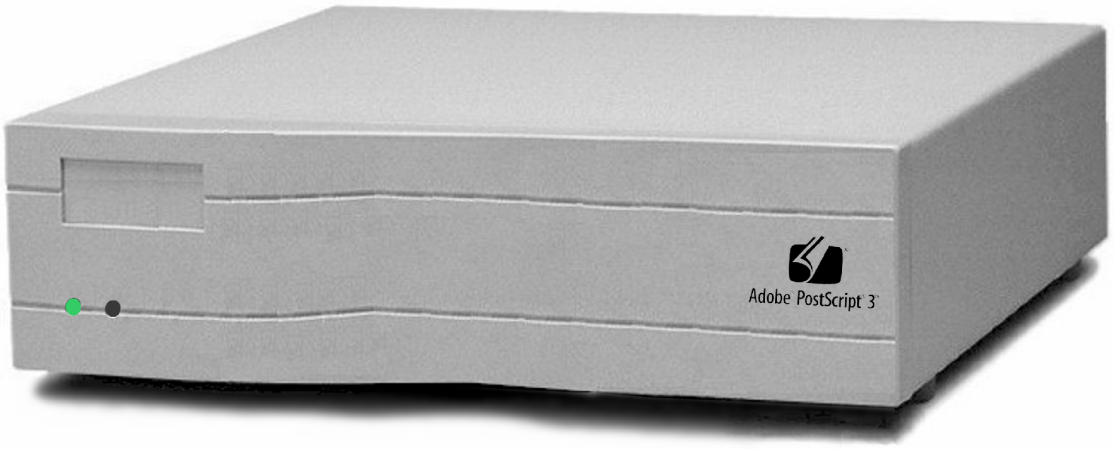
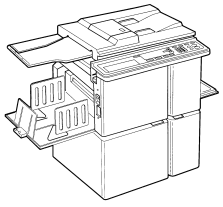
Controller Reference Manual





Customer Service

For a Printer Driver for your Digital Duplicator, contact:

The nearest authorized supplier for your digital duplicator.

For Customer Support and Service, contact:

The nearest authorized supplier for your digital duplicator.

Controller
Reference Manual

Part Number – RM026AW0

First Edition – January 1999

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First Edition – January 1999

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All references to PostScript on the screen or in this guide or manual are references either to the PostScript interpreter or to the PostScript Language.

Conventions

This manual uses the following conventions:

Bold indicates emphasis or a minor heading
Italic refers to a document title or is used for emphasis.

`COMPUTER` type indicates text visible on a computer screen

The cursive *l* is used in examples to distinguish the letter **l** from the numeral **1** (one). The character Ø is used in examples to distinguish the numeral **0** from the letter **O**.

Note 

Notes contain important information set off from the text. Special note headings, such as **Network Note**, indicate specific kinds of notes.

Caution 

Caution messages appear before procedures which, if not observed, could result in loss of data or damage to equipment.

Warning 

Warning messages alert you to a specific procedure or practice which, if not followed correctly, could cause serious personal injury.

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1

Spot Color Printing

Introduction

This chapter provides instructions on how to setup and use your digital duplicator in applications requiring *spot color printing*.

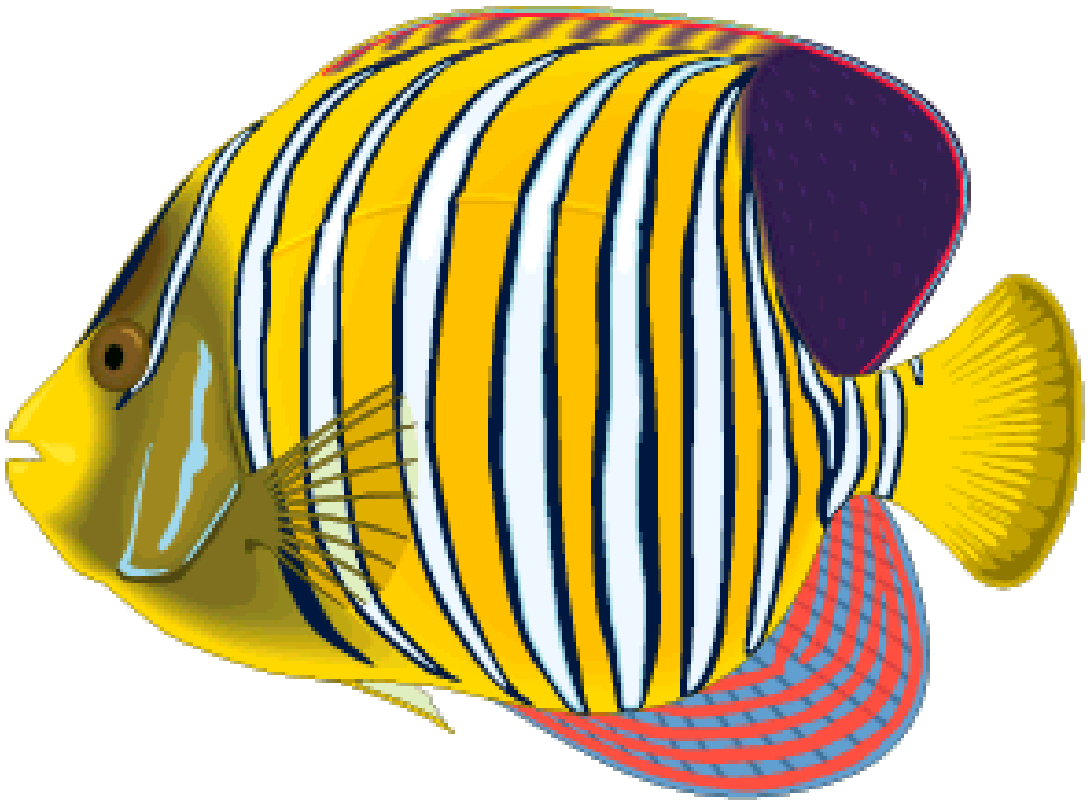


Figure 1-1.1. Spot color printing.

An Example Using Adobe PageMaker

The following steps will lead you through the process of creating a four-pass color print using desktop publishing software such as Adobe PageMaker.

Step 1

Locate the page or document you wish to print and open it in Adobe PageMaker. For our color page example, we will use the picture shown in the Adobe PageMaker file below.

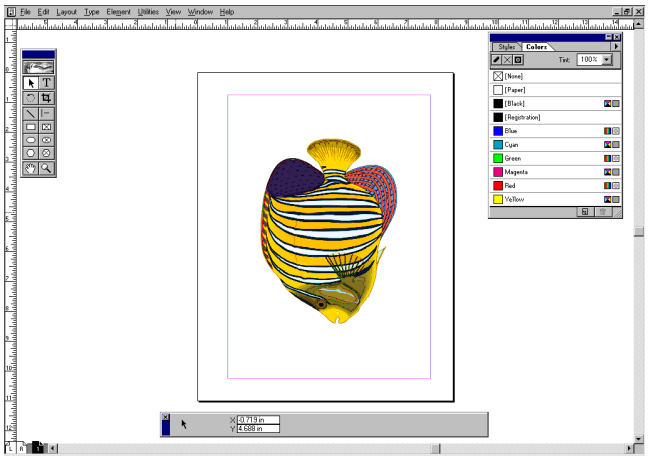


Figure 1-1.2. Open Adobe PageMaker.

Step 2

Open the Print screen.

Step 3

Enter the number of copies to be made.

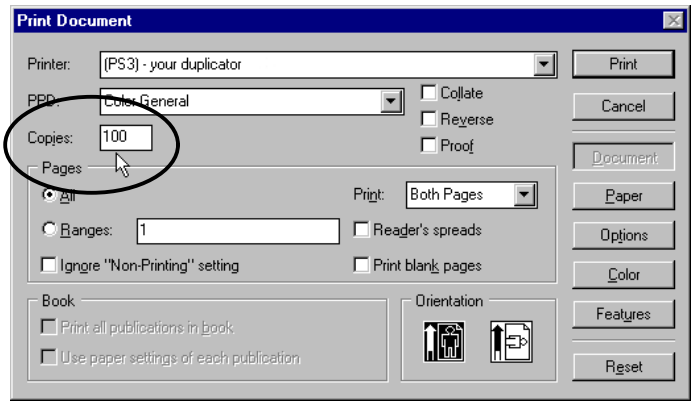


Figure 1-1.3. Enter the number of copies to be made.

Step 4

Select the Color button.

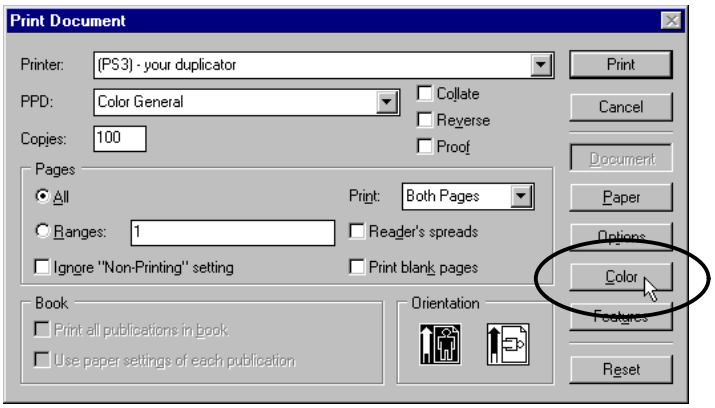


Figure 1-1.4. Select the Color button.

Step 5

Activate the **Separations** feature.

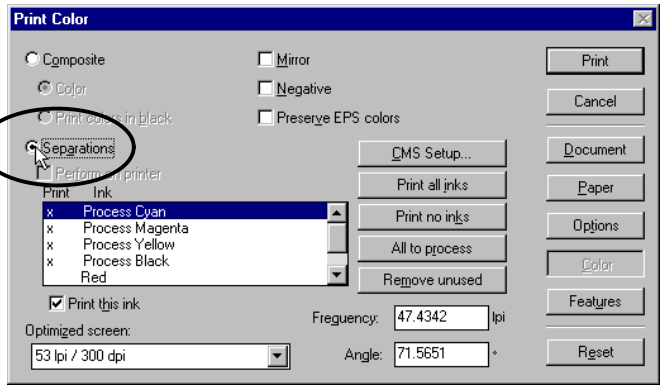


Figure 1-1.5. Activate Separations.

Note: this step only needs to be done for the first color.

Step 6

Perform the color selection process by turning off all colors. Do this by selecting the Print no inks button.

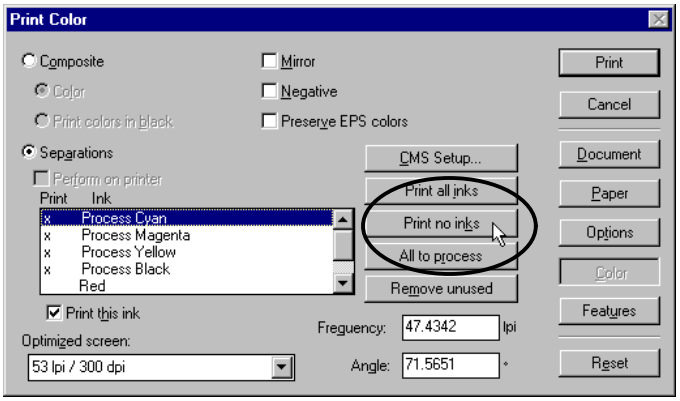


Figure 1-1.6. Turn off all colors.

Step 7

Now select/highlight the ink color that matches the drum you'll be using (in our example, it will be Cyan), then check the **Print this ink** box.

Figure 1-1.7. Select your ink color.

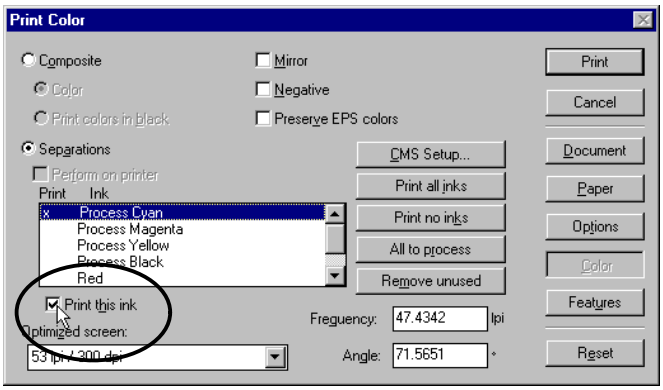


Figure 1-1.8. Enable printing for the color.

Step 8

Put the corresponding drum color into the duplicator, and make sure the proper amount of paper is loaded into the paper input tray.

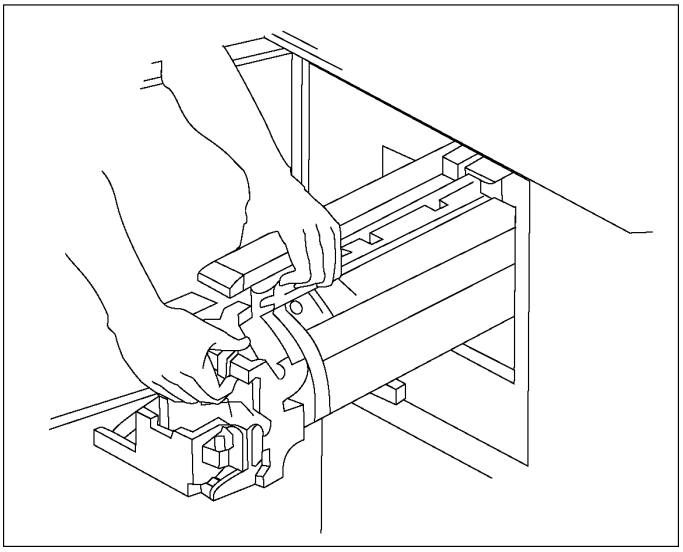


Figure 1-1.9. Load the color drum into the digital duplicator.

Step 9

Press the Print button to print the selected color separation.

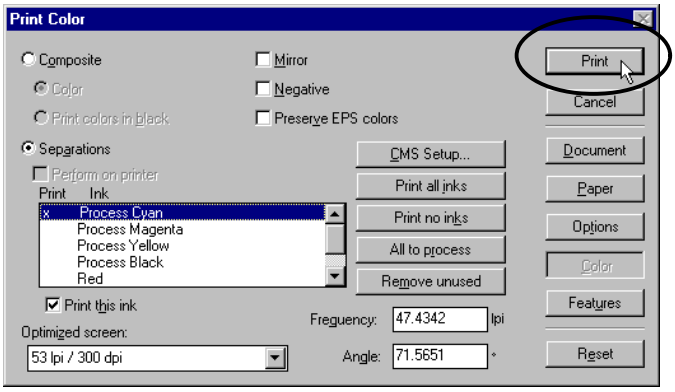


Figure 1-1.10. Print the selected color.

Step 10

Repeat Steps 2 through 4, then 6 through 9 until all four colors have been printed (CMYK).

2

PostScript Printing

Introduction

This chapter provides instructions on how to setup and use your digital duplicator for printing PostScript files. It includes information about:

- PostScript Language
  - PostScript Printer Drivers
  - Memory Requirements
- Typefaces
- Troubleshooting
- Generating a List of PostScript 3 Fonts Stored In Your Controller
- Related Documentation

PostScript Language

The controller contains genuine PostScript Level 3 software from Adobe, which is backward compatible with earlier versions of PostScript software.

PostScript Printer Drivers

To use software applications which support PostScript, you must select a PostScript language printer driver from within your application. For best results, use the driver/PPD for your digital duplicator installed during the Configuration Utility software setup (see Chapter 2, *Using Your Controller* in the Controller User's Guide).

If, for some reason, that driver is not available (for example, if you are using a version of Windows earlier than Windows 95), you may use one of the standard drivers that came with your operating system or software, such as:

1. Apple LaserWriter II NT/NTX
2. HP LaserJet 4
3. Generic PostScript

If your software does not offer a PostScript language printer driver selection, it may not support PostScript printing. For more information, see your software documentation or contact your software vendor.

Note

A file printed using the PostScript language may print differently than in other printer languages because the characters and spacing in your Adobe fonts may differ. Differences that exist between PostScript drivers can also cause this to happen.

Memory Requirements

The standard amount of memory which comes with your controller is sufficient to handle the requirements for PostScript printing.

Typefaces

The PostScript 3 language contains 136 scalable typefaces drawn from 40 typeface families, all licensed from Adobe Systems, Inc. Many more additional typefaces compatible with your controller are available from the Adobe Type Library. These typefaces can be purchased and used with your digital duplicator.

Since PostScript typefaces require software support, check your software documentation for information about using PostScript typefaces.

Note

You *should not* use PostScript typefaces in combination with PCL typefaces resident in your controller or with other typefaces supported by PCL, in the same document. Language switching allows you to use either PostScript or PCL-supported type, but *not both simultaneously*.

If you send a document with both PCL and PostScript fonts, the controller will pick a printer language – either PCL or PostScript – print the fonts native to it, and interpret the others. Thus some fonts may not print as expected.

For more information on Adobe typefaces available for your software, point your Internet web browser to: http://www.adobe.com

Printing devices driven by Adobe PostScript 3 printing technology come standard with 136 distinctive and stylish fonts, including those packaged with the leading operating systems (Windows® 3.1, Windows 95, Windows NT,® and Macintosh™) and application suites (such as Microsoft® Office). These fonts ensure cross-platform reliability and compatibility and let Mac and Windows users share source documents without impacting their page layout.

Albertus® Light
Albertus
Albertus Italic

Antique Olive® Roman
Antique Olive Italic
Antique Olive Bold
Antique Olive Compact

Apple Chancery

Arial™
Arial Italic
Arial Bold
Arial Bold Italic

ITC Avant Garde Gothic® Book
ITC Avant Garde Gothic Book Oblique
ITC Avant Garde Gothic Demi
ITC Avant Garde Gothic Demi Oblique

Bodoni Roman
Bodoni Italic
Bodoni Bold
Bodoni Bold Italic
Bodoni Poster
Bodoni Poster Compressed

ITC Bookman® Light
ITC Bookman Light Italic
ITC Bookman Demi
ITC Bookman Demi Italic

Carta®

Chicago

Clarendon* Light
Clarendon Roman
Clarendon Bold

Cooper Black
Cooper Black Italic

COPPERPLATE GOTHIC 32BC
COPPERPLATE GOTHIC 33BC

Coronet™

Courier
Courier Oblique
Courier Bold
Courier Bold Oblique

Eurostile™ Medium
Eurostile Bold
Eurostile Extended No.2
Eurostile Bold Ext No.2

Geneva

Gill Sans® Light
Gill Sans Light Italic
Gill Sans
Gill Sans Italic
Gill Sans Bold
Gill Sans Bold Italic
Gill Sans Extra Bold
Gill Sans Condensed
Gill Sans Condensed Bold

Goudy Oldstyle
Goudy Oldstyle Italic
Goudy Bold
Goudy Bold Italic
Goudy Extra Bold

Helvetica*
Helvetica Oblique
Helvetica Bold
Helvetica Bold Oblique
Helvetica Condensed
Helvetica Condensed Oblique

Figure 2-3.2.1. Internal PostScript 3 Typefaces, Page 1

Helvetica Condensed Bold
Helvetica Condensed Bold Oblique
Helvetica Narrow
Helvetica Narrow Oblique
Helvetica Narrow Bold
Helvetica Narrow Bold Oblique

Hoefler Text
Hoefler Text Italic
Hoefler Text Black
Hoefler Text Black Italic
Hoefler Ornaments

Joanna®
Joanna Italic
Joanna Bold
Joanna Bold Italic

Letter Gothic
Letter Gothic Slanted
Letter Gothic Bold
Letter Gothic Bold Slanted

ITC Lubalin Graph® Book
ITC Lubalin Graph Book Oblique
ITC Lubalin Graph Demi
ITC Lubalin Graph Demi Oblique

Marigold™

Monaco

ITC Mona Lisa® Recut

New Century Schoolbook Roman
New Century Schoolbook Italic
New Century Schoolbook Bold
New Century Schoolbook Bold Italic

New York

Optima* Roman
Optima Italic
Optima Bold
Optima Bold Italic

Oxford™

Palatino* Roman
Palatino Italic
Palatino Bold
Palatino Bold Italic

Stempel Garamond* Roman
Stempel Garamond Italic
Stempel Garamond Bold
Stempel Garamond Bold Italic

Symbol αβχδΑΒΧΔ♥♦♣♠⇑⇒∉∞

Tekton® Regular

Times* Roman
Times Italic
Times Bold
Times Bold Italic

Times New Roman®
Times New Roman Italic
Times New Roman Bold
Times New Roman Bold Italic

Univers*45 Light
Univers 45 Light Oblique
Univers 55
Univers 55 Oblique
Univers 65 Bold
Univers 65 Bold Oblique
Univers 57 Condensed
Univers 57 Condensed Oblique
Univers 67 Condensed Bold
Univers 67 Condensed Bold Oblique
Univers 53 Extended
Univers 53 Extended Oblique
Univers 63 Extended Bold
Univers 63 Ext. Bold Oblique

Wingdings® ✍⑧⌘✈☯

ITC Zapf Chancery® Medium Italic

ITC Zapf Dingbats® ❁❂✪✼❑❍➩①②

Figure 2-3.2.2. Internal PostScript 3 Typefaces, Page 2

Troubleshooting

For general troubleshooting, see *Troubleshooting* in Chapter 7, of the Controller User's Guide. The items in Table 2-4.1 are PostScript language-specific and may occur particularly in multiple printer language and shared printer environments.

Table 2-4.1. PostScript Troubleshooting

Condition	Recommended Action
A text listing of PostScript commands prints instead of your PostScript printing job.	A non-standard PostScript interpreter character may have confused the controller. • If you are in DOS, send the control command to put the printer into PostScript mode and re-send the print job. • If you are in Windows, make sure you are using the correct custom printer driver, and re-send the print job.
The job prints in Courier (the printer's default typeface) instead of the typeface you requested.	The requested typeface is not resident in the controller. Download the desired font.
A PostScript error page prints.	Make sure the print job is a PostScript job. Check to see if your software expected you to send setup or PostScript header files to the printer. Make whatever corrections are necessary and re-send the print job to the digital duplicator.
A page set for bleed-off printing is missing any print on the first part of the leading edge of the paper.	Due to the nature of the technology in the digital duplicator used to pick/pull the paper through the machine, the first 5 mm of the page (leading edge, or the first edge into the machine) will not have any printing on it. However, bleed-off printing may be doe all the way to the other three paper edges.

You are operating in DOS, and your computer displays:
`Writing to LPTn:`
`Abort, Retry, Ignore?`
	Try setting infinite timeouts on your computer. See your MS-DOS manual for information about the Mode command.

Generating a List of PostScript 3 Fonts Stored In Your Controller

A list of PostScript 3 fonts available in your controller for PostScript print jobs may be printed on the digital duplicator using the Diagnostic Page report. *This list includes only permanent fonts stored in the controller's ROM.*

To print a list of the controller's PostScript 3 fonts on the digital duplicator, perform the following steps:

1. Start the Configuration Utility program.
2. Under **Reports**, select **Diagnostic Page**, and click on the 

button.

The digital duplicator will print the Diagnostic Page report (which is the same as the Diagnostic Test Page, obtained by pressing the Diagnostic Test Page button on the rear of the controller chassis), which includes the list of all PostScript 3 fonts in the controller's permanent font memory.

Caution

Generating this printout deletes all *temporary soft fonts* (the fonts your software has downloaded for a specific document). Because of this, temporary soft fonts do not appear on the report.

Digital Duplicator Controller

Adobe® PostScript® 3™

Installed fonts:

Albertus ‡
Albertus Italic ‡
Albertus Light ‡
AntiqueOlive Bold §
AntiqueOlive Compact §
AntiqueOlive Italic §
AntiqueOlive Roman §
Apple Chancery ▫
Arial ‡
Arial Bold Italic ‡
Arial Bold ‡
Arial Italic ‡
ITC AvanteGarde Gothic Book °
ITC AvanteGarde Gothic Book Oblique °
ITC AvanteGarde Gothic Demi °
ITC AvanteGarde Gothic Demi Oblique °
Bodoni
Bodoni Bold
Bodoni Bold Italic
Bodoni Italic
Bodoni Poster
Bodoni Poster Compressed
ITC Bookman Demi °
ITC Bookman Demi Italic °
ITC Bookman Light °
ITC Bookman Light Italic °
Carta •
Chicago ▫
Clarendon †
Clarendon Bold †
Clarendon Light †
CooperBlack
CooperBlack Italic
COPPERPLATE THIRTYTHREE
COPPERPLATE THIRTYTWO
Coronet Regular ••
Courier
Courier Bold
Courier Bold Oblique
Courier Oblique
Eurostile **
Eurostile Bold **
Eurostile Bold Extended Two **
Eurostile Extended Two **
Geneva ▫
GillSans ‡
GillSans Bold ‡
GillSans Condensed Bold ‡
GillSans Bold Italic ‡
GillSans Condensed ‡
GillSans Extra Bold ‡
GillSans Italic ‡
GillSans Light ‡
GillSans Light Italic ‡
Goudy
Goudy Bold
Goudy Bold Italic
Goudy ExtraBold
Goudy Oldstyle Italic
Helvetica †
Helvetica Bold †
Helvetica Bold Oblique †
Helvetica Condensed †
Helvetica Condensed Bold †
Helvetica Condensed Bold Oblique †
Helvetica Condensed Oblique †
Helvetica Narrow †
Helvetica Narrow Bold †
Helvetica Narrow Bold Oblique †
Helvetica Narrow Oblique †
Helvetica Oblique †
Hoefler Text Black ▫
Hoefler Text Black Italic ▫
Hoefler Text Italic ▫
Hoefler Text Ornaments ▫
Hoefler Text ▫
Joanna ‡
Joanna Bold ‡
Joanna Bold Italic ‡
Joanna Italic ‡
LetterGothic
LetterGothic Bold
LetterGothic Bold Slanted
LetterGothic Slanted
ITC Lubalin Graph Book °
ITC Lubalin Graph Book Oblique °
ITC Lubalin Graph Demi °
ITC Lubalin Graph Demi Oblique °
Marigold *
ITC Mona Lisa Recut °
Monaco ▫
New Century Schoolbook Bold †
New Century Schoolbook Bold Italic †
New Century Schoolbook Italic †
New Century Schoolbook Roman †
New York ▫
Optima †
Optima Bold †
Optima Bold Italic †
Optima Italic †
Oxford *
Palatino Bold †
Palatino Bold Italic †
Palatino Italic †
Palatino Roman †
Stempel Garamond Bold †
Stempel Garamond Bold Italic †
Stempel Garamond Italic †
Stempel Garamond Roman †
ITC Symbol ° ΑβΧδΕφΓηΙφΚλΜ!≅#∃%⊥&
Tekton •
Times Bold †
Times Bold Italic †
Times Italic †
Times Roman †
Times New Roman Bold ‡
Times New Roman Bold Italic ‡
Times New Roman Italic ‡
Times New Roman ‡
Univers †
Univers Bold †
Univers Bold Oblique †
Univers Oblique †
Univers Light †
Univers Light Oblique †
UniversCondensed †
UniversCondensed Bold †
UniversCondensed Bold Oblique †
UniversCondensed Oblique †
UniversExtended †
UniversExtended Bold †
UniversExtended Bold Oblique †
UniversExtended Oblique †
Wingdings Regular **
ITC ZapfChancery Medium Italic °
ITC ZapfDingbats °

Configuration and Settings:

Model Number:	CPIF 26	Installed RAM:	32MB	Duplicator resolution:	400 DPI
Locale Setting:	US	Standard Ports:	Parallel AT	Video I/F Version:	unknown
PostScript Version:	3010.106	RAM Disk Size:	384KB	Default Paper Size:	Letter
Board ROM Version:	904243742	Hard Drive:	Not Installed	Auto-Cycle:	ON
Flash ROM Version:	17.098.280b	Additional Port:	Network	Diverted Copies Level:	99
Chassis Serial No:	AU598000000	IP Address:	90.0.0.200	PCL Symbol Set:	PC-8
Board Serial No:	00000	Ethernet Address:	00:40:af:79:1d:a0	Auto-Master Eject:	OFF
Network Serial No:	992180	Protocols Enabled:	TCP/IP IPX AT	Reserved RAM:	None
				RAM FontCache:	3MB

Figure 2-5.1 Diagnostic Page sample report.

Related Documentation

If you wish to learn more about the PostScript language, the following books are available at book stores or publishing houses.

PostScript Language Reference Manual: Second Edition, Adobe Systems Incorporated. Menlo Park: Addison-Wesley Publishing Company, Inc. ISBN 0-201-181127-4

PostScript Language Tutorial and Cookbook, Adobe Systems Incorporated. Menlo Park: Addison-Wesley Publishing Company, Inc. ISBN 0-201-10179-3.

PostScript Language Program Design. Adobe Systems Incorporated. Menlo Park: Addison-Wesley Publishing Company, Inc., December 1988.

Learning PostScript: a Visual Approach, Ross Smith, published by Peachpit Press. ISBN 0-938-151-12-6.

For more information on Adobe PostScript, point your Internet web browser to: http://www.adobe.com

3

PCL Printing

Introduction

This chapter provides instructions on how to use the controller's internal fonts that run under PCL. The following topics are covered in this chapter:

- Typefaces
  - Microsoft DOS and Windows support
  - Available type sizes
- Intellifont and TrueType
  - Intellifont
  - TrueType
  - Symbol Sets
  - Selecting font features using PCL commands
- Selecting Fonts
- Default Font
- Font Selection Priority
- Generating a List of the PCL-5e Fonts Stored in your Controller
- Related Documentation

For information regarding the use of PostScript fonts, see Chapter 2, *PostScript Printing*.

Typefaces

Your controller contains 45 internal scalable typefaces and a 16.67-pitch bitmapped Line Printer font. This broad selection of typefaces will support most types of office documents, from spreadsheets and reports to letters, presentations, and advertising literature.

Microsoft DOS Windows Support

Whether your software runs under MSDOS or Microsoft Windows, you can access any of the internal typefaces, along with hundreds of accessory typefaces available through third-party typeface vendors.

Available Type Sizes

Depending upon the capabilities of your software, you can size the proportionally spaced internal typefaces from .25 point to 999.75 points, in quarter-point increments.

Note 

You *should not* use PostScript typefaces in combination with PCL typefaces resident in your controller or with other typefaces supported by PCL, in the same document. Language switching allows you to use either PostScript or PCL-supported type, but *not both simultaneously*.

If you send a document with both PCL and PostScript fonts, the controller will pick a printer language – either PCL or PostScript – print the fonts native to it, and interpret the others. Thus some fonts may not print as expected.

Intellifont

Albertus
Albertus Extrabold
Antique Olive
Antique Olive Italic
Antique Olive Bold
Clarendon Condensed
Coronet
Courier
Courier Italic
Courier Bold
Courier Bold Italic
Garamond Antiqua
Garamond Kursiv
Garamond Halbfett
Garamond Kursiv Halbfett
Letter Gothic
Letter Gothic Italic
Letter Gothic Bold
Marigold
CG Omega
CG Omega Italic
CG Omega Bold
CG Omega Bold Italic
CG Times
CG Times Italic
CG Times Bold
CG Times Bold Italic
Univers Medium
Univers Medium Italic
Univers Bold
Univers Bold Italic
Univers Medium Condensed
Univers Medium Condensed Italic
Univers Bold Condensed
Univers Bold Condensed Italic
Line Printer (16.67 pitch, 8.5 point only)

TrueType

Arial
Arial Italic
Arial Bold
Arial Bold Italic
Symbol αβχΔΕΦΓ
Times New Roman
Times New Roman Italic
Times New Roman Bold
Times New Roman Bold Italic
Wingdings ♋♌♍♎♏♐♑

Figure 3-2.1. Internal PCL-5e Typefaces

Intellifont and TrueType

In your controller, the Intellifont and TrueType font scaling technologies both run under PLC-5e, giving you rapid font scaling inside the controller itself.

Intellifont

Intellifont is a font scaling technology developed by the AGFA division of Miles Inc. It is used on many scalable printers, including the digital duplicator controller. Most software packages support them, including Microsoft Windows and Corel WordPerfect applications.

TrueType

TrueType is a font scaling technology developed by the Microsoft Corporation and Apple Computer, Inc. Your controller has 14 internal typefaces that match the TrueType typefaces included with Microsoft Windows. This enhances Windows' printing performance and quality, because Windows applications do not have to download these typefaces to the controller.

Note 

You can access both Intellifont and TrueType type scaling technologies through Microsoft Windows and other applications.

Symbol Sets

A “symbol set” or “character set” (see Figure 3-3.3) is a collection of letters, numbers, and symbols designed for specific applications such as scientific equations, legal citations, and international languages.

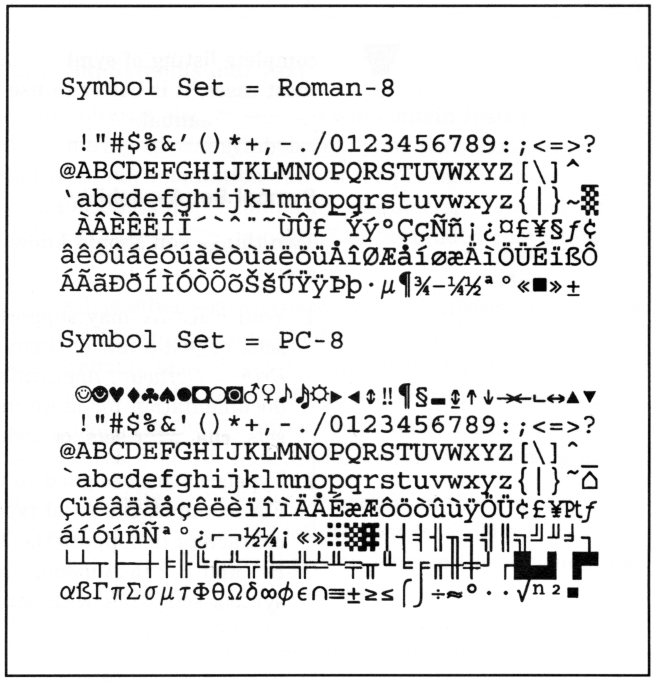


Figure 3-3.3. Roman-8 and PC-8 Symbol Sets

Selecting a Symbol Set

Selecting the active symbol set for your printer is done using the Configuration Utility program.

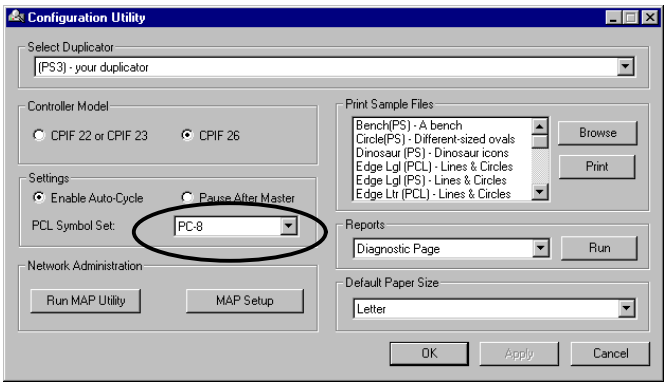


Figure 3-3.4. Selecting the controller's active symbol set.

Figure 3-3.4 shows the area of the Configuration Utility screen where you may change the active symbol set used by the controller. Simply use the right arrow to pull down the screen, use the bar to the right of the list to scroll to the desired symbol set, and click on it. The symbol set will remain active until another is selected using this screen.

Note

See Appendix D, *PCL Symbol Set Tables*, in the Controller Reference Manual, for details as to the symbol sets supported by the controller.

Software Symbol Set Availability

There are two things you should know about symbol set availability:

1. Your software may support all of your controller's symbol sets, or just a few of them. Refer to your software documentation for more information on what symbol sets, character sets, or code pages it supports.
2. Typefaces are designed to work with specific symbol sets. For example, the Arial typeface design does not include characters to support the Math-8 symbol set.

Refer to Appendix D, *PCL Symbol Sets,* in this manual to see which symbol sets work with the typefaces you are using.

Entering Symbols into Text

If you want to print a symbol such as infinity (∞), you must first select the symbol set that contains that character.

For example, the ∞ sign is character #236 in the PC-8 symbol set (see Appendix D, *PCL Symbol Sets*).

Your software documentation will contain instructions for entering special symbols into your text. Look in the software documentation's index for phrases such as "compose feature", "composite characters," "symbol sets," "character sets," "code pages," or "extended characters."

Selecting font features using PCL codes

If you are writing programs or using software that requires you to enter PCL codes to select fonts or font characteristics, you can find the PCL codes for selecting fonts in any typeface reference guide. Also, refer to the items listed in the *Related Documentation* section of this chapter.

Selecting Fonts

Fonts are selected through the software you are using. Look in your software documentation for topics such as “font selection,” “base font,” “printer setup,” “print options’” “font appearance’” “change font,” or “select type.”

Default Font

The default **PCL** font in the printer is `10 pitch Courier` with the Roman-8 symbol set. The printer uses this font unless your software sends (or you manually send) a printer font selection command to request a font in place of the default.

Font Selection Priority

In PCL mode, if both a scalable typeface and a bitmapped typeface are available from the same source, the selection criteria applied depends upon the dpi print resolution of the digital duplicator:

1. For 600 dpi digital duplicators:
   a. 600 dpi bitmapped font
   b. scalable font
   c. 300 dpi bitmapped font
2. For 400 dpi digital duplicators:
   a. 400 dpi bitmapped font
   b. scalable font
   c. 300 dpi bitmapped font
3. For 300 dpi digital duplicators:
   a. 300 dpi bitmapped font
   b. scalable font

Generating a List of PCL-5e Fonts Stored In Your Controller

The PCL Test Page report lists the typefaces and bitmapped fonts currently available in your controller for PCL print jobs. *This list includes only permanent fonts stored in the controller's ROM*.

Note 

See Chapter 2, *PostScript Printing*, for instructions on printing a list of PostScript typefaces.

To print a list of the controller's PCL fonts on the digital duplicator, perform the following steps:

3. Start the Configuration Utility program.
4. Under **Reports**, select **PCL Test Page**, and click on the 

button.

The digital duplicator will print a list of all PCL fonts in the controller's permanent font memory.

Caution 

Generating this printout deletes all *temporary soft fonts* (the fonts your software has downloaded for a specific document). Because of this, temporary soft fonts do not appear on the report.

Figure 3-7.1 PCL Test Page sample report.

Related Documentation

If you wish to learn more about PCL, HP-GL/2, or PJL, order the Technical Reference Manual bundle for an HP LaserJet printer from the Hewlett Packard Company. The HP part number (as of 6/17/97) for the Technical Reference Manual bundle is:

5021-0377

The documentation includes:

- PCL 5/HP-GL/2 Technical Reference Manual
- PJL Technical Reference Manual
- PCL 5 Comparison Guide
- PCL 5 Quick Reference Guide

The documentation package may be obtained by telephoning HP Parts Direct at 1 800 227 8164 (US). In other countries, contact your local HP office.

For additional information, point your Internet web browser to:

http://www.hp.com/

A

Controller I/O Port Specifications

Introduction

This appendix provides information about connecting your controller to your computer. Your controller supports connection to a computer for printing from a bi-directional parallel/ECP interface (PC), a LocalTalk interface (Mac), and a Local Area Network interface.

This appendix contains the following information:

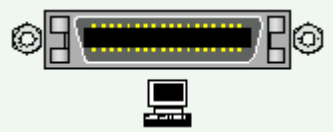
- Configuring Your Printer
- Parallel Port Connection
  - IEEE 1284 Parallel Port Characteristics
  - IEEE 1284 Port Pinout
  - MSDOS Commands for Parallel Port Use
- LocalTalk Connection
  - LocalTalk Port Characteristics
  - LocalTalk Port Pinout
- Local Area Network Connection
  - LAN Port Characteristics
  - LAN Port Pinout
- Controller ⇔ Digital Duplicator Cable Specifications

Caution

Proper Grounding: Ensure that all interface cables and host computer(s) or other equipment attached to the controller follow proper grounding methods for electronic equipment in accordance with local electrical codes.

Parallel Port Connection

Connecting to the parallel interface is generally the fastest method of sending data to your controller. It is probably the best choice especially if you use many soft fonts in your document, or if you print complex graphics.



The high-performance parallel input/output port on the controller utilizes the **IEEE 1284 – 1994** design, supporting hardware-enhanced, nibble-mode reverse-direction data transfer, for high-speed communication between the computer and controller. Be sure to use a cable conforming to this design standard to realize the full data speed benefit from this interface.

IEEE 1284 Parallel Port Characteristics

Maximum data speed: 2 MBytes/sec.

Maximum cable length: 10 meters (30 feet).

Chassis connector type: IEEE 1284 Type C (Mini-Centronics).

Design standard: IEEE 1284 – 1994.

Note

To use this interface, the parallel port (e.g., LPT1:) on your computer must be configured as an *ECP* (not EPP) *Printer Port*.

For more information on the parallel port, point your Internet web browser to:
http://www.fapo.com/ieee1284.htm

IEEE 1284 Parallel Port Pinout

Computer End 1284A Connector Pin	Signal	Controller End 1284C Connector Pin
1	nStrobe	15
18	Rtn	33
2	Data_1	6
19	Rtn	24
3	Data_2	7
19	Rtn	25
4	Data_3	8
20	Rtn	26
5	Data_4	9
20	Rtn	27
6	Data_5	10
21	Rtn	28
7	Data_6	11
2	Rtn	29
8	Data_7	12
22	Rtn	30
9	Data_8	13
22	Rtn	31
10	nAck	3
24	Rtn	21
11	Busy	1
23	Rtn	19
12	PE	5
24	Rtn	23
13	Select	2
24	Rtn	20
14	nAutoFeed	17
25	Rtn	35
15	nFault	4
23	Rtn	22
16	nInit	14
25	Rtn	32
17	nSelectIn	16
25	Rtn	34
(nc)	+5V/Host_Avail	18
(nc)	Perph_Avail	36

Table A-2.1. IEEE 1284 A-to-C Connector Contact Numbering

MSDOS Commands for Parallel Port Use

In the MSDOS environment, most personal computers default to a parallel printer port for printing. To ensure that your computer is sending information to your parallel printer port, type the following MS-DOS command at your MS-DOS prompt or include it in your AUTOEXEC.BAT file:

```
MODE LPT:,,P
```

For MS-DOS version 4.0 and above, enter:

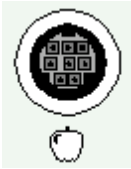
```
MODE LPT:,,B
```

Note 

This example assumes that your are using parallel printer port LPT1. If you are using LPT2 or LPT3, replace LPT1 in the example with the printer port that you are using.

LocalTalk Connection

The LocalTalk interface is used by the Macintosh series of computers designed and built by Apple Computer, Inc. It is a bi-directional port and supports the AppleTalk local area network (LAN) protocol.



LocalTalk Port Characteristics

Maximum data speed:	230.4Kbs / 28.8KBytes/sec.
Maximum cable length:	300 meters (1000 feet).
Chassis connector type:	8-pin mini-DIN female.
Design standard:	Apple proprietary.

For more information on AppleTalk and LocalTalk, point your Internet web browser to:
http://www.cisco.com/univercd/cc/td/doc/cisintwk/ito_doc/55142.htm

- or -

http://www.apple.com

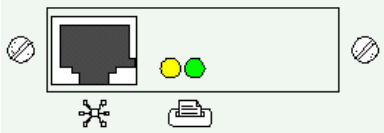
LocalTalk Port Pinout

Contact Number	Signal Name
1	(not connected)
2	(not connected)
3	- Data Out
4	Ground
5	- Data In
6	+ Data Out
7	(not connected)
8	+ Data In

Table A-4.1. LocalTalk Connector Contact Numbering.

Local Area Network Connection

The Local Area Network Port provides an interface to an Ethernet, 10BASE-T LAN.



Refer to *Using the Local Area Network Port* in Chapter 2, *Using Your Printer*, of the Controller User's Guide for instructions on using this interface.

Local Area Network Port Characteristics

Maximum data speed: 10 Mbps.

Maximum cable length: 100 meters (300 feet), UTP cable.

Chassis connector type: RJ-45.

Design standard: IEEE 802.3i, 10BASE-T Ethernet.

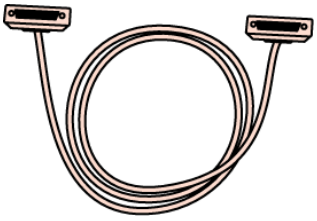
Local Area Network Port Pinout

I/O Pin #	UTP Wire color	Ethernet Signal Name
1	brown	Transmit +
2	brown/white	Transmit -
3	orange	Receive +
4	green	
5	green/white	
6	orange/white	Receive -
7	blue	
8	blue/white	

Figure A-5.1. Local Area Network Port Connector Contact Numbering

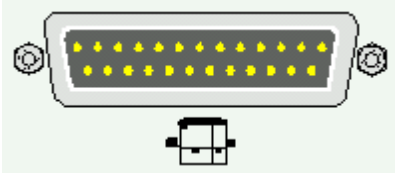
Controller ⇔ Digital Duplicator Cable Specifications

The cable connecting the controller to the digital duplicator has been constructed to provide the highest image quality to your digital duplicator.



Caution

A 10-ft (3 m) cable has been provided with your controller and is the recommended cable to be used for this purpose. Use of a cable other than the one supplied with your controller may adversely affect the image quality received and printed by your digital duplicator.



Compatibility

Max. Cable length: 3 meters (10 feet).

Chassis connector types:

Controller:	IEEE 1284 Type A, Male (DB25M).
Digital Duplicator:	IEEE 1284 Type A, Female (DB25F).
Design standard:	IEEE 1284 – 1994.

B

Upgrading Controller Memory

Introduction

This appendix covers:

- Memory (SIMM) Board Installation.
- Testing a Memory Upgrade.
- Troubleshooting a Memory Upgrade.

The controller has two SIMM (Single In-line Memory Module) slots. Use them to install additional printer memory. The controller may have up to 256 Mbytes of memory installed.

To be sure of compatibility with your controller, purchase SIMM boards from the authorized supplier of supplies and options for your model of controller.

Caution

Unauthorized installation or upgrading of memory will void your warranty.

If you have any questions, call your local sales or service representative for the digital duplicator or controller.

Memory (SIMM) Board Installation

Follow these instructions to install memory SIMM boards. Always install SIMM boards in the same manner.

Note

The following general guidelines apply to installing memory in the controller.

1) The controller must have at least the minimum/ standard amount of memory installed, as specified under the Printer Features section of the Controller User's Guide in order to function correctly.
2) The controller must have a SIMM board installed in slot 1.

Outline for Memory Upgrades

1. **Remove any existing/already installed SIMMs.**
2. **Install existing and new SIMMs per the SIMM-slot placement rules.**

SIMM-slot placement rules.

Case 1 – After removing any existing SIMM(s), a total of one SIMM is to be installed.

This situation would occur if, for example, you were to replace a partially- or non-functioning SIMM with a new one. In this situation, simply *substitute a new SIMM for the existing one, using only slot 1*. The new SIMM must meet or exceed the minimum memory requirements for your controller. For the sake of future upgrade compatibility, if the new SIMM is of the single-sided configuration (see figure B-1.1), it should have a PD (Presence Detect) jumper installed.

<u>Case 2</u> – After removing any existing SIMM(s), two SIMMs are to be installed, <u>at least one of which is a double-sided SIMM</u> (see figure B-1.2).

In this configuration, the double-sided SIMM board must be installed into slot 1. This is regardless of respective memory sizes of the SIMM boards – *the double-sided board always goes into slot 1*. If both SIMMs are double-sided, it does not matter which one goes into which slot.

<u>Case 3</u> – After removing any existing SIMM(s), two single-sided SIMMs are to be installed (see figures B-1.1).

This configuration could occur if, for example, you wanted to simply add a second SIMM to the controller's factory-shipped configuration. In this case, *the single-sided SIMM to be installed into slot 2 <u>must</u> have a PD jumper installed*.

<u>Unsupported Memory Configurations</u>

Memory configurations not listed under the rules above are not supported, or will not yield the correct amount of memory for the controller. This includes any combination of boards which:

1) Does not yield the minimum amount of memory needed by the controller.
2) Utilizes 1 or 2 Mbyte SIMMs.
3) Utilizes a single-sided SIMM in slot 2 that does not have a PD jumper installed.

If you believe your memory configuration is supported, but it is not yielding the correct amount of memory, see the section on *Troubleshooting a Memory Upgrade* located at the end of this Appendix.

Figure B-1.1 shows an example of a single-sided SIMM board with a PD jumper installed. The jumper, shown in the second (PD2) position, may be in any of the four possible positions shown in the diagram.

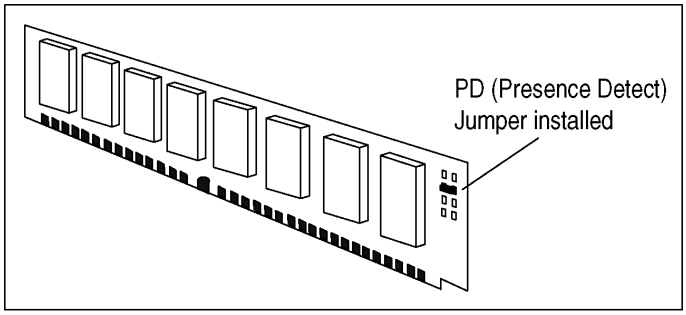


Figure B-1.1. Example of a single-sided SIMM with one PD jumper installed.

Figure B-1.2 shows an example of a double-sided SIMM board, where the memory chips are attached to both sides of the SIMM board.

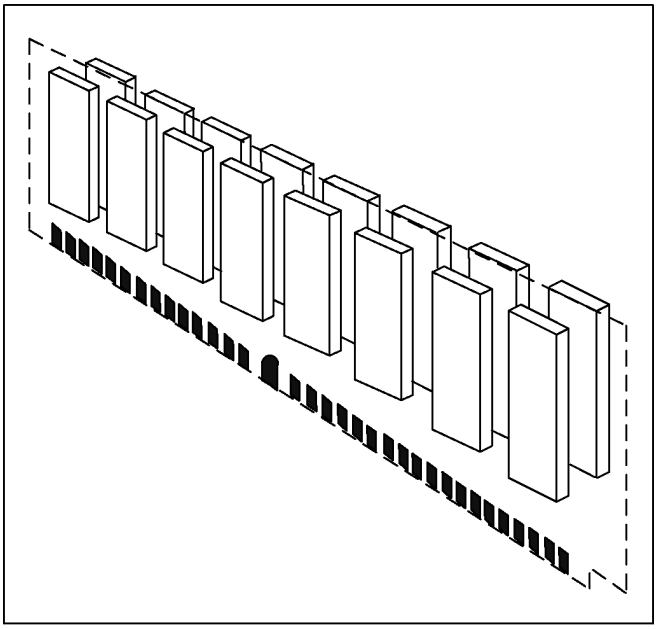


Figure B-1.2. Example of a double-sided SIMM.

Note

All memory boards used in upgrading the memory configuration of the controller must adhere to the JEDEC standards for 72-pin SIMMs. *Single-sided SIMMs placed in slot 2 must have at least one of the Presence Detect jumpers in place: PD1, PD2, PD3, or PD4.*

For more information, locate JEDEC Standard No. 21-C, pp. 4.4.2-1 through 4.4.2-16. A copy of these pages may be obtained by searching the following web site:

http://www.jedec.org.

Table B-1.1 is provided as a guide when upgrading memory.

It is recommended that memory be upgraded only in the configurations shown.

Total Controller Memory	Slot 1	Slot 2
8 MBytes	8 MByte SIMM ds	(empty)
12 MBytes	8 MByte SIMM ds	4 MByte SIMM
16 MBytes	8 MByte SIMM ds	8 MByte SIMM ds
16 MBytes	16 MByte SIMM	(empty)
20 MBytes	16 MByte SIMM	4 MByte SIMM ssj
24 MBytes	8 MByte SIMM ds	16 MByte SIMM
32 MBytes	16 MByte SIMM	16 MByte SIMM ssj
32 MBytes	32 MByte SIMM	(empty)
36 MBytes	32 MByte SIMM ds	4 MByte SIMM
40 MBytes	32 MByte SIMM ds	8 MByte SIMM ds
40 MBytes	8 MByte SIMM ds	32 MByte SIMM ds
48 MBytes	32 MByte SIMM ds	16 MByte SIMM
64 MBytes	32 MByte SIMM ds	32 MByte SIMM ds
64 MBytes	64 MByte SIMM	(empty)
68 MBytes	64 MByte SIMM	4 MByte SIMM ssj
68 MBytes	4 MByte SIMM	64 MByte SIMM ssj
72 MBytes	8 MByte SIMM ds	64 MByte SIMM
80 MBytes	16 MByte SIMM	64 MByte SIMM ssj
96 MBytes	32 MByte SIMM ds	64 MByte SIMM
128 MBytes	64 MByte SIMM	64 MByte SIMM ssj
128 MBytes	128 MByte SIMM ds	(empty)
132 MBytes	128 MByte SIMM ds	4 MByte SIMM
136 MBytes	128 MByte SIMM ds	8 MByte SIMM
144 MBytes	128 MByte SIMM ds	16 MByte SIMM
160 MBytes	128 MByte SIMM ds	32 MByte SIMM ds
196 MBytes	128 MByte SIMM ds	64 MByte SIMM
256 MBytes	128 MByte SIMM ds	128 MByte SIMM ds

Notes:

ds – Typically, the configuration of this SIMM is double-sided.

ssj – In single-sided configuration, this SIMM *must* have the PD jumper installed for the memory upgrade to function correctly.

Table B-1.1. Supported memory configurations.

Protecting the SIMM Board

SIMM boards can be easily damaged by small amounts of static electricity. To remove any static electricity from your body:

- ☞ Touch the surface of the antistatic package before removing the board from its package. When handling the board, frequently touch bare metal on the printer or the antistatic bag or wear an antistatic wrist strap.
- ☞ Avoid moving about the work area to prevent generating static electricity.
- ☞ Handle the board carefully at all times. Avoid flexing it or touching its components.

Caution 

When removing a board from the antistatic package, avoid touching the metal traces on the SIMM board through handling only by the edges.

Installation

The following section describes procedures to remove the controller's top cover and insert a SIMM board.

Warning

Hazardous voltages are present in the printer controller. Never remove any cover or work near exposed electrical parts while the power cord is connected.

Accessing the SIMM Slots.

1. Switch the controller OFF
2. **Unplug the power cord from the controller**.
3. Position the controller so the right side is facing you.
4. Place the antistatic bag containing the SIMM board(s) near the controller.
5. Use a Phillips #2 screwdriver to remove the four screws holding the top cover to the chassis.

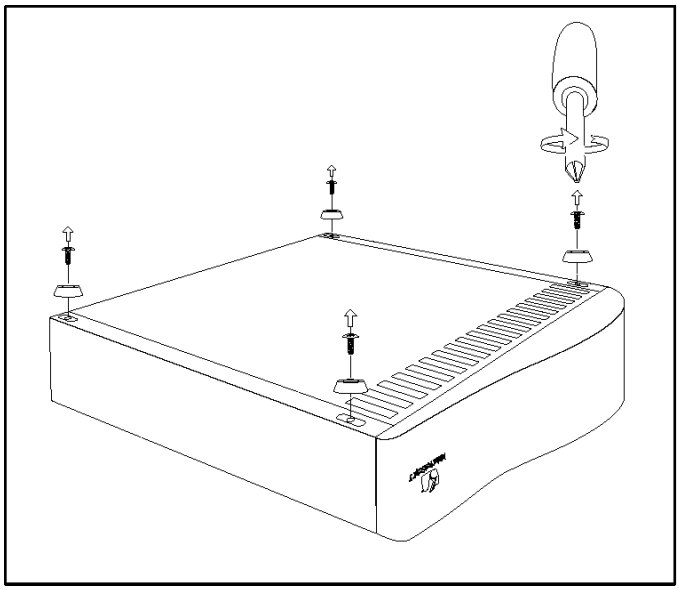


Figure B-1.3. Removing top cover hold-down screws.

6. Remove the top cover from the chassis.

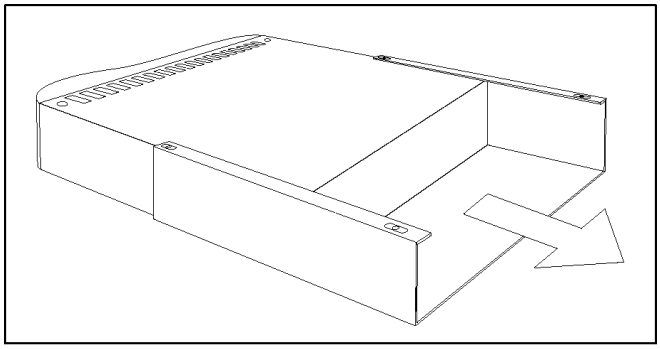


Figure B-1.4. Removing top cover.

7. Locate the memory SIMM memory slots. Note the location of slot 1. If only one SIMM is present, it is always located in slot 1.

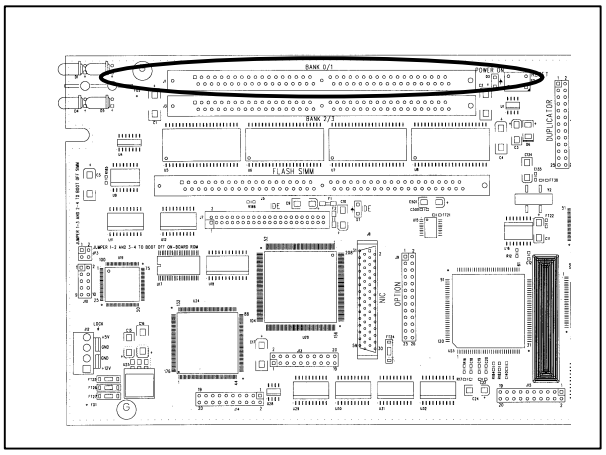


Figure B-1.5. Locating SIMM slot 1.

Removing currently installed SIMMs.

Note

Always begin SIMM removal with slot 1.

Refer to the *SIMM-slot placement rules* at the beginning of this Appendix for information as to which type of SIMM is installed into which slot.

1. Locate the metal locking tabs holding the SIMM in place on either side of the board slot.

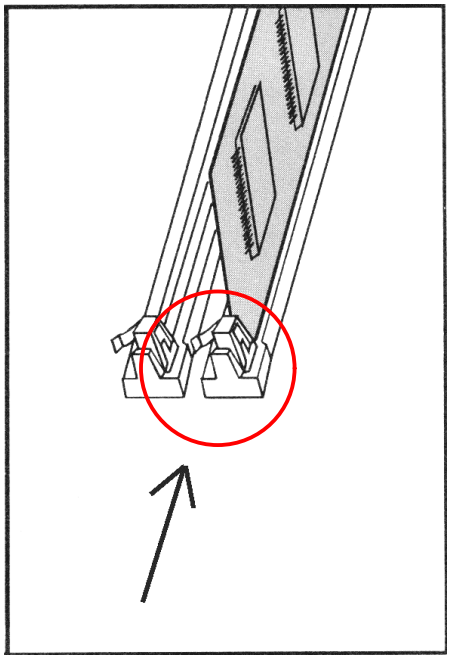


Figure B-1.6. Locate the SIMM locking tabs.

2. *Gently* push down on the metal locking tabs while rotating the board toward the back of the slot - shown as rotating down and to the left in Figure B-1.7 - until it clears the metal tabs. As it may take two hands to hold down the metal locking tabs on both sides of the board simultaneously, you may want to call for another person to assist you in this process.

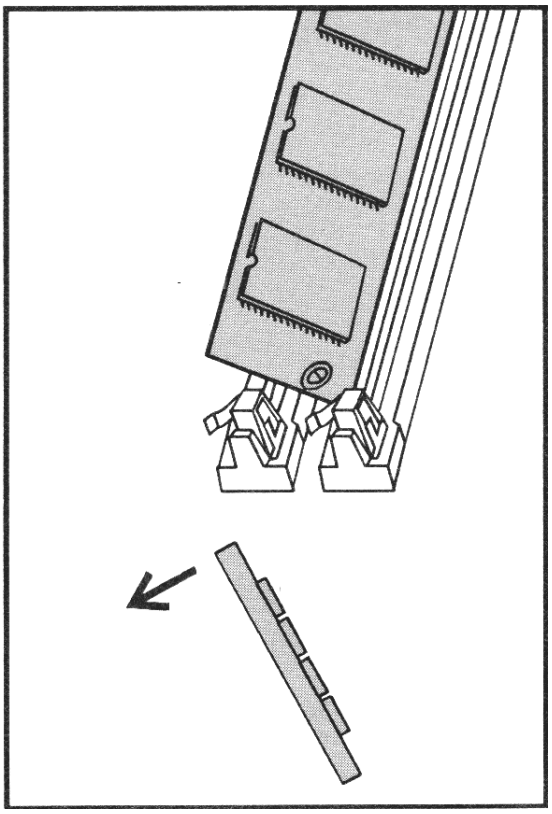


Figure B-1.7. Removing an existing SIMM board.

3. Remove the existing SIMM and place into an antistatic bag.

Installing SIMMs.

Note

For configurations where two SIMMs are to be installed, always begin installation with slot 2.

Refer to the *SIMM-slot placement rules* at the beginning of this Appendix for information as to which type of SIMM is installed into which slot.

1. Remove the new SIMM from its antistatic package. Hold the board with your forefingers on the side edges and your thumbs against the back edge, as shown in Figure B-1.8. Turn the board so the notch on one end is on the bottom and the metal teeth face toward the slot.

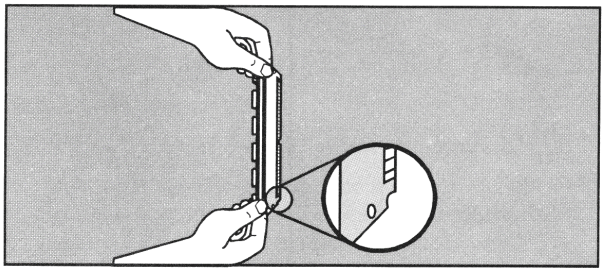


Figure B-1.8. Positioning the SIMM.

2. Hold the SIMM board at a 30-degree angle to the slot and push the edge of the board evenly and firmly into the slot, as shown in Figure B-1.9.

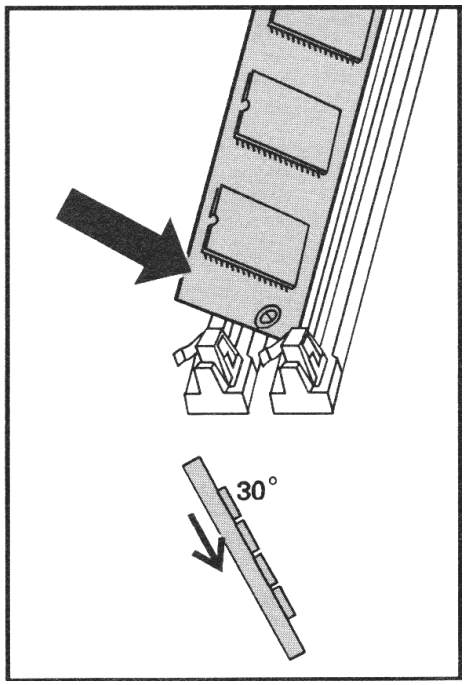


Figure B-1.9. Seating the SIMM board in the socket.

Rotate the board to the right until the board ‘clicks’ into the metal locking tabs, securing the board in place - see Figure B-1.10.

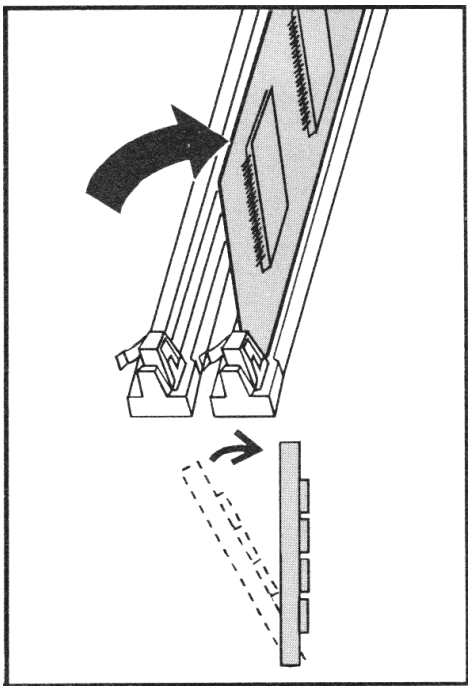


Figure B-1.10. Securing the SIMM board in the socket.

3. *Gently* rock the SIMM back and forth. If it is seated correctly, it will not lift away from the slot. If it lifts up, you have not pushed it firmly enough into the slot, and you must try installing again.
4. If another SIMM is to be installed (i.e., slot 1), simply repeat these installation steps.

Finishing up

1. Replace the top cover.
2. Replace the top cover hold down screws.
3. Plug in the power cord and switch the controller ON.

Testing a Memory Upgrade

The simplest way to test a memory upgrade performed on the controller is to do the following:

1) Check status lights on the controller front panel. After performing a power-on self check, the controller should show the status light condition for "Ready to print", as shown in Figure B-1.11. (See Appendix B, *Controller Status Lights*, in the Controller User's Guide, for a complete listing as to what conditions are indicated by the status lights, and how to interpret them.)

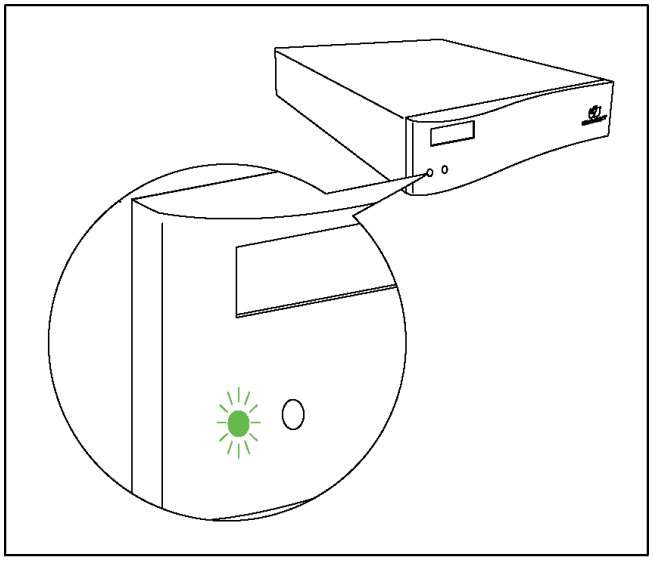
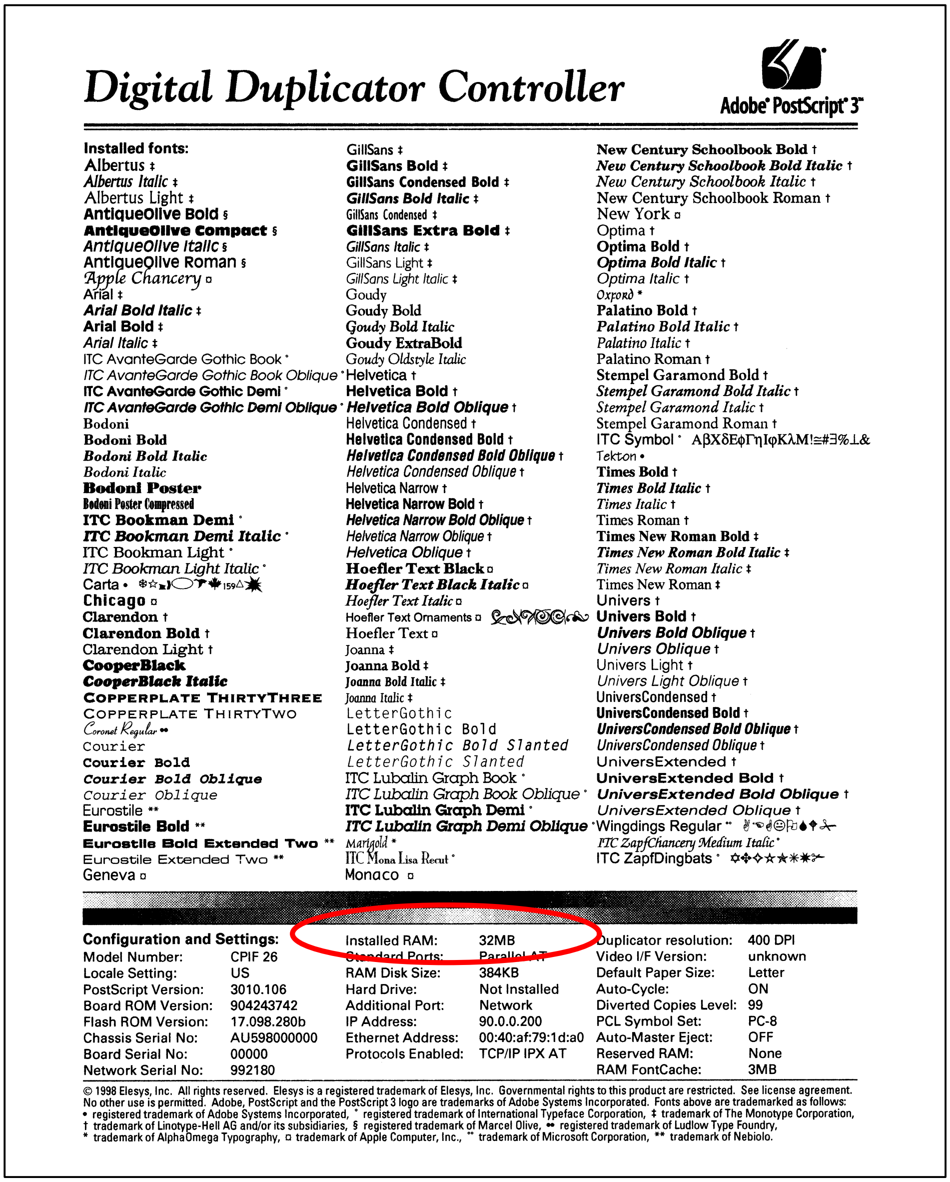


Figure B-1.11. 'Ready to Print' status light condition.

2) Print a Diagnostic Test Page (see *Diagnostic Test Page* in Appendix A of the Controller User's Guide if you need instructions), and note the area on the report which states the amount of memory available to the printer, as shown in Figure B-1.12.



Digital Duplicator Controller

Adobe® PostScript® 3™

Installed fonts:
Albertus ‡
Albertus Italic ‡
Albertus Light ‡
AntiqueOlive Bold §
AntiqueOlive Compact §
AntiqueOlive Italic §
AntiqueOlive Roman §
Apple Chancery ¤
Arial ‡
Arial Bold Italic ‡
Arial Bold ‡
Arial Italic ‡
ITC AvanteGarde Gothic Book °
ITC AvanteGarde Gothic Book Oblique °
ITC AvanteGarde Gothic Demi °
ITC AvanteGarde Gothic Demi Oblique °
Bodoni
Bodoni Bold
Bodoni Bold Italic
Bodoni Italic
Bodoni Poster
Bodoni Poster Compressed
ITC Bookman Demi °
ITC Bookman Demi Italic °
ITC Bookman Light °
ITC Bookman Light Italic °
Carta •
Chicago ¤
Clarendon †
Clarendon Bold †
Clarendon Light †
CooperBlack
CooperBlack Italic
Copperplate ThirtyThree
Copperplate ThirtyTwo
Coronet Regular ••
Courier
Courier Bold
Courier Bold Oblique
Courier Oblique
Eurostile **
Eurostile Bold **
Eurostile Bold Extended Two **
Eurostile Extended Two **
Geneva ¤
GillSans ‡
GillSans Bold ‡
GillSans Condensed Bold ‡
GillSans Bold Italic ‡
GillSans Condensed ‡
GillSans Extra Bold ‡
GillSans Italic ‡
GillSans Light ‡
GillSans Light Italic ‡
Goudy
Goudy Bold
Goudy Bold Italic
Goudy ExtraBold
Goudy Oldstyle Italic
Helvetica †
Helvetica Bold †
Helvetica Bold Oblique †
Helvetica Condensed †
Helvetica Condensed Bold †
Helvetica Condensed Bold Oblique †
Helvetica Condensed Oblique †
Helvetica Narrow †
Helvetica Narrow Bold †
Helvetica Narrow Bold Oblique †
Helvetica Narrow Oblique †
Helvetica Oblique †
Hoefler Text Black ¤
Hoefler Text Black Italic ¤
Hoefler Text Italic ¤
Hoefler Text Ornaments ¤
Hoefler Text ¤
Joanna ‡
Joanna Bold ‡
Joanna Bold Italic ‡
Joanna Italic ‡
LetterGothic
LetterGothic Bold
LetterGothic Bold Slanted
LetterGothic Slanted
ITC Lubalin Graph Book °
ITC Lubalin Graph Book Oblique °
ITC Lubalin Graph Demi °
ITC Lubalin Graph Demi Oblique °
Marigold *
ITC Mona Lisa Recut °
Monaco ¤
New Century Schoolbook Bold †
New Century Schoolbook Bold Italic †
New Century Schoolbook Italic †
New Century Schoolbook Roman †
New York ¤
Optima †
Optima Bold †
Optima Bold Italic †
Optima Italic †
Oxford *
Palatino Bold †
Palatino Bold Italic †
Palatino Italic †
Palatino Roman †
Stempel Garamond Bold †
Stempel Garamond Bold Italic †
Stempel Garamond Italic †
Stempel Garamond Roman †
ITC Symbol ° ΑβΧδΕφΓηΙφΚλΜ!≅#∃%⊥&
Tekton •
Times Bold †
Times Bold Italic †
Times Italic †
Times Roman †
Times New Roman Bold ‡
Times New Roman Bold Italic ‡
Times New Roman Italic ‡
Times New Roman ‡
Univers †
Univers Bold †
Univers Bold Oblique †
Univers Oblique †
Univers Light †
Univers Light Oblique †
UniversCondensed †
UniversCondensed Bold †
UniversCondensed Bold Oblique †
UniversCondensed Oblique †
UniversExtended †
UniversExtended Bold †
UniversExtended Bold Oblique †
UniversExtended Oblique †
Wingdings Regular °°
ITC ZapfChancery Medium Italic °
ITC ZapfDingbats °

Configuration and Settings:					
Model Number:	CPIF 26	Installed RAM:	32MB	Duplicator resolution:	400 DPI
Locale Setting:	US	Standard Ports:	Parallel AT	Video I/F Version:	unknown
PostScript Version:	3010.106	RAM Disk Size:	384KB	Default Paper Size:	Letter
Board ROM Version:	904243742	Hard Drive:	Not Installed	Auto-Cycle:	ON
Flash ROM Version:	17.098.280b	Additional Port:	Network	Diverted Copies Level:	99
Chassis Serial No:	AU598000000	IP Address:	90.0.0.200	PCL Symbol Set:	PC-8
Board Serial No:	00000	Ethernet Address:	00:40:af:79:1d:a0	Auto-Master Eject:	OFF
Network Serial No:	992180	Protocols Enabled:	TCP/IP IPX AT	Reserved RAM:	None
				RAM FontCache:	3MB

Figure B-1.12. Using the Diagnostic Test Page to verify correct memory installation.

Printing this page verifies that the

a) controller is able to communicate with the digital duplicator,
b) memory installation was done correctly,
c) amount of memory you installed is what you expected, and
d) memory is functioning correctly.

If the test page does not indicate the correct amount of memory, or there is some other problem, proceed with the next section (troubleshooting).

Troubleshooting a Memory Upgrade

A memory upgrade/installation can fail for several reasons:

1) In a two-memory-board installation, a single-sided memory card has been installed into slot 1 that does not have a PD jumper.
2) A memory board is not seated properly when installed.
3) Memory is installed correctly but is of insufficient size.
4) One or both of the memory boards has failed.

Check the following tables for the symptom you are experiencing to identify a course of action.

Symptom	Most Probable Causes	What to do
The **Diagnostic Test Page** indicates that the controller is recognizing memory, but it is not of the expected size.	1) The SIMM installed in slot 1 is not a *double-sided memory card*.	Procure a SIMM that is double-sided and install into slot 1.
	2) The SIMM installed in slot 2 is not seated properly	Properly re-install the SIMM in slot 2.
	3) The installed SIMM(s) has (have) a memory size that is *actually* smaller than it's specification.	a) Check to make sure the board part numbers are correct for the SIMM size. If not, obtain and install the correct ones for the desired memory size. b) The SIMM could have a fault in which it only reports part (for example, one-half) of the memory for which it is rated. In this case, the board must be returned to the vendor for replacement.

Table B-1.2. Troubleshooting – Incorrect Diagnostic Test Page.

Symptom	Most Probable Causes	What to do
The controller status lights indicate a controller unit failure.	1) The SIMM in slot 1 is not seated correctly.	Properly re-install the SIMM in slot 1.
	2) The SIMM in slot 1 is at fault.	If you have a SIMM in slot 2 and it has a memory size sufficiently large for the standard memory requirements of your controller, try installing it in the slot 1 position. If the controller responds positively to this, you probably have a faulty SIMM, which must be returned to the vendor for replacement.
	3) Total memory being reported is less than the standard memory configuration for your controller.	a) The combination of SIMMs yields a size under the standard memory configuration for your controller. You must install the minimum amount of memory so the controller will function. b) SIMMs in either slot do not report the correct amount of memory available to the controller. Try swapping the SIMMs from slot 1 to 2 to see if the controller will give a 'ready to print' status. If it will not, and you are sure the SIMMs are of the correct size, they are probably defective and must be returned to the vendor for replacement.

Table B-1.3. Troubleshooting - status light problem.

If the problems persist, call your supplier.

C

Font Basics

Introduction

This appendix contains basic information about fonts. The following topics are covered:

- Elements of a Font
- Screen Fonts for Windows
- Selecting Fonts
- Default Font
- Considerations For Shared Printer Environments
- Font Selection Priority

Elements of a Font

When you select a typeface through your word processing program or other software, you may be prompted to select a point size or pitch. When you set up your page layout, you will also choose whether the text will be in portrait or landscape orientation. This combination of a typeface, a specific point size, and an orientation is called a "**font**".

Typeface

A "typeface" is the name for a specific design of characters and symbols. For example, "Times New Roman" is one typeface and "Times New Roman Bold Italic" is another typeface (see Figure C-2.1). Both those typefaces belong to the Times New Roman typeface "family".

Figure C-2.1. Four Typefaces from the Times New Roman Family

Note

When you make a **bold** or *italic*, you are actually telling the software to select a different typeface.

Point Size

"Point size" refers to the height of your type measured in points (1/72 of an inch). All of your printer's proportionally spaced internal typefaces are scalable from .25 point to a maximum of 999.75 points in quarter-point increments, depending on the capabilities of your software.

Figure C-2.2 shows some commonly used point sizes.

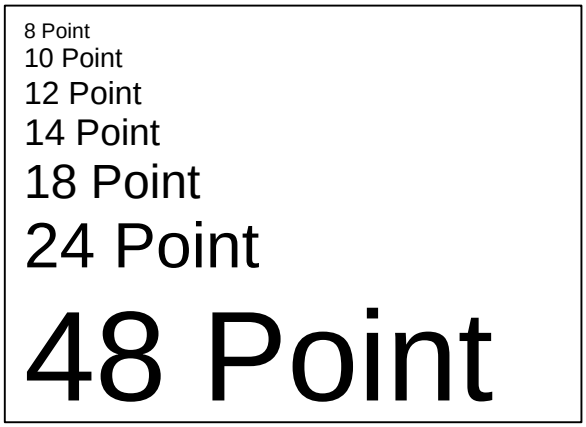


Figure C-2.2. Examples of Various Point Sizes

Pitch

"Pitch" refers to the number of characters that can be printed in one horizontal inch (see Figure C-2.3). For example, a font with a pitch of 10 will print 10 characters for every horizontal inch of text. Pitch only applies to typefaces with fixed spacing, such as Courier, letter Gothic, or Line Printer.

Your printer will scale typefaces that have fixed spacing from .5 to 85.7 pitch (depending upon the capabilities of your software).

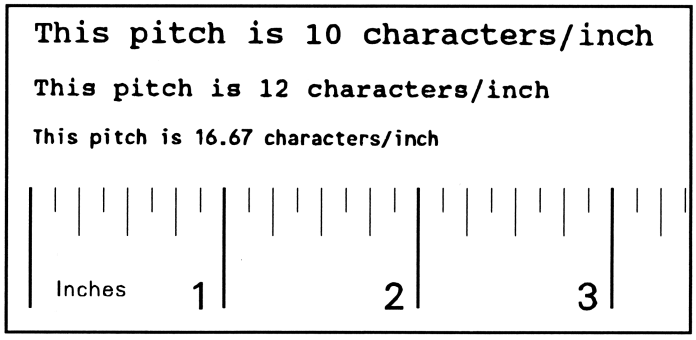


Figure C-2.3. Pitch

Orientation

Portrait orientation is vertical – see Figure C-2.4, Item 1. Landscape orientation is horizontal – see Figure C-2.4, Item 2. When the printer receives a software command to print in landscape orientation, it will automatically rotate any internal and accessory font to print along the wide edge of your paper (landscape mode).

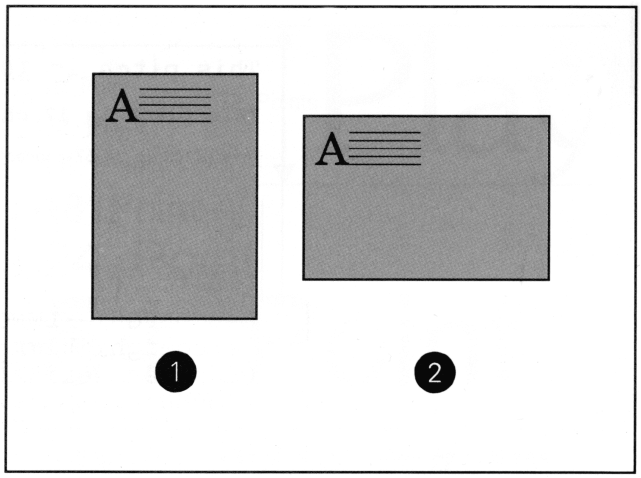


Figure C-2.4. Portrait and Landscape Orientations

Other Font Characteristics

A font has other characteristics such as stroke, weight, style, and spacing (proportional or fixed-pitch). Your software will probably not ask you to enter codes for these font characteristics.

Screen Fonts for Windows

To achieve true WYSIWYG (“what you see is what you get”) capability for software running under Microsoft Windows, you must have screen fonts that match your printer fonts.

Selecting Fonts

Fonts are selected through the software you are using. Look in your software documentation for topics such as “font selection,” “base font,” “printer setup,” “print options”, “font appearance”, “change font,” or “select type.”

Here are a couple of simple rules to remember regarding font selection:

1) *Do not mix PCL and PostScript fonts in the same document*. The controller must switch personalities in order to print one font versus the other, and it cannot do this halfway through a print job. Instead, it will try to substitute a suitable PCL font for the PostScript font being called for, or vice-versa, and your document will not look right when printed. For this reason, you should use all PCL or all PostScript fonts in a single document
2) Be sure to use the correct printer driver for the fonts you are using – either PCL or PostScript.

Default Font

The default font depends upon the printer language/ driver you are using. If you are using PCL, look under *Default Font* in Chapter 3, *PCL Printing*, in this manual. If you are using PostScript, look under *Default Font* in Chapter 2, *PostScript Printing*, in this manual.

Considerations for Shared Printer Environments

Your digital duplicator may be connected to other computers besides yours. This is done one of several ways:

1. Two computers may use the digital duplicator simultaneously using either of the two direct connection interfaces on the back of the controller (parallel or LocalTalk).
2. Your organization may be using a switch box to connect two or more computers, one at a time, to the digital duplicator.
3. The controller may be connected to a LAN, providing access to the digital duplicator to any number of users.

A combination of any of the above three methods.

Be sure to check with the other users of the digital duplicator before you download or remove soft fonts and typefaces. This will conserve memory and help you avoid unexpected printer output.

Font Selection Priority

This is the order in which your controller selects its fonts:

1. First, the controller looks for a downloaded soft font.
2. If the requested font is not available as a disk-based font (“soft font”), the controller checks for fonts in its memory (SIMM).
3. If the font is not available in it’s memory, the controller selects one of its internal fonts.

When choosing a font, the font must be available from one of the above sources. If the font you request is not available, the controller selects the closest match based on individual font characteristics.

D

PCL Symbol Sets

Introduction

Symbol sets are unique groupings of characters (alphabetic, numeric, punctuation, and special symbols) designed to meet the requirements of specific languages and occupations. To help you choose and use the proper symbol set, this appendix contains:

- Tables showing which symbol sets are supported by each of the controller's internal typefaces.
- Substitution table for accessing ISO symbols from the Roman-8 symbol set.

For information as to the characters available in each of the symbol sets, see the *Related Documentation* section of the Chapter 3, *PCL Printing*, in this Controller Reference Manual.

Note 

For PostScript symbol sets, see your software documentation. For general information, see Chapter 2, *PostScript Printing*, in this manual

Software Support

Although all the characters and symbols shown on the tables are printable, your software might not support some of them. Check your software documentation to see which symbol sets are supported. Look for phrases such as “code pages,” “extended characters,” and “character sets.”

Typeface Support

Typefaces are designed to include limited combinations of characters and symbols. Some typefaces, such as Wingdings, support only one specific symbol set. Other typefaces, such as CG Times and Univers, support almost all of the controller’s available symbol sets.

Use Table D-2.1 and Table D-2.2 to determine which symbol sets to use with the typefaces you have chosen. These tables also contain information to help you select symbol sets through your software application using PCL commands.

Note

Symbol sets other than those described here are available with various software products, such as word processors, spreadsheets, and desktop publishing programs.

Configuration Utility Symbol Set Name	ID	Albertus	Antique Olive	Clarend Cond.	Coronet	Courier	Garamond Antiqua	Letter Gothic	Line Prtr	Marigold	CG Omega	CG Times	Univers	Univ. Cond
Desktop	7J	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
ISO 8859-1 Latin 1	0N	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Legal	1U	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Math-8	8M					✓		✓				✓	✓	
MS Publishing	6J	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
PC-8	10U	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PC-8 D/N	11U	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PC-850	12U	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Pi Font	15U					✓		✓				✓	✓	
PS Math	5M					✓		✓				✓	✓	
PS Text	10J	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Roman-8	8U	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ventura Int'l	13J	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Ventura Math	6M					✓		✓				✓	✓	
Ventura US	14J	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Windows 3.0 Latin 1	9U	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Symbol	19M													
Wingdings	579L													

Table D-2.1. Intellifont Symbol Sets

Configuration Utility Symbol Set Name	ID	Arial	Times New Roman	Wingdings	Symbol
Desktop	**7J**				
ISO 8859-1 Latin 1	**0N**				
Legal	**1U**				
Math-8	**8M**				
MS Publishing	**6J**				
PC-8	**10U**				
PC-8 D/N	**11U**				
PC-850	**12U**				
Pi Font	**15U**				
PS Math	**5M**				
PS Text	**10J**				
Roman-8	**8U**				
Ventura Int'l	**13J**				
Ventura Math	**6M**				
Ventura US	**14J**				
Windows 3.0 Latin 1	**9U**				
Symbol	**19M**				
Wingdings	**579L**				

Table D-2.2. TrueType Symbol Sets

ISO Symbol Set Substitution

This table provides a quick reference for the values of special characters contained in ISO (International Standards Organization) symbol sets. ISO symbol sets contain the same characters as the ASCII symbol set, except for the character positions listed in this table. For example, within the ISO 21 (German) symbol set, the "section" sign (§) replaces the @ sign used in decimal position 64 of the ASCII symbol set.

			Decimal Character Equivalents											
ISO	Name	ID	35	36	64	91	92	93	94	96	123	124	125	126
6	ASCII	0U	#	$	@	[	\	]	ˆ	‘	{	|	}	~
4	United Kingdom	1E	£	$	@	[	\	]	^	`	{	|	}	¯
69	French	1F	£	$	à	°	ç	§	^	µ	é	ù	è	“
21	German	1G	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
15	Italian	0I	£	$	§	º	ç	é	^	ù	à	ò	è	ì
11	Swedish for Names	0S	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
17	Spanish	2S	£	$	§	¡	Ñ	¿	^	`	°	ñ	ç	~
60	Norwegian version 1	0D	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	¯

Table D-4.1. ISO Substitution Characters

Glossary

10Base-2 - IEEE 802.3 Ethernet standard implemented on thin coaxial (RG58) cable, where 10 = 10 Mbps transmission rate and Base = baseband. May have up to 185 meters between network nodes.

10Base-T - IEEE 802.3 Ethernet standard implemented on UTP cable, where 10 = 10 Mbps transmission rate and Base = baseband. May have up to 100 meters between a network node and a network drop.

25 MHz vs 100 MHz - These refer to CPU clock speeds. Generally, the higher the clock speed, the faster the computational speed of the CPU, and the computer.

300 DPI - A printer resolution specification stating that the length and width of the master will have 300 DPI.

300x400 - A printer resolution specification stating that the length of the master will have 300 DPI, while the width of the master will have 400 DPI.

386 - First-generation 32-bit x86 microprocessor introduced to the market by the Intel Corporation.

486 - Second-generation 32-bit x86 microprocessor introduced to the market by the Intel Corporation, incorporating a dedicated math coprocessor.

64 Bit Architecture - A CPU, memory, and I/O system that transfers data and instructions using an 8 byte-at-a-time (64 bits) process.

Adobe - A software company that produces the PostScript printer drivers and PostScript fonts and language used by your computer to communicate with the controller.

Adobe Certified - Indicates that the hardware or software has passed a rigorous set of tests by Adobe and is certified to perform printing tasks as stated by the manufacturer.

ANSI - American National Standards Institute – a standards committee that develops and publishes technical standards.

AppleTalk - A proprietary network layer protocol developed by Apple Computer, Inc. for use in its Macintosh series of computers.

AppleTalk Port - An I/O port that adheres to the AppleTalk standard.

Application - Computer programs which allow computer users to perform some specific task such as word processing, accounting, etc.

Application software - See Application.

Architecture - The design and implementation of connecting components, interfaces, and protocols in a computer, program, or network.

ASCII - American Standard Code for Information Interchange - A standard for encoding characters (including the upper and lowercase alphabet, numerals, punctuation, and control character) using seven bits. The standard is 128 characters; IBM expanded

the set to 256 by adding an eighth bit to each existing character. The expanded set provides graphic, Greek, scientific, financial, and foreign language characters.

ASIC Chip - Application-Specific Integrated Circuit – a semiconductor product created to perform a particular function. An example would be a logic chip in the controller or computer that allows the microprocessor (a generic or non-specific IC), to get and move data in a specific environment.

Auto Switching - Describes the behavior of the controller with respect to how it decides from which input port it will capture data for printing.

Bi-directional - Communication flow in two directions.

Binary Digit - Describes base-2 math or electronic states of zero (off) or one (on).

BIOS - Basic Input Output System – the hardware and firmware which allows a processor to control and use various aspects of a computer's hardware (such as disk drives, keyboard, monitor, and printer ports).

Bit - The smallest unit of storage or communication in a computer. See Binary Digit.

Bleed Off - The technique of printing to the physical edge of the document paper.

Bleed Through - The result when, during the printing process, ink saturates the paper and is deposited on the copy below it, or leaves residual ink on the drum which is passed on to the next copy, resulting in a 'ghost' image.

Buffer - A temporary data storage area necessarily used during data transfer between two systems or processes whose input and output data rates differ.

Built-In Fonts - Fonts which are resident in the controller and cannot be erased through normal use of the controller.

Byte - Eight bits, can represent a character or number, and is the most common form of data storage and transfer.

Cache – A high-speed, short-term storage area. Also describes the act of copying data from a relatively slow, long-term storage medium into a relatively fast storage medium/buffer, to enable fast access by multiple processes.

Cache Buffer - An area in RAM or on a hard drive used for storing frequently accessed data or program instructions.

Chip - The short name for an integrated circuit (IC) device.

CISC - Complex Instruction Set Computer – a type of CPU that can recognize as many as 100 or more instructions, enough to carry out most computations directly. Generally slower than a RISC processor.

CMYK - Cyan, Magenta, Yellow, and Black, the four colors used in making a composite color picture (K = key color = black) – see Color separations.

Coaxial wire - LAN interconnect wire, usually type RG58, runs from one computer workstation to another in a daisy-chain design.

Collate copies - The feature of most print management programs which sends one page after another to the printer. Note: must be turned off to prevent creating a new master for each copy printed.

Color separations - Individual, single-color images used to create a full-color printed image with a multiple-pass printing process. Colors typically used are CMYK.

Configuration Utility - The program used to manage printing tasks on a digital duplicator.

Connectivity - The term used to describe the physical methods for connecting the controller to a computer.

CPU - Central Processing Unit – the instruction execution and data processing component of the computer hardware.

Daisy Chain - A method described by serially connecting together several devices. Peripheral devices that use a SCSI port, such as a CDROM, hard disk and scanner, can be daisy chained to one SCSI port of a computer.

Diagnostic Test Page - Generated by the controller in response to the corresponding button on the back panel being pushed. It displays the controller's internal settings.

Dialog Box - A pop-up window in some programs used to get information from the user before proceeding with some task.

Digital Duplicator - A duplication device that takes electronic images from a scanner or controller, creates a master of the image, and produces copies of that image on plain paper.

DIMM - Dual Inline Memory Module, a type of RAM configuration

DIP Switch - A switch in DIP (Dual Inline Pin) configuration, usually located on a circuit board of a device.

DOS - Disk Operating System – a non-graphical line-oriented command-driven single-task program that provides application software access to computer BIOS functions, primarily the disk drives.

Dot Gain - Describes the result when ink spreads a small amount on the paper after passing through the holes in the master, to ultimately become bigger than the original hole.

Download - The process of moving software or data from one location (e.g., an FTP site on the Internet) to another (e.g., your computer).

DPI - Dots Per Inch – dots are the smallest printable units by a printer. Thus, DPI is the resolution specification of a printer or screen communicating the graininess of the resulting image.

DPI Resolution - The specification relating to the image quality of the printer or screen display. Generally, the higher the DPI rating, the better the image, and the more memory the product must use to create the image.

DRAM - Dynamic-refresh Random Access Memory - a type of RAM IC that uses solid state capacitor elements requiring continuous refresh to store information.

Drivers - A file containing information needed by an application program or operating system to operate a peripheral such as a monitor or printer.

Duplexing - Printing on both sides of a sheet of paper. Digital duplicators print duplex by having the user pass the paper through the digital duplicator a second time.

ECP - Enhanced Capability Port - An improved parallel port supporting two-way communication between the computer and the controller.

EEPROM - Electrically Erasable PROM – a form of EPROM that may be erased and re-programmed in-circuit. See Flash ROM.

EPP - See ECP.

EPROM - Electrically Programmable ROM – a ROM chip that can be re-programmed. In a controller, the EPROM contains the latest versions of the firmware, and the PostScript and PCL5e interpreters.

EPS - Encapsulated PostScript – a method of storing a high-resolution graphic image in the PostScript page description language.

EPS Files - A file containing an image saved in the EPS format.

Ethernet - The common name given the LAN technology standard described by IEEE 802.3. The Xerox Company originally developed Ethernet.

EtherTalk - The name given by Apple Computer to the process of using the AppleTalk protocol on an Ethernet LAN.

External drive - A hard drive, ZIP drive, JAZ drive, CDROM drive, floppy drive, etc. with its own case, cables and power supply, external to the computer. It is usually connected to the computer through a SCSI or parallel port.

Firmware - This is the operating system (BIOS) software of the computer or controller stored in ROM.

Firmware Version - This number communicates which revision of firmware is resident in the controller or computer.

Flash Memory - A type of ROM that may be electrically reprogrammed (updated or upgraded) though software rather than having to remove/replace it.

Flash ROM - See Flash Memory.

Floppy drive – The mechanism that writes and reads data to and from 3.5” floppy disks.

Font - An arrangement of screen or printing dots forming a certain style of character numbers, letters, or symbols.

Font Caching - Storing fonts in RAM or a hard drive speed up printing.

Font Matching - The process the controller uses to select a font for printing based on the instructions it receives from the printer driver. For example, when a document containing TrueType fonts is sent to the controller using a PostScript printer driver, the controller performs font matching to match each TrueType font with an equivalent, resident PostScript font. The same process is done if a document containing PostScript fonts is sent to the controller using the PCL printer driver. The

closeness of the matched font to the original determines how accurately the fonts are reproduced on the printed page.

GB - See Gigabyte

GDI - Graphical Device Interface - software that utilizes the computer's CPU and other resources, rather than dedicated internal hardware, to perform the RIP function.

Gigabyte - GB, GByte - A unit of measure for memory or disk storage capacity equal to 1,024 MBytes.

GUI - Graphical User Interface – the feature of a program where the interaction with the user is through high-resolution graphical screen displays (e.g., windows), and using tools like a computer mouse, versus a line-by-line text method. For example, MS Windows uses a GUI method, while MSDOS uses a line entry method.

Halftone computation - The process used by a RIP device to determine the size and density of dot placement when rendering a halftone image.

Halftoning - The process of creating the illusion of continuous tone on a printed image by breaking the image down into a series of dots. Varying the sizes and densities of the dots in a halftone screen creates the optical illusion of variations of gray or continuous color in the image.

Hard Disk/Drive - A computer storage device which uses a fixed, rotating platter as the storage medium for computer applications and data.

Hardware - The physical, tangible components of the product.

Hub – A 10base-T device used to connect two or more computers to each other.

I/O - Input/Output.

I/O port – see I/O and Port.

IBM Compatible - A computer that adheres to IBM's standards and is the equivalent in performance.

IEEE - Institute of Electrical and Electronic Engineers – the U.S.–based standards-setting and governing body of electrical engineers.

IEEE 1284 - Standard 1284 of the IEEE containing specifications of the bi-directional parallel port used in the controller and PC.

IEEE 802.3 - Standard 802.3 of the IEEE describing the 10 Mbit Ethernet LAN.

IEEE 802.3u - Standard 802.3u of the IEEE describing the 100 Mbit Ethernet LAN.

Image Overlay - The process of combining two digitized images onto a single digital duplicator master utilizing 1) the scanner in the digital duplicator and 2) a digitized image sent to the controller.

ISDN - Integrated Services Digital Network - digital telephone technology permitting the simultaneous transmission of voice, data, and video.

KB - see Kilobyte.

Kilobyte - A unit of measure for memory or disk storage equal to 1,024 bytes**.**

Knocking Out - Light type is knocked out of a dark background.

LAN - Local Area Network - a method using hardware and software to connect two or more computers together, to share information. Typically, a LAN connection is made via coaxial or UTP cables, or by means of line-of-sight infrared signals.

Leading Edge - Refers to the edge of the paper that first enters the paper input side of the digital duplicator.

Trailing Edge - Refers to the edge of the paper that last exits the paper output side of the digital duplicator.

LED - Light Emitting Diodes **–** lamps which emit light using semiconductor (versus incandescent) technology.

LocalTalk Cable - The cable conforming to the Apple-proprietary LocalTalk specifications used to connect two LocalTalk ports.

LocalTalk Port - An Apple-proprietary, serial port on the Macintosh computer which communicates via the AppleTalk protocol.

LPI - Lines Per Inch – the number of lines of characters per inch of vertical page space.

Mac - The short form of Macintosh, the name of the personal computer produced by Apple Computer, Inc.

Mac Clone - A computer that adheres to Apple Macintosh standards and is the equivalent in performance.

Main Board - See Motherboard.

Master Interlock - The term used to describe the condition where the digital duplicator refuses to make a new master because it is still using the current one. Typically, this occurs when the requested copy count has not run to 0, or a just-created master has only produced a proof copy.

Master Making - The process where the digital duplicator is creating the vellum master.

MB - see Megabyte

Mbps - Megabits-per-second - a unit of data communications speed measurement equal to one million bits per second.

Megabyte - A unit of measure for memory or disk storage equal to 1,024 KBytes.

Megahertz - Also described as MHz, a unit of frequency measurement equal to one million Hertz (cycles per second).

Memory - The component of a computer or controller where either temporary or permanent storage of data or CPU instructions takes place.

MHz - See Megahertz.

Microprocessor - The CPU of a computer or controller. Typical implementations in PC's include the x86 family from Intel, AMD and Cyrix for the PC-family, and the 68000 and G3 (RISC) families for the Apple Macintosh.

Microsoft Windows NT - See Windows NT 3.5 or Windows NT 4.0.

MIPS - Millions of Instructions Per Second – a term used to compare the execution speed of two CPUs.

MIPS Processor - A CPU or microprocessor made by the MIPS Technologies, Inc.

MMX - Matrix Multiply eXtensions - a set of instruction set extensions incorporated into later versions of x86 Pentium-level and higher microprocessors, enabling direct high-speed processing of multimedia data, including voice, audio, and video.

Moire - An interference pattern which usually results in distortion of an image, caused by overlaying the dots of different separation colors, or by printing a higher-resolution image (e.g. 400 dpi or 600 dpi) on a lower-resolution printer (e.g. 300 dpi).

Motherboard - The main board of the computer or controller which houses the CPU. It distributes signals to and receives information and power from plug-in ('daughter') boards, such as a power supply and LAN interface.

MSDOS - A version of DOS written by the Microsoft Corporation for x86 computers.

Multitasking - The term used to describe the feature of some operating systems where the computer may have several programs open and operating simultaneously.

Nanoseconds - $1x10^{-9}$ seconds, or one-billionth of a second in time.

NetBEUI - NetBIOS Extended User Interface - a network transfer protocol that defines the network layer of Microsoft and IBM local area networks.

NetWare - A proprietary NOS manufactured by Novell for local area networks.

Network - The term used to describe the connecting of two or more computers together for the purpose of sharing data and common resources such as printers and disk drives.

Network Address - A unique number that identifies a physical network node.

Network Drop - The physical port where a connection to a LAN by a computer may be made. A functioning network drop is usually attached to a hub.

NIC - Network Interface Controller – a board or card that connects to the motherboard of the computer or controller, providing the necessary electrical interface to communicate over a LAN.

NIC Utility - A software program design to assist the user in setting up and managing the NIC.

Node - Any network station or component with a unique network address.

Node Address **-** A unique number that identifies a device on a network

Non-parity **-** The situation where parity checking is not done (see Parity).

NOS – Network Operating System - the software providing a computer access to LAN resources.

Novell - The software manufacturer that invented, develops and distributes NetWare.

NT - New Technology – applied to Microsoft Windows, is the name for the non-threading technology used to implement the multitasking feature.

NVRAM – Non-Volatile RAM – memory into which the CPU may write data it needs to be kept intact if the power is lost. Batter-backed-up RAM is a type of NVRAM.

On-Line – Signals that the digital duplicator is ready to accept data and instructions from the controller.

OS - Operating System – the software that allows a program to or user to make use of the resources (disk drives, ports, display) of a computer.

Over Printing - Black type is over printed on light backgrounds.

PANTONE Colors - Used for printing inks. Each PANTONE color has a specified CMYK equivalent. To select a PANTONE color, first determine the ink color you want, using either the PANTONE Color Formula Guide 747XR or an ink chart obtained from your printer. PANTONE books are available from printers and graphic arts supply stores.

Parallel Cable - The cable used to connect the parallel port of the computer to the parallel input port of the controller.

Parallel Port - The port on the back of the computer, most commonly designated LPT1, which synchronously transfers one byte at a time between the computer and a peripheral.

Parity - The quality of oddness or evenness. Used in simple error detection schemes: when comparing two numbers, parity exists if both are odd or even; no parity exists of one is even and one is odd.

PC Clone - A computer that adheres to the IBM design standards and is the equivalent in performance

PCL5 - Version 5 of the Printer Control Language for laser printers developed by the Hewlett Packard Company. It is a set of commands that tell a printer and print driver how to print a document.

PCL5e - An enhanced version of PCL5, capable of translating documents sent in either PostScript or PCL5/5e. See PCL5

PDF - Portable Document Format – developed by Adobe to represent documents independent of the software, hardware, and operating system used to create the original document file.

PDL - Page Description Language, developed by Adobe to format documents sent to a printer. See PostScript.

Peer-To-Peer - Describes a network arrangement where workstations (peers) communicate with one another without the need for a server.

Pentium - A 32 bit, x86-class CISC microprocessor designed and manufactured by Intel and introduced in 1993.

Pentium II - A version of the Pentium microprocessor incorporating MMX and L2 (Level 2) cache technologies.

Peripheral - A physical device (such as a printer or disk subsystem) that is externally attached to a workstation or a network.

PJL - Printer Job Language - developed by the Hewlett Packard Company. It is printer programming language which uses @PJL line commands to send a print job to a PJL-compatible printer.

Port - The electronic hardware or software components allowing the CPU to communicate with peripherals. The serial, parallel, AppleTalk ports are all examples of I/O ports on controllers, PCs and Macs.

PostScript - The trade name of the Adobe PDL. First used by Apple.

PPD - PostScript Printer Description – a text file containing the characteristics of a particular printer. Used by a PostScript printer driver to correctly send a file for printing on a particular printer. All PostScript-capable printers must have a PPD file to operate properly.

Print Manger - The computer's operating system program that spools and otherwise manages print jobs sent from the computer to various printers.

Print Queue - A list of files that a print spooler prints in the background while the computer performs other tasks in the foreground.

Print server - A device and/or program that manages documents sent to a shared printer.

PROM - Programmable ROM – a ROM which may be programmed.

Protocol - Governing rules for communicating between two devices. Computers wishing to communicate over a LAN must do so using the same protocol.

Queuing - The process of saving documents to be printed in the spooler, on a first-in-first-out basis.

QuickDraw - Apple printer driver/management software that ships with their operating system. QuickDraw is NOT compatible with the Adobe PostScript printer driver.

RAM - Random Access Memory - the computers non-permanent primary working memory, in which program instructions and data are stored.

Rasterize - See RIP.

Registration - the alignment of color and graphics.

Removable Media - The storage component of a disk drive that may be removed and replaced. Typically these are of 100 Mbyte or larger capacities and, except for the removable feature, would be considered to be a hard drive. See also ZIP Drive and SyQuest.

Repeater - A device used to extend cabling distances by regenerating signals.

Resident Fonts - Type fonts stored permanently in the controller or printer.

Ring topology - A closed-loop topology in which data passes in one direction from station to station on the LAN. Each workstation on the ring acts as a repeater, passing data to the next workstation on the ring.

RIP - Raster Image Processor/Processing – the process of converting the print control codes sent from the computer printer driver into an image constricted of lines or dots, to be printed on a screen or paper.

RISC - Reduced Instruction Set Computer **–** a CPU architecture in which the number of instructions that the microprocessor can execute is reduced to a minimum, resulting in increased processing speed.

ROM - Read-Only Memory – an IC or other device used for permanent storage of data or instructions for the CPU.

Scanner - A peripheral device that digitizes artwork or photographs and stores the image as a file that you can merge with text in many word processing and page layout programs.

Scanning - The process of using a scanner to capture an image for use in an electronic medium.

Screen - The display screen or area of the computer.

SCSI - Small Computer System Interface (pronounced 'scuzzy'). An interface to the CPU bus allowing it to communicate with addressed devices such as hard disk drives, CDROM drives, scanners and laser printers.

Separations – See Color separations.

Serial Cable - The cable used to connect two serial port for the purpose of data communications between them.

Serial Port - A port that sends and receives data in serial fashion, one bit at a time, asynchronously.

Server - A network device that provides services to client stations. Services include shared disks, files, and printers.

Set Off - The process of ink from the front of a freshly-printed copy adhering to the back surface of the next copy to land on top of it.

Shielded Twisted Pair Cable - Twisted pair wire surrounded by a foil or mesh shield to reduce susceptibility to outside interference and noise.

SIMM - Single In-line Memory Module - A plug-in memory unit containing the chips that constitute the RAM in the controller (computer, laser printer etc.)

Soft Fonts - Type fonts downloaded to RAM space provided for them in the controller.

Software - Program instructions written to cause the computer to perform a task or set of tasks.

Spooling - See queuing.

Spot Color - Unblended color. Use spot colors to achieve exact color match.

SPP - Standard Parallel Port – an older parallel port definition that transfers data in one direction only, from the computer to the peripheral.

SPX - Sequenced Packet Exchange - a NetWare network protocol using IPX to deliver messages, then guaranteeing delivery of the messages and maintaining the order of the messages on the packet stream.

Star topology - A LAN topology in which each workstation connects to a central device

Star-wired topology - A ring network (such as a token-passing ring) cabled through centralized hubs or connection devices to create a physical star topology.

Switch - An mechanical, electronic, or software device that allows a user to start/enable or stop/disable a process.

SyQuest - A manufacturer of removable-media hard and tape drives.

TB - See Terabyte.

TCP/IP -Transmission Control Protocol/Internet Protocol - a communication protocol for internet routing and reliable message delivery, originally endorsed by the U.S. Department of Defense and implemented on ARPANET. TCP/IP is the basis of the Internet and is widely used in local area networks.

Terabyte -TB, TByte - a unit of measure for memory or disk storage capacity equal to 1,024 GB.

Terminal - A keyboard and display screen through which users can access a host computer.

TIFF - Tagged Image File Format - TIFF files are often used to hold scanned photographic images.

Tints - A lightened color created by controlling the number and size of the dots used to print the color.

Token Ring - A type of network topology developed by IBM for Unix systems.

Trapping - A technique in which adjacent colors are slightly overprinted, eliminating white-space gaps.

True Adobe PS - Not an emulated version of PostScript, but a true implementation of the language. See also Adobe Certified.

TrueType fonts - Font technology developed by Apple Computer that ships with Microsoft Windows.

TWAIN - Technology Without An Important Name – the protocol that allows a scanner to send images it creates directly into a user's word processing page layout program.

TWAIN Compliant – Incorporates the TWAIN protocol.

Unidirectional - Communication flow in one direction only (i.e., input or output, but not both).

Update - The term used to describe a revision of software or firmware incorporating changes designed to eliminate issues of non-conformance to specifications.

Upgrade - The term used to describe a revision of software or firmware incorporating changes designed to enhance or provide new functionality.

USB - Universal Serial Buss - a high-speed serial data buss capable of transferring data up to 12 Mbps.

UTP - Unshielded Twisted Pair – 4, twisted-pair wires combined as a single cable. Used to connect components of a 10Base-T LAN installation.

Vellum - The cloth-like material used to make a master in the digital duplicator.

Video Board - The electrical interface on the digital duplicator to which a controller communicates in order to print a page. THIS IS A RICOH PRODUCT AND MUST BE INSTALLED INTO ALL DIGITAL DUPLICATORS BEFORE THE CONTROLLER CAN BE UTILIZED.

Video Card - See Video Board.

Video Interface - See Video Board.

Virus - A computer program, usually very small, potentially damaging to a computer, software program, or data.

Vr4300 Chip - The microprocessor used in the CPIF-22/23/24/26/27.

WAN - Wide Area Network - a network linking computers, terminals, and other equipment over a large geographic area.

Windows 3.1 - A 16-bit implementation of a GUI-based OS. The product does not employ a multitasking feature, but does add a GUI interface to DOS, and allows more than one program to be open at once.

Windows 95/98 - A 32-bit implementation of a GUI-based OS utilizing a threading technology in its implementation of multitasking. Invented, developed, and marketed by the Microsoft Corporation.

Windows NT 3.5 - A 32-bit implementation of a GUI-based OS utilizing a non-threading technology to allow multitasking. It has a user interface similar to Windows 3.1. Invented, developed, and marketed by the Microsoft Corporation.

Windows NT 4.0 - Similar to Windows NT 3.5 but with a user interface similar to Windows 95. Invented, developed, and marketed by the Microsoft Corporation.

ZIP Drive - A removable-media drive manufactured by Iomega, providing 100 MBytes of storage space.

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