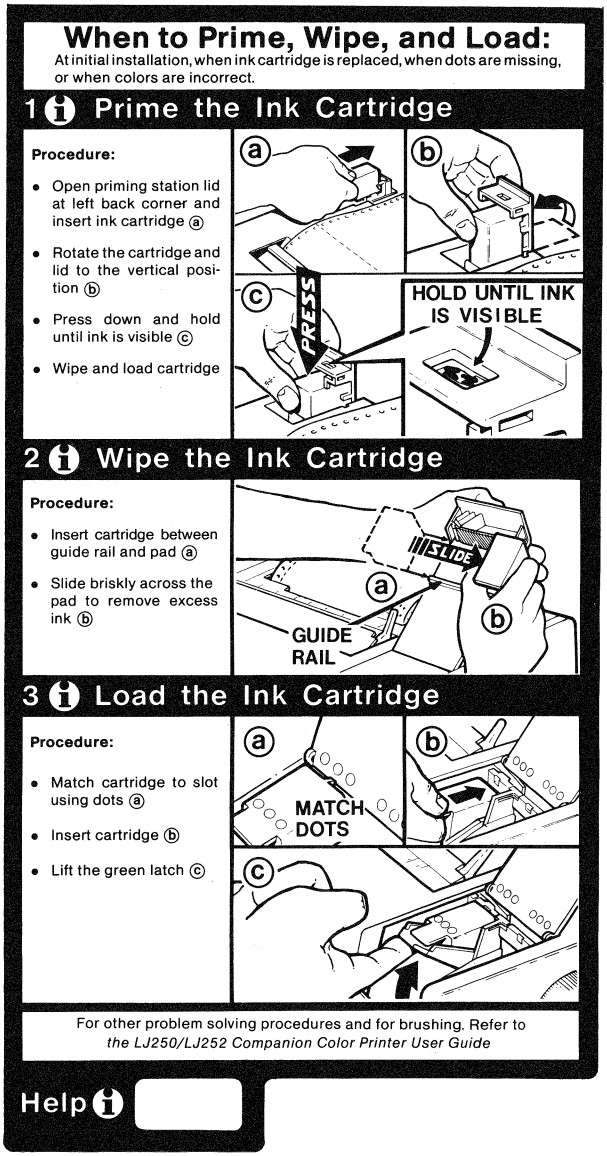
Store ink cartridges in their containers in the same environment as the printer (see Appendix C).

USING THE HELP CARD

The HELP card is located in a tray under the printer base. To access the card, pull the tab at the front of the printer forward. The card contains condensed instructions for priming, wiping, and loading the ink cartridges.



THE HELP CARD



MKV87-1421

SELF-TESTS

The LJ250 and LJ252 color printers have several built-in self-tests to help you confirm correct printer operation.

Power-Up Self-Test

When power is applied to the printer, the internal diagnostics are run. A flashing PROTOCOL/READY indicator indicates that the Power-Up Self-Test has failed. There is no printout associated with this test.

Procedure:

1. With the printer power OFF, press the POWER switch.

2. Observe the PROTOCOL/READY indicator on the control panel. A flashing PROTOCOL/READY indicates that the printer has failed the test.

Printing Self-Test

This self-test prints all text characters in an 80-column swirling test pattern and provides a color test pattern. All print nozzles are tested.

Detected logic failures are indicated by a flashing PROTOCOL/READY indicator on the control panel. See Appendix D for a sample printout.

Procedure:

1. Insert paper.

2. With power OFF, press the FORM FEED switch while momentarily pressing the POWER switch.

3. Release the FORM FEED switch.

4. After several lines have been printed, compare the printout to the sample in Appendix D.

5. Turn the printer power OFF to terminate the test.

Remote Self-Test (PCL Mode Only)
Remote Self-Test is initiated by sending an ESC z (1/11 7/10) when the printer is operating in the PCL protocol mode.

The Companion Color Printer prints all data preceding the self-test and moves the paper to the top-of-form. The self-test is printed and an internal diagnostic test is performed.

If no error is detected, the printer remains on-line, moves to the top of the next form, and continues processing data. If the printer detects an error, the PROTOCOL/READY indicator flashes.

During the Remote Self-Test, the input buffer is preserved, but programmable features such as underlining, down-loaded character, and so forth, may be lost.

See Appendix D for a sample printout.

Color Palette Display (Used as a Self-Test)
Prints all 256 colors that the Companion Color Printer is capable of printing. The palette can be used for verifying the colors and as a reference to the color numbers. The number on the side and top of the display indicate the color numbers.

Procedure:

1. Insert paper.

2. With the power OFF, press the READY and DEC/PCL switches while momentarily pressing the POWER switch.

3. Release the READY and DEC/PCL switches.

4. The printer takes several minutes to print all 256 colors and stops after one page.

NOTE: Keep a Color Palette Display printout with the printer documentation for reference.

Table 4-1 Self-Test Summary

Test	To Start Test	To End Test	Pass	Fail
Power-up	Power-up	N/A	PROTOCOL/READY does not flash.	Flashing PROTOCOL/ READY*
Printing	Power up/FF	Power OFF	Observe printout, PROTOCOL/READY does not flash.	Observe printout, flashing PROTOCOL/ READY*
Remote (PCL mode only)	From system send ESC z	N/A	Top-of-form after printout, PROTOCOL/READY does not flash.	Observe printout, flashing PROTOCOL/ READY*
Color Palette Display	Power-up/ READY & DEC/PCL simultaneously	N/A	Compare to earlier sample.	N/A

*A flashing PROTOCOL/READY indicator can indicate other conditions. See Table 4-2.

The PROTOCOL/READY indicator (amber) on the control panel indicates the printer protocol status and error conditions. A flashing PROTOCOL/READY indicates that the printer has an error condition or is deselected.

Table 4-2 Flashing PROTOCOL/READY Analysis

Test/Situation	Error Description
Printer not on-line	Normal, printer was deselected.
Printer was printing	Printer is out of paper.
	Carriage path is blocked.
Power-up	Internal diagnostics detects a logic failure in the printer.
Printing Self-Test	Logic failure is detected.

CORRECTING SIMPLE PROBLEMS

Table 4-3, Troubleshooting Checklist, shows how to correct many simple printer problems without calling for service. Always check this table before calling for service.

If you have a problem, follow these steps:

1. Find the description of the problem on the Troubleshooting Checklist.
2. Read the probable causes for that problem.
3. Follow the suggested solutions for each probable cause.

NOTE: The probable causes are listed in the order of what is most likely to be the cause.

If you cannot find your problem in the checklist, or if you cannot solve the problem, follow these steps.

1. Turn the power switch OFF and unplug the power module.
2. Contact the nearest DIGITAL Service Center or your sales representative.

Appendix B describes Digital Equipment Corporation's repair and support services.

NOTE: If you are a self-maintenance customer, refer to the LJ250/LJ252 Companion Color Printer Pocket Service Guide (EK-LJ250-PS) and the LJ250/LJ252 Companion Color Printer Technical Manual (EK-LJ250-TM).

Table 4-3 Troubleshooting Checklist

Problem	Probable Cause	Suggested Solution
No Power		
POWER indicator (green) not ON.	Power module is not connected or is defective.	Check power cord connections.
		Check power module for damage.
	Power source is defective.	Check power at outlet.
	Internal failure.	Call DIGITAL Field Service.
No Printout		
PROTOCOL/READY (amber) *not* flashing, passes Printing Self-Test.	Printer communications cable is not installed correctly.	Check cable connections at the printer and computer.
PROTOCOL/READY indicator (amber) *is* flashing.	Printer is off-line.	Press the READY switch to put the printer on-line.
	Printer is out of paper, or paper is not inserted correctly.	Reload paper, then press READY.
	Carriage path is blocked.	Remove obstruction, then press READY.

Table 4-3 Troubleshooting Checklist (Cont)

Problem	Probable Cause	Suggested Solution
No Printout (Cont)		
Carriage motion stops immediately after power is switched ON.	Carriage path is blocked.	Remove obstruction, then press READY.
Carriage makes a grinding noise.	Bail bar in open position.	Place bail bar against the platen.
Normal carriage travel, printer does not print.	Ink cartridge out of position.	Ensure that cartridge latch is closed.
	Ink cartridge nozzles plugged.	Prime and wipe ink cartridge (see **CORRECTING PRINT PROBLEMS**).
	Ink cartridge is exhausted.	Replace ink cartridge (see **REPLACING THE INK CARTRIDGES).**
No carriage movement on power-up and PROTOCOL/ READY indicator (amber) flashes. Pressing READY does not turn the indicator OFF.	Paper out or not engaging sensor.	Add or reposition paper, then press READY.
	Carriage movement obstructed.	Clear obstruction, then press READY.
	Internal failure.	Call DIGITAL Field Service.
Printing stops and the control panel lights go out.	Defective power module.	Replace power module.

Table 4-3 Troubleshooting Checklist (Cont)

Problem	Probable Cause	Suggested Solution
Poor Printing		
Print quality is poor.	Paper installed with wrong side out.	Install paper with the "Print This Side" marking toward printhead.
	Paper is not the recommended type.	Use DIGITAL recommended paper (see Appendix A).
	Ink cartridge is not installed correctly.	Remove ink cartridge and reinstall.
Blank spaces (missing dots) in horizontal row of characters.	Ink cartridges are plugged.	Refer to **CORRECTING PRINT PROBLEMS.**
	Ink cartridge is exhausted.	Replace ink cartridge (see **REPLACING THE INK CARTRIDGES).**
	Internal failure.	Call DIGITAL Field Service (see Appendix B).
Horizontal lines (banding) in solid colors.	Ink cartridges are plugged.	Refer to **CORRECTING PRINT PROBLEMS.**
	Ink cartridge is exhausted.	Replace ink cartridge (see **REPLACING THE INK CARTRIDGES).**
	Internal failure.	Call DIGITAL Field Service.

Table 4-3 Troubleshooting Checklist (Cont)

Problem	Probable Cause	Suggested Solution
Poor Printing (Cont)		
Printed lines overlap.	Paper path is obstructed.	Clear paper path.
	Friction feed is dirty.	Clean platen.
Printed pages have garbled characters, but Printing Self-Test is OK.	You have not chosen the correct values for your host computer.	Check the configuration switches on the rear panel, especially baud rate, data bits and parity, and protocol. If necessary, reselect the correct features and values on the host.
Images are the wrong size or distorted.	RETOS software not installed on your system.	Call your system manager, or see the RETOS documentation.
Color Problems		
Colors are faint.	Paper installed with wrong side out.	Install paper with the "Print This Side" marking toward printhead.
	Paper is not the recommended type.	Use DIGITAL recommended paper (see Appendix A).
	When printing transparencies, Transparency Mode not selected.	Select the Transparency Mode.

Table 4-3 Troubleshooting Checklist (Cont)

Problem	Probable Cause	Suggested Solution
Color Problems (Cont)		
Colors incorrect missing.	Ink cartridges are plugged.	Refer to **CORRECTING PRINT PROBLEMS.**
	Ink cartridge is exhausted.	Replace ink cartridge (see **REPLACING THE INK CARTRIDGES).**
	Internal failure.	Call DIGITAL Field Service.
White horizontal bands in color printouts.	Terminal setup.	Set terminal to NOBROADCAST.
Paper Problems		
Paper jams and PROTOCOL/READY indicator is flashing.	Paper path is obstructed.	Clear the paper path.
	Pinfeed paper holes are not seated in the tractor pins.	Adjust the paper.
	Right tractor is not in correct position for paper width.	Unlock and move the tractors. Avoid stretching or wrinkling the paper.
Printer stops, PROTOCOL/READY indicator flashes. Pressing READY causes the printer to print one line.	Printer is out of paper.	Reload paper, then press READY.

CORRECTING PRINT PROBLEMS

WARNING: The black ink is toxic if swallowed. Wash immediately with soap and water if you get ink on your hands.

Types of print problems that can be caused by the ink cartridges:

- Entire row of dots missing
- Horizontal lines (banding) in solid colors
- Incorrect or missing colors
- All text or all color missing
- Inconsistent colors
- Dots not uniform

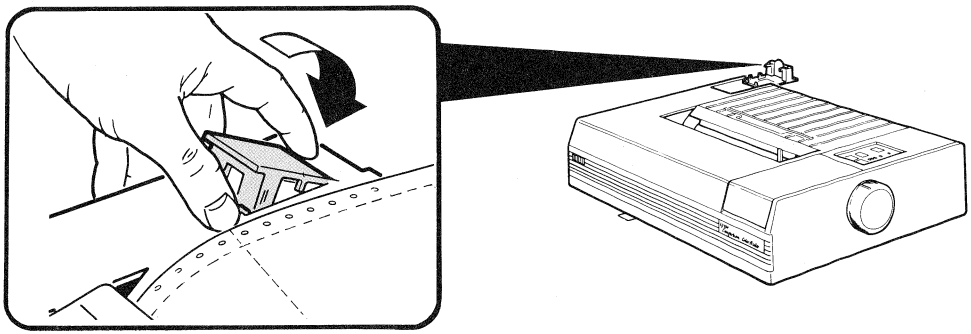
Air bubbles in the ink, or nozzles clogged by foreign material or dried ink, can cause the print problems listed above. These problems are cleared with three procedures:

- **Step 1** – Priming the ink cartridges,
- **Step 2** – Wiping the nozzles of the ink cartridge, and
- **Step 3** – Repeating the priming and wiping procedure twice. If the problem is not cleared, the leadframe on the carriage should be brushed.

Step 1 - Priming the Ink Cartridge

1. Open the carriage access cover and remove the suspect ink cartridge. The black ink cartridge is on the right.

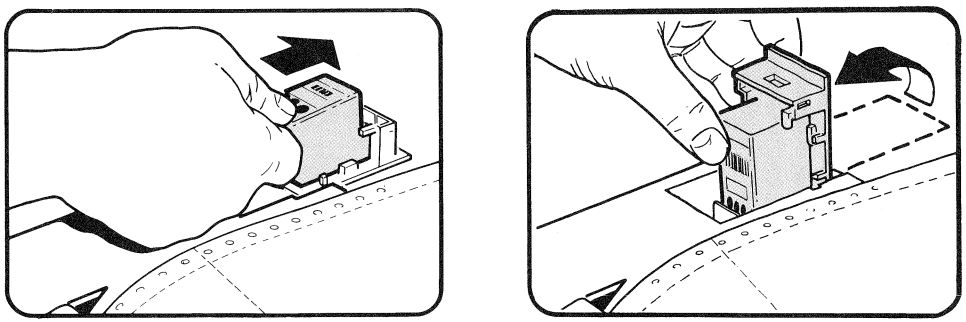
2. Open the priming station lid at the left-rear corner of the printer by pressing down on the rear of the lid.



MKV87-1392

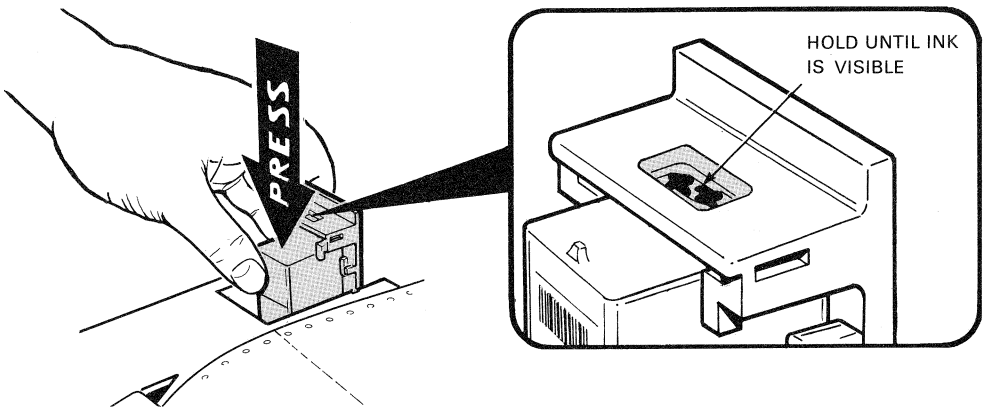
3. Slide the ink cartridge into the priming station's lid. The ink cartridge fits snugly into place and lies flat.

4. Rotate the priming station lid with the inserted ink cartridge to the upright position.



MKV87-1393

5. Press the priming station lid (with the ink cartridge attached) down once. Hold down the lid until some ink is visible through the window in the lid. It is not necessary to fill the window; holding about one second is usually sufficient.



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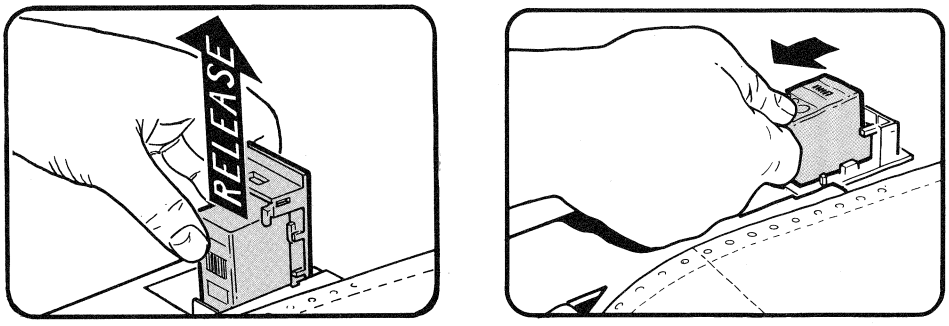
6. Slowly release the priming station lid and cartridge, waiting for the ink to recede from the window before sliding the cartridge out of the priming station.

CAUTION: DO NOT wipe ink from the nozzles with anything but the wiping pad.



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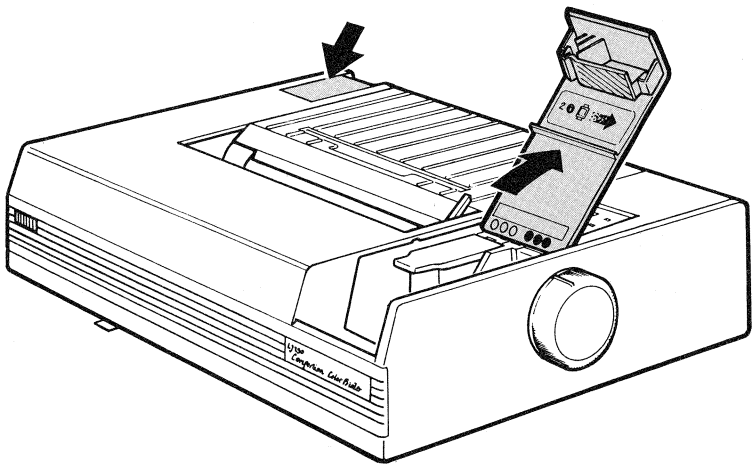
Step 2 - Wiping the Ink Cartridge

1. Close the priming station lid and open the carriage access cover on the right-front corner of the printer.



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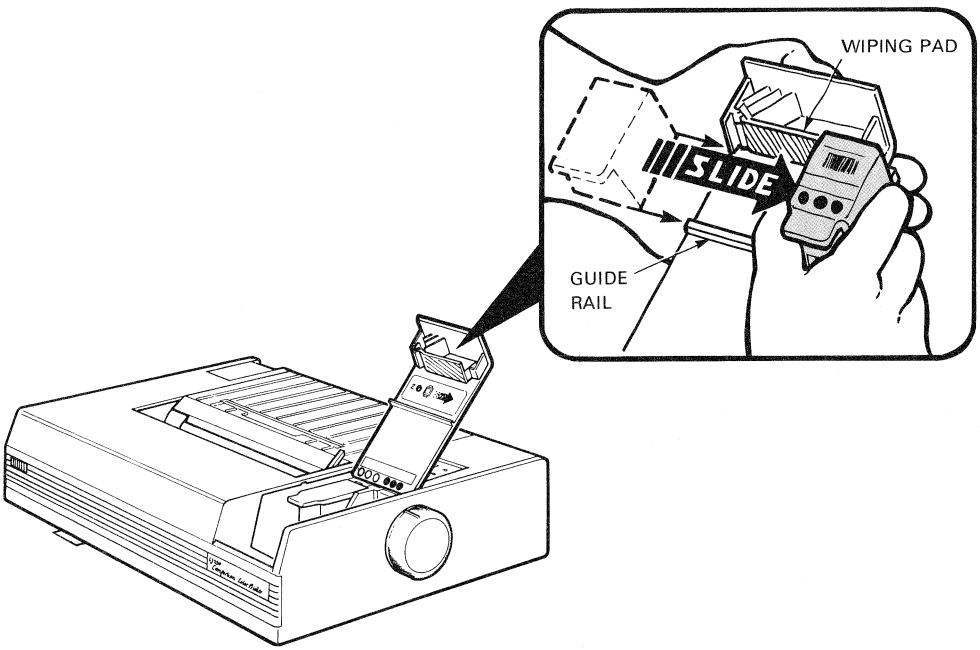
2. Insert the cartridge between the wiping pad and guide rail.

3. While supporting the cover with one hand, slide the ink cartridge horizontally across the pad with a brisk stroke so that the nozzles are wiped clean of ink.



MKV87-1397

4. Reinstall the cartridge. Prime and wipe the other cartridge, if required.

NOTE: *If the print problem is not corrected, prime and wipe the cartridge one more time. If a second priming and wiping does not correct the problem, brush the leadframe.*

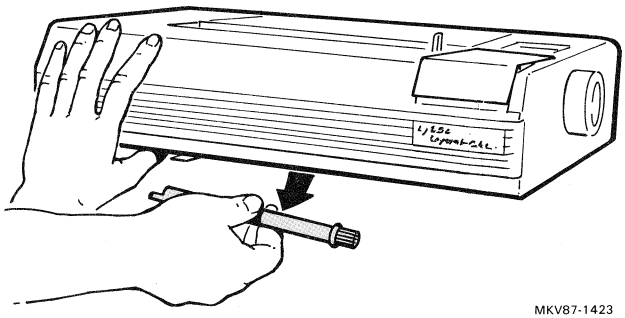
Step 3 – Brushing the Leadframe

If priming and wiping the ink cartridges twice does not restore the print quality, then brush the connectors on the carriage. Dried ink can cause a faulty electrical contact on the leadframe connector.

CAUTION: Use the brush only as instructed and NEVER brush the ink cartridges.

1. Turn the power OFF, open the carriage access cover, and remove the problem ink cartridge.

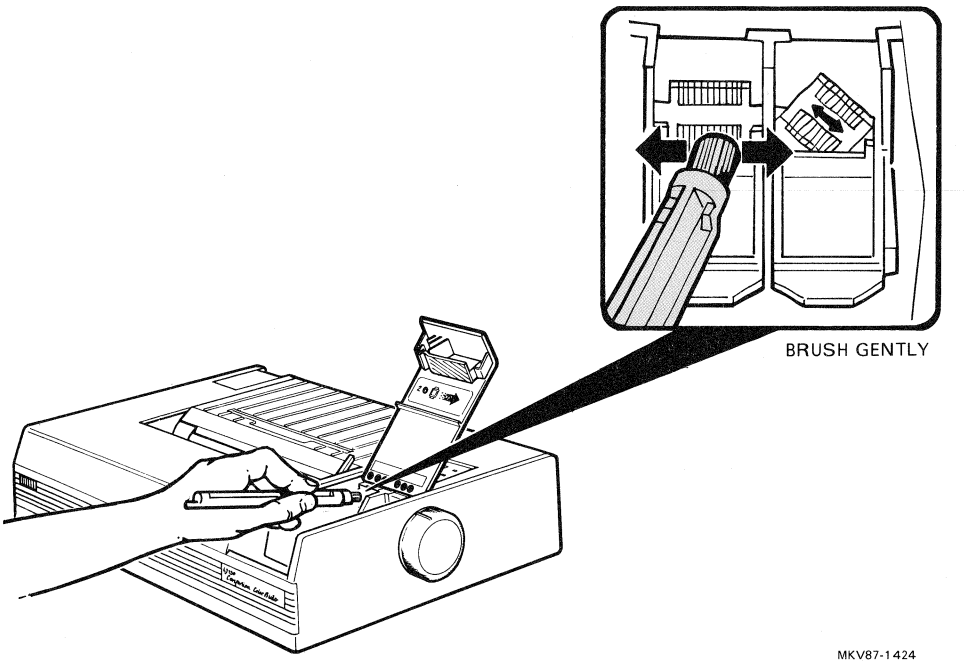
2. Remove the brush from the bottom of the printer. **USE ONLY THE SUPPLIED BRUSH.**



MKV87-1423

3. Rinse the brush in clean water and shake off the excess water.

4. With a side-to-side motion, *gently* brush the tips of the metal connectors five (5) times in each direction.



5. Reinstall the ink cartridge and run the Printing Self-Test to check the print quality.

6. If the print quality is still not satisfactory, then prime, wipe, and load a *new* ink cartridge.

If the print is still not satisfactory, call for service.

REPLACING THE INK CARTRIDGES

When to Replace an Ink Cartridge

When the *black* ink cartridge runs out of ink, the text deteriorates quickly (in about one page). Individual dots and rows of dots will be missing and the print becomes progressively lighter. A clogged nozzle can cause a similar symptom, but clogging usually occurs when the printer has been idle.

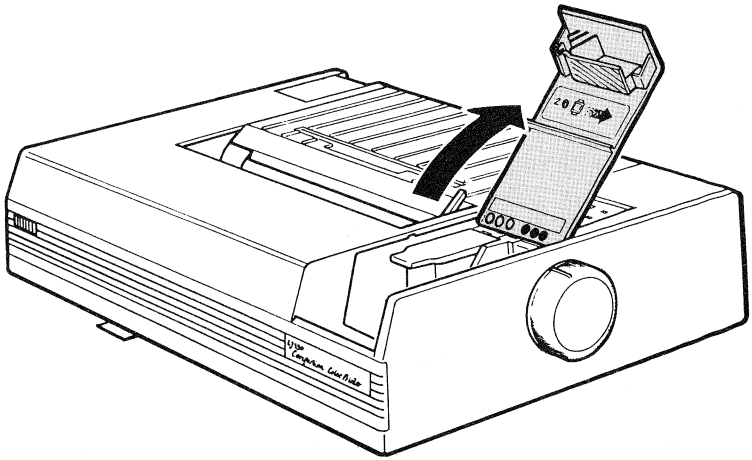
When the *color* ink cartridge runs out of ink, the colors change and become inconsistent. One of the three basic colors missing causes variations in the desired colors. This change in color will happen in about one page. A clogged nozzle can cause the same symptoms, but clogging usually occurs when the printer has been idle.

The Companion Color Printer uses two ink cartridges simultaneously. One cartridge has black ink (identified by three black dots) and the other cartridge has colored ink (identified by three colored dots). The ink cartridges must be primed and wiped before being installed.

Step 1 - Remove the Expended or Defective Ink Cartridge

1. Turn the printer power OFF.

2. Open the carriage access cover on the right-front corner of the printer.



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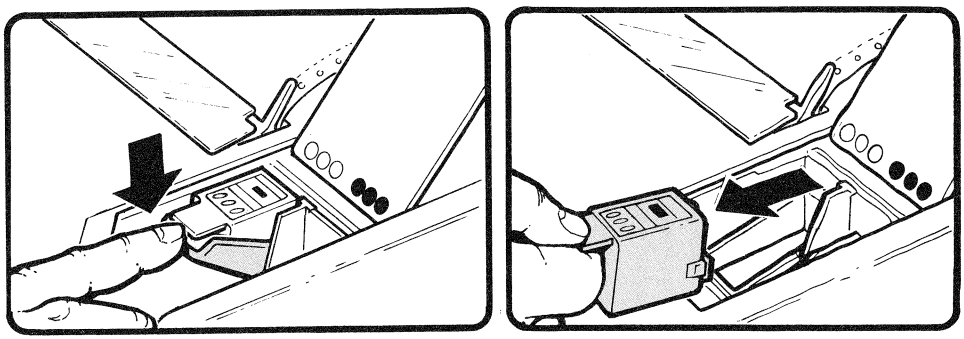
3. Lower the ink cartridge latch (green) and remove the ink cartridge to be changed. The black cartridge is on the right.



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Step 2 - Prime and Wipe the Fresh Ink Cartridge

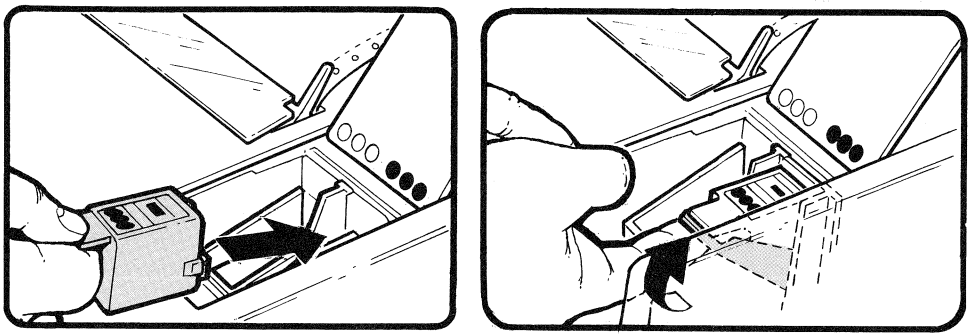
1. Remove the new ink cartridge from its packaging, including the tape over the nozzles.

2. Prime and wipe the new ink cartridge. (See Steps 1 and 2 of the **CORRECTING PRINT PROBLEMS** section for the priming and wiping procedures.)

Step 3 - Load the Fresh Ink Cartridge

1. Gently place the cartridge into the position on the carriage.

2. Snap the green latch into place to secure the cartridge.



MKV87-1398

3. Close the carriage access cover.

4. Run the Printing Self-Test to verify operation.

ACCESSORIES AND SUPPLIES A

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 the DIGITAL sales office in your area during regular business hours.

Table A-1 Accessories

Number	Description
LJ25X-DC	Dust cover
LJ25X-DS	Acrylic desk-top stand
LJ250-SW	Paper catcher
H0401-A	Crossover serial switch

Table A-2 Supplies

Number	Description
LJ25X-AB	Black ink cartridges, 1 per box
LJ25X-AA	Color ink cartridges, 1 per box
LJ25X-AC	Ink-jet paper, 8-1/2 in × 11 in, continuous form, 250 sheets per carton
LJ25X-AD	Ink-jet paper, 210 mm × 297 mm, continuous form, 250 sheets per carton
LJ25X-AE	Transparency film, 8-1/2 in × 11 in, 50 single sheets per carton
LJ25X-AF	Transparency film, 210 mm × 297 mm, 50 single sheets per carton

PRINTER CABLES

When connecting your Companion Color Printer to the following systems, use these cables:

Table A-3 Printer Cables

System	25-Pin Connector	or	DEConnect DEC423 Standard
VT100*	BCC19-15		BC16E and H8571-A
VT200	BCC20-10		BC16E and H8571-A
VT241	BCC20-10		BC16E and H8571-B
VT330	N/A		BC16E
VT340	N/A		BC16E
Rainbow	BCC19-15		BC16E and H8571-A
Professional	BCC20-10		BC16E and H8571-A
DECmate	BCC20-10		BC16E and H8571-A
VAX	BCC19-15		BC16E and H8571-A
MicroVAX	BCC20-10		BC16E and H8571-A
VAXstation	BC19M-10		N/A

* With printer port.

NOTE: Order cables through the DECdirect catalog. The MMJ adapter is included with the printer.

FIELD SERVICE INFORMATION B

DIGITAL EQUIPMENT CORPORATION'S SERVICES

Digital Equipment Corporation 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 meets your service needs, from complete DIGITAL support, to self-maintenance.

ON-SITE SERVICE

Digital Equipment Corporation 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 150 DIGITAL service centers in major cities worldwide, that offer convenient, fast, and dependable "return-to" maintenance at a savings over on-site service.

DECmailer

If you are capable of self-maintenance, you should use our fast turnaround module and subassembly repair service – DECmailer.

For more information on any of Digital Equipment Corporation's Maintenance Services, call the DIGITAL Field Service office in your area during normal business hours.

BEFORE CALLING FOR SERVICE DO THE FOLLOWING

1. Using the **CORRECTING SIMPLE PROBLEMS** section in Chapter 4, troubleshoot the printer.

2. If the Companion Color Printer will print, perform the printer self-tests described in the **SOLVING PROBLEMS** chapter of this manual and record the results.

3. Record the printer's model number and serial number (found on the printer base under the printer).

4. Record the system and application software type and the revision level.

5. Have your contract account number available.

OPERATING SPECIFICATIONS C

LJ250/LJ252 SPECIFICATIONS

Weight	4.5 kg (10 lb)
Dimensions	
Height	90 mm (3 1/2 inch)
Width	425 mm (16 3/4 inch)
Depth	260 mm (10 1/4 inch)
Environment	
Operating temperature	15°C to 30°C (59°F to 86°F)
Storage temperature	–40°C to 75°C (–40°F to 104°F)
Relative humidity	20% to 80%
Voltage, frequency	
LJ250-CA	100-120 Vac, 50/60 Hz
LJ250-A6	220-240 Vac, 50/60 Hz
LJ252-CA	100-120 Vac, 50/60 Hz
LJ252-A6	220-240 Vac, 50/60 Hz
Power consumption	40 W maximum
Power receptacle	Nonswitched, 3-prong, grounded
Power cord/module	2.0 m (6.5 feet) detachable
Serial interface connector	25-pin DTE type EIA RS-232-C with latching block that accepts SAE 4-40 screws

Parallel interface connector	Centronics 36-pin
Serial interface type	DEC423
Parallel interface type	Centronics
Ink cartridges	
Part numbers	Black – LA25X-AB Color – LA25X-AA
Shelf life	18 months in packaging 12 months in the printer
Printing methods	Unidirectional and bidirectional text printing. Unidirectional color and transparency printing.
Input buffer capacity	Up to 2048 characters (depending on features in use).
Buffer control	XON/XOFF software protocol, READY/OFF-LINE front panel control.
Print density	
Text, color graphics	180 × 180 dots per inch (30 × 30 matrix) 90 × 90 dots per inch (15 × 15 matrix)
Transparency Mode	180 × 180 dots per inch (30 × 30 matrix) 90 × 90 dots per inch (15 × 15 matrix)
Dot spacing	180 dots per inch
Dot size	0.0085 inch diameter

Printing speed	
Text	90 (167 burst) characters per second at 10 characters per inch.
Color Text	36 characters per second at 10 characters per inch.
Color Graphics	16.7 inches per second at 180 dots per inch.
On-board fonts	Courier – 12 point (10 characters per inch) Courier – 12 point (12 characters per inch) Gothic – 18 point (18 characters per inch)
Characters per inch (horizontal pitch)	10, 12, and 18 characters per inch (standard-width characters) 5, 6, and 9 characters per inch (double-width characters)
Vertical pitch	6 lines per inch 8, 9 lines per inch (optional)
Character sets	
DEC Mode	US ASCII DEC Supplemental Graphics VT100 Special Graphic DEC Technical National Replacement (NRC) ISO 8-bit Supplemental
PCL mode	PC-8 Roman 8 ECMA-94 PC-8 (Danish/Norwegian)
Character attributes	True descenders (j, y, PP, g, q) Shadow bold Underline Double underline Overline Color

MEDIA SPECIFICATIONS

General

Thickness	0.0042 inch to 0.0046 inch (0.107 to 119 mm)
Basis Weight	24 lb
Coating	DIGITAL coated paper (P/N LA25X-AC and LA25X-AD) is required for very high print quality.

Pinfeed Paper – A Size (8.5 inch × 11 inch)

Recommended Paper	DIGITAL P/N LA25X-AC, ink-jet paper, 8.5 in × 11 in (A size), continuous form, 250 sheets per carton.
Hole Spacing	0.50 in ± .01 in
Hole Diameter	0.156 in to 0.16 in

Pinfeed Paper – A4 Size (210 mm × 297 mm)

Recommended Paper	DIGITAL P/N LA25X-AD, ink-jet paper, 210 mm × 297 mm (A4 size), continuous form, 250 sheets per carton.
Hole Spacing	0.50 in ± .01 in
Hole Diameter	0.15 in to 0.16 in

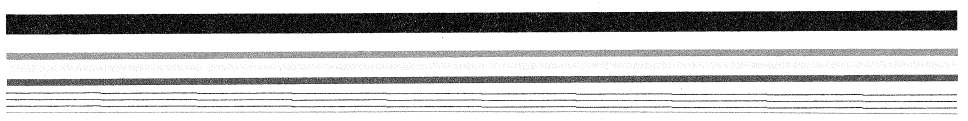
Single Sheet Transparency Film (8.5 in × 11 in)

Recommended Film	DIGITAL P/N LA25X-AE, transparency film, 8.5 in × 11 in, 50 single sheets per carton.

Single Sheet Transparency Film (210 mm × 297 mm)

Recommended Film	DIGITAL P/N LA25X-AF, transparency film, 210 mm × 297 mm, 50 single sheets per carton.

SAMPLE PRINTOUTS D



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RETOS SOFTWARE E

WHAT IS RETOS?

Software support for color sixel graphics is required to obtain color printouts. ReGIS files, such as those produced with DECslide or DECgraph, must be converted to sixel graphics. RETOS is a conversion utility that converts ReGIS to sixel graphics for printing on the LJ250 and LJ252 Companion Color Printer.

NOTE: You must be running VAX/VMS Version 4.4 or later, or MicroVMS 4.4 or later, to use the RETOS software.

RETOS FEATURES

- Page size and resolution compatibility with the Companion Color Printer.
- Full range of 256 colors.
- Ease of sharing graphics files by electronic mail.
- Files can be converted in a batch job and printed through a print queue without operator intervention.
- Sharing of a printer by several users by using a print queue rather than a terminal's printer port.

HOW RETOS MAY BE USED

LJ250 Connected to a Video Terminal

Typically, a user previews a ReGIS file on a video terminal. The Companion Color Printer is connected to the terminal's printer port. Since the Companion Color Printer only supports sixels for bit map display, the ReGIS output file requires conversion to sixel graphics before printing.

Send your RETOS-converted file through your DIGITAL video terminal to the Companion Color Printer attached to your printer port. Use the DCL TYPE command and the video terminal's Printer Controller Mode.

Using the Print Screen Key

An alternative method of printing ReGIS files is to use the terminal's Print Screen function; however, the printed image size may not match the video display size and aspect ratio.

LJ250/LJ252 Connected to a Host System

Another RETOS environment can have several users sharing a Companion Color Printer through a print queue. To print your RETOS-converted sixel graphics file on the LJ250/LJ252 connected to the printer queue, use the DCL PRINT command.

HOW TO LEARN MORE ABOUT RETOS

For detailed information on RETOS, see the *RETOS Installation and User's Guide*, AA-JU56A-TE.