DEClaser 3200 Printer

Operator's Guide

Order Number: EK–DC32P–OP–001

Digital Equipment Corporation
Maynard, Massachusetts

First Printing, September 1991

The Reader's Comments form at the end of this document requests your critical evaluation to assist in preparing future documentation.

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FCC NOTICE: This equipment generates and uses radio frequency energy and if not installed and used 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 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 methods.

– Reorient the receiving antenna.

– Relocate the computer or peripheral with respect to the receiver.

– Move the computer or peripheral away from the receiver.

– Plug the computer or peripheral into a different outlet so that they are on different branch circuits than the receiver.

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.

To meet FCC requirements, a shielded parallel cable is required to connect the device to a personal computer or other Class B device.

Cet équipement est conforme aux précisions de la norme CEE 82/499 sur la prévention et l'élimination des perturbations radioélectriques.

Règlement sur le brouillage radioélectrique au Canada: Cet appareil numérique respecte les limites de rayonnement de bruits radioélectriques applicables aux appareils numériques de classe B, prévues au Règlement sur le brouillage radioélectrique du ministère des Communications du Canada.

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Preface

The DEClaser 3200 printer uses electrophotographic laser technology to print text and graphics. It has a print resolution of 300 x 300 dots per inch and prints at speeds up to 13 pages per minute in simplex mode, and 11 pages per minute in duplex mode. The printer consists of an engine (print mechanism) and a controller (formatter) that are driven from host-based software to provide shared printer access from the Digital network. The printer can serve as a personal desktop printer or as a shared group printer.

The following are some of the features of the DEClaser 3200 printer:

- Two input paper trays, each with a capacity of up to 250 sheets of standard 80 g/m^2 (20 lb.) paper
- An output tray capacity of up to 500 sheets with accurate stacking and job offset
- Ability to print on paper, transparencies, labels, envelopes, and letterhead stationery
- Manual feed capacity for envelopes, labels, transparencies, or paper
- Support for both serial and parallel communication interfaces
- Convenient, easy-to-perform user maintenance
- Control panel with a liquid crystal display (LCD) that shows printer status at a glance
- Power saving mode that is invoked after the printer is idle for 2 hours
- Capacity for two optional font cartridges
- Built-in HP LaserJet IID protocol emulation

Options

In addition to the standard features, the following options are available for the DEClaser 3200 printer:

- A Legal-size paper cassette (8.5 in. x 14 in.)
- An adjustable paper cassette designed to accept various paper sizes (accommodates widths from 182 mm to 216 mm (7.17 in. to 8.5 in.) and lengths from 254 mm to 356 mm (10 in. to 14 in.))
- An A4 or Letter-size large capacity input tray (holds up to 1500 sheets of 80 g/m^2 (20 lb.) paper)
- A multi-media feeder designed to feed envelopes, transparencies, and self-adhesive labels (also feeds up to 200 sheets of 80 g/m^2 (20 lb.) paper)
- User-installable memory upgrade (up to 10.5 MB)
- Various Digital ANSI-compliant font cartridges
- HP LaserJet IID-compatible emulation font cartridges
- A user-installable PostScript emulation upgrade compatible with Adobe's PostScript page description language, gives the DEClaser 3200 printer the ability to print PostScript files.

See Appendix G for ordering information about these options.

Software Requirements

The availability of some features of the DEClaser 3200 printer depends on the operating and applications software used by the host computer system. For example, the DEClaser 3200 printer has the ability to print bold characters, but if your application program does not support bold printing, this feature would not be available. For information about the printer features you can use with your application program, consult your application program documentation.

For help choosing the right software package for your application needs, contact your Digital sales representative.

Document Structure

This guide explains how to use and maintain the DEClaser 3200 printer. It primarily covers the hardware (physical) aspects of the printer. For printer installation instructions, refer to the *DEClaser 3200 Printer Installation Guide* in this binder. See the Associated Documents section in this preface for information about software manuals that pertain to the DEClaser 3200 printer.

The guide is organized as follows:

- Chapter 1, Printer Components, describes the components and functions of the DEClaser 3200 printer.
- Chapter 2, Printer Operation, covers operating procedures such as powering the printer on and off and loading the paper cassettes. It also describes the printer status messages that are displayed during printer operation.
- Chapter 3, The Control Panel, covers the use of the printer's control panel. It describes operational information about the indicators, keys, and message display.
- Chapter 4, Printer Menus, explains how to configure the printer so that it can communicate with your computer system (Set Up Menu), how to save current settings or recall factory defaults (Defaults Menu), how to print the configuration sheet and font listings, and how to enter the control representation mode of operation (Test Menu).
- Chapter 5, Print Media, describes the various printing media that can be used, including paper, envelopes, transparencies, and labels. It also addresses the proper way to store and handle paper.
- Chapter 6, Troubleshooting, contains basic testing and troubleshooting techniques that allow you to correct common operating problems, such as poor printing and paper jams.
- Chapter 7, Maintenance, explains how to care for and maintain the printer.
- Chapter 8, Service, explains how to obtain service if the printer needs repair.
- Appendix A, DEC PPL3 Quick Reference Guide, lists the commands used to program the printer when DEC PPL3 protocol is selected. It is intended as a reference for the experienced programmer.
- Appendix B, LJ2D Quick Reference Guide, lists the commands used to program the printer when the LJ2D emulation mode is selected. It is intended as a reference for the experienced programmer.
- Appendix C, PostScript Operators Quick Reference Guide, lists the PostScript operators for the DEClaser 3200 printer. It is intended as a reference for the experienced programmer.
- Appendix D, VMS Device Control Library Example, contains an example procedure for creating and installing a device control library with useful printer features for the VMS operating system.

- Appendix E, LN03 Compatibility, highlights some of the differences between the DEClaser 3200 printer and the LN03 family of printers.
- Appendix F, Font Cartridge Information, contains information on how to access and use fonts from optional Digital ANSI-compliant font cartridges.
- Appendix G, Accessories and Supplies, lists some of the accessories and supplies available for the DEClaser 3200 printer and explains how to order them.
- Appendix H, Specifications, lists the power, environmental, and physical specifications of the printer.
- Appendix I, Cabling Information, lists the interface cables available for various host devices. This appendix also describes interface programming instructions for the IBM PC.
- The glossary contains definitions of printer-related terms.

Ordering Additional Copies of This Documentation Set

You can order additional copies of this documentation set from Digital as described in Appendix G. The ordering number for the documentation kit is EK–D3200–DK.

The documentation kit consists of the following:

- DEClaser 3200 Printer Installation Guide
- DEClaser 3200 Printer Operator's Guide
- DEClaser 3200 Printer Operator's Quick Reference Guide
- Spine insert for the binder
- Three-ring binder

NOTE

You cannot order the installation or the operator's guide individually. They only can be ordered as part of the complete documentation kit. The operator's quick reference guide can be ordered separately (see Appendix G.)

Associated Documents

Other manuals are available for use with the DEClaser 3200 printer. You can order these optional manuals from Digital as described in Appendix G.

- *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual* (AA–PBWGA–TE)
  This manual is for application programmers who create software that produces Digital ANSI-Compliant Printing Protocol level 3 output. It describes printer protocol character processing and printer control functions.
- *Digital ANSI-Compliant Printing Protocol Level 3 Programming Supplement* (EK–PPLV3–PS)
  This manual contains information specific to the DEClaser 3200 printer for programmers who create applications for Digital's ANSI-compliant level 3 devices. It is also for programmers who write applications with ANSI output that require conversion to the PostScript page description language for printing on Digital printers.
- *PostScript Printing Programming Supplement* (EK–POSTP–PS)
  This manual contains information specific to the DEClaser 3200 printer for programmers who create applications using the PostScript page description language.
- *PostScript Tutorial/Reference Manuals Kit (QA–VVZAD–GZ)*
  This PostScript tutorial/reference manuals kit contain's the following manuals:
  - *PostScript Language Reference Manual*
  - *PostScript Language Tutorial and Cookbook*
- *PostScript Translators Reference Manual for ReGIS and Tektronix 4010/4014* (AA–PBWFA–TE)
  This manual is for programmers who need to convert ReGIS or Tektronix 4010/4014 documents to PostScript for printing on PostScript printers. In addition to PostScript (when the PostScript option is installed), the DEClaser 3200 printer can also print Tektronix 4010/4014 and ReGIS files using DECprint Printing Services.

Conventions Used in This Guide

The following terms and conventions are used in this guide:

Convention	Meaning
NOTE	Notes provide important additional information.
CAUTION	Cautions provide information required to prevent damage to equipment.
WARNING	Warnings provide information to prevent personal injury.
Dash (–)	A statement preceded by a dash describes the result of a procedural step. For example: 1. Insert the paper cassette into the printer. – The Error indicator shuts off.
Check Mark (√)	A statement preceded by a check mark indicates a special instruction related to a procedural step. For example: 1. Insert the paper into the cassette, making sure the stack is below the paper snubbers. √ To prevent paper jams, do not load paper above the MAX limit line.
Key	A key name is shown enclosed in a box to indicate that you press that key on the control panel. Key names are always shown in initial capital letters. For example: 1. Press Test to enter the Test Menu.
UPPERCASE	All information on the message display is shown in uppercase. For example: – Printer status reads READY.

Safety Information

The DEClaser 3200 printer complies with all United States government safety regulations applicable to laser beam light exposure. Read the following information to become familiar with laser safety.

Laser Safety

The DEClaser 3200 printer complies with 21 CFR Chapter 1, Subchapter J, as a Class 1 laser product under the U.S. Department of Health and Human Services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and Safety Act of 1968. The printer does not emit hazardous light, since the laser beam is totally enclosed during all modes of customer operation and maintenance.

WARNING

Use of controls or adjustment procedures other than those specified in this manual may result in hazardous laser light exposure.

CDRH Regulations

The Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration implemented regulations for laser products on August 2, 1976. These regulations apply to laser products manufactured beginning August 1, 1976. Compliance is mandatory for products marketed in the United States.

1

Printer Components

This chapter describes the components of the DEClaser 3200 printer and their functions. This chapter also provides information about the operating space required to perform day-to-day printing operations.

1.1 Printer Components and Functions

This section points out the various printer components of the DEClaser 3200 printer. You should become familiar with the names and locations of the components because they are referred to on the message display and throughout the rest of this manual. Figure 1–1 and Figure 1–2 show the location of the external components such as release levers and cable connectors. These items are described in Table 1–1 and Table 1–2.

Figure 1–3 shows internal components such as the toner cartridge and photoreceptor drum. All of the items called out in Figure 1–3 (except for the print density adjustment knob) are consumables which are replaced at regular intervals. Table 1–3 descibes the function of these components.

Figure 1–1 Printer Components: Front View

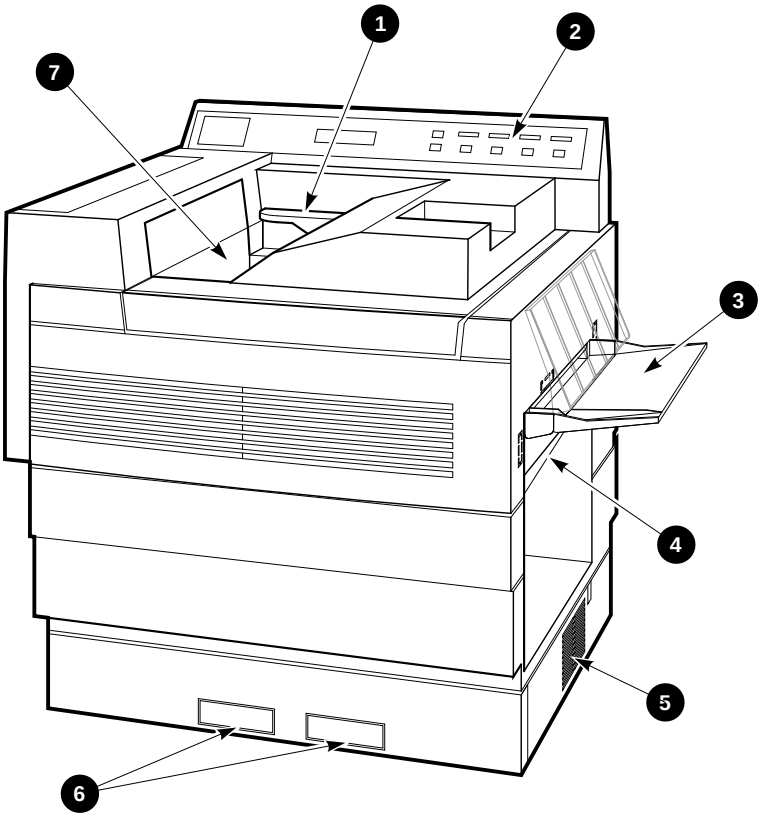


Table 1–1 Printer Components: Front View

	Component	Function
❶	Top Cover Release Lever	Lifting this lever unlocks the top cover so it can be opened to clear paper jams or to perform printer maintenance.
❷	Control Panel	The control panel consists of a graphic display, a message display, indicator lights, and function keys. It provides information on printer status and can be used to perform certain printer functions, such as printing the last page of a document or accessing the printer menus. See Chapter 3 for information about using the control panel. See Chapter 4 for information about using the control panel to access the SET UP, TEST, and DEFAULTS printer menus.
❸	Manual Feed Tray	Single sheets of paper, transparencies, self-adhesive labels, or envelopes can be manually fed into the printer using this tray. The tray can be folded in when not in use. See Section 2.7 for additional information about feeding paper manually. **NOTE:** *The manual feed tray is removed when you connect an optional multi-media feeder or large capacity input tray to the printer.*
❹	Right-Side Cover	The right-side cover opens to remove paper jammed in this area.
❺	Air Vent	This air vent provides proper ventilation for the printer. Be sure that the printer has adequate space around it to ensure proper ventilation (see Section 1.2).
❻	Font Cartridge Slots	These two slots accept optional font cartridges.
❼	Output Tray	Printed sheets are automatically collated and stacked (facedown) here. The output tray can hold up to 500 sheets of 80 g/m^2 basis weight (20 lb.) paper in simplex mode (with no offset), 400 sheets in simplex mode (with offset), and 300 sheets when printing in duplex mode (with or without offset).

Figure 1–2 Printer Components: Rear View

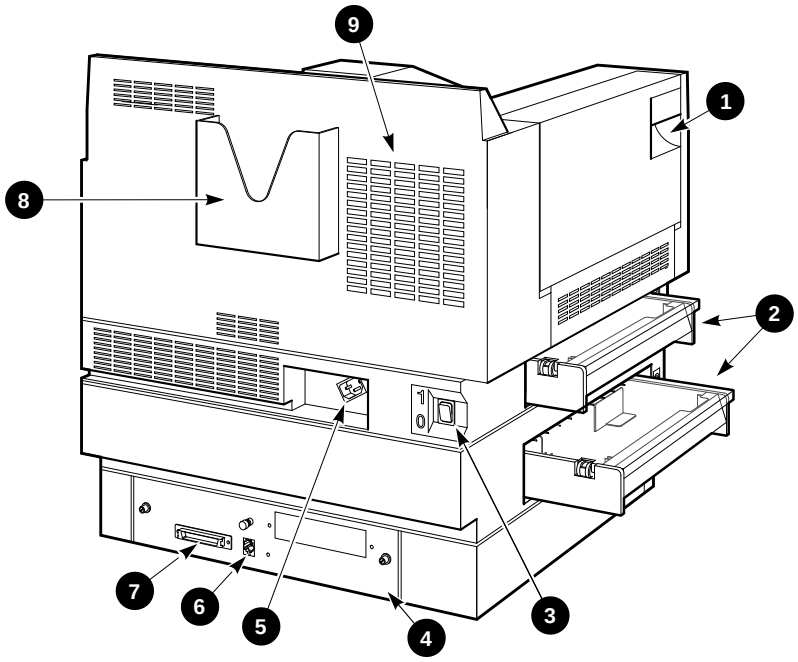


Table 1–2 Printer Components: Rear View

	Component	Function
❶	Left-Side Cover	The left-side cover opens to remove paper jammed in this area, and to perform user maintenance (fuser wick replacement). Paper reverses direction in this area when the printer is in duplex mode.
❷	Upper and Lower Paper Cassettes	The paper cassettes automatically feed paper to the printer. Each cassette can hold up to 250 sheets of 80 g/m^2 basis weight (20 lb.) paper. See Section 2.5 for information about loading the cassettes with paper.
❸	Power Switch	Powers the printer on or off. Pressing the switch to | turns power on; pressing the switch to O turns power off. See Section 2.3 and Section 2.4 for additional information about powering the printer on and off.
❹	Memory Board Access Cover	This cover can be removed to install the optional memory boards. Refer to the instructions that come with the memory boards for the installation procedure.
❺	Power Cord Receptacle	This is where the power cord is connected to the printer.
❻	DECconnect Serial (RS423) Interface Connector	This connector is used when the interface cable from the host computer is a serial cable. Refer to Appendix I for additional cabling information.
❼	Parallel (Centronics) Interface Connector	This connector is used when the interface cable from the host computer is a parallel cable. Refer to Appendix I for additional cabling information.
❽	Quick Reference Guide Holder	This is storage area used to keep the *DEClaser 3200 Quick Reference Guide* with the printer.
❾	Air Vent	The cooling fan exhausts air through this vent. Be sure that the printer has adequate space around it to ensure proper ventilation (see Section 1.2).

Figure 1–3 Printer Components: Inside View

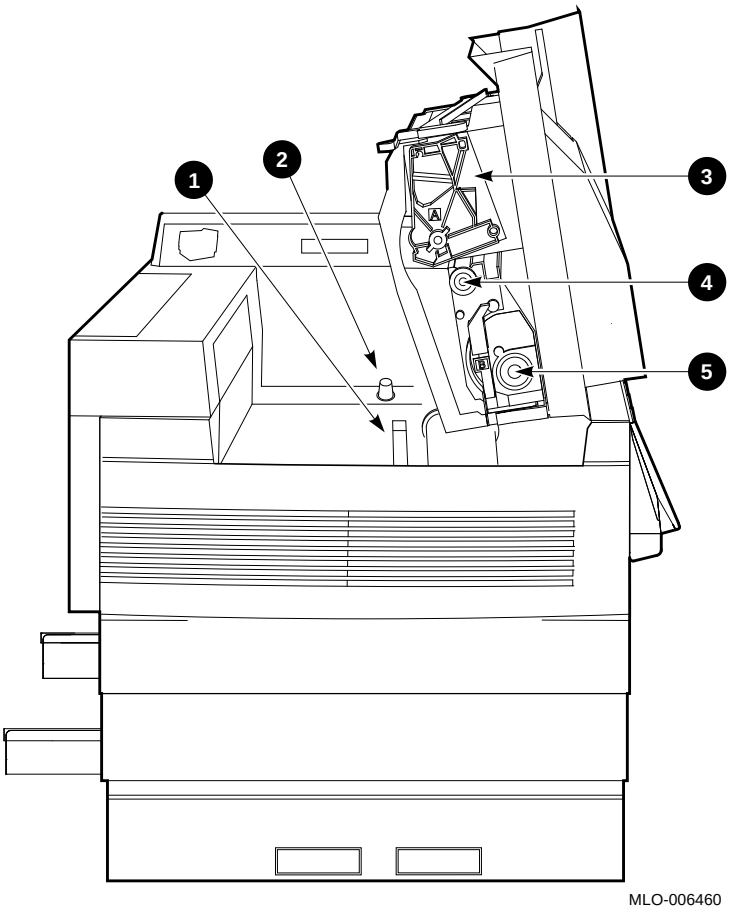


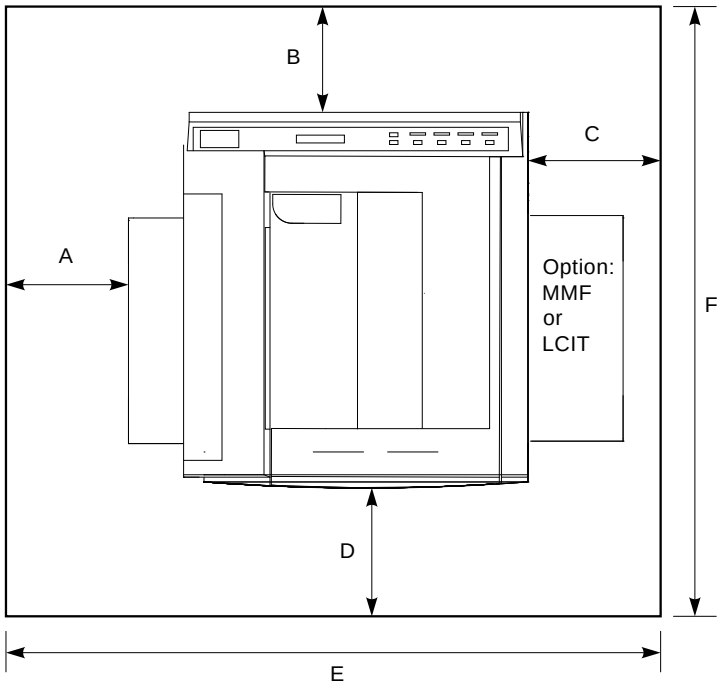
Table 1–3 Printer Components: Inside View

	Component	Function
❶	Transfer/Separation Charger	The transfer/separation charger places a high positive charge on the paper which attracts the toner image from the photoreceptor drum onto the paper as it passes by. You replace the charger periodically (at the same time as the developer cartridge) using the replacement instructions included in the kit. Between replacements, you may find it necessary to clean the corotron wire and saw-tooth comb on the charger to correct a print quality problem. See Section 7.1 for cleaning information.
❷	Print Density Adjustment Knob	Rotating the knob *clockwise* darkens the print; rotating the knob *counterclockwise* lightens the print. See Section 2.8 for additional information about setting the print density.
❸	Photoreceptor Drum (A)	Has a light-sensitive surface used to produce the latent print image. **CAUTION:** *The drum should not be exposed to ambient light for more than 10 minutes, otherwise print degradation may occur.* You replace the photoreceptor drum at 20K page intervals, using the replacement instructions included in the kit.
❹	Developer Cartridge (C)	The developer cartridge houses the toner cartridge. Its function is to transfer the toner onto the photoreceptor drum and develop the latent image on the drum. You replace the developer cartridge at 50K page intervals, using the replacement instructions included in the kit.
❺	Toner Cartridge (B)	The toner cartridge is inserted into the developer cartridge and is specially formulated for the DEClaser 3200 printer. The toner cartridge lasts approximately 6K pages, and is replaced using the instructions included in the kit.

1.2 Required Operating Space

Figure 1–4 shows the minimum amount of space required to perform daily operations. See Appendix H for additional information on environmental conditions that must be met in order for the printer to operate properly.

Figure 1–4 Operating Space



A	19.3 in	49.0 cm
B	7.5 in	19.0 cm
C	30.3 in	76.9 cm
D	24.4 in	61.9 cm
E*	67.6 in	171.7 cm
F*	51.6 in	131.1 cm

*These are the minimum operation dimensions.

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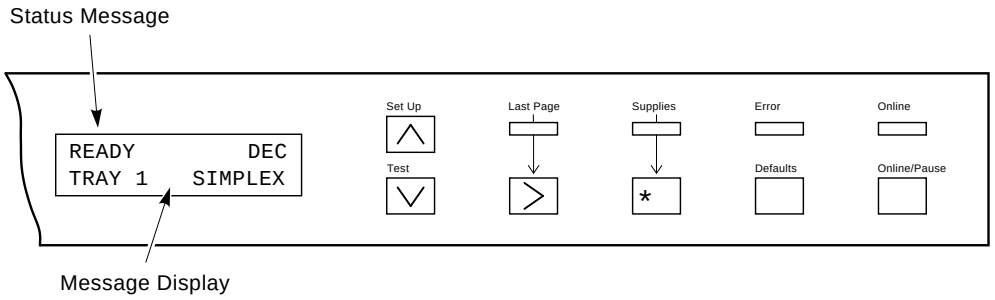
2
Printer Operation

This chapter provides the information necessary to perform day-to-day printer operations. It covers typical tasks, such as interpreting the printer status messages, powering the printer on and off, adding paper, and manual feed operation.

2.1 Printer Status Messages

During normal printing operations the printer status is shown in the upper left corner of the message display (Figure 2–1). These status messages let you see the current state of the printer at a glance.

Figure 2–1 Printer Status



The printer status messages are shown and described in Table 2–1.

Table 2–1 Printer Status Messages

Status Message	Meaning
READY	The printer is online, ready to receive and print data.
PAUSED	The printer is paused and not able to print data. Data can still be received until the printer communications buffer is full. To exit the paused state and place the printer back on line, press Online/Pause.
BUSY	The printer is receiving, processing, or printing data. If Online/Pause is pressed while the BUSY message is displayed, the Online indicator flashes until the printer is finished printing the current job. The printer enters the paused state when the job is completed.
LAST PAGE[1]	The LAST PAGE message is displayed when the last page of data is still in the print buffer. To print the last page, press >.
WAITING[2]	Displayed when the PostScript print job context is active, but there is no data to process.
PLEASE WAIT	This message is displayed during either of the following conditions: • The printer is warming up. • After clearing a printer error condition (for example, replacing the toner cartridge), this message is displayed briefly while the printer is reinitializing to its state before the error occurrence.

[1]This message is displayed only when DEC PPL3 or LJ2D protocol is selected.

[2]This message is displayed only when the PostScript protocol is selected.

(continued on next page)

Table 2–1 (Cont.) Printer Status Messages

Status Message	Meaning
POWER SAVER ON	This message is displayed after the printer has been idle for 2 hours. The fusing unit heater is turned off when the printer is in the power saver state. The printer automatically exits the power saver mode under either of the following conditions: • The printer receives a print job from the host or from the control panel (for example, printing the configuration sheet). • Any printer cover is opened and then closed. • When you switch protocols.
INITIALIZING PS[2]	You select the PostScript protocol but the printer is not ready to accept data from the host.
TEST PRINT PS[2]	Displayed when the PostScript start up page is being composed (about 45 seconds).

[2]This message is displayed only when the PostScript protocol is selected.

2.2 PostScript Instructional Messages

The messages shown and described in Table 2–2 are similar to the printer status messages, but are PostScript-specific. These messages are displayed only if the PostScript option is installed.

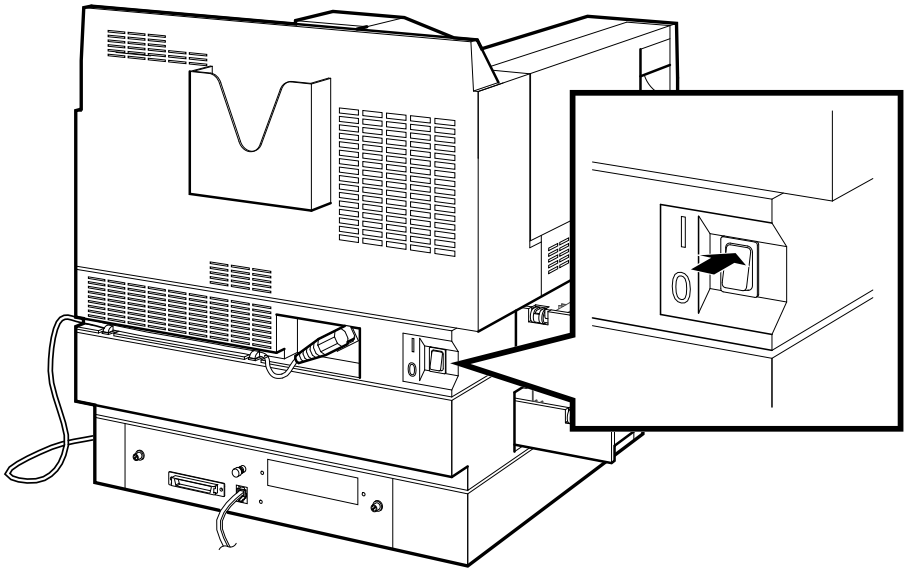
Table 2–2 PostScript Messages

Message	Meaning
WAIT FOR PAUSED	The control panel function requested cannot be performed because a PostScript job is currently being processed (when PostScript operator **allowjobreset** is true).
PRESS * TO ABORT	Press [*] to abort the current print job (when PostScript operator **allowjobreset** is false).

2.3 Turning the Printer On

Turn the printer on using the following procedure.

1. Press the power switch on the back of the printer to the | (ON) position.



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You should observe the following when you turn the printer on:

- All control panel indicators light for a moment.
- The Online indicator flashes while the printer is warming up, and performs a power-on diagnostic test. Diagnostic code numbers shown on the display change as the test is performed.
- The printer status reads READY and the Online indicator remains on following a successful completion of the diagnostic test.

If the printer does not turn on correctly, refer to Chapter 6 for troubleshooting information.

2.4 Turning the Printer Off

Turn the printer off using the following procedure.

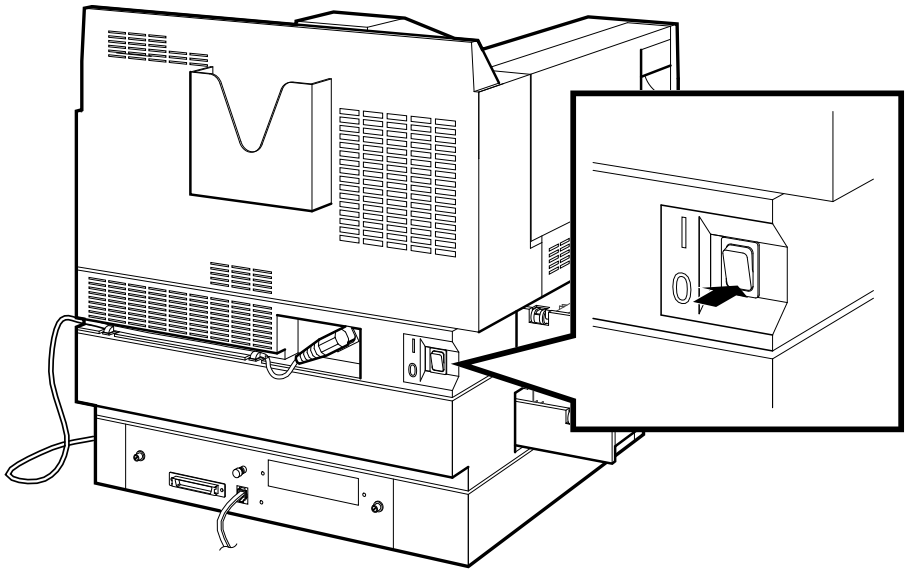
1. Be sure the printer is not printing and that the Last Page indicator is not on.

   √ Turning the printer off during printing causes paper jams and loss of data.

   √ Turning the printer off while the Last Page indicator is on causes the last page of data in the print buffer to be lost.

2. Press the power switch on the back of the printer to the O (OFF) position.

   √ After turning the printer off, always wait at least 5 seconds before you turn the printer back on. This waiting period ensures that the printer will initialize properly when power is turned back on.



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2.5 Guidelines for Loading Paper

The DEClaser 3200 printer comes standard with either two A4-size (210 mm x 297 mm) or two Letter-size (8.5 in. x 11 in.) paper cassettes, depending on the model ordered. Each paper cassette can hold up to 250 sheets of 80 g/m^2 basis weight (20 lb.) paper.

Here are some general guidelines to follow about the paper used in the printer.

- Use only high-quality paper as specified in Chapter 5.
- Do not use any paper that is creased, folded, clipped, stapled, or damaged.

CAUTION

Paper that is clipped or stapled can damage the printer.

- To prevent paper curl (a curve in the paper), stack the paper on a flat surface for storage.
- Prevent changes to the moisture content of the paper by storing it properly and rewrapping unused portions. Do not store paper directly on the floor.

Complete specifications for print media are in Chapter 5.

2.5.1 Loading Single-Size Paper Cassettes

Each paper cassette can hold up to 250 sheets of 80 g/m^2 basis weight (20 lb.) paper. Be sure to use high-quality paper such as those listed in Appendix G, to limit paper jams and ensure good print quality.

Do not attempt to alter the cassette to accommodate a different paper size, as this will cause paper jams. For information about the paper sizes that the optional adjustable paper cassette can accommodate, see Section 4.4.6.

NOTE

If you are changing paper sizes and you are using DEC PPL3 or PostScript protocols, you must power off the printer, install the new size cassette, and then power the printer back on again. If you are using LJ2D protocol, you must select the paper size from the LJ2D menu (Section 4.4.3.5.)

Single-size cassettes come in the following paper sizes.

Table 2–3 Single-Size Paper Cassettes

Paper Size	Dimensions
A4	210 mm x 297 mm
Letter	8.5 in. x 11 in.
Legal	8.5 in. x 14 in.

Adding Paper to the Cassette

This section describes how to add paper to the cassettes.

NOTE

If you are changing to a new cassette size, you must perform a printer reset after inserting the new cassette. See Section 4.6 for information about the printer reset feature.

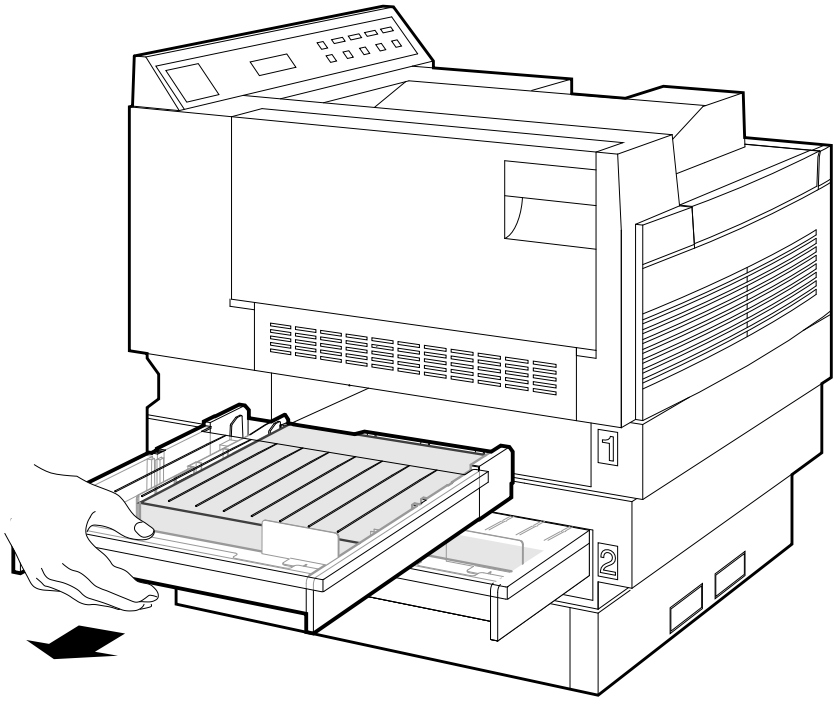
1. Make sure the printer has stopped printing, or that the printer status reads PAUSED, before removing the paper cassette.
   - If the paper cassette has run out of paper, the Error indicator lights and the message display reads ADD PAPER TO TRAY 1 (or 2).

CAUTION

The upper cassette can be removed (while the printer is printing) only if printing from the lower cassette (or from an optional feeder) in simplex mode. Do not remove the upper cassette if the printer is printing in duplex mode.

The lower cassette can be removed and reloaded with paper while the printer is printing from any other feed tray. Be sure to install the same size cassette back into the printer.

2. Remove the cassette from the printer by lifting it up slightly and then pulling it straight out from the printer.
   - The Supplies indicator lights.



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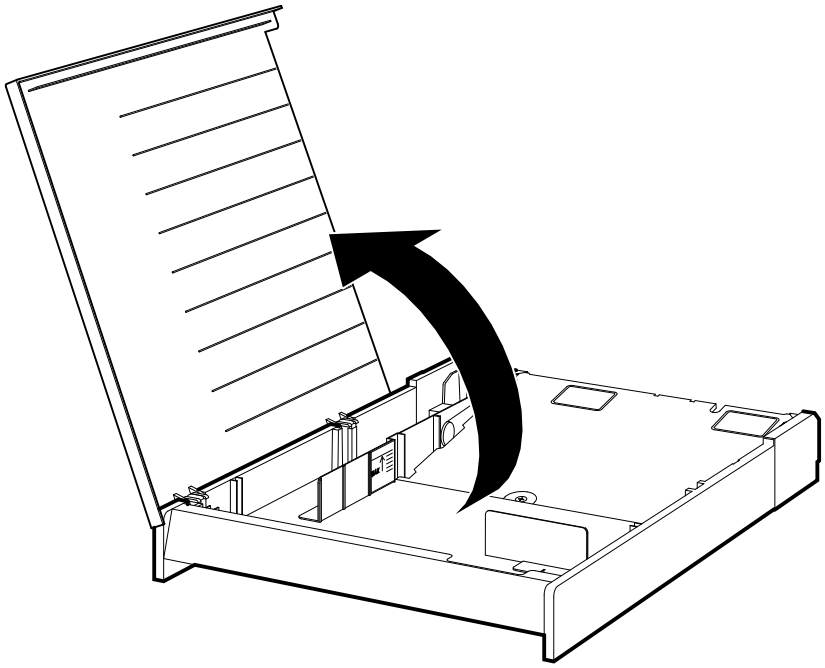
3. Lift the cassette cover open.



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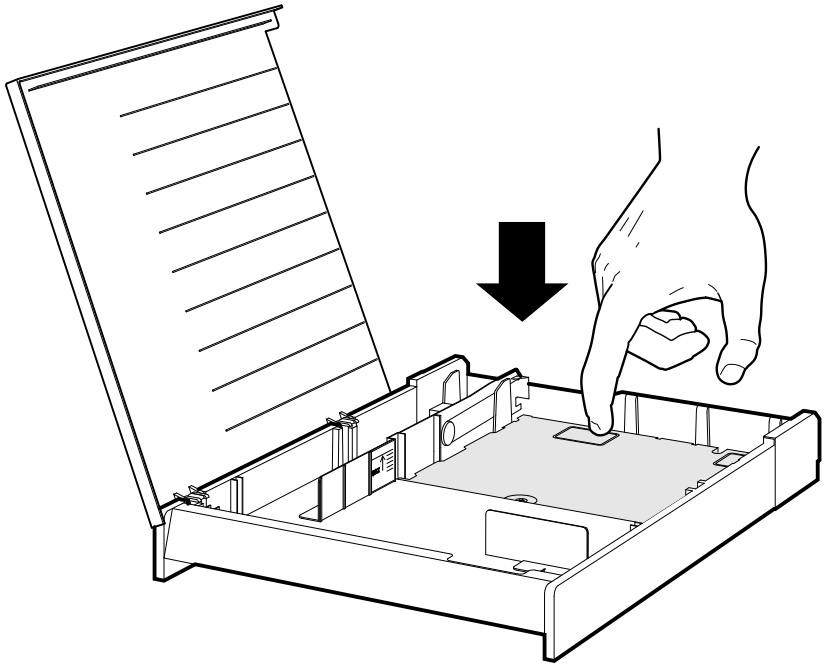
4. Press down the lifting plate to lock it in the loading (lowered) position.



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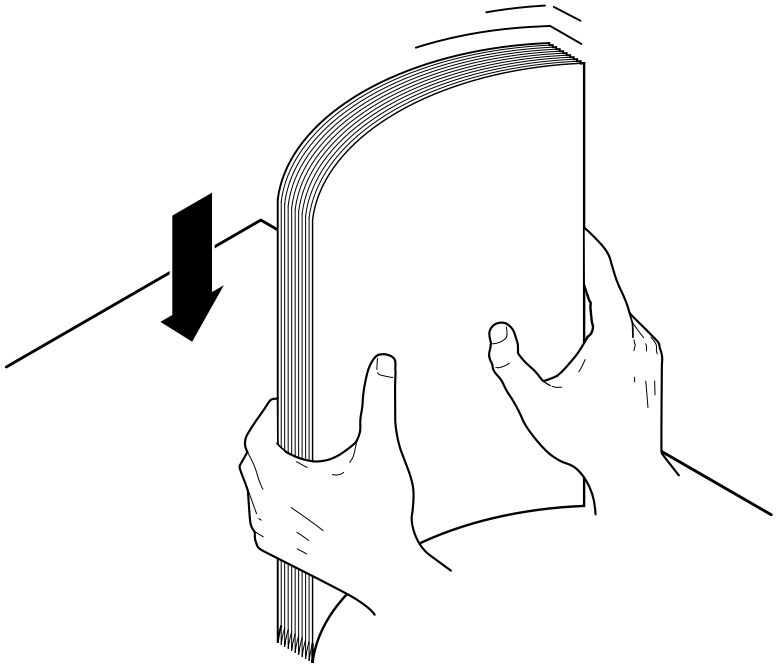
5. Tap a stack of paper on a flat surface to align the edges.



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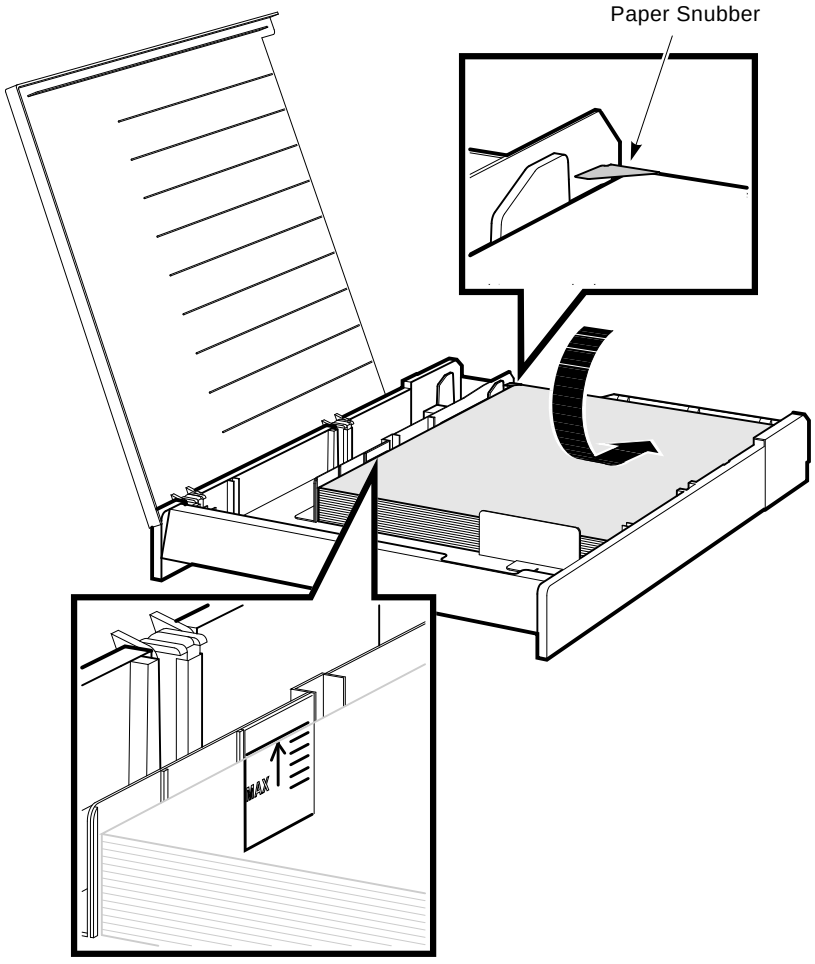
6. Insert the paper into the cassette, making sure the stack is below the paper snubbers.

   √ To prevent paper jams, do not load paper above the MAX limit line.

   √ Load prepunched paper with the holes facing the front of the printer.

   √ For simplex printing: load forms and letterhead paper facedown, with the top edge inserted first.

   For duplex printing: load forms and letterhead paper faceup, with the bottom edge inserted first.



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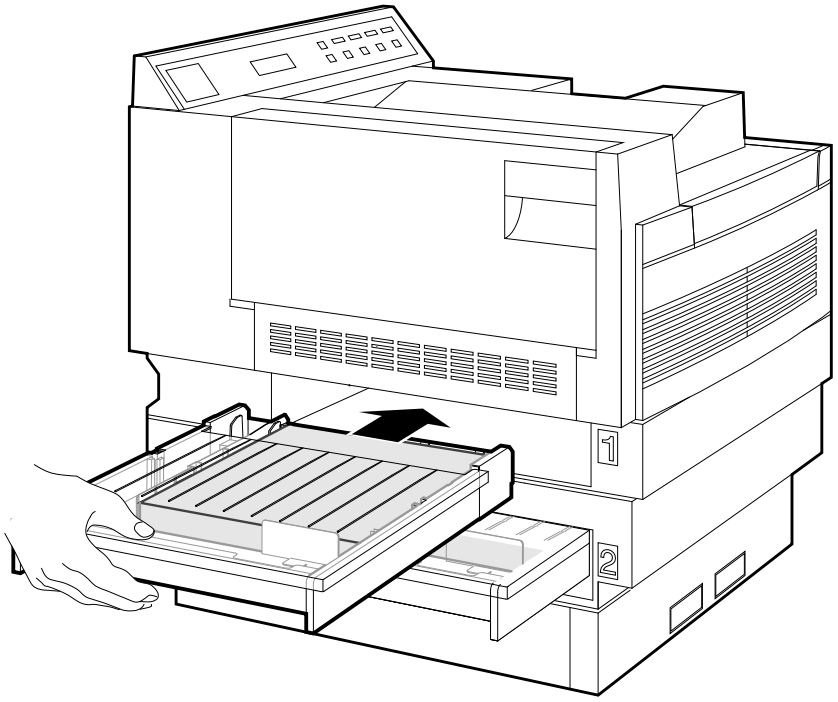
7. Close the paper cassette cover and insert the cassette into the printer.
   - The Error indicator goes off (if it was on).
   - The Supplies indicator goes off.



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2.6 Adjustable Paper Cassette Size Selection

An adjustable paper cassette is designed to accept various paper sizes. It can accommodate widths from 182 mm to 216 mm (7.17 in. to 8.5 in.), and lengths from 254 mm to 356 mm (10 in. to 14 in.).

When you use a standard single-size paper cassette, the printer knows the paper size because the cassettes are *keyed* to the paper size they contain. The (optional) adjustable paper cassette however, is not keyed to a particular size because it can accommodate multiple paper sizes. Before using an adjustable paper cassette, you must indicate the paper size from software or through the ADJ CASSETTE feature in the Set Up menu (see Section 4.4.6). The paper size selected under this feature determines the printable area on the page and should match the paper size you are using.

The DEClaser 3200 printer can be configured to recognize two different sizes of the adjustable paper cassettes, depending on the position of the magnets on the side of the cassette. Refer to the *DEClaser 3200 Printer Adjustable Paper Cassette User's Guide* for information about setting up the cassette for the CASSETTE A or CASSETTE B designation.

CAUTION

If you are printing in duplex mode, it is recommended that you use the lower cassette slot (Tray 2) to prevent possible paper jams.

If you are using two adjustable paper cassettes in duplex mode, be sure the paper size in Tray 1 is wider than the paper size in Tray 2 (or the LCIT if installed). Also, running out of paper in Tray 1 may cause paper jams.

The ADJ CASSETTE feature in the Set Up menu identifies the paper size you have loaded in the cassette. Table 2–4 is an example that describes how to select the Legal paper size for an adjustable paper cassette. This example assumes that:

- Factory defaults are in use
- CASSETTE A selected

See Table 4–39 for a complete listing of paper sizes for the adjustable paper cassette.

Table 2–4 Example of Setting the Adjustable Cassette Size

Operation	Display Reads
1. Press [Online/Pause] to pause the printer.	PAUSED (printer status)
– The Online indicator goes off.	
2. Press [Set Up] to enter the SET UP menu.	SET UP MENU PROTOCOL *
3. Press [>] until you reach the ADJ CASSETTE feature.	SET UP MENU ADJ CASSETTE
4. Press [V] to enter the ADJ CASSETTE feature.	ADJ CASSETTE CASSETTE A
5. Press [V] to select the CASSETTE A value.	CASSETTE A LETTER *
6. Press [>] until you reach the LEGAL paper size.	CASSETTE A LEGAL
7. Press [*] to select the LEGAL paper size.	CASSETTE A LEGAL *
8. Press [Online/Pause] to place the printer back on line.	READY (printer status)
– The Online indicator lights.	

2.7 Manual Feed Operation

The printer has a manual feed tray that can accept paper, transparencies, labels, and envelopes. This section describes how to use the manual feed tray.

NOTE

The manual feed tray is not available if the multi-media feeder is installed.

The manual feed tray can accommodate various media sizes from 105 mm ~ 257 mm (4.13 in. ~ 10.12 in.) wide, and from 191 mm ~ 364 mm (7.5 in. ~ 14.33 in.) long. Included in this range are the following popular paper and envelope sizes:

- Legal-size paper (8.5 in. x 14 in.)
- Letter-size paper, transparencies, and labels (8.5 in. x 11 in.)
- ISO A4-size paper, transparencies, and labels (210 mm x 297 mm)
- ISO A5-size paper (148 mm x 210 mm)
- ISO B4-size paper (250 mm x 353 mm)
- ISO B5-size paper (176 mm x 250 mm)
- JIS B4-size paper (257 mm x 364 mm)
- JIS B5-size paper (182 mm x 257 mm)
- Executive-size paper (7.25 in. x 10.5 in.)
- Half-letter/Statement-size (5.5 in. x 8.5 in.)
- Envelopes:
  - U.S. #10 (4.13 in. x 9.5 in.)
  - U.S. Business (9 in. x 12 in.)
  - U.S. Business (10 in. x 13 in.)
  - C4 (229 mm x 324 mm)
  - C5 (162 mm x 229 mm)
  - DL (110 mm x 220 mm)

When feeding media manually, you must specify the paper size you are using, either through your application program or by using printer commands.

NOTE

The paper size cannot be selected using the control panel if you are using DEC PPL3 protocol; it must be sent using software from the host system. The paper size can be selected if you are using LJ2D protocol, or the optional PostScript protocol.

Envelopes and labels have the same setup requirements as all other media. Since you print addresses in a particular area on envelopes, you must specify the proper print coordinates to print the addresses. Normally, the setup requirements for printing envelopes are defined by the application program you are using. Consult your application program documentation for details about its envelope printing feature.

If your application program does not have a label or envelope printing feature, you need to set up your files using commands that instruct the printer to print in the correct location. Appendix A, Appendix B, and Appendix C contain a listing of DEClaser 3200 printer commands and programming information for the experienced programmer.

2.7.1 Selecting Manual Feed Mode

The Manual Feed Mode can be selected from the control panel or through software from the host system. Selection from the control panel depends on the protocol selected. Each protocol will have its own tray selection feature. For DEC PPL3 protocol see Section 4.4.2.1, for LJ2D protocol, see Section 4.4.3.2, and for the optional PostScript protocol, see Section 4.4.5.3.

Table 2–5 is an example that describes how to select the Manual Feed Mode from the control panel when using DEC PPL3 protocol. This example assumes that factory defaults are in use.

Table 2–5 Selecting Manual Feed Mode

Operation	Display Reads
1. Press [Online] to pause the printer.	PAUSED (printer status) TRAY 1 (tray selection)
– The Online indicator goes off.	
2. Press [Set Up] to enter the SET UP menu.	SET UP MENU PROTOCOL
3. Press [∨] to enter the PROTOCOL feature.	PROTOCOL DEC PPL3 *
4. Press [∨] to enter the DEC PPL3 menu.	DEC PPL3 * TRAY SELECTION
5. Press [∨] to enter the TRAY SELECTION feature.	TRAY SELECTION TRAY 1 *
6. Press [>] until you reach the MANUAL value.	TRAY SELECTION MANUAL
7. Press [*] to select MANUAL.	TRAY SELECTION MANUAL *
8. Press [Online] to place the printer back on line.	READY (printer status) MANUAL (tray selection)
– The Online indicator lights.	

If you are using paper, labels, or transparencies, see Section 2.7.2 for manual feeding procedures. If you are using envelopes, see Section 2.7.3 for manual feeding procedures.

2.7.2 Feeding Paper, Transparencies, and Labels

Manual feed mode must be selected before you can feed media in the manual feed tray. When manual feed mode is selected, the tray selection on the message display reads MANUAL (for DEC PPL3 and LJ3D protocols), or MAN/MMF (for the optional PostScript protocol). If you need to select the manual feed mode of operation, see Section 4.4.2.1 (DEC PPL3), Section 4.4.3.2 (LJ2D), or Section 4.4.5.3 (PostScript) for information about selecting the manual feed mode for the protocol you are using.

If you are not familiar with the printer menus, see Chapter 4. It contains information about entering menu mode and selecting features from the printer menus.

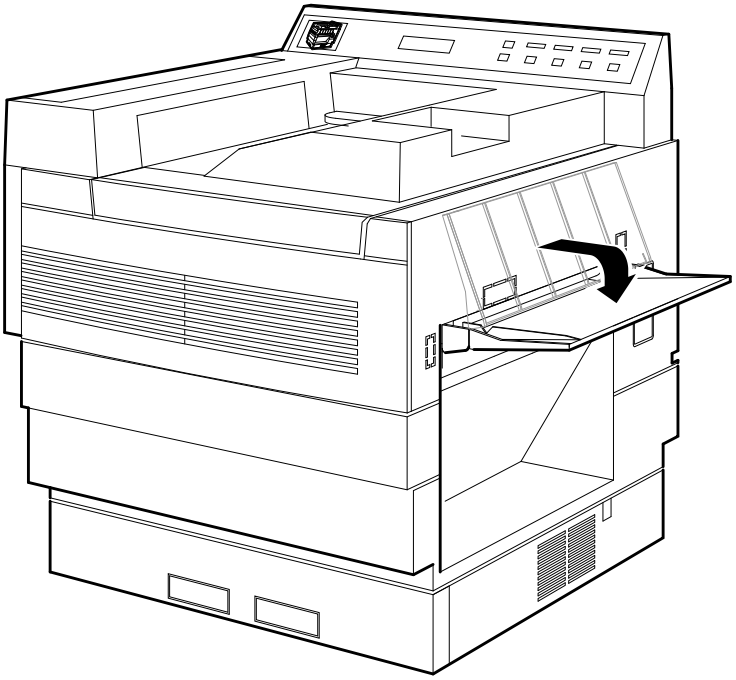
When the manual feed tray is selected and the printer receives a request to print, the following takes place:

- The Last Page indicator flashes
- The Error indicator lights
- The alarm beeps once
- The display reads:

  ADD PAPER
  TO MANUAL 0700

Use the following procedure to manually feed paper, transparencies, or labels into the printer.

1. Open the manual feed tray (if necessary).



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2. Insert a single sheet of paper into the tray until it stops and is picked up by the feed rollers.

   √ Align the paper against the paper guide on the feed tray.

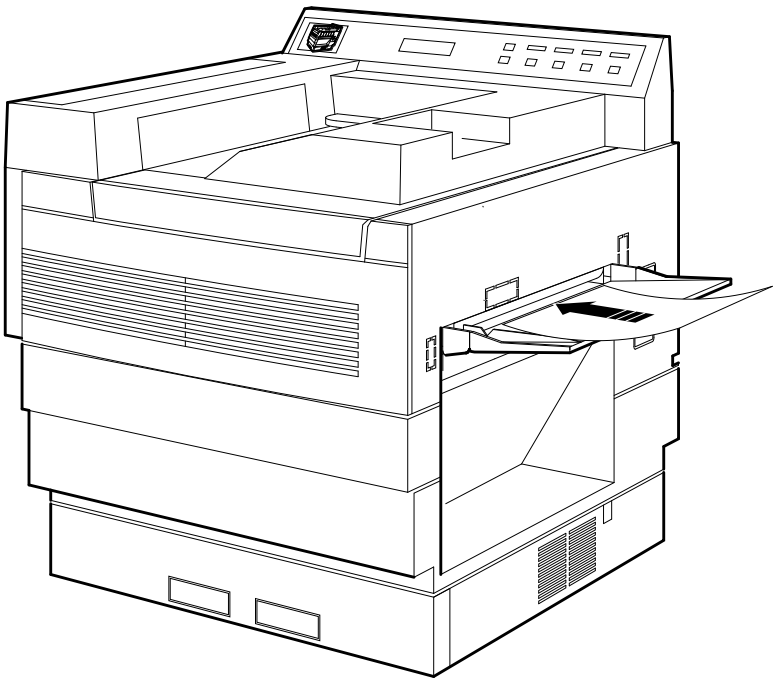
   √ Insert letterhead paper and pre-printed labels faceup, with the top edge first.

   √ Insert blank labels faceup.

   √ Insert prepunched paper with the holes facing the front of the printer.

   – The paper is automatically fed into the printer.

   – The printer prompts you to insert another sheet of paper (error message, alarm, and so on) if there are additional pages to print.



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2.7.3 Feeding Envelopes

Manual feed mode must be selected before you can feed media in the manual feed tray. When manual feed mode is selected, the tray selection on the message display reads MANUAL (for DEC PPL3 and LJ3D protocols), or MAN/MMF (for the optional PostScript protocol). If you need to select the manual feed mode of operation, see Section 4.4.2.1 (DEC PPL3), Section 4.4.3.2 (LJ2D), or Section 4.4.5.3 (PostScript) for information about selecting the manual feed mode for the protocol you are using.

If you are not familiar with the printer menus, see Chapter 4. It contains information about entering menu mode and selecting features from the printer menus.

When the manual feed tray is selected and the printer receives a request to print, the following takes place:

- The Last Page indicator flashes.
- The Error indicator lights.
- The alarm beeps once.
- The display reads:

  ADD PAPER
  TO MANUAL 0700

Before feeding envelopes, check the following items:

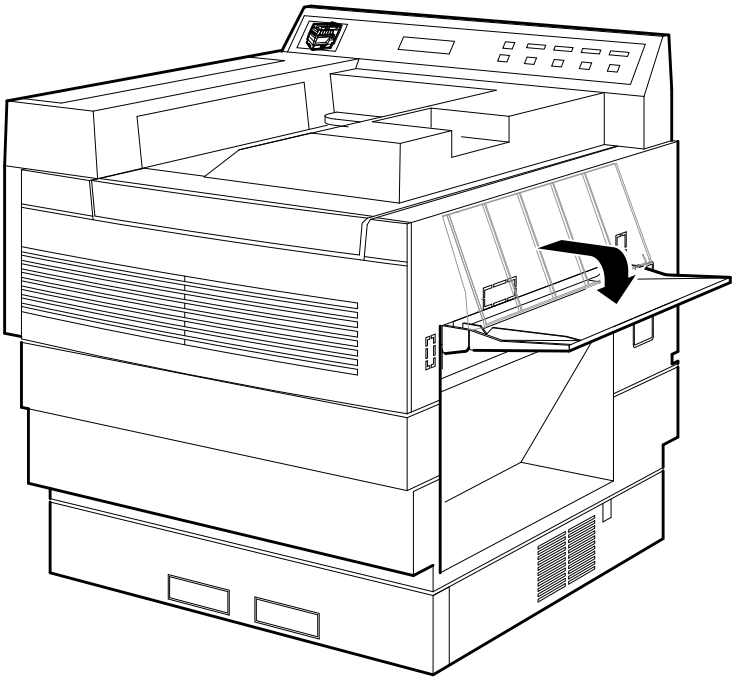
- The sealing flap should run along the length of the envelope for #10 Business type envelopes, not at the leading or trailing edges.
- The sealing flap should be folded properly, with none of the glue exposed.
- The leading and trailing edges should not be more than two layers thick.
- The envelope should be free of wrinkles or creases.

CAUTION

Do not use envelopes made of materials other than paper, or those that have fasteners or windows. To do so can cause serious damage to the printer. See Section 5.2 for complete envelope specifications.

Use the following procedure to load envelopes in the manual feed tray.

1. Open the manual feed tray.



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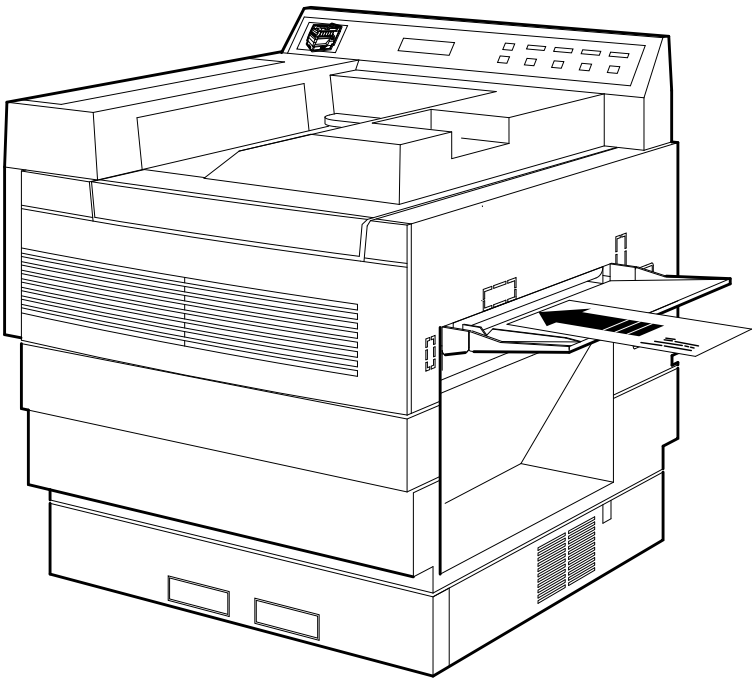
2. Insert a single envelope (faceup) into the tray until it stops and is picked up by the feed rollers.

   √ Align the top edge of the envelope against the paper guide on the feed tray.

   – The envelope is automatically fed into the printer.

   – The printer prompts you to insert another envelope (error message, alarm, and so on) if there are additional addresses to print.



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2.8 Adjusting the Print Density

Print density is the term used to describe the amount of toner applied to the paper. The print density adjustment knob regulates the amount of toner applied to the paper to produce a slightly lighter or darker print.

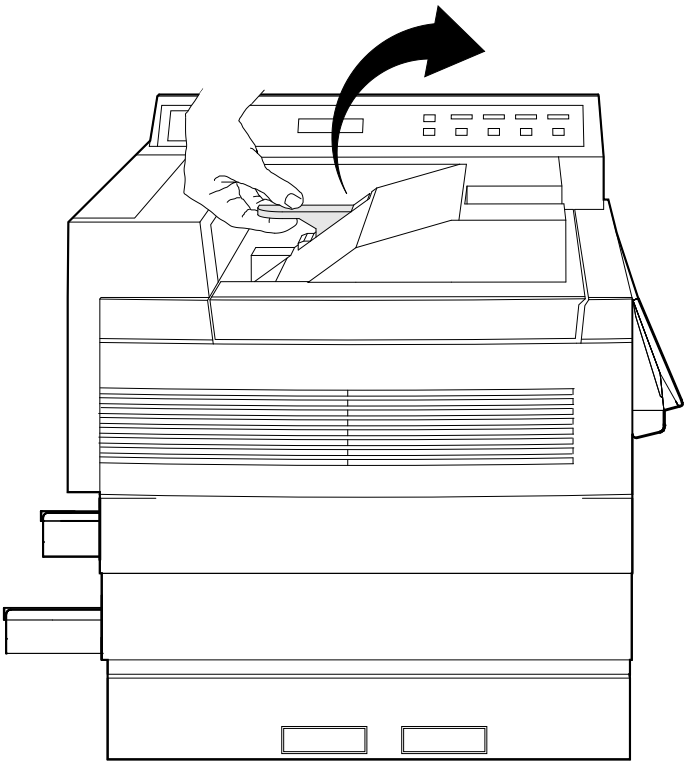
You can extend the life of a toner cartridge by using the lightest possible print density setting that gives you acceptable print quality.

NOTE

The toner cartridge life is approximately 6,000 A4 or letter-size pages. This specification is based on 5% toner coverage with the print density set at its factory default (midpoint) position. The actual number of pages you are able to print may be more or less, depending on your application and print density setting.

Use the following procedure to adjust print density.

1. Open the top cover by lifting up its release lever.



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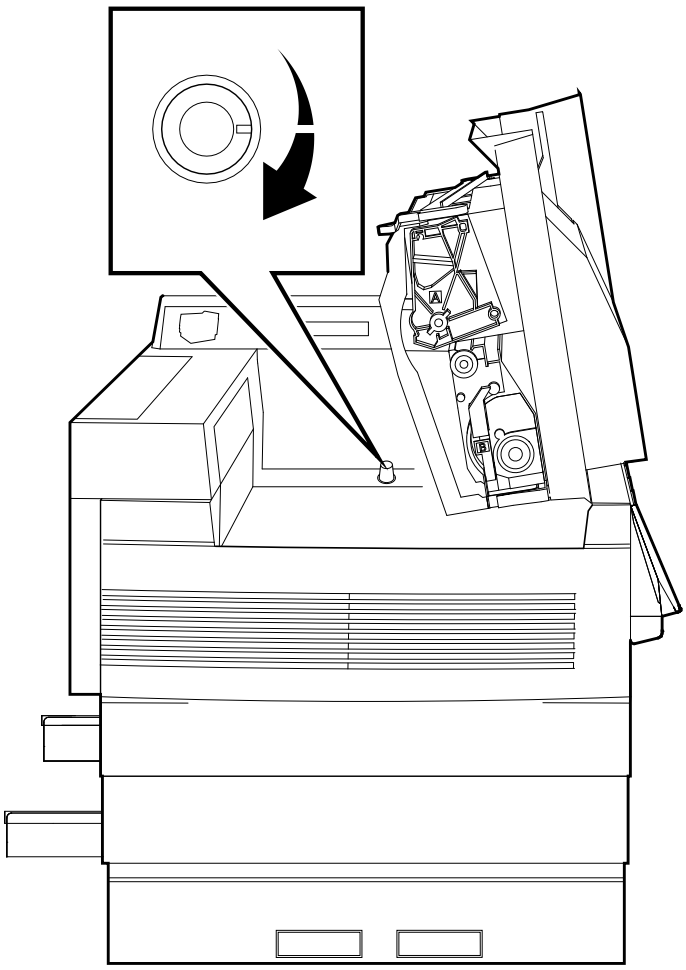
2. Rotate the adjustment knob clockwise to make the print darker, or counter-clockwise to make the print lighter.



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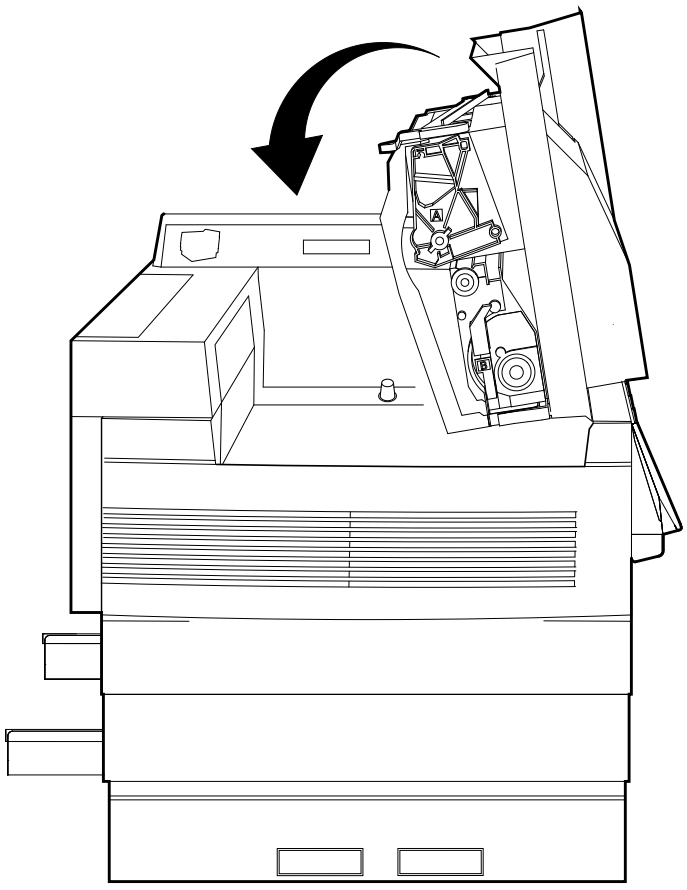
3. Close the top cover by pushing it down until it latches securely in place.



MLO-006492

√ Continue printing and check the results of the new density setting. If the results are not to your satisfaction, readjust the print density as necessary.

3

The Control Panel

The control panel shows you the status of the DEClaser 3200 printer. It consists of a graphic display, a message display, indicator lights, and function keys. While your host computer typically provides most of the communication to the printer, the control panel allows you to perform certain printer functions, such as configuring the printer menus, or printing a page of data that remains in the print buffer. This chapter explains the features and uses of the control panel.

Note that some of the keys have a symbol on them (for example, [*]). The symbol indicates that those keys perform a secondary function when the printer is in Menu Mode.

The printer is in Menu Mode when a menu (either Set Up, Test, or Defaults) has been entered (the display shows the menu or feature and associated value). The printer is in Operating Mode when it is on line (printer status reads READY), or when it is paused (printer status reads PAUSED). The differences between key functions in Operating Mode and Menu Mode are explained in Table 3–1.

The layout of the control panel is shown in Figure 3–1.

Figure 3–1 Control Panel

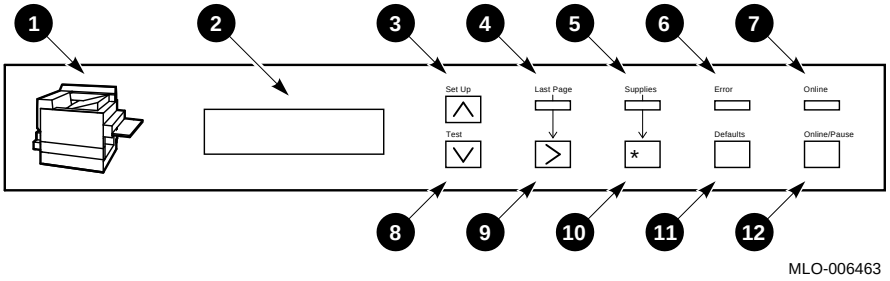


Table 3–1 Control Panel Functions

	Item	Function
❶	Graphic Display	The graphic display is an outlined image of the printer. Light emitting diodes (LEDs) at various locations on the image light to indicate paper tray selections, paper jam locations, and consumable replacement location. The paper tray LEDs are green; all other LEDs are red.

(continued on next page)

Table 3–1 (Cont.) Control Panel Functions

	Item	Function
❷	Message Display	The message display is used to show different types of information, depending on whether the printer is in Operating Mode or Menu Mode. **Operating Mode:** The message display typically shows the current printer status, protocol, tray selection, and whether printing in simplex or duplex mode during printer operation (see Figure 3–2). If the printer has not been activated after a period of 2 hours, the POWER SAVER ON message is displayed. Supplies needed and error conditions are also displayed when the printer is in Operating Mode (Figure 3–3). Refer to Chapter 6 for a complete list of error messages and the corrective actions to take. **Menu Mode:** When you enter menu mode the message display shows the selected menu and the top level feature currently selected (Figure 3–4). When you select a feature, the display shows the feature and the selected value. An asterisk (*) displayed next to the value indicates that the value is selected (Figure 3–5). See Chapter 4 for additional information about the printer menus.

(continued on next page)

Table 3–1 (Cont.) Control Panel Functions

	Item	Function
❸	Set Up / ^	This is a dual-function menu key and functions only when the printer is paused. It performs a different task, depending on whether the printer is in Operating Mode or Menu Mode. **Operating Mode:** Pressing Set Up enters the SET UP menu which contains printer configuration features such as protocol, tray selection, and communications interface. See Section 4.4 for information about the features in the SET UP menu. **Menu Mode:** Pressing ^ returns you to the previous level in the menu. This key is also used to increase numeric values for features such as form length, and font number in the LJ2D menu.
❹	Last Page Indicator (yellow)	The Last Page indicator works in conjunction with > to print data remaining in the print buffer. **On:** The last page of data remains in the print buffer (less than one side in simplex mode, or less than two sides in duplex mode). Press > to print the last page. **Flashing:** Data is being received, or a page is being printed. **Off:** No data remains in the print buffer.

(continued on next page)

Table 3–1 (Cont.) Control Panel Functions

Item	Function
❺ Supplies Indicator (yellow)	The Supplies indicator works in conjunction with [*] to inform you that: • A consumable cartridge is nearing the end of its useful life and needs to be reordered. • A consumable cartridge has reached its end of life and needs to be replaced. • The selected tray has run out of paper and needs to be refilled. • When a nonselected paper tray is not installed. • When NO OFFSET is selected. **On:** A consumable cartridge needs to be replaced soon, the tray has run out of paper, or a tray is not installed. Press [*] to display the Supplies menu to show which cartridge needs to be ordered, or which paper tray needs to be refilled. After reading the supplies message, you must press [*] to clear the message. **NOTE:** *The Error indicator lights when the tray runs out of paper. This error condition causes the printer to stop printing.* **Off:** No supplies are needed at this time.
❻ Error Indicator (amber)	The Error indicator lights when an error condition exists that stops the printer. A "beep" sounds when the printer first senses an alarm condition (unless the ALARM feature has been disabled). The message display works in conjunction with the Error indicator by showing the type of error and the error code number. For example: CLOSE TOP COVER 0103 The Error indicator goes off when the error condition is cleared. See Chapter 6 for troubleshooting and error information.

(continued on next page)

Table 3–1 (Cont.) Control Panel Functions

Item	Function
❼ Online Indicator (green)	The Online indicator works in conjunction with [Online/Pause] to indicate when the printer is on line. **On:** The printer is on line and controlled by the host computer (printer status reads READY). The host computer can send data to print, as well as commands to control the printer. **Off:** The printer is paused (printer status reads PAUSED) and not able to print any more data. Data can be received until the printer communications buffer is filled. **Flashing:** The printer is warming up or printing the current job before pausing.
❽ [Test] / [∨]	This is a dual-function key and functions only when the printer is paused. It performs a different task, depending on whether the printer is in Operating Mode or Menu Mode. **Operating Mode:** Pressing [Test] enters the Test menu, which contains features that allow you to print configuration and font status sheets. See Section 4.5 for information about the features in the Test menu. **Menu Mode:** Pressing [∨] advances you to the next level in the menu. This key is also used to decrease numeric values for features such as form length, and font number in the LJ2D menu.

(continued on next page)

Table 3–1 (Cont.) Control Panel Functions

Item	Function
❾ [>]	This is a dual-function key and performs a different task, depending on whether the printer is in Operating Mode or Menu Mode. **Operating Mode:** Works in conjunction with the Last Page indicator. Press [>] when the Last Page indicator is on to print the last page of data remaining in the print buffer. **Menu Mode:** Pressing [>] advances you to the next menu or feature. This key scrolls through each of the menus or features, and then repeats the cycle. This key is also used to advance to the next digit when changing features such as form length and font number in the LJ2D menu.
❿ [*]	This is a dual-function key and performs a different task, depending on whether the printer is in Operating Mode or Menu Mode. **Operating Mode:** This key operates when the Supplies indicator is on and the printer is on line. Press [*] to display the Supplies message to show which cartridge need to be ordered or replaced, which paper tray needs to be refilled, and so on. **NOTE:** *After reading the supplies message, you must press [*] to clear the message.* This key is also used to bypass certain errors when they are shown on the message display. For example: BAD COPROCESSOR PRESS * **Menu Mode:** Pressing [*] enters the current feature or selects the value shown on the message display.

(continued on next page)

Table 3–1 (Cont.) Control Panel Functions

	Item	Function
⓫	Defaults	Pressing Defaults selects the Defaults menu when the printer is paused. The Defaults menu contains selections to recall factory and user defaults, or to save currently selected features in user defaults. See Section 4.6 for information about the features in the Defaults menu.
⓬	Online/Pause	This is a dual-function key and performs a different task, depending on whether the printer is in Operating Mode or Menu Mode. **Operating Mode:** Pressing Online/Pause alternates the printer between the online and paused states. The printer's current state is indicated on the message display in conjunction with the Online indicator. If Online/Pause is pressed while printing, the Online indicator flashes until the printer is finished printing the current job. The printer pauses when the job is completed. **Menu Mode:** Press Online/Pause to exit Menu mode and place the printer back on line.

Figure 3–2 shows an example of printer status information displayed when the printer is in Operating Mode.

Figure 3–2 Operational Information

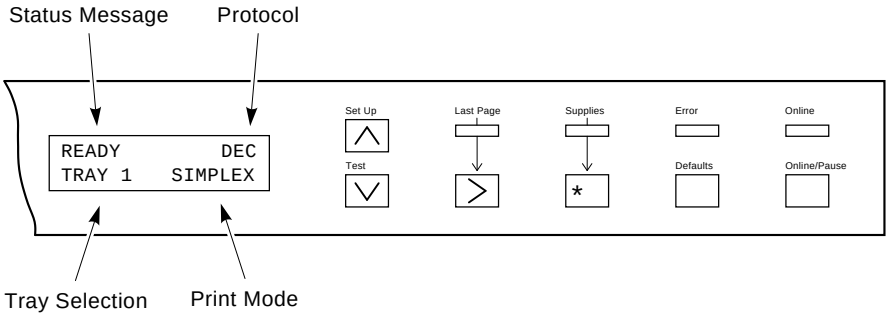


Figure 3–3 shows an example of error information displayed when the printer is in Operating Mode.

Figure 3–3 Error Information

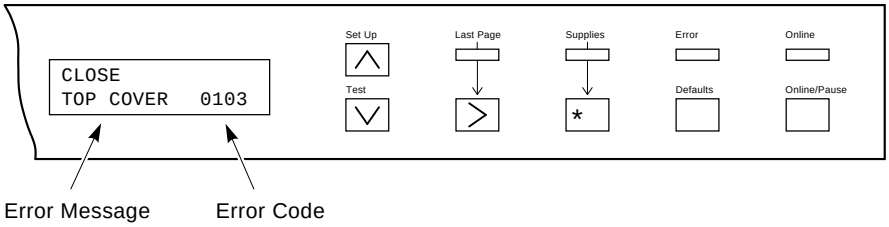


Figure 3–4 shows an example of menu information displayed when the printer is in Menu Mode.

Figure 3–4 Menu Information

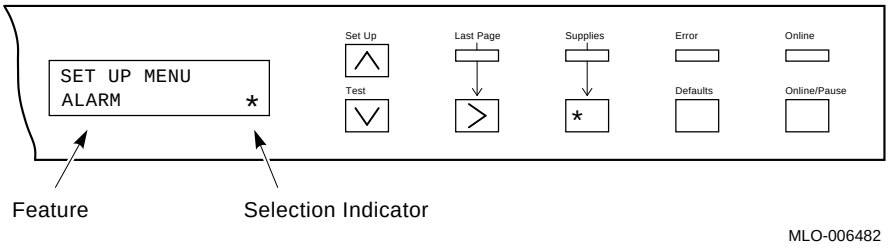
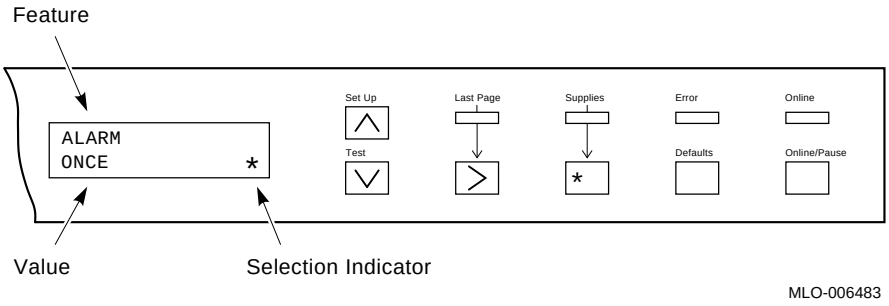


Figure 3–5 shows an example of feature information displayed when the printer is in Menu Mode.

Figure 3–5 Feature Information



4
Printer Menus

This chapter describes the use of the printer menus to configure, test, and save or recall default selections when the printer is in Menu Mode. These menus allow you to customize the printer to your specific host computer and software applications. The DEClaser 3200 printer has three main menus:

The Set Up Menu

The Set Up menu is used to configure the printer by selecting operating parameters (protocol, communications, and so on). These operating parameters are known as features and values. The Set Up menu is the largest of the main menus. In some cases, a Set Up menu feature may have its own secondary menus with additional features and values (for example, PROTOCOL). Refer to the diagram in Figure 4–4 for a listing of the Set Up menu features and values. See Section 4.4 for a complete description of the Set Up menu.

The Test Menu

The Test menu is used to print out the configuration and font status sheets. Refer to Section 4.5 for a complete description of the Test menu.

The Defaults Menu

The Defaults menu is used to recall factory and user default selections, to save newly selected features and values, or to reset the printer. This menu relates directly to the different types of memory the printer uses to store the operating parameters: ROM, RAM, and NVRAM. For additional information about the different types of printer memory, see Section 4.2. Refer to Section 4.6 for a complete description of each feature in this menu.

Some menu features can be accessed using commands from the host computer; others can be selected only from the control panel. This chapter describes how to select any of the printer features using the control panel. For information about selecting features using commands from the host computer, see the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual* and the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Supplement*.

4.1 Entering Menu Mode

When configuring any of the printer menus, the printer is said to be in Menu Mode. When the printer is in Menu Mode, the keys labeled with symbols on them take on a secondary Menu Mode function (see Section 4.1.1).

Table 4–1 describes how to select a printer menu.

NOTE

This procedure assumes that the factory default settings are the current selections in operating memory.

Table 4–1 Selecting a Printer Menu

Operation	Resulting Display Reads
1. Press Online/Pause to pause the printer.	PAUSED DEC TRAY 1 SIMPLEX
– The Online indicator goes off.	
2. Press Set Up, Test, or Defaults to enter the desired menu.	SET UP MENU PROTOCOL or TEST MENU CONFIG SHEET or DEFAULTS MENU PRINTER RESET
– The printer is now in Menu Mode and the keys labeled with symbols perform their Menu mode functions (Section 4.1.1).	

4.1.1 Key Functions in Menu Mode

When the printer is in Menu Mode, the keys labeled with symbols are used to access different menus, features, and values. Table 4–2 describes the function of these keys. After reading these descriptions, try using the keys to better understand their operation. See Section 4.3 for an example of how to use the Menu Mode keys to configure the printer.

Table 4–2 Key Functions: Menu Mode

Key	Function
[^]	o Returns to the previous level of operation in the menu o Increases numeric values in LJ2D protocol
[>]	o Scrolls through the menus and features in a circular fashion o Selects the next digit for numeric values in LJ2D protocol
[v]	o Advances to the next level of operation in the menu o Decreases numeric values in LJ2D protocol
[*]	o Enters the current feature or selects the value shown on the display

4.1.2 Reading the Display in Menu Mode

The message display shows menu, feature, and value selections when the printer is in Menu Mode. These items are accessed using the Menu Mode keys, as described in Table 4–2.

When you select one of the main menus, the message display shows the main menu and first feature. Figure 4–1 shows an example of the display when the Set Up menu is selected. Figure 4–2 shows an example of the display when a feature is selected.

NOTE

An asterisk (*) indicates that the value or feature shown is selected.

Figure 4–1 Menu Information

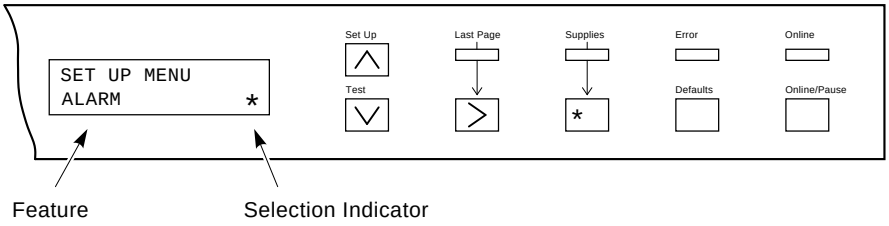
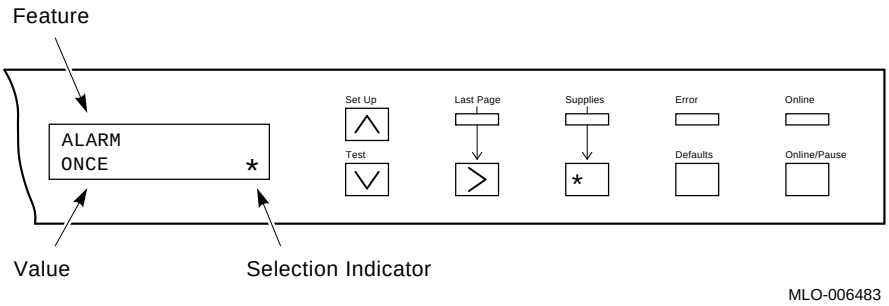


Figure 4–2 Feature Information



4.2 Printer Configuration Memory

The DEClaser 3200 printer uses the following types of memory for printer configuration:

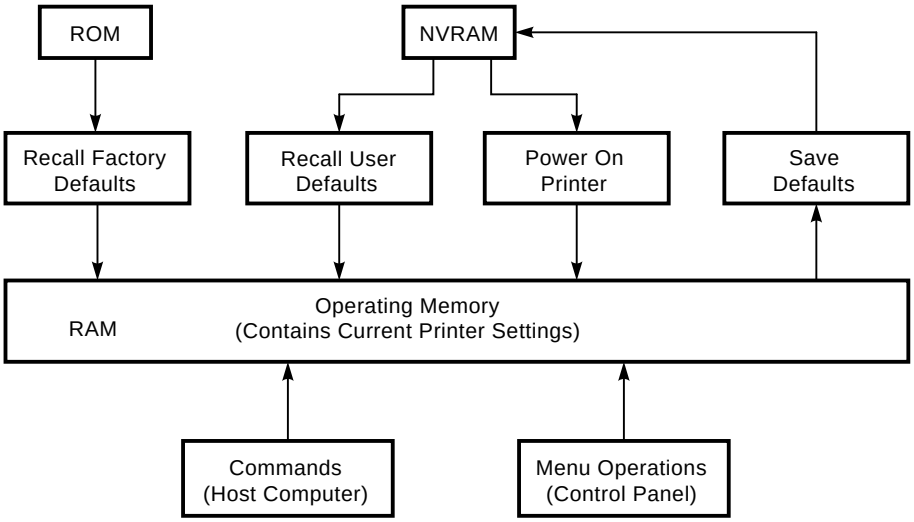
- RAM (random-access memory): the operating memory, containing the currently selected printer settings
- ROM (read-only memory): the factory defaults memory, containing default settings that have been programmed at the factory
- NVRAM (nonvolatile random-access memory): the user defaults memory, containing customized user default settings

NOTE

The printer configuration memories are separate and distinct from the total system memory listed on the configuration sheet (see Figure 4–12). Available memory is used to store downline loaded fonts, and the data you are printing. Configuration memory can only be accessed from the menus to set up the operational parameters of the printer.

Figure 4–3 shows the operational flow between the three types of configuration memory.

Figure 4–3 Operating Flow



RAM	Cleared at Power-Off (Can Be Changed)
ROM	Not Cleared at Power-Off (Cannot Be Changed)
NVRAM	Not Cleared at Power-Off (Can Be Changed)

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4.2.1 Operating Memory (RAM)

When the printer is powered on, it loads the values stored in user defaults memory (NVRAM) into the operating memory (RAM). The printer operates using these values. When you select new values (through commands or from the control panel), they are placed in the operating memory and become part of the printer settings currently in use. Because RAM is temporary, any changes made to the settings in the operating memory are lost if the printer is reset or powered off. If you want to retain changes you have made to the settings in operating memory, you must save them in NVRAM (see Section 4.6).

4.2.2 Factory Defaults Memory (ROM)

ROM contains the default values that are set at the factory. Because these values are stored in read-only memory, they cannot be changed. You can load the factory default settings into the operating memory using the Defaults menu (see Section 4.6).

4.2.3 User Defaults Memory (NVRAM)

The printer is able to operate in many environments using the factory default settings in ROM, but you may have to change some values to accommodate your particular application or host computer. NVRAM allows those changes to be saved in a nonvolatile memory so they are available each time you power on the printer. In a nonvolatile memory, the selected features and values are not cleared when the printer is turned off or reset. Selections are saved in NVRAM until you change them. See Section 4.6 for additional information about saving selections in NVRAM.

4.2.4 System Memory Allocation for DEC PPL3 and LJ2D Protocols

The DEClaser 3200 comes with 1 MB of system memory. The printer allocates system memory dynamically when font files are downloaded from an application, and when bitmap allocation is required for page imaging. The printer also reserves a portion of this memory for use by the printer firmware. For most applications, dynamic allocation of standard and optional configurations of system memory by the printer is acceptable.

Some applications will require more memory than the standard 1 MB configuration. For example, applications that use extensive graphics or require a large number of downloaded font files will need additional system memory to operate efficiently. Without additional memory, page breaks or missing font files may result. The amount of optional memory required to avoid these errors depends on your application, and whether you print in simplex or duplex mode.

You can allocate optional memory through the MEMORY MGMT feature in the DEC PPL3 protocol menu (Section 4.4.2.3), or the PAGE BUFFERS feature in the LJ2D protocol menu (Section 4.4.3.8), to reserve a portion of system memory for page imaging. This ensures that page breaks (due to page complexity) do not occur. However, this also reduces the amount of system memory available for downloaded font files. If your application software produces complex files using a large number of downloaded font files, you may need additional memory beyond the minimum required for bitmap allocation.

Use Table 4–3 as a guide to determine how much optional memory is required to enhance printer performance for your particular application. Optional memory can be purchased in 2 MB single in-line memory modules (SIMM's). See Appendix G for ordering information.

NOTE

If you are using the optional PostScript protocol, see Section 4.4.5 for information about PostScript memory allocation.

Table 4–3 System Memory Allocation

Number of Optional 2 MB SIMMS	Total System Memory	Application Support Provided
0	1 MB (standard)	Most simplex printing is possible, but complex pages cannot be guaranteed. Complex print jobs may cause page breaks.
1	3 MB	Most simplex printing is possible and can be guaranteed on Letter, A4, and Legal-size paper. Duplex printing is possible but cannot be guaranteed. For additional information about allocating memory, see Section 4.4.2.3 if you are using PPL3 protocol, or Section 4.4.3.8 if you are using LJ2D protocol.
2	5 MB	Most duplex printing is possible and can be guaranteed on Letter, A4, and Legal-size paper. For additional information about allocating memory, see Section 4.4.2.3 if you are using PPL3 protocol, or Section 4.4.3.8 if you are using LJ2D protocol.
3 4 5	7 MB 9 MB 10.5 MB	Same support as the 5 MB configuration, but the additional memory can be used to download a greater number of font files. **NOTE:** *10.5 MB is the maximum amount of system memory available. See your SIMM installation guide for additional information.*

4.3 Changing and Saving Menu Selections

Table 4–4 illustrates how to change operating parameters in the Set Up menu, and then save them using the Defaults menu. In this example you perform the following tasks:

- Select the Set Up menu.
- Change the baud rate from 9600 bits/second to 19200 bits/second.
- Select the Defaults menu.
- Save the new value in NVRAM.
- Select the Test menu.
- Print the configuration sheet to verify the new baud rate.
- Exit Menu Mode and return the printer on line.

NOTE

This procedure assumes that the factory default settings are the current selections in operating memory.

Table 4–4 Changing and Saving Menu Selections

Operation	Resulting Display Reads
1. Press Online/Pause to pause the printer. – The Online indicator goes off.	PAUSED DEC TRAY 1 SIMPLEX
2. Press Set Up to enter the SET UP menu. – The printer is now in Menu Mode.	SET UP MENU PROTOCOL
3. Press > until you reach the COMM INTERFACE feature.	SET UP MENU COMM INTERFACE
4. Press V to enter the COMM INTERFACE feature.	COMM INTERFACE SERIAL *
5. Press V to enter the SERIAL menu.	SERIAL * BAUD RATE

Operation	Resulting Display Reads
6. Press [∨] to enter the BAUD RATE feature.	BAUD RATE 9600 *
7. Press [>] until you reach 19200 baud.	BAUD RATE 19200
8. Press [*] to select 19200 baud.	BAUD RATE 19200 *
9. Press [∧] until you exit Menu Mode.	PAUSED DEC TRAY 1 SIMPLEX
10. Press [Defaults] to enter the DEFAULTS menu.	DEFAULTS MENU PRINTER RESET
11. Press [>] until you reach SAVE DEFAULTS.	DEFAULTS MENU SAVE DEFAULTS
12. Press [*] to select SAVE DEFAULTS. – The new baud rate is now saved.	DEFAULTS MENU SAVE DEFAULTS * (The asterisk appears momentarily.)
13. Press [∧] to exit Menu Mode.	PAUSED DEC TRAY 1 SIMPLEX
14. Press [Test] to enter the TEST menu.	TEST MENU CONFIG SHEET
15. Press [*] to select and print the CONFIG SHEET. – The Last Page indicator flashes as the sheet is printed. – The configuration sheet verifies the new baud rate of 19200.	TEST MENU CONFIG SHEET * (The asterisk is displayed while the sheet is printed.)

16. Press Online/Pause to exit Menu Mode and place the printer back on line.

READY	DEC
TRAY 1	SIMPLEX

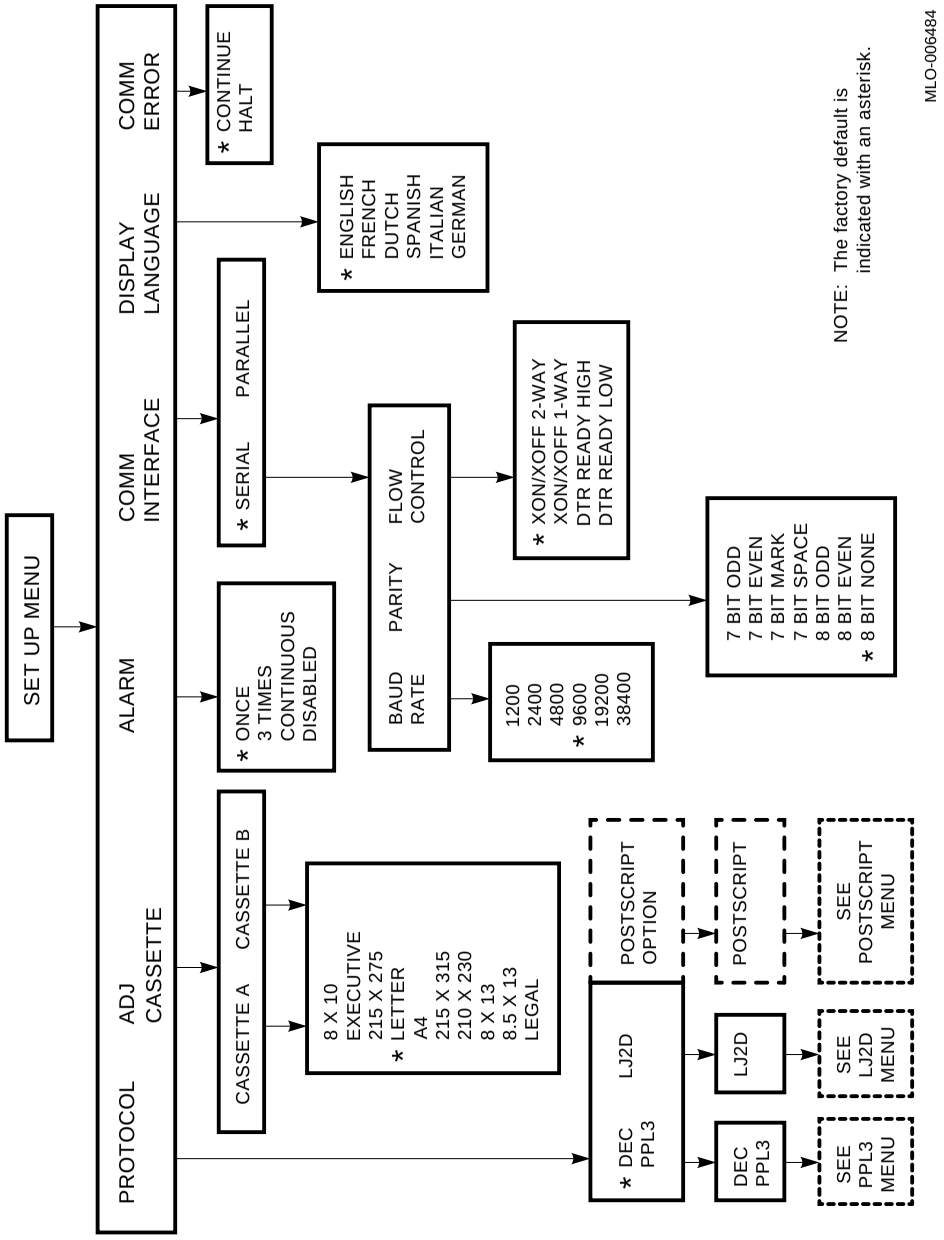
– The Online indicator lights.

4.4 Set Up Menu

You configure the DEClaser 3200 printer by selecting an appropriate set of values from the Set Up menu. Once values are selected, you can save them in NVRAM using the Defaults Menu (Section 4.6). Saving features in NVRAM allows you to retain the printer settings so that they need to be configured only once.

The Set Up menu is different from the Test and Default menus because it has several secondary menus. For example, the Protocol feature has secondary menus (DEC PPL3 and LJ2D), which have their own features and values (see Figure 4–4).

Figure 4–4 Set Up Menu Block Diagram



4.4.1 Protocol

This feature lets you select the printing protocol that matches your particular system. The protocol selections are secondary menus and contain features and values of their own. You must select the proper protocol operating parameters from these secondary menus.

Table 4–5 describes the protocol selections.

Table 4–5 Protocol

Feature	Menu	Description
PROTOCOL	DEC PPL3[1]	This is the Digital ANSI-Compliant Printing Protocol Level 3 menu. Select this menu when running ANSI applications. See Section 4.4.2 for information about the features and values in the DEC PPL3 menu.
	LJ2D	Select this menu if you are using programs that run using Hewlett-Packard's PCL4 operating protocol. See Section 4.4.3 for information about the features and values in the LJ2D menu.
	POST[2]	Select this menu if you are using programs that run under the PostScript operating protocol. See Section 4.4.4 for information about the features and values in the PostScript menu.

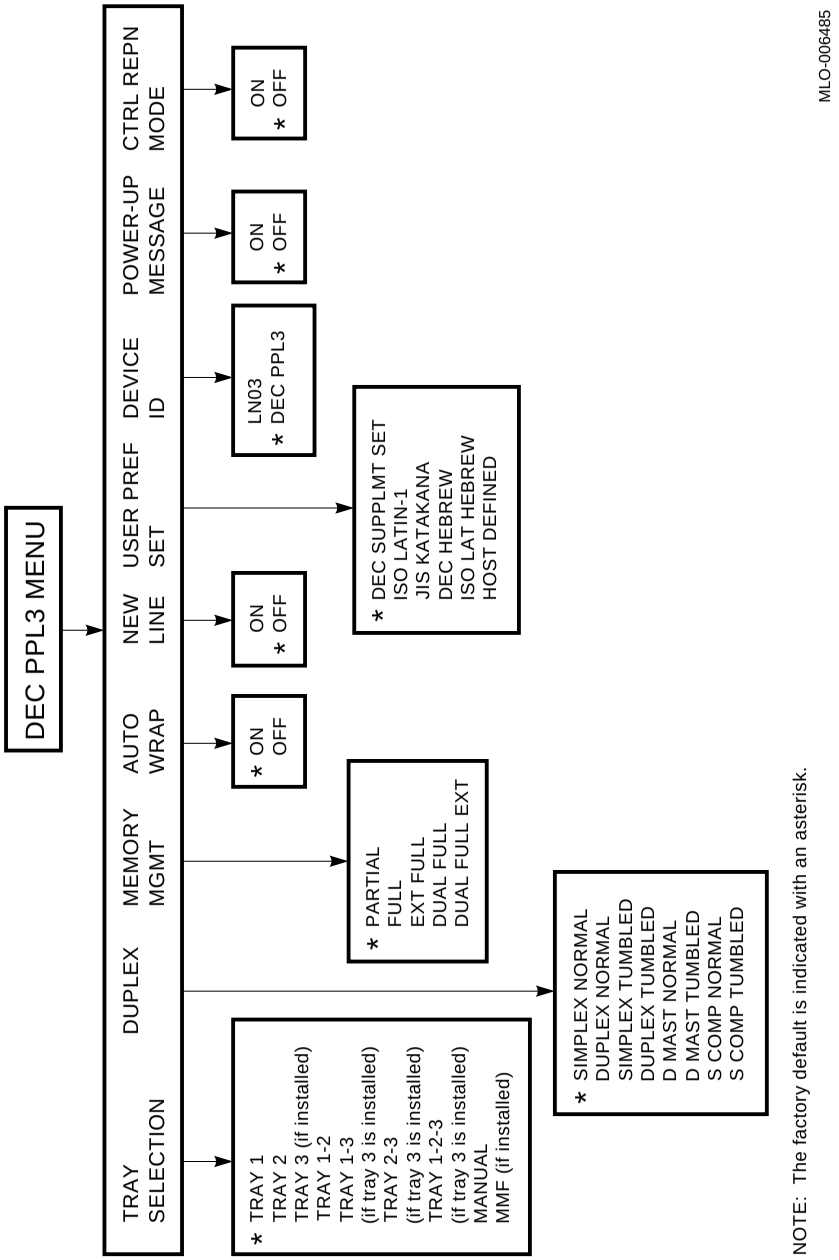
[1]Factory default setting

[2]Available only when the PostScript option is installed

4.4.2 DEC PPL3 Menu

This section describes the features and values in the DEC PPL3 protocol menu (Figure 4–5).

Figure 4–5 DEC PPL3 Menu



NOTE: The factory default is indicated with an asterisk.

4.4.2.1 Tray Selection

The tray selection feature allows you to select the tray that feeds paper to the printer. In addition to selecting a singular tray, a collection of trays can be selected to enable failover.

NOTE

When printing in duplex mode, you cannot add paper to TRAY 1 while printing from another tray. TRAY 1 *must* be installed to print in duplex mode.

This menu also contains selections for the optional large capacity input tray and the multi-media feeder (TRAY 3). These options are displayed on the menu only if they are installed. The paper tray selection is indicated on the message display when the printer is in Operating Mode.

Table 4–6 lists the tray selections.

Table 4–6 Tray Selection

Feature	Values	Description
TRAY	TRAY 1[1]	Feeds paper from the upper paper cassette.
	TRAY 2	Feeds paper from the lower paper cassette.
	TRAY 3[2]	Feeds paper from the optional LCIT.
	TRAY 1-2	Feeds paper from both TRAY 1 or TRAY 2.
	TRAY 1-3[2]	Feeds paper from both TRAY 1 or TRAY 3.
	TRAY 2-3[2]	Feeds paper from both TRAY 2 or TRAY 3.
	TRAY 1-2-3[2]	Feeds paper from TRAY 1, TRAY 2, or TRAY 3.
	MANUAL[3]	Selects the manual feed mode of operation (see Section 2.7).
	MMF[4]	Feeds paper from the optional MMF.

[1]Factory default setting

[2]Displayed only if the LCIT option is installed

[3]Not displayed if the MMF option is installed

[4]Displayed only if the MMF option is installed

4.4.2.2 Duplex

The duplex feature controls whether the DEClaser 3200 printer images data on one side of a sheet (called *simplex* printing), on both sides of the sheet (called *duplex* printing). The duplex feature can also perform more sophisticated printing modes, such as printing single-sided masters for double-sided reproduction at a later time.

The number and orientation of logical pages on physical sheets of paper is called the page layout. The page layout consists of the following attributes:

- Physical duplex or simplex: determines whether both sides of the sheet are actually printed
- Logical duplex or simplex: determines the action taken on the Newsheet (DECNS) DEC PPL3 command
- Tumbling: defines the binding edge for the physical sheet

Table 4–7 lists the results from the combinations of the physical and logical components of the print mode.

Table 4–7 Logical and Physical Print Mode Interactions

Logical Setting	Physical Setting	Result
Logical simplex	Physical simplex	True simplex: this corresponds to traditional simplex printing.
Logical duplex	Physical duplex	True duplex: the output is physically duplex. The DECNS command, if received during printing of a non-blank front page, ejects the current sheet, leaving a blank back page.
Logical duplex	Physical simplex	Duplex master: the output is physically simplex, although it can be used as a master in a duplexing copier. Page 1 is considered a logical front page. Page 2 is considered a logical back page. The DECNS command, if received during printing of a non-blank logical front page, ejects the current sheet, and then an extra sheet, producing a blank logical back page.
Logical simplex	Physical duplex	Simplex compressed: the output is physically duplex. However, DECNS does not produce blank pages.

Tumbling

The tumbling component of the print mode defines the binding edge of the physical sheet. Normal documents are designed to be bound along the long edge of the sheets. The top edge of the first page (side 1), is aligned with the top edge of the second page (side 2). For example, this manual is printed in duplex normal.

Tumbled documents are designed to be bound along the short edge of the sheets. The top edge of a portrait image on the front of the sheet is aligned with the bottom edge of the image on the back of the sheet. For example, legal documents are often printed in duplex tumbled.

The orientation of landscape printing (relative to portrait) is the same in tumbled pages as it is in normal pages. This should be taken into account when tumbling mixed-orientation (portrait and landscape) documents. If the document is bound on one edge as either a portrait or landscape document, the reading direction for the other orientation on adjacent pages is inconsistent.

Tumbling can also be used in simplex printing. In this case, the device rotates alternate pages by 180 degrees. Tumbling affects the 2nd, 4th, 6th, . . . pages after tumbling is selected.

All eight print modes resulting from the combination of the three components (logical simplex or duplex, physical simplex or duplex, and tumbling) can be selected through the duplex feature, as described in Table 4–8.

NOTE

Figure 4–6 shows the duplex input reference used for the output examples referred to in Table 4–8, and shown in Figure 4–7 and Figure 4–8.

Table 4–8 Duplex

Feature	Values	Description	Illustration
DUPLEX	SIMPLEX NORMAL[1]	Selects true simplex normal operation; binding is on the long edge.	Figure 4–7
	DUPLEX NORMAL	Selects true duplex normal operation; binding is on the long edge.	Figure 4–7
	SIMPLEX TUMBLED	Selects true simplex tumbled operation; binding is on the short edge.	Figure 4–7
	DUPLEX TUMBLED	Selects true duplex tumbled operation; binding is on the short edge.	Figure 4–7
	D MAST NORMAL	Selects duplex master normal operation; binding is on the long edge.	Figure 4–8
	D MAST TUMBLED	Selects duplex master tumbled operation; binding is on the short edge.	Figure 4–8
	S COMP NORMAL	Selects simplex compressed normal operation; binding is on the long edge.	Figure 4–8
	S COMP TUMBLED	Selects simplex compressed tumble operation; binding is on the short edge.	Figure 4–8

[1]Factory default setting

Figure 4–6 Duplex Input

Input:

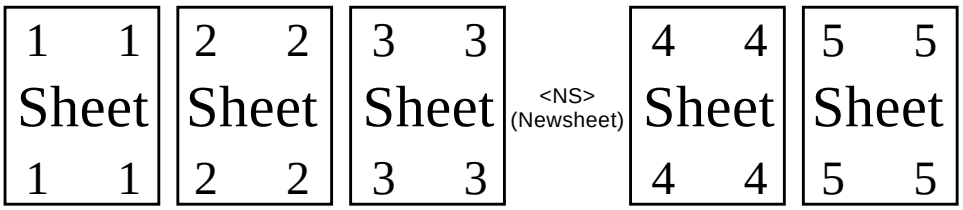


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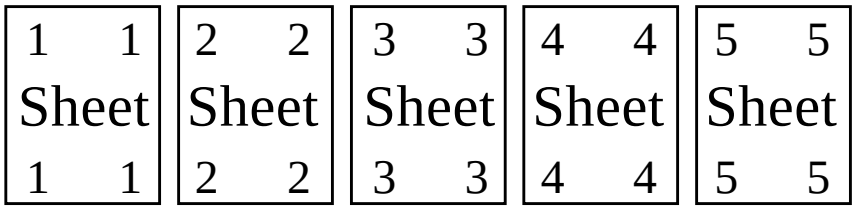
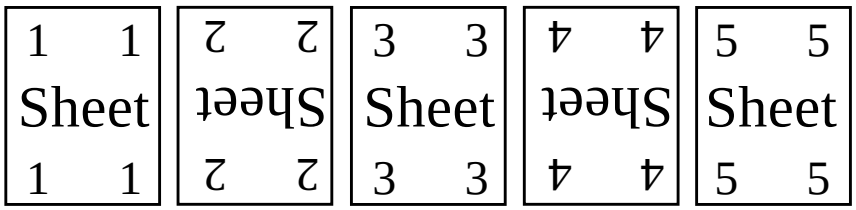
Figure 4–7 Duplex and Simplex Output

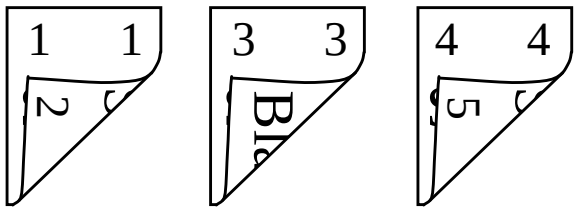
True Simplex Normal:



True Simplex Tumbled:

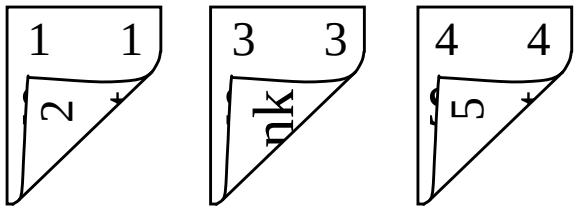


True Duplex Normal:



Sheet 1 and 2 Sheet 3 and Blank Sheet 4 and 5

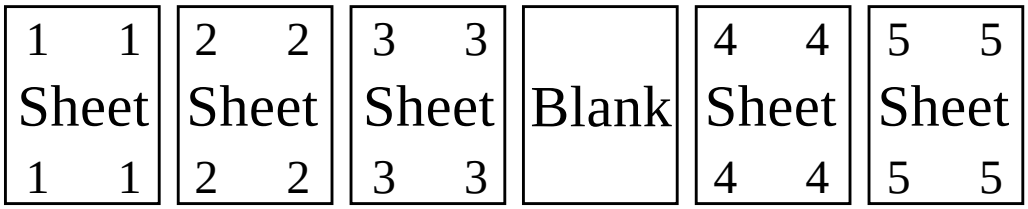
True Duplex Tumbled:



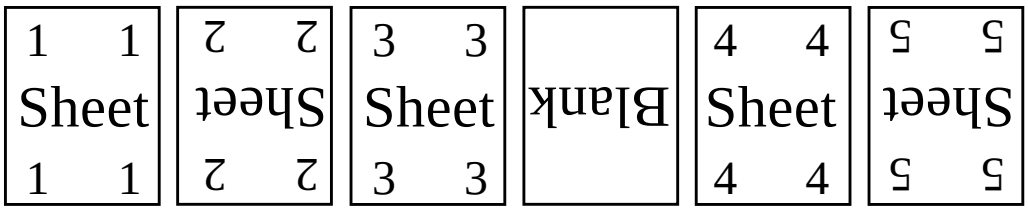
Sheet 1 and 2 Sheet 3 and Blank Sheet 4 and 5 MLO-005381

Figure 4–8 Duplex Master and Simplex Compressed Output

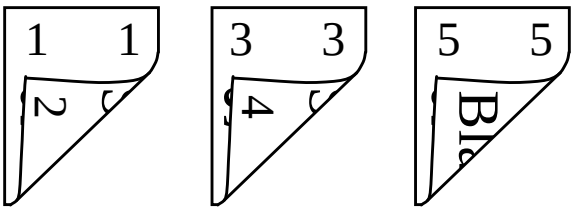
Duplex Master Normal:



Duplex Master Tumbled:

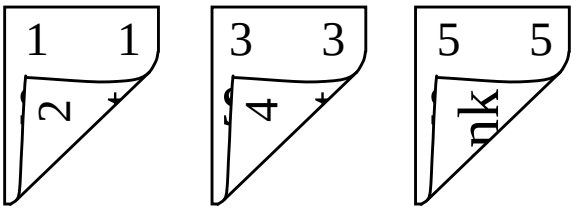


Simplex Compressed Normal:



Sheet 1 and 2 Sheet 3 and 4 Sheet 5 and Blank

Simplex Compressed Tumbled:



Sheet 1 and 2 Sheet 3 and 4 Sheet 5 and Blank

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4.4.2.3 Memory Management

The memory management feature allows you to instruct the printer to reserve memory space for one or two full bitmap pages, or not to reserve any bitmapped memory space for page printing. Since printer memory is shared with both fonts and graphics, it is usually desirable to let the printer allocate the memory dynamically, because even full page bitmap images often print when partial memory is selected. For additional information about system memory allocation, see Section 4.2.4. Table 4–9 describes the memory management selections.

Table 4–9 Memory Management Feature

Feature	Values	Description
MEMORY MGMT	PARTIAL[1]	Reserves no memory for bitmap pages; the memory is allocated dynamically.
	FULL[2]	Directs the printer to allocate memory space for one full bitmapped A4 or Letter-size page. The FULL setting eliminates page complexity errors but may slow the printer down if all pages require a full bitmap.
	EXT FULL[2]	Directs the printer to allocate memory space for one full bitmapped Legal-size page.
	DUAL FULL[3]	Directs the printer to allocate memory space for two full bitmapped A4 or Letter-size pages. The DUAL FULL setting guarantees printing in duplex mode.
	DUAL FULL EXT[3]	Directs the printer to allocate memory space for two full bitmapped Legal-size pages.

[1]Factory default setting

[2]Displayed when at least 2 MB of optional memory is installed

[3]Displayed when at least 4 MB of optional memory is installed

4.4.2.4 Auto Wrap

The auto wrap feature determines whether text wraps to the next line when it reaches the right margin. Table 4–10 describes the auto wrap selections.

Table 4–10 Auto Wrap

Feature	Values	Description
AUTO WRAP	ON[1]	When the print position exceeds the right margin, it wraps to the left margin of the next line.
	OFF	Text is not wrapped to the next line when the right margin is exceeded. Text beyond the right margin is lost.

[1]Factory default setting

4.4.2.5 New Line

The new line feature determines whether text advances to the next line upon receipt of a line feed (LF) from the host computer. Table 4–11 describes the new line selections.

Table 4–11 New Line

Feature	Values	Description
NEW LINE	ON	The printer advances the paper to the next line upon receipt of a line feed (LF) from the host computer.
	OFF[1]	The printer does not advance the paper to the next line when it receives a LF command.

[1]Factory default setting

4.4.2.6 User Preference Set

The user preference set defines the supplemental character set appropriate for your application or system. Table 4–12 lists the Digital supported character sets.

Table 4–12 User Preference Set

Feature	Values	Description
USER PREF SET	DEC SUPPLMT SET[1]	Uses the DEC Supplemental character set
	ISO LATIN-1	Uses the ISO Latin-1 character set
	JIS KATAKANA[2]	Uses the JIS Katakana character set
	DEC HEBREW	Uses the DEC 7-bit Hebrew character set
	ISO LAT-HEBREW	Uses the ISO Latin-Hebrew character set
	HOST DEFINED	The character set is defined by the host computer.

[1]Factory default setting

[2]Not a resident character set

4.4.2.7 Device Identification

The DEClaser 3200 printer can identify itself as a Digital ANSI-Compliant Printing Protocol Level 3 printer (DEC PPL3), and therefore can be recognized as such by symbionts and terminal drivers that conform to the Digital ANSI-compliant architecture. This identification is also compatible with level 2 devices, since all level 2 sequences are also supported.

You can also select an LN03 identification for applications that require the printer to identify itself as an LN03 printer. For example, the DECmate word processing system requires an LN03 device identification.

Table 4–13 describes the device identification selections.

Table 4–13 Device ID

Feature	Values	Description
DEVICE ID	DEC PPL3[1]	The printer identifies itself as a DEC PPL3 printer.
	LN03	The printer identifies itself as an LN03 printer.

[1]Factory default setting

4.4.2.8 Power-Up Message

The power-up message is displayed when the printer is turned on. Table 4–14 describes the power-up message values.

Table 4–14 Power-Up Message

Feature	Values	Description
POWER-UP MESSAGE	ON[1]	The printer sends an initialization message when the printer is turned on.
	OFF	No initialization message is sent when the printer is turned on.

[1]Factory default setting

4.4.2.9 Control Representation Mode

This feature enables the printer to stop interpreting control characters, and print out unprocessed data or commands from the host computer in control representation form. The printing of unprocessed data (with control characters embedded in the file) is convenient for debugging problems.

Table 4–15 describes the control representation mode values.

Table 4–15 Control Representation Mode

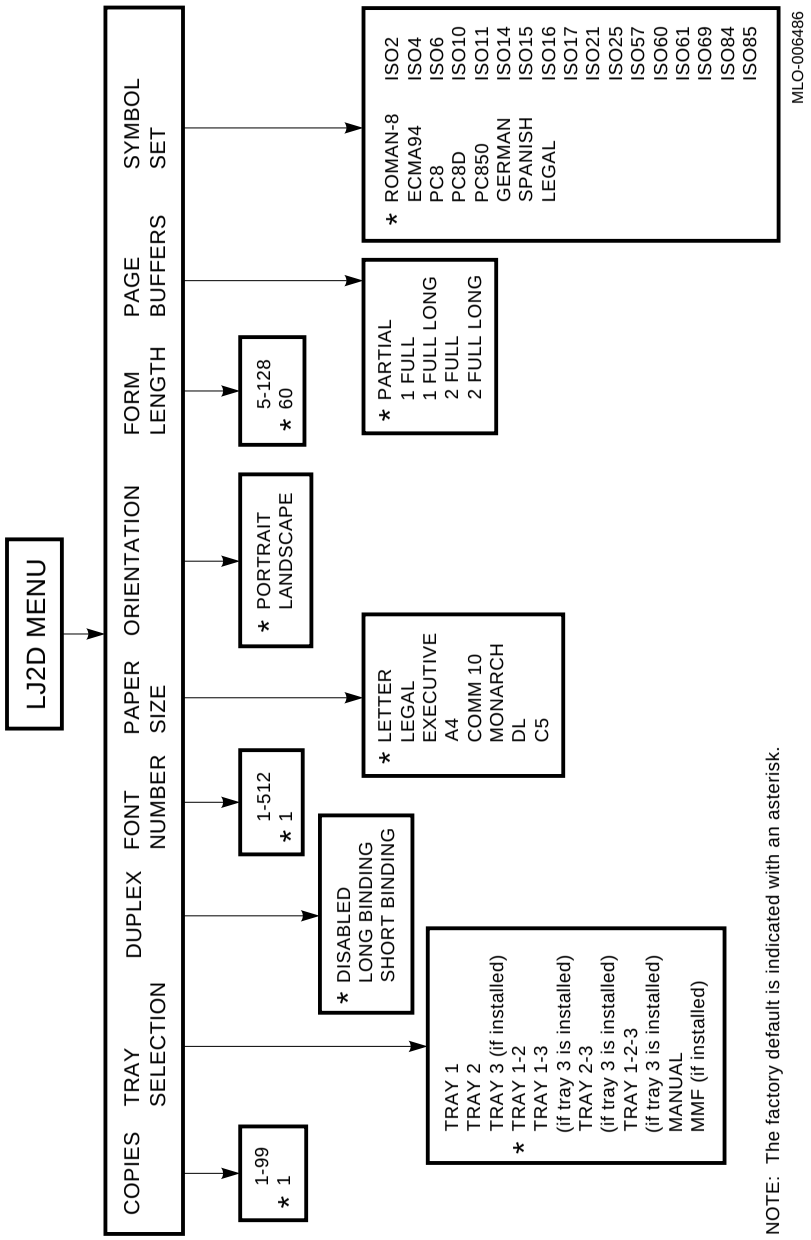
Menu	Feature	Description
CTRL REPN MODE	ON	The printer stops interpreting control characters and prints out unprocessed data and control characters from the host computer.
	OFF[1]	The printer stops printing in control representation form and returns to interpreting control characters.

[1]Factory default setting

4.4.3 LJ2D Menu

This section describes the features and values in the LJ2D protocol secondary menu (Figure 4–9).

Figure 4–9 LJ2D Menu



NOTE: The factory default is indicated with an asterisk.

4.4.3.1 Copies

The copies feature determines how many copies *of each page* are to be printed. This feature does not collate print jobs; it prints the requested number of copies of each page in the job (see Table 4–16).

NOTE

Use [*] to enter the feature, and to select the new value.
Use [^] to increase the numeric value.
Use [v] to decrease the numeric value.
Use [>] to move from one digit to the next.

Table 4–16 Copies

Feature	Values	Description
COPIES	01[1]—99	Sets the number of copies to print.

[1]Factory default setting

4.4.3.2 Tray Selection

The tray selection feature allows you to select the tray that feeds paper to the printer. In addition to selecting a singular tray, a sequence of trays can be selected to indicate the fail-over order.

NOTE

You cannot add paper to TRAY 1 while continuing to print from another tray when the printer is in duplex mode. TRAY 1 must be installed to print in duplex mode.

This feature also contains selections for the optional large capacity input tray (LCIT) and the multi-media feeder (MMF). These options are only displayed if they are installed. The paper tray selection is indicated on the message display when the printer is in Operating Mode.

Table 4–17 lists the tray selections.

Table 4–17 Tray Selection

Feature	Values	Description
TRAY SELECTION	TRAY 1-2[1]	Feeds paper from TRAY 2 when TRAY 1 is empty.
	MANUAL	Selects the manual feed mode of operation (see Section 2.7).
	MMF[2]	Feeds paper from the optional MMF.
	TRAY 1	Feeds paper from the upper paper cassette.
	TRAY 2	Feeds paper from the lower paper cassette.
	TRAY 3[3]	Feeds paper from the optional LCIT.
	TRAY 1-3[3]	Feeds paper from TRAY 1 when TRAY 3 is empty.
	TRAY 2-3[3]	Feeds paper from TRAY 2 when TRAY 3 is empty.
	TRAY 1-2-3[3]	Feeds paper from TRAY 2 when TRAY 3 is empty. Feeds paper from TRAY 1 when TRAY 2 is empty.

[1]Factory default setting

[2]Displayed only if the MMF option is installed

[3]Displayed only if the LCIT option is installed

4.4.3.3 Duplex

The duplex feature controls whether the DEClaser 3200 printer images data on one side of a sheet (called *simplex* printing), or on both sides of the sheet (called *duplex* printing).

Table 4–18 Duplex

Feature	Values	Description
DUPLEX	DISABLED[1]	Selects the simplex mode of operation.
	LONG BINDING	Selects the duplex mode of operation; binding is on the long edge.
	SHORT BINDING	Selects the duplex mode of operation; binding is on the short edge.

[1]Factory default setting

4.4.3.4 Font Number

The font number feature identifies the default font. Print the font status sheet for a listing of fonts and their associated font numbers (Section 4.5).

NOTE

Use [*] to enter the feature, and to select the new value.
Use [∧] to increase the numeric value.
Use [∨] to decrease the numeric value.
Use [>] to move from one digit to the next.

Table 4–19 Font Number

Feature	Values	Description
FONT NUMBER	001[1] - 512	Identifies the font used to print. Selecting font numbers outside of the specified range will default to the previously selected font.

[1]Factory default setting

4.4.3.5 Paper Size

The paper size feature defines the default paper size. The printer feeds paper from a tray defined in the tray selection sequence (Section 4.4.3.2) matching the default size selected. If the printer cannot locate a tray that matches the default size, an error messsage is displayed. See Section 6.4 for additional information about paper tray error messages.

Table 4–20 lists the paper size selections.

Table 4–20 Paper Size

Feature	Values	Description
PAPER SIZE	LETTER[1]	Selects 8.5 in. x 11 in. size paper
	LEGAL	Selects 8.5 in. x 14 in. size paper
	EXECUTIVE	Selects 7~7.5 in. x 10~10.5 in. size paper
	A4	Selects 210 mm x 297 mm size paper
	COMMERCIAL 10	Selects 4.13 in. x 9.5 in. size envelopes
	MONARCH	Selects 98 mm x 191 mm size envelopes
	DL	Selects 110 mm x 220 mm size envelopes
	C5	Selects 162 mm x 229 mm size envelopes

[1]Factory default setting

4.4.3.6 Orientation

The orientation feature determines the page orientation; either portrait or landscape. Orientation refers to the direction text and graphics are displayed on the page.

Table 4–21 Orientation

Feature	Values	Description
ORIENTATION	PORTRAIT[1]	Text and graphics are printed across the short-edge (width) of the page.
	LANDSCAPE	Text and graphics are printed across the long-edge (length) of the page.

[1]Factory default setting

4.4.3.7 Form Length

The form length feature sets the number of lines to print on the page. Typical form length settings are 60 lines per page for Letter-size paper, and 78 lines per page for Legal-size paper. These settings are based on 6 lines per inch after subtracting 1 inch from the page length to allow for space at the top and bottom of the page.

For example, to set Legal-size paper to 6 lines per inch you would take the page length (14), minus the top and bottom space (1), and come up with 13. 13 x 6 lines per inch = 78 lines per page. The number of lines per inch remains the same even if the page orientation changes. In other words, if you are printing 6 lines per inch in portrait mode, and then switched to landscape mode, the printer will continue to print at 6 lines per inch.

NOTE

Use [*] to enter the feature, and to select the new value.
Use [^] to increase the numeric value.
Use [v] to decrease the numeric value.
Use [>] to move from one digit to the next.

Table 4–22 Form Length

Feature	Values	Description
FORM LENGTH	.005 . . . 60[1] . . . 128	Indicates the number of lines to print on the page.

[1]Factory default setting

4.4.3.8 Page Buffers

The page buffers feature allows you to instruct the printer to reserve memory space for one or two full bitmap pages, or not to reserve any bitmapped memory space for page printing. Since printer memory is shared with both fonts and graphics, it is usually desirable to let the printer allocate the memory dynamically, because even full page bitmap images often print when partial memory is selected. For additional information about system memory allocation, see Section 4.2.4. Table 4–23 describes the page buffers selections.

Table 4–23 Page Buffer Feature

Feature	Values	Description
PAGE BUFFERS	PARTIAL[1]	Reserves no memory for bitmap pages; the memory is allocated dynamically.
	1 FULL[2]	Directs the printer to allocate memory space for one full bitmapped A4 or Letter-size page. The 1 FULL setting eliminates page complexity errors but may slow the printer down if all pages require a full bitmap.
	2 FULL[3]	Directs the printer to allocate memory space for two full bitmapped A4 or Letter-size pages. The 2 FULL setting guarantees printing in duplex mode.
	1 FULL LONG[2]	Directs the printer to allocate memory space for one full bitmapped Legal-size page.
	2 FULL LONG[3]	Directs the printer to allocate memory space for two full bitmapped Legal-size pages.

[1]Factory default setting

[2]Displayed when at least 2 MB of optional memory is installed

[3]Displayed when at least 4 MB of optional memory is installed

4.4.3.9 Symbol Set

The symbol set defines the character set to be used with the selected font. These symbol sets are designed to accommodate specific applications or language requirements. For example, the SPANISH character set contains symbols that apply specifically to the Spanish language.

The following symbol sets are always shown on the Font Status Sheet for resident fonts:

- ROMAN-8
- ECMA94
- PC8
- PC8DN

The remaining symbol sets appear on the Font Status Sheet only if they are selected from the menu. See Figure 4–13 for an example of the symbol sets listed on the Font Status Sheet. For more information about choosing a font, see Section 4.4.3.4.

Table 4–24 lists all of the available symbol sets.

Table 4–24 Symbol Set

Feature	Values	Values	Values
SYMBOL SET	ROMAN-8[1]	ECMA94	PC8
	PC8DN	PC850	LJ GERMAN
	LJ SPANISH	LJ LEGAL	ISO2
	ISO4	ISO6	ISO10
	ISO11	ISO14	ISO15
	ISO16	ISO17	ISO21
	ISO25	ISO57	ISO60
	ISO61	ISO69	ISO84
	ISO85		

[1]Factory default setting

4.4.4 PostScript Menu

This section describes the features and values in the PostScript protocol menu. Figure 4–10 shows a block diagram of the PostScript protocol menu.

PostScript is displayed as the protocol selection only when the PostScript option is installed and activated. If the option is not installed, POSTSCRIPT will not be shown as a protocol selection.

One important difference between the PostScript menu and other protocol menus is that *features are automatically saved in NVRAM when they are selected*. In other words, you do not have to go to the Defaults menu to save features in NVRAM. See Section 4.6 for additional information about Defaults menu functions when PostScript protocol is selected.

NOTE

All of these setup features can also be controlled by PostScript commands. See Appendix C for additional information about the PostScript operators.

4.4.5 System Memory Allocation for PostScript Protocol

The DEClaser 3200 printer comes standard with 1 MB of system memory. The PostScript option comes with three 2 MB SIMMs, for a total of 7 MB of system memory with the option installed. This base configuration allows the printer to process jobs of normal complexity and data volume at rated speed in simplex mode (about 13 pages per minute) for Letter and A4-size paper, even with the JAM RECOVERY feature enabled (Legal-size paper runs slightly slower). This configuration is sufficient for most PostScript printing jobs, but may not be adequate for some applications. Printer speed depends on the complexity of your application, whether you print in simplex or duplex mode, and whether or not jam recovery is desired. In addition, communication channel characteristics, such as baud rate, must also be taken into consideration when evaluating printer performance. Adding optional memory can improve printer performance and capability.

Available Scratch Memory (VM)

If a PostScript file fails to print and a VM error is returned to the host system, it is because the PostScript scratch memory limit was exceeded by a complex print job. Scratch memory can be increased to prevent this type of error by adding optional memory.

Font Cache

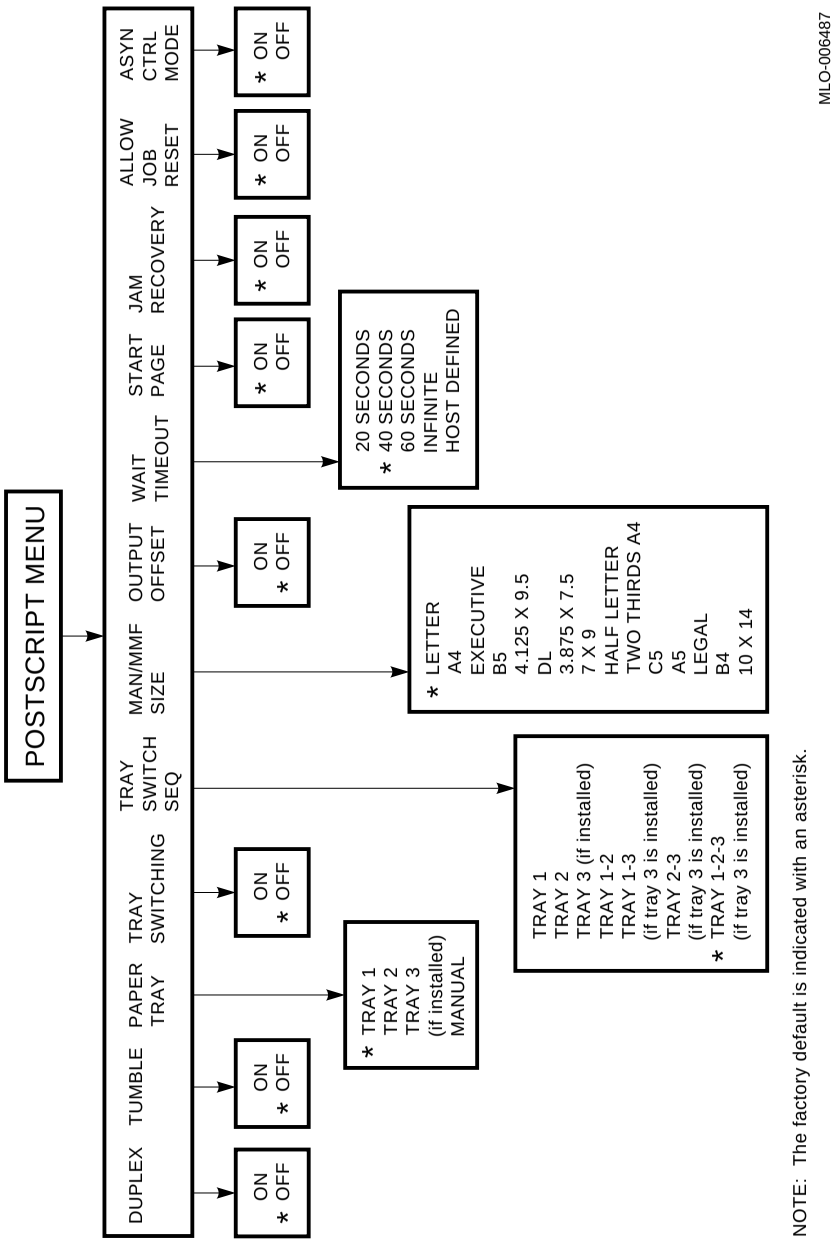
Frequently used characters can be stored in machine memory for re-use, improving overall printer performance. If your documents use a large variety of type styles or sizes, a larger font cache can improve performance markedly.

Use Table 4–25 as a guide to determine how much additional memory is required to enhance printer performance for your particular application. Optional memory can be purchased in 2 MB single in-line memory modules (SIMM's). See Appendix G for ordering information.

Table 4–25 PostScript Memory Allocation

Number of Optional 2 MB SIMMs	Total System Memory	Application Support Provided
0	7 MB (standard)	Simplex printing can be performed at rated speed (about 13 pages per minute) with JAM RECOVERY enabled, for Letter and A4-size paper (Legal-size paper runs slightly slower). Duplex printing at rated engine speed (about 11 pages per minute) can be performed with JAM RECOVERY disabled, for Letter, A4, and Legal-size paper.
1	9 MB	Duplex printing at rated engine speed is achievable with JAM RECOVERY enabled, for Letter and A4-size paper. Available scratch memory (PostScript VM) is increased by 25%.
2	10.5 MB	Duplex printing at rated engine speed can be performed with JAM RECOVERY enabled, for Letter, A4, and Legal-size paper. Available scratch memory (PostScript VM) nearly doubles over the 9 MB configuration. Font cache is increased by 40% over the 7 or 9 MB configurations. **NOTE:** *10.5 MB is the maximum amount of system memory available. See your SIMM installation guide for additional information.*

Figure 4–10 PostScript Menu



NOTE: The factory default is indicated with an asterisk.

4.4.5.1 Duplex

The duplex feature controls whether the printer writes data on one side of a sheet (called *simplex* printing), or on both sides of the sheet (called *duplex* printing).

Table 4–26 Duplex

Feature	Values	Description
DUPLEX	ON	Selects the duplex mode of operation.
	OFF[1]	Selects the simplex mode of operation.

[1]Factory default setting

4.4.5.2 Tumble

The tumble feature determines if the page is to be bound on the short edge of the paper. Binding is normally along the long edge of the paper (for example, this manual is bound on the long edge), but some jobs, such as legal documents, require binding along the short edge.

Table 4–27 Tumble

Feature	Values	Description
TUMBLE	ON	Binding is along the short edge of the paper.
	OFF[1]	Binding is along the long edge of the paper.

[1]Factory default setting

4.4.5.3 Paper Tray

The paper tray feature allows you to select the tray that feeds paper to the printer. This menu contains selections for the optional large capacity input tray (LCIT) and the multi-media feeder (MMF). The MANUAL/MMF value is displayed whether you are using the manual feed tray or the MMF.

Table 4–28 lists the tray selections.

Table 4–28 Paper Tray

Feature	Values	Description
PAPER TRAY	TRAY 1[1]	Paper feeds from the upper paper cassette.
	TRAY 2	Paper feeds from the lower paper cassette.
	TRAY 3[2]	Paper feeds from the optional LCIT.
	MANUAL/MMF	Selects the manual feed mode of operation, or the optional multi-media feeder if it is installed.
		If you are using the manual feed tray, you must also select the proper paper size. See Section 4.4.5.6 for information about the paper size selections.

[1]Factory default setting

[2]Displayed only if the LCIT option is installed.

4.4.5.4 Tray Switching

The tray switching feature is used in conjunction with the TRAY SWITCH SEQ feature described in Section 4.4.5.5 to designate if the paper tray fail-over sequence is enabled.

Table 4–29 Tray Switching

Feature	Values	Description
TRAY SWITCHING	ON	Enables the TRAY SWITCH SEQ feature allowing paper tray fail-over to occur.
	OFF[1]	Disables TRAY SWITCHING so that the TRAY SWITCH SEQ feature cannot be activated.

[1]Factory default setting

4.4.5.5 Tray Switch Sequence

The tray switch sequencing feature lets you feed from the selected tray until it runs out of paper, and then automatically switches over to the second or third tray to continue printing. You can then load paper into the empty cassette while feeding from the second cassette (if you are printing in simplex mode). This feature allows you to print continuously for larger print jobs when the same size paper is used in each of the sequenced trays. If the same size paper is not used in the trays, failover will not occur and the job will not print.

Note

When printing in duplex mode, you cannot add paper to the top cassette while continuing to print from another tray. The top cassette *must* be installed in order to print in duplex mode.

The TRAY SWITCH SEQ feature establishes that the failover order of the paper trays will occur when TRAY SWITCHING = ON (see Section 4.4.5.4). If TRAY SWITCHING = OFF, the TRAY SWITCH SEQ feature does not function.

Table 4–30 lists the tray selections.

Table 4–30 Tray Switch Sequence

Feature	Values	Description
TRAY SWITCH SEQ	TRAY 1	Feeds paper from the upper paper cassette
	TRAY 2	Feeds paper from the lower paper cassette
	TRAY 3	Feeds paper from TRAY 3
	TRAY 1-2	Feeds paper from TRAY 2 when TRAY 1 is empty
	TRAY 1-3	Feeds paper from TRAY 3 when TRAY 1 is empty
	TRAY 2-3	Feeds paper from TRAY 3 when TRAY 2 is empty
	TRAY 1-2-3[1]	Feeds paper from TRAY 2 when TRAY 1 is empty Feeds paper from TRAY 3 when TRAY 2 is empty

[1]Factory default setting.

4.4.5.6 Manual/Multi-Media Feeder Size

MAN/MMF SIZE indicates the paper size when using the manual feed tray, or the paper size used in the multi-media feeder if it is installed. The page is formatted to the size selected, regardless of the actual paper size used. This feature only functions when the paper tray selection is MAN/MMF (Section 4.4.5.3).

For information about feeding paper manually, see Section 2.7.

Table 4–31 Manual/Multi-Media Paper Sizes

Feature	Values	Description
MAN/MMF SIZE	LETTER[1]	Selects 8.5 in. x 11 in. paper size
	A4	Selects 210 mm x 297 mm paper size
	EXECUTIVE	Selects 7.25 in. x 10.5 in. paper size
	B5 (JIS)	Selects 182 mm x 257 mm paper size
	4.125 X 9.5	Selects #10 business envelope size
	DL	Selects 110 mm x 220 mm envelope size
	3.875 X 7.5	Selects 3.875 in. x 7.5 in. envelope size
	7 X 9	Selects 7 in. x 9 in. paper size
	HALF LETTER	Selects 5.5 in. x 8.5 in. paper size
	TWO THIRDS A4	Selects 198 mm x 210 mm paper size
	C5	Selects 162 mm x 229 mm envelope size
	A5	Selects 148 mm x 210 mm paper size
	LEGAL	Selects 8.5 in. x 14 in. paper size
	B4 (JIS)	Selects 257 mm x 364 mm paper size
	10 X 14	Selects 10 in. x 14 in. paper size

[1]Factory default setting

4.4.5.7 Output Offset

The output offset feature allows PostScript jobs to use the output tray offset positioning feature to separate the jobs as they are printed.

Table 4–32 Output Offset

Feature	Values	Description
OUTPUT OFFSET	ON	Enables the output tray offset feature to separate print jobs.
	OFF[1]	Disables the output tray offset feature; print jobs will not be separated.

[1]Factory default setting

4.4.5.8 Wait Timeout

The wait timeout feature determines the period of time the printer waits before aborting a job. The HOST DEFINED setting will be displayed when the timeout period is defined by the PostScript program itself.

Table 4–33 Wait Timeout

Feature	Values	Description
WAIT TIMEOUT	20 SECONDS	Aborts the print job 20 seconds after receiving the last character.
	40 SECONDS[1]	Aborts the print job 40 seconds after receiving the last character.
	60 SECONDS	Aborts the print job 60 seconds after receiving the last character.
	INFINITE	There is no time limit after receiving the last character.
	HOST DEFINED	This setting is displayed when the timeout period is set by the PostScript program.

[1]Factory default setting

4.4.5.9 Start Page

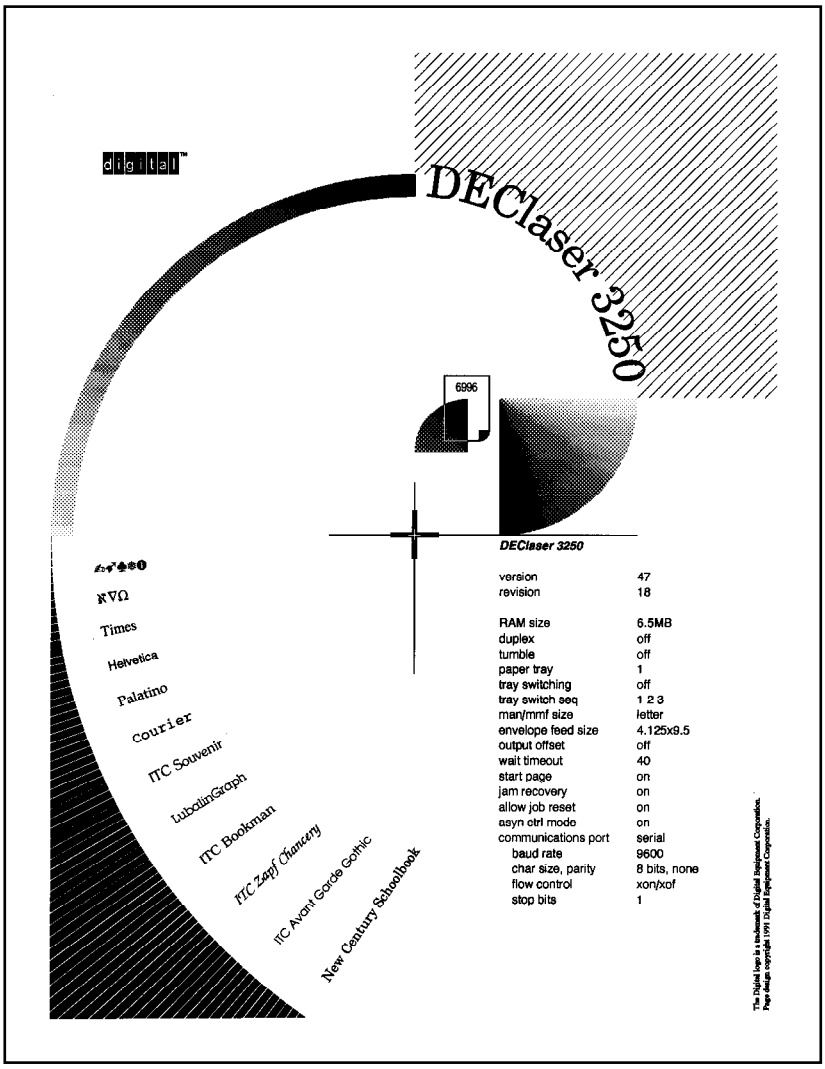
The start page feature determines whether the PostScript start page is printed each time the PostScript protocol is activated. The start page shows the fonts available, and lists all of the current settings for the PostScript menu (Figure 4–11).

Table 4–34 Start Page

Feature	Values	Description
START PAGE	ON[1]	The start page is printed when the PostScript protocol is activated.
	OFF	The start page is not printed when the PostScript protocol is activated.

[1]Factory default setting

Figure 4–11 Start Page



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4.4.5.10 Jam Recovery

The jam recovery feature ensures the printer's recovery from paper jams without losing data. This means the printer will automatically reprint any pages that jammed, and the host will not have to resend the job.

For information about memory allocation and how it affects jam recovery, see PostScript Memory Allocation under Section 4.4.4.

Table 4–35 Jam Recovery

Feature	Values	Description
JAM RECOVERY	ON	Ensures recovery from paper jams without losing data.
	OFF[1]	No guarantee that the printer will recover from data loss due to printer jams.

[1]Factory default setting

4.4.5.11 Allow Job Reset

The allow job reset feature described in Table 4–36 enables you to reset (abort) the current print job being processed from the control panel. Table 4–37 describes the procedure to abort a print job from the control panel.

NOTE

The current print job can always be aborted from the host, regardless of the ALLOW JOB RESET setting.

Table 4–36 Allow Job Reset

Feature	Values	Description
ALLOW JOB RESET	ON[1]	Allows you to abort a print job from the control panel.
	OFF	Print jobs cannot be aborted from the control panel.

[1]Factory default setting

Aborting a Print Job

Use the procedure in Table 4–37 to abort a print job from the control panel (when ALLOW JOB RESET is set to ON).

Table 4–37 Aborting a Print Job

Operation	Resulting Display Reads
1. Press Online/Pause to pause the printer.	PAUSED (printer status)
– The Online indicator goes off.	
2. Press * .	JOB FLUSHED (momentarily) PAUSED (printer status)
3. Press Online/Pause to place the printer back on line.	READY (printer status)
– The Online indicator lights.	
– The printer accepts the next job.	

4.4.5.12 Asynchronous Control Mode

The asynchronous control mode feature determines whether the CTRL C and CTRL T codes are handled *synchronously* within the data stream, or *asynchronously* at the communications handler.

Table 4–38 Asynchronous Control Mode

Feature	Values	Description
ASYN CTRL MODE	ON[1]	Control codes are handled asynchronously.
	OFF	Control codes are handled synchronously.

[1]Factory default setting

4.4.6 Adjustable Cassette

The adjustable cassette feature defines the paper size used in the adjustable paper cassette. This feature is used only when an adjustable paper cassette is installed (see Section 2.6 for additional information about using adjustable paper cassettes). It is not used for single-size paper cassettes, which are keyed for one-size paper operation. The page is formatted to the size selected, regardless of the actual paper size in the cassette. If your application requires a paper size other than those listed in the menu, measure the size of your paper and select the next larger size in the menu.

CAUTION

If the paper in the cassette is shorter than the selected paper size in the menu, the printer will jam.

Table 4–39 lists the adjustable cassette paper size selections.

Table 4–39 Adjustable Paper Cassette Sizes

Feature	Values	Description
CASSETTE A	LETTER[1]	Selects 8.5 in. x 11 in. paper size
or	A4	Selects 210 mm x 297 mm paper size
CASSETTE B	215 X 315	Selects 215 mm x 315 mm paper size
	210 X 330	Selects 210 mm x 330 mm paper size
	8 X 13	Selects 8 in. x 13 in. paper size
	8.5 X 13	Selects 8.5 in. x 13 in. paper size
	LEGAL	Selects 8.5 in. x 14 in. paper size
	8 X 10	Selects 8 in. x 10 in. paper size
	EXECUTIVE	Selects 7.25 in. x 10.5 in. paper size
	215 X 275	Selects 215 mm x 275 mm paper size

[1]Factory default setting

4.4.7 Alarm

The alarm feature described in Table 4–40 determines whether the printer sounds an audible alarm (“beep”) when an error, such as a paper jam, occurs.

Table 4–40 Alarm Feature

Feature	Values	Description
ALARM	ONCE[1]	Sounds a beep one time when the printer encounters an error condition.
	3 TIMES	Sounds a beep three times when the printer encounters an error condition.
	CONTINUOUS	Sounds a beep continuously until the error condition is cleared.
	DISABLED	No alarm sounds when the printer encounters an error condition.

[1]Factory default setting

4.4.8 Communications Interface

The DEClaser 3200 printer supports both parallel and serial interface connections. The interface must match the type used by the host computer as described in Table 4–41.

You cannot make communications interface selections using commands from the host computer. All values must be selected from the control panel. Once you make the selections, save them in NVRAM so that they will be activated (loaded into operational memory) each time the printer is powered on (see Section 4.6).

Table 4–41 Communications Interface

Feature	Values	Description
COMM INTERFACE	SERIAL[1]	Selects the serial interface to communicate with the host computer. Select this value if your computer uses a serial interface.
		When SERIAL is selected, you must select values for all the other features (baud rate, parity, and so on) in the Serial menu (see Section 4.4.9).
	PARALLEL	Selects the (Centronics) parallel interface to communicate with the host computer. Select this value if your printer uses a parallel interface.

[1]Factory default setting

4.4.9 Serial Menu

The Serial menu contains the features used to interface with the host using a serial interface. Make selections from this menu when SERIAL has been selected from the Communications Interface feature, Section 4.4.8.

4.4.9.1 Baud Rate

The baud rate feature is used to set the printer transmit and receive speed used to communicate with the host computer. The printer speed must match the speed used by the host computer.

Table 4–42 Baud Rate

Feature	Values	Description
BAUD RATE	1200 2400 4800 9600[1] 19200 38400	Sets the transmit and receive speed of the printer.

[1]Factory default setting

4.4.9.2 Parity

The parity feature determines the format the printer uses to communicate with the host computer. The first part of the value (7 or 8) is the number of data bits the printer expects to see in each character it receives. The second part of the value is the type of parity bit the printer looks for in each character. A parity check is a method used to detect errors when data is sent over a communications line. Some systems use an odd or even parity checking bit to detect errors, while others use a mark or space to indicate the presence of a signal (Mark=1, Space=0). Format for both the data bits and parity bit must match the format of the host computer for the printer and host to communicate.

Table 4–43 Parity

Feature	Values	Description
PARITY	8 BIT NONE[1]	Uses 8 data bits with no parity check.
	7 BIT ODD	Uses 7 data bits plus an odd parity check.
	7 BIT EVEN	Uses 7 data bits plus an even parity check.
	7 BIT MARK	Uses 7 data bits plus a mark parity check.
	7 BIT SPACE	Uses 7 data bits plus a space parity check.
	8 BIT ODD	Uses 8 data bits plus an odd parity check.
	8 BIT EVEN	Uses 8 data bits plus an even parity check.

[1]Factory default setting

4.4.9.3 Flow Control

The flow control feature selects the method used to regulate the flow of data to the input buffer of the printer and to the host.

The XON/XOFF value uses software to regulate the flow of data to the input buffer of the printer. It is sometimes referred to as software handshaking protocol, a method the printer and the host computer use to exchange on/off signals. These signals prevent the input buffer from overflowing with data. If handshaking is not enabled, and the input buffer becomes full, the overflowing data will be lost. XON/XOFF must be enabled in systems that use this software handshaking protocol to prevent the loss of data.

The data terminal ready (DTR) value uses hardware to regulate the flow of data to the input buffer of the printer. The printer transmits a signal to the DTR line of the serial port when it is ready to receive data. This is sometimes referred to as hardware handshaking protocol.

Note

When using the DTR feature with Digital systems, the DTR value should always be set to DTR READY HIGH. When the DTR signal is fixed high, it indicates to the system that the printer is present and ready to receive data.

Table 4–44 describes the selections for the flow control feature.

Table 4–44 Flow Control

Feature	Values	Description
FLOW CONTROL	XON/XOFF 2-WAY[1]	Controls data flow from the printer to the host and from the host to printer using XON/XOFF control characters.
	XON/XOFF 1-WAY	Controls the data flow from the host to printer only.
	DTR READY HIGH	Sets the data terminal ready (DTR) line to a fixed high signal to indicate the printer is ready to receive data from the host.
	DTR READY LOW	Sets the data terminal ready (DTR) line to a fixed low signal to indicate the printer is ready to receive data from the host.

[1]Factory default setting

4.4.10 Display Language

The language feature lets you display messages in any of the languages listed in Table 4–45. Status messages, error messages, printer menus, and the configuration sheet are displayed in the selected language. Service call messages are only displayed in English.

You cannot select this feature using commands from the host computer. You must select the language from the control panel. You can then save the setting in NVRAM (see Section 4.6) so it is invoked each time the printer is powered-up.

Table 4–45 Language

Feature	Values	Description
LANGUAGE	ENGLISH[1] FRENCH DUTCH SPANISH ITALIAN GERMAN	Displays messages in the selected language.

[1]Factory default setting

4.4.11 Communications Error Feature

The communications feature can be set to either stop printing or to continue printing when the printer encounters a communication error during data transmission. Table 4–46 describes the communication error selections.

Table 4–46 Communications Error

Feature	Values	Description
COMM ERROR	CONTINUE[1]	Overrides any communication errors and continues printing.
	HALT	Displays an error message when a communications error is encountered and stops printing until the error is bypassed. Press [*] to display the next error message (if any). If there are no other error messages, printing and processing continue.

[1]Factory default setting

4.5 Test Menu

The Test menu is used to print the printer configuration sheet and the font status sheets. Table 4–47 describes the features in the Test menu.

NOTE

The Test menu is not functional when the optional PostScript protocol is active. You must select either the DEC PPL3 or LJ2D protocol to print the configuration sheet or font status sheets.

Table 4–47 Test Menu

Menu	Feature	Description
TEST MENU	CONFIG SHEET	Prints the configuration sheet that lists all the printer operating parameters (Section 4.5.1).
	FONT STATUS	Prints the font status sheets that show the printer fonts available (Section 4.5.2).

4.5.1 Printing the Configuration Sheet

Selecting CONFIG SHEET from the Test menu prints the configuration sheet which lists the total print count, available memory, and all of the operating parameters that are saved and currently in use. Figure 4–12 is an example of the configuration. You can print a copy of the configuration sheet to verify all the printer operating parameters, or to determine the total print count and available memory.

NOTE

You must select either the DEC PPL3 or LJ2D protocol to print the configuration sheet.

Figure 4–12 Configuration Sheet

DECLASER 3200 Printer Page Count 11595

Protocol Firmware: V1.0 Page Description Language : PostScript
Engine Firmware: V1.0 Co-processor : Installed
Total System Memory: 2324932 Available Memory : 6494148 bytes

Set Up Menu Settings

Feature Name	Saved Settings	Current Setting
PROTOCOL	LJ2D	DEC PPL3
ADJ CASSETTE		
CASSETTE A	EXECUTIVE	LETTER
CASSETTE B	LETTER	LETTER
ALARM	ONCE	ONCE
COMM INTERFACE	PARALLEL	SERIAL
BAUD RATE	NA	9600
PARITY	NA	8 BIT NONE
FLOW CONTROL	NA	XON/XOFF 1-WAY
DISPLAY LANGUAGE	ENGLISH	ENGLISH
COMM ERROR	HALT	CONTINUE
DEC PPL3		
TRAY SELECTION	TRAY 1	TRAY 1
DUPLEX	SIMPLEX NORMAL	SIMPLEX NORMAL
MEMORY MGMT	PARTIAL	PARTIAL
AUTO WRAP	OFF	ON
NEW LINE	ON	OFF
USER PREF SET	DEC SUPPLMT SET	DEC SUPPLMT SET
DEVICE ID	LNO 3	DEC PPL3
POWER-UP MESSAGE	OFF	OFF
LJ2D		
COPIES	1	1
TRAY SELECTION	TRAY 1	TRAY 1
DUPLEX	DISABLED	DISABLED
FONT NUMBER	500	1
PAPER SIZE	LETTER	LETTER
ORIENTATION	PORTRAIT	PORTRAIT
FORM LENGTH	7	60
PAGE BUFFERS	PARTIAL	PARTIAL
SYMBOL SET	ROMAN-6	ROMAN-8
POSTSCRIPT		
DUPLEX	ON	ON
TUMBLE	ON	ON
PAPER TRAY	TRAY 1	TRAY 1
TRAY SWITCHING	ON	ON
TRAY	TRAY 1-2-3	TRAY 1-2-3
MAN/MMF SIZE	EXECUTIVE	EXECUTIVE
OUTPUT OFFSET	ON	ON
WAIT TIMEOUT	20 SECONDS	20 SECONDS
START PAGE	OFF	OFF
JAM RECOVERY	OFF	OFF
ALLOW JOB RESE	ON	ON
ASYN CTRL MODE	ON	ON

To order your DECLASER 3200 family supplies options, contact your local Digital Sales office or Authorized Digital Distributor.

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4.5.2 Printing the Font Status Sheets

Selecting FONT STATUS from the Test menu prints the font status sheets which show the available printer fonts. Figure 4–13 shows an example of the DEC PPL3 font status sheet. For additional information about fonts for the DEClaser 3200 printer, see Appendix F.

NOTE

You must select either the DEC PPL3 or LJ2D protocol to print the font status sheet.

Figure 4–13 Font Status Sheet

FONT LIST

Type Family	Font File ID	Sample
RESIDENT		
RCOURIR	RCOURIR202SK00GG0001UZZZ02F000	AaAaBbCcDdEe1234567890
RCOURIR	RCOURIR202SK00GG00245ZZZ02F000	ÁáÁáÂâÃãÄäÅå±²³ ʕµ¶· ʕ¹°
RCOURIR	RCOURIR202SK00GG006DDZZZ02F000	ÁáÁáÂâÃãÄäÅå±²³´µ¶· ¸¹°
RCOURIR	RCOURIR202SK00GG0001QZZZ02F000	∝α∝α∞β+χΔδ∇ε⌐∠√¬⌐⟩ʕʕ⟩
RCOURIR	RCOURIR202SK00GG0001CZZZ02F000	A▒A▒B␉C␌D␍E␊1234567890
RCOURIR	RCOURIR202SK00GG0024DZZZ02F000	A⅃A⅃B⅄ C⅂D∩E⅂ 1234567890
RCOURIR	RCOURIR202SK00GG006DKZZZ02F000	ʕ⅃ʕ⅃ʕ⅄ ʕ⅂ʕ∩ʕ⅂ ±²³´µ¶· ¸¹°
RCOURIR	RCOURIR202SK00GG001TGZZZ02F000	ʕ⅃ʕ⅃ʕ⅄ ʕ⅂ʕ∩ʕ⅂ ±²³ ʕµ¶· ʕ¹°
RCOURIR	RCOURIR202SK00GG00244ZZZ02F000	AaAaBbCcDdEe1234567890
RCOURIR	RCOURIRJ02SK00GG0001UZZZ02F000	AaAaBbCcDdEe1234567890
RCOURIR	RCOURIRJ02SK00GG00245ZZZ02F000	ÁáÁáÂâÃãÄäÅå±²³ ʕµ¶· ʕ¹°
RCOURIR	RCOURIRJ02SK00GG006DDZZZ02F000	ÁáÁáÂâÃãÄäÅå±²³´µ¶· ¸¹°
RCOURIR	RCOURIRJ02SK00GG0001QZZZ02F000	∝α∝α∞β+χΔδ∇ε⌐∠√¬⌐⟩ʕʕ⟩
RCOURIR	RCOURIRJ02SK00GG0001CZZZ02F000	A▒A▒B␉C␌D␍E␊1234567890
RCOURIR	RCOURIRJ02SK00GG0024DZZZ02F000	A⅃A⅃B⅄ C⅂D∩E⅂ 1234567890
RCOURIR	RCOURIRJ02SK00GG006DKZZZ02F000	ʕ⅃ʕ⅃ʕ⅄ ʕ⅂ʕ∩ʕ⅂ ±²³´µ¶· ¸¹°
RCOURIR	RCOURIRJ02SK00GG001TGZZZ02F000	ʕ⅃ʕ⅃ʕ⅄ ʕ⅂ʕ∩ʕ⅂ ±²³ ʕµ¶· ʕ¹°
RCOURIR	RCOURIRJ02SK00GG00244ZZZ02F000	AaAaBbCcDdEe1234567890
RCOURIR	RCOURIR101VK00GG0001UZZZ02F000	[illegible]
RCOURIR	RCOURIR101VK00GG00245ZZZ02F000	[illegible]
RCOURIR	RCOURIR101VK00GG006DDZZZ02F000	[illegible]
RCOURIR	RCOURIR101VK00GG0001QZZZ02F000	[illegible]
RCOURIR	RCOURIR101VK00GG0001CZZZ02F000	[illegible]
RCOURIR	RCOURIR101VK00GG0024DZZZ02F000	[illegible]
RCOURIR	RCOURIR101VK00GG006DKZZZ02F000	[illegible]
RCOURIR	RCOURIR101VK00GG001TGZZZ02F000	[illegible]
RCOURIR	RCOURIR101VK00GG00244ZZZ02F000	[illegible]
RELITE0	RELITE0L02SK00GG0001UZZZ02F000	AaAaBbCcDdEe1234567890
RELITE0	RELITE0L02SK00GG00245ZZZ02F000	ÁáÁáÂâÃãÄäÅå±²³ ʕµ¶· ʕ¹°
RELITE0	RELITE0L02SK00GG006DDZZZ02F000	ÁáÁáÂâÃãÄäÅå±²³´µ¶· ¸¹°
RELITE0	RELITE0L02SK00GG0001QZZZ02F000	∝α∝α∞β÷χΔδ∇ε⌐∠√¬⌐⟩ʕʕ⟩
RELITE0	RELITE0L02SK00GG0001CZZZ02F000	A▒A▒B␉C␌D␍E␊1234567890
RELITE0	RELITE0L02SK00GG0024DZZZ02F000	A⅃A⅃B⅄ C⅂D∩E⅂ 1234567890
RELITE0	RELITE0L02SK00GG006DKZZZ02F000	ʕ⅃ʕ⅃ʕ⅄ ʕ⅂ʕ∩ʕ⅂ ±²³´µ¶· ¸¹°
RELITE0	RELITE0L02SK00GG001TGZZZ02F000	ʕ⅃ʕ⅃ʕ⅄ ʕ⅂ʕ∩ʕ⅂ ±²³ ʕµ¶· ʕ¹°
RELITE0	RELITE0L02SK00GG00244ZZZ02F000	AaAaBbCcDdEe1234567890
DBULTN1	DBULTN1202SK00GG0001UZZZ02F000	AaAaBbCcDdEe1234567890
DBULTN1	DBULTN1202SK00GG00245ZZZ02F000	ÁáÁáÂâÃãÄäÅå±²³ ʕµ¶· ʕ¹°
DBULTN1	DBULTN1202SK00GG006DDZZZ02F000	ÁáÁáÂâÃãÄäÅå±²³´µ¶· ¸¹°
D000000	D000000202SK00GG0001QZZZ02F000	∝α∝α∞β+χΔδ∇ε⌐∠√¬⌐⟩ʕʕ⟩
D000000	D000000202SK00GG0001CZZZ02F000	A▒A▒B␉C␌D␍E␊1234567890
DBULTN1	DBULTN1202SK00GG0024DZZZ02F000	A⅃A⅃B⅄ C⅂D∩E⅂ 1234567890
DBULTN1	DBULTN1202SK00GG006DKZZZ02F000	ʕ⅃ʕ⅃ʕ⅄ ʕ⅂ʕ∩ʕ⅂ ±²³´µ¶· ¸¹°
DBULTN1	DBULTN1202SK00GG001TGZZZ02F000	ʕ⅃ʕ⅃ʕ⅄ ʕ⅂ʕ∩ʕ⅂ ±²³ ʕµ¶· ʕ¹°
DBULTN1	DBULTN1202SK00GG00244ZZZ02F000	AaAaBbCcDdEe1234567890
DBULTN1	DBULTN1J02SK00GG0001UZZZ02F000	AaAaBbCcDdEe1234567890
DBULTN1	DBULTN1J02SK00GG00245ZZZ02F000	ÁáÁáÂâÃãÄäÅå±²³ ʕµ¶· ʕ¹°
DBULTN1	DBULTN1J02SK00GG006DDZZZ02F000	ÁáÁáÂâÃãÄäÅå±²³´µ¶· ¸¹°
D000000	D000000J02SK00GG0001QZZZ02F000	∝α∝α∞β+χΔδ∇ε⌐∠√¬⌐⟩ʕʕ⟩
D000000	D000000J02SK00GG0001CZZZ02F000	A▒A▒B␉C␌D␍E␊1234567890

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4.6 Defaults Menu

The Defaults menu is used to perform the following functions:

- Reset the printer
- Recall the default settings programmed at the factory
- Recall customized user default settings stored in NVRAM
- Save changed settings in NVRAM

The features in the Defaults menu relate directly to the types of memory the printer uses to store settings. See Section 4.2 for additional information about printer configuration memory.

Table 4–48 describes the Defaults menu features.

Table 4–48 Defaults Menu

Menu	Feature	Description
DEFAULTS MENU	PRINTER RESET[1]	**PPL3:** Resets the printer to the power-up state. Loads the user default settings into operating memory. **LJ2D:** Performs a printer reset restoring the printer to its initial state.
	RECALL FACT DFT	Loads the factory default settings from ROM into the operating memory for current use.
	RECALL USER DFT[1]	Loads the settings saved by the user from NVRAM into the operating memory for current use.
	SAVE DEFAULTS[1]	Saves the currently selected features and values in NVRAM. Settings stored in NVRAM are called “user default” settings, and are loaded into the operating memory each time the printer is powered on.

[1]Available with DEC PPL3 and LJ2D protocols only

5
Print Media

This chapter describes the print media that are appropriate for use with the DEClaser 3200 printer. The types of print media described in this chapter are paper, labels, transparencies, and envelopes.

The DEClaser 3200 printer produces excellent print quality using electrophotographic laser technology. The laser printing process differs greatly from that of a conventional impact printer, so paper selection is particularly important. Because toner is bonded to the paper as it passes through the heat and pressure rollers of the fusing unit, the paper must be able to withstand high heat and pressure. Photocopier paper is generally acceptable for use in the DEClaser 3200 printer.

CAUTION

Always select print media according to the instructions and specifications in this chapter. When selecting paper or other print media, print test samples on the media you want to use. Be sure to consider the heat limitations of transparencies and the glues used on envelopes and labels. The inks and pigments used on chemically treated or coated paper (such as preprinted forms or colored paper) must also be able to withstand the high heat and pressure of the fusing unit. Otherwise, damage to media and the printer may result.

Print quality can also deteriorate if paper is not stored properly. Read Section 5.5 for complete information about storing paper. For a complete listing of recommended print media and ordering information, see Appendix G.

5.1 Paper Specifications

This section contains information on the sizes and specifications of plain paper that can be used with the DEClaser 3200 printer. Single-size cassettes come in A4, Letter, or Legal sizes. The DEClaser 3200 printer can also use an optional adjustable size cassette that can be configured to accept various paper sizes. For information about the paper sizes that the adjustable paper cassette can accommodate, see Section 4.4.6.

The printer also has a manual feed tray that can accommodate the following range of paper sizes:

Width: 105 mm to 257 mm (4.125 in. to 10.12 in.)
Length: 191 mm to 364 mm (7.5 in. to 14.33 in.)

Table 5–1 lists paper specifications for the DEClaser 3200 printer.

Table 5–1 Paper Specifications

Category	Specification
Paper weight: plain paper	60 g/m^2 to 90 g/m^2 basis weight (16 lb. to 24 lb.)
Paper weight: envelopes	60 g/m^2 to 90 g/m^2 basis weight (16 lb. to 24 lb.)
Acid content	pH 5.5 minimum, (type 111 permanence)
Electrical resistivity	1×10^{10} to 1×10^{13} ohm-cm
Cutting accuracy	$\pm$ 0.7 mm from nominal
Cutting angle	90° $\pm$ 0.2°
Coefficient of friction	0.4 to 0.7
Moisture content	4% to 6%
Thickness	0.086 mm to 0.107 mm
Smoothness	100–300 Sheffield
Brightness	84% minimum recommended
Cotton (rag) content	25% maximum
Opacity	85% opaque minimum

5.1.1 Special Considerations When Printing on Paper

Because of the way laser printers bond toner to the paper, you must observe some special requirements with certain types of papers:

- The ink from some preprinted papers, such as those with a company letterhead, can cause smearing and, in some cases, could damage the printer. Do not use paper printed with Thermographics letterheads.
- Do not use colored papers where the color is applied as a coating to the surface.
- Do not use thermal papers.
- Do not use carbon papers.
- To prevent paper jams, do not load paper above the MAX limit line on the cassette.
- For simplex printing: load forms and letterhead paper facedown in the cassette, with the top edge inserted first.
- For duplex printing: load forms and letterhead paper faceup in the cassette, with the bottom edge inserted first.
- Load prepunched paper with the holes facing the front of the printer.

NOTE

See Appendix G for acceptable papers available from Digital.

5.2 Envelope Specifications

The DEClaser 3200 printer accepts the following sizes of envelopes for use with the manual feed tray:

- #10 Business (4.125 in. x 9.5 in.)
- Business (9 in. x 12 in.)
- Business (10 in. x 13 in.)
- C4 (229 mm x 324 mm)
- C5 (162 mm x 229 mm)
- DL or C5/6 (110 mm x 220 mm)

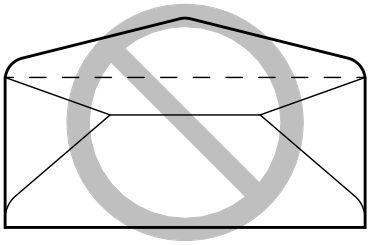
Envelopes must meet the same specifications as paper (see Table 5–1). Before feeding envelopes, check the following items:

- The sealing flap on #10 type business envelopes should run along the length of the envelope, not at the leading and trailing edges.
- The sealing flap should be folded properly, with none of the glue exposed.
- The leading and trailing edges should not be more than two layers thick.
- The envelope should be free of wrinkles or creases.

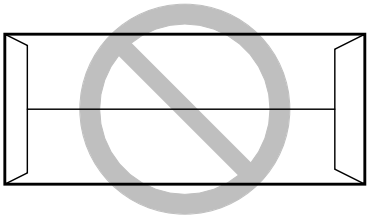
CAUTION

Do not use envelopes made of materials other than paper, or those that have fasteners or windows. Figure 5–1 shows the type of envelopes that cannot be used with the printer.

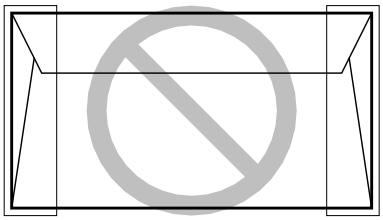
Figure 5–1 Unacceptable Envelopes



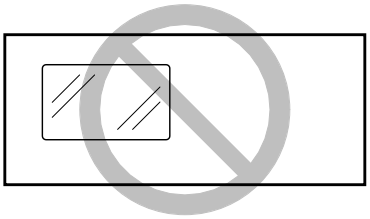
Open sealing flap



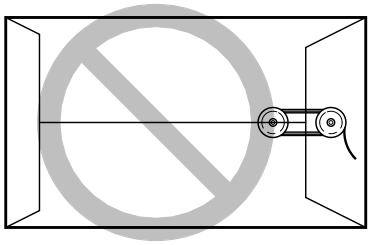
Sealing flaps at leading and trailing edges



Three or more layers at the leading and trailing edges



Transparent windows



Clasps, snaps, or strings

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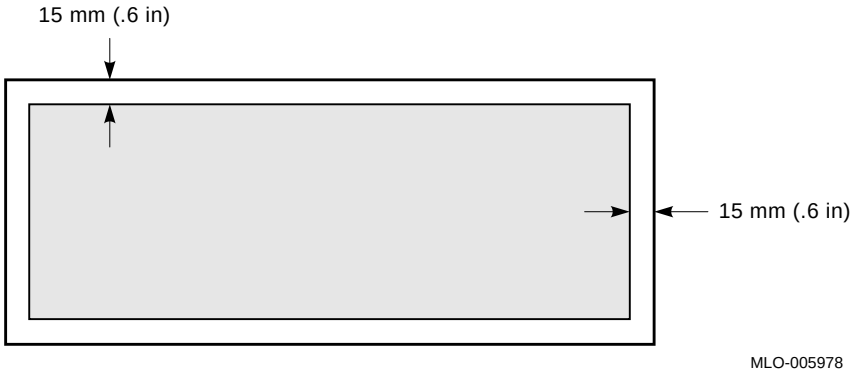
5.2.1 Special Considerations When Printing on Envelopes

Observe the following requirements when printing on envelopes:

- Feed envelopes from the manual feed tray one at a time (see Section 2.7.3).
- Print envelopes only on the front side.
- Since you need to print addresses in a particular area on envelopes, you must specify the proper print coordinates to print the addresses (see *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual* and *Digital ANSI-Compliant Printing Protocol Level 3 Programming Supplement*).
- Printing in the 15 mm (.6 in.) border around the envelope may cause print quality problems with some types of envelopes. For best print quality, do not print in this border.

Figure 5–2 Printing Border



5.3 Transparency Specifications

Table 5–2 and Table 5–3 contain information on the sizes and specifications of transparencies that can be used with the DEClaser 3200 printer.

Table 5–2 Transparency Sizes

Transparency Size	Dimensions
A4	210 mm x 297 mm
Letter	8.5 in. x 11 in.

Table 5–3 Transparency Specifications

Category	Specification
Transparency weight	142 ± 4 g/m^2 basis weight
Thickness	0.105 ± 0.005 mm
Material	Polyester (coated)
Curl	5.0 mm maximum
Cutting accuracy	± 0.7 mm from nominal
Cutting angle	90° ± 0.2°
Base heat stability	0.8 % maximum heat shrinkage at 195° C (385° F) for 15 minutes

5.3.1 Special Considerations When Printing on Transparencies

Observe the following requirements when printing on transparencies:

- Feed transparencies from the manual feed tray one at a time.
- It's preferable to remove transparencies from the output tray as each one is printed to prevent them from sticking to each other.

NOTE

See Appendix G for acceptable transparencies available from Digital.

5.4 Label Specifications

A self-adhesive label consists of a face sheet with an adhesive backing layer, and a carrier sheet. The carrier sheet and adhesive used for the labels must be able to meet the heat tolerance specification of 195°C (385°F) for at least 0.1 second.

CAUTION

Exposed adhesive on labels can cause damage to the printer. To test for adhesive that may be exposed, press a plain piece of paper on top of the sheet of labels. If the paper sticks to the labels, do not use those labels.

Table 5–4 lists the specifications for self-adhesive labels that can be used with the DEClaser 3200 printer.

Table 5–4 Self-Adhesive Label Specifications

Category	Specification
Face Sheet	51±4 g/m^2 basis weight
Backing Sheet	50±3 g/m^2 basis weight
Face Sheet Adhesive Coating	15.5±2.5 g/m^2 basis weight
Total Basis Weight	116.5±9.5 g/m^2
Total Thickness	0.125±0.010 mm
Moisture Content	4.5% to 7.0%

5.4.1 Special Considerations When Printing on Labels

Observe the following requirements when printing on labels:

- Feed labels from the manual feed tray one sheet at a time.
- Be sure the carrier sheet is not exposed.
- Be sure no adhesive is exposed.

NOTE

See Appendix G for acceptable labels available from Digital.

5.5 Paper Handling and Storage

Although you may be using paper that meets all specifications, improper handling and storage may affect the quality of the paper and the performance of the printer. This can cause paper jams, misfeeding, and other printer performance problems.

Follow the recommendations in this section on paper storage and handling to reduce the possibility of printer jams and misfeeds.

5.5.1 Paper Handling

Observe the following requirements when handling paper:

- Load paper cassettes to their proper capacity rather than adding small amounts at a time. Loading small amounts of paper can create air pockets between small stacks of paper, and this can cause paper jams.
- When you unwrap a new package of paper, discard the top and bottom sheets, as they tend to absorb the most humidity from the surrounding environment. Always store unused paper in its original wrapping. The wrapping protects the paper against humidity.
- Sudden changes in temperature or humidity can cause paper curl, leading to misfeeds and paper jams. If you bring paper from a storage location that differs greatly in temperature or humidity from the new location, leave the paper (unopened) for a day to allow it to adjust to the new environment.
- Check the paper for curl after printing a few pages. If an excessive amount of curl is present or multiple paper jams occur, try turning the stack of paper over in the cassette.
- Follow the instructions in Chapter 2 to properly load paper.

5.5.2 Paper Storage

Observe the following requirements when storing paper:

- Do not store paper directly on the floor, as floors are generally humid.
- Store paper on a flat surface to prevent paper curl.

6
Troubleshooting

This chapter contains troubleshooting information for the DEClaser 3200 printer. It is divided into the following sections:

- Common operating problems
- Communication errors
- Error messages
- Paper jams

6.1 Common Operating Problems

Table 6–1 lists common operating problems and their possible solutions. All corrective actions should be followed in the order in which they are listed. Before calling for service, check the table to solve printer problems

NOTE

Since many problems with print quality could be caused by a faulty or spent cartridge, it is recommended that you keep a spare toner, developer, and photoreceptor drum cartridge kits as replacements. Cartridge replacement instructions come with each kit.

Table 6–1 Common Operating Problems

Problem	Possible Cause	Corrective Action
No Power		
The printer does not turn on when you set the power switch to the | (ON) position.	The power source is defective.	Make sure the power cord is plugged into the wall outlet. Check that there is power at the wall outlet by plugging in a lamp to see if it lights. If the lamp does not light, call your building maintenance services to check the circuit supplying power to that outlet.
	The power cord is not connected or is damaged.	Check the power cord for damage and secure connections at the printer and at the wall outlet.
	The power supply fuse has blown.	Call for service (Chapter 8).
No Printout		
The printer status reads PAUSED.	The printer is in the paused state.	Press Online/Pause to place the printer on line.

(continued on next page)

Table 6–1 (Cont.) Common Operating Problems

Problem	Possible Cause	Corrective Action
No Printout		
The printer status reads READY.	The communications interface selections (baud rate, parity, and so on), do not match the host settings.	See Section 4.4.8 for information about these features.
	The interface cable is not connected properly.	Check the cable connections at the printer and at the host computer.
	Software or command problem.	Try printing the Configuration Sheet (Section 4.5). If the printer is able to print the Configuration Sheet, the problem is in the user command or software (consult your application/software manuals).
	The developer cartridge is damaged.	Replace the developer cartridge.
The printer status reads READY and the Last Page indicator is on.	Data are still in the print buffer.	Press [>] to print the remaining data.

(continued on next page)

Table 6–1 (Cont.) Common Operating Problems

Problem	Possible Cause	Corrective Action
Poor Printing		
Vertical/horizontal deletions or spots on the page.	Toner is not being dispersed evenly.	Remove the developer cartridge (with the toner cartridge still installed) and gently rock the cartridge 3 or 4 times to distribute the toner evenly within the cartridge. **NOTE:** You may want to do this over a piece of newspaper in case any residual toner falls from the cartridge. Reinstall the developer cartridge and print about 10 pages to confirm that the problem has been corrected.
	Dirty transfer/separation charger.	Clean the transfer/separation charger (Section 7.1).
	Paper is damp.	Replace with dry paper.
	Damaged photoreceptor drum cartridge.	Replace the photoreceptor drum cartridge.
Printing is too light.	The print density setting is incorrect.	Adjust the print density setting (Section 2.8).
	The drum cartridge is poorly grounded.	Remove and reinstall the drum cartridge.
	Faulty drum cartridge.	Replace the drum cartridge.
	Dirty transfer/separation charger.	Clean the transfer/separation charger (Section 7.1).
	Faulty transfer/separation charger.	Replace the transfer/separation charger.
	Paper is damp.	Replace with dry paper.
Printing is too dark.	The print density setting is incorrect.	Adjust the print density setting (Section 2.8).

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Table 6–1 (Cont.) Common Operating Problems

Problem	Possible Cause	Corrective Action
Poor Printing		
The page printed black.	Faulty power supply or board.	Call for service (Chapter 8).
The page printed blank.	The developer cartridge not installed properly.	Remove and reinstall the developer cartridge.
	Faulty developer cartridge.	Replace the developer cartridge.
	The toner cartridge has run out of toner.	Replace the toner cartridge.
Stray toner is fused to the paper.	The transfer/separation charger is dirty.	Clean the transfer/separation charger (Section 7.1).
	A new consumable cartridge was just installed.	Print several copies of the configuration sheet to remove any residual toner (see Section 4.5.1).
	The fusing unit rollers are dirty.	Replace the fusing unit cleaning pad.
	Faulty photoreceptor drum cartridge.	Replace the photoreceptor drum cartridge.
	The developer cartridge is not functioning properly.	Replace the developer cartridge.
The overall print quality is poor.	The print medium is not the recommended type.	See Chapter 5 for print media specifications.

(continued on next page)

Table 6–1 (Cont.) Common Operating Problems

Problem	Possible Cause	Corrective Action
Miscellaneous		
Frequent paper jams and torn or damaged prints.	Paper does not meet specifications.	See Chapter 5 for print media specifications.
	Paper is damp.	Reload with dry paper.
	Transfer/separation charger is not seated properly.	Remove and reseat transfer/separation charger.
	There is an obstruction in the paper path.	See Section 6.5 for instructions on clearing paper jams.
	The fusing unit gate is not closed.	Open the left side cover and close (lower) the fusing unit gate to its operating position.
	The paper is not loaded properly.	See Chapter 2 for information about loading paper in the cassettes.
Frequent paper jams and torn or damaged prints only in duplex mode.	The upper casette cover is dirty or damaged.	Clean the upper cassette cover. Replace the upper cassette.
The print is skewed (not aligned with the top edge of the paper).	Paper does not meet specifications.	See Chapter 5 for paper specifications.
	Paper is not loaded properly.	Remove and reload paper (Section 2.5).
Printed pages have corrupted characters.	Incorrect printer features were selected.	Print a Configuration Sheet and verify that the printer settings (baud rate, parity, and so on) match the host computer settings (Section 4.4.8).
	Defective font cartridge.	Replace font cartridge.

(continued on next page)

Table 6–1 (Cont.) Common Operating Problems

Problem	Possible Cause	Corrective Action
Miscellaneous		
Print lines overlap.	The vertical pitch setting is incorrect.	Correct the vertical pitch setting in your application program.
Page breaks occur.	Insufficient memory for complex pages.	Install additional memory. See Section 4.2.4 for additional information about system memory.
Printer is missing fonts.	Insufficient memory to load all fonts.	Install additional memory. See Section 4.2.4 for additional information about system memory.
PostScript VM errors occur.	Exceeded the scratch memory limit.	Install additional memory. See Section 4.4.5 for additional information about system memory.

6.2 Communication Errors

Communication errors result from the failure of the host computer to communicate properly with the printer. These errors can be caused by a faulty interface cable, or interruption in data flow.

Use the following procedure when you encounter a communication error.

1. Make sure the printer is on line.
   - Printer status reads READY.
2. Be sure the printer is configured correctly for your computer. For example, check the parity and baud rate settings to see that they match those of the host computer.
3. Check to see that the interface cable is properly connected to both the printer and host computer.
4. If the problem persists, set the COMM ERROR feature (Section 4.4.11) to HALT and run a reliable software application. If the problem still persists, try a different interface cable. If the new interface cable does not solve the problem, call Digital Customer Services and report the error code number (see Chapter 8 for service information).

6.3 Error, Supplies, and Service Messages

The DEClaser 3200 printer displays a message and an error code when the printer encounters a problem. Most error messages are self explanatory (for example, CLOSE TOP COVER), but in some cases you may need additional information. Table 6–2 lists error messages numerically by error code. The table details the message, its meaning, and the corrective action to be taken.

NOTE

To clear some paper jams, you may be required to access more than one area of the printer. Follow the corrective action indicated on the display panel, or the order listed in Table 6–2 to clear the jams. For additional information about clearing paper jams, see Section 6.5.

Table 6–2 Error, Supplies, and Service Messages

Message	Code	Meaning	Corrective Action
CLOSE TOP COVER	0103	Top cover is open.	Close the top cover.
CLOSE LEFT COVER	0104	Left side cover is open.	Close the left side cover.
CLOSE RIGHT COVER	0105	Right side cover is open	Close the right side cover.
CALL SERVICE	0300	RAM read/write test failure	Turn the printer off, and then turn it back on after 5 seconds. If this does not clear the error, call for service and report the error code.
CALL SERVICE	0301	ROM checksum test failure	Turn the printer off, and then turn it back on after 5 seconds. If this does not clear the error, call for service and report the error code.
CALL SERVICE	0302	DC control board microprocessor failure	Turn the printer off, and then turn it back on after 5 seconds. If this does not clear the error, call for service and report the error code.

(continued on next page)

Table 6–2 (Cont.) Error, Supplies, and Service Messages

Message	Code	Meaning	Corrective Action
CALL SERVICE	0305	Communications (ESS) board connection failure	Turn the printer off, and then turn it back on after 5 seconds. If this does not clear the error, call for service and report the error code.
CALL SERVICE	0312	NVRAM read/write failure	Turn the printer off, and then turn it back on after 5 seconds. If this does not clear the error, call for service and report the error code.
CALL SERVICE	0313	PROM checksum failure	Turn the printer off, and then turn it back on after 5 seconds. If this does not clear the error, call for service and report the error code.
CALL SERVICE	0401	Main motor failure	Call for service and report the error code.
CALL SERVICE	0600	Start of scan is late.	Call for service and report the error code.
CALL SERVICE	0601	Start of scan failure	Call for service and report the error code.
ADD PAPER TO MANUAL	0700	No paper in manual feed tray	Insert paper into the manual feed tray.
CHECK MMF	0700	Multi-media feeder is out of paper or has a paper jam.	Refill the multi-media feeder with paper, or clear the jammed paper.
ADD PAPER TO TRAY 1	0701	Tray 1 is out of paper.	Refill tray 1 with paper.
ADD PAPER TO TRAY 2	0702	Tray 2 is out of paper.	Refill Tray 2 with paper.
ADD PAPER TO TRAY 3	0703	LCIT is out of paper.	Refill the LCIT with paper.
INSERT TRAY 1	0705	Tray 1 is missing.	Install the upper cassette tray.
INSERT TRAY 2	0706	Tray 2 is missing.	Install the lower cassette tray.
INSERT TRAY 3	0707	The LCIT is missing.	Install the LCIT.

(continued on next page)

Table 6–2 (Cont.) Error, Supplies, and Service Messages

Message	Code	Meaning	Corrective Action
CLEAR PAPER PATH	0820	Manual feed tray registration jam	Remove jammed paper from manual feed tray. Open the top cover and remove jammed paper.
CLEAR PAPER PATH	0821	Jam in paper tray 1	Remove the upper cassette and remove jammed paper. Open the right side cover and remove jammed paper.
CLEAR PAPER PATH	0822	Jam in paper tray 2	Remove the lower cassette and remove jammed paper. Open the right side cover and remove jammed paper.
CLEAR PAPER PATH	0823	LCIT registration jam	Remove jammed paper from the LCIT. Open the top cover and remove jammed paper.
CLEAR PAPER PATH	0824	Duplex registration jam	Remove the upper cassette and remove jammed paper.
CLEAR PAPER PATH	0826	Duplex return leading-edge jam	Remove the upper cassette and remove jammed paper. Open the left side cover and remove jammed paper.
CLEAR PAPER PATH	0827	Duplex return trailing-edge jam	Remove the upper cassette and remove jammed paper. Open the left side cover and remove jammed paper.
CLEAR PAPER PATH	0830	Trailing-edge jam	Open the top cover and remove jammed paper. Open the right side cover and remove jammed paper.

(continued on next page)

Table 6–2 (Cont.) Error, Supplies, and Service Messages

Message	Code	Meaning	Corrective Action
CLEAR PAPER PATH	0831	Tray 1 trailing-edge jam	Open the top cover and remove jammed paper. Remove the upper cassette and remove jammed paper. Open the right side door and remove jammed paper.
CLEAR PAPER PATH	0832	Lower cassette trailing-edge jam	Open the top cover and remove jammed paper. Remove the lower cassette and remove jammed paper. Open the right side door and remove jammed paper.
CLEAR PAPER PATH	0833	LCIT trailing-edge jam	Open the top cover and remove jammed paper. Open the right side cover and remove jammed paper.
CLEAR PAPER PATH	0834	Duplex return trailing-edge jam	Open the top cover and remove jammed paper. Remove the upper cassette and remove jammed paper. Open the right side door and remove jammed paper.
REORDER CARTRIDGE A	0901	Photoreceptor drum is nearing end of life.	Reorder the photoreceptor drum cartridge (see Appendix G).
REPLACE CARTRIDGE A	0902	Photoreceptor drum has reached end of life.	Replace photoreceptor drum cartridge.
INSTALL CORRECT CARTRIDGE A	0903	Photoreceptor drum cartridge is the wrong type.	Install the correct photoreceptor drum cartridge.
INSERT CARTRIDGE A	0904	Photoreceptor drum is missing or has failed.	Install (or replace) the photoreceptor drum cartridge.
REORDER CARTRIDGE C	0911	Developer cartridge is nearing end of life.	Reorder the developer cartridge (see Appendix G).

(continued on next page)

Table 6–2 (Cont.) Error, Supplies, and Service Messages

Message	Code	Meaning	Corrective Action
REPLACE CARTRIDGE C	0912	Developer cartridge is empty.	Replace the developer cartridge.
INSTALL CORRECT CARTRIDGE C	0913	Developer cartridge is the wrong type.	Install the correct developer cartridge.
INSERT CARTRIDGE C	0914	Developer cartridge is missing or faulty.	Install (or replace) the developer cartridge.
REORDER CARTRIDGE B	0921	Toner cartridge is nearing end of life.	Reorder the toner cartridge (see Appendix G).
REPLACE CARTRIDGE B	0922	Toner cartridge is empty.	Replace the toner cartridge.
INSTALL CORRECT CARTRIDGE B	0923	Toner cartridge is the wrong type.	Install the correct toner cartridge.
INSERT CARTRIDGE B	0924	Toner cartridge is missing or faulty.	Install (or replace) the toner cartridge.
CALL SERVICE	1001	Fuser has failed.	Call for service and report the error code.
CALL SERVICE	1002	Fuser thermistor is disconnected.	Call for service and report the error code.
CALL SERVICE	1003	Fuser temperature is too low.	Call for service and report the error code.
CALL SERVICE	1004	Fuser temperature is too high.	Call for service and report the error code.
CALL SERVICE	1005	Fuser stays on too long.	Call for service and report the error code.
CLEAR PAPER PATH	1020	Paper from manual feed tray has jammed in fuser.	Open the top cover and remove jammed paper. Open the left side cover and remove jammed paper.
CLEAR PAPER PATH	1021	Paper from the upper cassette has jammed in the fusing unit.	Open the top cover and remove jammed paper. Open the left side cover and remove jammed paper.

(continued on next page)

Table 6–2 (Cont.) Error, Supplies, and Service Messages

Message	Code	Meaning	Corrective Action
CLEAR PAPER PATH	1022	Paper from the lower cassette has jammed in the fusing unit.	Open the top cover and remove jammed paper. Open the left side cover and remove jammed paper.
CLEAR PAPER PATH	1023	Paper from the LCIT has jammed in the fusing unit.	Open the top cover and remove jammed paper. Open the left side cover and remove jammed paper.
CLEAR PAPER PATH	1024	Paper from the duplex return area has jammed in the fusing unit.	Open the top cover and remove jammed paper. Open the left side cover and remove jammed paper.
CLEAR PAPER PATH	1025	Leading-edge jam in left side cover	Open the left side cover and remove jammed paper.
CLEAR PAPER PATH	1026	Trailing-edge jam in left side cover	Open the left side cover and remove jammed paper.
EMPTY THE OUTPUT TRAY	1111	Output tray is full.	Remove paper from the output tray.
NO OFFSET	1120	Offset malfunction	Call service and report the error code.
COMM ERROR PRESS ∗[1]	1401	Transmission error; unknown communication error	See Section 6.2 for troubleshooting information. If error continues, call service and report the error code.
COMM ERROR PRESS ∗[1]	1402	Framing error; data not properly received.	See Section 6.2 for troubleshooting information. If error continues, call service and report the error code.
COMM ERROR PRESS ∗[1]	1403	Receive buffer overrun	See Section 6.2 for troubleshooting information. If error continues, call service and report the error code.

[1]The COMM ERROR feature must be set to HALT for this error to be displayed (see Section 4.4.11).

(continued on next page)

Table 6–2 (Cont.) Error, Supplies, and Service Messages

Message	Code	Meaning	Corrective Action
COMM ERROR PRESS *[1]	1405	Received data parity check failed	See Section 6.2 for troubleshooting information. If error continues, call service and report the error code.
BAD CART 1 PRESS *	1500	Unable to verify font cartridge 1	Replace font cartridge 1, or press [*] to ignore the error and proceed. **CAUTION:** *Turn the printer off before replacing the font cartridge.*
BAD CART 2 PRESS *	1500	Unable to verify font cartridge 2	Replace font cartridge 2, or press [*] to ignore the error and proceed. **CAUTION:** *Turn the printer off before replacing the font cartridge.*
BAD MEM BD 1	1502	SIMMs are incorrectly positioned.	Reposition SIMMs on the board so that there are no gaps between them. **NOTE:** *Be sure the .5 MB SIMM is in the slot following the last 2 MB SIMM.*
BAD MEM BD 2	1502	SIMMs are incorrectly positioned.	Reposition SIMMs on the board so that there are no gaps between them. **NOTE:** *Be sure the .5 MB SIMM is in the slot following the last 2 MB SIMM.*
BAD MEM BD 3	1502	SIMMs are incorrectly positioned.	Reposition SIMMs on the board so that there are no gaps between them. **NOTE:** *Be sure the .5 MB SIMM is in the slot following the last 2 MB SIMM.*

[1]The COMM ERROR feature must be set to HALT for this error to be displayed (see Section 4.4.11).

(continued on next page)

Table 6–2 (Cont.) Error, Supplies, and Service Messages

Message	Code	Meaning	Corrective Action
BAD MEM BD 4	1502	SIMMs are incorrectly positioned.	Reposition SIMMs on the board so that there are no gaps between them. **NOTE:** *Be sure the .5 MB SIMM is in the slot following the last 2 MB SIMM.*
BAD MEM BD 1	1503	Optional memory (SIMM 1) failure	Replace SIMM 1
BAD MEM BD 2	1503	Optional memory (SIMM 2) failure	Replace SIMM 2
BAD MEM BD 3	1503	Optional memory (SIMM 3) failure	Replace SIMM 3
BAD MEM BD 4	1503	Optional memory (SIMM 4) failure	Replace SIMM 4
BAD MEM BD 5	1503	Optional memory (SIMM 5) failure	Replace SIMM 5
BAD COPROCESSOR PRESS *	1508	Coprocessor failure	Call service and report the error code. You can continue to use the printer by pressing [*] and then selecting another protocol (see Section 4.4.1).
BAD NVM PRESS *	1509	NVRAM failure	Select correct printer settings and save them in NVRAM (see Chapter 4). If saving the printer settings in NVRAM does not solve the problem, call service and report the error code. Press [*] to continue using the printer.

(continued on next page)

Table 6–2 (Cont.) Error, Supplies, and Service Messages

Message	Code	Meaning	Corrective Action
BAD COMM BD PRESS *	1511	Communications board failure (nonfatal)	Communications board is faulty but is still functional through the serial or parallel ports. Call service and report the error code. Press [*] to continue using the printer.
BAD COMM BD PRESS *	1519	Communications board failure (fatal)	Call service and report the error code.
CALL SERVICE	1520	Communications (ESS) board failure	Call service and report the error code.
ADD PDL MEMORY PRESS *	1521	Insufficient memory for the PostScript option	Add additional memory. The printer can be used in the meantime by pressing [*] and then selecting another protocol (see Section 4.4.1).
BAD PDL BD PRESS *	1523	PostScript option board failure	Call service and report the error code. The printer can be used in the meantime by pressing [*] and then selecting another protocol (see Section 4.4.1).
CALL SERVICE	1526	Host interface failure	Call service and report the error code.
MEMORY ERROR PRESS *	None	Insufficient memory using LJ2D protocol	Add additional memory (see Section 4.2.4).

6.4 LJ2D Error Messages

Certain error messages are displayed only when LJ2D protocol is selected. These messages pertain to tray selection and paper size. When the printer receives a command for a paper size that is not currently loaded in the default paper tray (or in a fail-over tray), one of the messages listed in Table 6–3 is displayed.

Table 6–3 lists the error messages and corrective action to take.

Table 6–3 LJ2D Error Messages

Message	Meaning	Corrective Action
TRAY 1 LOAD *Paper Size*[1]	Request for a paper size not currently loaded in TRAY 1.	Load the proper size paper in the upper cassette. If you do not have a cassette with the requested paper size, press [*] to bypass the error. The job will print from a tray currently loaded in the printer.
TRAY 2 LOAD *Paper Size*[1]	Request for a paper size not currently loaded in TRAY 2.	Load the proper size paper in the lower cassette. If you do not have a cassette with the requested paper size, press [*] to bypass the error. The job will print from a tray currently loaded in the printer.
TRAY 3 LOAD *Paper Size*[2]	Request for a paper size not currently loaded in TRAY 3.	Press [*] to bypass the error. The job will print from a tray currently loaded in the printer.
TRAY 1 or 2 LOAD *Paper Size*[1]	Request for a paper size not currently loaded in TRAY 1 or 2.	Load the proper size paper in the upper or lower cassette. If you do not have a cassette with the requested paper size, press [*] to bypass the error. The job will print from a tray currently loaded in the printer.

[1] *Paper Size* may be EXEC, LETTER, LEGAL, or A4.

[2] *Paper Size* may be LETTER or A4.

(continued on next page)

Table 6–3 (Cont.) LJ2D Error Messages

Message	Meaning	Corrective Action
TRAY 1 or 3 LOAD *Paper Size*[2]	Request for a paper size not currently loaded in TRAY 1 or 3.	Load the proper size paper in the upper cassette. If you do not have a cassette with the requested paper size, press [*] to bypass the error. The job will print from a tray currently loaded in the printer.
TRAY 2 or 3 LOAD *Paper Size*[2]	Request for a paper size not currently loaded in TRAY 2 or 3.	Load the proper size paper the lower cassette. If you do not have a cassette with the requested paper size, press [*] to bypass the error. The job will print from a tray currently loaded in the printer.
TRAY 1, 2, or 3 LOAD *Paper Size*[2]	Request for a paper size not currently loaded in TRAY 1, 2, or 3.	Load the proper size paper in the upper or lower cassette. If you do not have a cassette with the requested paper size, press [*] to bypass the error. The job will print from a tray currently loaded in the printer.
MANUAL FEED *Paper Size*[1]	Request to feed paper manually.	Feed the requested size paper into the manual feed tray.
MANUAL ENVELOPE FEED *Envelope Size*[3]	Request to feed envelopes manually.	Feed the requested size envelopes into the manual feed tray.
MEMORY ERROR PRESS *	Insufficient memory to accommodate all fonts or page composition.	Add additional memory (see Section 4.2.4).

[1]*Paper Size* may be EXEC, LETTER, LEGAL, or A4.

[2]*Paper Size* may be LETTER or A4.

[3]The *Envelope Size* may be COMMERCIAL 10, MONARCH, DL, or C5.

6.5 Paper Jams

The following actions occur when there is a paper jam in the printer:

- The printer stops printing and enters the PAUSED state.
- The Error indicator lights.
- The error message CLEAR PAPER PATH is displayed with a corresponding error code number.
- A paper jam indicator lights on the graphic display showing the area of the paper jam.
- The alarm sounds (if enabled).

Paper jams generate various error codes, depending on which sensors in the paper path detect the jam. Figure 6–1 illustrates the paper paths in the printer.

Figure 6–1 Printer Paper Paths

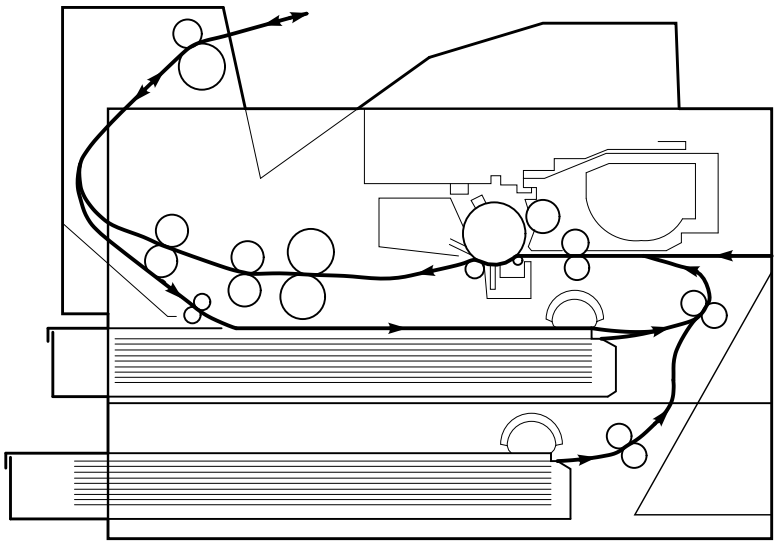
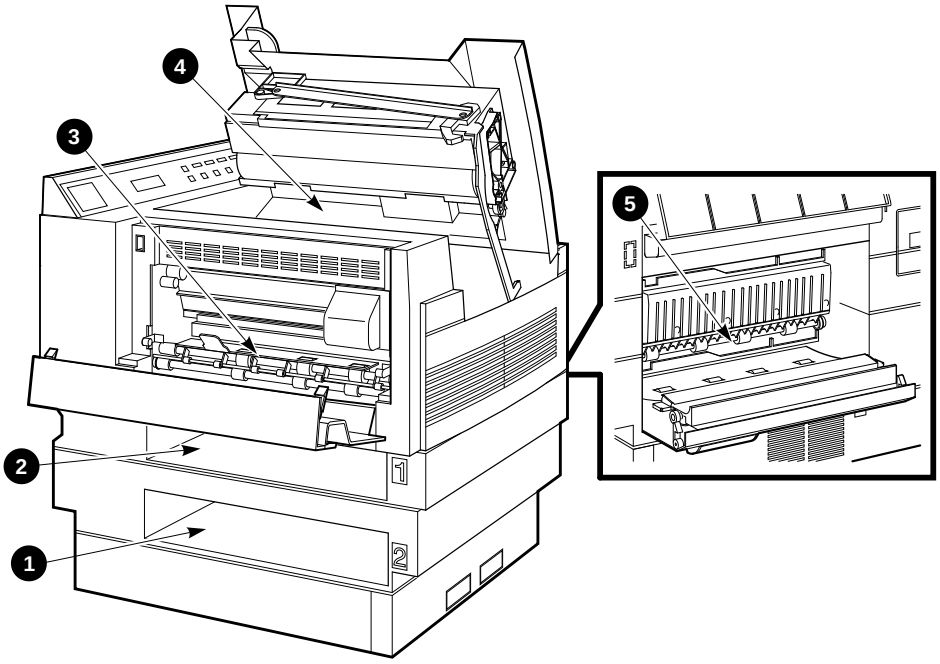


Table 6–2 identifies all paper jams and describes the corrective action to be taken based on the error code number. It is not always necessary to consult Table 6–2 for two reasons: the graphic display indicates where the paper jam occurs, and there are only five components that may need to be opened or removed to access jammed paper (Figure 6–2).

NOTE

If you have options such as the LCIT or Multi-Media feeder, you may have to remove them in order to clear paper jams in those areas.

Figure 6–2 Paper Jam Locations



1. Lower cassette
2. Upper cassette
3. Left-side cover
4. Top cover
5. Right-side cover

6.6 Basic Paper Jam Clearance Procedure

Clearing paper jams on the DEClaser 3200 printer is a straightforward task. The following is a basic procedure to clear jammed paper from the printer. If you need more detailed information to clear a paper jam, see Section 6.7.

NOTE

Whenever you clear a paper jam, you must open and then close at least one cover to clear the error message.

1. Look at the graphic display on the control panel to locate where the paper jam occurred, as indicated by the red LEDs.
2. Open the appropriate cover (or remove the indicated cassette) and gently remove the jammed paper (refer to Figure 6–2).

CAUTION

When removing paper from the fusing area (behind the left side cover), be sure to open the top cover first. Opening the top cover releases the tension between the fusing unit rollers making it easier to remove the jammed paper.

Be sure the fusing gate is closed before closing the left side cover. Failure to close the fusing gate **will result in a paper jam**.

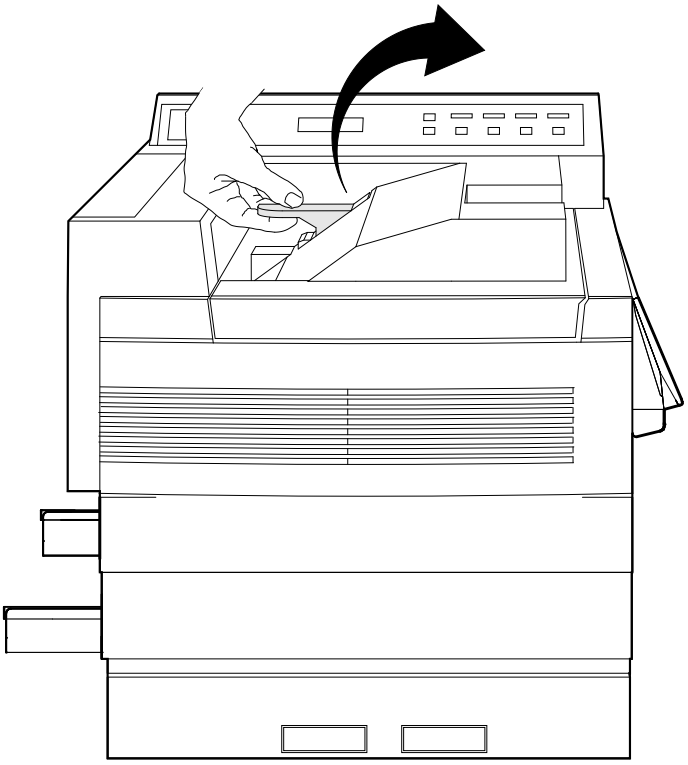
Also, do not leave the top cover open for more than 10 minutes. Light can damage the photoreceptor drum and cause print quality problems.

3. Press Online/Pause to place the printer back on line (if necessary) after clearing the jam.

6.7 Detailed Paper Jam Clearing Procedure

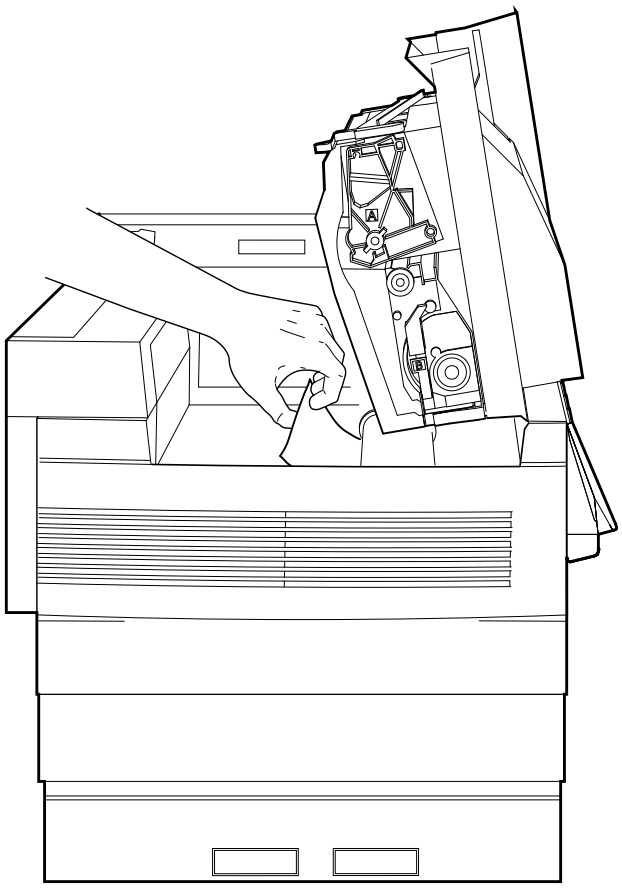
The following paper jam clearance procedure can be used to clear any type of paper jam. Use this procedure if you are unsure of the paper jam location.

1. Open the top cover.



MLO-006491

2. Remove any jammed paper inside the printer.

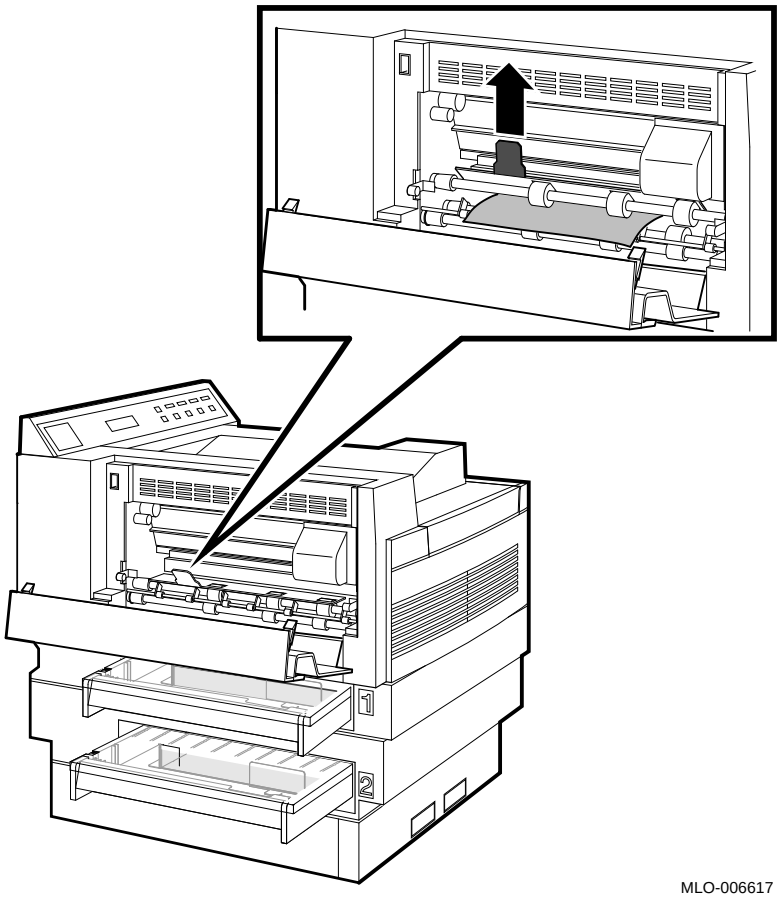


MLO-006615

3. Open the left side cover and lift the tab on the fusing unit gate to remove any jammed paper.

WARNING

The fusing unit may be hot. Use caution when removing paper from this area.

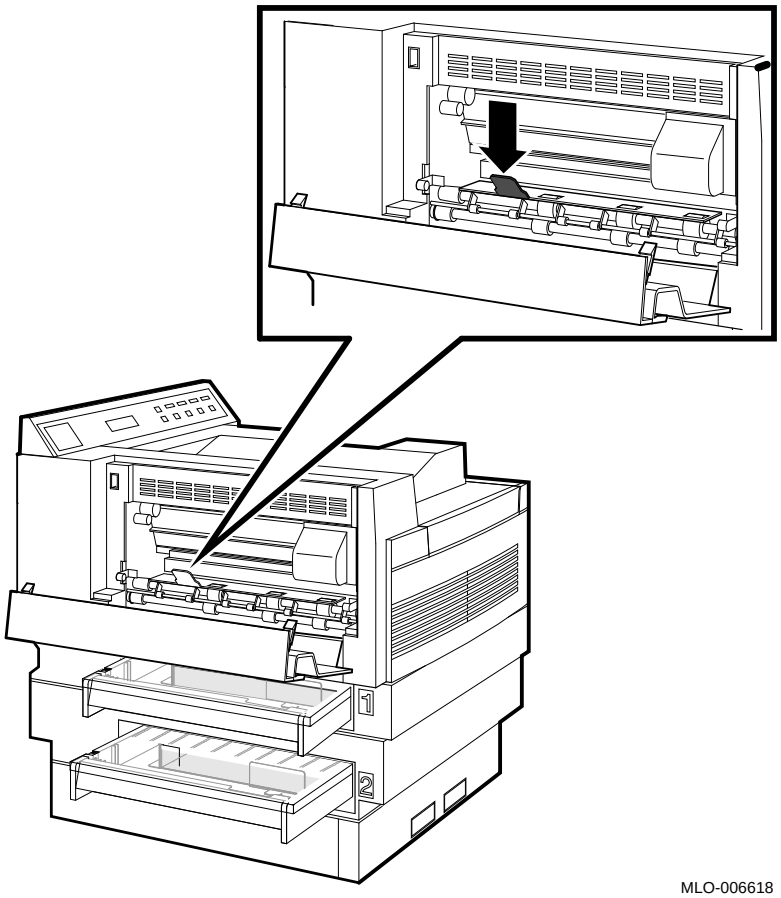


MLO-006617

4. Close the fusing unit gate back to its operating position and close the left side cover.

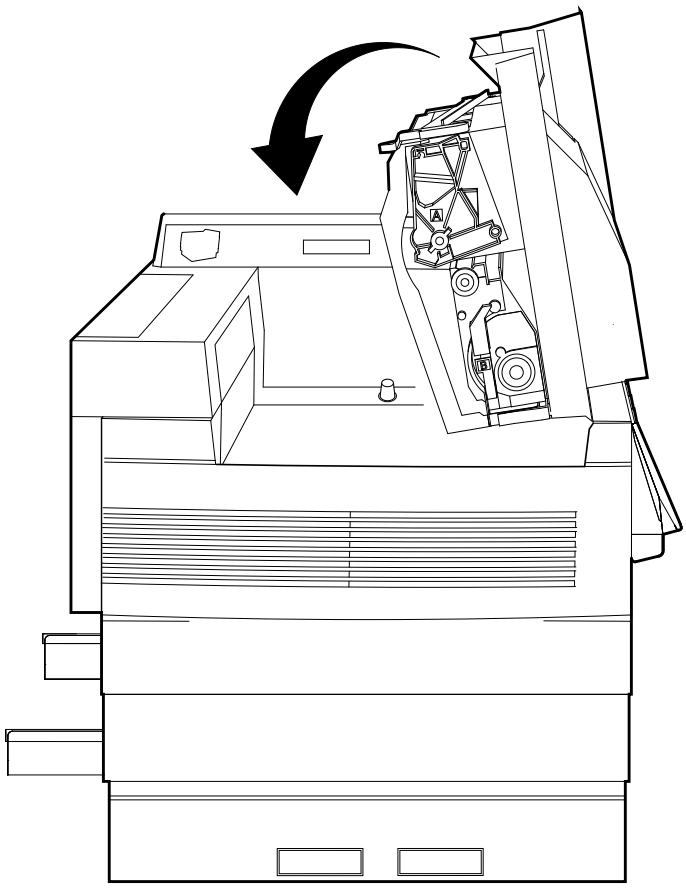
CAUTION

Be sure the fusing gate is closed before closing the left side cover. Failure to close the fusing gate **will result in a paper jam**.



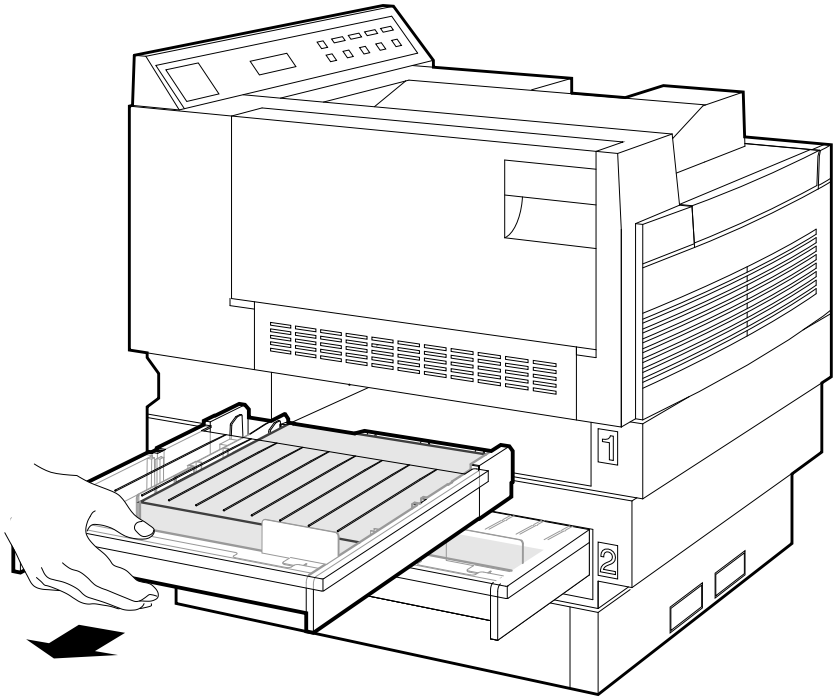
MLO-006618

5. Close the top cover.



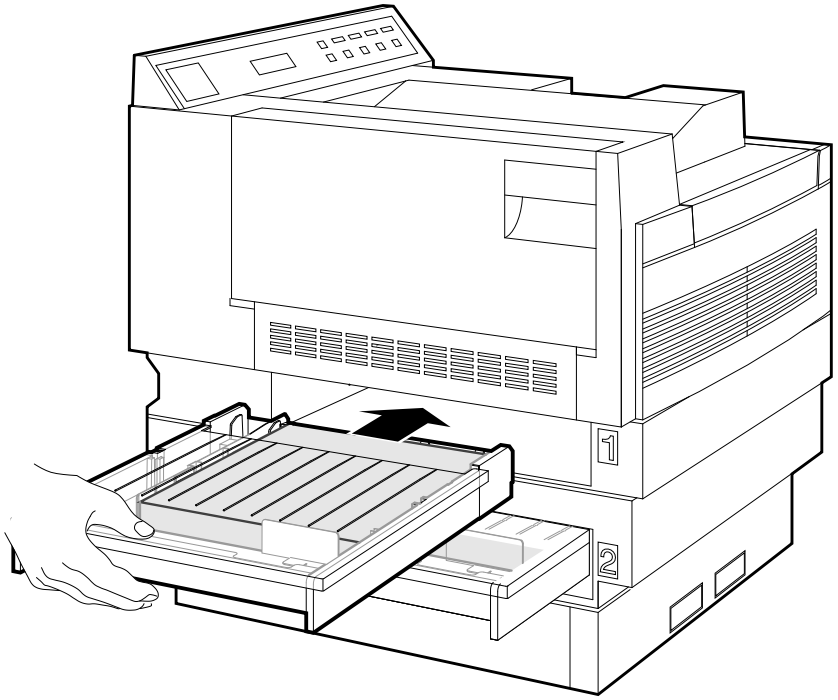
MLO-006492

6. Remove the upper and lower cassettes and remove any jammed paper.



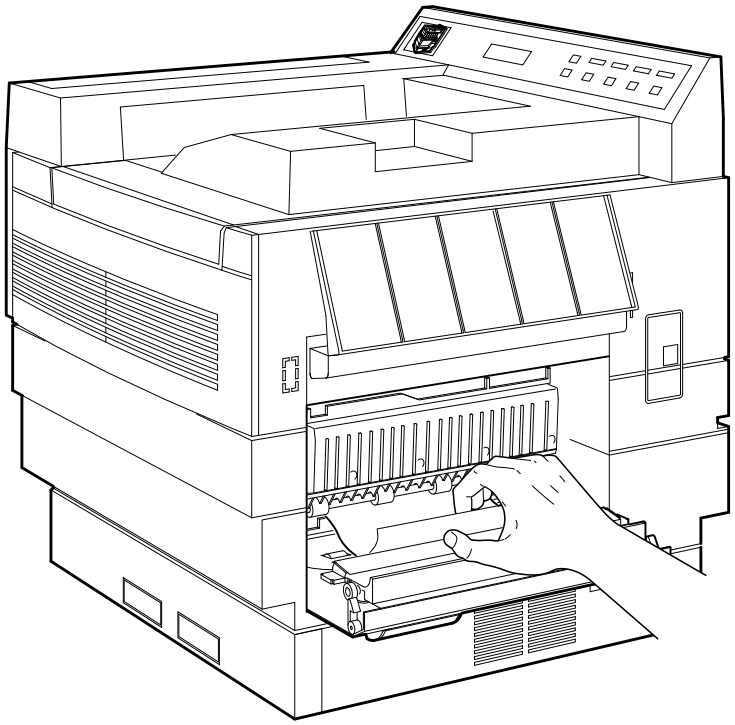
MLO-006464

7. Insert the upper and lower cassettes.



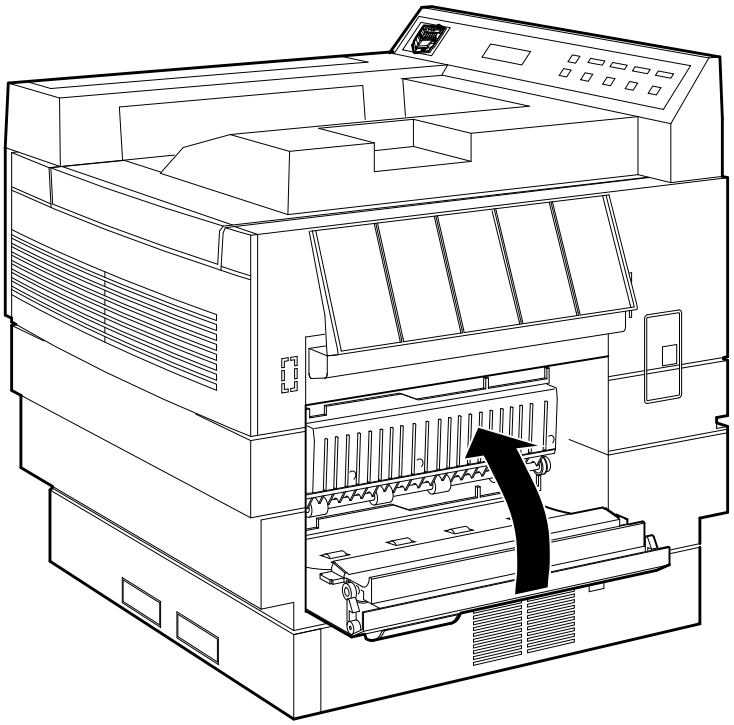
MLO-006272

8. Open the right side cover and remove any jammed paper.



MLO-006614

9. Close the right side cover.



MLO-006613

10. Press Online/Pause to place the printer back on line (if necessary).

7
Maintenance

Most maintenance for the DEClaser 3200 printer is in the form of replacing consumables when they reach their end of life. These consumables consist of the photoreceptor drum, developer, and toner cartridges. When an item needs replacing, the printer displays a message instructing you to replace the particular cartridge. All instructions for replacing consumables come in each cartridge kit. For information about ordering consumables, refer to Appendix G.

One additional maintenance procedure needs to be performed between periodic cartridge replacement; cleaning the transfer/separation charger. Although the transfer/separation charger is at 50,000 page intervals, it should be cleaned at 20,000 page intervals (when the photoreceptor drum is replaced) to ensure the highest print quality.

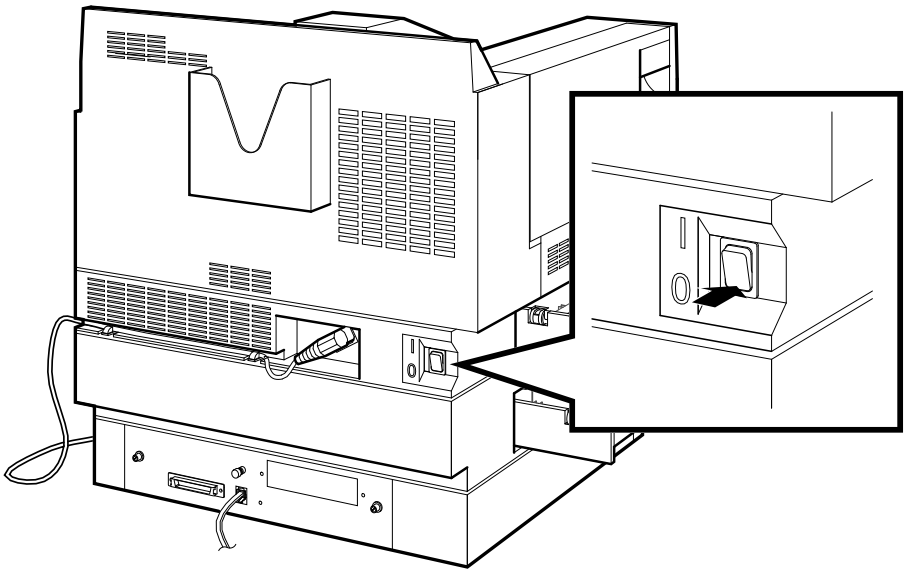
7.1 Cleaning the Transfer/Separation Charger

Use the following procedure to clean the transfer/separation charger each time the photoreceptor drum is replaced, or when recommended in the troubleshooting section.

NOTE

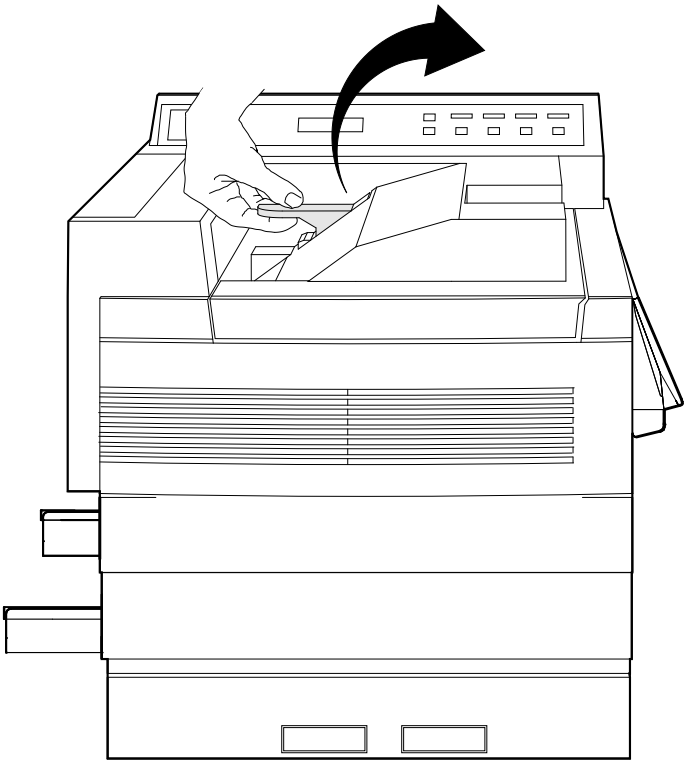
This procedure uses the cotton swab and cleaning brush supplied with the photoreceptor drum kit. You may want to clean the charger over a piece of newspaper to catch the residual toner dislodged from the cleaning.

1. Turn the printer off by pressing the power switch on the back of the printer to the O (OFF) position.



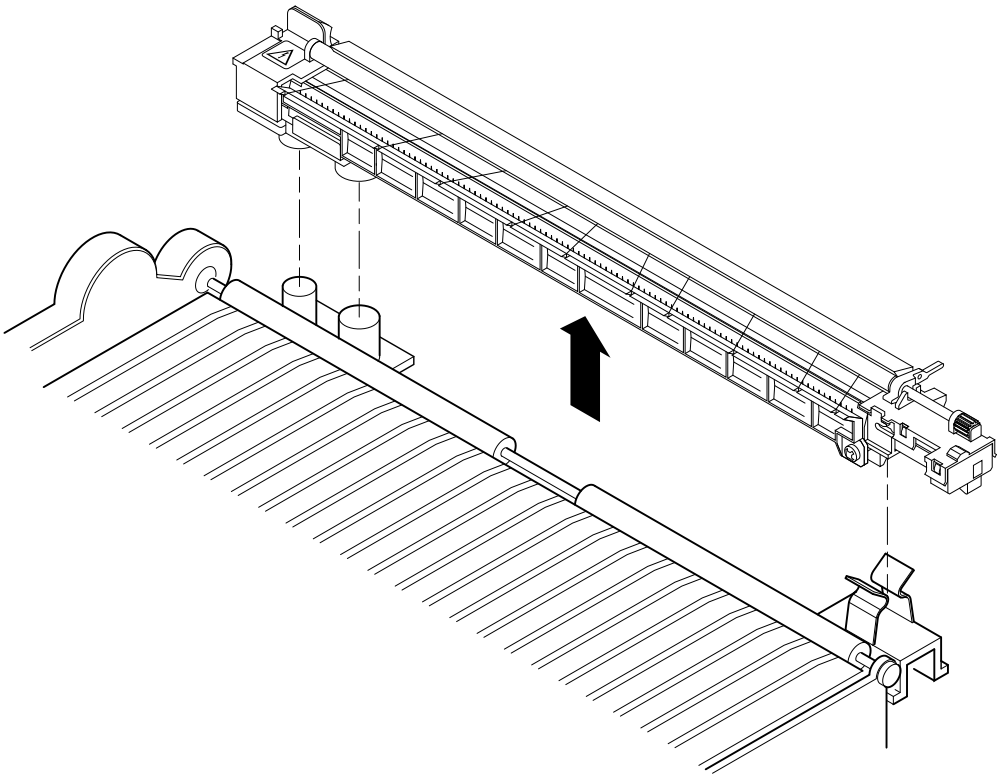
MLO-006265

2. Open the top cover by lifting up its release lever.



MLO-006491

3. Grasp each (green) end of the transfer/separation charger and lift it out of the printer.

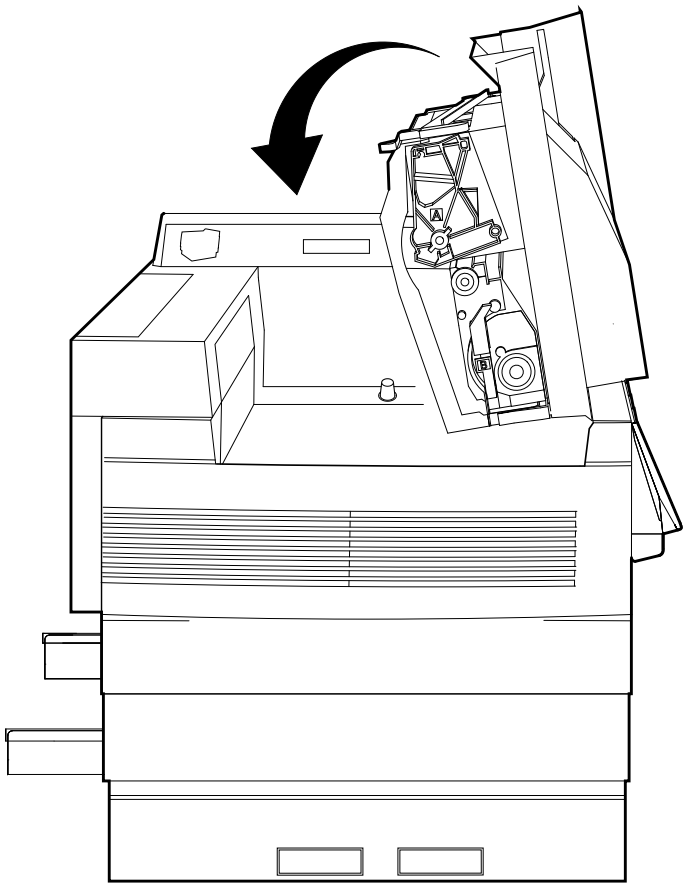


MLO-006778

4. Close the top cover by pushing it down until it latches securely in place.

NOTE

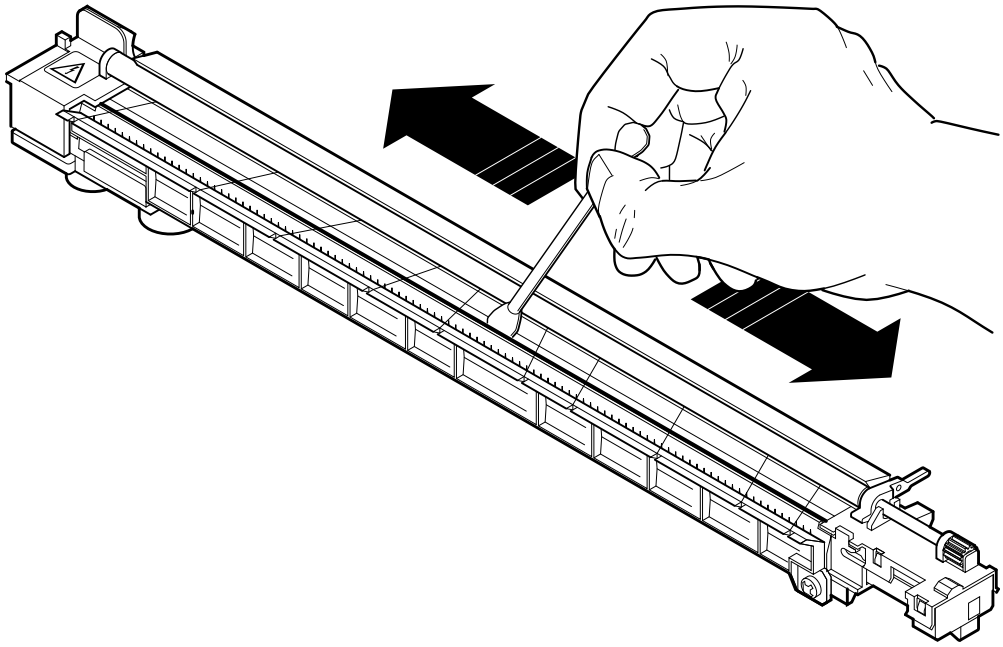
The top cover is closed at this time to prevent light exposure to the photoreceptor drum.



MLO-006492

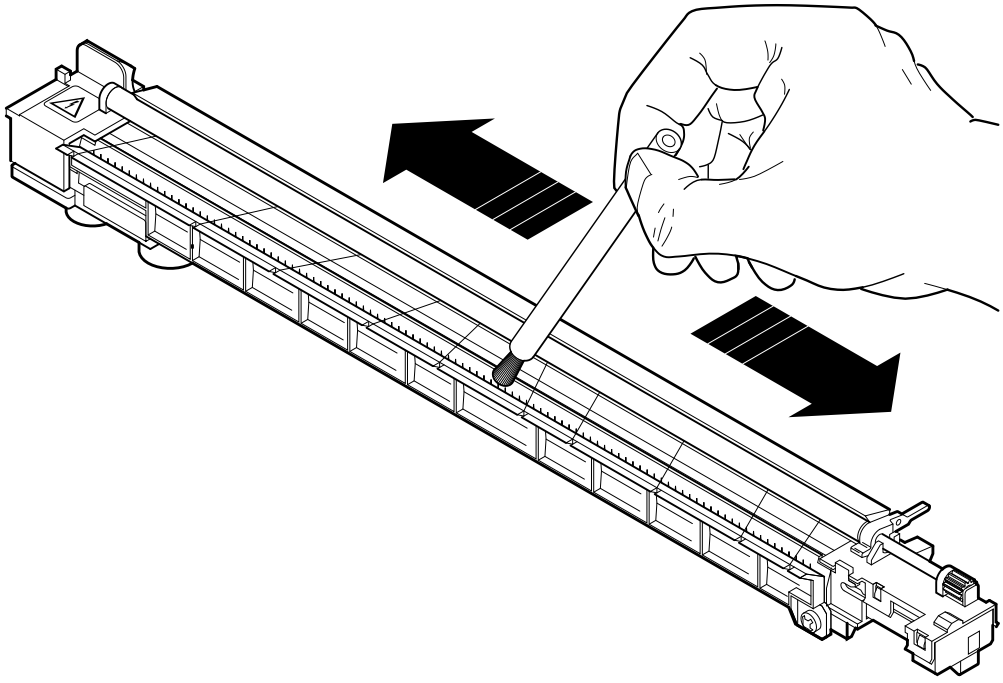
5. Gently clean the corotron wire with the cotton swab until no toner remains on the wire.

   √ Clean only the corotron wire, being careful to move around the nylon wires that pass diagonally over it.



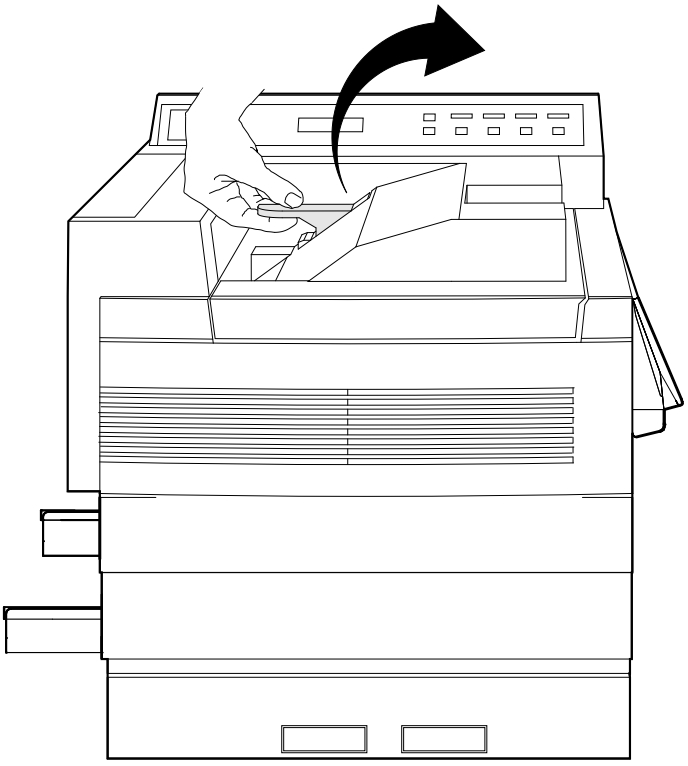
MLO-006779

6. Hold the charger upright in the vertical position and clean the toner from the sawtooth comb with the cleaning brush.



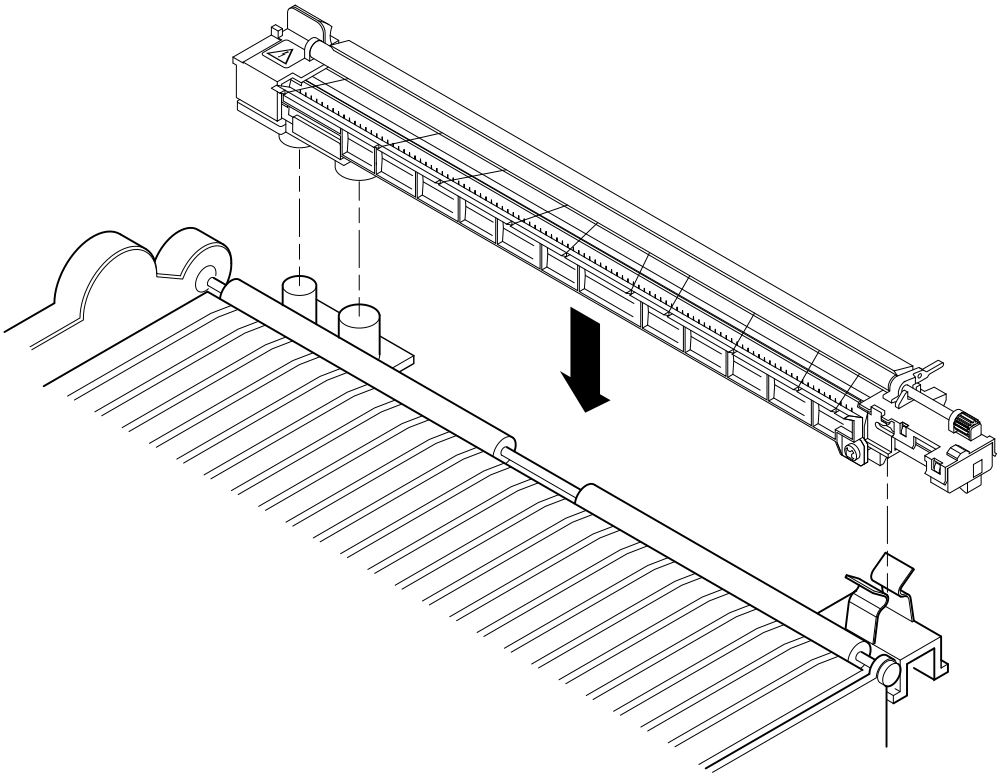
MLO-006780

7. Open the top cover by lifting up its release lever.



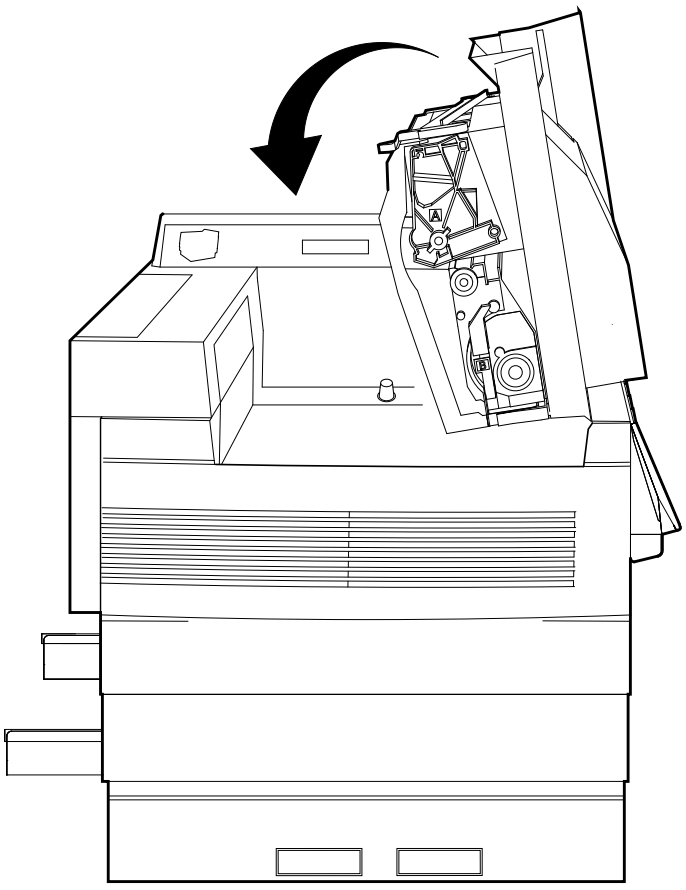
MLO-006491

8. Install the transfer/separation charger into the printer.



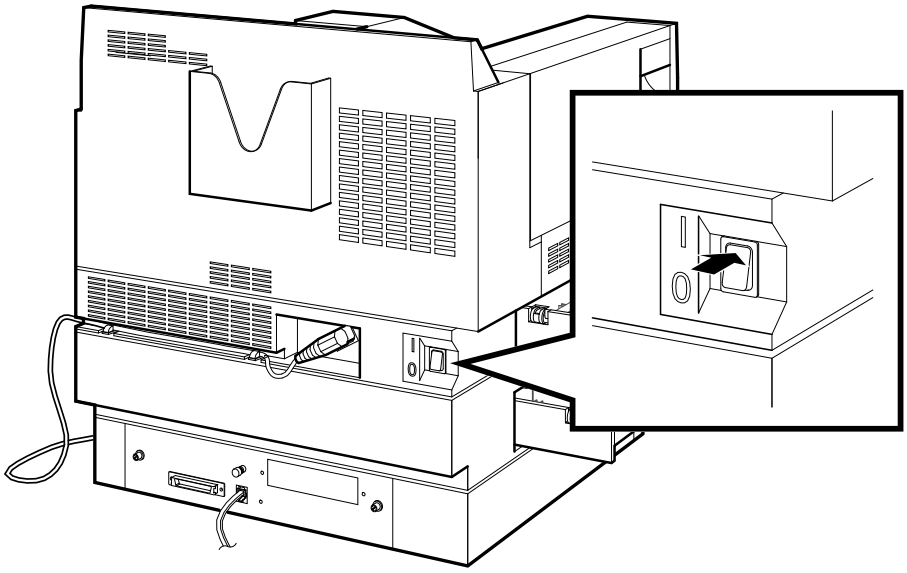
MLO-006781

9. Close the top cover by pushing it down until it latches securely in place.



MLO-006492

10. Turn the printer on by pressing the power switch on the back of the printer to the | (ON) position.



MLO-006273

8
Service

If you cannot correct a problem with the DEClaser 3200 printer, request servicing by a qualified Digital Services engineer. This chapter lists the available services.

8.1 Digital Equipment Corporation Services

Digital Equipment Corporation provides a wide range of maintenance programs for printers. 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.

Digital offers fast, low-cost, high-quality maintenance performed at your site by trained service specialists. Whether you select the DECservice or Basic Service agreements, or choose the Time and Materials service, your printer will receive the best possible maintenance.

There are more than 150 Digital carry-in service centers in major cities around the world. These service centers offer convenient, fast, and dependable maintenance at a savings over on-site service.

If you prefer self-maintenance, you can mail in your field replaceable unit (FRU) for repair through our fast DECmailer repair service.

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

Refer to the list of questions in Table 8–1 before calling the service center.

Table 8–1 Questions to Consider Before You Call

Is the call necessary?	Check Chapter 6. Often you can solve the problem yourself.
Who should call for service?	Typically, the system manager should place the call for service.
Where should you call?	In the continental United States: If you purchased on-site warranty support at the time of sale, call Digital at 1–800–DEC–8000. If you you do not have on-site warranty support and are returning the printer to Digital for service, call 1–800–225–5385. For per call service information, call your local Digital sales office. In Alaska, Hawaii, Canada, and Europe: Call your local Digital sales office for service.
What does the service center need to know?	Record the serial and model numbers located on the label on the rear of the printer.
How should you describe the problem?	Summarize the problem. Make a note of: • What you were doing when the printer failed • Any messages on the display panel • Any strange noises Stay by the printer and host system if possible, because the service engineer may ask you to re-create the problem.

A

DEC PPL3 Quick Reference Guide

This quick reference guide contains basic information about using DEC PPL3 programming instructions with your DEClaser printer.

For quick reference, see these sections:

Category	Location
Unit Selection	Section A.1
Spacing, Implicit Cursor Motion, Sheet Size and Margins	Section A.2
Tabs	Section A.3
Explicit Cursor Movement	Section A.4
Font Management and Attribute Selection	Section A.5
Vectors	Section A.6
Reports	Section A.7
Device Control	Section A.8
Miscellaneous	Section A.9

For detailed information about sending commands from the host computer, consult the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual* and the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Supplement*.

Conventions

The following conventions are used throughout this appendix.

Convention	Meaning
CSI	This is the control character (9/11) used to introduce the Control Sequence Introducer as part of the format of a DEC PPL3 command; for example, CSI Pn A. Both parameter characters and intermediate characters are supported in a CSI control sequence.
ESC	This is the control character (1/11) used to introduce an escape sequence as part of the format of a DEC PPL3 command; for example, ESC 4. Unlike the CSI commands, ESC commands do not support parameter characters.
SP	Indicates a space character (2/0) as part of the format of a DEC PPL3 command; for example, CSI 3 SP X. Spaces appear between characters in commands for clarity; they are not part of the command syntax unless indicated with the SP character.
Ps	Selective parameter, or one that identifies a list of options pertaining to the specific command. If ">" (3/14) or "?" (3/15) occurs at the beginning of a string of parameters, the parameters that follow are Digital private parameters. If ">" or "?" is present, it must occur only once at the beginning of the parameter string.
Pn	Intermediate character component of an escape sequence, control sequence, or control string.
Fs	Used to identify sequences where the final character can vary.

A.1 Unit Selection

PUM–Positioning Unit Mode

`CSI 11 h` Sets the Positioning Unit Mode

`CSI 11 l` Resets the Positioning Unit Mode

SSU–Select Size Unit

`CSI Ps SP I`

Where:

Ps = 2 is decipoint 1/720 inch.

Ps = 7 is pixel 1/300 inch.

Ps = ?1 is centipoint 1/7200 inch.

A.2 Spacing, Implicit Cursor Motion, Sheet Size and Margins

DECOPM–Origin Placement Mode

`CSI ? 52 h` Sets Origin Placement Mode

`CSI ? 52 l` Resets Origin Placement Mode

DECSLPP–Set Lines per Physical Page

`CSI Pn t`

Where:

Pn = 0 Sets the form length to the logical paper size.

Pn = n is the numeric value according to the SSU sequence and PUM setting.

DECSLRM–Set Left and Right Margins

`CSI Pn1 ; Pn2 s`

Where:

Pn1 = n — is the left margin-setting numeric value according to the SSU sequence and PUM setting (Pn1 = 0 is treated as 1).

Pn2 = n — is the right margin-setting numeric value according to the SSU sequence and PUM setting (Pn2 = 0 is treated as 1).

DECSSS–Set Sheet Size

`CSI Ps1 ; Ps2 ; Pn3 ; Pn4 SP {`

Where:

Ps1	Ps2	Input Tray
Ps1 = 0	Ps2 = 1	Top and bottom trays with key “A”
Ps1 = 0	Ps2 = 2	Top and bottom trays with key “B”
Ps1 = 1	Ps2 = 1	Top tray, key “A”
Ps1 = 1	Ps2 = 2	Top tray, key “B”
Ps1 = 2	Ps2 = 1	Bottom tray, key “A”
Ps1 = 2	Ps2 = 2	Bottom tray, key “B”
Ps1 = 4	Ps2 = any	Multi-Media Feeder[1]
Ps1 = 99	Ps2 = any	Manual feed tray[2]

[1]The size of this tray may only be specified when this option is installed.

[2]The size of this tray may only be specified when the Multi-Media Feeder is not installed.

Where:

Pn3 = n — is the width of the medium (defined as leading edge).

Pn4 = n — is the length of the medium.

DECSTBM–Set Top and Bottom Margins

`CSI Pn1 ; Pn2 r`

Where:

Pn1 = n is the top margin-setting numeric value according to the SSU sequence and PUM setting (Pn1 = 0 is treated as 1).

Pn2 = n is the bottom margin-setting numeric value according to the SSU sequence and PUM setting (Pn2 = 0 is treated as 1).

DECVPFS–Variable Page Format Select

`CSI Ps1 ; Pn2 ; ... ; Pn11 SP z`

Where:

Ps1 = 0, 1 is portrait orientation.

Ps1 = 2 is landscape orientation.

Ps1 = Other is portrait orientation.

Table A–1 DECVPFS Numeric Parameters[1]

	Meaning	If "Zero"
Pn2	Length of paper	Default[1]
Pn3	Width of paper	Default[1]
Pn4	Top margin	1
Pn5	Bottom margin	Bound of printable area (Pn2 minus .5 inch)
Pn6	Left margin	1
Pn7	Right margin	Bound of printable area (Pn3 minus .5 inch)
Pn8	Page home line	Top margin
Pn9	Page end line	Bottom margin
Pn10	Line home position	Left margin
Pn11	Line end position	Right margin

[1]All Pn values are according to the SSU sequence and PUM setting.

PFS–Page Format Select

CSI Ps SP J

Where:

Ps = 0	Portrait normal text
Ps = 1	Landscape normal text
Ps = 2	Portrait normal A4
Ps = 3	Landscape normal A4
Ps = 4	Portrait normal North American letter
Ps = 5	Landscape normal North American letter
Ps = 6	Portrait extended A4
Ps = 7	Landscape extended A4
Ps = 8	Portrait extended legal
Ps = 9	Landscape extended legal
Ps = ?20	Portrait extended North American letter private
Ps = ?21	Landscape extended North American letter private
Ps = ?22	Portrait extended A4 private
Ps = ?23	Landscape extended A4 private
Ps = ?24	Portrait extended legal private
Ps = ?25	Landscape extended legal private

DECAWM–Autowrap Mode

CSI ? 7 h	Sets Autowrap Mode
CSI ? 7 l	Resets Autowrap Mode

DECCRNLM–Carriage Return/New Line Mode

CSI ? 40 h	Set–CR acts as New Line
CSI ? 40 l	Reset–CR acts as Carriage Return

DECPSM–Horizontal Pitch Select Mode

CSI ? 29 h	Sets Horizontal Pitch Select Mode
CSI ? 29 l	Resets Horizontal Pitch Select Mode

DECPSP–Proportional Spacing Mode

CSI ? 27 h	Sets Proportional Spacing Mode
CSI ? 27 l	Resets Proportional Spacing Mode

DECSHORP–Set Horizontal Pitch

CSI Ps w

Where:

Ps = 0	is determined by current font.
Ps = 1	is 720 centipoints (10 characters/inch).
Ps = 2	is 600 centipoints (12 characters/inch).
Ps = 3	is 545 centipoints (13.2 characters/inch).
Ps = 4	is 436 centipoints (16.5 characters/inch).
Ps = 5	is 1440 centipoints (5 characters/inch).
Ps = 6	is 1200 centipoints (6 characters/inch).
Ps = 7	is 1090 centipoints (6.6 characters/inch).
Ps = 8	is 872 centipoints (8.25 characters/inch).
Ps = 9	is 480 centipoints (15 characters/inch).
Ps = 11	is 420 centipoints (approx. 17.1 characters/inch).
Ps = 12	is 840 centipoints (approx. 8.55 characters/inch).
Ps = 13	is 400 centipoints (18 characters/inch).
Ps = 14	is 800 centipoints (9 characters/inch).
Ps = 15	is 696 centipoints (approx. 10.3 characters/inch).

DECVERP–Set Vertical Pitch

CSI Ps z

Where:

Ps = 0	is determined by the current font.
Ps = 1	is 1200 centipoints (6 lines/inch).
Ps = 2	is 900 centipoints (8 lines/inch).
Ps = 3	is 600 centipoints (12 lines/inch).
Ps = 4	is 3600 centipoints (2 lines/inch).
Ps = 5	is 2400 centipoints (3 lines/inch).
Ps = 6	is 1800 centipoints (4 lines/inch).
Ps = 10	is 1152 centipoints (66 lines/A-size printable area).
Ps = 11	is 1152 centipoints (66 lines/A-size printable area).
Ps = 12	is 864 centipoints (88 lines/A-size printable area).
Ps = 13	is 576 centipoints (132 lines/A-size printable area).
Ps = 14	is 3456 centipoints (22 lines/A-size printable area).
Ps = 15	is 2304 centipoints (33 lines/A-size printable area).
Ps = 16	is 1728 centipoints (44 lines/A-size printable area).

JFY–Justify

CSI Ps SP F

Where:

Ps = 0	Stops text justification
Ps = 2	Justifies text with limits
Ps = ?2	Justifies text without limits

LNM–Line Feed/New Line Mode

CSI 20 h	Set–LF acts as New Line
CSI 20 l	Reset–LF acts as Line Feed

SHS–Set Horizontal Spacing

`CSI Ps SP K`

Where:

Ps = 0 is 720 centipoints (10 characters/inch).

Ps = 1 is 600 centipoints (12 characters/inch).

Ps = 2 is 480 centipoints (15 characters/inch).

Ps = 3 is 1200 centipoints (6 characters/inch).

SPI–Spacing Pitch Increment

`CSI Pn1 ; Pn2 SP G`

Where:

Pn1 = 0 Line spacing is determined by the current font.

Pn1 = n Line spacing is determined by the numeric value according to the SSU sequence and PUM setting.

Pn2 = 0 Character spacing is determined by current font.

Pn = n Character spacing is determined by the numeric value according to the SSU sequence and PUM setting.

SVS–Set Vertical Spacing

`CSI Ps SP L`

Where:

Ps = 0 is 1200 centipoints (6 lines/inch).

Ps = 1 is 1800 centipoints (4 lines/inch).

Ps = 2 is 2400 centipoints (3 lines/inch).

Ps = 3 is 600 centipoints (12 lines/inch).

Ps = 4 is 900 centipoints (8 lines/inch).

Ps = 5 is 1416 centipoints (6 lines/30 mm).

Ps = 6 is 2136 centipoints (4 lines/30 mm).

Ps = 7 is 2856 centipoints (3 lines/30 mm).

Ps = 8 is 720 centipoints (12 lines/30 mm).

Ps = 9 is 3600 centipoints (2 lines/inch).

A.3 Tabs

DECCAHT–Clear All Horizontal Tabs

ESC 2 Clears all horizontal tab stops.

DECCAVT–Clear All Vertical Tabs

ESC 4 Clears all vertical tab stops.

DECHTS–Horizontal Tab Set

ESC 1 Sets a tab stop at the active horizontal position.

DECSHTS–Set Horizontal Tab Stops

CSI Pn ;...; Pn u

Where:

Pn = n is the number of units according to the SSU sequence and PUM setting.

DECSVTS–Set Vertical Tab Stops

CSI Pn ;...; Pn v

Where:

Pn = n is the number of units according to the SSU sequence and PUM setting.

DECVTS–Vertical Tab Set

ESC 3 Sets a tab stop at the active vertical position.

TBC–Tab Clear

`CSI Ps ;...; Ps g`

Where:

Ps = 0 is clear one horizontal tab stop at active column.

Ps = 1 is clear one vertical tab stop at active line.

Ps = 2 is clear all horizontal tab stops.

Ps = 3 is clear all horizontal tab stops.

Ps = 4 is clear all vertical tab stops.

A.4 Explicit Cursor Movement

CUU–Cursor Up

`CSI Pn A`

Where:

Pn = 0 is treated as 1 vertical position up.

Pn = n is the numeric value according to the SSU sequence and PUM setting.

HPA–Horizontal Position Absolute

`CSI Pn ‘`

Where:

Pn = 0 is treated as horizontal position 1.

Pn = n is the numeric value according to the SSU sequence and PUM settings.

HPB–Horizontal Position Backward

`CSI Pn j`

Where:

Pn = 0 is treated as 1 horizontal position to the left.

Pn = n is the numeric value according to the SSU sequence and PUM settings.

HPR–Horizontal Position Relative

`CSI Pn a`

Where:

Pn = 0 is treated as 1 horizontal position to the right.

Pn = n is the numeric value according to the SSU sequence and PUM setting.

VPA–Vertical Position Absolute

`CSI Pn d`

Where:

Pn = 0 is treated as veritcal position 1.

Pn = n is the numeric value according to SSU sequence and PUM setting.

VPB–Vertical Position Backward

`CSI Pn k`

Where:

Pn = 0 is treated as 1 vertical position up.

Pn = n is the numeric value, according to SSU sequence and PUM setting.

VPR–Vertical Position Relative

`CSI Pn e`

Where:

Pn = 0 is treated as 1 vertical position down.

Pn = n is the numeric value, according to SSU sequence and PUM setting.

A.5 Font Management and Attribute Selection

ASCEF–Announce Subset of Code Extension Facilities

ESC SP Fs

If the final character is:

L is ISO 4873, Level 1.

M is ISO 4873, Level 2.

N is ISO 4873, Level 3.

DECATFF–Assign to Type Family or Font

DCS Ps1 ; Ps2 } id_string ST

Where:

Ps1 = 0 or 1	assigns a font collection plus by a 16-character font identifier to SGR number.
Ps1 = 2	assigns type family ID (7 characters) to SGR number.
Ps1 = 3	assigns a 16-character font ID to SGR number.
Ps1 = 4	assigns a 12-character font collection ID to SGR number.
Ps2 = 10	is the primary SGR font selection.
Ps2 = 11	is the first alternative.
Ps2 = 12	is the second alternative.
	.
	.
	.
Ps2 = 19	is the ninth alternative.
id_string	is the CFFF identifier required by the type of assignment identified by Ps1.

DECAUPSS–Assign User-Preference Supplemental Character Set

`DCS Ps ! u D...D ST`

Where:

Ps = 0 is a 94-character set.

Ps = 1 is a 96-character set.

Possible D . . . D values:

%5	DEC Supplemental	(Ps = 0)
A	ISO Latin-1 Supplemental	(Ps = 1)
I	JIS Katakana[1]	(Ps = 0)
"4	DEC Hebrew Supplemental	(Ps = 0)
H	ISO Latin-Hebrew Supplemental	(Ps = 1)

[1]Not resident

DECDTFF–Delete Type Family or Font File

`DCS Ps ~ id_string ST`

Where:

Ps = 0	requires the ID string for a 7-character type family ID.
Ps = 1	requires the ID string for a 31-character font file ID.
`id_string`	is the CFFF identifier required by the type of assignment identified by Ps.

DECLFF–Load Font File

DCS Ps1 ; Ps2 ; Ps3 y font_record, font_record; comment_record ST

Where:

Ps1 = 0 is Digital font file format.

Ps2 = 0 is print the summary sheet.
Ps2 = 1 is do not print the summary sheet.
Ps2 = 2 is send font error and warning information.
Ps2 = 3 is print the summary sheet and sent font error and warning information.

Ps3 = 0 is delete all fonts.
Ps3 = 1 is replace loaded font files with same ID as loaded font file.

LS1R–Locking Shift 1 Right

ESC ~ G1 becomes the active GR character set.

LS2–Locking Shift 2

ESC n G2 becomes the active GL character set.

LS2R–Locking Shift 2 Right

ESC } G2 becomes the active GR character set.

LS3–Locking Shift 3

ESC o G3 becomes the active GL character set.

LS3R–Locking Shift 3 Right

ESC | G3 becomes the active GR character set.

SCS–Select Character Set

ESC I* ...In F

Where:

I* = ((Left parenthesis)[1]	designates the character set into G0.
I* =) (Right parenthesis)[1]	designates the character set into G1.
I* = * (Asterisk)[1]	designates the character set into G2.
I* = + (Plus sign)[1]	designates the character set into G3.
I* = - (Minus sign)[2]	designates the character set into G1.
I* = . (Period)[2]	designates the character set into G2.
I* = / (Slash)[2]	designates the character set into G3.

[1]For 94-character sets

[2]For 96-character sets

Table A–2 Character Set Identification

Character Set	Number of Characters	Character Set Identifier
British	94	A
ASCII	94	B (initial setting for G1 and G0)
DEC Dutch	94	4
DEC Finnish	94	5
French	94	R
DEC French Canadian	94	9
German	94	K
ISO Italian	94	Y
Legal	94	%4
JIS Roman	94	J
JIS Katakana[1]	94	I
DEC Norwegian/Danish	94	6
ISO Spanish	94	Z
DEC Swedish	94	7
DEC Swiss	94	=
Norwegian/Danish	94	‘
DEC Supplemental	94	%5
DEC Technical	94	>
DEC Special Graphics	94	0
DEC Portuguese	94	%6
User Preference Supplemental[2]	94	< (initial setting for G2 and G3)
DEC 7-Bit Hebrew	94	%=
DEC Hebrew Supplemental	94	"4
ISO Latin-1 Supplemental	96	A
ISO Latin-Hebrew Supplemental	96	H

[1]Not resident

[2]By default, User Preference Supplemental is DEC Supplemental to ensure compatibility.

DECMM–Memory Management

`CSI Ps + v`

Where:

Ps = 0, 1	Imaging capabilities are not guaranteed.
Ps = 2[1]	A or A4-size imaging is guaranteed without complexity errors.
Ps = 3[1]	Legal-size imaging is guaranteed without complexity errors.
Ps = 4[1]	A or A4-size imaging is guaranteed without complexity errors in duplex mode.
Ps = 5[1]	Legal-size imaging is guaranteed without complexity errors in duplex mode.

[1]Available only when additional memory is installed

GSM–Graphic Size Modification

`CSI Pn1 ; Pn2 SP B`

Where:

Pn1 = 0	is treated as 100% of the GSS.
Pn1 = Decimal value	is the percentage of the height set by GSS.
Pn2 = 0	is treated as 100% of the GSS.
Pn2 = Decimal value	is the percentage of the width set by GSS.

GSS–Graphic Size Select

`CSI Pn SP C`

Where:

Pn = 0	is 10 points.
Pn = n	is the font height according to SSU sequence.

SGR–Select Graphic Rendition

`CSI Ps ; . . . ; Ps m`

Where:

Ps = 0	Turns off all attributes (standard and private)
Ps = 1	Turns on bold
Ps = 3	Turns on italics
Ps = 4	Turns on underline
Ps = 9	Turns on strike-through
Ps = 10 . . . 19	As defined by DECATFF
Ps = 21	Turns on double underline
Ps = 22	Turns off bold
Ps = 23	Turns off italics
Ps = 24	Turns off underline and double-underline
Ps = 29	Turns off strike-through
Ps = 53	Turns on overline
Ps = 55	Turns off overline
?0	Turns all private attributes off[1]
?4	Turns superscript on, subscript off
?5	Turns subscript on, superscript off
?6	Turns on overline
?24	Turns off superscript and subscript
?26	Turns off overline

[1]Turns off subscript, superscript, and overline

A.6 Vectors

DECRVEC–Draw Relative Vector

```
CSI Ps1 ; Pn2 ; Pn3 SP |
```

Where:

Ps1 = 0	Draws a horizontal (X) line to the right.
Ps1 = 1	Draws a vertical (Y) line down.
Ps1 = 2	Draws a horizontal (X) line to the left.
Ps1 = 3	Draws a vertical (Y) line up.

Pn2 = n	is the line length according to the SSU sequence.
Pn2 = n	is the line width according to the SSU sequence.

DECVEC–Draw Vector

```
CSI Ps1 ; Pn2 ; Pn3 ; Pn4 ; Pn5 ! |
```

Where:

Ps1 = 0	Draw horizontal line (X)
Ps1 = 1	Draw vertical line (Y)
Ps1 = Other	Perform no action

Pn2 = n	is the horizontal line (X) start position according to the SSU sequence.
Pn3 = n	is the verical line (Y) start position according to the SSU sequence.
Pn4 = n	is line length according to the SSU sequence.
Pn5 = n	is line width according to the SSU sequence.

A.7 Reports

CPR–Cursor Position Report

`CSI Pn1 ; Pn2 R`

Where:

`Pn1` Numeric parameter describing the active vertical position according to the SSU sequence and PUM setting.

`Pn2` Numeric parameter describing the active horizontal position according to the SSU sequence and PUM setting.

DA–Device Attributes

`CSI c` Requests the Primary Device Attributes Report

DAR–Response to Device Attributes (DA) Request

`CSI ? Ps1 ; Ps2 ; ... ; Psn c`

The following is the generic response indicating a Digital level 3 printer:

`CSI ? 73 ; 4 ; 6 ; 8 ; 9 ; 10 ; 11 ; 12 ; 16 ; 18 ; 19 c`

The following is an alias response for backward compatibility with the LN03 printer:

`CSI ? 26 c`

DA2–Device Attributes (Secondary)

`CSI > c` Requests a Secondary Device Attributes Report

DA2R–Device Attributes (Secondary) Report

`CSI > Ps1 ; Ps2 ; Ps3 ; Ps4 c`

Where:

Ps1 = 53	Identifies the DEClaser 3200 printer.
Ps2 = *xx*	*xx* is the major firmware version number.
Ps2 = 10	Minor firmware version 1.0–yy
Ps3 = 0	No memory cards are installed.
Ps3 = n	is the amount of memory (in Mbytes) installed using 2-Mbyte memory cards.
Ps4 = n	is the sum of the codes of installed protocols.
Ps4 = 1	PostScript emulation protocol is present.
Ps4 = 8	HP–PCL4 emulation protocol (LJ2D) is present.
Ps4 = 9	HP–PCL4 and PostScript emulation protocols are present.
Ps5 = *yy*	Firmware edit revision *yy*
Ps5 = 00	Version x.x-00
Ps6 = 0	No input paper handling options are installed.
Ps6 = 1	Large capacity input tray (LCIT) is installed.
Ps6 = 2	Multi-Media feeder (MMF) is installed.
Ps7 = 0	No engine or controller options are installed.
Ps7 = 1	Coprocessor is installed.

DECRFS–Request Font Status

`CSI Ps " {`

Where:

Ps = 0 Send both reports (same as 1 followed by 2).

Ps = 1 Send font status (includes all built-in fonts, downline loaded fonts, and cartridge fonts).

Ps = 2 Send status of memory bytes available for downline loaded fonts.

DECFSR–Font Status Report

If DECRFS is 1 or 0:

`DCS 1 " { report_string ST`

If DECRFS is 2 or 0:

`DCS 2 " { nnn ST`

Where:

nnn indicates the number of bytes available in memory for downline loading.

`report_string` lists the resident font file id's.

DSR–Device Status Report

CSI Ps n

Where:

Ps = 0	No errors
Ps = 3	Errors

DSR–Device Status Request

CSI Ps n

Where:

Ps = 0 or 5	Send an extended status report.
Ps = 6	Send a cursor position report.
Ps = ?1	Disable all unsolicited status reports.
Ps = ?2	Enable brief unsolicited status reports, and send extended status report.
Ps = ?3	Enable extended unsolicited status report, and send extended status report.

A.8 Device Control

DECSCL–Set Conformance Level

CSI Ps " p

Where:

Ps = 0 is treated as 73.

Ps = 71 Reset to DEC PPL1 defaults

Ps = 72 Reset to DEC PPL2 defaults

Ps = 73 Reset to DEC PPL3 defaults

DECSTR–Soft Terminal Reset

CSI ! p Resets the printer to initial state values and returns to DEC PPL3 protocol.

RIS–Reset to Initial State

ESC c Resets the printer to initial state values and returns to DEC PPL3 protocol.

DECASFC–Automatic Sheet Feeder (input tray) Control

CSI Ps ! v

Where:

Ps = 0 No tray change

Ps = 1 Selects the top tray

Ps = 2 Selects the bottom tray

Ps = 3 Selects the LCIT (large capacity input tray)[1]

Ps = 4 Selects the MMF (multi-media feeder)[1]

Ps = 99 Selects manual feed operation[2]

---

[1]Available only when the option is installed

[2]Available only when the MMF option is not installed

DECFIN–Document Finishing

CSI Ps ! }

Where:

Ps = 0 Uses the default offset position (no offset) for output paper stacking.

Ps = 1 Toggles the paper offset to the alternate position.

DECNS–New Sheet

CSI SP s Executes a conditional Form Feed and insures that printing resumes on a new front face.

DECSDPM–Set Duplex Print Mode

CSI Ps SP x

Ps	Print Mode	Physical State	Tumbling State	Manual/MMF Fallback
0	True simplex normal	Simplex	Off	–
1	True simplex normal	Simplex	Off	–
2	True simplex tumbled	Simplex	On	–
3	True duplex normal	Duplex[1]	Off	5
4	True duplex tumbled	Duplex[1]	On	6
5	Duplex master normal	Simplex	Off	–
6	Duplex master tumbled	Simplex	On	–
7	Simplex compressed normal	Duplex[1]	Off	1
8	Simplex compressed tumbled	Duplex[1]	On	2

[1]Manual/MMF does not support duplex printing.

DECSITF–Select Input Tray Failover

CSI Ps1 ; Ps2 ; . . . Psn SP w

Where:

Ps1 = 0	Disables all composite input trays
Ps1 = 1	Defines composite tray 1
Ps2–Psn = n	Designates the tray as a member of the composite tray (tray numbers are the same as in DECASFC sequence)

DECSNC–Set Number of Copies

CSI Pn & q

Where:

Pn = 0	is treated as 1 copy.
Pn = 1–99	is the number of copies.
Pn > 99	is treated as 99 copies.

A.9 Miscellaneous

CRM–Control Representation Mode

CSI 3 h	Sets Control Representation Mode
CSI 3 l	Resets Control Representation Mode

ROCS–Return from Other Coding System

ESC % @ Returns to DEC PPL3 from an alternate protocol emulation mode (LJ2D).

SOCS–Select Other Coding System

ESC % 8	Selects HP PCL emulation mode (LJ2D protocol)
ESC % / 4	Selects PostScript interpreter mode (PostScript protocol)

SnC1R–C1 Receive Mode

CSI SP 6	Interprets C1 codes as C0 codes
CSI SP 7	Interprets C1 codes as C1 codes

B

LJ2D Quick Reference Guide

This LJ2D Quick Reference Guide contains basic information about using PCL programming instructions with your DEClaser 3200 printer.

See these sections for quick reference:

Category	Section
Job Control Commands	Section B.1
Page Control Commands	Section B.2
Cursor Positioning Commands	Section B.3
Font Selection Commands	Section B.4
Font Management Commands	Section B.5
Soft Font Creation Commands	Section B.6
Graphics Commands	Section B.7
Macro Commands	Section B.8
Troubleshooting Commands	Section B.9
Protocol Switching Commands	Section B.10

Conventions

The following example of a command illustrates the conventions used throughout this appendix.

```
ESC X g # p T[data]
```

Convention	Meaning
ESC	This is the *control or escape character* (1/11) used to introduce an escape sequence as part of the format of an LJ2D command; for example, ESC & ℓ # X.
X	This is the *parameterized character* used to indicate that the escape sequence is parameterized. Parameterized characters used range from 2/1→2/15.
g	This is the *group character* used to indicate the type of group control being used in the command. Group characters used range from 6/0→7/14.
#	This is the *value field* used to express a numeric decimal value. Field values use a group of characters in the range of 3/0→3/9. Field values may be preceded by a "+" or "-" and can also use decimal values after a decimal point. If a field value is not specified, a default value of 0 is assigned.
p	This is the *parameter character* used to combine escape sequences by specifying the previous field that applies to the parameter. Parameter characters used range from decimal 6/0→7/14 (decimal).
T	This is the *termination character* used to terminate the escape sequence. Termination characters used range from 4/0→5/14.
[data]	This is 8-bit binary data used with some commands to identify graphics data, downline loaded fonts, and so on.

Note

All characters used to display escape sequences in this appendix assume the Roman 8 character set.

B.1 Job Control Commands

Printer Reset

ESC E Prints any remaining data, deletes temporary fonts and macros, and then restores the printer to the initial state (user defaults).

Output Offset

ESC & 11 T Toggles the current paper offset position to the alternate position.

NOTE: *Powering up the printer, or switching protocols, sets the printer to no offset.*

Number of Copies

ESC & ℓ # X

Where:

is the number of copies from 1 to 99.

Simplex/Duplex Print

ESC & ℓ # S

Where:

= 0 Selects simplex printing.

= 1 Selects duplex printing, normal.

= 2 Selects duplex printing, tumble.

Left Offset Registration

ESC & ℓ # U

Where:

is the number of decipoints[1] (1/720 inch) used to move the origin of the logical page along the short edge of the paper.

[1]Positive numbers move the origin to the right; negative numbers move it to the left (valid to 4 places).

Top Offset Registration

ESC & ℓ # Z

Where:

is the number of decipoints[1] (1/720 inch) used to move the origin of the logical page along the long edge of the paper.

[1]Positive numbers move the origin down the page; negative numbers move it up (valid to 4 places).

Duplex Page Side Selection

ESC & a # G

Where:

= 0 Prints on the next side of the sheet.

= 1 Prints on the next front side.

= 2 Prints on the next back side.

B.2 Page Control Commands

Page Size

ESC & ℓ # A

Where:

# = 1	Executive (7.25 inches x 10.5 inches)
# = 2	Letter (8.5 inches x 11 inches)
# = 3	Legal (8.5 inches x 14 inches)
# = 26	A4 (210 mm x 297 mm)
# = 80	Monarch Envelope (3.875 inches x 7.5 inches)
# = 81	Commercial 10 Business Envelope (4.125 inches x 9.5 inches)
# = 90	International DL Envelope (110 mm x 220 mm)
# = 91	International C5 Envelope (162 mm x 229 mm)

Paper Source

ESC & ℓ # H

Where:

# = 0	Print the current page (paper source remains unchanged).
# = 1	Feed paper from the upper cassette (Tray 1).
# = 2	Feed paper from the manual feed tray.
# = 3	Feed envelopes from the manual feed tray.
# = 4	Feed paper from the lower cassette (Tray 2).
# = 5	Feed paper from the optional LCIT (Tray 3).
# = 6	Feed paper from the optional MMF (manual feed tray).

Page Length

ESC & ℓ # P

Where:

is the number of lines assigned to the logical page.

Orientation

ESC & ℓ # O

Where:

= 0 Portrait page orientation

= 1 Landscape page orientation

Left Margin

ESC & a # L

Where:

is the left margin column number (starting with 0).

Right Margin

ESC & a # M

Where:

is the right margin column number.

Clear Horizontal Margins

ESC 9 Resets left and right margins to their default settings.

Top Margin

ESC & ℓ # E

Where:

is the number of blank lines between the top of the logical page and the top of the text area.

Text Length

ESC & ℓ # F

Where:

is the number of lines in the text area.

Perforation Region

ESC & ℓ # L

Where:

# = 0	Allows you to print in the area between the bottom margin and the top margin of the next page.
# = 1	Attempts to write in this region brings you to the next page.

Horizontal Motion Index (HMI)

ESC & k # H

Where:

# =	The distance between columns in increments of 1/120 inch (0 . . . 32767).

Vertical Motion Index (VMI)

ESC & ℓ # C

Where:

# =	The distance between lines in increments of 1/48 inch (0 . . . 32767[1]).

[1]Valid to 4 decimal places

Line Spacing

ESC & ℓ # D

Where:

# = 1	1 line/inch
# = 2	2 lines/inch
# = 3	3 lines/inch
# = 4	4 lines/inch
# = 6	6 lines/inch
# = 8	8 lines/inch
# = 12	12 lines/inch
# = 16	16 lines/inch
# = 24	24 lines/inch
# = 48	48 lines/inch

B.3 Cursor Positioning Commands

Cursor positioning can be either absolute or relative. Absolute positioning moves the cursor distances referenced from the left and top margins. Relative positioning moves the cursor distances referenced from the current cursor position. Relative moves are indicated by using signed numbers (for example, # = +20, or # = -132); absolute moves are indicated by unsigned numbers (for example, # = 20, or # = 132).

Horizontal Cursor Positioning (in Columns)

ESC & a # C

Where:

is the distance or position in columns[1].

[1]Valid to 4 decimal places

Horizontal Cursor Positioning (in Decipoints)

ESC & a # H

Where:

is the distance or position in decipoints[1] (1/720 inch).

[1]Valid to 2 decimal places

Horizontal Cursor Positioning (in Dots)

ESC * p # X

Where:

is the distance or position in dots (1/300 inch).

Horizontal Cursor Positioning Control Codes

The following control codes are used to horizontally position the cursor.

CR[1] (carriage return)	Moves the cursor to the left margin on the current line.
SP (space)	Moves the cursor one column[2] to the right on the current line.
BS (back space)	Moves the cursor left a distance equal to the width of the last printed character or space.[2]
HT[3] (horizontal tab)	Moves the cursor to the next tab stop on the current line. **NOTE** *Tab stops are set every eighth column beginning at the left margin.*

[1]Carriage return operation may be modified by Line Termination.

[2]When using fixed pitch fonts, the actual distance the cursor moves is defined by the current HMI setting.

[3]HT is ignored if the current HMI setting is 0.

Vertical Cursor Positioning (in Rows)

ESC & a # R

Where:

is the distance or position in columns [1] (as determined by the VMI setting).

[1]Valid to 4 decimal places

Vertical Cursor Positioning (in Decipoints)

ESC & a # V

Where:

is the distance or position in decipoints[1] (1/720 inch).

[1]Valid to 2 decimal places

Vertical Cursor Positioning (in Dots)

ESC * p # Y

Where:

is the distance or position in dots (1/300 inch).

Half Line-Feed

ESC = Moves the cursor to the same character position one-half line down[1].

[1]The actual distance the cursor moves depends on the current VMI or Line Spacing setting.

Vertical Cursor Positioning Control Codes

The following codes are used to vertically position the cursor.

LF (line feed)	Moves the cursor to the same horizontal position on the next line.
FF (form feed)	Moves the cursor to the same horizontal position at the top of the text area on the next page (top margin).

Line Termination

`ESC & k # G`

Where:

# = 0	CR→CR; LF→LF; FF→FF
# = 1	CR→CR-LF; LF→LF; FF→FF
# = 2	CR→CR; LF→CR-LF; FF→CR-FF
# = 3	CR→CR-LF; LF→CR-LF; FF→CR-FF

Push/Pop Cursor Position

`ESC & f # S`

Where:

# = 0	Push (store the current cursor position)
# = 1	Pop (recall the last stored cursor position)

B.4 Font Selection Commands

Symbol Set

`ESC ( ID` Selects the primary symbol set and symbol set identification number.

`ESC ) ID` Selects the secondary symbol set and symbol set identification number.

Where:

ID = the symbol set identification number (see Table B–1)

Table B–1 ID Numbers and Symbol Set Names

ID Number	Symbol Set Name	ID Number	Symbol Set Name
0N	ECMA-94 Latin 1	2S	ISO 17: Spanish
0G	HP German	1G	ISO 21: German
1U	HP Legal	0F	ISO 25: French
8U	HP Roman-8	2K	ISO 57: Chinese
1S	HP Spanish	0D	ISO 60: Norwegian Version 1
2U	ISO 2: International Reference Version	1D	ISO 61: Norwegian Version 2
1E	ISO 4: United Kingdom	1F	ISO 69: French
0U	ISO 6: ASCII	5S	ISO 84: Portuguese
3S	ISO 10: Swedish	6S	ISO 85: Spanish
0S	ISO 11: Swedish	10U	PC-8
0K	ISO 14: JIS ASCII	11U	PC-8 (Danish/Norwegian)
0I	ISO 15: Italian	12U	PC-850
4S	ISO 16: Portuguese		

NOTE

Other symbol sets are available from cartridges or by downloading.

Spacing

ESC (s # P Selects spacing for the primary font.

ESC) s # P Selects spacing for the secondary font.

Where:

= 0 is fixed spacing.

= 1 is proportional spacing.

Pitch

ESC (s # H Selects horizontal spacing for the fixed spaced primary font.

ESC) s # H Selects horizontal spacing for the fixed spaced secondary font.

Where:

is the pitch in characters/inch[1]

---

[1]Valid to 2 decimal places

Height (Point Size)

ESC (s # V Selects the font height for the primary font.

ESC) s # V Selects the font height for the secondary font.

Where:

is the height in points[1].

---

[1]Valid to 2 decimal places

Style

ESC (s # S Selects the primary font style.

ESC) s # S Selects the secondary font style.

Where:

= 0 Upright style

= 1 Italic style

Stroke Weight

ESC (s # B Selects the stroke weight for the primary font.

ESC) s # B Selects the stroke weight for the secondary font.

Where:

= values from -7 to +7 (see Table B–2 for typical examples).

Table B–2 Stroke Weight Examples

# = -7	Ultra thin
# = -5	Thin
# = -3	Light
# = 0	Medium, or Book
# = +3	Bold
# = +5	Black
# = +7	Ultra black

Typeface Selection

ESC (s # T Selects the typeface for the primary font.

ESC) s # T Selects the typeface for the secondary font.

Where:

= 0 Line printer

= 3 Courier

NOTE

Other typefaces are available from cartridges or by downloading.

Selection of the Default Font

ESC (3 @ Selects the default primary font characteristics.

ESC) 3 @ Selects the default secondary font characteristics.

Transparent Print Data

ESC & p # X [transparent data]

Where:

is the decimal number of characters you want to print in transparent mode.

Underline

ESC & d @ Underline is disabled.

ESC & d # D Underline is enabled.

Where:

= 0 Fixed position underlining

= 3 Floating position underlining

B.5 Font Management Commands

Font ID

ESC * c # D

Where:

is the font ID number (0 through 32767).

Font Control

ESC * c # F

Where:

= 0 Delete all soft fonts.

= 1 Delete all temporary soft fonts.

= 2 Delete soft font (the font ID number must have been previously specified).

= 3 Delete character code (the font ID number and the character code must have been previously specified).

= 4 Make soft font temporary (the font ID number must have been previously specified).

= 5 Make soft font permanent (the font ID number must have been previously specified).

= 6 Copy the currently selected font into RAM as a temporary font (a font ID number must have been previously assigned to the temporary font).

Font Selection by ID

ESC (# X Selects the soft font as the primary font.

ESC) # X Selects the soft font as the secondary font.

Where:

is the soft font ID number (0 through 32767).

B.6 Soft Font Creation Commands

Font Descriptor

`ESC ) s # W [font descriptor data]` Downloads the font descriptor to the printer.

Where:

identifies the number of bytes in the font descriptor.

Character Code

`ESC * c # E` Establishes the decimal character code for the next character downloaded.

Where:

is the decimal character code.

Character Descriptor/Data

`ESC ( s # W [character descriptor & data]` Downloads the character descriptor and character data.

Where:

is the number of bytes in the character descriptor and data (32767 maximum).

B.7 Graphics Command

Raster Graphics Resolution

ESC * t # R

Where:

# = 75	75 dots-per-inch
# = 100	100 dots-per-inch
# = 150	150 dots-per-inch
# = 300	300 dots-per-inch

Raster Graphics Presentation Mode

ESC * r # F

Where:

# = 0	Prints image in the orientation of the logical page.
# = 3	Prints image along the width of the physical page.

Start Raster Graphics

ESC * r # A

Where:

# = 0	Sets left graphics margin at X-position 0.
# = 1	Sets left graphics margin at the current X-position.

Set Compression Mode

ESC * b # M

Where:

= 0 Unencoded

= 1 Run-length encoding

= 2 Tagged image file format (TIFF) rev. 4.0

Transfer Raster Data

ESC * b # W [raster data] Transfers a row of raster graphics to the printer.

Where:

is the number of bytes in the raster row.

End Raster Graphics

ESC * r B Indicates the transfer of a raster graphic image has ended.

Horizontal Rectangle Size (in Decipoints)

ESC * c # H Specifies the rectangular width of the fill area in decipoints.

Where:

is the number of decipoints (1/720 inch).

Horizontal Rectangle Size (in Dots)

ESC * c # A Specifies the rectangular width of the fill area in dots.

Where:

is the number of dots (1/300 inch).

Vertical Rectangle Size (in Decipoints)

ESC * c # V Specifies the rectangular fill area height in decipoints.

Where:

is the number of decipoints (1/720 inch).

Vertical Rectangle Size (in Dots)

ESC * c # B Specifies the rectangular fill area height in dots.

Where:

is the number of dots (1/300 inch).

Area Fill ID

ESC * c # G Specifies the level of shading or the type of pattern to use when filling a rectangular area.

Where:

# indicates the level of shading using values from 1 through 100 (100 = a black page).

or

# indicates the type of fill pattern to use (1 through 6).

Fill Rectangular Area

ESC * c # P

Where:

= 0 Solid area fill

= 2 Shaded fill

= 3 Defined pattern fill

B.8 Macro Commands

Macro ID

ESC & f # Y Establishes a macro ID number for use in subsequent macro commands.

Where:

is the macro ID number (0 through 32767).

Macro Control

ESC & f # X Used to define, invoke, and delete macros.

Where:

= 0 Start macro definition (for last ID specified).
= 1 Stop macro definition.
= 2 Execute macro (for last ID specfied).
= 3 Call macro (for last ID specfied).
= 4 Enable macro for automatic overlay (for last ID specified).
= 5 Disable automatic overlay.
= 6 Delete all macros.
= 7 Delete all temporary macros.
= 8 Delete macro (for last ID specfied).
= 9 Make macro temporary (for last ID specfied).
= 10 Make macro permanent (for last ID specfied).

B.9 Troubleshooting Commands

End-of-Line Wrap

ESC & s # C

Where:

# = 0	Enables end-of-line wrap when text reaches the right margin.
# = 1	Disables end-of-line wrap when text reaches the right margin (data is truncated).

Display Function

ESC Y	Escape sequences and control codes are printed.
ESC Z	Escacpe sequences and control codes are executed.

B.10 Protocol Switching Commands

ROCS–Return from Other Coding System

ESC % @	Returns to PPL3 protocol.

SOCS–Select Other Coding System

ESC % 8	Selects HP PCL emulation mode (LJ2D protocol).
ESC % / 4	Selects PostScript interpreter mode (PostScript protocol).

C

PostScript Operators

Table C–1 lists the PostScript operators supported by the DEClaser 3200 printer. These operators are in addition to the set of operators listed in Adobe's PostScript Language Reference Manual.

Table C–1 PostScript Operators on the DEClaser 3200 Printer

Operator	Explanation
10x14	Imposes a coordinate space suitable for 10 in. x 14 in. media.
10x14tray	Selects the manual feed and imposes the **10x14** page type.
3.875x7.5	Imposes a coordinate space for 3.875 in. x 7.5 in. envelopes.
3.875x7.5tray	Selects the manual feed or MMF and imposes the **3.875x7.5** page type.
4.125x9.5	Imposes a coordinate space for 4.125 in. x 9.5 in. envelopes.
4.125x9.5tray	Selects the manual feed or MMF and imposes the 4.125 in. x 9.5 in. page type.
7x9	Imposes a coordinate space suitable for 7 in. x 9 in. media.
7x9tray	Selects the manual feed or MMF and imposes the 7 in x 9 in. page type.
a4	Imposes a coordinate space suitable for A4 media.
a4small	Imposes an A4 coordinate space with reduced imageable area.
a4tray	Selects a tray containing A4 media and imposes the **a4** page type.
a5	Imposes a coordinate space suitable for A5 media.
a5tray	Selects the manual feed or MMF and imposes the **a5** page type.

(continued on next page)

Table C–1 (Cont.) PostScript Operators on the DEClaser 3200 Printer

Operator	Explanation
allowjobreset	Returns a value that indicates whether cancellation of a job from the control panel is allowed.
asynchcontrolsmode	Returns a value that reflects whether Control-C and Control-T are interpreted asynchronously (as received) or as part of the interpreter's data stream.
b4	Imposes a coordinate space suitable for B4 media.
b4tray	Selects the manual feed or MMF and imposes the **b4** page type.
b5	Imposes a coordinate space suitable for B5 media.
b5tray	Selects the manual feed or MMF and imposes the **b5** page type.
c5	Imposes a coordinate space suitable for C5 envelopes.
c5tray	Selects the manual feed or MMF and imposes the **c5** page type.
checkconfiguration	Checks the current hardware configuration and returns error states, if any.
checkpassword	Determines if a value is equal to the printer password.
colorimage	Renders a sampled image in one-, three-, or four-color components onto the current page.
componentids	Returns a number of PostScript objects, each identifying a component of the device.
currentblackgeneration	Returns the current black generation function of the graphics state.
currentcacheparams	Returns the current cache parameters.
currentcmykcolor	Returns the four components of the current color of the graphics state.
currentcolorscreen	Returns all 12 current halftone screen parameters of the graphics state.
currentcolortransfer	Returns the current transfer function for each color of the graphics state.
currentpacking	Returns the array packing mode currently in effect.
currentundercolorremoval	Returns the current undercolor removal function of the graphics state.

(continued on next page)

Table C–1 (Cont.) PostScript Operators on the DEClaser 3200 Printer

Operator	Explanation
DECimage	Returns the image-printing mode currently in effect.
DECimageparams	Returns the DECimage parameters currently in effect.
defaultDECimage	Returns the printer's default image-printing mode.
defaultDECimageparams	Returns the printer's default DECimage parameters.
defaultduplexmode	Returns the default value of physical duplex mode.
defaultenvelopefeedsize	Returns the default medium size and orientation that will be imposed by the operator **envelopetray**. Factory defaults are 4.125 in. x 9.5 in. envelopes.
defaultjobtimeout	Returns the default value for job timeout.
defaultmansize	Returns the default page size and orientation for manual feed.
defaultoutputpositioning	Returns the default state of **outputpositioning**.
defaultpagetimeout	Returns the default value for page timeout.
defaultpapertray	Returns the value for the default input tray.
defaulttimeouts	Returns the default values of job, manual feed, and wait timeouts.
defaulttrayswitch	Returns the default value for input tray fail-over.
defaulttumble	Returns the default value for tumble mode.
deviceid	Returns the hardware model ID and the device controller firmware ID.
dl	Imposes a coordinate space suitable for DL (C5/6) envelopes.
dltray	Selects the manual feed or MMF and imposes the **dl** page type.
dojamrecovery	Returns a value indicating whether jam recovery is turned on.
dostartpage	Returns a value indicating whether the PostScript configuration page is printed when the interpreter is started or restarted.
duplexmode	Returns the current setting of physical duplex mode.
eescratch	Returns a value at the position index in NVRAM scratch array. The valid index values are 0 to 63.

(continued on next page)

Table C–1 (Cont.) PostScript Operators on the DEClaser 3200 Printer

Operator	Explanation
eexec	Reads encrypted data from the source (either file or string) and executes it.
envelopetray	Selects the manual feed or MMF and installs the coordinate space indicated by **defaultenvelopefeedsize**.
errorinfo	After an error, this array contains information about the error.
executive	Puts a serial PostScript printer into interactive mode. Do not use this operator in a PostScript program.
executivepage	Imposes a coordinate suitable for executive-size (7.25 in. x 10.5 in.) paper.
executivetray	Selects the adjustable cassette (if present and associated with executive-sized paper) and imposes the **executivepage** page type.
exitserver	Escapes from the server **save/restore** context in order to change persistent or otherwise privileged parameters or modes.
feedsenvelopes	Always returns a Boolean value of *true*.
firstside	Returns a value indicating on which side of a logical sheet the current page will print.
halfletter	Imposes a coordinate space suitable for 5.5 in. x 8.5 in. media.
halflettertray	Selects the manual feed or MMF and imposes the **halfletter** page type.
hardwareiomode	Returns a value indicating which communications interface is selected (0 for serial, 1 for parallel).
idlefonts	Returns information about the fonts to be scan-converted during idle time.
ISOLatin1Encoding	Returns the ISO Latin Alphabet No. 1 character set encoding.
jobname	Accepts and returns the name of the current job.
jobtimeout	Returns the number of seconds remaining before the job timeout occurs.
legal	Imposes a coordinate space suitable for 8.5 in. x 14 in. media.
legalsmall	Imposes a legal-size coordinate space with reduced imageable area.

(continued on next page)

Table C–1 (Cont.) PostScript Operators on the DEClaser 3200 Printer

Operator	Explanation
legaltray	Selects a tray that contains legal-size media and installs the **legal** page type.
letter	Imposes a coordinate space suitable for 8.5 in. x 11 in. media.
lettersmall	Imposes a letter-size coordinate space with reduced imageable area.
lettertray	Selects a tray that contains letter-size media and installs the **letter** page type.
manualfeed	Returns or sets a value that determines whether paper should be fed from manual feed.
manualfeedtimeout	Returns the manual feed timeout currently in effect.
maxoutputposition	Returns the value 1, which is the greatest value the output jogger can accept.
newsheet	Declares the current page as the first side of the sheet.
note	Imposes **lettersmall**, **legalsmall**, or **a4small** coordinate spaces if a letter, legal, or A4 tray is selected for input.
outputposition	Returns the value 0 or 1, depending on the state of the output jogger. This value is stable; that is, the setting retains its value across job boundaries.
outputpositioning	Returns a value indicating whether **setoutputposition** would take effect, if attempted.
packedarray	Creates a packed array object.
pagecount	Returns the number of pages printed. “Page” is defined as one side of a sheet of paper.
pagestackorder	Returns a Boolean value of *true*, indicating facedown stacking.
pagetimeout	Returns the number of seconds remaining before the current page times out.
pagetype	Returns the default pagetype, 1 or 0.
papersize	Returns the name of the operator that describes the current size. It also returns Boolean value that indicates whether the paper is loaded short edge first (*true*) or long edge first (*false*).
papertray	Returns a value that indicates which slot has been selected for the current input tray.
printername	Returns the value set by **setprintername**. The name is a persistent value. The default value is “DEClaser 3250”.

(continued on next page)

Table C–1 (Cont.) PostScript Operators on the DEClaser 3200 Printer

Operator	Explanation
product	Returns the name of the product: "DEClaser 3250".
quit	Executes a **stop** when executed from **userdict**. Exits and restarts the interpreter when executed from **systemdict** in privileged mode.
ramsize	Returns the number of bytes of RAM in the printer.
realtime	Returns the value of a clock that counts in realtime. The resolution of the clock is in 10 millisecond increments.
returnstatus	Communicates status information back to the print symbiont (for use by Digital only).
revision	Returns the revision level of the interpreter as an integer.
sccbatch	Returns serial line communications parameters.
setallowjobreset†	Allows or disallows cancellation of a job from the control panel.
setasynchcontrolsmode†	Sets the value that reflects whether Control-C and Control-T are executed asynchronously as received or as part of the interpreter's data stream.
setblackgeneration	Sets the current black generation function parameter.
setcacheparams	Sets the character cache parameters.
setcmykcolor	Sets the current color parameter to the color described by the parameters.
setcolorscreen	Sets the current halftone screen definitions for red, green, blue, and gray.
setcolortransfer	Sets the current transfer function parameters for red, green, blue, and gray.
setDECimage	Sets the image-printing mode.
setDECimageparams	Sets the DECimage parameters.
setdefaultDECimage†	Sets the default image-printing mode.
setdefaultDECimageparams†	Sets the default DECimage parameters.
setdefaultduplexmode †	Sets the default physical duplex mode for subsequent jobs.
setdefaultenvelopefeedsize †	Specifies the default page size applicable when **envelopetray** is executed.
setdefaultjobtimeout†	Sets the default timeout limit for jobs.

†Must be outside the server loop

(continued on next page)

Table C–1 (Cont.) PostScript Operators on the DEClaser 3200 Printer

Operator	Explanation
setdefaultmansize†	Specifies the default page size and orientation for manual feed operation.
setdefaultoutputpositioning†	Sets the state of **defaultoutputpositioning**.
setdefaultpagetimeout†	Sets the default timeout limit for pages.
setdefaultpapertray†	Sets the slot to be used as the default input tray.
setdefaulttimeouts†	Sets the values for the default page, job, manual feed, and wait timeouts. The value zero for any timeout disables that particular timeout.
setdefaulttrayswitch †	Sets the value assigned to **defaulttrayswitch**.
setdefaulttumble†	Sets the default value for tumble mode.
setdojamrecovery†	Enables or disables complete jam recovery.
setdostartpage†	Sets the power-on default for either printing or not printing of the PostScript configuration start page.
setduplexmode	Sets the physical duplex mode for the current job.
seteescratch†	Writes the value at the position index in array format in NVRAM that is reserved for scratch use. The valid index values are 0 to 63.
setidlefonts†	Selects the fonts to be scan-converted during idle time.
setjobtimeout	Sets the timeout period for the current job.
setoutputposition	Causes the output positioning mechanism to change, but only if **outputpositioning** is *true*. If **outputpositioning** is *false*, no change to the output position occurs. No error is generated.
setoutputpositioning	Sets the state returned by **outputposition**.
setpacking	Sets the array packing mode.
setpagestackorder	Sets the stack order for the output tray. This printer is only capable of face-down stacking.
setpagetimeout	Sets the timeout period for the current page.
setpagetype†	Specifies the default pagetype. The valid values are 0 or 1.
setpapertray	Selects the input tray for the current job.
setpassword†	Changes the current password.
setprintername†	Changes the value that will be returned by **printername**.

†Must be outside the server loop

(continued on next page)

Table C–1 (Cont.) PostScript Operators on the DEClaser 3200 Printer

Operator	Explanation
setsccbatch†	Accepts arguments as if to change serial communications settings, but no changes are made.
setsoftwareiomode	Changes from the PostScript interpreter to the specified mode at the end of the current job. A value of 0 specifies PostScript protocol; 10 specifies DEC PPL3 protocol.
settrayswitchpath	Changes the search list for input tray failover.
settumble	Sets tumble mode for the current job.
setundercolorremoval	Sets the current undercolor removal function parameter.
setvmlimit	Allows for a reduction in the amount of virtual memory used for the current job. This is used for emulating less capable machines.
sheetcount	Returns the number of sheets of paper that have been delivered to the output tray.
softwareiomode	Returns the identification of the interpreter to be selected at the end of the job.
status	Returns a *true* status if the operand is a valid file object.
trayswitch	Returns or sets the setting of input tray failover.
trayswitchpath	Returns the array of tray values accessible to input tray failover.
tumble	Returns a Boolean value that indicates the current setting for tumble mode.
twothirdsa4	Imposes a coordinate space suitable for two-thirds A4-size media.
twothirdsa4tray	Selects the manual feed or MMF slot and imposes the **twothirdsa4** page type.
waittimeout	Returns the number of seconds a job will wait without receiving data before the job will be aborted.

†Must be outside the server loop

D

VMS Device Control Library Example

The DEClaser 3200 printer provides several useful paper handling options, such as duplex printing, multiple input trays, and selecting manual feed. All of these features can be controlled from the host system.

This appendix gives an example procedure for creating and installing a device control library that provides the user with access to these features from the VMS operating system. Your system manager must create and install the device control library and set up printer queue definitions that use this library.

Once installed, the device control library is accessible to anyone on a VMS host system. The library will provide setup modules that you can use to access the DEClaser 3200 printer features without the need to modify your applications. Many features supported by this library are also available on Digital's other level 3 printers–the DEClaser 1100, DEClaser 2100, and DEClaser 2200.

D.1 Creating the Device Control Library

To create the device control library, you will create several text files, each containing one or more DEC PPL3 commands, and representing a setup module that the user will have access to. These text files are then inserted into a text library file using the LIBRARY command.

This appendix describes 21 example setup modules. Refer to Table D–2 for an explanation of these modules. Table D–1 lists the filename and contents for each of the text files that you must create using the text editor of your choice. To create each text file, you must

1. Edit a new text file with the filename shown in the first column of Table D–1.
2. Type in the DEC PPL3 commands shown in the second column of Table D–1 exactly as shown on one line of the file.
3. Exit the editor to save the text file.

In the second column of Table D–1, you will see the symbols <FF> and <ESC>. Instead of typing the individual characters < F F > or < E S C >, you must insert the Form Feed (coded as 00/12) or Escape (coded as 01/11) control character into the file, using the special character insert facility provided by your text editor. Where you see the symbol <SP>, type a space character.

Table D–1 Filenames and Contents for Example SETUP Modules

Filename	DEC PPL3 Commands
TRAY1.TXT	<FF><ESC>[1!v
TRAY2.TXT	<FF><ESC>[2!v
TRAY3.TXT	<FF><ESC>[3!v
TRAY4.TXT	<FF><ESC>[4!v
MAN.TXT	<FF><ESC>[99!v
SPX.TXT	<FF><ESC>[1<SP>x
DPX.TXT	<FF><ESC>[3<SP>x
DPXT.TXT	<FF><ESC>[4<SP>x
A.TXT	<FF><ESC>[?20<SP>J
ALAND.TXT	<FF><ESC>[?21 <SP>J<ESC>[2<SP>I<ESC>[11h <ESC>[1;7559s<ESC>[11l
A4.TXT	<FF><ESC>[?22<SP>J
A4LAND.TXT	<FF><ESC> [?22<SP>J<ESC>[2<SP>I <ESC>[11h<ESC>[1;8057s<ESC>[11l
EXEC.TXT	<FF><ESC>[0;0;7560;5400<SP>{<ESC>[1;7560;5400<SP>z
EXECLAND.TXT	<FF><ESC>[0;0;7560;5400<SP>{ <ESC> [2;5400;7560<SP>z
LEG.TXT	<FF><ESC>[?24<SP>J
LEGLAND.TXT	<FF> <ESC>[?25<SP>J<ESC>[2 <SP>I <ESC>[11h<ESC>[1;9447s<ESC>[11l
ENV7.TXT	<FF><ESC>[0;0;2790;5400<SP>{<ESC>[2;2790;5400<SP>z
ENV10.TXT	<FF><ESC>[0;0;2970;6660<SP>{<ESC>[2;2970;6660<SP>z
ENVDL.TXT	<FF><ESC>[0;0;3118;6236<SP>{<ESC>[2;3118;6236<SP>z
ENVC5.TXT	<FF><ESC>[0;0;4592;6491<SP>{<ESC>[2;4592;6491<SP>z

(continued on next page)

Table D–1 (Cont.) Filenames and Contents for Example SETUP Modules

Filename	DEC PPL3 Commands
LPR66.TXT	<FF><ESC>[<SP>L<ESC>[?52h<ESC>[11h <ESC>[181;5940s<ESC>[2g <ESC>[757;1333;1909;2485;3061;3637;4213;4789;5365; 5941u<ESC>[1;7920r<ESC>[11l

You have now created 21 text files. The next step is to insert these text files into a device control library. Use the following DCL command to create the library.

```
$ LIBRARY/CREATE/TEXT ANSI_SETUPS.TLB
```

Then issue the following DCL command for each of the 21 files you just created.

```
$ LIBRARY/INSERT ANSI_SETUPS.TLB filename.txt
```

Where *filename.txt* is the name of one of the text files.

D.2 Installing the Device Control Library

You must now install the device control library in the SYS$LIBRARY directory so that the system can access it. To install the library, copy the file ANSI_SETUPS.TLB to SYS$LIBRARY:ANSI_SETUPS.TLB. Your system manager typically performs the rest of this procedure because SYSPRV privilege must be enabled.

If your system already has a device control library for DEClaser or other Digital ANSI-compliant printers, you may want to create a search list instead. Use the following DCL command to create a search list.

```
$ DEFINE/SYSTEM your_logical_name ANSI_SETUPS,existing_library
```

When this search list is used with a queue management command, the ANSI_SETUPS library will be searched first, followed by your existing library. (The DEFINE command must also be added to one of the system startup command files.)

You may prefer to include selected setup modules in your existing device control library. Use the following DCL command to insert new modules into an existing device control library.

```
$ LIBRARY/INSERT existing_library.TLB filename.txt
```

Once you have installed the device control library, you must now edit the system startup files that involve printer queue initialization. (These are usually found in the SYS$STARTUP directory.) For each printer queue initialization command (INITIALIZE/QUEUE) for which you want to provide this library, add the following /LIBRARY qualifier (or change the existing qualifier) to the following.

```
/LIBRARY=ANSI_SETUPS
```

If you defined a search list, use the following qualifier.

```
/LIBRARY=your_logical_name
```

After you have modified the system startup files, the library will be available on those queues when you next reboot your system. You can also stop and restart the relevant queues with the following commands to make the library available immediately.

```
$ STOP/QUEUE/NEXT DEClaser_queue
$ START/QUEUE/LIBRARY=ANSI_SETUPS DEClaser_queue
```

NOTE

Your installation may be using separation pages (flag pages, trailer pages, and so on) to identify print jobs, especially if your printer is in a shared environment. If your installation requires separation pages and you wish to use this example device control library, Digital recommends that you only use job separation pages and avoid file separation pages.

Job separation pages are selected through the /SEPARATE qualifier of the INITIALIZE/QUEUE and START/QUEUE DCL commands. File separation pages are selected through the /DEFAULT qualifier of these commands and can also be selected by the user through qualifiers to the PRINT command. Spurious blank pages may be produced if file separation pages are used with this example device control library.

D.3 Modifying the Device Control Library

When you discover other setup needs for your DEC PPL3 print jobs, you can easily customize this device control library for your installation. For example, additional setup modules could be created to support the following features of the DEClaser 3200 printer.

- Enabling the “job jogging” feature through the use of the Document Finishing (DECFIN) command.

- Using the Set Sheet Size (DECSSS) and Variable Page Format Selection (DECVPFS) commands to support special media sizes for use with the optional Multi-Media Feeder or adjustable paper cassette.
- Switching between DEC PPL3 and LJIID emulation protocols with the Select Other Coding System (SOCS) command.

To create a module, you edit a text file and type in the necessary DEC PPL3 commands. Then, with SYSPRV privilege enabled, you must stop all of the printer queues using the library, and then issue the following DCL command.

```
$ LIBRARY/INSERT ANSI_SETUPS.TLB new_module.TXT
```

Then, re-start the printer queues. The new module is now available to all users on the system.

Refer to the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*, and *Digital ANSI-Compliant Printing Protocol Level 3 Programming Supplement* for detailed information on DEC PPL3 commands for your DEClaser 3200 printer. Refer to the *VAX/VMS Guide to Maintaining a VMS System* for more information on modifying and managing printer queues.

D.4 Using the Setup Modules

Once the device control library is installed and associated with a printer queue, you can use these example setup modules in that library when printing to your DEClaser 3200. You may invoke a setup module from the DCL command line:

```
$ PRINT/SETUP=(SPX,TRAY1,ALAND) your_file
```

The setup modules may also be invoked from applications that allow user specified setup modules. (Digital's ALL-IN-1 Office Automation product is an example of one such application.)

Table D–2 provides a summary and quick reference guide to this example device control library. The following examples illustrate typical uses of the modules in the library.

- To print on Letter-size paper, with landscape orientation, simplex (one-sided), use the following command.

  ```
  $ PRINT/QUEUE=DEClaser_queue/SETUP=(ALAND,SPX) your_file
  ```

- To print on Letter-size paper, with landscape orientation, duplex (two-sided), use the following command.

  ```
  $ PRINT/QUEUE=DEClaser_queue/SETUP=(ALAND,DPX) your_file
  ```

- The following command will print several files, each with different attributes.

  ```
  $ PRINT/QUEUE=DEClaser_queue first_file/SETUP=(TRAY1,EXEC),–
  $_ second_file/SETUP=(TRAY2,LEGAL,DPX),–
  $_ third_file/SETUP=(TRAY2,LEGAL,SPX)
  ```

  The first file is formatted for Executive-size paper and uses paper tray 1. The second file is formatted for Legal-size paper, and will be printed duplex, using paper tray 2. The third file is also formatted for Legal-size paper, but will be printed simplex from tray 2.

- The following command will print an address file to the optional Multi-Media Feeder (MMF), followed by a letter, printed duplex using paper tray 1.

  ```
  $ PRINT/QUEUE=DEClaser_queue address.txt/SETUP=(ENV10,TRAY4),–

  $_ letter.txt/SETUP=(A,TRAY1,DPX)
  ```

  The /SETUP qualifier on the address file selects the location from which to draw the envelope and the format for a #10 envelope. (The TRAY4 module is used for the MMF; you can also manually feed envelopes, in which case you would specify /SETUP=(MAN,ENV10).) The /SETUP qualifier on the letter file requests formatting for standard Letter-size paper, supplied from tray 1.

  Note

  You must specify both the paper cassette (tray) and the page format on the PRINT command line. Also, you must have the proper size paper loaded into the DEClaser 3200 printer. For example, using /SETUP=(TRAY1,LEGAL) requires you to have Legal-size paper in paper tray 1.

Table D–2 ANSI_SETUPS Example Device Control Library Reference Guide

Module	Description
	Tray Selection
TRAY1	Print job using media in tray 1.
TRAY2	Print job using media in tray 2.
TRAY3	Print job using media from the optional Large Capacity Input Tray (tray 3).
TRAY4	Print job using media from the optional Multi-Media Feeder.
MAN	Print job using manually fed media.
	Duplex Printing
SPX	Print job simplex (one-sided).
DPX	Print job duplex (two-sided).
DPXT	Print job duplex and tumble.
	Page Format
A	Sets up printer for Letter size, portrait format.
ALAND	Sets up printer for Letter size, landscape format.
A4	Sets up printer for A4 size, portrait format.
A4LAND	Sets up printer for A4 size, landscape format.
EXEC	Sets up printer for Executive size, portrait format.
EXECLAND	Sets up printer for Executive size, landscape format.
LEG	Sets up printer for Legal size, portrait format.
LEGLAND	Sets up printer for Legal size, landscape format.
LPR66	Sets up printer for true 6 lines/inch lineprinter emulation.
	Envelope Format
ENV7	Sets up printer for #7 size envelope (3.88" x 7.5"), landscape format.
ENV10	Sets up printer for #10 size envelope (4.13" x 9.5"), landscape format.
ENVDL	Sets up printer for DL size envelope (110 x 220 mm), landscape format.
ENVC5	Sets up printer for C5 size envelope (162 x 229 mm), landscape format.

E

LN03 Compatibility

This appendix contains information highlighting the differences between the DEClaser 3200 printer and the LN03 printer family (LN03 and LN03 Plus). The information emphasizes the differences affecting compatibility between the printers.

E.1 General Differences

The following list identifies the general differences between the LN03 printer and the DEClaser 3200 printer.

- Font cartridges for the DEClaser 3200 printer do not have the same physical format or the same internal data format as the font cartridges for the LN03. If your application requires special cartridges (logos, signatures, private character sets), you need to use a soft copy or have a new cartridge made.
- The DEClaser 3200 printer comes with 1 MB of RAM and can be upgraded up to 10.5 MB. This memory is not dedicated as it is on the LN03. For example, the LN03 PLUS option is dedicated to bitmap processing, while the RAM cartridges are dedicated to font storage. On the DEClaser 3200 printer you can use the available memory for font storage, bitmap storage, or a display list. When you want to ensure the availability of bitmap memory, use the memory management command (DECMM), or one of the values under the Memory Management feature (Section 4.4.2.3) to allot the proper memory space. When you want to ensure the availability of font memory, load the fonts at the beginning of the print job. See Section 4.2.4 for additional information about memory allocation.
- Unlike the LN03 printer, the DEClaser 3200 printer does not use DIP switches to select features. Instead, it uses setup menus and a nonvolatile memory to select and save features.

E.2 Printable Area Compatibility

The printable area on the DEClaser 3200 printer is approximately the same as the printable area on the LN03 printer. There is a nonprintable area of approximately 6 mm (.25 in.) around the page.

This difference does not affect any application using the predefined Page Format Selections (PFS) or applications that do not print within 6 mm (.25 in.) of the paper edge. When the LN03 printer encounters a character that exceeds the printable area, it tries to shift the character so that it falls within the printable area. The DEClaser 3200 printer does not image any characters that exceed the printable area, so some characters may not be imaged.

E.3 DEC PPL3 Protocol Compatibility

The following describes issues of DEC PPL3 protocol compatibility between the LN03 printer and the DEClaser 3200 printer.

- The LN03 rounds a relative motion of 1 decipoint down to a relative motion of 0, causing cumulative errors; the DEClaser 3200 printer keeps its position accurately. This produces a side effect when a relative motion of 0 is interpreted as a relative motion of 1 by both devices when using decipoints. The result is 0 motion on the LN03 and 1 decipoint motion on the DEClaser 3200 printer.
- When trying to image past the bottom margin, the LN03 printer does not always wrap. Wrapping depends on the glyph shape and the line spacing. For example “a” may print but “j” may not. The DEClaser 3200 printer always wraps if the character box crosses the bottom margin, even though the character may not have a descender. This ensures that all characters either print or all characters wrap to the next page.
- You should use the level 3 device identification for the DEClaser 3200 printer when possible. This allows the software to be compatible with future devices.

  Some applications, such as DECmate, require you to set up the printer to respond as an LN03 printer. When the device identification is set to LN03, it responds as a base model LN03, not an LN03 PLUS, even though it may have sufficient memory for a full bitmap.

  The DEClaser 3200 printer does not support LA100 or LQP02 device identifications; the LN03 does. See Section 4.4.2.7 for additional information about device identification.
- The DEClaser 3200 printer does not support Tektronix mode; the LN03 PLUS does.

- The DEClaser 3200 printer does not contain the Modern Gothic font; the LN03 PLUS does.
- If a font used on the page is deleted to free up memory for another requirement, the DEClaser 3200 printer may cause a page break but, unlike the LN03 PLUS, does not try to transfer the display list to bitmap memory. If you encounter page breaks, set the memory management value to FULL (Section 4.4.2.3).

NOTE

The FULL value can be activated only if at least 2 MB of optional RAM is installed in the printer.

- When a font report is issued, the DEC Supplemental Character Set is reported as 245 (94-character set %5), rather than 01O (94-character set <), which is the User Preference character set. Three Hebrew character sets and the Legal character set reside in the DEClaser 3200 printer. The additional character sets modify the font status report because more fonts are included.
- The DEClaser 3200 printer enforces the Common Font File Format (CFFF) syntax and semantics more strictly than the LN03. Therefore, some fonts that contain errors and still load on the LN03 may not load properly on the DEClaser 3200 printer and will generate an error report.
- The DEClaser 3200 printer can save more user default settings in NVRAM than the LN03 can save using DIP switches. Therefore, when a reset command is received, more values can be restored in the DEClaser 3200 printer. To ensure that values are not cleared during a reset, save them to NVRAM.

F

Fonts for the DEClaser 3200 Printer

This appendix describes the contents of the optional DEC PPL3 font cartridges supported by your DEClaser printer.

The DEClaser 3200 printer can use the following optional DEC PPL3 font cartridges:

Font Name	Order Number
CG Times	LN08X–CA
CG Triumvirate	LN08X–CB
ITC Souvenir and Script	LN08X–CC
Monospaced	LN08X–CD

F.1 Font Attributes

Each font has attributes that define the appearance of characters. The following table lists examples of these attributes.

Attribute	Examples
Type family	Courier, Elite
Spacing	Proportional, fixed
Type size	10 point, 24 point (1 point = 1/72 inch)
Scale factor	1:1, 2.5:1 (vertical-to-horizontal comparison to a standard height-to-width ratio)
Type style	Normal, italic
Character weight	Normal, bold
Character proportion	Normal, expanded, condensed

Refer to the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual* for complete information on these attributes.

F.2 Supported Font Cartridges

Table F–1 describes four of the standard DEC PPL3 optional font cartridges available for the DEClaser 3200 printer.

The number in the Select Graphic Rendition (SGR) column is used in a control sequence to invoke a particular font or type family. When the type family is invoked, everything you print appears in the characteristics of that family until you change the font cartridge or return the printer to its default state.

Note that different cartridges use the same SGR number for different type families. Additional programming is required if you want to use two type families with the same SGR number. For example, SGR 17 is used to reference type families in both the CG Times font cartridge and the ITC Souvenir font cartridge. You should not use the CG Times and the ITC Souvenir cartridges inserted into your printer at the same time, without reassigning the SGRs. Refer to the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual* for complete information about assigning SGR numbers.

When you invoke the SGR number in an escape sequence, that particular type family is selected in your printer. Everything you print appears in these characteristics until you change the font (and SGR number) by way of an escape sequence, turn the printer off, or reset the printer. Turning the printer off and then on selects the default type family.

The Complement column identifies the type size, type style, and character weight of the fonts included in each cartridge. For example, 8I means that the font is 8-point type size and the type style is italic. 12B means that the font is 12-point type size and the character weight is bold.

Table F–1 Font Cartridge Characteristics

Type Family	SGR	Font Vendor	Complement	Character Sets
LN08X–CA Times Cartridge				
CG Times	17	Compugraphic	8, 8I, 8B, 10, 10I, 10B, 12, 12I, 12B, 14, 18, 18B, 24	ASCII, ISO Latin-1 Supplemental, DEC Supplemental
LN08X–CB Triumvirate Cartridge				
CG Triumvirate	18	Compugraphic	8, 8I, 8B, 10, 10I, 10B, 12, 12I, 12B, 14, 18, 18B, 24	ASCII, ISO Latin-1 Supplemental, DEC Supplemental
LN08X–CC Souvenir and Script Cartridge				
ITC Souvenir	17	Compugraphic	8, 8I, 8B, 10, 10I, 10B, 12, 12I, 12B, 14	ASCII, DEC Supplemental
English Embassy 116	19	Bitstream	14, 18	ASCII, DEC Supplemental
LN08X–CD Monospaced Cartridge				
Courier	11	Bitstream	10I	ASCII, ISO Latin-1 Supplemental, Legal
Elite	12	Bitstream	10I	ASCII, ISO Latin-1 Supplemental, Legal
OCR–A	None	Compugraphic	10	ASCII
OCR–B	None	Compugraphic	10	ASCII, ISO Latin-1 Supplemental
Barcode 3 of 9	17	C Centennial	18, 36	ASCII
Swiss	18	Bitstream	14, 18, 18B, 24	ASCII, ISO Latin-1 Supplemental, DEC Supplemental
Letter Gothic	19	Bitstream	10, 10I, 14, 14I	ASCII, ISO Latin-1 Supplemental, Legal

F.3 Selecting Fonts

This section describes how to select fonts using the WPS–PLUS and DECmate/WPS systems, as well as a summary of programming information to use on various operating systems.

F.3.1 WPS–PLUS

You must use an appropriate keyword when using fonts with WPS–PLUS.

- For WPS–PLUS/VMS (V3.0, V3.1) or ALL–IN–1 (V2.3, V2.4) applications: the *Guide to Modifying Printer Tables* contains detailed instructions for using keywords.
- For WPS–PLUS/VMS (V4.0) applications: fonts, keywords, and tray entries supplied in the printer tables for the DEClaser series printers are listed and described in the online document WPSPLUS$SYSTEM:KEYWORDS.WPL, which is installed with the V4.0 software.

F.3.2 DECmate/WPS

For complete information on DECmate/WPS, refer to *DECmate, Using the LN03*.

When using a font cartridge on a DECmate/WPS system, enter a printer font control block. The following is a general example:

```
----------------START CONTROL--------------
PRINT FONT A FN SZ HW VS
----------------END CONTROL----------------
```

Where:

A = "Normal" or "Bold"

FN = Font number (see Table F–2)

SZ = Point size in decipoints

HW = Horizontal width

VS = Vertical spacing

Examples of Choosing Fonts

To select CG Times 10-point bold font, use the following command:

```
------------START COMMAND-----------
PRINTER FONT BOLD 8 100 24 48
------------END COMMAND-------------
```

To select the Letter Gothic 14-point font in the Legal Character Set, use the following two commands:

```
------------START COMMAND-----------
PRINTER FONT NORMAL : 140 33 56
------------END COMMAND-------------
------------START COMMAND-----------
PRINTER CHRSET NORMAL %4
------------END COMMAND-------------
```

To select CG Triumvirate 24-point normal, use the following command:

```
------------START COMMAND-----------
PRINTER FONT NORMAL 9 240 53 104
------------END COMMAND-------------
```

Table F–2 Printer Font Control Block for Proportional Fonts

Type Family	FN	SZ	HW	VS
CG Times	8	80	20	40
	8	100	24	48
	8	120	28	56
	8	140	30	64
	8	180	39	80
	8	180	38	80[1]
	8	240	53	104
CG Triumvirate	9	80	20	40
	9	100	24	48
	9	120	28	56
	9	140	33	64
	9	180	42	80
	9	180	43	80[1]
	9	240	53	104
ITC Souvenir	8	80	19	64
	8	100	23	80
	8	120	27	80
	8	140	30	64
English Embassy	:	140	30	64
	:	180	39	80
OCR–A	N/A	100	30	48
OCR–B	N/A	100	30	48
Barcode 3 of 9	8	180	0	0
	8	360	0	0
Letter Gothic	:	100	25	48
	:	140	33	56
Swiss	9	140	33	64

[1]Because only the HW value is different from the previous style, this style is printed in bold.

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Table F–2 (Cont.) Printer Font Control Block for Proportional Fonts

Type Family	FN	SZ	HW	VS
	9	180	42	80
	9	180	43	80[1]
	9	240	53	104

[1]Because only the HW value is different from the previous style, this style is printed in bold.

F.4 Summary of Programming Information

You can use the following examples directly or with systems other than the ones mentioned in this chapter.

Use the following procedure to select fonts:

1. Select the font by choosing the font SGR number from Table F–3; for example, <ESC>[17m
2. Use the following command to print proportionally spaced fonts properly: <ESC>[?27h
3. Select the point sizes within the font family using the Graphic Size Modification (GSM) command; for example, <ESC>[140;140<SP>B for a 14-point font.

Note

Graphic Size Modification (GSM) is used to select point sizes within a font family. The Pn1 and the Pn2 values should be the same.

The following table lists some of the most used fonts and how to invoke them.

To . . .	Enter . . .
Select the bold attribute	<ESC>[1m
Turn off the bold attribute	<ESC>[22m
Select the italic attribute	<ESC>[3m
Turn off italic attribute	<ESC>[23m
Turn off all attributes	<ESC>[0m (This action does not deselect the font.)

Examples of Choosing Fonts

To select CG Times 10-point font, use the following command:

```
<ESC>[17m<ESC>[?27h<ESC>[100;100<SP>B
```

To select the CG Triumvirate 12-point italic font, use the following command:

```
<ESC>[18m<ESC>[?27h<ESC>[120;120<SP>B<ESC>[3m
```

To select the OCR–A font, you must first assign OCR–A to an otherwise unused SGR number between 10 and 19, using the type family ID. For example, to assign SGR number 19, enter the following command:

```
<ESC>P2;19}ROCRA00<ESC>\
```

You may now select OCR–A using `<ESC>19m<ESC>[?27l`. This command turns off proportional spacing and assumes that the 10-point font will be selected.

For more detailed information, refer to the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual* and the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Supplement*.

Table F–3 lists the characteristics of the four font cartridges you can purchase for your printer.

Table F–3 Font Access and Font Control Values

Type Family	SGR	Type Size	Type Family ID	GSM Pn1;Pn2
CG Times	17	8	RTIMES0	80;80
	17	10	RTIMES0	100;100
	17	12	RTIMES0	120;120
	17	14	RTIMES0	140;140
	17	18	RTIMES0	180;180
	17	24	RTIMES0	240;240
CG Triumvirate	18	8	RTRMVRT	80;80
	18	10	RTRMVRT	100;100
	18	12	RTRMVRT	120;120
	18	14	RTRMVRT	140;140
	18	18	RTRMVRT	180;180

(continued on next page)

Table F–3 (Cont.) Font Access and Font Control Values

Type Family	SGR	Type Size	Type Family ID	GSM Pn1;Pn2
	18	24	RTRMVRT	240;240
ITC Souvenir	17	8	RSOUVNR	80;80
	17	10	RSOUVNR	100;100
	17	12	RSOUVNR	120;120
	17	14	RSOUVNR	140;140
English Embassy	19	14	RENGEMB	140;140
	19	18	RENGEMB	180;180
OCR–A	None	10	ROCRA00	100;100
OCR–B	None	10	ROCRB00	100;100
Barcode 3 of 9	17	18	DBAR39M	180;180
	17	36	DBAR39M	360;360
Letter Gothic	19	10	RLTRGTH	100;100
	19	14	RLTRGTH	140;140
Swiss	18	14	DMNSSWS	140;140
	18	18	DMNSSWS	180;180
	18	24	DMNSSWS	240;240

F.5 Using Barcode 3 of 9

This section describes how to use the Barcode 3 of 9 font.

The industry-standard barcode font, called “Barcode 3 of 9,” produces machine-readable output in which each character is represented by a code printed from bar and space elements.

The name “3 of 9” is derived from the code structure, which consists of three wide elements and six narrow elements, for a total of nine elements. The nine elements consist of five bars and four spaces. A group of codes that begin and end with an asterisk (the start/stop code) is called a barcode symbol.

The following sections provide general information for using the barcode cartridge. Refer to *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual* and *Digital ANSI-Compliant Printing Protocol Level 3 Programming Supplement* for more information on programming your DEClaser printer.

The barcodes are provided in two heights: an 18-point height and a 36-point height. The 18-point height consists of 1/4 inch bars that can be used repetitively to produce a total symbol height. The 36-point height consists of 3/8 inch bars, plus a 10-point human-readable character beneath the bars. The 36-point height provides a complete and simple-to-use font.

A "quiet zone" of white space is required both before and after the symbol; the minimum quiet zone is 0.20 inch; the ASCII Space character can be used to help the user reserve space for the "quiet zone."

F.5.1 Encoding a Symbol

Barcode 3 of 9 represents 43 alphanumeric characters, making it unique among barcodes and suitable for many applications. With extended Barcode 3 of 9, combinations of the original 43 characters represent the full ASCII character set, including lowercase.

Barcode 3 of 9 contains the numerals 0 through 9, the uppercase alphabet A through Z, and the punctuation characters; period (.), minus (-), dollar sign ($), plus sign (+), slash (/), percent sign (%), and the asterisk (*) which is used as the start/stop character. Each symbol, framed by asterisks, may contain combinations of characters in any order. The barcode for the space character is placed in the ASCII underline code position. This placement makes the symbol look unbroken, and it prevents automatic justification from stretching the space.

To encode the text string `QC301 H3.B2` in a barcode, put an ASCII asterisk before and after it to create the symbol, and substitute an underline for the space: `*QC301_H3.B2*`. A barcode reader will read `*QC301 H3.B2*`. Some barcode readers suppress the asterisks and read this symbol as `QC301 H3.B2`.

F.5.2 Character Combinations for Extended Codes

The full ASCII character set can be represented by two character combinations using the following symbols as special codes:

% (percent)
$ (dollar)
+ (plus sign)
\ (backslash)

For example, "+A" would be read as "a." If you are using "extended 3 of 9," take care whenever one of these four codes is used. It is the responsibility of the user software to generate such character pairs correctly. The decoding of these pairs can be done automatically by the barcode reader.

G

Accessories and Supplies

This appendix lists the accessories and supplies available for the DEClaser 3200 printer. Table G–1 lists the options currently available for the DEClaser 3200 printer. Contact your Digital sales representative or refer to your latest DECdirect catalog for a complete list of products and pricing information. See Section G.1 for additional ordering information.

Table G–1 Accessories and Supplies

Part Number	Description
Fonts	
LN08X–CA	CG Times proportional font cartridge (DEC PPL3 only)
LN08X–CB	CG Triumvirate proportional font cartridge (DEC PPL3 only)
LN08X–CC	ITC Souvenir and Script font cartridge (DEC PPL3 only)
LN08X–CD	Monospaced font cartridge (DEC PPL3 only)
LN08X–CF	Blank 256KB font cartridge
LN08X–CG	Blank 512K font cartridge
LN08X–CH	WordPerfect font cartridge (LJ2D only)
LN08X–CI	Microsoft font cartridge (LJ2D only)
Memory Options	
LN08X–UC	2-MB SIMM memory board
PostScript Option	
LN08X–UA	PostScript upgrade kit

(continued on next page)

Table G–1 (Cont.) Accessories and Supplies

Part Number	Description
Paper Feeders	
LN08X–TE	Multi-Media feeder (MMF)
LN08X–TF	Large capacity input tray for Letter-size paper
LN08X–TG	Large capacity input tray for A4-size paper
Paper Cassettes	
LN08X–TD	Adjustable-size paper cassette
LN08X–TC	Letter-size paper cassette
LN08X–TB	Legal-size paper cassette (8.5 in. x 14 in.)
LN08X–TA	A4-size paper cassette (297 mm x 182 mm)
Printer Consumables	
LN08X–AA	Toner cartridges (2) Each cartridge lasts approximately 6K pages.
LN08X–AB	Photoreceptor drum cartridge kit (includes fuser wick) The photorecptor drum cartridge is replaced at 20K page intervals.
LN08X–AC	Developer cartridge kit (includes transfer/separation charger and toner cartridge) The developer cartridge is replaced at 50K page intervals.

(continued on next page)

Table G–1 (Cont.) Accessories and Supplies

Part Number	Description
Media	
LN01X–AB	Letter-size paper 8 ½ in. x 11 in. 5000 sheets per box
LN01X–AD	A4-size paper 297 mm x 210 mm 5000 sheets per box
LN01X–AC	Legal-size paper 8 ½ in. x 14 in. 5000 sheets per box
LN03X–AJ	Letter-size transparencies 8 ½ in. x 11 in. 50 sheets per box
LN03X–AK	A4-size transparencies 297 mm x 210 mm 50 sheets per box
H9850–TA	Laser labels (30/sheet x 100 sheets per box)
H9850–TB	Laser labels (21/sheet x 100 sheets per box)
Miscellaneous	
BC19M–10	IBM/Centronics parallel cable

(continued on next page)

Table G–1 (Cont.) Accessories and Supplies

Part Number	Description
Documentation	
AA–PBWGA–TE	Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual
EK–PPLV3–PS	Digital ANSI-Compliant Printing Protocol Level 3 Programming Supplement
AA–PBWFA–TE	PostScript Translators Reference Manual for ReGIS and Tektronix 4010/4014
EK–POSTP–PS	PostScript Printers Programming Supplement
QA–VVZAD–GZ	PostScript Tutorial/Reference Manuals Kit
EK–D3200–DK	DEClaser 3200 Printer Documentation Kit (Installation, Operator's, and Quick Reference Guides)
EK–DEC32–RF	DEClaser 3200 Printer Operator's Quick Reference Guide

G.1 Ordering Information

Use the addresses and telephone numbers in Table G–2 and Table G–3 to order products and documentation for the DEClaser 3200 printer.

Table G–2 Ordering Within the U.S.A.

MAIL	Digital Equipment Corporation PO Box CS2008 Nashua, NH 03061
TELEPHONE	Order toll free 1–800–DIGITAL between the hours of 8:30 a.m. and 8:00 p.m. Eastern Standard Time

Table G–3 Ordering Outside the U.S.A.

MAIL	Digital Equipment Corporation Attention: Accessories & Supplies Business Manager c/o Local Subsidiary or Digital-Approved Distributor
TELEPHONE	
In Canada	Order toll free 1–800–267–6215
In Australia	Outside Sydney Metropolitan Area (toll free): 008–226–363 From Sydney Metropolitan Area: 412–7000
In New Zealand	Auckland (toll free): 0800–800–332

H

Specifications

This appendix contains the specifications for the DEClaser 3200 printer.

H.1 Operating Specifications

Table H–1 lists the operating, storage and interface specifications for DEClaser 3200 printer.

Table H–1 DEClaser 3200 Specifications

Type:	Desktop page printer
Printing Method:	Electrophotographic, using laser beam scanning
Laser Power:	10 mW maximum
Resolution:	300 dpi
Printing Speed:	Simplex: 13 pages/minute maximum, using A4 or Letter-size paper Duplex: 11 pages/minute maximum using A4 or Letter-size paper
Warm-Up Time:	Less than one minute at 20°C (68°F)
Paper Cassette:	Approximate capacity is 250 sheets Letter (8.5 in. x 11 in.) A4 (210 mm x 297 mm) Legal (8.5 in. x 14 in.)
Manual Feed:	One sheet at a time 105 mm x 257 mm (4.12 in. to 10.12 in. wide) 190 mm x 364 mm (7.5 in. to 14.33 in. long)

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Table H–1 (Cont.) DEClaser 3200 Specifications

Output Tray Capacity:	Up to 500 sheets (job offset facedown stacking)
Paper Weight Range Cassette Feed:	60 g/m^2 to 80 g/m^2 basis weight (16 lb. to 21 lb.)
Paper Weight Range Manual Feed:	60 g/m^2 to 90 g/m^2 basis weight (16 lb. to 24 lb.)
DEC PPL3 Font Files:	There are 20 built-in DEC PPL3 font files. The font files consist of 4 fonts and 5 character sets. These fonts are: • Courier 10 point, 10 pitch normal[1] portrait • Courier 10 point, 10.3 pitch normal[1] portrait • Courier 6.7 point, 13.6 pitch normal[1] landscape • Elite 10 point, 12 pitch normal[1] portrait For each font, the following character sets reside in the printer: • DEC Supplemental • ISO Latin-1 • DEC 7-Bit Hebrew • ISO Latin-Hebrew Supplemental
HP LaserJet IID Emulation Font Files:	The HP LaserJet IID emulation font files consist of 41 fonts and 25 symbol sets, and 2 typefaces.
Font Cartridges:	Capacity for two optional DEC PPL3 or LJ2D font cartridges
Built-in RAM:	1.0 MB, expandable to 10.5 MB with optional SIMMs
Host Interface:	Parallel (Centronics) and serial (RS423 MMJ configuration)

[1]Normal means that the font is not set in bold, italics, or otherwise attributed.

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Table H–1 (Cont.) DEClaser 3200 Specifications

Acoustic Noise:	53 dB(A) maximum during standby 55 maximum during printing
Operating Temperature:	10°C to 32°C (50°F to 90°F)
Operating Humidity:	20% to 80% relative humidity
Storage Temperature:	-20°C to 40°C (-4°F to 104°F)
Storage Humidity:	10% to 85% relative humidity
Line Voltage:	120 Vac, 60 Hz, 12 A max 220–240 Vac, 50 Hz, 7 A max
Power Consumption:	Running = 0.85 KW Standby = 0.3 KW
Installed Weight:	Approximately 38 kg (85 lb.)
Dimensions:	Width: 670 mm (26.4 in.) Depth: 536 mm (21.1 in.) Height: 496 mm (19.5 in.)

H.2 Serial Interface Signals

All interface signals specified in this section conform to EIA Standard RS-423 (EIA Industrial Electronics Bulletin No.12).

The printer provides the interface signals shown in Table H–2. Designations of circuit direction are provided to indicate the source of the signals.

H.2.1 Connector

A Digital standard connector is used to support the serial interface. This connector is a modular 6-pin DECconnect-type connector. Table H–2 describes the serial interface signals.

Table H–2 Serial Interface Signals

DEConnect Pin	Direction	Name	RS-423 Function	EIA-232 Equivalent
1	From printer	TR	TERMINAL READY	CD
2	From printer	SD	SEND DATA	BA
3	From printer		SEND COMMON	
4	To printer		RECEIVE COMMON	
5	To printer	RD	RECEIVE DATA	BB
6	To printer	DM	DATA SET READY	CC

Signal levels and polarities are according to EIA Standard RS-423. (For reference only, a voltage in the range of -5 to -6 volts is required for a binary 1, MARK state, or OFF condition; a voltage in the range of +5 to +6 volts is required for a binary 0, SPACE state, or ON condition.)

H.2.1.1 Send Common

This circuit establishes the common ground reference potential for the Send Data and Terminal Ready interface circuits.

H.2.1.2 Receive Common

This circuit establishes the common ground reference potential for the Receive Data and Request To Send interface circuits.

H.2.1.3 Receive Data

The printer receives signals on this circuit that represent serially encoded characters being sent to the printer.

H.2.1.4 Send Data

The printer sends signals on this circuit that represent serially encoded characters being sent from the printer.

H.2.1.5 Terminal Ready

The printer sends a signal on this circuit that indicates the type of buffer control selected.

When XON/XOFF control is selected for buffer control, this signal indicates the printer's readiness to send and receive data. The printer is ready to send and receive data after it completes its power-up initialization and remains ready to communicate indefinitely.

When DTR is selected for buffer control, this signal indicates whether or not there is room in the input buffer for more data. When the buffer has room and the printer has completed power-up initialization, this line goes high (+5V). When the buffer reaches maximum capacity, this line goes low (-5V).

Refer to Section 4.4.9.3 for more details on buffer control.

H.2.1.6 Data Set Ready

The printer ignores this signal and assumes that it is always high.

H.3 Parallel Interface Requirements

The parallel interface is an 8-bit industry-compatible interface. It resides on the printer controller board and contains the functionality described in this section. This interface is capable of supporting data transfer at the rate of at least 25 Kbytes per second.

H.3.1 Connector

The interface connector is a 36-pin (female) Amphenol-type accessible from the rear of the printer.

H.3.2 Interface Signals

The printer shall provide the interface signals shown in Table H–3. Designations of circuit direction are provided to indicate the source of the signals.

Table H–3 Parallel Interface Signals

Pin	Direction	Signal	Description
1	To printer	STROBE L	STROBE pulse low to read data. A strobe low signal will raise BUSY line to high.
2	To printer	DATA BIT 1[1]	
3	To printer	DATA BIT 2[1]	
4	To printer	DATA BIT 3[1]	
5	To printer	DATA BIT 4[1]	
6	To printer	DATA BIT 5[1]	
7	To printer	DATA BIT 6[1]	
8	To printer	DATA BIT 7[1]	
9	To printer	DATA BIT 8[1]	
10	From printer	ACKNLG L	ACKNLG pulse low indicates data received and ready to receive more data.

[1]These signals are the 1st to the 8th bits of parallel data and are active high for a logical 1.

(continued on next page)

Table H–3 (Cont.) Parallel Interface Signals

Pin	Direction	Signal	Description
11	From printer	BUSY H	BUSY "high", indicates the printer cannot receive data (buffer full). BUSY high occurs when the printer is paused, or an error condition exists.
12	From printer	PE H	PAPER END high signal indicates paper out.
13	From printer	SLCT H	A high signal indicates the printer is in the select state. A low signal occurs when printer is deselected or if an error condition exists.
14	From printer	Ground	
15	From printer	Stunt box signal	2 MHz clock
16	From printer	0 Volts	Logic ground
17			Chassis Ground
18	From printer	+5 volts	
19-29	0 Volts		TWP returns all at Logic ground
30	0 Volts		INIT ground
31	To printer	INIT L	INIT L (low) resets the printer to its initial state and clears the buffer. The printer must see a pulse > 50 micro-seconds to activate this signal.
32	Not used		
33	Open		
34	Not used		
35	Ground		
36	From printer	DP Busy	Not used.

I

Cabling Information

This appendix describes the different cable combinations to use for connecting your printer to a host device and includes IBM PC interface programming instructions.

I.1 Cable Combinations

Table I–1, column 1, lists the devices that can connect your printer. They are grouped by the type of connector they use. The second column lists the part numbers of the adapter and the cable required for each device. Determine what device you have and obtain the appropriate adapter. The third column describes how to connect the adapter and/or the cable to the printer.

Table I–1 Cables and Adapters for Communication Connections

Connector Type	Adapter and Cable Required	Connecting Instructions
25-Pin Plug Devices		
VAXstation 3200/3500 VT100 Series DECserver 200/MC (DSRVB–AA) CPU RS232 Ports	H8571–A and BC16E[1]	Attach the H8571–A (25-pin-to-MMJ) adapter to these devices, then connect one end of the BC16E cable to the H8571–A. Attach the other end of the BC16E cable to the printer.

[1]The BC16E (DECconnect cable) is included with the DEClaser 3200 printer.

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Table I–1 (Cont.) Cables and Adapters for Communication Connections

Connector Type	Adapter and Cable Required	Connecting Instructions
9-Pin Plug Devices (DEC)		
VT200 Series DECmate PRO Series VAXstation 2000	H8571–B and BC16E[1]	Attach the H8571–B (9-pin-to-MMJ) adapter to these devices, then connect one end of the BC16E cable to the H8571–B. Attach the other end of the BC16E cable to the printer.
DEC423 (MMJ) Serial Devices		
VAXmate MicroVAX 2000 DECserver 300 DECserver 200/DL (DSRVB–BA) VT300 Series CPU DEC423 Ports	BC16E[1]	Attach one end of the BC16E cable to one of these devices. Attach the other end of the BC16E cable to the printer.
25-Pin Socket Devices		
Rainbow Digital Modems	H8571–D and BC16E[1]	Attach the H8571–D adapter to one of these devices, then connect one end of the BC16E cable to the H8571–D. Attach the other end of the BC16E cable to the printer.

[1]The BC16E (DECconnect cable) is included with the DEClaser 3200 printer.

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Table I–1 (Cont.) Cables and Adapters for Communication Connections

9-Pin Plug Devices IBM PC/AT Type		
DECstation 210, 212 DECstation 316, 320 IBM PC/AT	H8571–J and BC16E[1]	Attach the H8571–J adapter to one of these devices, then connect one end of the BC16E cable to the H8571–J. Attach the other end of the BC16E cable to the printer. Use data transmit ready (DTR) flow control (see Section 4.4.9.3).
European DECstations Serial Port		
200 Series	12–27591–01 Extender and H8571–A and BC16E[1]	Connect the female socket of the extender cable to the host device and the male plug of the extender cable to the H8571–A. Attach one end of the BC16E to the H8571–A and the other end of the BC16E cable to the printer.
300, 350 Series	H8571–A and BC16E[1]	Attach the H8571–A adapter to one of these devices, then connect one end of the BC16E cable to the H8571–A. Attach the other end of the BC16E cable to the printer.
European DECstations Parallel Port		
200, 300, 350 Series	BC19M–10	Connect the BC19M–10 to the DEClaser printer and to the host device.

[1]The BC16E (DECconnect cable) is included with the DEClaser 3200 printer.

I.2 Interface Programming Instructions

This section describes how to set up an IBM PC to interface with your printer.

I.2.1 Serial Flow Control

If you are using an IBM PC or compatible and you want to use the optional serial port on your PC, follow these steps:

1. Edit your AUTOEXEC.BAT file by adding the following two lines:

   ```
   mode com1:9600,n,8,1,p
   mode lpt1:=com1:
   ```

   where:

`mode com1:9600,n,8,1,p`	Specifies that the first serial port (COM1) is used by the printer, that 9600 baud is the communication speed, that no parity is selected, that 8 data bits are selected, that 1 stop bit is used, and that the host continuously retries on time-out errors.
`mode lpt1:=com1:`	Reassigns the printer output to COM1, the first serial port.

   Note

   On IBM personal computers and compatibles, printer output is normally directed to LPT1, the first parallel port.

2. Connect the H8571–J adapter, as described in Table I–1.
3. Refer to Section 4.4.9.3 for information about selecting DTR flow control.

If you are using a 25-pin PC/SA with XON/XOFF, follow these steps:

1. Edit your AUTOEXEC.BAT file to contain the following two lines:

   ```
   mode com1:9600,n,8,1,-,B
   mode lpt1:=com1:
   ```

   where:

`mode com1:9600,n,8,1,-,n`	Specifies that the first serial port (COM1) is used by the printer, that 9600 baud is the communication speed, that no parity is selected, that 8 data bits are selected, that 1 stop bit is used, that the host tries only once to connect, then time-out, and that the type weight is normal.
`mode lpt1:=com1:`	Reassigns the printer output to COM1, the first serial port.

   Note

   On IBM personal computers and compatibles, printer output is normally directed to LPT1, the first parallel port.

2. Connect the H8571–J adapter, as described in Table I–1.
3. Refer to Section 4.4.9.3 for information about selecting XON/XOFF.

I.2.2 Parallel Communication

If you are using an IBM PC, DECstation PC, or compatible and want to use the parallel port, follow these steps:

1. Refer to Section 4.4.1 for information about selecting parallel operation.
2. Use Digital's BC19M–10 cable or the industry standard Centronics 25-pin D-shell cable to make the connection from the PC to the DEClaser 3200 printer.

Glossary

ASCII

American Standard Code for Information Interchange. The ASCII code table is widely used for data processing and communication. The codes listed represent a set of characters and commands.

A4-size

The European paper size of 210 mm x 297 mm.

basis weight

A measurement that describes the paper weight density in grams per square meter. Acceptable basis weight ranges for the DEClaser 3200 printer are from 60 g/m^2 to 90 g/m^2, or the equivalent of 16 lb. to 24 lb. To determine the basis weight in pounds, divide the g/m^2 by 3.75.

baud rate

The speed (bits/second) at which the computer and the printer communicate when a serial interface is used.

bitmap

An image in digitized form that can be stored, transmitted, and reproduced precisely.

bitmap font

The type of font created from a bitmap pattern. A bitmap font has a fixed size, similar to the type set in typography. The Courier font used by the DEC PPL3 protocol is an example of a bitmap font.

buffer

An area in the printer's memory used for temporary storage of data during input and output operations.

built-in fonts

Fonts that reside in memory and are shipped with the printer. These fonts are sometimes referred to as internal, or resident fonts.

character attribute

A feature of a highlighted character. You can select underlining, bold printing, italic printing, and strike-through attributes.

character set

A set of codes that correspond to a set of characters. For example, a character set might contain the code for an uppercase A or the number 1. Character sets do not describe the style (font) of a printed character.

command

An instruction that tells the printer to perform a certain function. Commands are sent from the host computer to the printer when the printer is on line.

configuration

The process of changing the settings of the printer or computer to communicate properly with each other. For example, if you use a serial interface, features such as baud rate and parity must be configured to match the host computer and printer.

Control Representation Mode

Allows the printer to print out unprocessed data or commands from the host computer in hexadecimal form. The printing of unprocessed data is helpful when debugging programs.

DEC PPL3

Level 3 of the Digital ANSI-Compliant Printing Protocol. DEC PPL3 is the protocol used to run ANSI applications.

downline loaded fonts

Fonts that are transferred (downline loaded) from the host computer and temporarily stored in the printer's memory. Downline loaded fonts have priority over DEC PPL3 built-in fonts and are cleared when you use a software command or when you power off the printer.

dpi

Dots per inch. A unit of measurement to indicate printer resolution.

DTR

Data Terminal Ready. A control signal used with RS423 serial communication. DTR regulates the flow of data to the input buffer of the printer by placing a high or low voltage on the DTR line of the serial port. DTR is sometimes known as “hardware handshaking protocol.”

duplex

A page layout indicating that a document is to be printed on two sides.

factory defaults

Values or settings that have been programmed at the factory. The printer assumes the factory default values until specific changes are made (by saving them in NVRAM). For example, the COMM INTERFACE factory default value for the DEClaser 3200 printer is serial. Factory default values are stored in ROM and cannot be changed.

fail-over

Refers to the automatic selection of a new paper tray in the event that the currently selected tray runs out of paper. When the selected tray runs out of paper, another tray assigned in the sequence that meets the criteria (same size paper) would be the fail-over tray that feeds paper.

font

The artistic representation of a typeface that describes a set of characters by point size, weight, and style.

font attributes

The seven characteristics of a font that define how printed characters look when you use that font: type family, spacing, type size, scale factor, typeset, character weight, and character proportion. These attributes are not affected by the character set you use.

font file (DEC PPL3)

A data file that contains information used to reproduce a particular font.

font file ID (DEC PPL3)

A 31-character code that describes the character set and font attributes for a given font file.

font ID (DEC PPL3)

A 16-character code that describes the seven basic font attributes (including type family) of the ROM fonts. The code cannot contain lowercase letters.

font # (LJ2D)

A number used to identify which font the printer uses.

fusing unit

The fusing unit contains heat and pressure rollers that bond the toner to the paper.

host

A computer that provides services and enables startup and management of peripheral devices, such as printers.

image area

The printable portion of a page. Like most printers, the DEClaser 3200 printer does not allow printing to the physical edge of the page.

initialize

To set starting values such as counters, switches, or addresses, at the beginning of, or at prescribed points in a computer routine.

interface

Connects two devices (through the interface cable) such as a computer and printer, making it possible for them to communicate with each other. The DEClaser 3200 printer supports a parallel (Centronics) and a serial (RS423) interface.

landscape printing

A method of printing characters parallel to the long edge of the paper. Landscape printing is typically used for printing wide charts or tables.

LCD

Liquid crystal display. The printer messages are displayed on the LCD, which is part of the control panel.

LCIT

Large capacity input tray. The LCIT can hold about 1,000 sheets of 80 g/m^2 basis weight paper.

Legal-size

The North American paper size of 8 ½ in. x 14 in.

Letter-size

The North American paper size of 8 ½ in. x 11 in.

line weight

The thickness of a line. The thicker the line, the heavier the line weight.

menu

Menus contain the features and values to configure the printer or selections to print status sheets or to save values. For example, the Set Up menu contains features such as PROTOCOL and COMM INTERFCE to select which protocol and type of interface you want to use. The Defaults menu contains selections that allow you to save or recall default values. The DEClaser 3200 printer has three main menus: Set Up, Test, and Defaults.

moisture content

The ratio of water to the dry mass of paper. The moisture content can vary depending on the type of paper and the amount of humidity it is exposed to.

NVRAM

Nonvolatile random-access memory. NVRAM retains data even after the printer is powered off. NVRAM is particularly useful when you are setting up the printer configuration, because all of the values can be saved and retained.

on line

A communications mode during which the printer can receive and print data from the host computer. When the Online indicator is on, it indicates that the printer is on line.

operating memory

Contains the current print settings loaded from NVRAM, and any modifications. Operating memory is random-access memory (RAM), and is cleared when the printer is powered off. Operating memory is sometimes known as “working memory.”

page

In the context of a printer, a page is the image you are printing; you may print up to two pages per sheet (one page per side).

parallel interface

A data communications interface that transmits multiple bits of data (usually in 1-byte segments) simultaneously. The DEClaser 3200 printer uses a Centronics parallel interface.

pause

A paused state of operation during which the printer cannot print data received from the host computer. When the Online indicator is off, it indicates that the printer is paused.

portrait printing

A method of printing characters parallel to the short edge of the paper. This is the normal page orientation for printing. For example, this page is printed in a portrait orientation.

PostScript language

A programming language designed to convey a description of a desired page to a printer. It can describe a page containing any combination of text, graphical shapes, and digitized images.

primary charge corona wire

A wire located inside the photoreceptor drum cartridge that places an electrical charge on the photosensitive drum, preparing it to accept an image from the laser beam.

printer controller firmware

The firmware that interprets the data in a print request according to a specified data syntax, builds bitmaps of each page to be printed, and forwards the bitmaps to the print engine, which produces the printed output.

print density

Print density refers to the amount of toner applied to the paper. A lighter density setting applies less toner to the paper; a darker density setting applies more toner to the paper.

printer software

The software that handles the communications between the process that makes a print request (a terminal), the process that provides resources (a host), and the process that performs the printing service (a print queue).

protocol

A procedure or set of rules that controls the communication between computers and peripherals. Also, a set of conventions between communicating processes regarding the format and contents of messages to be exchanged.

RAM

Random-access memory. RAM retains data only while power remains on. Data is cleared from RAM when the printer is powered off. The DEClaser 3200 printer contains 0.5 MB of built-in RAM which is expandable to 10.5 MB with optional memory boards (SIMMs).

resolution

The number of ink dots in a defined area used to print a character. The resolution of the DEClaser 3200 printer is 300 dots per inch (dpi).

ROM

Read-only memory. ROM contains all of the factory default feature values. It is a permanent memory and cannot be cleared or changed.

serial interface

A data communications interface that transmits data sequentially, one bit at a time, at a fixed speed. The DEClaser 3200 printer uses an RS423 serial interface.

sheet

In the context of a laser printer, the physical piece of paper that is printed.

SIMM

Single in-line memory module. Up to 5 SIMMs can be added to the DEClaser 3200 printer for a total of 10.5 MB of RAM.

simplex

A page layout indicating that a document is formatted to be printed on one side of a sheet.

symbol set (LJ2D)

The symbol set defines the character set to be used with the selected font.

toner

Dry ink (in the form of black powder), which is used to form the characters on the paper.

type family

A group of fonts that have a similar design, but differ in the six other font attributes. For example, Courier is the type family that resides in the DEClaser 3200 printer.

type family ID (DEC PPL3)

A 7-character code that identifies a type family font attribute.

user defaults

Values or settings that have been saved in NVRAM by the user. The printer loads the user default selections into the operating memory each time the printer is powered on. Default values stored in NVRAM are not affected by reset commands or powering off the printer.

XON/XOFF

A software protocol used with serial communication. It regulates the flow of data to the input buffer by exchanging on/off signals with the host computer. XON/XOFF is sometimes referred to as “software handshaking protocol.”

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