

HP

PCL/PJL

Reference

**PCL 5
Printer Language
Technical Reference
Manual**

PCL 5 Printer Language Technical Reference Manual

HP Part No. 5961-0509
Printed in USA
First Edition - October 1992

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Printing History

This manual was created using *HP Tag/Vectra* software on an HP Vectra Personal Computer. The body text is printed in *Helvetica* fonts. The camera-ready copy was printed on an HP LaserJet IIISi printer with Resolution Enhancement technology (REt) and was then reproduced using standard offset printing.

First Edition – October 1992

NOTICE

This document is the current edition of the technical reference manual for PCL 5 and earlier printers. It replaces the September 1990 edition of the *HP PCL 5 Printer Language Technical Reference Manual* (p/n 33459-90903). If you have ordered another PCL Technical Reference document, this manual and the *PCL 5 Comparison Guide* are the updated replacement documents.

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Inside This Manual

What You Can Learn From This Manual

Hewlett-Packard has developed a standard set of printer features for use in all HP printers. Printer features are accessed through the corresponding commands of Hewlett-Packard's PCL language. This manual describes the PCL 5 printer language. This includes descriptions of the commands available for Hewlett-Packard PCL 5 LaserJet printers and the basic requirements of PCL language programming. With the release of new LaserJet family printers there are new features added which supplement the existing PCL base set. Features of future printer releases are not covered in this document. The new features are described in the latest version of the *PCL 5 Comparison Guide*. Programmers should familiarize themselves with the information provided in the *PCL 5 Comparison Guide* in addition to the information in this document.

Experienced Users

This manual was written for people with some programming experience. Many of the concept discussions assume some programming knowledge.

When writing a PCL language program, you should know the PCL language concepts and commands presented in this manual, and should be aware of the differences in implementation of the PCL 5 printer language for the various HP LaserJet printers, as described in the *PCL 5 Comparison Guide*.

Non-technical Users

Many software applications (word processing software, spreadsheets, etc.) allow you to embed printer commands as **escape sequences** in the body of your documents. This manual presents the full syntax and explanation of all the commands supported by PCL 5 LaserJet printers. These commands enable you to take advantage of the LaserJet printer's advanced feature set.

Note

Since actual implementation of printer commands within software applications varies from package to package, specific examples are not given. For examples of printer command usage with many popular software packages, refer to HP's *Software Application Notes*, provided with the printer. The most current versions of software application notes can be obtained through the HP Forum on CompuServe, by fax using the HP FIRST fax service, or through HP's literature distribution. Refer to Appendix A for more information.

Chapter Summaries

A brief description of each chapter is provided below.

Chapter 1 - Introduction to HP PCL

This chapter gives a brief history of the development of the PCL language, describes the PCL language levels (architecture), and describes the PCL command structure (control codes and escape sequences).

Chapter 2 - The Page

This chapter introduces the idea of the logical page and identifies the area in which printing can occur. It also describes the PCL coordinate system and the HP-GL/2 picture frame.

Chapter - The Print Environment

This chapter introduces the printer's feature settings, collectively, as the print environment. It includes descriptions of the factory default environment, user default environment, and the modified print environment. The effect of printer reset functions is also described.

Chapter 4 - PCL Job Control Commands

This chapter describes the commands which provide job control. Job control commands are usually grouped together and sent at the beginning of a job. Job control includes restoration of the User Default Environment, selection of the number of copies of each page to be printed, duplex print commands, and unit of measure specification.

Chapter 5 - Page Control Commands

This chapter describes the commands providing page format control. Page format control allows you to select the page source, size, orientation, margins, and text spacing.

Chapter 6 - Cursor Positioning

This chapter describes how to position the cursor within the logical page.

Chapter 7 - Fonts

This chapter describes basic font information including font characteristics.

Chapter 8 - PCL Font Selection

This chapter describes how to select a font for printing using the font characteristics commands. The underline feature is described at the end of the chapter.

Chapter 9 - Font Management

This chapter describes font management which provides mechanisms for downloading and manipulating soft fonts.

Chapter 10 - User-Defined Symbol Sets

This chapter describes the capability of some PCL 5 printers to enable users to define their own symbol sets for special needs.

Chapter 11 - Soft Font Creation

This chapter describes how to organize font/character data for downloading to the printer.

Chapter 12 - Macros

This chapter describes macro commands which store a block of PCL commands and data which can be used repeatedly without redefining the block. The macro function reduces the number of commands that must be sent to the printer.

Chapter 13 - The PCL Print Model

This chapter describes the PCL print model which allows for special effects when printing.

Chapter 14 - PCL Rectangular Area Fill Graphics

This chapter describes how to define and fill a rectangular area with one of the predefined PCL patterns, or with a user-defined pattern.

Chapter 15 - Raster Graphics

This chapter describes how to download raster graphics to the printer, and includes various techniques for reducing the amount of data needed to define the raster image.

Chapter 16 - Status Readback

This chapter describes the PCL status readback features. Status readback enables you to obtain PCL status information from the printer, such as: available printer (user) memory, a list of fonts and symbol sets, and the ID numbers of macros and user-defined patterns.

Chapter 17 - An Introduction to HP-GL/2 Vector Graphics

This chapter introduces basic information for HP-GL/2. It lists the vector graphics commands, and describes the HP-GL/2 command syntax. An overview of several important topics is also provided, such as the PCL Picture Frame concept, scaling, pen status and location, and absolute vs. relative pen movement.

Chapter 18 - The Picture Frame

This chapter describes how to set up an area on the page for printing vector graphics (the PCL Picture Frame). It discusses the commands necessary to define and position the picture frame, along with the commands used to enter and exit HP-GL/2 mode.

Chapter 19 - The Configuration and Status Group

This chapter describes the commands used to set default conditions and values for programmable HP-GL/2 features. It also explains the commands used for scaling, establishing a soft-clip window, and rotating the HP-GL/2 coordinate system.

Chapter 20 - The Vector Group

This chapter provides information about pen movement and drawing lines, arcs, and circles. It also covers a way to encode coordinates for increased print speed.

Chapter 21 - The Polygon Group

This chapter explains the polygon mode and how it is used to draw polygons, subpolygons and circles. The commands for drawing and filling wedges and rectangles are also described in this chapter.

Chapter 22 - The Line and Fill Attributes Group

This chapter describes the commands used to vary the line types and fill patterns used to create HP-GL/2 graphics.

Chapter 23 - The Character Group

This chapter contains information about the commands used to print text (labels) in HP-GL/2 mode. This allows you to print HP-GL/2 labels in almost any size, slant and direction using proportional or fixed-spaced scalable fonts.

Chapter 24 - Programming Hints

This chapter provides programming information for use during the development of PCL software.

Related Documentation

The following related manuals provide further information about HP LaserJet printers, including their features and functions.

PCL 5 Comparison Guide

This document contains supplemental information for programming PCL 5 LaserJet printers. It identifies how different HP PCL 5 LaserJet printers implement the commands described in the *HP PCL 5 Printer Language Technical Reference Manual*. It provides printer-specific information on feature sets, paper handling, fonts, and the printer's control panel.

Intellifont Scalable Typeface Format

This document provides information for designing scalable fonts using Agfa's Font Access Interchange Standard (FAIS). This document can be obtained from Agfa Division, Miles Inc. by writing to the address below or by phone.

Agfa Division, Miles Inc.
Typographic Systems
OEM Technical Support
90 Industrial Way
Wilmington, MA 01887
(508) 658-5600

TrueType Font Files

This document, which provides information for designing scalable fonts using Microsoft Corporation's TrueType font scaling technology has been made available in downloadable form on both CompuServe and Internet. Contact Microsoft Corporation for details.