CTOS

Generic Print System
Administration Guide

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CTOS®
Generic Print System™
Administration Guide

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Product Information Announcement

CTOS® Generic Print System™ Administration Guide

This Product Information Announcement announces the release and availability of the *CTOS® Generic Print System™ Administration Guide*

This guide contains user and reference information on the Generic Print System (GPS). It provides detailed procedures for installing devices (printers and plotters). It also provides comprehensive information on device drivers that have been tested and qualified to work with specific devices. In addition, it explains how to troubleshoot problems when they arise.

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About This Guide

The *CTOS Generic Print System Administration Guide* is one of a three-part set about printing. The other two guides in the set include *CTOS Generic Print System Using the Print Manager* and *CTOS Generic Print System Using the Font Tool.*

The *CTOS Generic Print System Administration Guide* contains user and reference information on the Generic Print System (GPS). It provides detailed procedures for installing devices (printers and plotters) on your workstation using the Print Manager's installation commands. It also provides comprehensive information on device drivers that have been tested and qualified to work with specific devices. In addition, it explains how to troubleshoot problems when they arise.

If you haven't installed GPS and are using the pre-GPS system, see Appendix B, "Notes for Pre-GPS Printing."

Who Should Use This Guide

The intended audience for this guide is any individual who is responsible for connecting printers and/or setting up and maintaining GPS. This person is usually referred to as a *system administrator.*

This guide assumes that you have a working knowledge of both the Executive and the Context Manager. If you're installing printers, you should be familiar with simple cluster concepts, which are explained in the *CTOS System Administration Guide.*

How This Guide Is Organized

As mentioned above, this guide contains user and reference information. Although you can go through the sections in any order, depending on your particular needs, it is recommended that you read Sections 1 through 3 if you're setting up GPS for the first time. Also, before you begin any installation procedures, you may want to refer to Section 6 for a summary of the Print Manager and Executive installation commands.

To find important information, refer to the list below.

To find	Turn to
Definitions of printing terms and concepts	Section 1
Information on printing modes	Section 1
How GPS works	Section 2
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What's New in GPS

This edition of the *CTOS Generic Print System Administration Guide* contains the following new information introduced with the release of GPS 2.6:

- Support for the PCL5 device driver.

- Support for new printers:

  The PCL5 and HP LaserJet device drivers have been tested and qualified on the following new Unisys printers: AP9310, AP9312, and AP9316.

  The PostScript device driver has been tested and qualified on the AP9310, AP9312, and AP9316 with the PostScript option installed.

  The PCL5 and HP LaserJet device drivers have been tested and qualified on the following Hewlett-Packard LaserJet printers: LaserJet Series III and HP LaserJet Series 4

  Note: *Unless indicated otherwise, the AP9310, AP9312, and AP9316 printers will be specified as AP9300 series printers.*

- Configurable printer list.

- You can monitor up to 200 printers on the Print Manager Home display; by pressing **NEXT PAGE** and **PREV PAGE** you can page through the printer list.

- Deinstall GPS Device Driver command from the Executive command line.

  Note that this command is not available with the basic GPS package. However, you can add the command by using the Command File Editor, as explained in the *CTOS Generic Print System Software Release Announcement*.

- Support for duplex printing (printing on both sides of a page).

  This feature applies to printers using the PCL5 and HP LaserJet device drivers.

- Support for resolution setting 600 x 600 dpi (dots per inch).

  This feature applies to printers using the PCL5 and HP LaserJet device drivers.

- Support for suppressing form feeds after a binary job.

  This feature applies to GPAM mode jobs only.

- Information on the Laser and Dot Matrix device drivers is now provided in this guide. (This information was formerly documented in the Laser device driver and Dot Matrix device driver supplements. With the release of GPS 2.6, these supplements will no longer be published.)

- Printing support for the SuperGen Series 3000 workstation.

- Terminology change.

  Cluster workstations are now referred to as *client* workstations.

Where to Go for More Information

The documents listed below provide additional information related to this guide. See also the release documentation that accompanies the distribution media.

CTOS Generic Print System Using the Print Manager

This guide contains information on the nonadministrative functions of the Print Manager, such as printing and controlling a printer (for example, pausing and restarting it).

CTOS Generic Print System Using the Font Tool

This guide contains information on configuring the Font Database.

CTOS Basic Asynchronous Terminal Emulator User's Guide

This manual describes how to use Basic ATE to transfer files, access a wire service, and troubleshoot a serial printer.

BTOS Hardware Installation Guide

This guide provides hardware installation information on all BTOS workstations.

CTOS Cluster and Network Hardware Installation Guide

This guide is a planning aid that discusses such subjects as cable routing for clusters and local area networks, cable types, and connection methods. It also contains information for planning and installing a cluster.

CTOS Workstations Installation Guide

This guide describes the installation procedures for the CTOS workstation family. It covers only the procedures for hardware installation.

CTOS Context Manager Manual

This manual describes how to use, install, configure, and troubleshoot the Context Manager. Also includes information on programming applications to run under CM.

CTOS Executive Reference Manual

This manual provides descriptions and details about parameter fields for Executive commands.

CTOS Executive User's Guide

This guide introduces the most commonly used Executive utilities and features.

CTOS Generic Print System Programming Guide

This guide contains information on writing applications that use the Generic Print System or the Generic Print Access Method.

CTOS Office Applications Programming Guide

This guide explains how to write software applications that interface directly with CTOS applications.

CTOS Programming Guide Volume II

This guide describes the extended system services, such as the mouse services, the Queue Manager, and the spooler.

CTOS Status Codes Reference Manual

This manual contains a comprehensive listing of all status codes that can be generated by a workstation or a shared resource processor. The codes are organized, explained, and interpreted in numerical order.

CTOS System Administration Guide

This guide provides detailed information about configuring system software on workstations and shared resource processors.

CTOS System Software Installation and Configuration Guide

This guide provides step-by-step instructions for installing the operating systems and Standard Software.

GPS Device Driver Manual

This manual explains how to create GPS device drivers.

Conventions

The following conventions are used throughout this guide:

- *Italics* to identify new terms and the names of fields and forms.

  Volume, directory, and file names also appear in italics, for example, *[Sys]<Sys>Sys.printers*.

  In addition, variable information appears in italics, for example,

  . . .Ws*NNN*, where *NNN* stands for a three-digit number. . .

- **Boldface** type to identify keys you press and characters you type.

Section 1
About Devices and Printing

This section introduces terms and concepts that are used throughout this guide. If you're not familiar with these terms and concepts, read this section before performing your GPS installation. See also Section 2, "How GPS Works," for a detailed description of the components of GPS.

Note that in this guide the term *device* refers to printers and plotters.

This section describes the following:

- Spooled printing
- Direct printing
- Ports
- Cables
- Device configuration switches, which include settings for baud rate, data bits, stop bits, parity, and protocol ("handshake")
- Printing capabilities, such as letter-quality text and draft-quality text
- Printing modes

Spooled Printing

Devices can be configured for direct or spooled printing. If you set up your device for spooled printing, each document is sent to a temporary queue before it is sent to the device. This means that you don't have to wait until the device becomes available before you send a print request; you can queue up multiple jobs whenever you want.

Spooled printing is the best alternative within a cluster or network, since devices can easily be shared, and each user can make print requests without having to wait for others to finish with the device. Each device may have its own queue, or several compatible devices can share a queue (see "Configuring Equivalent Devices to Share the Same Queue," in Section 4, "Installing GPS System Services"). Note that you can set up some devices for spooled printing and others for direct printing within the same cluster.

You can tell if a device is set up for spooled printing by looking at the Print Manager's Home display. Spooled printing is indicated if the Queue column shows a queue name. (To install a device for spooled printing, a queue name *must be* specified in the *Queue Name* field of the *Device Installation* form.)

Direct Printing

If your device is set up for direct printing, a document to be printed is transferred directly from your disk to the device.

With direct printing, the device must be free before you can make a print request; the next print request is not accepted until the previous one has been completely printed.

Direct printing lacks the convenience of spooled printing because it always depends on the availability of the device.

You can tell if a device is set up for direct printing by looking at the Print Manager's Home display. Direct printing is indicated if the Queue column is blank. (To install a device for direct printing, a queue name *must not be* specified in the *Queue Name* field of the *Device Installation* form.)

Ports

Ports, which are also referred to as input/output (I/O) channels, are communications outlets on a workstation. You use them to connect your workstation to other devices, such as printers. Generally, up to three devices can be connected to a workstation; however, with port expansion modules, you can attach more devices. (For more information, see "Multiline Port Expander Module," and "Four-Port Data Communications Expansion Modules," in Section 3, "Connecting a Device.")

This guide discusses two types of ports: serial ports (sometimes labeled channel A and channel B), and parallel ports.

- A device functioning in serial mode (where data bits are transferred to the device one at a time over a single line) is connected to one of two serial ports. The software names for these ports are [ptr]A and [ptr]B.

- A device functioning in parallel mode (where data bits are transferred to the device simultaneously over separate lines) is connected to the parallel port. The software name for this port is [lpt].

Figures 3-1 to 3-13, in Section 3, show the ports available on various workstations and on a shared resource processor.

Note that when you install a device, the port you use to attach the device must match the entry in the *Port* field of the *Device Installation* form. As explained above, depending on whether the port is a serial or parallel port, the *Port* field can contain the entry [ptr]A, [ptr]B, or [lpt]. You can also specify [Nul] as a port name, which indicates no output to any port and is used mainly for testing purposes. In addition, you can specify a Network Printing Gateway as a port name if you plan to send print jobs from a CTOS environment to non-CTOS systems connected by networks. For more information on the Network Printing Gateway, see Section 5, "Installing Network Printing Gateway Services."

Cables

Cables are used to connect the devices to the ports on your workstation. The type of cable you use depends on whether the device is functioning in serial or parallel mode.

In general, if the device is functioning in serial mode, a crossed RS-232-C cable is required. If the device is functioning in parallel mode, a Centronics-compatible interface cable is required.

Figures 3-14 to 3-20, in Section 3, show the cabling needed for communication with workstations.

Device Configuration Switches

If your device functions in serial mode, you need to set the correct baud rate, data bits, stop bits, and parity. You also have to make sure you're using the right protocol, or "handshake." These terms are described below.

Baud rate   Indicates the speed at which data is transmitted.

Data bits   Indicate the number of bits per character that are transmitted.

Stop bits   Indicate to the workstation or device receiving information when one character ends and the next one begins.

Parity   Acts as a check on the data bits that are transmitted.

Protocol   Indicates hardware and software settings that control the flow of data between your workstation and the device.

Printing Capabilities of a Device

The devices described in Sections 8 through 10 have one or more different printing capabilities, such as vector art, letter-quality text, draft-quality text, and raster images. When you know the printing capabilities of a device, you know what kind of output to expect.

The printing capabilities are defined as follows:

Vector art   Includes pictures and charts created by applications such as OFIS Graphics, Art Designer, and Chart Designer.

Letter-quality text   Includes the full range of character formatting, such as boldface type and underlined text, as shown in the pages created by applications such as OFIS Document Designer.

Draft-quality text   Does not include all the character attributes contained in a document, such as boldface and underline.

Raster images   Refers to images scanned by applications such as OFIS Imager and Image Designer.

Printing Modes

You can specify one of three printing modes when you print a file using the Executive Print command or the Print Manager's Print form. The *printing mode* indicates how the contents of the file will be passed to the device.

For additional information on how device drivers handle printing modes, see the next subsection, "Configuring Device Driver Normal Mode Processing."

The three printing modes are described below.

Normal mode   Use Normal mode for ASCII text files or Generic Print Access Method (GPAM) files (for example, when you have printed to a file from OFIS Document Designer). Also, use Normal mode to print Tagged Image File Format (TIFF) files, which are files created by OFIS Imager or Image Designer In addition, use Normal mode for Computer Graphics Metafile (CGM) files, which are standard file formats for graphics. For more information on GPAM and CGM files, see the *CTOS Generic Print System Programming Guide*. For more information on TIFF files, see the *OFIS Imager* and *Image Designer* manuals.

Binary mode   The device driver determines the appropriate processing to use in order to print the file. This is based on the entries in the *Device Setup* field of the *Device Installation* form. If the file is a GPAM, TIFF, or CGM file, the device driver performs the appropriate translations. For ASCII files, the method the device driver uses can be changed by specifying the option you want in the *Device Setup* field of the *Device Installation* form. (See "Default Print Modes for Normal Jobs," under "Device Setup" in Table 4-6, in Section 4.)

Binary mode (cont.)

Use Binary mode if you want the file to be passed directly to the device with no interpretation of the data. For example, use Binary mode to print the output of pipe drivers, copy escape sequences, download soft fonts to a device, or print jobs from DOS to UNIX.

WP Mode

If you have printed to a file from OFIS Writer or the Word Processor, the file can usually be printed in Normal mode. However, you should use WP mode if, when you printed to the file, you added a printer type to the file specification in the *Printer Name* field. For example, if you typed **<Docs>MyDocument** in the *Printer Name* field, you would use Normal mode to print the file through the Print Manager; but if you typed **<Docs>MyDocument: Diablo630**, you would use WP mode.

Depending on the application being used, WP mode is also known as Image mode or Plotter mode.

Configuring Device Driver Normal Mode Processing

For a general description of printing modes, see "Printing Modes," above.

There are several methods that GPS device drivers use to process print jobs, which are described below. This information is useful when filling in the *Device Setup* field of the *Device Installation* form, as explained under each device driver in Sections 8 through 10. For a detailed description of the *Device Setup* field entries, see "Device Setup" in Table 4-6 in Section 4, "Installing GPS System Services."

- If an application submits a print job in a specific mode, such as Binary, the device driver will automatically switch to that print mode and then print the job. Other supported print modes for applications include WP, GPAM, TIFF, CGM, XLateFS, Simple, and SDC.

- If a print mode is not specified, the default mode Normal is used. Or, Normal is used when you specifically indicate you want to print in Normal mode. The device driver will decide how to print the job based upon its Normal mode configuration. (See Table 1-1, at the end of this discussion, for a description of the Normal Mode processing features.) Print jobs are configured in Normal mode by specifying **Normal:GPAM** in the *Device Setup* field of the *Device Installation* form or by omitting this entry completely.

The device driver handles print jobs in Normal mode in one of two ways:

- In the first way, which is the default, the device driver examines the job for GPAM, TIFF, or CGM headers, and based on this information will switch to the appropriate print mode.

  If the print job is *not* one of these three types, the device driver will assume that the job is an ASCII text file and format the output automatically. For ASCII jobs printed in this way, the device driver will supply page eject commands between full pages of text and at the end of the job. It will also print text using the default font keyword (if any) specified in the *Device Setup* field (for example, **Font:Courier[10]**). In addition, the device driver will provide line wrapping if the **Wrap:Yes** keyword is present when text lines exceed the Chars Per Line length value.

- In the second way, you can have the device driver process Normal mode print jobs as if they were printed on a line printer. There are two different "line printer styles" to choose from:

  If you type **Normal:Simple** in the *Device Setup* field, basic ASCII line printer support is provided with limited formatting (see Table 1-1).

  If you type **Normal:XLateFile**, non-ASCII line printer support is provided without formatting (see Table 1-1).

  If you want translation support for printers that do *not* use the ASCII character code set, you must specify one of the following keyword combinations in the *Device Setup* field:

  Normal:XLateFile XLateFile:*[Vol]<Dir>filename*

  Normal:Simple XLateFile:*[Vol]<Dir>filename*

  where *[Vol]<Dir>filename* indicates the volume, directory, and file name of the translation file.

The following table shows how the device driver processes print jobs that are configured in Normal mode. For example, **Normal:XLateFile** converts tabs into spaces, converts the end-of-line character to dependent new line characters, and wraps lines.

Table 1-1. Normal Mode Processing Features

Processing Feature	GPAM (default)	Simple	XLateFile
Uses the *New Line Map Mode* field to map CTOS Newline characters to CR and/or LF characters.	*	Yes	
Uses the *Expand Tab Size* field to expand tab characters to the specified number of space characters.		Yes	
Always uses the *Chars Per Line* field to wrap lines that exceed the specified line length.		Yes	Yes
Translates pre-GPS escape codes to printer-specific commands.	N/A†		Yes
Translates output bytes using an external translation file (for example, from ASCII to EBCDIC) by specifying **XLateFile:Filespec** in the *Device Setup* field.includes	N/A†	Yes	Yes
Uses the *Chars Per Line* field value to wrap lines to the next page when the line length exceeds this field value *and* **Wrap:**keyword is present in the *Device Setup* field.	Yes‡		
Sets a default font if none is specified in the GPAM job if the **Font:**keyword is present in the *Device Setup* field.	Yes		

*The LPTSimple device driver uses the New Line Map Mode field value also for GPAM processing. No other GPS device drivers use this field for GPAM mode.

†Not Applicable

‡The Wrap: feature is used only for unformatted ASCII files printed in Normal:GPAM mode.

Section 2
How GPS Works

This section describes GPS and the Print Manager and explains what happens when you install GPS. This section also shows you how GPS controls devices and handles all your print requests. In addition, it defines and describes

- The Print Service
- The Queue Manager
- The device driver
- The Font Service
- The Scaling Font Service
- The Font Database
- Pipe drivers
- Network Printing Gateway

What Is GPS?

GPS is a set of software programs that provides printing services for applications using the CTOS operating system. GPS manages all printing communications between your workstation and the devices attached to your cluster and/or networked clusters.

When you make a printing request, GPS simplifies the tasks your application must perform to process the print request. These tasks have been made "generic" so that you can use GPS with a wide variety of applications and devices.

What Is the Print Manager?

The Print Manager is an application program that you use to communicate with GPS. You can use the Print Manger to install or deinstall GPS. You can also use the Print Manager for nonadministrative functions, such as printing, controlling a device (pausing or restarting it), and displaying a list of waiting print requests.

Note: *This manual does not cover the nonadministrative functions of the Print Manager, such as pausing and restarting a device. For information on using the Print Manager on a daily basis, see the* Using The Print Manager Manual.

What It Means to Install GPS

As mentioned earlier, GPS is a set of software programs. More specifically, GPS is made up of a set of system services. *System services* are programs that reside in workstation memory and can be added or removed at any time. They provide special services to the system. For example, GPS provides the printing service.

When you install GPS onto your system, it can mean two different things:

1. It can mean a *distribution installation,* which is the process of copying GPS software, such as GPS 2.6, from floppy disks (also known as diskettes or distribution diskettes) onto a hard disk.

2. It can mean a *system service installation,* which is the process of loading GPS system services from the hard disk into workstation memory.

To use GPS, you need to perform both installations. The release documentation for GPS explains the distribution installation. This guide describes the system service installation via the Print Manager. GPS system services are defined in the next subsection.

Components of GPS

GPS uses up to four different types of system services when it processes a print request. These system services are described below.

Queue Manager   Maintains lists (queues) of all waiting print jobs for devices set up for spooled printing.

Font Service   Acts as a central storage facility for information on font sizes and widths for various device types. (The Font Service is used by office publishing applications such as OFIS Document Designer, as well as the various device drivers.)

Print Service   Routes print and status requests to the designated device and coordinates the work of the entire Generic Print System.

With direct printing, the Print Service determines if the device is free; if it is, the Print Service sets up the device for printing and forwards the print job directly to the device driver.

With spooled printing, the print job is spooled by the Print Service, which then registers the job with the Queue Manager. When the printer is free, the Print Service retrieves the next job from the Queue Manager and then sends it to the device driver.

Note that the Print Service performs the tasks that were formerly performed by the spooler and routing switch.

device driver   Controls the device and translates print jobs into the language of a specific device.

GPS is distributed with a number of different device drivers, each for a specific device or type of device. For example, a specific device driver is distributed for use with the Epson FX-286, and a different device driver is distributed for use with most daisy-wheel printers.

The device drivers and their capabilities are discussed in Sections 8 through 10. See also the release documentation for GPS.

Normally, device drivers send their output to physical ports attached to the workstation. However, with GPS 2.5 and later, you can configure device drivers to send their output to Network Printing Gateways to be delivered to printers attached to non-CTOS workstations. Device drivers that function in this manner are known as *Virtual Printer device drivers*. For more information on Network Printing Gateways, see Section 5, "Installing Network Printing Gateway Services."

What Happens When You Send a Print Request

The illustrations below shows how the GPS system services operate together to process a print request.

The Print Service receives a print job and determines where the job will be printed.

Three print jobs! Do you all have to print here?

Yes   Yes   No

Print Service

If the print job will be printed at another node or workstation, the Print Service sends the job to the Print Service at that node or workstation.

No? OK, you go to the Print Service at the next node or workstation.

Bye!

Print Service

If the print job will be printed at one's own node or workstation, the Print Service determines if the job will be printed on a spooled or direct printer.

You both print here. Do you need a spooled or direct printer?

Spooled   Direct

Print Service

If the print job will be printed on a spooled printer, the Print Service spools the file. The Print Service then tells the Queue Manager where to print the job.

This one goes at the end of the queue for device A.

End of the line for you, Bub.

OK.

Print Service

Queue Manager

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The Print Service checks if the device driver is free. If it is, the Print Service sends the print job to the device driver. If the device driver is not free, it returns the job with the message "Device not available."

You need a direct printer. Let's see...is the device driver free? No?...OK, it's free. Give your command to the device driver.

Bye!

Print Service

When the last job is finished, the Print Service asks the Queue Manager for the next job in line.

Who's next?

Print Service

This guy over here.

Queue Manager

Queue A

Queue B
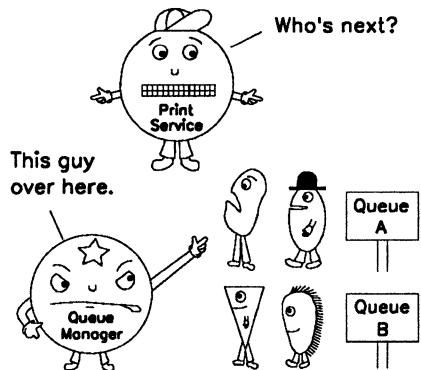
The device driver translates the print job's generic commands into the specific commands that the printer needs.

Print the alphabet, three letters per line.

Print an A...
Print a B...
Print a C...
New line...

Right!

A..B..C..

Device Driver

Direct Printer
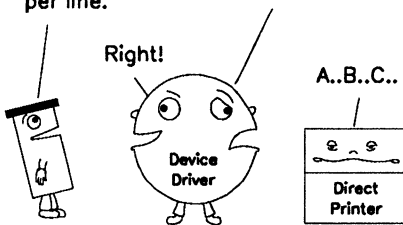
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The Print Service sends the next job to the device driver.

You go to the device driver.

OK, bye.
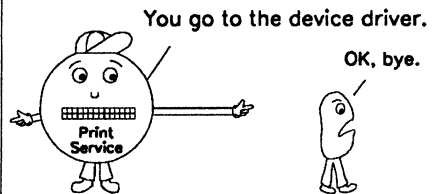
Print Service

The spooled printer prints the job.

Print a Z..Print a Y..
Print an X..
New line..

Print the alphabet backwards, three letters per line.

Z.. Y.. X..

Right.

Spooled Printer

Device Driver
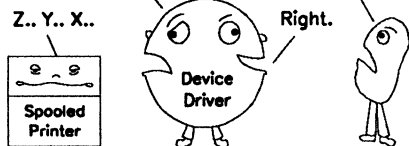
The Font Service

As mentioned earlier, the *Font Service* acts as a central storage facility for information on device font size and width. (A *font* is a collection of characters [such as numerals or letters of the alphabet] that have a distinct unified appearance. Sometimes fonts are called *typefaces*.)

Each device can print certain fonts, but not others. For example, some devices can print boldface text, but not italic text. Laser printers often have a dozen or more fonts available, while simple dot matrix printers may have only one or two.

The Font Service, which is distributed with GPS, is used by OFIS Document Designer and the various device drivers. OFIS Document Designer uses the Font Service while formatting a document prior to printing. Device drivers also reference the Font Service during printing to provide information on how to select fonts and how to access a set of substitution tables (reduction tables) that specify which font to substitute if the font selected is not supported on the device where the document is printed.

The Font Service must be installed where it can be accessed by OFIS Document Designer and the device drivers. Therefore, it is usually installed at the server. However, the Font Service can also be installed at a local workstation, which may improve performance.

The Scaling Font Service

The Scaling Font Service is interchangeable with the Font Service. It serves the same requests, so only one of the two can be installed on the same system. It has all the capabilities of the standard Font Service, but it also provides screen fonts and fonts downloadable to certain devices in a wide range of sizes. The Scaling Font Service can scale, on demand, point sizes from 1 to 99 based on outline information from the Font Service.

The Scaling Font Service is used to support applications such as OFIS Document Designer, which display WYSIWYG typographic fonts. Typographic fonts include proportional fonts in a wide variety of sizes and styles.

For information on installing the Scaling Font Service software, see the release documentation for the Scaling Font Service. To install the Scaling Font Service automatically whenever you reboot, see "Installing the Scaling Font Service for Your WYSIWYG Display," in Section 4, "Installing GPS System Services."

The Font Database

The Font Database describes the fonts available on devices to which you may have access. Tools are distributed with GPS that allow you to modify the Font Database, giving you the ability to take full advantage of all the fonts your device offers.

Note that the Font Database is not only used for devices attached to your workstation or those on the cluster. It is also used for any device you're likely to print to. Therefore, a common Font Database should be constructed to provide uniform font services for all devices, no matter where they are on the network.

Modifying the Font Database is described in detail in the *Using the Font Tool Manual.*

Pipe Drivers

Pipe drivers are similar to device drivers in that they convert print jobs into the language of a specific device. The only difference is that pipe drivers are often used when you print to a disk file rather than to a device. When files are printed to a disk from OFIS Document Designer, they contain GPAM formatting commands. The pipe driver translates this information into a file that contains the commands for a specific type of device.

For each device driver, except the binary mode driver, there is a corresponding pipe driver.

Generally, only programmers developing new device drivers use pipe drivers, but there are circumstances when other users may find them useful. For example, suppose you wanted to create a PostScript file from your BTOS/CTOS system to be used on another system, such as a UNIX system. You would use OFIS Document Designer to "print to a file," which creates a GPAM file. You would then use the Pipe PostScript command to transform the GPAM file to PostScript. You could then transport the file to the non-BTOS/CTOS system and print it there.

For more information on pipe drivers, see Appendix E, "Using Pipe Drivers."

Network Printing Gateway

The Network Printing Gateway is an optional feature that allows you to send print jobs from a CTOS environment to remote systems (non-CTOS systems) that are connected by networks, such as Unix systems. Also, users on these remote systems can print their jobs on GPS printers.

During the device driver installation procedure, you can configure GPS device drivers to send output to Network Printing Gateways. When the device drivers are set up in this way, they are called *Virtual Printer device drivers*. These drivers are running on CTOS workstations but are preparing jobs for printers that are not physically attached to these workstations.

Note that a Network Printing Gateway is not included in the GPS package but must be ordered separately from Unisys or a third party vendor. (Just as there can be different device drivers, there can be several different Network Printing Gateways.) A Network Printing Gateway product is a family of services - some running on CTOS and others running on whatever system is being communicated with across the network. For information on installing the CTOS side of a Network Printing Gateway, see Section 5, "Installing Network Printing Gateway Services."

Section 3
Connecting a Device

This section describes the various environments in which you can set up a device. It also provides port and cable information. Unless noted otherwise, all devices mentioned in this guide have been tested to run with GPS.

For detailed device information, see Sections 8 through 10.

For information on the SuperGen Series workstations (series 2000, 3000, and 5000), see "Connecting Devices to SuperGen Series Workstations," later in this section.

Checklists and step-by-step procedures are given for

- Connecting devices to a workstation

- Connecting devices to a shared resource processor (SRP)

- Connecting devices that have not been qualified to run with GPS

If you're already familiar with the steps for connecting devices, you can use the checklists at the beginning of each procedure as a quick reference guide. Each checklist provides an overview of the steps that are needed to complete a specific task. The procedures that follow the checklists are more detailed and are useful if you're connecting devices for the first time.

Before You Begin

This subsection provides questions to consider as you prepare to connect your device.

Where Should I Put the Device?

You can attach a device to any workstation on the cluster. This means that it can be connected to a workstation (whether or not it has local disk storage) or to a shared resource processor being used as a server for the cluster.

If you have a clustered environment, the device can be attached to the server or to any of the client workstations. In general, you can attach the device anywhere you want; your primary consideration should be convenience.

What If I Have a Network?

Networking means you're using networking software. A network of workstations is made up of nodes. (A *node* is one of a number of junctions in a network where communication lines terminate and/or originate.) A node is usually a standalone workstation or the server of a cluster.

If you want the device to be shared by users on more than one node, networked together, you can attach it to any workstation at any of the nodes. Make sure networking software, GPS, and the Queue Manager are installed on both nodes. For an example of how your printing system could be set up for network printing, see Figure 4-2, Examples C and D, in Section 4.

If you are installing GPS onto a network with more than three nodes, see Appendix D, "Tuning Networked Print Services."

Accessing Other Devices in the Network

If you're set up for network printing, use the Print Manager's Setup command to make devices at other nodes accessible to the local workstation. The Setup command updates your local list of available devices to include devices already installed at other nodes throughout the network.

To access other devices in the network,

1. From the Home display, press **F7** (Setup).

2. Either select a node from the displayed list or type in the name of a node if it is not listed. (When you start typing, a place for the new entry is created.)

3. Press **GO**.

   The devices installed at the selected node are displayed in the *Device* field.

4. Move the arrow keys to highlight the desired device.

5. Press **MARK** to select the device. (A device is selected when it is underlined.)

   Note that you can select more than one device at the same time by repeating steps 4 and 5. If you want to deselect a device, move the arrow keys to the desired device and press **MARK** to remove the underline.

6. Press **GO** to add the device(s) to your list.

Which Port Should I Use to Connect a Device?

Depending on whether a device functions in serial or parallel mode, it is attached to a serial port (channel) or parallel port on the workstation or on a shared resource processor. Figures 3-1 to 3-13, later in this section, show the ports available. If the device can operate in either serial or parallel mode, decide which one you want to use. Consult the documentation that comes with your device if you need more information.

If you have no available ports on a workstation, you can add a Multiline Port Expander Module or DCX Four-Port Data Communications Expansion Module to the server (or any other) workstation. A Multiline Port Expander Module, for example, adds four additional RS-232-C communications connectors to the workstation. Figures 3-5 and 3-6, later in this section, illustrate these different modules.

Do I Have the Correct Cable?

It's important that you have the correct cable to attach the device to the type of port you're using. The following four types of cables are illustrated and discussed in detail in "Cables," at the end of this section:

- Centronics-compatible cable

- Plotter connection cable

- Serial printer interface cable

- Serial cable for CTS/DTR communications

Note that in some cases you may need a modified cable to work with your device. For additional information, see the cable descriptions in Sections 8 through 10. See also the manual that comes with your device.

Connecting Devices to a Workstation

The checklist below summarizes the procedure for connecting devices to a workstation. If you've previously connected devices, you may want to use this checklist as a guide. The procedure that follows the checklist contains detailed steps and is useful if you're connecting devices for the first time.

Checklist

❑ Turn the device on and verify that it's working.

❑ Make sure the switches are set correctly. (If you change any switches, turn the device off and then on again to implement the new settings.)

❑ Plug the cable into the device; then plug the other end into the port.

❑ Check to see that the cable works.

❑ Install GPS system services.

Procedure

To connect a device to a workstation,

1. Connect the device to a power source, and turn on the device.

2. Verify that the device is working by running the self-test described in the documentation supplied by the manufacturer.

3. Set the device configuration switches as indicated for the device (as shown in Sections 8 through 10).

   If your device functions in serial mode, set the correct baud rate, data bits, stop bits, and parity. Also, make sure you're using the correct protocol. Note that the settings on the device *must* match the settings you choose on the *Device Installation* form of the Print Manager.

4. Locate the port (parallel or serial) you want to use at the workstation where you are attaching the device. Port information is provided in Sections 8 through 10.

   On the workstation, serial ports are marked *Channel*, and the parallel port is marked *Parallel Port*.

   The ports available on various workstations and on the shared resource processor are illustrated in Figures 3-1 to 3-12, later in this section.

5. Plug the correct cable into the device; then plug the other end into the port on the workstation. The standard types of cables are illustrated in Figures 3-13 to 3-19, at the end of this section. Additional cabling information is provided in Sections 8 through 10.

   If the device you're using requires a modified cable, check with your distributor to see that you have the appropriate cable.

6. Check the cable and switch settings on the device by following the steps below. This ensures that the workstation is communicating properly with the device.

   Note: The procedure below does not work with all devices. For example, it will not work with the Imagen and PostScript printers or certain HP laser printers.

   a. In the Executive command line, type **Copy**; then press **RETURN**.

      If your device is functioning in parallel mode, complete the form as follows:

      Copy
          File from   [KBD]_____
          File to   [lpt]_____
          [Overwrite ok?]   _____
          [Confirm each?]   _____

      If your device is functioning in serial mode, type the name of the serial port you're using in the *File to* field. For example, if you're using channel A, type **[ptr]A**; for channel B, type **[ptr]B**.

   b. Press **GO**.

   c. At the keyboard, type in several lines of text.

      At this point, some devices will start printing automatically. With others, you may first have to press **NEXT PAGE** or **FINISH**.

   d. Press **FINISH** to end your session.

      (Press **ACTION-FINISH** if **FINISH** doesn't cause the Executive to display a new command prompt.)

      If the device does not start printing, and you receive an error message, see "Problems Checking the Cables," in Section 11, "Troubleshooting."

Where to Go From Here

Once you've completed the hardware installation procedures for connecting your device to a workstation, the next step is to install the GPS system services. This involves two steps:

1. Installing GPS software using the distribution diskettes.

2. Installing GPS system services through the Print Manager.

For information on GPS system service installation, see Section 4, "Installing GPS System Services."

Connecting Devices to a Shared Resource Processor

The checklist below summarizes the procedure for connecting devices to a shared resource processor. If you've previously connected devices to a shared resource processor, you may want to use this checklist as a guide. The procedure that follows the checklist contains detailed steps and is useful if you're connecting devices for the first time.

Checklist

❑ Turn the device on and verify that it's working.

❑ Make sure the switches are set correctly. (If you change any switches, either press **RESET**, or turn the device off and then on again to implement the new settings.)

❑ Attach the cable to the device and to an appropriate port on a workstation. (This is temporary and is only performed to check the cable.)

❑ Check to see that the cable works.

❑ Locate the port on the shared resource processor board where the device is to be attached. Plug the cable into the processor board; then plug the other end of the cable into the device.

❑ Install GPS system services.

Procedure

To connect devices to a shared resource processor,

1. Connect the device to a power source, and turn on the device.

2. Verify that the device is working by running the self-test described in the documentation supplied by the manufacturer.

3. Set the device configuration switches as indicated for the device (as shown in Sections 8 through 10).

    If your device functions in serial mode, set the correct baud rate, data bits, stop bits, and parity. Also, make sure you're using the correct protocol.

4. Check to see that the cable works and that the switch settings (refer to the printer's manual) are correct by attaching the cable to an appropriate port on a workstation. (Attaching the device to a workstation is temporary and is performed only to check the cable.)

    If you're not sure how to do this, follow steps 4, 5, and 6 in "Connecting Devices to a Workstation," earlier in this section.

5. After you've tested the cable, unplug it from the workstation.

6. Locate the port on the shared resource processor where the device should be attached. You can attach the device to one of the General Processor boards (GP, GP/CI, or GP/SI), a Terminal Processor board (TP), or a Cluster Processor (CP) board. If you need help, see Figures 3-8 through 3-10, later in this section.

    Note that on a TP board, only the first four of the RS-232 ports are available for device attachment. The valid port names are [ptr]A through [ptr]D.

7. Plug the cable into the shared resource processor port; then plug the other end into the device. (If both ends of the cable are the same size, it usually doesn't matter which end you plug into the device or shared resource processor port.)

Where to Go From Here

Once you've completed the hardware installation procedures for connecting your device to a shared resource processor, the next step is to install the GPS system services. This involves two steps:

1. Installing GPS software using the distribution diskettes.

2. Installing GPS system services through the Print Manager.

For information on GPS system service installation, see Section 4, "Installing GPS System Services."

Connecting Nonqualified Devices

Nonqualified devices are printers and plotters that have not been tested and qualified for use with GPS. As a result, Unisys makes no commitment to support these devices.

If a nonqualified device is truly compatible with one of the qualified devices described in this guide, the device driver for the qualified device might work. For example, if you have a device that emulates an HPLaserJet, you may be able to get the device to work successfully with the GPS HPLaserJet device driver. However, there is no guarantee that when a manufacturer states that two devices are compatible, that the device driver for one will work for the other. For information on devices, see Sections 8 through 10. You can obtain additional information in the release documentation for GPS.

Note that there is a generic device driver, called *LptSimpleDD.run*, that should work with most ASCII devices if you only want to produce draft-quality text (with 12 point Courier font). There is also a daisy wheel driver, *DaisyDD.run*, that works with several of the daisy wheel printers and produces letter-quality text. In many cases, the PostScript device driver can be used with nonqualified PostScript printers.

Connecting a nonqualified device is similar to connecting a qualified device, which is described in detail in "Connecting Devices to a Workstation," earlier in this section. Be sure to read the "Before You Begin" subsection before you start the hardware installation.

The following switch settings are suggested for nonqualified serial
devices:

Baud rate	9600 (Depending on the device, this value varies.)
Parity	Even (Depending on the device, this value varies.)
Duplex	Full
Line Control Mode	XON/XOFF
WPS	If this switch exists, it should *always* be set to Off.
Auto	Cr/Lf Off

Connecting Devices to SuperGen Series Workstations

You can attach two serial devices and one parallel device to the
SuperGen Series 2000 and 3000. Note that the serial connectors on these
workstations differ from those on other workstations you may have
installed. These connectors are 9-pin D connectors and should be used
for asynchronous equipment only. You may need to change the cables on
your serial device to accommodate these connectors.

You can attach three serial devices and one parallel device to the Super-
Gen Series 5000. One of the serial connectors is a 9-pin D connector and
should be used for asynchronous equipment only.

For detailed information on a specific SuperGen Series workstation, see
one of the following manuals: the *SuperGen Series 2000 Hardware
Installation and Owner's Guide*, the *SuperGen Series 3000 Hardware
Installation and Owner's Guide*, or the *SuperGen Series 5000 Hardware
Installation and Owner's Guide*. For information on pin assignments and
RS232 cabling, see the *CTOS Cluster and Network Hardware
Installation Guide*.

See the diagrams in Figure 3-11 through 3-13 for the location of the
serial and parallel ports on the Series 2000, 3000, and 5000, respectively.
You can find additional port information under "SuperGen Series Work-
station Printer Ports," later in this section.

Note that for the SuperGen Series 2000, the total baud rate for both ports is 19200. This means that port A and port B can each have a baud rate of 9600; or, one of the ports can have a baud rate of 19200.

For the SuperGen Series 3000, the total baud rate for both ports is 9600. This means that port A and port B can each have a baud rate of 4800; or, one of the ports can have a baud rate of 9600.

Ports

As mentioned earlier in this section, devices are connected to a workstation by attaching the cable to the parallel port or to one of the serial ports, depending on the apabilities of the device. Ports can also be referred to as input/output (I/O) channels.

If you are using a shared resource processor, parallel ports or serial ports are also available on the General Processor, Cluster Processor, or Terminal Processor boards.

The following diagrams show the location of the parallel or serial ports of the various systems. Additional information is available in the hardware and installation manuals for each type of system. You can also refer to the *CTOS Cluster and Network Hardware Installation Guide*, the *BTOS Hardware Installation Guide*, and the *CTOS Workstations Installation Guide*.

Modular Workstation Printer Ports

Remember that the term *modular workstation* replaces the model names for Convergent NGENs and the Unisys B25 series of workstations (B26, B27, B28, B28-EXP, and B38 workstations).

B26, B28, and B38 Workstation Printer Ports

Figure 3-1 shows the printer ports for the B26, B28, and B38 workstations.

Serial Printer

Serial Port [ptr]A

Serial Port [ptr]B

Processor
Module

Serial Printer

Parallel Port [lpt]

Processor Module

Parallel Printer

2355.3-1
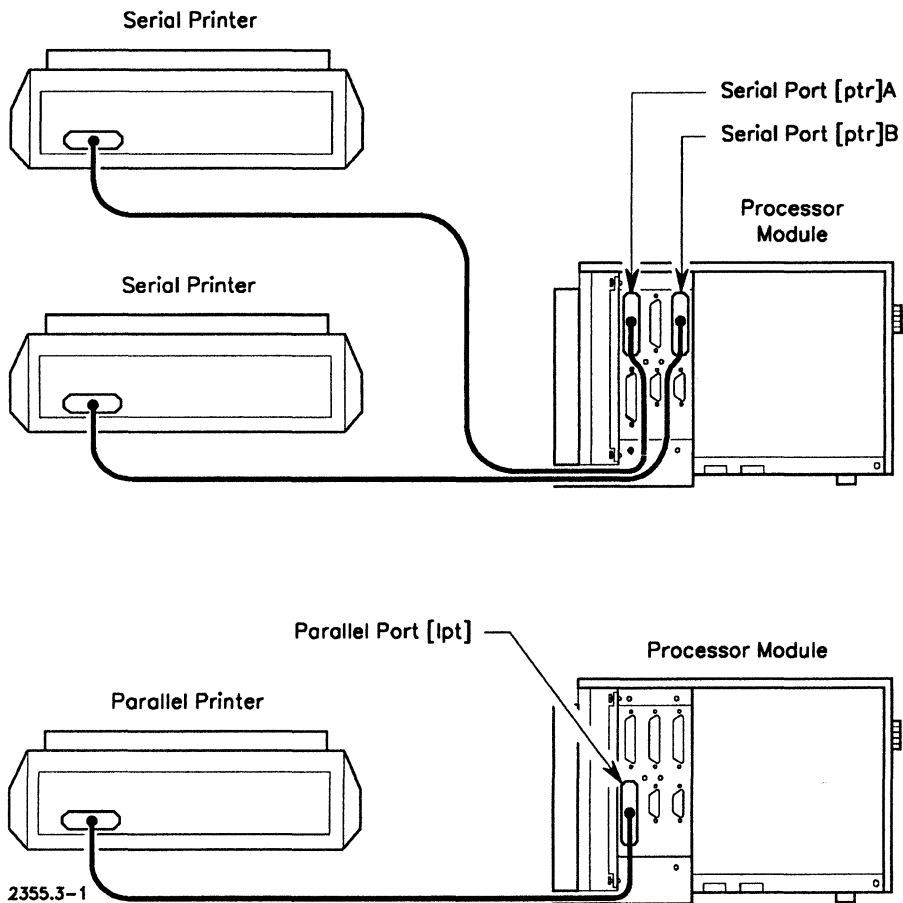
Figure 3-1.   B26, B28, and B38 Workstation Printer Ports

B27 Workstation Printer Ports

Figure 3-2 shows the workstation printer ports for the B27.
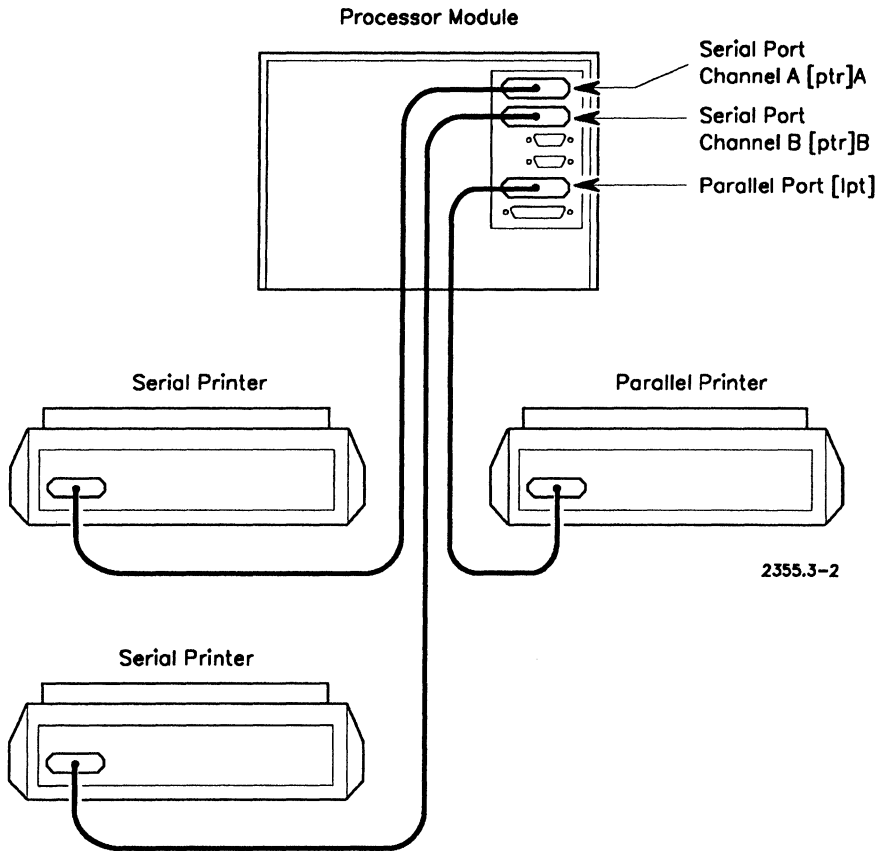
Figure 3-2. B27 Workstation Printer Ports

B28 Expandable Workstation (EXP) Printer Ports

Figure 3-3 shows the workstation printer ports for the B28-EXP.

_____ **CAUTION** _____

Do not connect GPS devices to the RS232 FSA port unless it is specifically
required. The power supplied by the FSA port can damage the device.
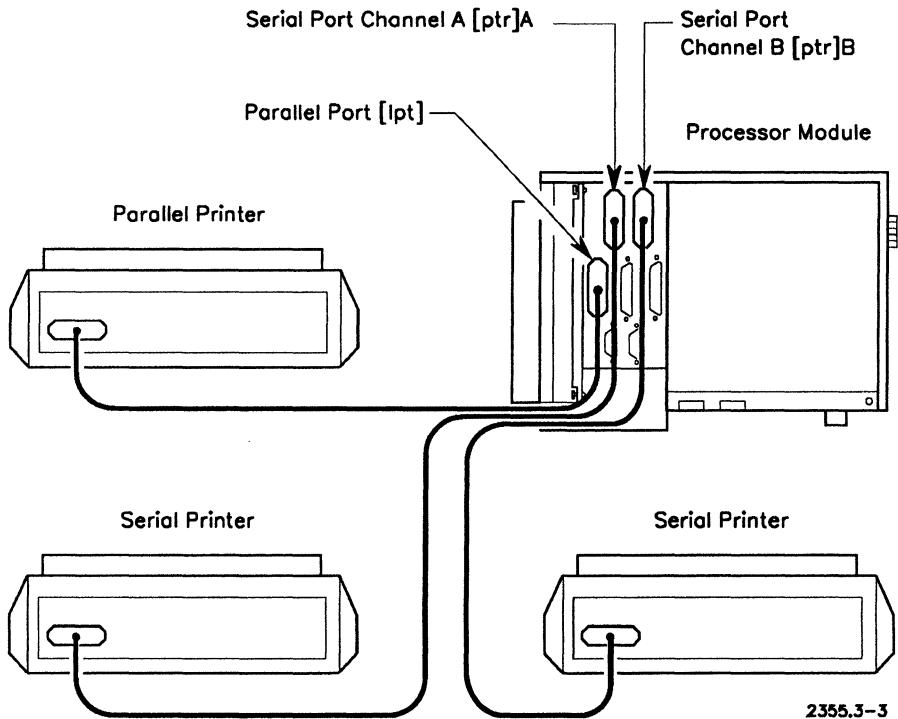
Figure 3-3. B28 EXP Printer Ports

Integrated Workstation Printer Ports

The term *integrated workstation* replaces the model names for Convergent Series i and Unisys B39 workstation.

Series i and B39 Printer Ports

Figure 3-4 shows the workstation printer ports for the Series i and B39.
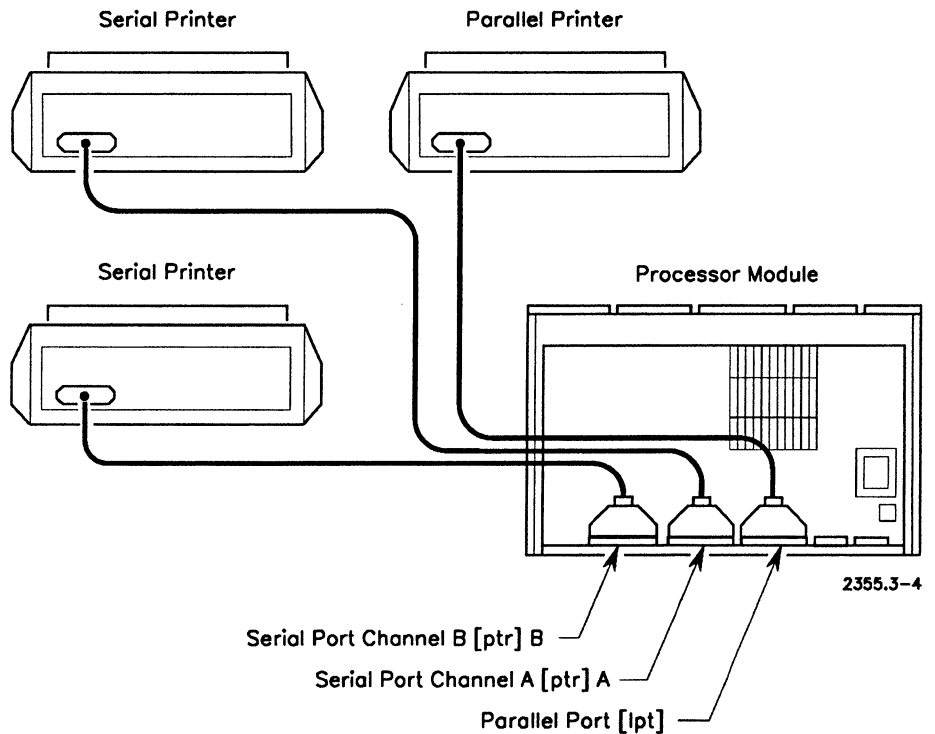
Figure 3-4. Series i and B39 Workstation Printer Ports

Port Expansion Modules

Port expansion modules provide additional communications connectors to a modular or integrated workstation. The following port expansion modules are described below: the Multiline Port Expander Module and two four-port data communications expansion modules.

Multiline Port Expander Module

You can have up to two Multiline Port Expander Modules on a workstation. Multiline Port Expander Modules add four additional RS-232-C communications connectors to the workstation. For the first module, the ports are named [ptr]1A, [ptr]1B, and so on; for the second module, the ports are named [ptr]2A, [ptr]2B, and so on, as shown in Figure 3-5.
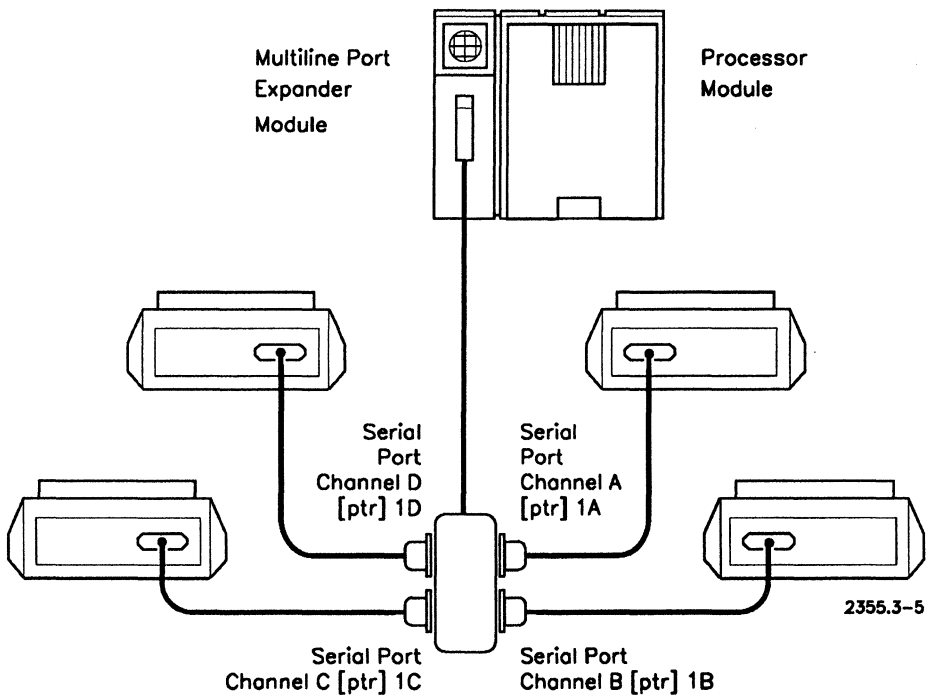
Figure 3-5. Multiline Port Expander Module

Four-Port Data Communications Expansion Modules

There are two four-port data communications expansion modules (shown in Figure 3-6, below): the B25-DCX and the B27-DCX. Both modules provide workstations with four bidirectional ports. You can have a maximum of two four-port data communications modules per system. However, the modules cannot be connected directly together. (For more information, see the *BTOS Hardware Installation Guide*.)

As you attach peripherals to these modules, use the RS232-1 connector for the device with the highest baud rate, the RS232-2 connector for the device with the next highest rate, and so on.

Note that if you are attaching a peripheral to the B27-DCX module and are using a workstation other than a B27, you must also use a B25-FXC adapter module, which is placed to the left of the B27-DCX.

Note too that the sum of the baud rates of all used serial ports of a four-port module must be no more than 9600 baud.

For example:

        Port 1A: 1200 baud

        Port 1B: 4800 baud

        Port 1C: 2400 baud

        Port 1D: 1200 baud
                   ———————

        Total: 9600 baud

B25–DCX Module   Serial Port Channel A [ptr] 1A

Serial Port Channel D [ptr] 1D   Serial Port Channel B [ptr] 1B

Serial Port Channel C [ptr] 1C

B27–DCX Module   Serial Port Channel A [ptr] 1A

Serial Port Channel D [ptr] 1D   Serial Port Channel B [ptr] 1B

Serial Port Channel C [ptr] 1C   2355.3–6
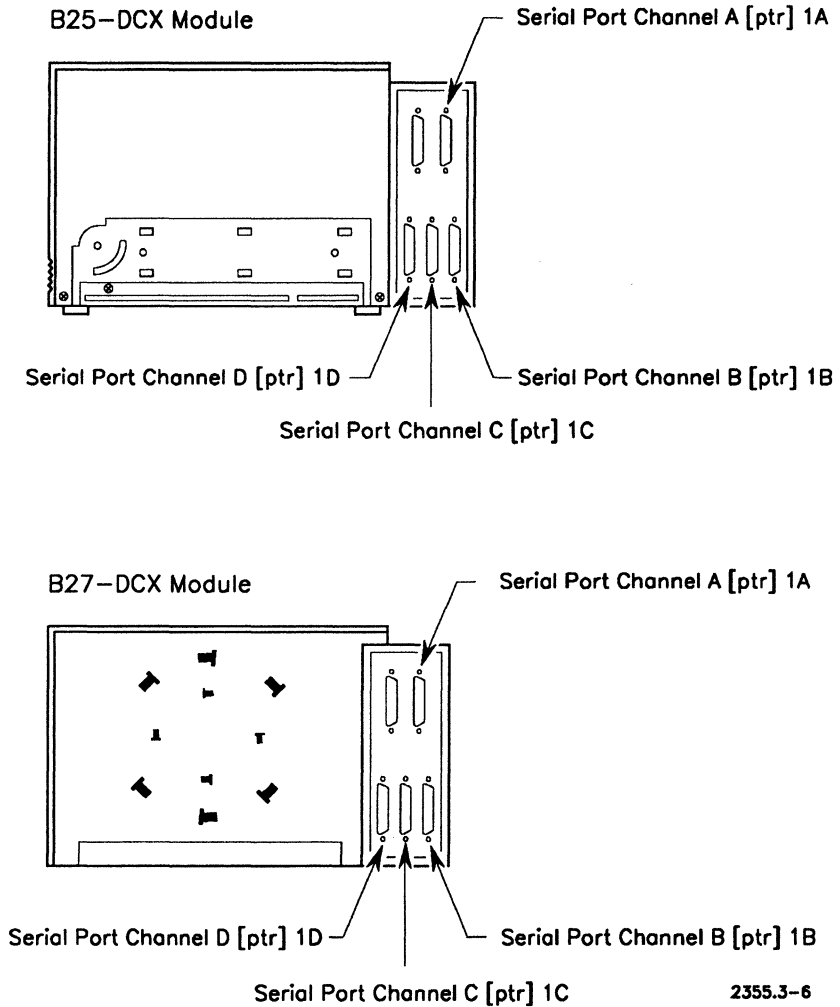
Figure 3-6. Four-Port Data Communications Expansion Modules

Low-Cost Workstation (LCW) Printer Ports

Figure 3-7 shows the printer ports for the CWS (diskless client workstation), B27-LCW, and B28-LCW.
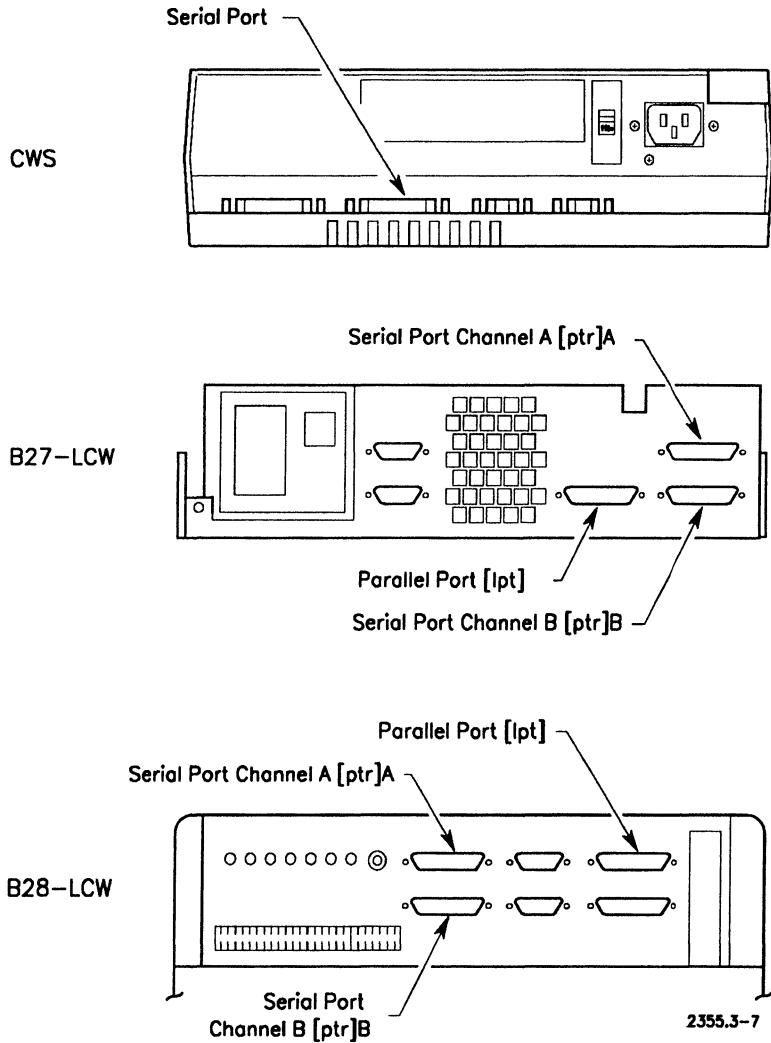
Figure 3-7. Low-Cost Workstation Printer Ports

Shared Resource Processor Printer Ports

Figures 3-8 to 3-10 show the location of the parallel and serial ports on the shared resource processor.

Terminal Processor (TP)

Cluster Processor (CP)
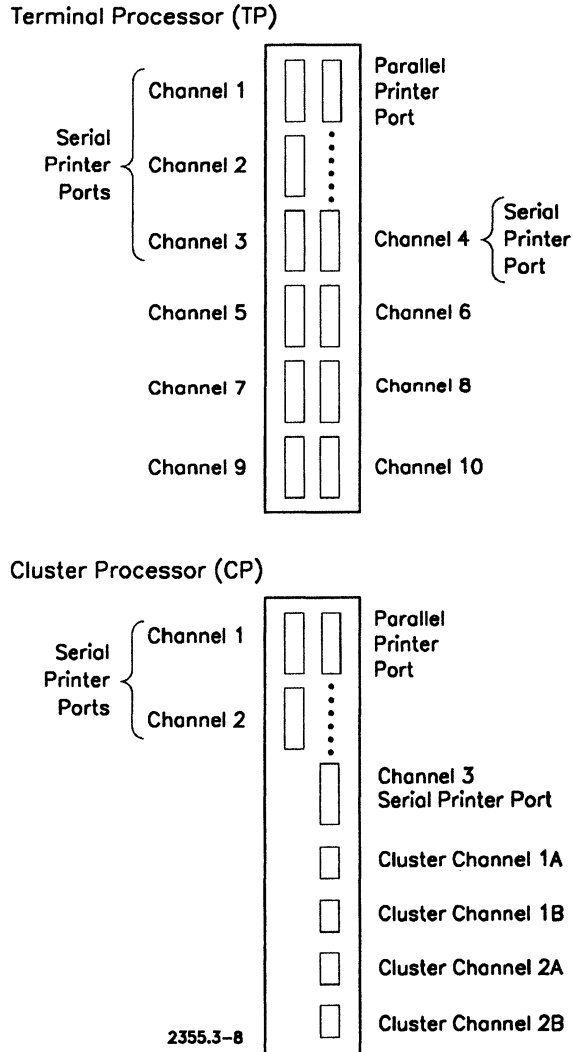
2355.3-8

Figure 3-8.   TP and CP Processor Printer Ports

General Processor (GP)

Empty Slot	Channel A ⎫
	⎬ Serial Printer Ports
	Channel B ⎭
	Parallel Printer Port
	Status Display LEDs
	Cluster Channel 1A
Empty Slot	Cluster Channel 1B
	Cluster Channel 2A
	Cluster Channel 2B
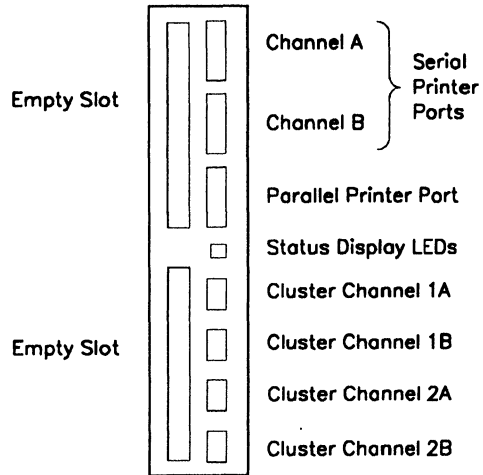
General Processor Communications Interface (GP/CI)

Communications Channel 3	Channel A ⎫
	⎬ Serial Printer Ports
Communications Channel 4	Channel B ⎭
Communications Channel 5	Parallel Printer Port
	Status Display LEDs
Communications Channel 6	Cluster Channel 1A
	Cluster Channel 1B
Communications Channel 7	Cluster Channel 2A
Communications Channel 8	Cluster Channel 2B
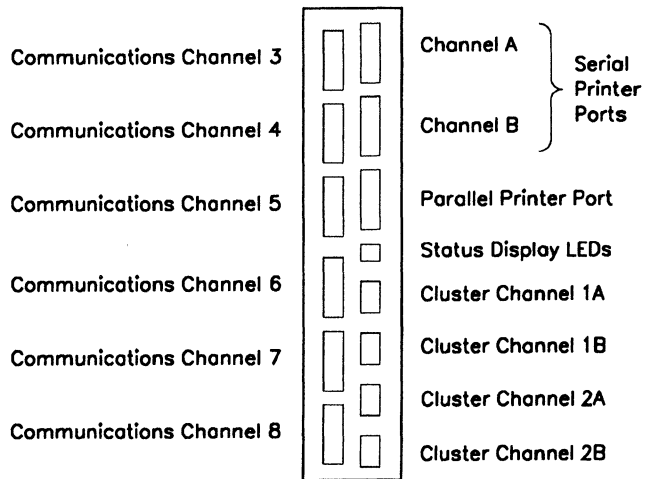
2355.3-9

Figure 3-9.   GP and GP/CI Processor Printer Ports

General Processor SCSI Interface (GP/SI)
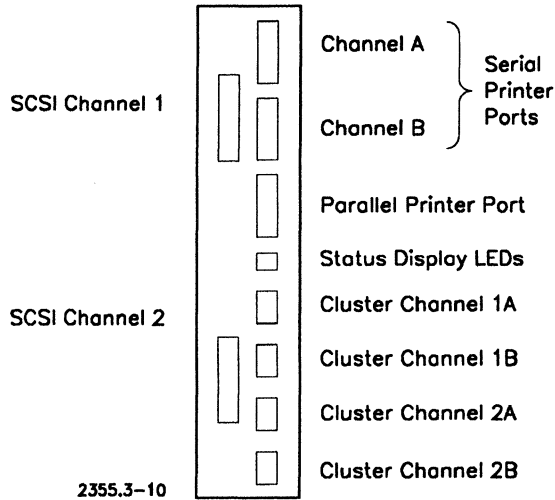
Figure 3-10. GP/SI Processor Printer Ports

SuperGen Series Workstation Printer Ports

Figures 3-11 through 3-13 show the location of the parallel and serial ports on the SuperGen Series 2000, 3000 and 5000, respectively.

Note that the serial ports on the Series 2000 and 3000 have 9-pin D connectors and should be used for asynchronous equipment only.
Note too that for the SuperGen Series 2000, the total baud rate for both ports is 19200. This means that port A and port B can each have a baud rate of 9600; or, one of the ports can have a baud rate of 19200. For the SuperGen Series 3000, the total baud rate for both ports is 9600. This means that port A and port B can each have a baud rate of 4800; or, one of the ports can have a baud rate of 9600.

For further information on the SuperGen Series workstations, see one of the following manuals: the *SuperGen Series 2000 Hardware Installation and Owner's Guide*, the *SuperGen Series 3000 Hardware Installation and Owner's Guide*, or the *SuperGen Series 5000 Hardware Installation and Owner's Guide*. For information on pin assignments and RS232 cabling, see the *CTOS Cluster and Network Hardware Installation Guide*.

FOR SERIAL DEVICES

Serial Port A [ptr]A

A

B

Serial Port B [ptr]B

FOR PARALLEL DEVICES

Parallel Port [lpt]
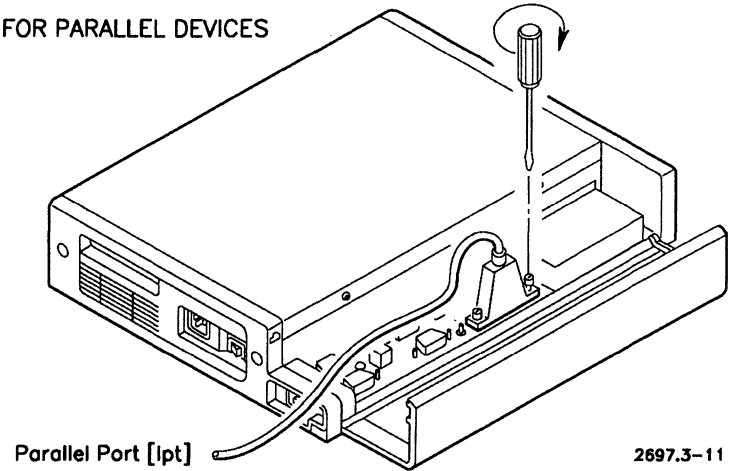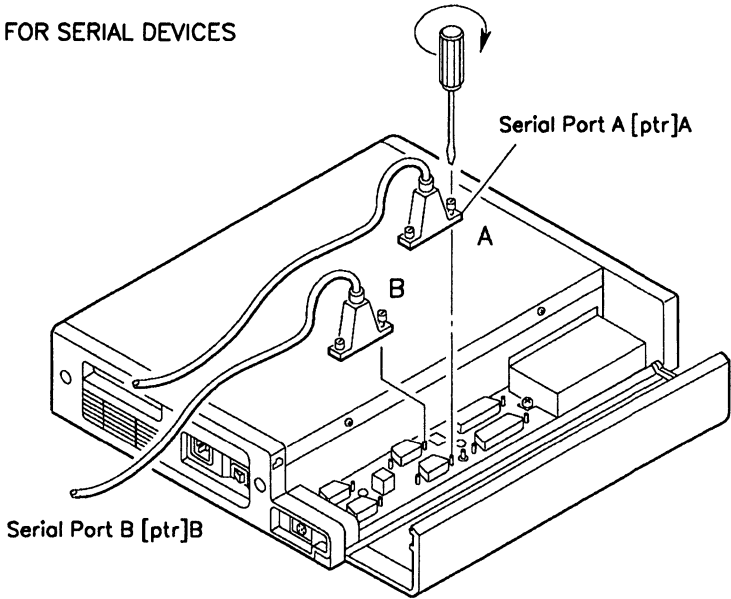
2697.3-11

Figure 3-11. SuperGen Series 2000 Workstation Printer Ports
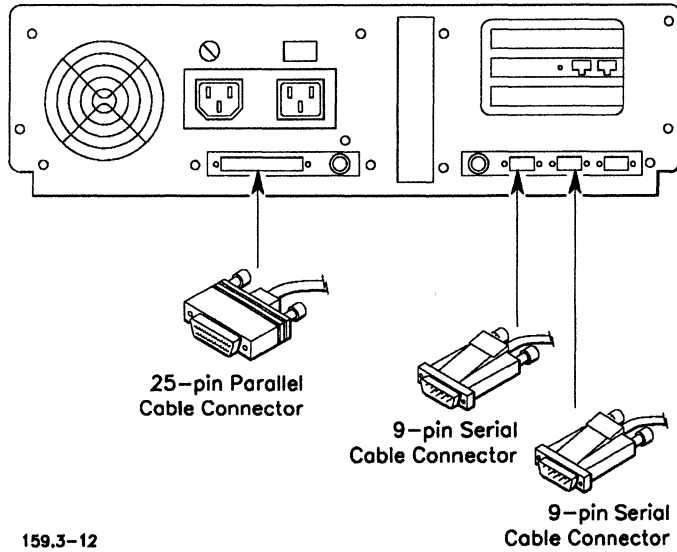
159.3-12

Figure 3-12.   SuperGen Series 3000 Workstation Printer Ports

Note that there are three serial ports on the Series 5000; one of these ports has a 9-pin D connector and should be used for asynchronous equipment only.

Serial Port C [ptr]C

Serial Port B [ptr]B

Serial Port A [ptr]A

Parallel Port [lpt]
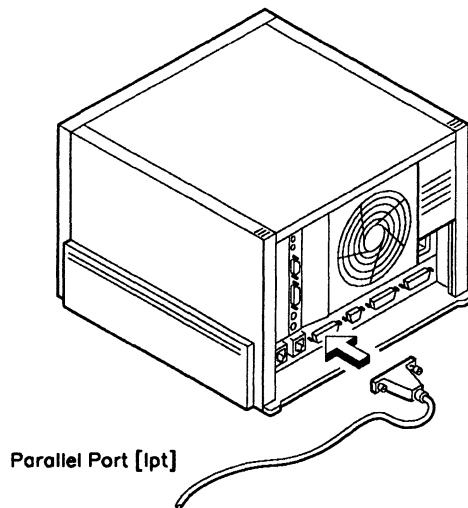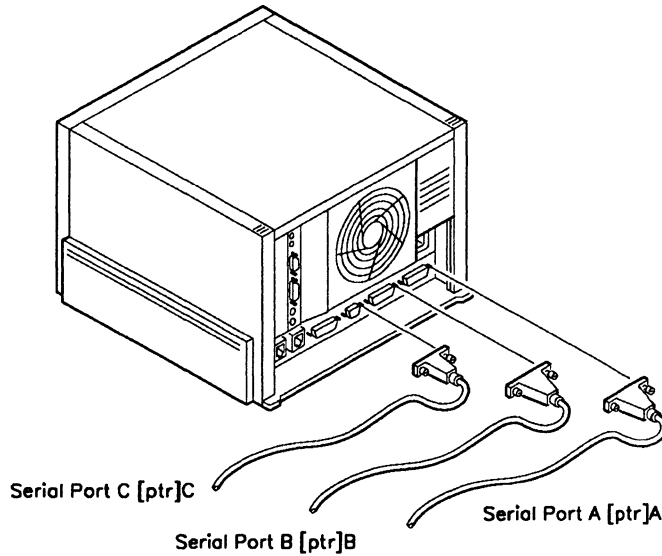
159.3-13

Figure 3-13. SuperGen Series 5000 Workstation Printer Ports

Cables

Sometimes the cable that comes with the device is not suitable. If this is the case, you can order the appropriate cable from your Unisys sales or marketing representative. Alternatively, you can use one of the four types of cables described in this subsection. These cables include

- Centronics-compatible printer cable

- Plotter connection cable

- Serial printer interface cable

- Serial cable for CTS/DTR communications

Note: *Since the way in which each type of device transmits and receives data varies, you may need to modify your cable to work with your device. Modifications for devices tested for use with GPS are described in Sections 8 through 10.*

Detailed information on the construction of cables can be found in the hardware reference manual for your processor module, for example, the *CTOS Workstations Installation Manual* and the *CTOS Cluster and Network Hardware Installation Guide.*

Centronics-Compatible Cable

The Centronics-compatible cable is generally used to connect devices to the parallel printer port [lpt]. This cable works with most parallel printers (see Figure 3-14).

For the SuperGen Series 3000 and 5000, the parallel cable pinouts are shown in Figure 3-15 and Figure 3-16.

Workstation		Printer	Assignment
1	————————➤	2	LPT0+
10	◄————————➤	20	GND
2	————————➤	3	LPT1+
10	◄————————➤	21	GND
3	————————➤	4	LPT2+
10	◄————————➤	22	GND
4	————————➤	5	LPT3+
11	◄————————➤	23	GND
5	————————➤	6	LPT4+
11	◄————————➤	24	GND
6	————————➤	7	LPT5+
11	◄————————➤	25	GND
7	————————➤	8	LPT6+
12	◄————————➤	26	GND
8	————————➤	9	LPT7+
12	◄————————➤	27	GND
14	————————➤	1	LPTSTROBE−
15	◄————————➤	19	GND
16	◄————————	10	LPTACK−
15	◄————————➤	28	GND
17	◄————————	11	LPTBUSY+
15	◄————————➤	29	GND
22	◄————————	13	LPTSELECT+
9	◄————————➤	14	GND
21	◄————————	12	LPTNOPAPER+
9	◄————————➤	16	GND
25	◄————————➤	17	CHASSIS GND (Shield)
12	◄————————➤	14	GND (Spare Conductor)
12	◄————————➤	14	GND (Spare Conductor)
9	◄————————➤	16	GND (Spare Conductor)
9	◄————————➤	16	GND (Spare Conductor)

159.3−14

Figure 3-14.   Centronics-Compatible Cable Pinouts (NGEN Type [LPT])

Workstation		Printer	Assignment
1	⟶	1	PSTB−
2	⟷	2	LPD0
3	⟷	3	LPD1
4	⟷	4	LPD2
5	⟷	5	LPD3
6	⟷	6	LPD4
7	⟷	7	LPD5
8	⟷	8	LPD6
9	⟷	9	LPD7
10	⟵	10	PACK−
11	⟵	11	PBUSY−
12	⟵	12	PPE
13	⟵	13	PSLCT
14	⟶	14	PAFD
15	⟵	15	PERR
16	⟶	16	PINIT−
17	⟶	17	PSLIN−
18	⟷	18	GND
19	⟷	19	GND
20	⟷	20	GND
21	⟷	21	GND
22	⟷	22	GND
23	⟷	23	GND
24	⟷	24	GND
25	⟷	25	GND
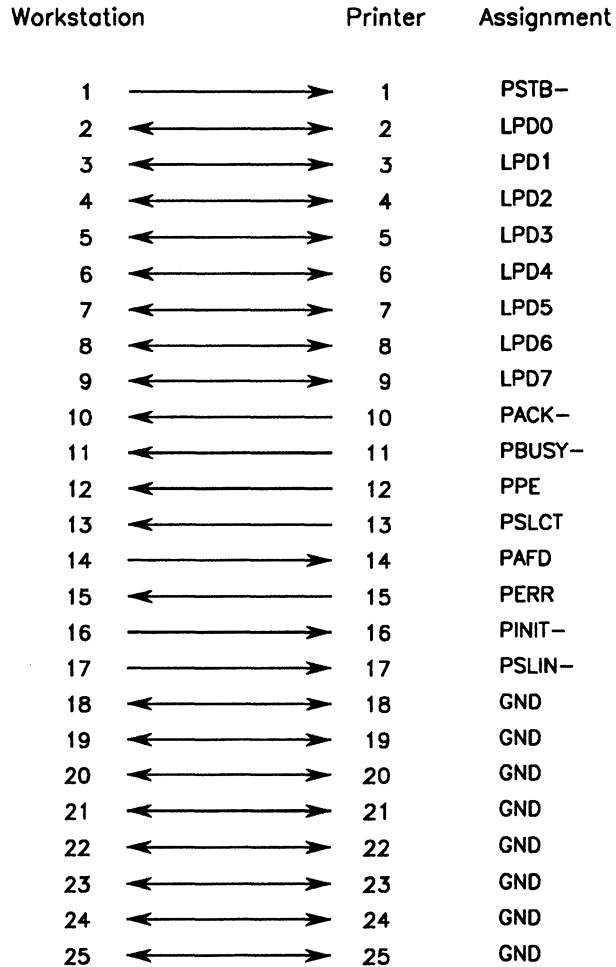
159.3−15

Figure 3-15. Centronics-Compatible Cable Pinouts for the SuperGen Series 3000 and 5000 Connection (PC Type [LPT])

Workstation		Printer	Assignment
1	⟶	1	Strobe (PSTB−)
2	⟶	2	Data Bit 0 (LPD0)
3	⟶	3	Data Bit 1 (LPD1)
4	⟶	4	Data Bit 2 (LPD2)
5	⟶	5	Data Bit 3 (LPD3)
6	⟶	6	Data Bit 4 (LPD4)
7	⟶	7	Data Bit 5 (LPD5)
8	⟶	8	Data Bit 6 (LPD6)
9	⟶	9	Data Bit 7 (LPD7)
10	⟵	10	Acknowledge (PACK−)
11	⟵	11	Busy (PBUSY−)
12	⟵	12	Paper End (PPE)
13	⟵	13	Select (PSLCT)
14	⟶	14	Auto Feed (PAFD−)
15	⟵	32	Error (PERR−)
16	⟶	31	Initialize Printer (PINIT−)
17	⟶	36	Select Input (PSLIN−)
18	⟵•⟶	19	Ground
	⟶	20	
19	⟵•⟶	21	Ground
	⟶	22	
20	⟵•⟶	23	Ground
	⟶	24	
21	⟵•⟶	25	Ground
	⟶	26	
22	⟵•⟶	27	Ground
	⟶	28	
23	⟵⟶	33	Ground
24	⟵⟶	29	Ground
25	⟵⟶	30	Ground
		17	To Shield

159.3−16

Figure 3-16. Parallel Cable Pinouts for the SuperGen Series 3000 and 5000 Connection (PC Type [LPT])

Plotter Connection Cable

The plotter connection cable is generally used to connect plotters or devices that will not be using any hardware protocol to a serial I/O port. If you're using a plotter connection cable, specify either *XON/XOFF* or *None* in the *Line Control Mode* field of the Print Manager *Device Installation* form.

The plotter connection cable is a type of crossed RS-232-C cable (see Figure 3-17).

For information on the plotters you can use, see the release documentation for the graphics package you are using.

Assignment	Workstation		Printer	Assignment
Protective Ground (Shield)	1	←——————→	1	Protective Ground (Shield)
Transmit Data	2	——————→	3	Receive Data
Receive Data	3	←——————	2	Transmit Data
Request to Send	4		4	Request to Send
Clear to Send	5		5	Clear to Send
Signal Ground	7	←——————→	7	Signal Ground
Data Set Ready	6		6	Data Set Ready
Carrier Detect	8		8	Carrier Detect
Data Terminal Ready	20		20	Data Terminal Ready

159.3-17

Figure 3-17. Plotter Cable Pinouts

Serial Printer Interface Cables

The serial printer interface cable is generally used to connect devices to a serial I/O port.

The cable shown in Figure 3-18 is a type of crossed RS-232-C cable that is for 25-pin connector ports. It works with most serial printers using the XON/XOFF protocol. It also supports standard CTS/RTS protocol.

Note: *The 3-wire XON/XOFF cables are unsupported in order to provide support for printer status information to GPS device drivers.*

Assignment	Workstation		Printer	Assignment
Protective Ground (Shield)	1	←————————→	1	Protective Ground (Shield)
Transmit Data	2	————————→	3	Receive Data
Receive Data	3	←————————	2	Transmit Data
Request to Send	4	←————————	5	Clear to Send
Clear to Send	5	————————→	4	Request to Send
Signal Ground	7	←————————→	7	Signal Ground
Data Set Ready	6	←——┐ ┌——→	6	Data Set Ready
Carrier Detect	8	←——•—•——→	8	Carrier Detect
Data Terminal Ready	20	——┘ └——	20	Data Terminal Ready

159.3–18

Figure 3-18.   Serial Printer Interface Cable Pinouts for 25-Pin Connections

The cable pinouts shown in Figure 3-19 are for 9-pin connector ports. Use these pinouts to connect printers to SuperGen Series 2000 work-stations.

Assignment	Workstation (9 Pin DCE)	Serial Printer (25 Pin DTE)	Assignment
RLSD	1	1	GND
RXD	2	2	TXD
TXD	3	3	RXD
DTR	4	6	DSR
		8	CD
GND	5	7	GND
DSR	6	20	DTR
RTS	7	5	CTS
CTS	8	4	RTS
RI	9		
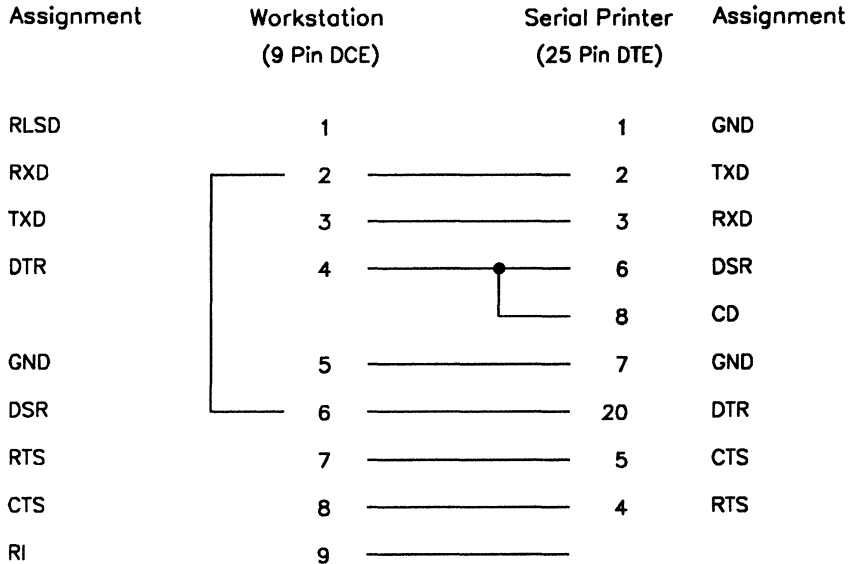
159.3–19

Figure 3-19.   Serial Printer Interface Cable Pinouts for 9-Pin Connections (PC Type)

Serial Cable for CTS/DTR Communications

The serial cable for CTS/DTR communications is used if you want to use CTS protocol with a device using DTR protocol.

The RS-232-C wires for RCV and XMIT and for DTR and CTS must be crossed. This is sometimes described as "null-modem" cable. A "straight cable," such as that used between a workstation (DTE) and a modem (DCE), will not work because the signals are not symmetrically crossed. For CTS line control to work correctly with a device using DTR, the cable should be a CTS/DTR cable.

Note that if the documentation supplied by the manufacturer indicates that the device supports DTR communications, specify *CTS* or *Both* in the *Line Control Mode* field of the Print Manager *Device Installation* form.

The serial cable for CTS/DTR communications is shown in Figure 3-20.

Assignment	Workstation		Printer	Assignment
Protective Ground (Shield)	1	←——————→	1	Protective Ground (Shield)
Transmit Data	2	——————→	3	Receive Data
Receive Data	3	←——————	2	Transmit Data
Signal Ground	7	←——————→	7	Signal Ground
Clear to Send	5	——————→	20	Data Terminal Ready
		——→	8	Carrier Detect
		——→	6	Data Set Ready
Data Set Ready	6	←——————	5	Clear to Send
Carrier Detect	8	←		
Data Terminal Ready	20	←		
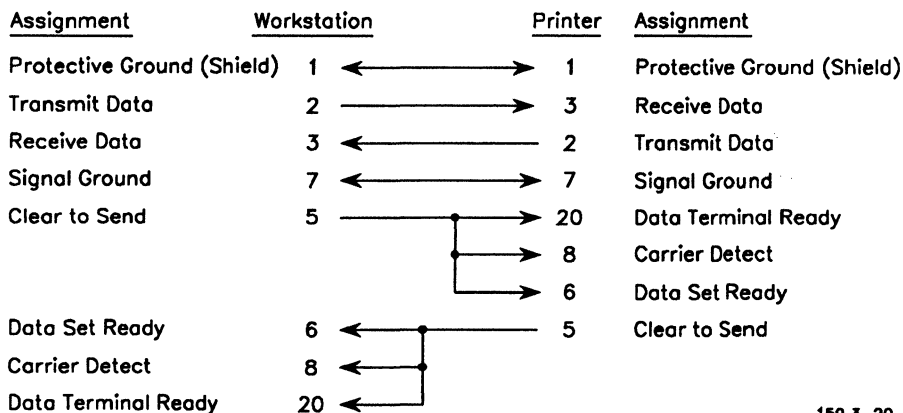
159.3–20

Figure 3-20. Serial Cable Pinouts for CTS/DTR Communications

Section 4
Installing GPS System Services

This section provides detailed instructions for installing GPS system services within a clustered environment. In general, GPS is used in the same way whether it is running on a standalone workstation or on a workstation within a cluster.

If you've already installed GPS and just want a brief summary of how the system services are installed, see "Placement of GPS System Services," later in this section.

Note: *If you make a mistake during the installation process or find that your new GPS installation isn't functioning properly, you may have to start the installation over again. For details on how to do this, see "Starting a New Installation Over Again," later in this section. For complete troubleshooting information, see Section 11, "Troubleshooting."*

In this section, step-by-step procedures are given for

- Installing GPS on a workstation (This includes a server, client workstation, or diskless client workstation.)

- Installing GPS on a shared resource processor used as a server

- Installing the Screen Font Services and the Scaling Font Service for high-resolution monitors

- Installing GPS with nonqualified GPS devices

This section also explains how to do the following:

- Obtain administrative privileges so that the Print Manager's administrative commands work from your workstation

- Assign a default device

- Start your installation over again if you have any problems

- Deinstall and reinstall GPS system services

- Change the configuration for a device that is already installed
- Rename a device
- Append a new DevHelp list of device types
- Reorganize and add to and delete from the DevHelp list of device types
- Modify options in the *Device Setup* field of the *Device Installation* form
- Install additional devices
- Delete device names from the Print Manager screen
- Customize device access so that several users can use the same workstation
- Configure equivalent devices to share the same queue

Before You Begin

Before you use the Print Manager to install GPS system services, you should make sure the correct software has been installed on the server, as outlined below. Also, you should check the placement of GPS system services with the cluster, which is described in "Placement of GPS System Services," later in this section.

Preparing for Installation

Install the following software at the server:

- Standard Software at the revision level noted in the release documentation for GPS. (If you're installing GPS on a server or standalone workstation, be sure you've installed the Queue Manager files. These files are on the Master Utilities Diskette.)

- GPS 2.6 or later.

Note: *Users with a WYSIWYG display or a high-resolution VGA display using applications such as OFIS Document Designer can install the Screen Font Database or Scaling Font Service. (With the Scaling Font Service, you can obtain a wider selection of fonts and point sizes.) For more installation information, see "Installing the Font Service for Your WYSIWYG Display," or "Installing the Scaling Font Service for Your WYSIWYG Display," later in this section.*

Remember, the installation process involves two steps:

1. Installing GPS 2.6 software

    When you perform this installation, you're copying the new GPS distribution files onto a hard disk. This is sometimes known as *distribution installation* and is explained in detail in the release information for GPS.sys.

2. Installing GPS system services

    When you perform this installation, you're loading GPS system services from the hard disk into workstation memory. This is sometimes known as *system service installation*.

    You can install GPS system services using the Print Manager installation commands or the Executive Install Generic Print System command.

In this guide, *GPS installation* refers to system service installation, unless noted otherwise. For more information about GPS system services, see Section 2, "How GPS Works."

Note: *The Context Manager cannot be running when you install GPS system services. Sign on with the user name* **GPS** *or some other user name that does not automatically install the Context Manager.*

Placement of GPS System Services

GPS systems services are installed within a cluster as follows:

• The *Font Service* should be installed at the server and optionally at each client workstation that has a device attached to it. Performance is improved when the Font Service is installed at the client workstation. (The Font Service can also be installed on a non-GPS local file system to obtain faster access to fonts.)

• The *Queue Manager* must be installed on the server of each cluster where spooled devices are installed or on any standalone workstation where you want to have spooled printing.

• The *Print Service* must be installed at the server and at each workstation that has a printing device attached to it.

• The appropriate *device driver* must be installed for each device at the workstation where the device is attached.

Note: *All GPS system services required for the device are automatically installed (with default parameters) when you install the device driver. If you want to install system services with nondefault parameters, you must install each one individually before installing the device driver.*

Figures 4-1 and 4-2 show four possible configurations for your printing system in clustered or networked systems.

For an example illustrating network printing between heterogeneous networks, see Figure 5-1 in Section 5, "Installing Network Printing Gateway Services."

Note that you can use GPS with BNet Cluster, a product that is included with BNet II 3.0 (see Example D, below). BNet Cluster permits BNet access and services at a client workstation, which becomes a distinct node on the network. Even though the client workstation is its own node, it is not a server system and doesn't manage the cluster's resources. Because of this, GPS network printing must not be configured using Print Manager's Setup function for the client workstation node. Instead, BNet should be set up to "hop" to the server node to obtain a list of available network printers.

Example A: Spooled Printer Attached to the Server or SRP.
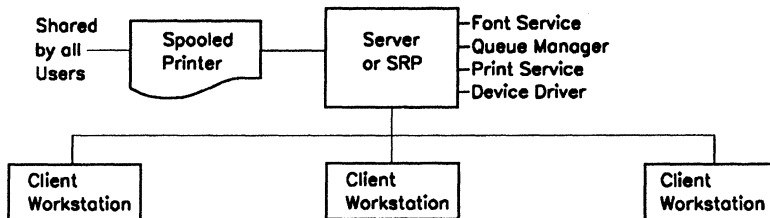
Example B: Shared Printers Attached to Client Workstations.
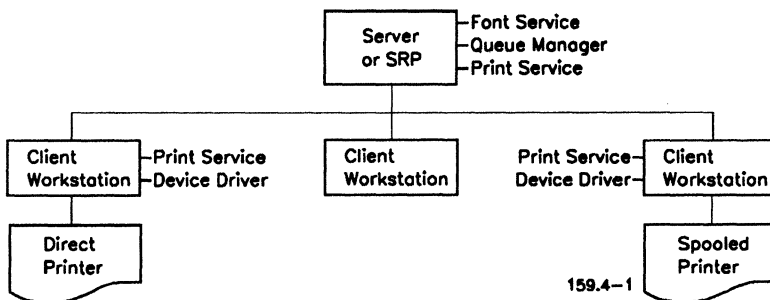
Figure 4-1. Examples of a GPS Configurations Within a Cluster

Example C: Network Printing.
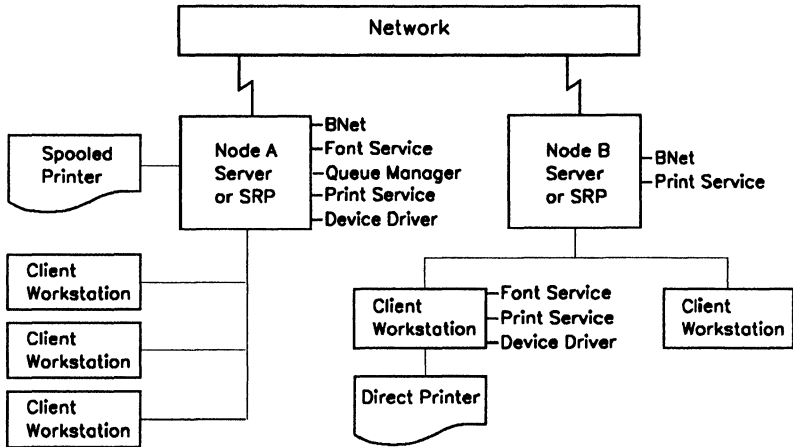
Example D: Network Printing With BNet Cluster.
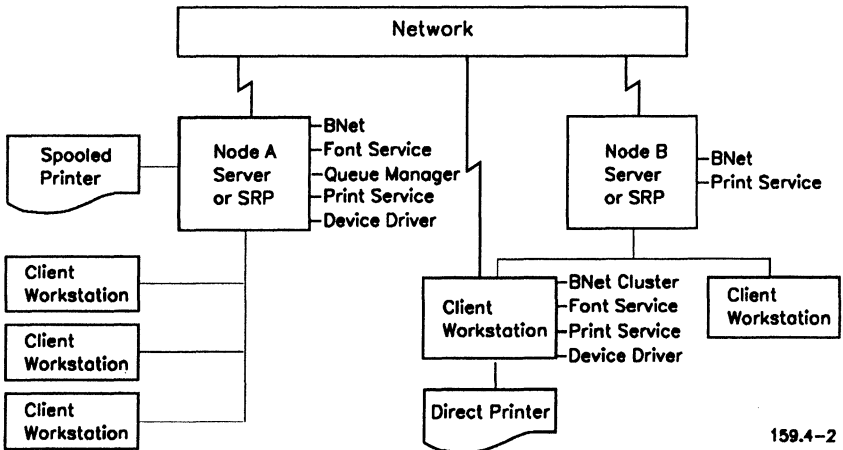
Figure 4-2.   Examples of a GPS Configuration In a Network

Note: *If one of the users at Node A is going to print to a printer attached*
to Node B, the Font Database at each node must be compatible.

Steps for Installing GPS System Services

The procedure below contains detailed steps and is useful if you're installing GPS for the first time. Steps are also provided for checking your installation and adding GPS to your *SysInit.jcl* file.

If you've previously installed GPS but have forgotten parts of the procedure, refer to "Placement of GPS System Services," earlier in this section. (All parameters on the system service forms are explained in the tables later in this section.)

Procedure

The steps below show you how to install GPS for direct or spooled printing.

To install GPS at your workstation,

1. Type **GPS** as the signon name, and press **GO**.

2. When the Executive command line is displayed, type **Print Manager** (or a unique abbreviation, such as **pr man**); then, choose one of the following:

   a. Press **GO**.

      The Home display appears, which shows the status of all devices on your cluster. (For information on adding printers installed at other nodes, see "Accessing Other Devices in the Network," in Section 3.)

   b. Press **RETURN**.

      The Executive command form is displayed. In the *[Max number of printers]* field, enter the maximum number of printers you plan to monitor. The minimum value you can enter is *19*; and depending on the amount of memory you have, the maximum is *200*. If you do not enter a number, either the default is displayed (19 printers) or whatever number was previously specified. (Printers will be listed on the Print Manager Home display, which you can page through by pressing **NEXT PAGE** or **PREV PAGE**.)

3. Press **GO**.

   The Home display appears, which shows the status of all devices on your cluster.

4. Press **F9** (Admin).

   The Admin display appears, which gives status information for the Font Service, Queue Manager, Print Service, and locally installed devices. If a device is attached and is not listed, press **F2** (Update).

```
Print Manager                     Admin                         User: GPS
InstallerFile: [Sys]<Gps>GPS.Printers                  Wed Jan 23, 1991 8:30 AM
───────────────────────────────────────────────────────────────────────────────

  Service ──────── Device Name ──── Location ──────────── Status ──────
  Font Service                                            not installed
  Queue Manager                                           not installed
  Print Service                                           not installed
  Device Driver





  ┌───────┬────────┬────────┬─────────┬─────────┬─────────┬──────┬─────────┐
  │ Print │ Update │ Status │ Install │ De-Inst.│  Server │ Poll │  Home   │
  └───────┴────────┴────────┴─────────┴─────────┴─────────┴──────┴─────────┘
```

2355.4-a

5. Install the Font Service (as described below) if you are using an application that takes advantage of fonts, such as OFIS Document Designer. The Font Service should be installed at the server and optionally at each client workstation that has a device attached to it.

   Alternatively, you can install the Scaling Font Service, which provides additional capabilities. (Note that you cannot install the Scaling Font Service from the Print Manager. For installation information, see "Installing the Scaling Font Service for Your WYSIWYG Display," later in this section.)

To install the Font Service,

   a. From the Admin display, use the arrow keys or press **NEXT** to select *Font Service*. Press **F4** (Install) to display the *Font Service* form, as shown below, with the defaults specified. Note that you can replace the default name with a customized runtime font database created with the Font Tool.

   For an explanation of the *Font Service Form* fields, see Table 4-2, at the end of this section.

   Install Font Service
       [Font Database]   [Sys]<Gps>Font.dbs
       [Bytes of Buffer Space] 8192

   For screen (raster) fonts, change the entry to *[Sys]<Gps>ScreenFont.dbs* (or to whatever the file name is of the runtime screen font database).

   Note that if you use a large number of fonts, performance may be improved by increasing the value in the *Bytes of Buffer Space* field.

   b. Press **GO** to accept the defaults. Otherwise, change the defaults; then press **GO**.

   The Admin display appears and indicates that the Font Service has been installed.

6. Install the Queue Manager if you want to set up the device for spooled printing. Remember, the Queue Manager can only be installed on a server or standalone workstation. Also, you should install the Queue Manager before you install the Print Service or any device driver.

To install the Queue Manager,

a. Use the arrow keys or **NEXT** or select *Queue Manager*. Press
    F4 (Install) to display the *Queue Manager* form, as shown
    below, with the defaults specified.

    For an explanation of the *Queue Manager Form* fields, see Table
    4-4, at the end of this section.

    The maximum number of dynamic queues can only be set at
    installation. There should be one dynamic queue for each
    spooled GPS device, plus one dynamic queue for each entry
    listed in the *Queue.index* file. Add more dynamic queues if
    more printers are to be installed. Note that you may need
    dynamic queues for other applications besides GPS.

    Install Queue Manager
       [Use cache?]   No, Yes
       [Maximum number of dynamic queues]   20

b. Press **GO** to accept the defaults. (The defaults are highlighted.)
    Otherwise, make the necessary changes, and then press **GO**.

    The Admin display appears and indicates that the Queue
    Manager has been installed on the server.

7. Install the Print Service. Each workstation that has a device
    attached must have the Print Service installed. If you want client
    workstations to share a device, the Print Service must also be
    installed at the server. For network printing, the Print Service
    should be installed at the server at each node. (For an explanation of
    the *Print Service Form* fields, see Table 4-5, at the end of this
    section.)

    To install the Print Service:

    a. From the Admin display, use the arrow keys or press **NEXT** to
        select *Print Service*. Press **F4** (Install) to display the *Print
        Service* form, as shown below. (The default options are
        underlined.)

b. In the first field of the form (*[Number of devices attached locally]*), specify the number of printing devices you expect to install at this workstation. (Whenever possible, spooling is done at the server for all spooled devices in the cluster.)

c. At the server only, the next field is *[Total number of devices monitored]*. Enter the maximum number of printing devices throughout the entire network that will be used by everyone on the cluster. This field does not appear if you are installing the Print Service on a client workstation.

d. If you are at a client workstation: In the *[Number of simultaneous spool jobs]* field, the value you enter should be *1* spool job per printer or the number you specified in the *[Number of devices attached locally]* field. If you receive error code 400, reduce the value in the *[Number of simultaneous spool jobs]* field. Enter a larger value only when you anticipate that several jobs will be submitted simultaneously.

If you are at a server: Since most spooling is now done at the server, the *[Number of simultaneous spool jobs]* field on the server system should be large enough to accommodate all users on the cluster. Enter a value equal to the total number of print jobs spooled simultaneously. If you receive error code 400, decrease this value.

e. The fields *[Increase stack size by]* and *[Increase heap size by]* should not have to be changed. If, however, you receive error code 4531, you will need to increase the stack size in the *[Increase stack size by]* field. An increase of 100 bytes should be sufficient. If you receive error code 4533, you will need to increase the stack size in the *[Increase heap size by]* field. An increase of 2000 bytes should be sufficient.

f. In the *[Old Spooler commands]* field, specify *Control*, instead of *None*, if you have old spooler (pre-GPS) applications that need to use the control queues to halt and restart devices. (*Control* or *Status* will affect the performance of printer status updates since device polling takes place through the control queues.)

Note that a *None* entry *does not* prevent GPS from printing, controlling, or monitoring jobs submitted by old applications through spooler bytestreams. *None* uses fewer Queue Manager resources: one dynamic queue for each device. (When *None* is specified, GPS uses requests, which are routed between the Print Services and device drivers directly.)

(For a further explanation of the *Print Service Form* fields, see Table 4-5, at the end of this section.)

Maximum Device Allocation:
 [Number of devices attached locally] 3_____
 [Total number of devices monitored] 48_____
Maximum Spooling Allocation:
 [Number of simultaneous spool jobs] 10_____
Context Memory Allocation:
 [Increase stack size by]   0_____
 [Increase heap size by]   0_____
Pre-GPS Device Control and/or Status:
 [Old Spooler commands] Control,
 Status, None   None_____
 Polling Frequency (time in seconds)
  [Network]60   [Local]3

g. Press **GO**.

The Admin display appears and indicates that the Print Service has been installed.

8. Install the device driver at each workstation where a device is attached.

To install the device driver,

a. Use the arrow keys or **NEXT** to select *Device Driver*. Press **F4** (Install) to display the *Device Installation* form. Certain defaults are already specified, which may or may not be correct for you. If you have a device installed already, the *Device Installation* form shows the device name and queue name for that device, as well as the parameters that were used to install it.

b.   Press **F4** (DevHelp). (For additional information on DevHelp, see "The DevHelp List of Device Types," later in this section.)

A list of devices that are available for use with GPS is displayed.

c.   Use the arrow keys or **NEXT** to select the desired device, and press **GO**.

Depending on the device you selected, either the *Device Installation* form is shown again or a display showing optional device setup parameters appears.

If the *Device Installation* form is shown, go to step d.

The display showing optional device setup parameters indicates options you can specify in the *Device Setup* field, such as resolution settings and/or sheet feeder types. The default options are underlined. To choose a different option, press an arrow key to highlight the option; then, press **MARK** to select it. To deselect it, press **MARK** again. Be sure to choose only one resolution and/or sheet feeder option. When conflicting options are chosen (for example, resolution:150 resolution:300), the first one is used in the installation.

Press **GO**, and continue on to step d.

d.   The *Device Installation* form is displayed, and all the default parameters are automatically entered for the selected device. If the device name and queue name for the previously installed device are still shown, delete them (press **CODE-DELETE**).

For a detailed explanation of the *Device Installation Form* fields, see Table 4-6, at the end of this section.

A sample *Device Installation* form is shown in Figure 4-3. This example shows how the form would look if you were installing a Diablo 630 API-2 printer.

e.   Type the name you want to use for the device in the *Device Name* field.

Press **RETURN** or **NEXT** to move from one field to another; use **UP ARROW** to move up.

f. Type a queue name in the *Queue Name* field if you want to set up the device for spooled printing. To simplify system administration, it's a good idea to use the same name for the queue that you assigned as the device name. If you leave this field blank, the device is installed for direct printing.

g. Either type in the location of the device in the *Location* field or leave this field blank. If you type in a location, you can use any descriptive name, such as *Gloria's office* or *printer room*.

```
Print Manager                          InstDD                            User: GPS
InstallerFile: [Sys]<Gps>GPS.Printers                      Wed Jan 23, 1991 8:05 AM

  Device Name [          ]              Queue Name  [          ]
  Driver Run File [                                                        ]
  Port ([ptr]xx[lpt]xx)  [[ptr] b]      Location  [ Office            ]
  Font Device Type        [          ]  Banner Pages  [ No, Yes ]
  Transmit Time Out  [  60  ]           Printing Process Priority [ 133 ]
  Normal Print Job Parameters: [     ]  Expand Tab Size   [  8  ]
  New Line Map Mode: [ Lf, Cr, CrLf ]   Chars Per Line    [ 85 ]
  [ptr]xxParameters
  Baud Rate  [ 1200 ]   Line Control Mode  [ None, XonXoff, CTS, Both ]
  Data Bits   [  7  ]   Stop Bits [ 1 ]   Parity:  [ None, Even, Odd, 1, 0 ]

  Device Setup
  [                                                                        ]
  Default Page Dimensions (inches)
  Length   [  11.0  ]      Top Border    [          ]   Left Border  [     ]
  Width    [  8.5   ]      Bottom Border [          ]   Right Border [     ]
  Storage Allocation (1K units)
  Font/Graphics Work Area  [ 4 ]        Output Buffer  [ 0 ]

  [    ] [    ] [    ] [DevHelp] [DevSave] [    ] [    ]  [    ] [Admin] [Home]
```

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Figure 4-3. Example of a Device Installation Form

     h.   Be sure that the fields are filled in correctly; change the defaults if necessary. Pay particular attention to the port fields, because many devices have both serial and parallel options.

         If you're installing a device for serial printing, the entries in the fields for baud rate, parity, and data bits must match the hardware settings on the device. (For switch setting information, See Sections 8 through 10.) The port you used to attach the device must match the entry in the *Port* field. For example, if you attached the device to [ptr]A, make sure *[ptr]A* is indicated in the *Port* field.

         If you're installing a device on a shared resource processor, be sure to specify in the *Board ID* field the processor board on which you're performing the installation. Valid entries are FP*xx*, CP*xx*, DP*xx*, SP*xx*, TP*xx*, GP*xx*, where *xx* indicates the board's position in the cabinet when viewing a shared resource processor from the back. For example, the first File Processor is identified as FP00, while the second and third ones are FP01, FP02, and so on.

         Note that you must be running the Print Manager on the same board the device is on.

9.   When you complete the form, press **GO**.

Note: *If you want to change any of the fields in the* Device Installation *form after you press* **GO**, *you'll have to first deinstall the device driver (select the device whose parameters you want to modify, press* **F5** *[De-Inst] and* **GO***); then, you'll have to install the device driver again, as described in step 8, above. For more information, see "Changing the Configuration for an Already Installed Device," later in this section.*

The following system services are now installed on your workstation:

- The Font Service, if one is not already installed

- The Queue Manager, which is installed at the server if you specified spooled printing

- The Print Service, if one is not already installed

- A device driver for the device you selected

To reconfigure a particular system service, deinstall it; then, modify its parameters and reinstall it separately as follows:

a. Use the arrow keys or press **NEXT** to select to the desired system service(s).

b. Press **F4** (Install) and fill in the form that is displayed.

c. Press **GO**.

10. If you are attaching more than one device to this workstation, repeat steps 8 and 9.

11. Press **FINISH** to exit the Print Manager.

Checking Your Installation

To check your installation,

1. From either the Home or Admin display, mark the name of your newly installed device.

2. Press **F1** (Print) and type the name of one of your files in the *File list* field. For example, type **[Sys]<Sys>.user**

3. Press **GO**.

    Check the printed document. If you have any problems or need to start your installation over again, see Section 11, "Troubleshooting," or see "Starting a New Installation Over Again," later in this section.

4. Press **FINISH** to exit the Print Manager.

Adding GPS to Your SysInit.jcl File

To ensure that GPS will be reinstalled whenever you reboot from your workstation, you need to add GPS to your *SysInit.jcl* file, as follows:

1. Type **Editor** on the Executive command line, and press **RETURN**.

2. Type **[Sys]<Sys>SysInit.jcl** in the *File name(s)* field, and press **GO**.

3. Add the following entry to your *SysInit.jcl* file:

    $Run [Sys]<Gps>GpsInstall.run

    If you're creating a new *SysInit.jcl* file, type the following:

    $Job Sysinit
    $Run [Sys]<Gps>GpsInstall.run
    $End

4. Press **FINISH**; then press **GO**.

For more information on the *SysInit.jcl* file, see the *CTOS System Administration Guide*.

The next time you reboot, GPS will automatically be installed with the parameters you specified.

If you want to obtain Print Manager administrative privileges by using a signon name other than **GPS**, or if you want to assign a default device, see "The Final Steps of Your Installation," later in this section.

Installing the Font Service for Your WYSIWYG Display

Users with a WYSIWYG or VGA high-resolution display who don't have devices connected to their client workstation but have local file systems can install screen font services by adding a line to their *SysInit.jcl* file. (Note that the Scaling Font Service also provides screen fonts, as explained in the next subsection, "Installing the Scaling Font Service for Your WYSIWYG Display.")

To install screen font services automatically whenever you reboot your system,

1. Install the Screen Font Database software. (See your Screen Font Database Release Notice.)

2. Edit the *[Sys]<Sys>SysInit.jcl* file, and make the following entry:

   $Run [Sys]<Sys>FontService.run,[Sys]<Gps>ScreenFont.dbs,8192

Alternatively, you can install screen font services through the Print Manager, as follows:

1. Install the Screen Font Database software.

2. From the Print Manager Admin display, use the arrow keys or **NEXT** to select *Font Service*. Then press **F4** (Install) to display the *Font Service* form, as shown below.

   ```
   Install Font Service
       [Font Database]              [Sys]<Gps>ScreenFont.dbs
       [Bytes of Buffer Space]      8192
   ```

3. Change the default entry in the *[Font Database]* field by typing in **[Sys]<Gps>ScreenFont.dbs**. If necessary, change the default in the *[Bytes of Buffer Space]* field to a higher value (this may improve performance). (For an explanation of the fields in the *Font Service* form, see Table 4-2, later in this section.)

4. Press **GO**.

Installing the Scaling Font Service for Your WYSIWYG Display

Users with a WYSIWYG or high-resolution VGA display can obtain a wider selection of fonts and point sizes by using the Scaling Font Service. Note that the Scaling Font Service is used in place of the standard Font Service. This means that only one of the two services can be installed on the same system.

To install the Scaling Font Service automatically whenever you reboot your system,

1. Install the Scaling Font Service software. (See the release documentation for the Scaling Font Service for installation information.)

   Before going on to the next step, make sure the Font Service is *not* installed. If the Font Service is installed, use the Deinstall Font Service command to remove it.

2. Edit the *[Sys]<Sys>SysInit.jcl* file, and make the following entry:

   $Run [Sys]<Sys>ScalingFontService.run

   Also, delete or comment out any lines that indicate the Font Service is to be run. For example, delete the following:

   $Run [Sys]<Sys>FontService.run

   or

   $Run [Sys]<Sys>FontService.run,[Sys]<Gps>ScreenFont.dbs,15000

Alternatively, you can install the Scaling Font Service by using the Executive installation command shown below.

1. Type **Install Scaling Font Service** on the Executive command line.

2. Press **RETURN**.

    The following form is displayed:

    Install Scaling Font Service
        [Font Database ([Sys]<gps>ScalingFont.dbs)]   _____
        [Bytes of Buffer Space (8192)]   _____
        [# of outline cache blocks @64K RAM (1)]   _____
        [# of scaled metrics to cache @1K disk (200)]   _____
        [Cache file [Sys]<Gps>ScalingFont.metrics)]   _____
        [Outline directory ([Sys]<SFS>)]   _____

3. If necessary, change the default entries. For an explanation of the fields in the *Scaling Font Service* form, see Table 4-3, later in this section.

4. Press **GO**.

Installing GPS On a Diskless Client Workstation

This subsection applies to diskless client workstations that have devices attached. It shows you how to set up distinct JCL files so that each diskless client workstation can install different GPS system services when the workstations are booted.

If each workstation is installing the same GPS system services, or if you're using diskless client workstations that do not have devices attached, it is not necessary to have different JCL files. In these cases, you only need to follow the procedures for adding a workstation prefix and installing GPS system services. You can boot in the standard way, without using the main boot menu.

Procedure

The procedure for installing GPS on a diskless client workstation is divided into six parts, as follows:

1. Adding a workstation prefix

2. Installing GPS system services

3. Referencing a system image file

4. Installing GPS on multiple diskless client workstations

5. Creating a JCL file

6. Booting the workstation

Note: *For detailed information about setting up system image files and JCL files for diskless workstations, see the* CTOS System Administration Guide.

Adding a Workstation Prefix

Client workstations with no disk storage share the same GPS directory at the server workstation. Because of this, you need to assign a set of characters that can be used to uniquely identify each client workstation. GPS uses a *workstation prefix* for this purpose. The workstation prefix identifies a unique *Gps.printers* file. This file contains both configuration information for GPS system services to be installed at that workstation and defines the devices that are initially displayed on the Print Manager screen for that user.

The workstation prefix is identified in each user's user configuration file.

Note: *If you have several printers, you must have a unique workstation prefix for each printer; and when you sign on to a specific workstation, your user configuration file must contain the workstation prefix for that workstation only.*

To add a workstation prefix,

1. Edit or create the user configuration file, as follows:

    a. Type **Editor** on the Executive command line, and press **RETURN**.

    b. Type **[Sys]<Sys>***UserName***.user** in the *File name(s)* field, where *UserName* indicates the name you'll use to sign on.

2. Press **GO**. If you're creating a new user configuration file, press **GO** again.

    (For information on the user configuration file, see the *CTOS System Administration Guide*.)

3. Add the following entry:

    :GpsWorkstationPrefix:aaa

    The entry **aaa** is for example only. You can use any string of characters that uniquely identifies the workstation. (To simplify system administration, you may want to use your user name as the workstation prefix.) If you're installing GPS system services on several diskless client workstations on the cluster, you must use a different string of characters for each diskless client workstation.

Note that to perform any of the GPS installation functions from the Print Manager, your user configuration file must also contain this entry:

:GpsUserClass:admin

4. Press **FINISH**; then press **GO**.

Installing GPS System Services

To install GPS system services,

1. Sign on to the workstation using the name you used for your user configuration file above. (As mentioned above, be sure you sign on with a user configuration file containing the workstation prefix for the specific workstation you're using.)

2. When the Executive command line is displayed, type **Print Manager** (or a unique abbreviation, such as **pr man**) and press **GO** or **RETURN**.

    a. If you press **GO**, the Home display appears.

        The Device column of the Home display is blank since you will now be creating a special *Gps.printers* file for the diskless workstation.

    b. If you press **RETURN**, the Executive command form is displayed. If necessary, specify a value in the *[Max number of printers]* field, as explained below; then press GO to display the Home screen.

        In the *[Max number of printers]* field, enter the maximum number of printers you plan to monitor. The minimum value you can enter is 19; and depending on the amount of memory you have, the maximum is 200. If you do not enter a number, either the default is displayed (19 printers) or whatever number was previously specified. (Printers will be listed on the Print Manager Home display, which you can page through by pressing **NEXT PAGE** or **PREV PAGE**.)

3. Press **F2** (Update) to list the devices already installed on the cluster.

4. Press **F9** (Admin) and follow the procedure described in "Steps For Installing GPS System Service," earlier in this section. (Start with step 4 of the procedure.)

The configuration you set up is written to the file *[Sys]<Gps>***aaa**>*Gps.printers*, where **aaa** is the GPS workstation prefix you specified in your user configuration file. (Remember, the *Gps.printers* file contains device installation information, which is used by the Generic Print System comand.)

Referencing the System Image File

Depending on your workstation type, a diskless client workstation, by default, boots from *[Sys]<Sys>WsNNN>SysImage.sys*, where *NNN* is a three-digit workstation number. (Workstation type numbers for diskless client workstations are listed in Table 4-1, below.) For example, a diskless B26 workstation boots from *[Sys]<Sys>Ws252>SysImage.sys*. For complete information on workstation type numbers, see the *CTOS System Administration Guide*.

Table 4-1. Workstation Type Numbers for Diskless Client Workstations

Workstation Number (NNN)	Processor
092	Series 3000
127	B27
200	B24
212	B38* and 386 NGEN*
219	Series 2000
242	B28, 286 NGEN, B38*, and 386 NGEN*
252	B26, CWS, and 186 NGEN

*Boot ROM versions 3.2 and higher boot from 212; versions lower than 3.2 boot from 242. The boot ROM version is displayed on the Bootstrap menu.

Installing GPS on Multiple Diskless Client Workstations

If you want to install GPS on more than one diskless client workstation, you must use a different workstation system number to uniquely identify each diskless client workstation. You do this by creating a text file that references one of the *WsNNN* system image files. (For example, if you're installing GPS on a B26, you would create a text file that references the *Ws252* system image file.) By having a text file reference one of the "real" system image files, you can have multiple diskless client workstations boot from a common system image file (thus conserving disk space), while each diskless client workstation has its unique JCL file.

If you're installing GPS on multiple diskless client workstations, follow the steps below to create a text file that references one of the system image files.

1. Type **Editor** on the Executive command line, and press **RETURN**.

2. Type **[Sys]<Sys>Ws118>SysImage.sys** in the *File name(s)* field.

    The number **118** is for example only. This number *must* be the same for the JCL file you are going to create.

    If you're installing several diskless client workstations on the cluster, you must use a different three digit number (less than 256) for each diskless client workstation.

3. Press **GO** twice.

4. Depending on the type of workstation you're using, add the following entry to the text file:

    [!Sys]<Sys>Ws*NNN*>SysImage.sys

    where *NNN* is a three-digit workstation number (see Table 4-1, above).

5. Press **FINISH**; then press **GO**.

Creating the JCL File

In order to have the GPS system services installed automatically when you boot, you need to create a JCL file (if you don't already have one). If you have more than one diskless client workstation installing GPS, each workstation can execute a unique JCL file when you boot.

To create the JCL file,

1. Type **Editor** on the Executive command line, and press **RETURN**.

2. If you have a single diskless client workstation with a printing device attached, in the *File name(s)* field type

    [Sys]<Sys>Ws*NNN*>SysInit.jcl

    As mentioned previously, depending on your workstation type, *NNN* is the default for diskless client workstations (see Table 4-1, above).

3. If you have more than one diskless client workstation with a printing device attached, in the *File name(s)* field type
    [Sys]<Sys>Ws118>SysInit.jcl

    The number **118** is for example only. Remember, this number *must* be the same for the text file you created in "Referencing the System Image File," above. You can use any three digit number (less than 256) for each diskless client workstation.

4. Press **GO** twice to create the JCL file, and then add the entries shown below.

    $Job Sysinit,*UserName*
    $Run [Sys]<Gps>GpsInstall.run
    $End

    where *UserName* is your signon name.

5. Press **FINISH**; then press **GO**.

Booting Diskless Client Workstations

Diskless workstations boot automatically from the default system image file at the server. However, to boot multiple diskless client workstations, you must select an option from the Bootstrap menu. A representative Bootstrap menu is shown in Figure 4-4, below. (For more information, see the *CTOS System Administration Guide*.)

V3.2
B, D, L, M, P, T:

2355.4-4
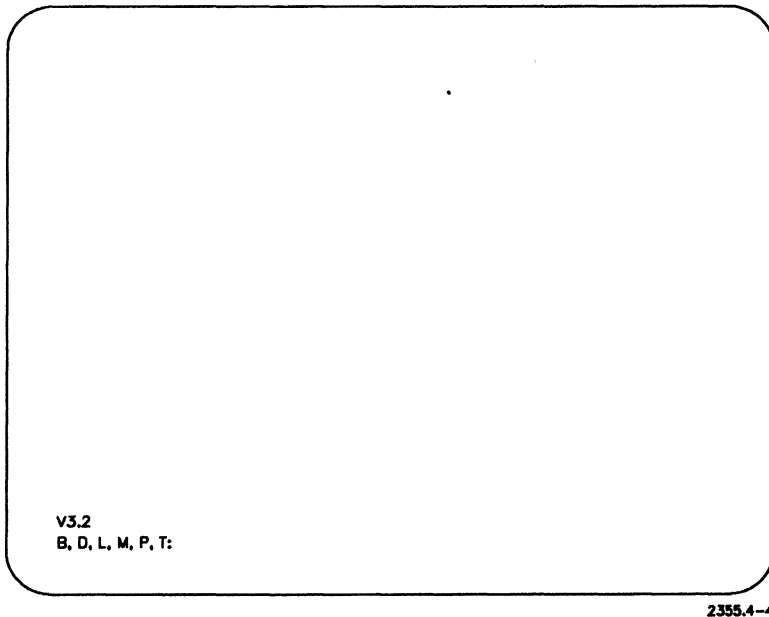
Figure 4-4. Bootstrap Menu

To boot multiple diskless client workstations from the server,

1. Display the Bootstrap menu: Hold down the **SPACEBAR** while you turn on or reset the workstation.

2. When the Bootstrap menu appears, type **T**.

3. Type **118** (or whatever number you chose when you created the system image file).

4. Press **RETURN**.

5. Type **B** (for X-Bus and X-Bus + workstations) or **C** (for EISA/ISA workstations).

6. Repeat the above steps for each diskless client workstation on the cluster.

Note that you must follow this same procedure each time you boot the diskless client workstation.

Explanation of the GPS Installation Procedure

In this explanation of the installation procedure, **118** is used as an example only.

When you type **118** in the Bootstrap menu, the diskless client workstation boots by first referencing the contents of the *[Sys]<Sys>ws118>SysImage.sys* text file and then referencing *[Sys]<Sys>ws118>SysInit.jcl*. As the JCL routine is executed, the Job statement containing the user name is read by *GpsInstall.run*. This indicates to *GpsInstall.run* which user configuration file to open. (The user configuration file contains the workstation prefix that identifies the correct *Gps.printers* file.) When you enter the Print Manager, the *Workfile* field, in the top left corner of your screen, should indicate *[Sys]<Gps>***aaa***Gps.printers*, where **aaa** is your workstation prefix number.

Checking Your Installation

To check your installation, follow the procedure described in "Checking Your Installation," earlier in this section.

Installing GPS on a Shared Resource Processor (SRP)

> *Note:* *If you are installing GPS on a shared resource processor running XEBTOS 7.2 or CTOS/SRP 1.4, see Appendix A for installation information.*

You install GPS system services on the processor boards of a shared resource processor server. If you're running the CTOS/XE operating system 3.0 with Standard Software 12.0 or later, you can do this interactively by using the Cluster View command. Alternatively, you can install GPS, without Cluster View, when the Print Manager is in Server mode. In either case, you can ensure that GPS will be reinstalled whenever you reboot from your workstation by adding GPS to the *SysInit.jcl* file of the server.

> *Note:* *Before you install GPS on a cluster that uses a shared resource processor as a server, you should be familiar with the system administration for a shared resource processor. If you are not, see the* CTOS System Administration Guide *before you do this installation.*

GPS System Service Placement on a Shared Resource Processor

SRP (Rear View)

Print Service
Device Driver

Queue Manager
Font Service

```
G C C
P P P
0 0 0
0 0 1
```

2355.4-b

Spooled
Printer
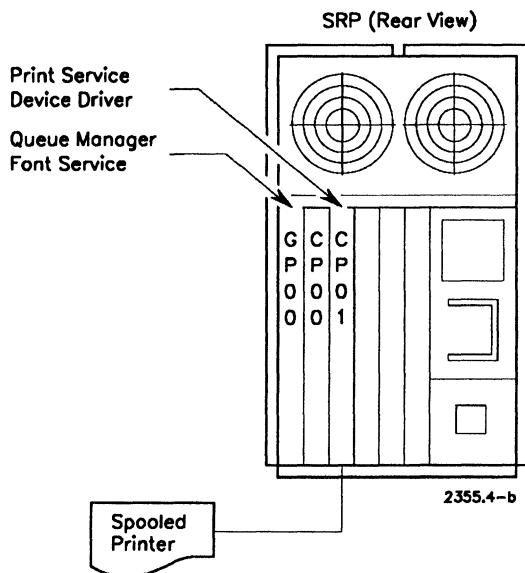
GPS system services may be installed on any combination of boards; however, the recommended SRP installation sequence is to install the Font Service and the Queue Manager on the master processor. The master processor must be a disk-controlling processor; that is, it must be a File Processor (FP), a Data Processor (DP), or a General Processor with SCSI interface (GP/SI). Since GPS system services access disks frequently, these services will operate more efficiently when executing directly on an FP, DP, or GP/SI. Note that the Font Service and Queue Manager will be installed before the other GPS system services.

The other GPS system services (the Print Service and device drivers) may be installed on any combination of Cluster Processor (CP), Terminal Processor (TP), and General Processor (GP) boards. Only one Print Service can be installed on the shared resource processor; the Print Service is generally on the board where the most frequently used devices are attached.

Installing GPS With Cluster View

With the Cluster View facility, you can interactively execute Print Manager installation commands on the shared resource processor server while you are at your client workstation. When you use Cluster View, your keyboard and monitor are communicating with a processor on the server as though it were your local processor. (Without Cluster View, you cannot interactively install GPS. That is, you must use the Print Manager's Server mode to set up the *GPS.printers* file so that the actual installation can take place when you reboot your system. For more information, see "Installing GPS Without Cluster View Using Server Mode," later in this section.)

Note: *You must run a separate Cluster View session for each board where you install a GPS system service. That is, if the Cluster View session is running on the GP00 processor board, you cannot, when in the Print Manager, install a device driver on CP01. It is possible, however, to install GPS on different boards when in Server mode.*

To install GPS with Cluster View,

1. On the Executive command line, type **Administrator Cluster View**

2. Press **RETURN**.

3. Fill in the command form, as shown in the following example.

    In the *[Processor name]* field, specify the four-character processor ID for the processor on which you want to install GPS system services. In the [*User name*] field, specify any valid user whose user configuration file indicates Admin privileges and does not have a GPS workstation prefix. Also, if necessary, specify a password in the *[User file password]* field.

    ```
    Cluster View
        [Processor name (XE only)]    GP00
        [User name]                   GPS
        [User file password]          ####
        [Node name]
        [Old XE run file]
        [Run file to invoke]
        [Partition size]
    ```

4. Press **GO**.

5. The Executive command line or the Signon screen is displayed. If the Signon screen is displayed, start the Executive by signing on with the user name **GPS** or some other name (having *GpsUserClass:Admin* in the user configuration file) that does not automatically install the Context Manager.

6. Type **Print Manager** in the Executive command line, and press **GO**.

7. Follow the steps for installing system services in "Steps For Installing GPS System Services," earlier in this section. Note that when filling in the *Board ID* field in the *Device Installation* form, be sure to specify the name of the board where the device is connected. This should be the same board name you indicated in the *[Processor name]* field of the *Cluster View* command form.

   Remember that to install a GPS system service on another board, you must run a separate Cluster View session and then specify this board name in the *Board ID* field.

8. Press **FINISH** to terminate your Cluster View session.

   If you have several GPS devices to install interactively, start a new Administrator Cluster View session for each board on which you're performing the installation.

Checking Your Installation

To check your installation,

1. From either the Home or Admin display, select the name of your newly installed device.

2. Press **F1** (Print) and type the name of one of your files in the *File list* field. For example, type **[Sys]<Sys>.user**

3. Press **GO**.

If you want to obtain Print Manager administrative privileges by using a signon name other than **GPS**, or if you want to assign a default device, see "The Final Steps of Your Installation," later in this section.

Installing GPS Without Cluster View Using Server Mode

When you install GPS without Cluster View, you perform the "installation" process using the Print Manager in Server mode. (You can access Server mode from the Admin display by pressing **F7** [Server]). The word *installation* is in quotation marks because GPS system services are not actually installed through the Print Manager as they are when you install them during a Cluster View session. Instead, when in Server mode, the Print Manager prepares the initialization files so that the GPS installation can take place when you reboot the shared resource processor.

Note that when the Print Manager is in Server mode, all the Print Manager installation commands are still accessible to you. You go through the normal steps of installing a device, but instead of actually installing GPS system services, you're recording changes to the *Gps.printers* file at the server. The contents of this file determine which GPS system services are to be installed on the shared resource processor during system initialization, when you reboot the server.

Automatically Installing GPS During System Initialization

As stated earlier in this section, when you install GPS on a workstation, you can edit your system initialization file so that GPS system services are installed automatically when you reboot. This also applies to a shared resource processor; however, there are some additional considerations:

- You must specify the processor board(s) where the system services will be installed.

- You should make sure that you specify the system services in the order that you want them to be installed from the Print Manager.

- You can create more than one system initialization file to correspond to the keyswitch positions on the front of the shared resource processor. The files are named

  [Sys]<Sys>Sysinit.k.*jcl*

  where *k* corresponds to the keyswitch position, either N, R, or M. (The keyswitch positions refer to NORMAL, REMOTE, or MANUAL, respectively.)

- In the absence of the system initialization file for a particular keyswitch position, the shared resource processor executes *[Sys]<Sys>SysInit.jcl*, if it exists.

Note: *All GPS system services will automatically install at boot time if you've already performed the installation functions in the Print Manager, as explained in "Installing GPS With Cluster View," earlier in this section. When you install GPS through the Print Manager, installation and configuration information is recorded in the [!Sys]<Sys>GPS.printers file. The contents of this file determine which GPS system services are to be installed on the shared resource processor when you reboot the server. For this reason, you should not have a GPS workstation prefix in your user configuration file. (When you specify a workstation prefix entry in your user configuration file, a unique GPS.printers file is created.)*

Creating a System Initialization File

If you do not already have a system initialization file, use the Editor to create one, as shown below. For an example of a system initialization file, see "Sample Shared Resource Processor Initialization File," later in this section.

1. Type **Editor** on the Executive command line, and press **RETURN**.

2. Since you want to create this file on the server, specify the file name as follows:

   Editor
     [File name(s)]   [!Sys]<Sys>SysInit.k.jcl_____

   Remember, *k* corresponds to the keyswitch position.

3. Press **GO**. The Editor is started, and a blank screen is displayed.

4. To install GPS on different processor boards, see the sample entries in "Sample Shared Resource Processor Initialization File," below.

   Note that if you have several devices connected to the shared resource processor, you can install device drivers on multiple boards.

5. When you have added the desired entries, press **FINISH**; then press **GO**.

The next time you reboot, GPS system services will automatically be installed on the processor boards that you specified.

Sample Shared Resource Processor Initialization File

As mentioned previously, how you configured and installed GPS from the Print Manager determines what is installed when you reboot. Also, the order in which the system services are installed at boot time is determined by their order in the *SysInit.jcl* file. In the sample file below, it is assumed that in the Print Manager you installed the Queue Manager and Font Service first on the GP board and did not install the Print Service. Then, devices were installed on the GP01 and TP00 boards, respectively.

Note that the Print Service is automatically installed (with either default values or those you specified in the Print Manager) when you install a device driver the first time.

```
Job Sysinit

GP00
;**The next statement installs the Queue Manager and Font
;Service**
Run [Sys]<Gps>GpsInstall.run
FrontPanel 92
Run [Sys]<Sys>SRPSeqService.run
FrontPanel 93
Run [Sys]<Sys>MailService.run
FrontPanel 94

GP01
;**The next statement installs the Print Service and Device
;Driver #1**
Run [Sys]<Gps>GpsInstall.run
FrontPanel 95
RunNoWait  [Sys]<Sys>RUM.run
FrontPanel 96

TP00
;**The next statement installs Device Driver #2**
Run [Sys]<Sys>GpsInstall.run
FrontPanel 97
Run <Sys]<Sys>ModemServer.run
FrontPanel 98
Run <Sys]<Sys>CommunicationsManager.run,Line1
FrontPanel 99

GP00
RunNoWait  [Sys]<Sys>RUM.run

$End
```

Using GPS With Nonqualified Devices

Devices that have been qualified by Unisys use customized device drivers to translate a generic set of printer commands into specific commands for that device.

Nonqualified devices don't have predesignated GPS device drivers and haven't been tested by Unisys. As mentioned previously, Unisys does not make any commitment to support these devices. However, if a nonqualified device is compatible with a qualified one, the device driver for one may also work for the other.

Use the following guidelines to install GPS if you're using a nonqualified device:

- Follow the normal procedure for installing GPS with qualified devices, as described throughout this section.

- Be sure to take special care in completing the Print Manager *Device Installation* form.

  In the *Driver Run File* field, try *LptSimpleDD.run* for draft-quality line printing, *DaisyDD.run* for daisy wheel printers, *PSDD.run* for PostScript printers, *HPLaserJetDD.run* for HP compatible laser jet printers, and so on.

  Note that there is no guarantee that *DaisyDD.run*, *PSDD.run*, and *HPLaserJetDD.run* will work with nonqualified devices. *LptSimpleDD.run* should work, as a simple line printer, with all ASCII nonqualified devices.

- For detailed information on the capabilities of each device, refer to Sections 8 through 10.

If you have trouble printing, test the device with the Basic Asynchronous Terminal Emulator (Basic ATE), as explained in Section 11, "Troubleshooting." If the trouble continues, try adjusting the *Device Installation* form parameters and the switches on the device.

If you still can't print, you probably need a customized device driver. You can write a customized device driver yourself using the GPS Device Driver Kit, another GPS product.

The Final Steps of Your Installation

After you install GPS, you may want to set up your workstation so that you can always obtain GPS administrative privileges when you sign on. You may also want to assign a GPS default device if you generally print to the same device. The procedures for these two operations are described below in "Obtaining Print Manager Administrative Privileges," and "Assigning a GPS Default Device," respectively.

Obtaining Print Manager Administrative Privileges

When you install GPS software through the distribution diskettes, a *Gps.user* file is created that automatically gives you administrative privileges when you sign on with the user name **GPS**. (When you enter the Print Manager, the Home display should indicate the Admin command (**F9**) on the Function Key menu.) With administrative privileges, you can perform GPS installation functions from the Print Manager.

If you want to sign on with a name other than **GPS** and still have administrative privileges, you must add an entry to your user configuration file, as shown in the following procedure:

1. Type **Editor** on the Executive command line, and press **RETURN**.

2. Type **[Sys]<Sys>***UserName***.user** in the *File name(s)* field, where *UserName* is your signon name.

3. Press **GO**.

4. Add the following entry to the file:

    :GpsUserClass:Admin

5. Press **FINISH**; then press **GO**.

For more information on the user configuration file, see the *CTOS System Administration Guide*.

Assigning a Default GPS Device

If you consistently use the same device, you may want that device listed as your default device. In this way, you don't have to type in the device name every time you want to print. For example, in OFIS Document Designer and Multiplan, the default device is listed in the *Print name* field of the *Print* form. Alternate device names are listed below the *Print name* field.

To assign a default GPS device,

1. Follow steps 1 through 3 in the subsection "Obtaining Print Manager Administrative Privileges," above.

2. Add the following entry to the file:

    :GpsDefaultPrinter:*PrinterName*

    where *PrinterName* is the name of the device you want to use as the default.

Starting a New Installation Over Again

If you're having problems with your installation, you may have to deinstall the device's device driver or other GPS system services and then reinstall them. For example, if you need to change the *Device Installation* form entries for a device you've already installed, you must first deinstall the device driver for that device and then reinstall the device with the desired entries. The general steps for performing a deinstallation are described below. For specific steps on changing the *Device Installation* form entries, see "Changing the Configuration for an Already Installed Device," later in this section.

Be aware that if you separately deinstall a device driver, this does not affect the other GPS system services. However, if you deinstall the Print Service, all local device drivers are also deinstalled.

If you deinstall the Font Service, and there is no Font Service at the server, the device driver will return an error code. The same thing happens if you deinstall the Queue Manager. When these system services are reinstalled, the device drivers will recover and continue operation.

Note: *If you're using GPS on a shared resource processor running XEBTOS 7.2 or CTOS/SRP 1.4, you should perform all the Print Manager install and deinstall functions in Server mode (press* **F7** *[Server]).*

Deinstalling GPS System Services

To deinstall a device driver only,

1. From the Print Manager Admin display, select the device you want to deinstall.

2. Press **F5** (De-Inst), and then press **GO**.

   The Admin display shows that the selected device driver is not installed.

To deinstall one or more locally installed device drivers from the Executive,

1. On the Executive command line, type **Deinstall GPS Device Driver**.

2. Press **RETURN**. (If this command is not available, you can add it using the Command File Editor, as explained in the *CTOS Generic Print System Software Release Announcement.*)

3. In the *Device name(s)* field, type the the names of the device drivers you want to deinstall, and then press **GO**.

To reinstall these device drviers from the Executive command line, type **Install Generic Print System** and press **GO**. For more information, see "Reinstalling GPS System Services," below.

To deinstall the Print Service and locally installed devices,

1. From the Print Manager Admin display, select *Print Service.*

2. Press **F5** (De-Inst), and then press **GO**.

   The Admin display shows that the Print Service and local device driver(s) are not installed.

To deinstall the Font Service, Scaling Font Service, or Queue Manager from the Print Manager,

1. From the Print Manager Admin display, select *Font Service* or *Queue Manager*.

2. Press **F5** (De-Inst), and then press **GO**.

    The Admin display shows that the Queue Manager or Font Service is not installed.

To deinstall the Font Service, Scaling Font Service, or Queue Manager from the Executive,

1. On the Executive command line, type **Deinstall Font Service** or **Deinstall Queue Manager**

2. Press **GO**.

Note: *If you're having problems with your installation, you may want to remove installation and configuration information from memory and start over again. You should only do this if all attempts at correcting the problem have failed. For information on starting all over, see the last suggestion under "The Device Doesn't Work When You Try to Print," in Section 11, "Troubleshooting."*

Reinstalling GPS System Services

You can reinstall all GPS system services using one of the GPS Executive commands or by rebooting your workstation. In addition, you can reinstall specific system services or a particular device driver.

Note that the procedures below are for workstations, not for shared resource processors. For a shared resource processor, check that the appropriate JCL files are set up correctly (for example, the statement *$Run [Sys]<Gps>GpsInstall.run* is not commented out); then reboot the shared resource processor.

Reinstalling All GPS System Services

To reinstall all GPS system services,

1. On the Executive command line, type **Install Generic Print System**.

2.   Press **GO**.

The Install Generic Print System command also reinstalls the local
device drivers that were deinstalled using the Deinstall GPS Device
Driver command.

You can also reinstall all the GPS system services by rebooting your
workstation. In this case, your *[Sys]<Sys>SysInit.jcl* file must contain
the following entries:

$Job   SysInit
$Run   [Sys]<Gps>GpsInstall.run

Remember, *GpsInstall.run* installs GPS system services based on the
entries made (from the Print Manager) to the *Gps.printers* file.

Reinstalling Specific GPS System Services

To reinstall only specific GPS system services, select the desired system
service from Print Manager Admin display; then press **F4** (Install) and
GO.

You can also install the Font Service and Queue Manager from the
Executive by using the Install Font Service and Install Queue Manager
commands, respectively.

Reinstalling a Specific Device

To reinstall a particular device,

1.   From the Print Manager Admin display, select the device you want to
      reinstall.

2.   Press **F4** (Install).

      The *Device Installation* form is displayed, showing the parameters
      you used to install that device.

3.   If necessary, change the configuration; then press **GO**.

      A message is displayed indicating that the device is installed.

Changing the Configuration for an Already Installed Device

Suppose you've just installed GPS through the Print Manager and your installation isn't functioning because you discover that you used incorrect parameters when you completed the *Device Installation* form. Or, suppose you've decided to rename your device. To change the configuration of a device, you must use the De-Inst command to deinstall the device driver; then, you must reinstall the device using the correct parameters.

Note that if your device is connected to a shared resource processor running XEBTOS 7.2 or CTOS/SRP 1.4, use the Print Manager in Server mode to make the necessary changes in the *Device Installation* form, and then reboot the shared resource processor. (For more information on Server mode, see "Installing GPS Without Cluster View Using Server Mode," earlier in this section.)

To change the configuration for an already installed device,

1. Press **F9** (Admin), if necessary, and select the device whose parameters you want to modify; then press **F5** (De-Inst) and **GO**.

    The Admin display is updated and indicates that the device's device driver is not installed.

2. In the *Device Name* field, use the arrow keys to select the device you want to reinstall.

3. Press **F4** (Install).

    The *Device Installation* form is displayed, showing the parameters you used to install that device.

4. Make the necessary changes in the form. For example, if you want to rename the device, press **CODE-DELETE**, and type in the desired name.

5. Press **GO**.

    The device is reinstalled with the new parameters.

The DevHelp List of Device Types

By using the DevHelp list of device types, you can install a specified device with default installation parameters. When you select a device type from the list and press **GO**, all the default parameters for that device are automatically entered in the *Device Installation* form. (For information on using DevHelp to install a device, see step 8 in "Steps For Installing GPS System Services," earlier in this section.)

The figure below shows an example of a DevHelp list of device types.

Print Manager	DevHelp	User: GPS
Path: [Sys]<Gps>		Wed Jan 23, 1991 8:03 AM

AP1324	HP LaserJet	QMS PS-800
AP1327	HP LaserJet+	Qume Sprint 5
AP1329	HP LaserJet 500	Qume Sprint 9
AP9205<LaserJet>	HP LaserJet Series II	Qume Sprint 11/55
AP9205<PostScript>	HP LaserJet Series III	TI 2115

159.4-c
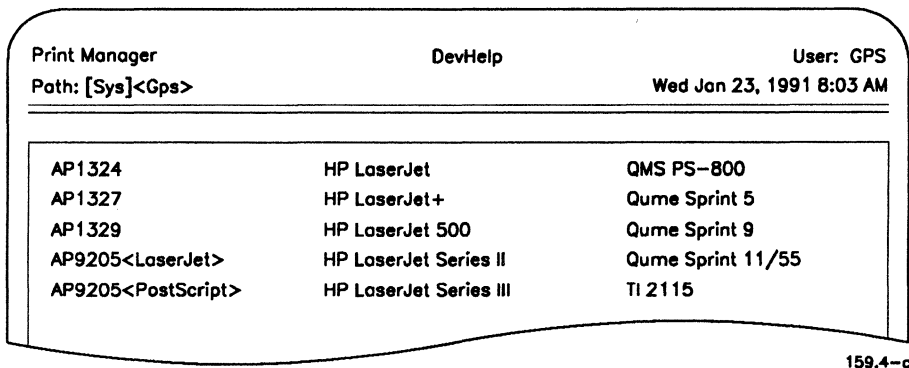
Appending a New DevHelp List of Device Types

You can append a new DevHelp list to your existing one by using the Append command. This means that you can obtain a new DevHelp list of new devices and device drivers without overwriting your old list. This feature is useful if you've made changes to your old list, deleted something by accident, or just installed new software.

To append a new DevHelp list,

1. Press **F9** (Admin), if necessary; make sure the highlight is on a device name, and press **F4** (Install).

    The *Device Installation* form is displayed.

2. Press **F4** (DevHelp).

    The DevHelp list of device types is displayed. (The DevHelp screen will be blank if you deleted the file *[Sys]<Gps>DevHelp*.)

3. Press **F3** (Append).

   After a few moments, a new DevHelp list (from the *DefaultDevHelp* file) is appended to the old list.

Note that you'll probably have duplications in your list. To remove any device types that you no longer want, highlight each type and press the **DELETE** key.

Adding Device Types To the DevHelp List of Device Types

To add a device type to the DevHelp list of devices, follow the procedure in "Modifying and Saving Options in the Device Installation Form," later in this section. In this procedure, you'll change the parameters for an existing device and then save these parameters under a new name.

Deleting Device Types From the DevHelp List of Device Types

A list of device types is displayed when you use the Print Manager DevHelp command. You can delete device types from this list. You can also add new ones, as explained in "Modifying and Saving Options in the Device Installation Form," below.

To delete a device type from the DevHelp list of device types,

1. From the Admin display, select *Device Driver* (the last entry in the *Service* field); then press **F4** (Install).

   The *Device Installation* form is displayed.

2. Press **F4** (DevHelp).

   The list of device types is displayed.

3. Highlight the device type you want to delete, and press **F6** (Delete).

4. Press **GO** twice.

   The device type is removed from the DevHelp list devices.

Reorganizing the DevHelp List of Device Types

You can move device types to the end of the DevHelp list by highlighting the device type and pressing the **MOVE** key.

Modifying And Saving Options in the Device Installation Form

After you have completed the *Device Installation* form, you can make changes to the form and then save these changes by using the DevSave command. Changes can be saved under a new device type name or to an existing device type. If you choose a new device type name, it is added to the DevHelp list of devices.

Using the DevSave Command

To modify and save options in the *Device Installation* form for a specific device, use the DevSave command as follows:

1. Press **F9** (Admin), if necessary; then select the desired device, and press **F4** (Install).

   The *Device Installation form* is displayed.

2. Modify the *Device Installation* form. Note that all changes will be saved *except* for the device name, queue name, and location.

   Make sure you've specified the desired values before going on to the next step.

3. Press **F5** (DevSave).

   The DevHelp list of device types is displayed, with a blank field at the end.

4. To add a new device type name, type the desired name in the blank field at the end of the DevHelp list Otherwise, select an existing device type. Note that when you select an existing device type, the information in that device type is overwritten.

5. Press **GO** to save everything (except the entries noted in step 2) under the name you specified.

    A form is displayed showing the fields *Device Setup Message* and *Device Setup Value*. You can use this form to specify additional device setup options. These options can then be included in the *Device Setup* field (as explained in step 6).

    If you're modifying an existing device type, the *Device Setup Message* and *Device Setup Value* fields will display the existing options. If you've specified a new device name, these fields will be blank.

    Note that each entry in the *Device Setup Message* field identifies and refers to a corresponding entry in the *Device Setup Value* field. For example, if your screen shows

    ```
    Device Setup Message        Device Setup Value

    Imagen style lines          Lines:Imagen
    ```

    the entry *Imagen style lines* explains the meaning of *Lines:Imagen*. You can type any message in the *Device Setup Message* field. However, you *must* type a valid entry in the *Device Setup Value* field. (For a list of valid entries, see the discussion in "Device Setup," for each driver in Sections 8 through 10. Also see "Device Setup" in Table 4-6, "Device Installation Form Fields," later in this section.)

6. Add to or change the options in the *Device Setup* field, as follows:

    a. If necessary, move the **DOWN ARROW** key in the *Device Setup Message* field to create a blank field.

    b. Type the message you want in the *Device Setup Message* field. Press **RETURN** and type the entry associated with this message in the *Device Setup Value* field.

    c. If you want to change the default options displayed in the *Device Setup* field or add new ones, select the desired option(s), as follows: In the *Device Setup Message* field, use the arrow keys to highlight each option you want; then press **MARK**. (A default option is selected when it is underlined.) To unmark default options, press **MARK** again to remove the underline.

7. Press **GO**.

The *Device Installation* form is displayed. If you've marked default options, the values specified in the *Device Setup Value* fields are now included in the *Device Setup* field. If you saved the modified Device Installation form under a new name, the DevHelp list should now display that name.

Installing Additional Devices

To install additional devices, follow steps 8 and 9 in "Steps For Installing GPS System Services," earlier in this section. Note that before you install a new device driver, you may have to deinstall the Print Service and reinstall it with a higher value. This would be necessary if the number you specified in the *[Number of devices attached locally]* field of the *Print Service* form was not sufficient.

To check the installation of your new device, print a file, such as *[Sys]<Sys>.user*. Don't print a file created by other applications because these applications may include special codes that cannot be processed by the Print Manager.

Adding Printers Elsewhere on a Network

The Print Manager shows status information for printers listed on the Home display. With the Set Up command (**F7**), you can add printers that are installed at other network nodes. (With the Update command (**F2**), you can display an updated list of devices.)

For information on how to add printers on the network, see "Accessing Other Devices in the Network," in Section 3.

Deleting Device Names From the Print Manager Screen

You can delete device names so that they don't appear on any of the Print Manager screens. This is useful if you're not using a specific device at the present time. Note that you can only delete device names that are not installed locally.

There are two ways of removing a device name:

- You can remove the device temporarily and redisplay it by pressing **UPDATE**

  or

- You can remove the device permanently so that it will not redisplay. When you remove a device permanently, you must make sure that the device *is not* installed anywhere on the cluster. Also, you must delete the device from the displayed list of all GPS Print Manager lists (on the Home display) throughout the cluster.

To remove a device name temporarily,

1. From the Home display or Admin display, select the device name you want to delete.

2. Press **DELETE**, and then press **GO**.

   The device name is no longer displayed in any of the *Device Name* fields.

To redisplay the device name,

1. Press **F10** (Home) to show the Home display.

2. Press **F2** (Update).

   Update displays an updated list of devices that are listed in memory by the Print Service at the server.

To remove a device name permanently,

1. At the server and client workstations that show the device name: From the Home display or Admin display, select the device name you want to delete.

2. Press **DELETE**, and then press **GO**.

3. Deinstall the Print Service at the server.

4. Reinstall the Print Service at the server.

   The device name is no longer displayed in any of the *Device Name* fields. It *will not* reappear if you press **UPDATE**.

Customizing Device Access When Several Users Share a Workstation

If several users are sharing a workstation, they can have their own *Gps.printers* files. With a unique *Gps.printers* file, users can display on the Print Manager screen only the devices they want to see. This is useful if a number of users are installing and deinstalling different devices. (As mentioned previously in this section, the *Gps.printers* file contains device installation information and defines which devices are initially displayed on the Print Manager screen.)

When you create your own *Gps.printers* file, you must add a workstation prefix to your user configuration file, as described below. Based on the workstation prefix entry in your user configuration file, a unique *Gps.printers* file is created when you enter the Print Manager.

To customize device access,

1. Edit or create the user configuration file, as follows:

    a. Type **Editor** on the Executive command line, and press **RETURN**. ·

    b. Type **[Sys]<Sys>***UserName***.user** in the *File name(s)* field, where *UserName* is your signon name.

2. Press **GO**. If you're creating a new user configuration file, press **GO** twice.

    (For information on user configuration file entries, see the *CTOS System Administrator's Guide*.)

3. Add the following entry:

    :GPSWorkstationPrefix:*UserName*

    where *UserName* is your signon name.

    Note that the workstation prefix *does not* have to be your signon name. You can use any string of characters that uniquely identifies the workstation.

4. Press **FINISH**; then press **GO**.

5. Log out.

6. Sign on to the workstation with the name you used for your user configuration file in step 1b, above.

7. Type **Print Manager** in the Executive command line, and then press **GO**.

8. Press **F9** (Admin).

   The top left corner of your screen, should indicate

   `[Sys]<Gps>xxxGps.printers`

   where *xxx* is your GPS workstation prefix.

9. Press **F2** (Update) to get a list of devices installed on the cluster.

10. Use the **DELETE** key to delete any device name you do not want to be in your customized *Gps.printers* file.

Configuring Equivalent Devices to Share the Same Queue

Two or more compatible devices that are connected to the same workstation can share a queue. By having devices share the same queue, you can maximize printing output. In addition, users won't have to wait as long for their print outs, as the print jobs will go to whichever device becomes free first.

To set up devices so they share the same queue, the devices *must* be installed with the same device driver, with compatible parameters, and share the same *[Scr]* volume. For example, they must have the same font device type, resolution, and so on.

To configure equivalent devices to share the same queue,

   Install two device drivers and specify the same queue name for both of them. (The queue name is specified in the *Queue Name* field of the *Device Installation* form.)

For detailed information on installing a device driver, follow steps 8 and 9 in "Steps For Installing GPS System Services," earlier in this section.

System Service Form Fields: Explanation

This subsection explains the fields that are displayed when you use the
Print Manager (or the Executive, in the case of the Scaling Font Service)
to separately install a particular system service.

Table 4-2. Font Service Form Fields

Fields	Description
Font Database	Indicates the name of the font database file that the Font Service will access. If you created a new font database, you can specify a directory other than the default.
	The default is *[Sys]<Gps>Font.dbs*.
Bytes of Buffer Space	Indicates the amount of memory to be used for keeping font data available.
	The default is *8192*. If you use a large number of fonts, you may get better performance by increasing this value. The maximum value you can enter is 64K bytes.

Note that you must install the Scaling Font Service from the Executive command line; you cannot it install from the Print Manager. (If necessary, see "Installing the Scaling Font Service for Your WYSIWYG Display," earlier in this section.)

Table 4-3. Scaling Font Service Form Fields

Fields	Description
Font Database	Indicates the name of the Font Database file that the Scaling Font Service will access. The default is [Sys]<Gps>ScalingFont.dbs.
	If the default volume and/or directory is full, you can put the Scaling Font Service in another location.
Bytes of Buffer Space	Indicates the amount of memory to be used for keeping font data available. The default is 8192.
	If you use a large number of fonts, you may get better performance by increasing this value. The maximum value you can enter is 64K bytes.
# of outline cache blocks	Indicates the number of 64K memory blocks that will be reserved to the Scaling Font Service to hold font outlines.
	The default is one cache block, which holds two or three font outlines.
# of scaled metrics to cache	Indicates the size of the scaled metrics file.
	By default, the size of the scaled metrics file, in sectors, is three times the number of metrics to cache. This means if the file did not previously exist, it is allocated to about 600 sectors.
	If the file does already exist, and you specify a different number, the font metrics file is either extended or truncated.
Cache file	Indicates the location of the scaled metrics file. The default is [Sys]<Gps>ScalingFont.metrics.
	If the default volume and/or directory is full, you can put the scaled metrics file in another location.
Outline directory	Indicates the location of the outline files. The default is [Sys]<SFS>.
	If the [Sys] volume is full, you can put the outline directory on another volume.

Table 4-4. Queue Manager Form Fields

Fields	Description
Use cache?	The default is *Yes*. It is recommended that the cache be used with GPS. Specify *No* if you do not want the installation to allocate an additional 4K-byte buffer for the Queue Manager. Without the cache, the Queue Manager uses less space but runs slower.
Maximum number of dynamic queues	The default is *20*. The number of dynamic queues should be equal to the number of queue entries in the *Queue.index* file plus the number of spooled GPS devices *not* listed in the *Queue.index* file. Note that you may need dynamic queues for other applications besides GPS that may use the Queue Manager. The maximum number of queues can only be set at the installation of the Queue Manager.

Table 4-5. Print Service Form Fields

Fields	Description
Number of devices installed locally	Enter the maximum number of devices you expect to install on this workstation. The default is *3*. If you receive error code 4599 when attempting to install a new device, increase the value in this field.
Total number of devices monitored	This parameter appears on server systems only. It should contain the maximum number of printing devices throughout the entire network that will be used by everyone on the cluster. The default is *48*. If you receive error code 4592, increase the value in this field.

continued

Table 4-5. Print Service Form Fields (cont.)

Fields	Description
Number of simultaneous spool jobs	This parameter is used to specify an estimate of the maximum number of jobs that will be spooled simultaneously.
	On client workstations, a value equal to the number of devices should be sufficient.
	On servers, the value typically should be much larger than the value entered in the first parameter (*Number of devices installed locally* field).
	The default is *3* on client workstations and *6* on servers.
	This number provides resources for peak printing activity and generally should be correlated to the total number of users having access to the printers on the cluster. If you receive error code 722, increase the value in this field. If you receive error code 400, then reduce either the number of devices to be monitored or the number of simultaneous spool jobs.
Increase stack size by	This parameter is incremental and should not need to be changed. If, however, you receive error code 4531 or 4534, you will need to increase the stack size. An increase of 100 bytes should be sufficient.
Increase heap size by	This parameter is incremental and should not need to be changed. If, however, you receive error code 4533 or 4534, you will need to increase the heap size. An increase of 2000 bytes should be sufficient.
Old spooler commands	This parameter determines whether the Print Service should provide the services that allow old spooler applications to control and monitor GPS devices.
	The default is *None*. Jobs submitted for printing by old applications or by applications using spooler byte streams will be printed even if *None* is specified. If you have pre-GPS applications, such as OFIS Writer, that need to control printing devices, use *Control*.
	Control uses the pre-GPS method for controlling printers by creating a separate control queue for each printer. This option also creates the spooler status queue for monitoring the status of printers.
	Status uses the spooler status queue only, which uses fewer GPS resources.

Table 4-5.   Print Service Form Fields (cont.)

Fields	Description
Polling Frequency	This parameter specifies how often the Print Service should poll the status of local and network printers.
	Network specifies how often GPS polls printers located at other nodes in the network. The default value instructs GPS to poll the status printers installed at other nodes every 60 seconds.
	Local specifies how often GPS polls printers located on the local cluster. The default setting instructs GPS to poll those printers every 3 seconds.

Table 4-6.   Device Installation Form Fields

Fields	Description
Device Name	The name you want to use for the device, for example, Imagen. The device name can be up to 12 characters; it must be different from any other device name already on the system or network.
Queue Name	The name you want to use for the queue. This field must be completed for spooled printing; it must be left blank for direct printing. The queue name can be up to 12 characters; it must be unique within the cluster. To avoid confusion, use the same name for the queue and the device.
Driver Run File	The name of the device driver run file for this device. It includes the volume and directory names.
	Note that the names of all currently supported device driver run files are listed in Sections 8 through 10.

Table 4-6. Device Installation Form Fields (cont.)

Fields	Description
Port	[lpt] indicates a parallel device; [ptr]X indicates a serial device, where X specifies the name of the serial port, for example, [ptr]A. [Nul] indicates no output to any port. (This entry can be used for testing purposes.)
	You can also specify the name of a Network Printing Gateway. For more information, see Section 5 "Installing Network Printing Gateway Services."
	If you're using a Multiline Port Expander Module, [ptr]NX indicates the name of the port: N is the number of the module, and X is the letter that specifies the port to which you attach the device. For example, ports are named [ptr]1A, [ptr]1B, and so on for the first module; [ptr]2A, [ptr]2B, and so on for the second module.
Location	The area where the device is located. For example, lab, Willie's office, and so on. The location name can be 25 characters long and may include blanks.
Font Device Type	Indicates the device type with which the device driver should identify itself for purposes of accessing the Font Service. The entry in this field must match a device type included in the Font Database.
	If this field is blank, the device driver assumes its own built-in device type.
Banner Pages	*Yes* indicates that at the beginning of each print job you want a separate page containing the document name, user name, and time printed..
Board ID	Indicates the processor board on the shared resource processor where the device is connected. Valid entries are FPxx, CPxx, DPxx, SPxx, TPxx, GPxx, where xx indicates the board's position in the cabinet when viewing a shared resource processor from the back. For example, the first File processor is identified as FP00, while the second and third one are FP01, FP02, and so on.
	Note that this field is displayed only when the Print Manager is in Server mode or is running on a shared resource processor.

continued

Table 4-6.   Device Installation Form Fields (cont.)

Fields	Description
Transmit Time Out	Indicates the number of seconds the device driver should wait before indicating that the device is down.
Printing Process Priority	Indicates the process priority the device driver should use when executing. You can use values between 120 and 133; 120 is the highest priority.
	Note that a process priority between 120 and 130 significantly improves printing time over the default priority of 133. However, this improved printing speed is achieved at the cost of slower execution of other programs executing at the same time.
New Line Map Mode*	The LPT Simple device driver is the only driver that uses this field for GPAM printing.
	Determines device interpretation (mapping) of outgoing CTOS New Line characters (0Ah).
	Lf maps an outgoing line feed into an ASCII LF(0Ah).
	Cr maps an outgoing carriage return into an ASCII CR (0Dh).
	CrLf maps an outgoing carriage return into a carriage return/linefeed sequence (ASCII CR/LF [0Dh/0Ah]).
Expand Tab Size*	Indicates the number of blanks into which to map a tab character. The tab size is set to the width of the number of spaces specified in the size of the default font (12 point Courier). This entry is overridden by applications that set their own tab spacing, such as OFIS Document Designer.

* These fields are used by device drivers only when the print mode for normal jobs is *not* GPAM. For more information, see "Default Print Modes for Normal Jobs," under "Device Setup," later in this table.

Table 4-6. **Device Installation Form Fields** (cont.)

Fields	Description
Chars Per Line* (non-GPAM output)	Indicates the number of characters the device should print per line.
	GPAM (Generic Print Access Method) output files (such as those produced by OFIS Document Designer) will not use the value you enter here.
	The page width and left and right borders determine how many characters are printed per line, based upon the pitch of the default font (usually 10 characters per inch.) Line wrapping occurs only in ordinary (non-GPAM) ASCII documents and only when *Wrap* is specified in the *Device Setup* field. The device driver inserts an end-of-line indication for the device after this number of characters has been encountered without an end-of-line indication.

Note that you need to complete the following fields for a serial device only.

Fields	Description
Baud Rate	Indicates a transmission speed, which can be from 20 baud to 19200 baud.
	The value in this field should match the hardware settings.
Line Control Mode	Indicates line control for data transmission. These values are determined by the needs of the device.
	CTS suspends data transmission if the Clear to Send signal is not received.
	XON/XOFF suspends data transmission between receipt of an XOFF character (13h) and an XON character (11h).

continued

* These fields are used by device drivers only when the print mode for normal jobs is *not* GPAM. For more information, see "Default Print Modes for Normal Jobs," under "Device Setup," later in this table.

Table 4-6.   Device Installation Form Fields (cont.)

Fields	Description
Line Control Mode (cont.)	*Both* suspends data transmission if either an XOFF character is received or if the Clear to Send signal is not received. *None* selects no line control.
Data Bits	Indicates the number of data bits per character. Data bits don't include the parity bit if parity is even, odd, 0, or 1. The value in this field should match the hardware settings of the printer. Typically, *8* indicates no parity; *7* indicates any parity, such as even, odd, 0, or 1.
Stop Bits	Indicates the number of stop bits per character, which is generally *1*. The value in this field should match the hardware settings of the printer.
Parity	Acts as a check on the data bits. If you specify *None*, increase the number of data bits to account for the absence of a parity bit. The value in this field should match the hardware settings.
Acknowledge Delay (Fill in this field for a parallel device only.)	For devices that take longer than 10 to 20 microseconds to send an acknowledgment (ACK), enter the additional delay time.
Device Setup	***Notes:*** 1. *This field is used to enter device-specific configuration information.* 2. *The keyword entries and device setup information provided below are common to all device drivers. There are also Device Setup entries that are device-specific. For more information on these entries, see the discussion in "Device Setup" for each device driver described in Sections 8 through 10.*

Table 4-6. Device Installation Form Fields (cont.)

Fields	Description
Keyword entries: **Normal:**	Default Print Modes for Normal Jobs: This is an optional entry. You should not use the *Normal:* keyword unless you are setting up a printer to act as a line printer. For additional information, also see "Configuring Device Driver Normal Mode Processing," in Section 1. Three options are provided: *GPAM, Simple, or XlateFile.* These options are described below. (Note that if no entry is made in this field, *Normal:GPAM* is used.) The *Normal:GPAM* entry causes the device driver to examine the print job for GPAM, TIFF, or CGM headers and switch to the appropriate print mode automatically. If these headers are not present, the device driver assumes the job is an ASCII text file. For ASCII files printed this way, the *Wrap:* keyword, if present and set to *Yes,* will wrap the text. Also, text using the default font will be printed if the *Font:*keyword entry is present, where *keyword* indicates font family and point size (for example, Font:Courier[10]). The *Normal:GPAM* entry is the recommended mode because it uses GPS and the features of the device driver to their fullest extent. Type **Normal:Simple** to bypass all byte-for-processing. No character translation is done. This mode is recommended only for high speed line printers that have a single font and no font styles. This mode converts tabs into spaces, converts the end-of-line character to dependent new line characters, and wraps lines. Type **Normal:XlateFile** to process the file for pre-GPS spooler escape sequences. The escape sequences are expanded but no other character translation is performed. This mode converts tabs into spaces, converts the end-of-line character to dependent new line characters, and wraps lines. *Note:* *The tab expansion, end-of-line conversion, and line wrapping are done according to the values entered in the* Expand Tab Size *field,* New Line Map Mode *field, and* Chars Per Line *field, which are described earlier in this table.*

Table 4-6.   Device Installation Form Fields (cont.)

Fields	Description
Device Setup *(cont.)*	Translation File:
Keyword entries: **XLateFile:**	The entry in this field configures the port driver to translate the character set when the port is set to normal mode.
	Specify the keyword *XLateFile:* followed by the file name of the translation table to be used by the port driver. For example, type **XLateFile:***[Vol[<Dir>filename,* where *[Vol[<Dir>filename* is the location and name of the translation file.
	Note that you can use the keyword *XLateFile* whenever you specify *Normal: Simple* or *Normal:XlateFile. Normal:GPAM* ignores *XLateFile.* In summary, you can type one of the following combinations:
	Normal: Simple XLateFile:*[Vol]<Dir>filename* **Normal: XLateFile XLateFile:***[Vol]<Dir>filename* **Normal: Simple** (Use only if you're *not* translating)
SuppressFF:	Suppress Form Feed:
	By default, GPS device drivers issue a page eject between binary and GPAM jobs. This happens because the device driver does not assume that the printer was left with the form at the top of the page (TOP).
	You can specify whether or not you want to suppress a form feed by typing **Yes** or **No**. (The default is *No.*)
	To suppress a form feed, type **Yes.** This means the printer *will not* eject a blank page before printing.
	To allow the printer to perform a form feed, type **No** or omit this entry. This means the first page ejected from the printer will be blank.
SwapArea:	Device Driver Overlays:
	All device drivers, except Daisy, LPT Simple, and Binary Mode, are overlaid. This means that only part of these device drivers is in memory at any one time.

Table 4-6. Device Installation Form Fields (cont.)

Fields	Description
Device Setup *(cont.)* **SwapArea:** *(cont.)*	When a portion of the device driver code that is not in memory must be executed, the code is read into memory from disk, overwriting a portion of driver code that was already in memory. Functions that are infrequently required or are required for only certain documents are read into memory when needed. The area of device driver memory into which code overlays are read from disk is called the *swapping area*. Overlaid device drivers are configured with a default swapping area that will normally be the maximum size. If you want the device driver's swapping area to be made large enough to contain all of the driver's code overlays in memory at once, type the following string: **SwapArea:ALL** If you want to explicitly set the size of the swapping area in kilobytes, type the following string: **SwapArea:**xx, where xx represents a decimal number. For example, if xx were 12, it would mean that a swapping area of 12,288 bytes would be allocated for that device driver.
Keyword entries:	Device-Reset String:
Reset:	A device-reset string can be specified at device driver installation. This is usually done for compatibility with pre-GPS applications (like the Word Processor) that send a hexadecimal escape sequence to specific devices. If such a string is specified, it will be to output to the device each time the following occurs: • A print job is canceled • A pre-GPS "reset" spooler escape sequence is en-countered in a non-GPAM document (for example, from WP or OFIS Writer) A device-reset string must consist of two parts, with no spaces between them: 1. A prefix, which must be the character string **Reset:**

continued

Table 4-6.   Device Installation Form Fields (cont.)

Fields	Description
Device Setup *(cont.)*	2. A reset sequence, which consists of the actual hexadecimal values that are output to the device when it is reset. The reset sequence must consist of only hexadecimal digits, and there must be an even number of digits.
	For example, if the characters *Ab1* were to be output whenever a device should be reset, then the following string should be entered into the *Device Setup* field when the device driver is installed: **Reset:416231** (The characters *Ab1* have the hexadecimal values 41, 62, and 31, respectively. The reset sequence above is the concatenation of these values.)
Keyword entries	Page-Landscape String:
PageL:	If you have a device that requires a special hexadecimal string to command the device into landscape mode, that string can be specified at device driver installation.
	If such a string is specified, and if two-page orientations are allowed by the particular device driver, the string is output to the device each time that a new page begins and the page is a landscape page. (A *landscape* page is wider than it is long.)
	This feature alone cannot enable device rotation to the landscape orientation; it must be used with GPS device drivers that also support the landscape orientation. These drivers can support several similar output devices which differ in the command codes required to put them into landscape mode. The Daisy driver *[Sys]<Gps>DaisyDD.run* supports this feature. To specify a page-landscape string, enter the following two-part character string (no spaces) in the *Device Setup* field:
	1. A prefix, which must be the character string **PageL:**
	2. A command sequence, which consists of the actual hexadecimal values that are output to the device when a landscape page begins. The sequence must consist of only hexadecimal digits, and there must be an even number of digits. A maximum of 10 bytes may be specified.

Table 4-6. Device Installation Form Fields (cont.)

Fields	Description
Device Setup *(cont.)*	
Keyword entry:	Page-Portrait String:
PageP:	If you have a device that requires a special hexadecimal string to command the device into portrait mode, that string can be specified at device driver installation.
	If such a string is specified, and if two-page orientations are allowed by the particular device driver, the string is output to the device each time that a new page begins and the page is a portrait page. (A *portrait* page is longer than it is wide.)
	This feature alone cannot enable device rotation to the portrait orientation; it must be used with GPS device drivers that also support the portrait orientation. These drivers can support several similar output devices which differ in the command codes required to put them into portrait mode. The Daisy driver *[Sys]<GPS>DaisyDD.run* supports this feature.
	To specify a page-portrait string, enter the following two-part character string (no spaces) in the *Device Setup* field:
	1. A prefix, which must be the character string **PageP:**
	2. A command sequence, which consists of the actual hexa-decimal values that are output to the device when a portrait page begins. The sequence must consist of only hexadecimal digits, and there must be an even number of digits. A maximum of 10 bytes may be specified.

Table 4-6. Device Installation Form Fields (cont.)

Fields	Description
Default Page Dimensions	This field is used to enter the default page dimensions (in inches) for page width, length, and borders to be used when unformatted documents are printed. For 132-column paper, change the width from *8.5* to *14.0*. For legal size paper, change the length from *11.0* to *14.0*. Note that this does not apply to applications that use the user-specified page dimensions, such as OFIS Document Designer.

If your printer supports landscape printing, you can set the default page orientation to landscape by reversing the values in the *Length* and *Width* fields. For example, if you had a laser printer with a landscape printing capability and portrait page dimensions of *8.5 x 11*, you can configure its default page orientation to landscape mode by entering **8.5** in the *Length* field and **11.0** in the *Width* field.

When specifying the page dimensions for borders, you should be aware of the fact that printing devices that use page sheet feeders or paper trays are often unable to print to the physical edges of the page (top, bottom, left, right). For most drivers, borders are margins or "dead zone" sizes, which are non-printable areas. For the HP LaserJet driver, borders do not mean margins, and the driver will "clip" or "cut off" data outside the printable area. In this case, borders are offsets of the coordinate systems of the printer. It is recommended that you accept the defaults (leave the fields blank) when specifying borders. Most printer manuals will specify the size of any "nonprintable" areas on a page. |

Table 4-6. Device Installation Form Fields (cont.)

Fields	Description
Font/Graphics Work Area	This field is used to enter the amount of memory to be reserved by the device driver for font information, for scaling raster images, and for rasterizing vector art. (Use the DevHelp command when installing a device to get the recommended Font Data Table Size value.)
	The release documentation for GPS describes the recommended values for each type of supported device. The maximum value is 64K bytes. (Error codes 7649, 15333, 15334, or 15343 may be generated when the size of the Font Graphics Work Area is too small.)
Output Buffer	This field is used to enter the amount of memory to be reserved by the device driver for output of data. Some devices perform better (faster) when given data in large amounts. For these types of devices, increase the number in this field to improve performance (the maximum is 20K bytes).
	To determine the optimal buffer size/performance:
	1. Use a document that can be printed repeatedly.
	2. Keep *0* as the value in the *Output Buffer* field; record the time it takes to print your job.
	3. Set the buffer to **10**; print and time your job again.
	4. If the preformance is better, try **15**; if worse, try **5**.
	5. If necessary, continue to increase or decrease the output buffer value until you feel the performance has improved sufficiently.

Section 5
Installing Network Printing Gateway Services

This section is for users who plan to install a Network Printing Gateway, which is an optional feature and is not included in the GPS package. With a Network Printing Gateway, print jobs can be sent to printers attached to remote systems across networks other than BNet or CT-Net. Print jobs can also be received from remote users and printed on GPS printers.

Step-by-step procedures are given for

- Installing a Network Printing Gateway

- Installing a Virtual Printer device driver

For detailed installation instructions, see the documentation that comes with the network printing gateway software.

Figure 5-1 shows a possible configuration for a Network Printing Gateway. Note that the Network Printing Gateway must be located on the same client system as the Virtual Printer device driver.
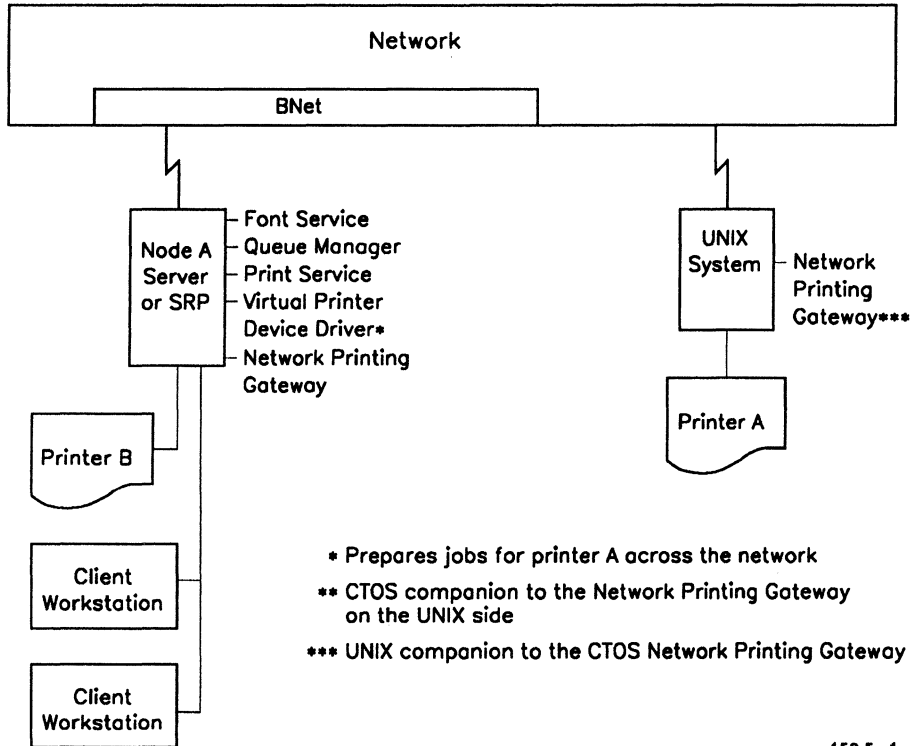
Figure 5-1. Example of Network Printing Between Heterogeneous Networks

Before You Begin

It is assumed that your have already installed GPS software and the necessary GPS system services. If this is not the case and you're installing GPS for the first time, see Section 4, "Installing GPS System Services."

Before you install the Network Gateway Printing services, be sure the GPS-compatible network printing gateway software has been installed on your system. (Network printing gateway software is not included in the GPS package and must be ordered separately from Unisys or a third party vendor.)

Obtaining Network Printing Administration Privileges

If the Admin display of the Print Manager program does not contain the entry *Net Gateway*, you need to obtain network printing administration privileges to perform the installation of the Network Gateway Printing services. To get administrative privileges, you must add an entry to your user configuration file, as shown below. With this entry, you automatically have the standard GPS administration privileges, which allow you to perform all GPS installation functions from the Print Manager.

1. Type **Editor** on the Executive command line, and press **RETURN**.

2. Type **[Sys]<Sys>***UserName***.user** in the *File name(s)* field, where *UserName* is your signon name.

3. Press **GO**.

4. Add the following entry to the file:

    :GpsUserClass:NPGWAdmin

5. Press **FINISH**; then press **GO**.

    When you enter the Print Manager, *Net Gateway* should appear on the Admin display.

For more information on the user configuration file, see the *CTOS System Administration Guide*.

Steps for Installing the Network Printing Gateway Services

The procedure below contains steps for installing the Network Printing Gateway services, which includes a Network Printing Gateway and Virtual Printer device drivers.

Procedure for Installing a Network Printing Gateway

To install a Network Printing Gateway,

1. Type **Print Manager** (or a unique abbreviation, such as **pr man**) and press **GO**.

    The Home display appears, which shows the status of all devices on your cluster.

2. Press **F9** (Admin).

    The Admin display appears, as shown below. The Admin display gives status information for the Font Service, Queue Manager, Print Service, Network Printing Gateway, and locally installed devices. (If a device is attached and is not listed, press **F2** [Update]).

    Note that if the entry *Net Gateway* is not listed, see "Obtaining Network Printing Administration Privileges," above.

```
┌─────────────────────────────────────────────────────────────────────┐
│  Print Manager               Admin                    User: GPS       │
│  InstallerFile: [Sys]<Gps>GPS.Printers        Wed Jan 23, 1991 8:30 AM │
│ ─────────────────────────────────────────────────────────────────────│
│  ┌ Service ────── Device Name ──── Location ────────── Status ──────┐ │
│  │ Font Service                                        not installed │ │
│  │ Queue Manager                                       not installed │ │
│  │ Print Service                                       not installed │ │
│  │ Net Gateway                                         not installed │ │
│  │ Device Driver                                       not installed │ │
│  │                                                                   │ │
│  │                                                                   │ │
│  │                                                                   │ │
│  │                                                                   │ │
│  │                                                                   │ │
│  │                                                                   │ │
│  │                                                                   │ │
│  └───────────────────────────────────────────────────────────────── │
│  ┌─────┬──────┬──────┐ ┌───────┬────────┐ ┌────────┬──────┐ ┌──────┐ │
│  │Print│Update│Status│ │Install│De-Inst.│ │ Server │ Poll │ │ Home │ │
│  └─────┴──────┴──────┘ └───────┴────────┘ └────────┴──────┘ └──────┘ │
└─────────────────────────────────────────────────────────────────────┘
```

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3. To install the Network Printing Gateway,

    a. Use the arrow keys or press **NEXT** to select *Net Gateway*.

    b. Press **F4** (Install) to display the *Network Printing Gateway*
        installation form, as shown below. For information on the
        entries that go in this form, see the documentation that comes
        with the network printing gateway software.

        <u>Install GPS Network Printing Gateway</u>

        [Network Printing Gateway Name]   _____
        [Maximum number of Outbound Sessions]   _____
        [Maximum number of Inbound Sessions]   _____
        [Session Time Out (seconds)]   _____
        [Transport Time Out (seconds)]   _____
        [Transport Connection Setup]

In the *Network Printing Gateway Name* field, specify the name of the Network Printing Gateway. (There is a 12-character maximum.)

In the *Maximum number of Outbound Sessions* field, enter the number of print jobs to be submitted simultaneously to a remote printer. (There is a 3-digit maximum.)

In the *Maximum number of Inbound Sessions* field, enter the number of print jobs coming from a remote printer across the network. (There is a 3-digit maximum.)

In the *Session Time Out* field, specify how long you want to wait for the CTOS processing. (There is a 3 digit maximum.)

In the *Transport Time Out* field, specify how long you want to wait for the remote processing across the network. (There is a 3-digit maximum.)

In the *Transport Connection Setup* field, specify the parameters noted in the documentation that comes with the network printing gateway software. (There is a 52-character maximum.)

c.   Press **GO**.

The Admin display appears and indicates that the Network Printing Gateway has been installed.

Procedure for Installing a Virtual Printer Device Driver

With GPS 2.5 and above, you can configure GPS device drivers to send their output to Network Printing Gateways to be delivered to printers attached to non-CTOS workstations. When you set up the device drivers in this way, they are known as Virtual Printer device drivers. Although Virtual Printer device drivers are running on CTOS workstations, they are preparing jobs for printers that are not physically attached to the CTOS workstations.

You install a Virtual Printer device driver the same way you install a GPS device driver except for certain field entries. (For detailed information on installing device drivers, see step 8 in "Steps for Installing GPS System Services," in Section 4.)

To install a Virtual Printer device driver,

1. From the Admin display of the Print Manager program, use the arrow keys or **NEXT** to select *Device Driver*.

2. Press **F4** (Install).

   A *Device Installation* form is displayed.

3. Press **F4** (DevHelp).

   A list of devices that are available for use with GPS is displayed.

4. Select a device that is closest to the characteristics of the remote printer.

5. Fill in the fields as if you were installing a standard device driver but note the exceptions below. (Use **CODE-DELETE** to delete unwanted entries.)

   a. In the *Port* field, specify the name of the Network Printing Gateway. (You can only specify a Network Printing Gateway name on the same client system; you cannot specify a port name since the printer is not physically connected to a CTOS workstation.)

   b. For the entries in the *Location* field and *Transmit Time Out* field, and the values following *Net:* in the *Device Setup* field, refer to the documentation that comes with the network printing gateway software. If specific entries are *not* noted in the documentation, fill in the *Location* field as you would for an ordinary device driver, and leave the *Transmit Time Out* and *Device Setup* fields blank.

6. When you complete the form, press **GO**.

   The Virtual Printer device driver is now installed on your workstation.

7. Press **FINISH** to exit the Print Manager.

Section 6
GPS Administrative Commands

This section summarizes the Print Manager and Executive commands that can be used to install and deinstall devices. These commands are generally used by the system administrator and include the following:

Print Manager Commands	Executive Commands
Admin	Install Generic Print System
Install	Install Queue Manager
DevHelp	Deinstall Queue Manager
DevSave	Deinstall GPS Device Driver
Append	Install Font Service
De-Install	Deinstall Font Service
Server	Install Scaling Font Service
	Administrator Cluster View

This section also describes the status messages that appear on the Print Manager displays.

Note: *All the Print Manager's nonadministrative commands, such as Print, Update, Status, Poll, and so on, are summarized in the subsection "Nonadministrative Print Manager Commands," at the end of this section. These commands, along with an introduction to the Print Manager, are described in detail in the* Using the Print Manager Manual.

Print Manager Commands

You issue Print Manager commands by pressing function keys. These keys are located across the top of the keyboard and are marked **F1** through **F10**. Each function key corresponds to one of the commands on the Function Key menu, which is displayed along the bottom of the Print Manager screen.

After you start the Print Manager, the Home display appears on the screen, as shown in Figure 6-1. Function keys **F1** through **F8** show some of the nonadministrative commands. You can return to this display at any time from anywhere else in the Print Manager by pressing the function key **F10** (Home).

If you have system administrator privileges, the Print Manager Home display should indicate an administration command, known as the Admin command (**F9**), on the Function Key menu. If the Home display doesn't show Admin (**F9**), see "Obtaining Print Manager Administrative Privileges," in Section 4, "Installing GPS System Services."

Note: *If a long list of device names is displayed on the Home display, you can page through the list by using the* **NEXT PAGE** *or* **PREV PAGE** *keys.*
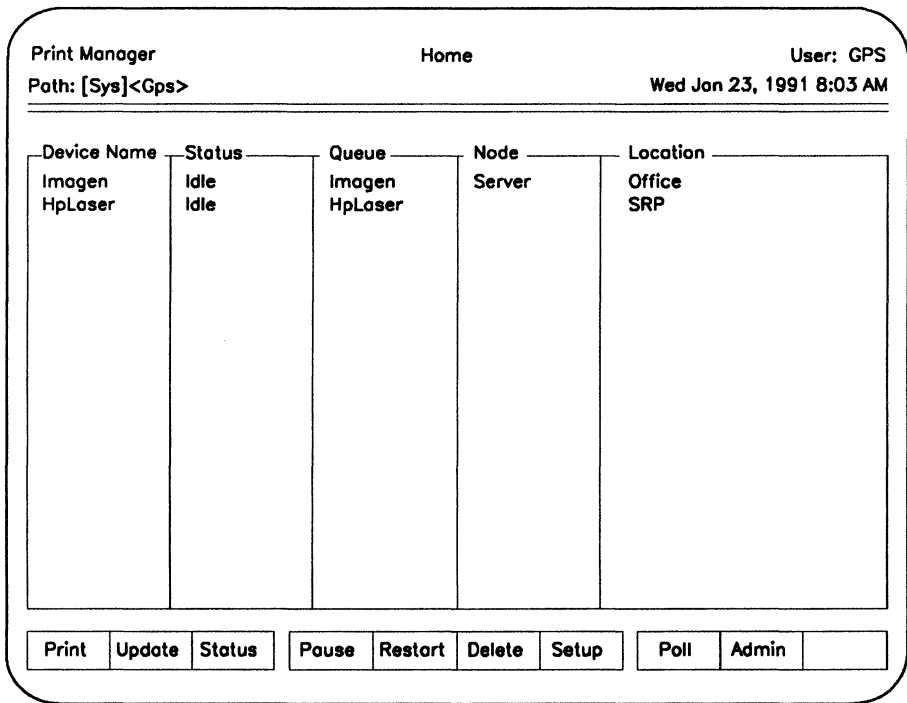
159.6-1

Figure 6-1. Home Display

Using the Admin Display

When you press **F9** (Admin), the Admin display appears (see Figure 6-2). The Admin display gives status information for the Font Service, Queue Manager, Print Service, and locally installed device drivers. For a description of the status messages that may appear in the *Status* field of the Admin display, see "Print Manager Status Messages," later in this section.

The Admin display also provides access to the Print Manager's installation functions. From the Admin display, you can perform the administrative tasks described in the following subsection. You can also perform certain nonadministrative tasks, which are described in "Nonadministrative Print Manager Commands," later in this section.

```
Print Manager                    Admin                           User: GPS
InstallerFile: [Sys]<Gps>GPS.Printers                  Wed Jan 23, 1991 8:30 AM

 ┌ Service ───────── Device Name ───── Location ───────── Status ─────────┐
   Font Service                         Local             Installed
   Queue Manager                        Server            Installed
   Print Service                        Server            Installed
   Device Driver     Imagen             Office            Idle
   Device Driver     HpLaser            SRP               Idle
   Device Driver




 ┌─────┬──────┬──────┐ ┌──────┬────────┐ ┌──────┐ ┌─────┬─────┐ ┌──────┐
 │Print│Update│Status│ │Install│De-Inst.│ │Server│ │Poll │     │ │ Home │
 └─────┴──────┴──────┘ └──────┴────────┘ └──────┘ └─────┴─────┘ └──────┘
```
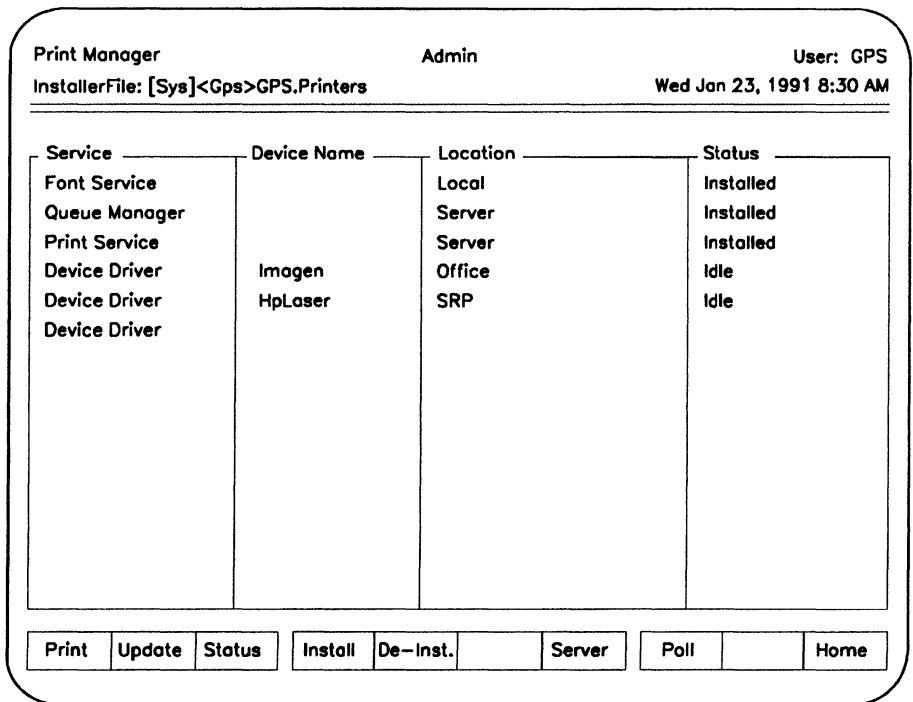
159.6-2

Figure 6-2. Admin Display

Using the Print Manager's Installation Commands

This subsection gives a brief explanation of the administrative commands you can issue from the Admin display. When you press **HELP**, you can also get a description of the commands associated with each Print Manager screen.

Install
(**F4**)

Used to install (or reinstall if they were previously removed) the following system services on the workstation where you have the device attached:

- A Queue Manager, if you specified spooled printing and a Queue Manager does not already exist on the server.

  The Queue Manager must be installed on the server of each cluster where spooled devices are installed or on any standalone system where you want to have spooled printing.

- The Font Service, if one is not already installed on the server.

  The Font Service can be installed on the server and shared by all client workstations that use it. However, OFIS Document Designer performance--in particular, for WYSIWYG and VGA mode--is improved if you also install the Font Service separately at each workstation.

- The Print Service, if one is not already installed on the workstation.

  The Print Service must be installed on each workstation where a device is attached. If devices are to be shared within a cluster or shared with another node in a network, the Print Service must also be at the server, whether or not a device is attached.

- A device driver for the device.

When you press **F4** (Install) to install a device driver, another Function Key menu is displayed with the commands DevHelp and DevSave.

DevHelp
(**F4**)
Displays the DevHelp list of device types. When you mark a device type and press **GO**, the *Device installation* form appears with the default parameters for the selected device.

DevSave
(**F5**)
Allows you to add device types to the DevHelp list of devices or modify the devices on the list. You can also use this command to change the default parameters in the *Device Setup* field of the *Device installation* form.

When you press (**F4**) DevHelp or (**F5**) DevSave, a Function Key menu is displayed with the command Append.

Append
(**F3**)
Appends a new DevHelp list to your existing one.

De-Inst
(**F5**)
Used to deinstall the Queue Manager, the Font Service, the Print Service, and device driver(s) on your workstation.

Server
(**F7**)
Puts the Print Manager in Server mode so that GPS can be configured to be installed on a shared resource processor (SRP). In Server mode, the Print Manager prepares the *Gps.printers* file so that the installation can take place when you reboot the SRP.

The Server command also displays system services and devices installed at the server.

The **DELETE** key removes the highlighted device from the device list. Note that this key is *not* the function key Delete (**F6**); it is the key on the keyboard.

Executive Commands

The Executive commands listed below can be used instead of the Print Manager commands to install GPS.

Initially, you should install the GPS system services through the Print Manager so that installation and configuration information is recorded in the *Gps.printers* file. The information recorded in the *Gps.printers* file is used when you issue the Executive installation commands.

To issue one of the Executive commands,

1. Type the command on the Executive command line.

2. Press **RETURN**.

    A system service form is displayed. If you want to change the defaults, fill in the form with the desired parameters.

    (For a description of the forms, see "System Service Form Fields: Explanation," in Section 4, "Installing GPS System Services.")

3. Press **GO**.

Using the Executive's Installation Commands

The following Executive commands can be used to install GPS.

Install Generic
Print System

Used to automatically install all GPS system ser-
vices (with defaults) that were previously installed on
your workstation and recorded in the *Gps.printers*
file. This includes all device drivers, the Font
Service, and the Print Service.

(Since installation is automatic, the system service
forms are not displayed. If you want to change the
defaults or install a new device, do so through the
Print Manager by installing each system service
separately.)

Note that you can reinstall specific system services
through the Print Manager Admin display: Select
the system service you want to reinstall; press
F4 (Install), and then press **GO**.

Note too that the Install Generic Print System
command installs all device drivers that were
deinstalled using the Deinstall GPS Device Driver
command.

Install Queue
Manager

Used to install the Queue Manager on your work-
station. The Queue Manager can only be installed on
a server or a standalone workstation.

Deinstall Queue
Manager

Used to remove the Queue Manager from memory on
your workstation.

Deinstall GPS
Device Driver

Used to remove one or more GPS device drivers.
Note that this command does not update the
GPS.printers file. This means you can use the Install
Generic Print System command to reinstall devices.
If necessary, you can add the Deinstall GPS Device
Driver command with the Command File Editor (see
the *CTOS Generic Print System Software Release
Announcement*).

Install Font Service	Used to install the Font Service on your workstation.
Deinstall Font Service	Used to remove the Font Service or Scaling Font Service from memory.
Install Scaling Font Service	Used instead of the standard Font Service to provide a wider selection of fonts and point sizes. (To deinstall the Scaling Font Service, use the Deinstall Font Service command.)
Administrator Cluster View	Used to install GPS on the SRP processor boards if you're running CTOS/XE operating system 3.0 with Standard Software 12.0 or later.

Nonadministrative Print Manager Commands

The following commands are described in detail in the *Using the Print Manager Manual.* Unless otherwise noted, the following commands are shown at the bottom of the Home display.

Print (**F1**)	Displays a form from which you can specify a document for printing.
Update (**F2**)	Displays an updated list of devices that are listed in memory by the Print Service at the server.
Status (**F3**)	Displays printing information. For example, displays the names of finished print jobs and the time they printed, and the names of print jobs waiting to be printed.
Detail (**F2**)	From the Status or Queue display, shows details about the print job currently selected, such as the number of copies and the size of the file.
Queue (**F3**)	From the Status display, lists the documents that are currently waiting to be printed.
Pause (**F4**)	Temporarily stops a device. For example, if there was a paper jam, this command would allow you to halt the device so you could clear the jam.

Restart (**F5**)	Starts a device again if it is paused, offline, out of paper, or the device-timeout period has elapsed. Also use Restart after you've issued the Align command (see Align, below).
Delete (**F6**)	Deletes the job currently printing when pressed from any display other than the Status or Queue displays.
	Deletes the currently selected job from Status and Queue displays.
	Also, deletes a job that is waiting to print if the job is selected from the Status display.
	Note that to delete devices from your local device list (shown on the Home display), you must use the **DELETE** key. For information on how to do this, see "Deleting Device Names From the Print Manager Screen," in Section 4.
Align (**F7**)	From the Status display or the Detail display, pauses the device so that you can align the paper. You must then start the device again with the Restart command.
Setup (**F7**)	Used to add devices from elsewhere in your network to the *Device name* field of the Home display.
	Adding a device from a remote node adds the device to the list of devices kept by the Print Service at the server. Use the Update command to display an updated list of devices.
	For more information on Setup, see "Accessing Other Devices in the Network," in Section 3.
Poll (**F8**)	Updates current information about devices and print jobs.

Printer Status Messages

This subsection provides a brief explanation of the status messages that may appear in the *Status* fields of the Home, Admin, and Print displays. When applicable, suggestions are given on how to remedy problems that may arise.

Off line

The device is not responding to the GPS device driver's last attempt to deliver data. This can happen when the device is out of paper, out of ribbon, or there's a paper jam or cable separation.

Note that error codes 300 or 716 (for Virtual Printer device driver) can also indicate an off line status.

Check the device to see what is needed. For example, add paper if necessary. Then, from the Print Manager, press **F5** (Restart) and **GO**. If it appears that nothing is wrong with the device, press **F5** and **GO**.

Paused

Someone temporarily stopped the print job while it was in progress. From the Print Manager, press **F5** (Restart) and **GO**.

Idle

There are no print jobs in the queue.

Printing

A print job is currently printing.

Load print-
wheel:xxx Then
restart output.

You've previously specified that a certain typeface or font be used to print all or part of your document.

Mount the desired print wheel or cartridge; then, from the Print Manager, press **F5** (Restart) and **GO**. Be aware that some devices (such as the HP Laser Jet) do not allow cartridge changes while a job is in progress.

If you don't want to change the print wheel or cartridge, press **F5** (Restart) and **GO** to resume printing.

You usually receive this message because the Font Database has been configured to prompt you whenever a particular font cartridge or wheel is not the one most recently used. For example, the HP Laser Jet device type is configured to prompt for the Hewlett-Packard A or B cartridges when certain fonts are needed.

If you receive this prompt frequently but do *not* use cartridges or wheels with your device, you should modify the Font Database accordingly (using the Font Tool) or install the driver with a different font device type. See the *Using the Font Tool Manual* for more information. For driver-specific information, see Sections 8 through 10.

Load form:xxx
Then restart
output.

You've previously specified that a special form (paper) be used to print all or part of your document.

Mount the proper form; then, press **F5** (Restart) and **GO**. If you don't want to change the paper, press **F5** (Restart) and **GO** to resume printing.

Error xxx   There's a problem in the software or hardware you
                          are using.

                          Check the *CTOS Status Codes Reference Manual* for
                          a description of the error.

Not Installed   A GPS system service is not installed in memory.
                          For example, the Print Service may not be installed
                          at the server, or a device driver may not be installed
                          at the workstation.

                          If you're installing or reinstalling these services,
                          select the desired service and press **F4** (Install). For
                          detailed installation instructions, see Section 4,
                          "Installing GPS System Services."

Down   The server is not running.

Section 7
Using GPS with Non-GPS Applications

This section shows you how to access GPS facilities if you have an application that has not been modified to work with GPS, such as OFIS Writer or the Word Processor.

To use GPS with non-GPS applications, you must do the following:

- Using the Print Manager, go through the standard procedures for installing GPS on a new device. For detailed information on installing GPS, see Section 4, "Installing GPS System Services."

- Make an entry for the new device in the *Sys.printers* file, as described in "Editing the Sys.printers File," later in this section.

Note: *Applications that haven't been modified for use with GPS bypass GPS when printing directly. If you want to use GPS with these applications, you must set up your printing system for spooled printing.*

In addition, you can't print across a network with non-GPS applications that haven't been modified for use with GPS.

The Sys.printers File

The *Sys.printers* file is used with non-GPS applications. It contains the device name, device configuration file name or queue name, device type, and sheet feeder name. At print time, the application can reference the file, find the device type, and tailor the print request accordingly.

For non-GPS applications to access the GPS facilities, you must specify the same device name and queue name in the *Sys.printers* file that you specified in the *Device* and *Queue Name* fields of the Print Manager *Device Installation* form.

Note that each time you add devices (using the Print Manager) to your GPS system, you must alter the *Sys.printers* file to include them. This is done in order to make the new devices available to the older applications that only read the *Sys.printers* file.

Editing the Sys.printers File

To use GPS with non-GPS applications, edit the *Sys.printers* file, as follows:

1. Type **Editor** on the Executive command line; then, press **RETURN**.

2. Type **[Sys]<Sys>Sys.printers** in the *File name(s)* field; then press **GO**.

3. Edit the *Sys.printers* file so that the entries for the device name and queue name match the entries you made in the *Device Installation* form when you installed the device through the Print Manager. If necessary, see the example below.

4. Press **FINISH**; then press **GO**.

Example

Suppose you filled in the Print Manager *Device Installation* form as follows:

```
Print Manager                        InstDD                              User: GPS
InstallerFile: [Sys]<Gps>GPS.Printers                      Wed Jan 23, 1991 8:05 AM

  Device Name [ Diablo            ]        Queue Name [ Diablo      ]
  Driver Run File  [[Sys]<Gps>DaisyDD.run                                       ]
  Port ([ptr]xx[lpt]xx) [[ptr] a]         Location [ Office              ]
  Font Device Type      [          ]       Banner Pages [ No, Yes ]
  Transmit Time Out  [ 60 ]                Printing Process Priority [ 133 ]
  Normal Print Job Parameters: [     ]     Expand Tab Size  [ 8 ]
  New Line Map Mode: [ Lf, Cr, CrLf ]      Chars Per Line  [ 85 ]
  [ptr]xxParameters
  Baud Rate  [ 1200 ]    Line Control Mode [ None, XonXoff, CTS, Both ]
  Data Bits  [ 7 ]       Stop Bits [ 1 ]   Parity: [ None, Even, Odd, 1, 0 ]

  Device Setup
  Diablo630  DiabloF32
  Default Page Dimensions (inches)
  Length  [ 11.0 ]       Top Border    [        ]     Left Border  [      ]
  Width   [ 8.5 ]        Bottom Border [        ]     Right Border [      ]
  Storage Allocation (1K units)
  Font/Graphics Work Area [ 4 ]            Output Buffer [ 1 ]

  [    ][    ][    ] [DevHelp][DevSave] [    ][    ] [    ] [Admin][Home]
```

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Your *Sys.printers* file should contain the following entries:

```
Diablo: [Diablo]: Diablo630: : DiabloF32
```

In this sample entry shown above,

Diablo	(the first entry) is the name used to refer to the device. It matches the name in the *Device Name* field of the Print Manager *Device Installation* form.
[Diablo]	(the second entry) indicates the queue name. It matches the name in the *Queue Name* field of the Print Manager *Device Installation* form. Remember, non-GPS applications can only reference GPS devices that are spooled.
Diablo630	(the third entry) indicates the printer format in which the document is to be generated from OFIS Writer or the Word Processor. It matches the entry in the *Device Setup* field of the Print Manager *Device Installation* form for the Daisy driver.
: :	(the fourth entry) which is blank in the example above, is the plotter type (for example, HP7470A). This field is ignored by OFIS Writer or the Word Processor, but the colons must be included in the file even if you have no entry.
DiabloF32	(the fifth entry) indicates the type of sheet feeder. It matches the entry in the *Device Setup* field of the Print Manager *Device Installation* form for the Daisy driver.

Section 8
GPS Device Drivers: Basic Package

This section describes the device drivers that are included in the basic GPS product package. These device drivers are as follows:

- Binary Mode

- LPT Simple

- HP Plotter

- Daisy

These device drivers have been tested and qualified to work with the devices described in this section. (Figure 8-1 lists the devices and the device drivers they use.)

Note: *For information on supported Laser device drivers and Dot Matrix device drivers, see Section 9 and 10, respectively.*

The discussion on each device driver in the GPS basic package includes the following subsections, when applicable:

Overview Lists the devices that use the driver.

Provides general information about the features of the driver.

Device Installation Information Displays a sample *Device Installation* form.

Provides information on certain key entries in the *Device Installation* form, such as driver run file, ports used, font device types, and device setup entries.

Font Information	Discusses the font families implemented for the driver.
	Discusses the alias field of the font key in the Font Database.
	Explains how to modify the Font Database to use a different sets of fonts with each driver.
Status Codes	Lists and defines device-specific status codes. (For GPS status codes, see Section 11, "Troubleshooting.")
Cables and Switch Settings	Describes cable connections and switch settings for each device.

Note: When *installing printers, use the Print Manager DevHelp key (F4). With DevHelp, the* Device Installation *form shows the default parameters for the selected device. For information on using DevHelp, follow steps 8 and 9 in "Steps For Installing GPS System Services," in Section 4.*

Binary Mode Device Driver

Used by any device where the only data sent to it is in the device–specific language; that is, the driver does no translation of data.

LPT Simple Device Driver

Used by line printers and most devices to produce draft–quality text only; that is, used for devices that print ASCII text and have standard simple line control.

HP Plotter Device Driver

Used by the following plotters: HP7550A, HP7475A, HP7470. Also may be used with other Hewlett–Packard compatible plotters.

Daisy Device Driver

Used by the following printers: AP1302, AP1303, AP1305, AP1307, Diablo 630 API–2, Diablo 630 HPR05, Envision 420, Envision 430, NEC 3515, Qume Sprint 5, Qume Sprint 9, Qume Sprint 11/55 Plus. Also may be used with other text–only Diablo compatible printers.

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Figure 8-1. GPS Basic Device Drivers and Devices

Binary Mode Device Driver

Overview

The Binary Mode device driver is provided to make a device driver of minimal size available for use with applications that have printer-specific code embedded within them. The Binary Mode device driver prints jobs that are already in device-specific format; that is, the driver does not alter the job in any way when the data is transmitted to the printer. All device drivers support binary or image mode, but the Binary Mode device driver is considerably smaller than other device drivers because it *only* supports binary mode jobs.

Device Installation Information

When installing the Binary Mode device driver, you should be aware of the following:

- You must specify *[Sys]<Gps>BinaryModeDD.run* in the *Driver Run File* field of the *Device Installation* form.

- You must specify *No* in the *Print Banner Pages* field.

- The Font Database cannot be accessed. (The following fields are ignored by the Binary Mode device driver: *Font Device Type*, *Page Dimensions*, and *Font/Graphics Work Area*.)

- The *Device Setup* field will only accept the keyword and one of the values listed below. No other device setup parameters are recognized by the Binary Mode driver.

Keyword	Values
Normal:	XlateFile Simple
XlateFile:	(enter the volume, directory, and file name)

The value indicates the processing mode or file specification. For more information, see "Configuring Device Driver Normal Mode Processing," in Section 1. Also see "Default Print Modes for Normal Jobs" and "Translation File," respectively, under *Device Setup*, in Table 4-6.

The format for the *Device Setup* field entry is

Normal:*processing mode*

If you're translating to a non-ASCII device, the format is

Normal:*processing mode* XlateFile:*[Vol]<Dir>filename*

Explanation of Device Setup Parameters

Normal: *processing mode*	Can be XlateFile, Simple, or left blank. Print jobs in Normal mode will be treated as ASCII files by the device driver.
	If the value entered is XlateFile or Simple, you should process jobs as described in "Default Print Modes for Normal Jobs" under *"Device Setup"* in Table 4-6.
XlateFile: *[Vol]<Dir>file- name*	The file specification entered in the name of the translation table to be used by the port driver.
	Note that XlateFile is only recognized if *Normal:XlateFile* is specified in the *Device Setup* field. In this case, the entries in the *Device Setup* field are specified as follows:
	Normal:XlateFile XlateFile:*[Vol]<Dir>file-* *name*
	where
	[Vol]<Dir>filename indicates the location and file name of the translation file.

LPT Simple Device Driver

Overview

The LPT Simple device driver has the following capability:

Draft-quality text only

This driver supports all of the ordinary monospaced data processing class printers. Any printer that can recognize and interpret the ASCII character set and the ASCII control line feed (LF), carriage return (CR), and form feed (FF), can be controlled by the LPT Simple device driver.

Note that the LPT Simple device driver does not provide font support.

The Printronix MVP printer, which is described later in this section, uses the LPT Simple device driver.

Device Installation Information

Figure 8-2 displays a sample *Device Installation* form for a device that uses the LPT Simple device driver. For a detailed explanation of each field in this form, see Table 4-6, in Section 4, "Installing GPS System Services."

```
Print Manager                      InstDD                        User:  GPS
InstallerFile: [Sys]<Gps>GPS.Printers                    Wed Jan 23, 1991 8:05 AM

  Device Name [                    ]        Queue Name [              ]
  Driver Run File [[Sys]<Gps>LptSimpleDD.run                               ]
  Port ([ptr]xx[lpt]xx)  [[lpt]  ]          Location [                     ]
  Font Device Type [                 ]      Banner Pages  [No, Yes ]
  Transmit Time Out  [ 90 ]                 Printing Process Priority [133]
  Normal Print Job Parameters: [      ]     Expand Tab Size  [ 8 ]
  New Line Map Mode: [Lf, Cr, CrLf ]        Chars Per Line   [85]
  [lpt]xxParameters _____
  Acknowledge Delay   [ 0 ]
  Device Setup _____
  [                                                                    ]
  Default Page Dimensions (inches) _____
  Length   [ 11.0 ]        Top Border   [       ]     Left Border  [      ]
  Width    [  8.5 ]        Bottom Border [      ]     Right Border [      ]
  Storage Allocation (1K units) _____
  Font/Graphics Work Area  [ 4 ]          Output Buffer  [ 1 ]


  [     ] [     ] [     ] [DevHelp] [DevSave] [     ] [     ]   [     ] [Admin] [Home]
```

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**Figure 8-2.   Sample Device Installation Form for Direct Printing With a
Printronix MVP**

Driver Run File

The *Driver Run File* field should display *[Sys]<Gps>LptSimpleDD.run*

Port Used

Any serial port or parallel port.

Font Device Type

The default is Simple.

Device Setup

> *Note:* *Device Setup parameters common to all drivers are described in "Device Setup," in Table 4-6, in Section 4.*

If the font device type is Simple (that is, this driver is always used with a device having one font), then specifying **Normal:Simple** in the *Device Setup* field will improve performance of ASCII jobs. The table below summarizes other possible entries.

Keyword	Values
Normal:	GPAM, XlateFile Simple
XlateFile:	(enter the volume, directory, and file name)
Wrap:	Yes, No

The *Normal* and *XlateFile* entries indicate the processing mode file specification, respectively. For detailed information, see "Configuring Device Driver Normal Mode Processing," in Section 1. Also see "Default Print Modes for Normal Jobs" and "Translation File," respectively, under *Device Setup*, in Table 4-6.

The *Wrap* entry determines how GPS treats line wrap for unformatted documents (documents that do not contain explicit positioning commands). Applications that generate GPAM output, such as OFIS Document Designer, format their own document output and do not wrap around.

The format for the *Device Setup* field entries is

Normal:*processing mode*

Wrap:*response*

If you're translating to a non-ASCII device, the format is

Normal:*processing mode* XlateFile:*[Vol]<Dir>filename*

Explanation of Device Setup Parameters

Normal:
processing mode

Can be GPAM, XlateFile, Simple, or left blank. If the value entered is GPAM or is left blank, print jobs will be treated as ASCII files by the device driver.

If the value entered is XlateFile or Simple, you should process jobs as described in "Default Print Modes for Normal Jobs" under "Device Setup" in Table 4-6. Also see "Configuring Device Driver Normal Mode Processing," in Section 1.

XlateFile:
[Vol]<Dir>file-name

The file specification entered in the name of the translation table to be used by the port driver.

Note that XlateFile is only recognized if *Normal:XlateFile* is specified in the *Device Setup* field. In this case, the entries in the *Device Setup* field are specified as follows:

Normal:XlateFile XlateFile:*[Vol]<Dir>file-name*

where

[Vol]<Dir>filename indicates the location of the translation table.

Wrap:*response*

For Normal mode ASCII jobs only (where **Normal:GPAM** is specified in the *Device Setup* field).

By default, text that appears to extend beyond the right edge of the page is not wrapped to the next line, but text that appears to extend beyond the bottom edge of the page is automatically moved onto the next page.

If you want lines automatically wrapped if they are too long and text automatically placed on the next page if it is too long for the current page, type the following string: **Wrap:Yes**

Font Information

This subsection assumes that you are familiar with certain general principles of the Font Database, which are discussed in detail in the *Using the Font Tool Manual.*

The standard Font Database reduces all fonts for the LPT Simple driver to 12 point (10 pitch) Courier. The only printable characters output are those in the ASCII range (21 to 7E hex).

The LPT Simple device driver, however, is designed to support more sophisticated character translation and font selection, providing that such information specific to an individual printer is added to the Font Database. If this is done, it is advised that a distinct font device type should be used.

The LPT Simple device driver parses the font key alias according to the same rules as the Daisy device driver. Printers on which different pitches can be selected by an escape sequence could utilize this feature. Different point sizes could select different font keys, which in turn could specify the appropriate escape sequence (in the alias) to set the printer's pitch. The pitch (character width) selected must also be entered into the font key (for example, 72/12 for 12 pitch) so that OFIS Document Designer and the LPT Simple device driver "understand" what pitch is in effect.

This driver assumes that text is printed six lines to the inch. Horizontal pitch is determined by information retrieved from the Font Database. Within those parameters, this device driver will place text on the page as near to its requested location as possible. Truly desirable results can only be obtained by specifying character and line spacings that fit these constraints when formatting the document.

Cables and Switch Settings

This subsection contains device-specific information on cable connections and switch settings.

Printronix MVP

Cable Information

Use the Centronics-compatible cable, which is described in "Cables," in Section 3.

Switch Settings

Figure 8-3 shows the Printronix MVP switches.
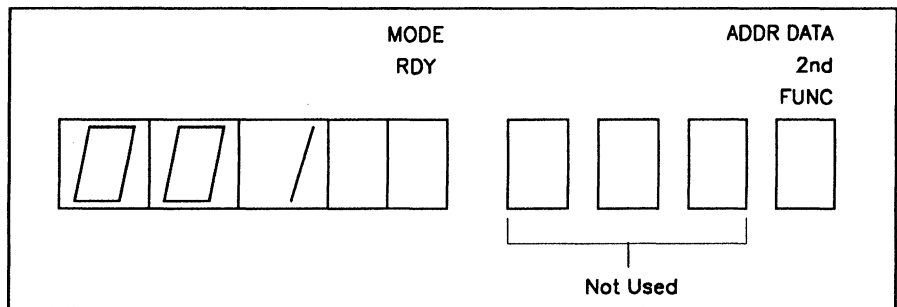
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Figure 8-3. Printronix MVP Switches

To set the Printronix switches for graphics printing,

1. Turn on the printer. (The power switch is on the back panel of the printer.)

2. Lift up the front cover.

3. Press the second **FUNC** button once.

4. Press **RDY** four times.

   The LED indicator to the left of the RDY button reads 001. This sets the size of the printed dots to graphics specifications.

To set the Printronix switches for text printing,

1. Turn on the printer. (The power switch is on the back panel of the printer.)

2. Lift up the front cover.

3. Press the second **FUNC** button once.

4. Press **RDY** six times.

    The LED indicator to the left of the RDY button reads 002. This sets the size of the printed dots to text specifications.

HP Plotter Device Driver

Overview

The HP Plotter device driver has been tested and qualified on the following plotters:

HP7475A

HP7550A

HP7470A

The HP Plotter device driver has the following capabilities:

*   Vector art

*   Color printing

This driver does not support text or raster images.

All three plotters support A4 paper and landscape printing; however, only the HP HP7475A and HP7550A plotters support A3 paper, 11x17-inch paper, and portrait printing. The HP7470A *does not* support these options.

The HP Plotter device driver supports all ten colors provided by Hewlett-Packard. This means that if the hardcopy uses ten colors, the plotter prints as much as it can; it then stops for you to put in the remaining color pens in the required position.

This driver doesn't support opaque graphics; all fill patterns are treated as transparent. This means that if a polygon overlays another polygon, the bottom one and its fill patterns will be seen through the fill of the top polygon.

Device Installation Information

Figure 8-4 displays a sample *Device Installation* form for a device that uses the HP Plotter device driver. For a detailed explanation of each field, see Table 4-6, in Section 4, "Installing GPS System Services."

```
Print Manager                        InstDD                              User: GPS
InstallerFile: [Sys]<Gps>GPS.Printers                      Wed Jan 23, 1991 8:05 AM

  Device Name [              ]              Queue Name [              ]
  Driver Run File [ [Sys]<Gps>HPPlotterDD.run                                    ]
  Port ([ptr]xx[lpt]xx) [[ptr] b]          Location [              ]
  Font Device Type [            ]          Banner Pages [ No, Yes ]
  Transmit Time Out [ 15 ]                 Printing Process Priority [ 133 ]
  Normal Print Job Parameters: [     ]     Expand Tab Size [ 8 ]
  New Line Map Mode: [ Lf, Cr, CrLf ]      Chars Per Line [ 85 ]
  [ptr]xxParameters _____
  Baud Rate [ 2400 ]    Line Control Mode [ None, XonXoff, CTS, Both ]
  Data Bits [ 8 ]       Stop Bits [ 1 ]    Parity: [ None, Even, Odd, 1, 0 ]

  Device Setup _____
  Printer:HP7470A  Pens:BkRd  Media:Paper
  Default Page Dimensions (inches) _____
  Length [ 11.0 ]          Top Border [      ]        Left Border [      ]
  Width  [ 8.5 ]           Bottom Border [      ]     Right Border [      ]
  Storage Allocation (1K units) _____
  Font/Graphics Work Area [ 20 ]          Output Buffer [ 0 ]

  [    ]  [    ]  [DevHelp] [DevSave]  [    ]  [    ]  [Admin] [Home]
```

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Figure 8-4. Sample Device Installation Form for Direct Printing With an HP7470A

Note that the *New Line Map Mode* field must be set to *Lf*.

Driver Run File

The *Driver Run File* field should display *[Sys]<Gps>HPPlotterDD.run*

Port Used

Any serial port or parallel port.

Font Device Type

The default font device type is HPPlotter.

Device Setup

Note: *Device Setup parameters common to all drivers are described in "Device Setup," in Table 4-6, in Section 4.*

The *Device Setup* field will accept the following keywords and values:

Keyword	Values	Default
Printer:	HP7475A, HP7550A HP7470A	HP7475A
Pens:	List of valid pen colors on the plotter	
Media:	Paper, Trans	Paper
Pause:	Yes, No	Yes

The format for the Device Setup field entries is

Printer:*printer type* Pens:*pen color* Media:*media type* Pause:*response*

For a description of the values, see "Explanation of Device Setup Parameters," below.

By default, each plotter displays the following:

The HP7470A displays

>   Printer:*HP7470A* Pens:*BkRd* Media:*Paper*

The HP7475A displays

>   Printer:*HP7475A* Pens:*BkRdOrGrBlVi* Media:*Paper*

The HP7470A displays

>   Printer:*HP7550A* Pens:*BkRdOrGrBlViYlBn* Media:*Paper*

Explanation of Device Setup Parameters

Printer: *printer type*	Identifies the type of plotter.
Pens: *pen color*	Informs the device driver of the pen color on the selected plotter. The default for each plotter is shown in Table 8-1, below.
	If you want to enter pen color parameters other than the defaults, you must always indicate two pens for the HP7470A plotter, six pens for the HP7475A plotter, and eight pens for the HP7550A plotter. You specify pens in increasing pen number order using a two-character mnemonic for each color. The acceptable mnemonics and the colors they represent are shown in Table 8-2, below.
Media: *media type*	Identifies the type of media, which can be paper or trans (for transparency). When printing on transparencies, the speed of the plotter is reduced to obtain a better image.
Pause: *response*	Indicates to the driver whether or not to pause before every new page. For plotters with automatic paper loading, you can disable the pause function by typing **Pause:No**

Table 8-1. Default Pen Colors for HP Plotters

Pen	HP7550A	HP7470A	HP7475A
1	Black	Black	Black
2	Red	Red	Red
3	Orange		Orange
4	Green		Green
5	Blue		Blue
6	Violet		Violet
7	Brown		
8	Yellow		

Table 8-2. Pen Color Mnemonics for HP Plotters

Mnemonic	Color	Mnemonic	Color
Bk	Black	Vi	Violet
Rd	Red	Yl	Yellow
Or	Orange	Bn	Brown
Gr	Green	Aq	Aqua
Bl	Blue	Rv	Red-Violet

Font Information

Although the HP plotter does not print text, it requires a font device type. Since all devices check the Font Database at installation time, any font device type known to the Font Database will do.

Status Codes

HP Plotter Device Driver Status Codes

Decimal Value	Meaning
15301	The type of printer indicated is not a valid printer name.
15302	The type of media indicated is not a valid media string.
15303	The number of pens indicated is not correct for the plotter selected.
15304	The pen parameters are incorrect.
15305	The polygon sent to the driver is too complex. Reduce the complexity of the picture.
15306	The driver received too many polypoints. Reduce the complexity of the picture.

Cables and Switch Settings

This subsection contains device-specific information on cable connections and switch settings.

HP7470A, HP7475A, HP7550A

Cable Connections

If you do not have the appropriate cables, you can order them from your Unisys sales or marketing representative. Alternatively, you can connect a plotter to a serial port using a serial printer interface cable or to a parallel port using a Centronics-compatible cable. Both cables are described in "Cables," in Section 3.

Switch Settings

If the default settings are not appropriate, see the manual supplied with the plotter for more information.

Daisy Device Driver

Overview

The Daisy device driver has been tested and qualified on the following Unisys printers:

AP1302

AP1303

AP1305

AP1307

You can also use the Daisy device driver on the following non-Unisys printers:

Diablos 630 API-2

Diablo HPR05

Envision 420 Vector printer

Envision 430 VectorPrinter

NEC 3515

Qume Sprint 5

Qume Sprint 9

Qume Sprint 11/55

In addition, you can use the Daisy device driver on some laser printers that emulate the Diablo 630.

The Daisy device driver has the following capability:

Letter-quality text

Device Installation Information

Figure 8-5 displays a sample *Device Installation* form for a device that uses the Daisy device driver. For a detailed explanation of each field, see Table 4-6, in Section 4, "Installing GPS System Services."

```
Print Manager                    InstDD                        User: GPS
InstallerFile: [Sys]<Gps>GPS.Printers                 Wed Jan 23, 1991 8:05 AM

 Device Name [            ]        Queue Name [            ]
 Driver Run File [ [Sys]<Gps>DaisyDD.run                              ]
 Port ([ptr]xx[lpt]xx)  [[ptr] b]   Location [                  ]
 Font Device Type [                ]  Banner Pages [No, Yes]
 Transmit Time Out [ 60 ]           Printing Process Priority [133]
 Normal Print Job Parameters: [    ]  Expand Tab Size [ 8 ]
 New Line Map Mode: [Lf, Cr, CrLf]   Chars Per Line [ 85 ]
 [ptr]xxParameters ─────────────────────────────────────────
 Baud Rate [9600]    Line Control Mode [None, XonXoff, CTS, Both]
 Data Bits [ 8 ]     Stop Bits [ 1 ]   Parity: [None, Even, Odd, 1, 0]

 Device Setup ──────────────────────────────────────────────
 Printer:AP1305
 Default Page Dimensions (inches) ──────────────────────────
 Length [ 11.0 ]       Top Border [        ]    Left Border [   ]
 Width  [ 8.5 ]        Bottom Border [      ]   Right Border [  ]
 Storage Allocation (1K units) ─────────────────────────────
 Font/Graphics Work Area [ 6 ]      Output Buffer [ 0 ]

 [    ][    ][DevHelp][DevSave][    ][    ][Admin][Home]
```

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Figure 8-5. Sample Device Installation Form for Direct Printing With an AP1305

Notes:

1. *To install the AP1302 or AP1303, select AP1307 in DevHelp. Make sure the dip switches on your printers match the interface parameters on the* Device Installation *form.*

2. *When you install the Qume Sprint 11/55 printer, make sure the* Line Control Mode *field is set to CTS.*

Driver Run File

The *Driver Run File* field should display *[Sys]<Gps>DaisyDD.run*

Port Used

Any serial port or parallel port.

For the Diablo 630 API-2 and Envision printers, printer switches must be set differently depending on the port you use. For more information, see "Cables and Switch Settings," later in this section.

For the Qume Sprint 11/55, a different Qume connection and cable must be used for each type of port. For more information, see "Cables and Switch Settings," later in this section.

Font Device Type

The default font device type is Daisy. With the Font tool, you can generate distinct font device types, such as Diablo and NEC. For more information, see "Font Information," later in this section, and the *Using the Font Tool Manual.*

Device Setup

> **Note:** *Device Setup parameters common to all drivers are described in "Device Setup," in Table 4-6 in Section 4.*

The *Device Setup* field will accept the following keywords and values:

Keyword	Values	Default
Printer:	AP1305, AP1307, Diablo, Diablo630, QumeSprint9, Envision, NEC3515	AP1307
SheetFeeder: or Feed:	Ziyad200, Ziyad300 DiabloF32, DiabloF33, NecSingle, NecDual, BDT	None

The format for the *Device Setup* field entries is

Printer:*printer type* Sheetfeeder:*sheetfeeder type*

For a description of the values, see "Explanation of Device Setup Parameters," below.

Explanation of Device Setup Parameters

Printer:
printer type
Identifies the type of printer you are installing. By default, both the Qume Sprint 5 and Qume Sprint 11 printers display *QumeSprint9* as the printer type. This is not a typographical error.

If you have an AP1307 with a QumeSprint9 interface board, specify AP1305 as the printer type.

If you have an AP1307 with a Diablo interface, specify AP1307 as the printer type.

Sheetfeeder: *sheetfeeder type*	For the AP1305 and AP1307 printers, the sheetfeeder type is Diablo F32, Diablo F33, Ziyad 200, Ziyad 300, or BDT.
	For the Diablo 630 API-2 and Diablo HPR05, the sheetfeeder type is Diablo F32 or Diablo F33.
	For the Envision printers, no sheetfeeders are currently available.
	For the NEC3515, the sheetfeeder type is NecSingle or NecDual.
	For the Qume 5, Qume 9, and Qume 11/55, the sheet feeder type is Ziyad200 or Ziyad300.

Font Information

This subsection assumes that you are familiar with certain general principles of the Font Database, which are discussed in detail in the *Using the Font Tool Manual.*

As mentioned earlier, the default font device type for the Daisy device driver is *Daisy.* If you have several different types of daisy wheel printers, with different wheels available for each, you should generate a database with distinct font device types, such as *Diablo* and *NEC.* The device types that are created have appropriate reductions for various general font descriptions and correct character translations for the actual wheels for each printer. When you install each device, you should specify the correct value in the *Font Device Type* field of the *Device Installation* form. This principle holds for other device drivers as well.

The Daisy device driver parses the font key alias for the following two reasons:

1. To determine the cartridge or print wheel to be loaded (through operator intervention).

2. To find and transmit to the device any escape sequences.

The alias is divided into tokens, delimited by spaces. Any token that starts with $\backslash E$ (or $\backslash e$) is assumed to be an escape sequence. $\backslash E$ represents the escape character, and it can occur several times in the escape sequence. All other tokens are assumed to be parts of a cartridge or print wheel name. If the wheel (or cartridge) name is present in a font key alias, and if that name is different from the wheel name last requested, that name will be used to prompt the printing device operator to install the desired cartridge or print wheel. If no such name is present, it is assumed that any print wheel or cartridge is acceptable, no prompt is issued, and the record of the last mounted print wheel or cartridge is unchanged.

The Font Database contains fonts for the daisy device in three font families:

- Courier

- CourierWP

- Cubic PS 96

12 point Courier calls for a 10 pitch Courier wheel, while 10 point Courier calls for an *Elite* (12 pitch) wheel.

CourierWP is similar to Courier, except that wheels with Word Processing symbols (such as the section symbol, §) are requested first, instead of standard ASCII wheels. This family can be eliminated from the Font Database, if you want to adopt a set of wheels differentiated only by font and not by character set differences.

Cubic PS 96 is a proportional font family, present in the Font Database in only a single size and style.

The "pseudo family" feature of the Font Database serves to map from the old wheel-set names (distinct by size and style as well as by family) to the appropriate font descriptions, including font family and type size. For example, a pseudo family in the standard database maps Elite 12 to 10 point Courier. The current Font Database supports all the print wheels available through some of the earlier word processing products. The Font Tool has a utility to add information to the Font Database from Word Processor wheel set files. Consult the *Using the Font Tool Manual* for the details of this conversion process.

Status Codes

Daisy Device Driver Status Codes

Decimal Value	Meaning
15300	An unrecognized printer type was entered after the keyword Printer:
15301	An unrecognized sheetfeeder type was entered after the keyword SheefFeeder: or Feed::

Cables and Switch Settings

This subsection contains device-specific information on cable connections and switch settings.

AP1302, AP1303, AP1305 and AP1307

Cable Connections

If you do not have the appropriate cables, you can order them from your Unisys sales or marketing representative. Alternatively, you can connect a printer to a serial port using a serial printer interface cable or to a parallel port using a Centronics-compatible cable. Both cables are described in "Cables," in Section 3.

Switch Settings

If the default settings are not appropriate, see the documentation supplied with the printers.

Diablo 630 API-2

Cable Connections

To connect the printer to the serial port, the cable that comes with the Diablo 630 API must be modified to work with all applications. The Diablo API-2 printer will function in serial mode using an RS-232-C cable from Diablo (shown in Figure 8-6), modified as shown in Figure 8-7.

For parallel printing, the Centronics-compatible cable (available from Diablo) must be used with an additional standard (36- to 25-pin) Centronics cable. The Centronics cable is described in "Cables," in Section 3.

```
Workstation              Printer

    1  ————————————  22

    2  ————————————  24

    3  ————————————  48

    4  ————————————  23

    5            no connection

    6  ————————————  49

    7  ————————————  47

    8

   20  ————————————  25
```

159.8−6
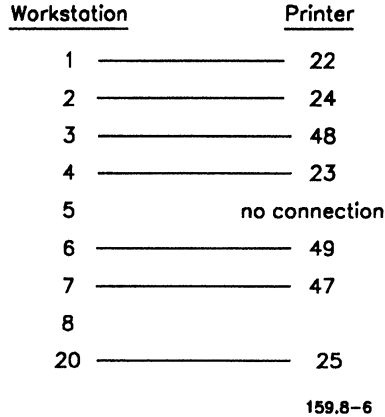
Figure 8-6.   Original RS-232-C Cable Pinouts for Diablo 630 API-2

```
Workstation              Printer

    1  ————————————  22

    2  ————————————  48

    3  ————————————  24

    4  ┐
        │
    5  ┘

    6  ┐
        ├————————————  25
    8  ┘

    7  ————————————  47

   20  ————————————  49
```

159.8−7
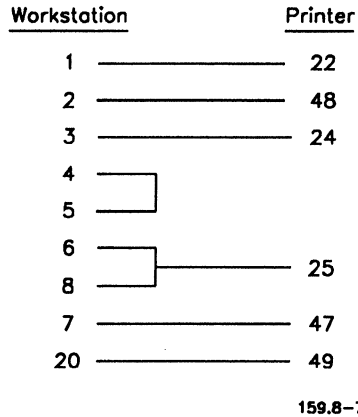
Figure 8-7.   Modified RS-232-C Cable Pinouts for Diablo 630 API-2

Switch Settings

Figure 8-8 shows the switches of the Diablo 630 API-2 printer.
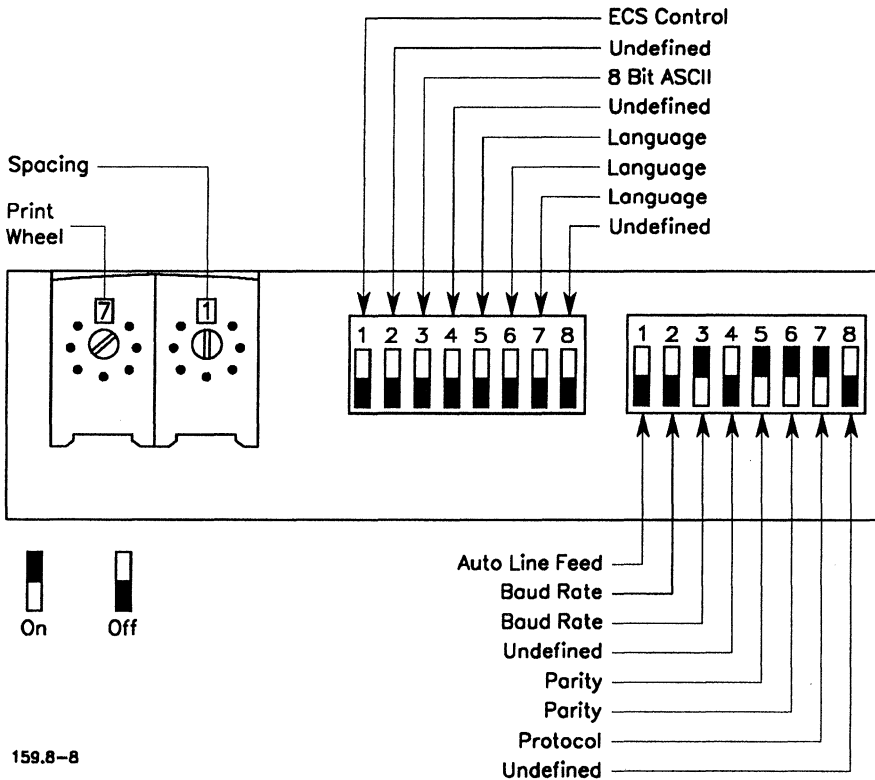
Figure 8-8. Diablo 630 API-2 Switches

Rotary Switches

Left   Set as documentation (Print wheel) inside the printer indicates for the print wheel: usually 7.

Right   *Always* set to 1, even if documentation (Spacing) inside the printer indicates otherwise.

Left Inside DIP Switches

1	ECS control	Off (On for extended character set)
2	Undefined	Off
3	8 Bit ASCII	Off
4	Undefined	Off
5	Language	Off
6	Language	Off
7	Language	Off
8	Undefined	Off

Right Inside DIP Switches

1	Auto Line Feed	Off
2	Baud rate	Off (Assumes 1200 baud)
3	Baud rate	On (Assumes 1200 baud)
4	Undefined	Off
5	Parity	On
6	Parity (Even)	On
7	Protocol	On
8	Undefined	Off

Diablo 630 HPR05

Cable Connections

The Diablo 630 HPR05 is connected to a serial port using a serial printer interface cable. (The serial printer interface cable is described in "Cables," in Section 3.)

In certain configurations of the Diablo 630 HPR05 serial printer, the Printer Ready signal is at pin 11 of the RS-232-C connector, rather than at pin 20. (The Printer Ready signal appears at pin 11 unless a jumper is installed between pins 5 and 6 of plug A60 on the HPR05 logic board. When the jumper is installed, the Printer Ready signal appears on pin 20.) If you're using the cable connection shown in Figure 8-9, but your printer is configured with the Printer Ready signal at pin 11, the result is that the signal never reaches the workstation, and data is not transmitted to the printer. If you encounter this problem, you can modify the printer end of the printer cable, as shown in Figure 8-10.

_____ **CAUTION** _____
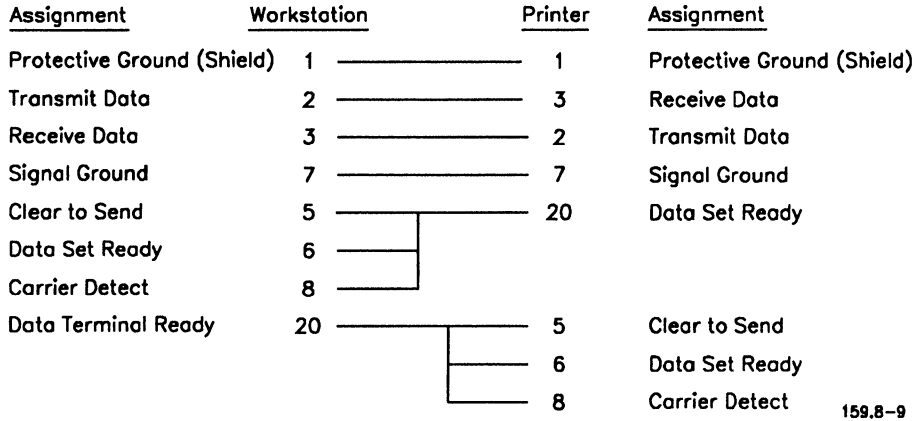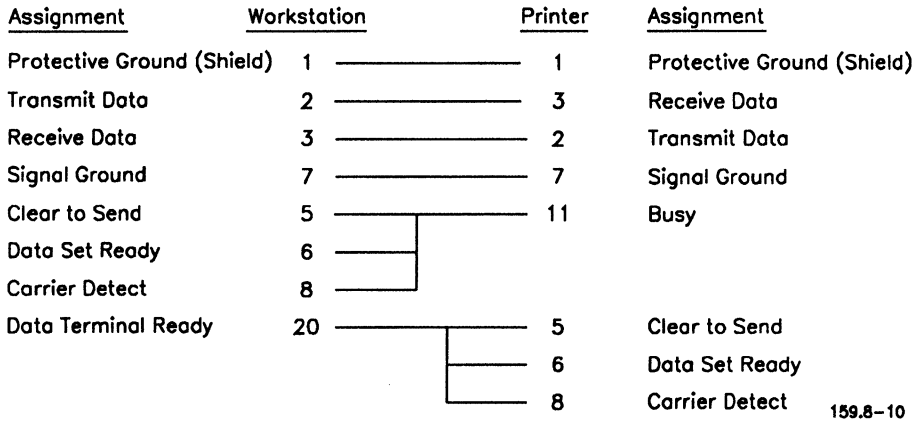
When you modify the printer cable, it becomes asymmetrical, and the proper end must be plugged into the proper device. Also, the modified cable may not work for all printer configurations. Therefore, both types of cables may be needed.

Assignment	Workstation		Printer	Assignment
Protective Ground (Shield)	1	————————	1	Protective Ground (Shield)
Transmit Data	2	————————	3	Receive Data
Receive Data	3	————————	2	Transmit Data
Signal Ground	7	————————	7	Signal Ground
Clear to Send	5	————	20	Data Set Ready
Data Set Ready	6			
Carrier Detect	8			
Data Terminal Ready	20	————————	5	Clear to Send
			6	Data Set Ready
			8	Carrier Detect

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Figure 8-9.   Original Cable Connection for the Diablo 630 HPR05 Serial Printer

Assignment	Workstation		Printer	Assignment
Protective Ground (Shield)	1	————————	1	Protective Ground (Shield)
Transmit Data	2	————————	3	Receive Data
Receive Data	3	————————	2	Transmit Data
Signal Ground	7	————————	7	Signal Ground
Clear to Send	5	————	11	Busy
Data Set Ready	6			
Carrier Detect	8			
Data Terminal Ready	20	————————	5	Clear to Send
			6	Data Set Ready
			8	Carrier Detect

159.8−10

**Figure 8-10.   Modified Cable Connection for the Diablo 630 HPR05 Serial
Printer**

Switch Settings

Switch settings for the HPR05 should be set as shown below. The settings are illustrated in Figure 8-11. Do not set the spacing switches to proportional, even if proportional print wheels are being used.

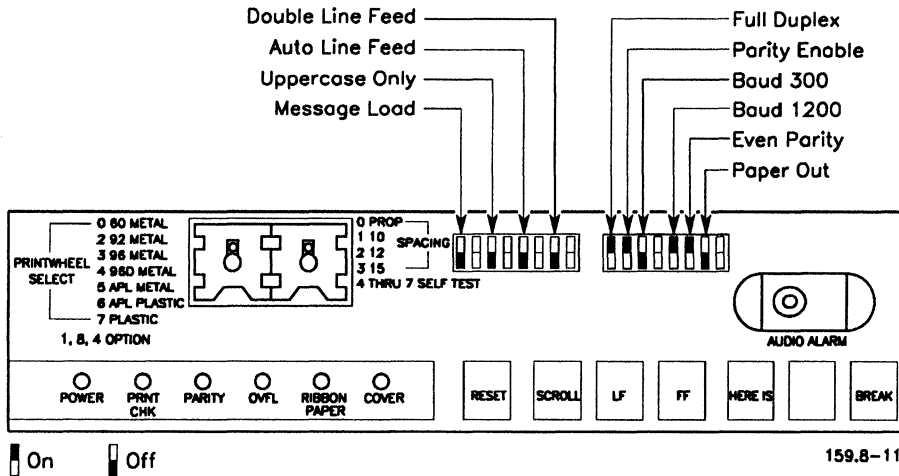| Print wheel select	Match print wheel in use
Double line feed	Off
Auto line feed	Off
Uppercase only	Off
Message load	Off
Full duplex	On
Parity enable	On
Baud 300	Off
Baud 1200	On
Even parity	On
Paper out	Off

**Figure 8-11. Diablo HPR05 Switches**

Envision 420 or Envision 430 Vector Printer

Cable Connections

To connect the Envision printer to a serial port, use a serial printer interface cable. To connect it to a parallel port, use a Centronics-compatible cable. Both cables are described in "Cables," in Section 3, "Connecting a Device."

Switch Settings

Note that the Envision must be in Diablo Emulation (text) mode. Figure 8-12 shows the front panel of the Envision printer and the switch settings you should use.

Visible Switches

Switches Beneath Cover

159.8-12
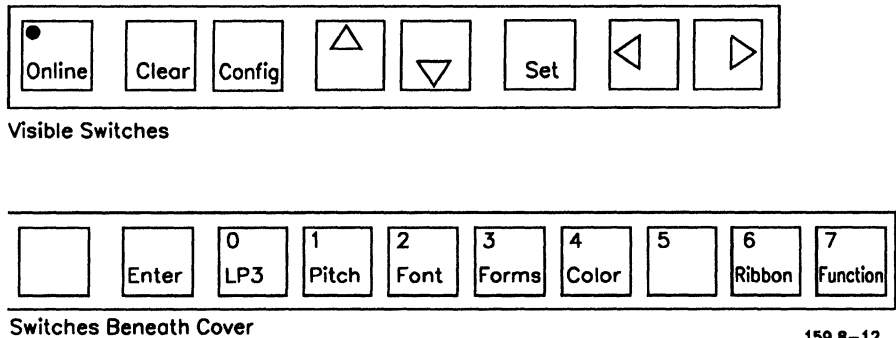
Figure 8-12. Envision Front Panel Switches

To set the Envision printer for serial printing, you must change the default Envision configuration. First, print a copy of the Envision default configuration when the printer is offline (see step 1 below). Then, set the front panel switches as shown below (see steps 2 through 4).

1. Print a copy of the default configuration, as follows:

    a. Press **Function-5-0-Enter**

    b. Press **Config**

2. Change the baud rate, as follows:

    a. Press **Function-1-1-Enter**

    b. Press **3-Enter**

3. Change the data bits, as follows:

    a. Press **Function-1-3-Enter**

    b. Press **3-Enter**

4. Change the parity, as follows:

    a. Press **Function-1-2-Enter**

    b. Press **1-Enter**

To set the printer for parallel printing, you need to change the default configuration from *serial* to *parallel*. To do so, follow these two steps:

1. Print a copy of the default configuration, as follows:

    a. Press **Function-5-0-Enter**

    b. Press **Config**

2. Change the setting, as follows:

    a. Press **Function-1-0-Enter**

    b. Press **1-Enter**

NEC 3515

Cable Connections

The NEC 3515 SpinWriter can be connected to the serial port using the serial printer interface cable with some modification, as shown in Figure 8-13. NEC uses a normally unused pin on the standard serial interface to indicate the state of the receive buffer. While a SpinWriter has room in its receive buffer, pin 19 of the standard serial interface is held high. Should this buffer become saturated, pin 19 is held low until more space becomes available. The cable modification shown in Figure 8-13 takes full advantage of this design.
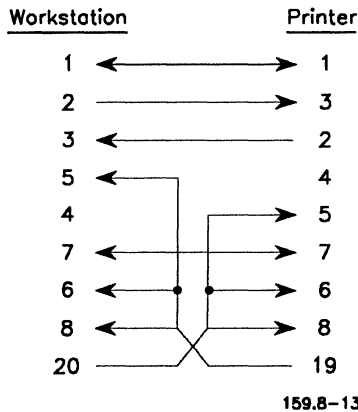

Figure 8-13. Cable Pinouts for the NEC 3515 Serial Connection

Switch Settings

Switch Set 1	Setting
Local LF	Down (line feed not automatic)
Even Parity	Up
Parity Check	Up
Full Duplex	Up

Switch Set 2	Setting
LF (8/6)	Down (6 lines per inch)
SP	Set according to print thimble. (See NEC documentation.)
SP	Set according to print thimble. (See NEC documentation.)
SP	Set according to print thimble. (See NEC documentation.)

Switch Set 3	Setting
PW Select	Set according to print thimble
PW Select	Set according to print thimble
Paper out	Down (halts when out)
Test	Down (no test)

Switch Set 4	Setting
1 Power On	Down
2 Form feed/Line feed	Down
3 Horizontal Tab Clear	Down
4 Auto Return	Down (no)
5 Protocol	Up (XON/XOFF)
6 Break/Interrupt	Down Break
7 Cut Sheet Guide	Down (Cut Sheet Guide only)
8 Error Monitor	Down

Figure 8-14 shows the switches of the NEC 3515 printer.

Power On
Form Feed/Line Feed
Horizontal Tab Clear
Auto Return
Protocol   Full Duplex
Break/Interrupt   Parity Check
Cut Sheet Guide   Even Parity
Error Monitor   Local LF

PW Select   SP
Paper Out   LF (8/6)
Test

Switch Up   Switch Down

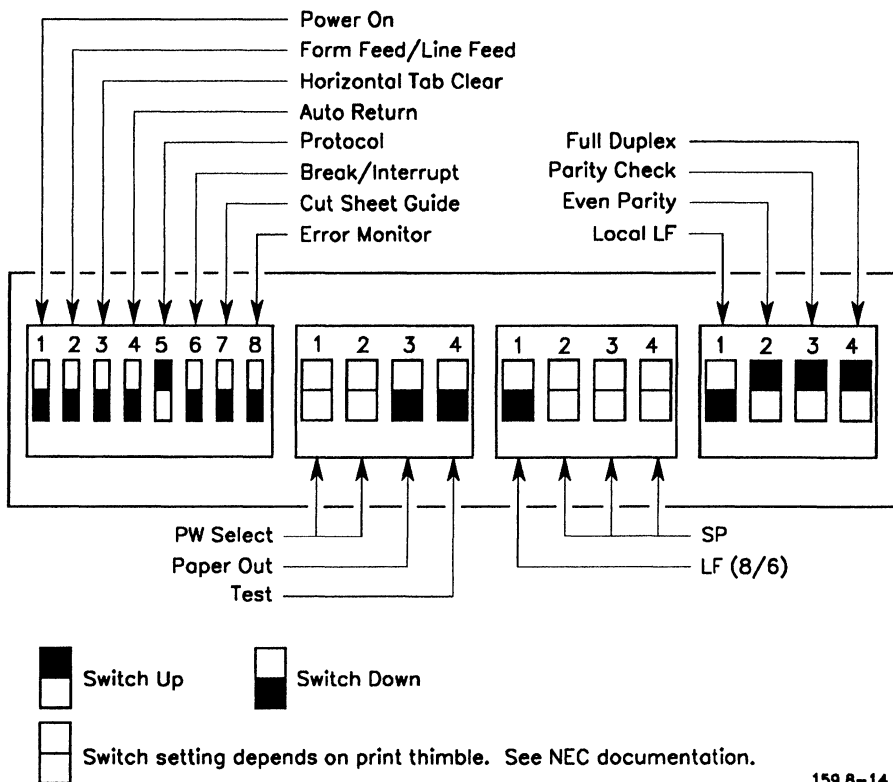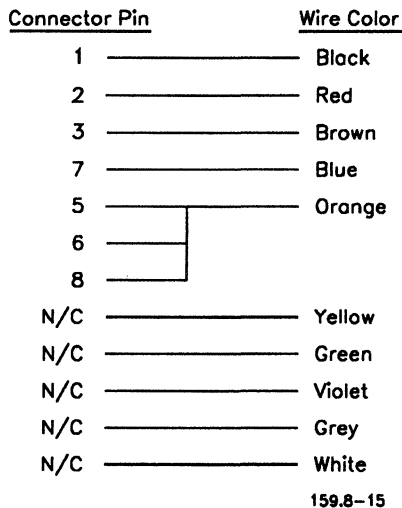Switch setting depends on print thimble. See NEC documentation.

159.8-14

Figure 8-14. NEC 3515 Front Panel Switches

Qume Sprint 5

Cable Connections

This printer must be connected by a serial printer interface cable such as the one described in "Cables" in Section 3. The serial interface option for the Qume Sprint 5 serial printer does not provide the standard female 25-pin D-type cable connector mounted on the back of the printer. (This connection is standard on the Qume Sprint 9 serial printer and on the Diablo HPR05.) Instead, the serial interface is a 10-conductor cable that is hardwired to the printer. The diagram in Figure 8-15 shows the proper way to connect the wires within the cable to a male 25-pin D-type connector to plug into one of the serial ports on the workstation.

Connector Pin	Wire Color
1	Black
2	Red
3	Brown
7	Blue
5	Orange
6	
8	
N/C	Yellow
N/C	Green
N/C	Violet
N/C	Grey
N/C	White

159.8-15

Figure 8-15. Modified Cable Connections for the Qume Sprint 5 Serial Printer

Newer versions of the Qume Sprint 5 support XON/XOFF handshaking; older versions do not. All versions support CTS protocol handshaking, provided you use the correct cable (see Figure 8-16). Check the documentation for your Sprint 5 to determine if it supports XON/XOFF handshaking protocol.
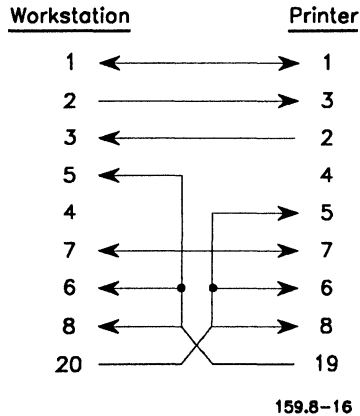

159.8-16

Figure 8-16. Cable Pinouts for the Qume Sprint 5 CTS Protocol Serial Cable

Switch Settings

Figure 8-17 shows the switches of the Sprint 5 printer. The WP/WPS switch found on some Qume printers should always be set to WP.
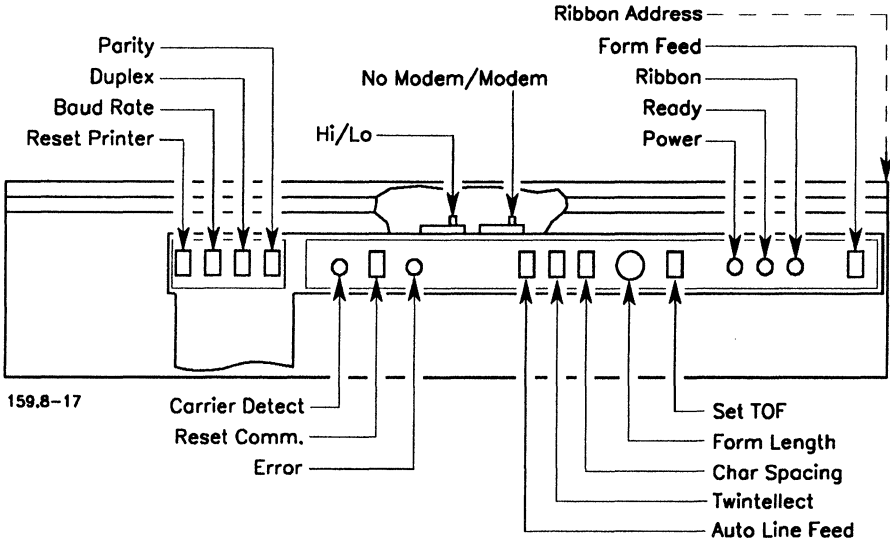

Figure 8-17. Qume Sprint 5 Switches

The Qume Sprint 5 contains three types of switches that you can change. They are described below.

Front Panel Switches

Baud rate	1200
Duplex	Full
Parity	Even
Auto linefeed	Off
Twintellect	Standard
Character spacing	10
Form length	11

Keyboard Switch

On-line	On

Inside Switches

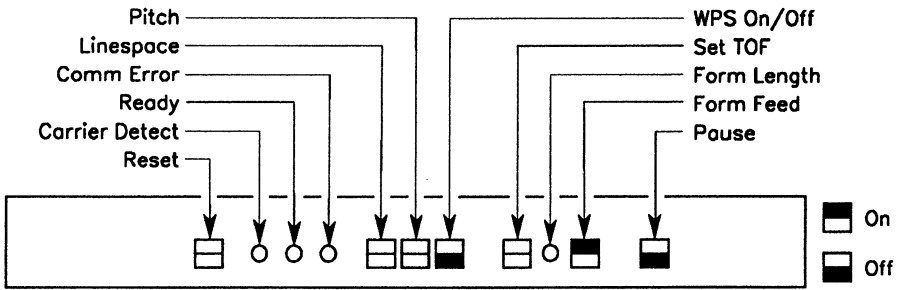|	
No modem	High (left)
Baud rate	High (left)

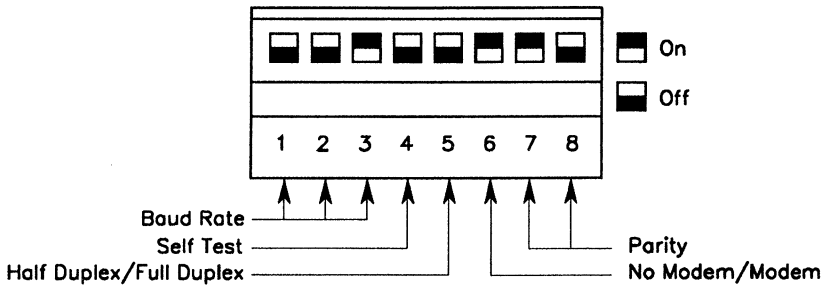## Qume Sprint 9

Cable Connections

This printer must be connected by a serial printer interface cable such as the one described in "Cables," in Section 3.
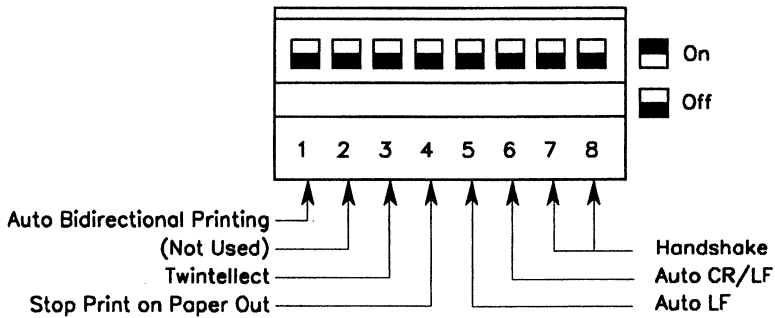
Switch Settings

Figure 8-18 shows the switches of the Sprint 9 printer. The WP/WPS switch found on some Qume printers should always be set to WP.

Pitch ——————————— WPS On/Off
Linespace ——————— Set TOF
Comm Error ——————— Form Length
Ready ————————— Form Feed
Carrier Detect ———— Pause
Reset

On

Off

Standard Front Panel

On

Off

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

Baud Rate
Self Test —————————— Parity
Half Duplex/Full Duplex —————— No Modem/Modem

"A" (Left Hand) Internal Front Panel Switches

On

Off

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

Auto Bidirectional Printing
(Not Used) —————————— Handshake
Twintellect —————————— Auto CR/LF
Stop Print on Paper Out —————— Auto LF

159.8-18   **"B" (Right Hand) Internal Front Panel Switches**

Figure 8-18.   Qume Sprint 9 Switches

Front Panel Switches

Linespace	3, 6, or 8 lines per inch
Pitch	10, 12, or 15 characters per inch
WPS	Off
Set TOF	Set top-of-form as needed
Form length	Set form length as needed
Form feed	On
Pause	Off

Internal Front Panel Switches

A8	Even parity	Off
A7	Even parity	On
A6	No modem	On
A5	Full duplex	Off
A4	Self test	Off
A3	1200 baud	On
A2	1200 baud	Off
A1	1200 baud	Off
B8	XON/XOFF	Off
B7	XON/XOFF	Off
B6	Auto CR/LF	Off
B5	Auto LF	Off
B4	Stop print on paper out	Off
B3	Twintellect	Off
B2	Not Used	
B1	Auto bidirectional printing	Off

Qume Sprint 11/55 Plus

Cable Connections

The Qume Sprint 11/55 Plus printer must be connected to the workstation using a Qume connection with the appropriate cable. You can use the Centronics-compatible Qume connection for parallel printing; you can use the RS-232-C Qume connection for serial printing. Provided you use the properly modified cable, you can also use CTS hardware protocol. For the correct pin assignments, see Figure 8-16, earlier in this section.

For serial printing with an RS-232-C Qume connection, set the connection switches as follows (see Figure 8-19).

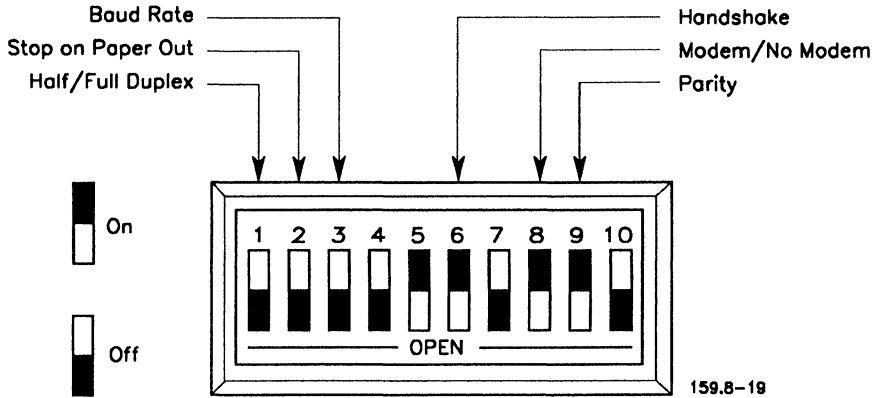|		
1	Half/Full Duplex	Off (full duplex)
2	Stop on Paper Out	Off
3	Baud rate	Off (1200 baud)
4		Off
5		On
6	Handshake	On (XON/XOFF)
7		Off
8	Modem/No Modem	On (No modem)
9	Parity	On (Even)
10		Off

Figure 8-19.   Qume Connection RS-232-C Switches

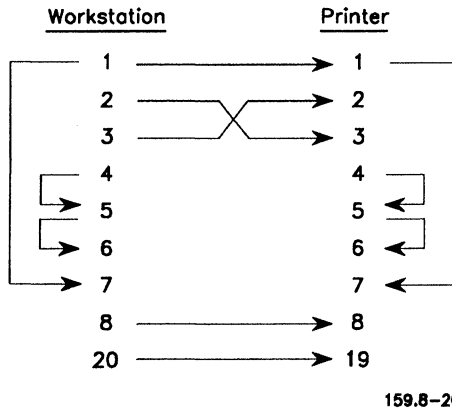The cable for the RS-232-C Qume connection is shown in Figure 8-20.

Figure 8-20.   Cable for Qume Sprint 11/RS-232-C

For parallel printing with a Centronics-compatible Qume connection, set the connection switches as shown below. (The switch settings are shown in Figure 8-21.) You need a standard 36-to-25 pin parallel interface cable for the Centronics-compatible Qume connection. (See "Cables," in Section 3.)

1	Inhibit Prime on select	On
2	Stop on Paper Out	Off
3	Auto Carriage	Off
4	Not Used	
5	Not Used	
6	Not Used	
7	Not Used	
8	Inhibit Delete	On
9	Inhibit Select/Deselect	On
10	Inverted Data Storage	Off
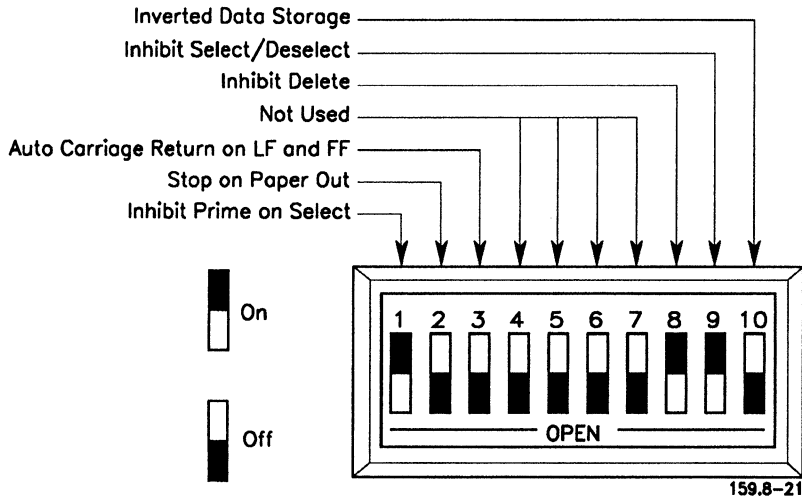
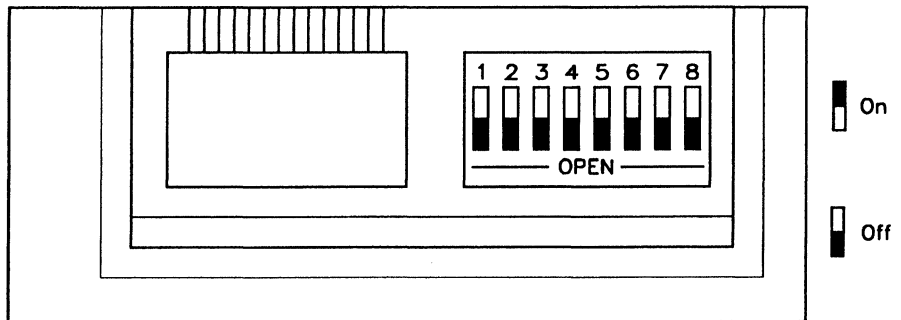Figure 8-21. Centronics-Compatible Qume Connection Switches

Switch Settings

Figures 8-22 shows the switches on the front of the Qume Sprint 11/55 Plus printer. Figure 8-23 show the switches on the back of the printer.
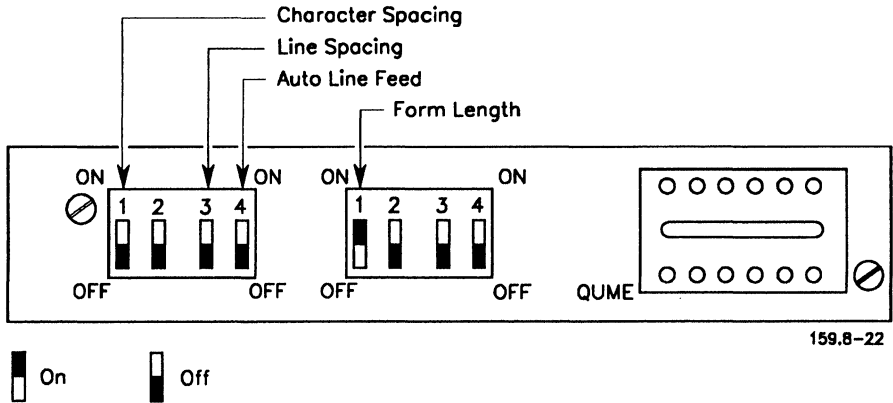
Figure 8-22.   Qume Sprint 11/55 Front DIP Switches

Some Qume Sprint 11/55 printers do not have inside front DIP switches.

Figure 8-23.   Qume Sprint 11/55 Back Switches

Internal Front DIP Switches

1	Character Spacing	Off (10 pitch)
2		Off
3	Line Spacing	Off (6 lpi)
4	Auto Line Feed	Off
1	Form length	On (11 inches)
2		Off
3		Off
4		Off

Back Switches

1	Reserved Twintellect	Off
2		Off
3	Twintellect German WP	Off
4	Reserved Twintellect	Off
5	Auto Bidi Print	Off
6	Auto CR/LF	Off
7	Not Used	Off
8		Off

Section 9
Laser Device Drivers

This section describes the following device drivers:

- AP Laser

- APV Laser

- HP LaserJet

- PCL5

- Imagen 8300

- PostScript

These device drivers have been tested and qualified to work with the devices described in this section. (Figure 9-1 lists the devices and the device drivers they use.)

Note that almost all Laser devices print from trays or bins that prevent the device from printing to the extreme edges of the page (top, bottom, left and right). These areas are called "dead zones," and you can adjust them by specifying a value in the border fields in the *Device Installation* form (see the "Default Page Dimension" subsection for each device driver, later in this section). Also, the point that the device uses for the origin may differ from device to device. GPS and GPAM use the top left corner of the page as (0,0). Some devices, such as the HP LaserJet, use a point approximately 1/4" from the left edge of the page as (0,0). Each device driver attempts to compensate for these "dead zone" margins and origin offsets.

The discussion on each device driver includes the following subsections, when applicable:

Overview   Lists the devices that use the driver.

Provides general information about the features of the driver.

Device   Displays a sample *Device Installation* form.
Installation
Information   Provides information on certain key entries in the *Device Installation* form, such as driver run file, ports used, font device type, and device setup entries.

Font   Discusses the font families implemented for the
Information   driver.

Discusses the alias field of the font key in the Font Database.

Explains how to modify the Font Database to use a different sets of fonts with each driver.

Status Codes   Lists and defines device-specific status codes. (For GPS status codes, see Section 11, "Troubleshooting.")

Cables and   Describes cable connections and switch settings for
Switch   each device.
Settings

*Note: When installing printers, use the Print Manager DevHelp command (**F4**). With DevHelp, the* Device Installation *form shows the default parameters for the selected device. For information on using DevHelp, follow steps 8 and 9 in "Steps for Installing GPS System Services," in Section 4.*

AP Laser Device Driver

> Used by the following printers:
> AP9206, AP9208, AP9215, AP9215-1, AP9230

APV Laser Device Driver

> Used by the following printer:
> AP9215-1.

HP LaserJet Device Driver

> Used by the following printers:
> AP9210, AP9310, AP9312, AP9316, LZ-5, LZ-12,
> HP LaserJet, HP LaserJet+, HP LaserJet 500,
> HP LaserJet Series II, HP LaserJet Series III,
> HP LaserJet Series 4. Also may be used by other
> Hewlett-Packard PCL language printers.

PCL5 Device Driver

> Used by the following printers:
> AP9310, AP9312, AP9316,
> HP LaserJet Series III, HP LaserJet Series 4

Imagen 8300 Device Driver

> Used by the following printers:
> Imagen IP2, Imagen IP3.
> Also may be used by other Impress
> language printers.

PostScript Device Driver

> Used by the following printers:
> AP9310, AP9312, AP9316, AP9415, QMS-PS800,
> T12115, LaserWriter, LaserWriter Plus,
> LaserWriter II NTX, AP9210 with PostScript card.
> Also may be used by other PostScript
> printers.

159.9-1

Figure 9-1.   Laser Device Drivers and Devices

AP Laser Device Driver

Overview

The AP Laser device driver has been tested and qualified on the following Unisys printers:

AP9206

AP9208

AP9215 and AP9215-1 (is treated as AP9215)

AP9230

The AP Laser device driver has the following capabilities:

- Letter-quality text

- Vector art

- Raster images

The AP Laser device driver supports all normal text attributes, such as bold and underline. It supports 6, 8, 15, and 30 page-per-minute printing and 75, 100, 150, and 300 dots-per-inch (dpi) graphics on all printers. It also maps shades of solid, halftone, and quarter-tone fill patterns to appropriate gray levels. Color printing is not available.

In addition, this driver supports two sheet feeder bins on the AP9215, AP9215-1, and AP9230 printers.

The amount of graphics area that may be printed on an AP9208 is limited by the amount of memory available on the device. The amount of graphics area that may be printed on an AP9215 is limited by the resolution of the graphics as well at the amount of memory available. A full page of graphics is supported only on the AP9215 at a low resolution (150 dots per inch). Otherwise, about half of a page of graphics may be printed.

Device Installation Information

> *Note:* *When installing the AP9215-1 with the AP Laser device driver,*
> *select* AP9215-1 (Laser) *from the DevHelp display.*

Figure 9-2 displays a sample *Device Installation* form for a device that
uses the AP Laser device driver. For a detailed explanation of each field,
see Table 4-6, in Section 4.

```
Print Manager                           InstDD                          User: GPS
InstallerFile: [Sys]<Gps>GPS.Printers                        Wed Jan 23, 1991 8:05 AM

 Device Name  [            ]          Queue Name  [            ]
 Driver Run File  [[Sys]<Gps>APLaserDD.run            ]
 Port ([ptr]xx[lpt]xx)  [[ptr] b]      Location  [            ]
 Font Device Type  [                ]  Banner Pages  [No, Yes]
 Transmit Time Out  [ 90 ]             Printing Process Priority  [133]
 Normal Print Job Parameters:  [    ]  Expand Tab Size  [ 8 ]
 New Line Map Mode:  [Lf, Cr, CrLf]    Chars Per Line  [85]
 [ptr]xxParameters
 Baud Rate  [9600]   Line Control Mode  [None, XonXoff, CTS, Both]
 Data Bits  [ 8 ]    Stop Bits  [ 1 ]   Parity:  [None, Even, Odd, 1, 0]

 Device Setup
 Printer:AP9208  Res:75
 Default Page Dimensions (inches)
 Length  [ 11.0 ]    Top Border  [    ]       Left Border  [    ]
 Width   [ 8.5 ]     Bottom Border  [    ]    Right Border  [    ]
 Storage Allocation (1K units)
 Font/Graphics Work Area  [20]         Output Buffer  [ 0 ]

 [    ][    ][    ][DevHelp][DevSave][    ][    ][    ][Admin][Home]
```

159.9-2

Figure 9-2. Sample Device Installation Form for Direct Printing
With an AP9208

Driver Run File

The *Driver Run File* field should display *[Sys]<Gps>APLaserDD.run*

Port Used

Any serial port or parallel port.

Font Device Type

The default font device type is AP9215. You must change this entry to reflect the printer you are using. For example, if you're installing an AP9208, enter **AP9208** as the font device type.

Device Setup

Notes:

1. *Device Setup parameters common to all drivers are described in "Device Setup," in Table 4-6, in Section 4.*

2. *The AP9206, AP9208, AP9215, and AP9215-1 have sheet feeder support. With the AP9215 and AP9215-1, you do not have to specify a sheet feeder in the* Device Setup *field. The default is the one selected on the printer control panel. If you want to select a specific bin, use the Page Attributes menu in OFIS Document Designer and specify the bin number in the* Sheet feeder *field.*

The *Device Setup* field will accept the following keywords and values:

Keyword	Values	Default
Printer:	AP9206, AP9208, AP9215, AP9215-1, AP9230	No default. Enter the printer model number in the *Device Setup* field. For example, for an AP9206 printer, enter **Printer:AP9206**; for an AP9208, enter **Printer:AP9208,** and so on. If you fail to make this entry, the printer may not operate properly. In fact, it may print random characters.
Resolution: Res:	75. 100, 150, 300	The default is 75. To change this value, enter: **Res:100** **Res:150** **Res:300**
Font:	Font family and point size	For Normal mode ASCII jobs only. The default is 12 point Courier. To change the value, enter it in this format: **Font:Courier[12]**
Sheetfeeder:	Yes, No	The default is No. To change the value, enter: **Sheetfeeder:Yes**
Collate:	Yes, No	The default is No. To have copies collated enter: **Collate:Yes** or simply **Collate:**

The format for the *Device Setup* field entries is

Printer:*printer type* Res:*resolution setting* Font:*FontFamily[PointSize]*

Sheetfeeder:*Sheetfeeder type* Collate:*response*

For a description of the values, see "Explanation of Device Setup Parameters," below.

Explanation of Device Setup Parameters

Printer: *printer type*	Identifies the type of printer you are installing.
Resolution: *resolution setting*	Informs the driver what resolution to use for graphics printing. (The previous use of *low* or *high* to select 150 or 300 dots per inch [dpi] graphics printing no longer applies.)
Font: *FontFamily[PointSize]*	For Normal mode ASCII jobs only (where **Normal:GPAM** is specified in the *Device Setup* field).
	Informs the driver what default font to use. (Use of a proportional font as the default is not supported.) If the font name has blanks, substitute a slash (/) for the blanks. For example, if the font name is Century School-book, type **Font:Century/Schoolbook[12]**
	If you do not enter a default font, 12 point Courier is used.
Sheetfeeder: *Sheetfeeder type*	When installing AP9206 and AP9208 printers with an auxiliary bin, type **Sheetfeeder:Yes**

Collate:*response*   By default, multiple copies of pages are uncollated. This means that all the duplicates of a particular page are printed together. (For example, if you're printing three copies of a document, you'll get three copies of the first page, followed by three copies of the second page, and so on.)

If you want the pages collated (duplicates of a particular page *are not* printed together), type **Collate:Yes** or **Collate:**

Default Page Dimensions

The default borders for the AP Laser Device Driver are the following "dead zone" margins:

Top Border .17	Left Border .17
Bottom Border .31	Right Border .25

When Printer:AP9208 is specified, the dead zones are modified as follows: .033 is added to the left border, .017 is added to the right border, and .021 is added to the top border.

The AP Laser device driver offsets the origin by .17 in the x direction and .16 in the y direction.

For more information on page dimensions for Laser device drivers, see the introductory discussion at the beginning of this section.

Font Information

The information in this subsection is useful if you want to customize font databases for the AP Laser driver. If you are not familiar with certain general principles of the Font Database, see the *Using the Font Tool Manual*.

Font Families

The following families have been defined for the AP Laser device driver:

Courier	Helvetica
Prestige	Line Printer
Gothic	Gothic Condensed
APBoldPS	OCR-A
Orator	OCR-B
BTOSCharSet	OCR-B Ext
Times	

Font Keys

Twenty-eight font keys have been defined for the font device type AP9206; nine font keys have been defined for the font device type AP9215. These font keys allow you to use the resident fonts on the printers in the point sizes available.

BTOSCharSet is a downloadable font provided in the file *[Sys]<Gps>BTOSCharSetDLF.Font*. Print this file to the printer in binary mode to define the font.

Character Sets

The following character sets have been provided:

AP9206cs	OCRA-06cs
AP9215cs	OCRB-06cs
APBoldFace	OCRBExt-06cs
B2x-cs	

Width Tables

The following width tables have been provided:

APBoldwt	Helv6-06wt
Helv10-06wt	Helv8-06wt
Helv12-06wt	Times10-06wt
Helv14-06wt	Times8-06

Translation Tables

The following translation tables are the first level tables for different character sets:

APBoldtt   OCRA-06tt
B2x-tb   OCRB-06tt
ctToAP9206   OCRBExt-06tt
ctToAP9215

ECS is the name of the second level translation table used for some character sets.

Font Alias

For the font alias, specify the font name in the alias string as it appears in the status printouts on the printer.

Status Codes

AP Laser Device Driver Status Codes

Decimal Value	Meaning
15300	The type of printer indicated is not a recognized string.
15301	The resolution indicated is not a valid resolution.
15302	Sheetfeeder value not valid.

Cables and Switch Settings

This subsection contains device-specific information on cable connections and switch settings.

AP9206, AP9208, AP9215, AP9230

Cable Connections

If you do not have the appropriate cables, you can order them from your Unisys sales or marketing representative. Alternatively, you can connect a printer to a serial port using a serial printer interface cable or to a parallel port using a Centronics-compatible cable. Both cables are described in "Cables," in Section 3.

Switch Settings

If the default settings are not appropriate, see the manual supplied with the printer for more information.

APV Laser Device Driver

Overview

The APV Laser device driver has been tested and qualified on the following printer sold by Unisys:

AP9215-1

The APV Laser device driver has the following capabilities:

- Letter-quality text

- Raster images

This driver supports all normal text attributes, such as bold and underline. It supports 15 page-per-minute printing and 300 dots per inch (dpi). It also maps shades of solid, halftone, and quarter-tone fill patterns to appropriate gray levels. Color printing is not available.

In addition, the APV Laser driver supports both sheet feeder bins on the AP9215-1 printer.

This driver does not rasterize the vector data (the AP Laser driver does), but it makes use of the rasterizing capability of the printer. Vector graphics is sent directly to the printer. Note that a polygon of more than 128 points cannot be filled. As a result, only the perimeter of the polygon is drawn and not the fill pattern.

Device Installation Information

> *Note:* When installing the AP9215-1, use the Print Manager DevHelp
> command **(F4)**, and select AP9215-1 (VLaser).

Figure 9-3 displays a sample *Device Installation* form for a device that
uses the APV Laser device driver. For a detailed explanation of each
field, see Table 4-6, in Section 4.

```
Print Manager                    InstDD                        User: GPS
InstallerFile: [Sys]<Gps>GPS.Printers              Wed Jan 23, 1991 8:05 AM

 Device Name  [                    ]       Queue Name  [          ]
 Driver Run File  [[Sys]<Gps>APVLaserDD.run                            ]
 Port ([ptr]xx[lpt]xx)  [[ptr] b]         Location  [                   ]
 Font Device Type    [              ]      Banner Pages  [No, Yes]
 Transmit Time Out  [ 90 ]                 Printing Process Priority [ 133 ]
 Normal Print Job Parameters: [     ]      Expand Tab Size  [ 8 ]
 New Line Map Mode: [ Lf, Cr, CrLf ]       Chars Per Line  [ 85 ]
 [ptr]xxParameters
 Baud Rate  [ 9600 ]   Line Control Mode  [ None, XonXoff, CTS, Both ]
 Data Bits  [ 8 ]      Stop Bits [ 1 ]    Parity: [ None, Even, Odd, 1, 0 ]
 Device Setup
 [                                                                    ]
 Default Page Dimensions (inches)
 Length  [ 11.0 ]      Top Border    [      ]    Left Border  [      ]
 Width   [ 8.5 ]       Bottom Border [      ]    Right Border [      ]
 Storage Allocation (1K units)
 Font/Graphics Work Area  [ 20 ]           Output Buffer [ 0 ]

 [    ][    ][    ][DevHelp][DevSave][    ][    ][    ][Admin][Home]
```

159.9-3

**Figure 9-3. Sample Device Installation Form for Direct Printing
With an AP 9215-1**

Driver Run File

The *Driver Run File* field should display *[Sys]<Gps>APVLaserDD.run*

Port Used

Any serial port or parallel port.

Font Device Type

The default font device type is AP9215.

Device Setup

Notes:

1. *Device Setup parameters common to all drivers are described in "Device Setup," in Table 4-6, in Section 4.*

2. *The APV Laser driver uses the parameter Font:FontFamily[PointSize] the same way the AP Laser driver does. (See "Device Setup" for the AP Laser driver, earlier in this section.)*

3. *The AP9215-1 has sheet feeder support; you do not have to specify a sheet feeder in the* Device Setup *field. The default is the one selected on the printer control panel. If you want to select a specific bin, use the Page Attributes menu in OFIS Document Designer and specify the bin number in the* Sheet feeder *field.*

Default Page Dimensions

The default borders for the APV Laser device driver are the following "dead zone" margins:

Top Border .17	Left Border .17
Bottom Border .31	Right Border .25

The APV Laser device driver offsets the origin by .17 in the x direction and .16 in the y direction.

For more information on page dimensions for Laser device drivers, see the introductory discussion at the beginning of this section.

Font Information

The font information for the AP and APV Laser drivers is the same, except the default font device type for the APV Laser driver is always AP9215. For a detailed discussion on fonts, see the subsection "Font Information," for the AP Laser device driver, earlier in this section.

Cables and Switch Settings

This subsection contains device-specific information on cable connections and switch settings.

AP9215-1

Cable Connections

If you do not have the appropriate cables, you can order them from your Unisys sales or marketing representative. Alternatively, you can connect the printer to a serial port using a serial printer interface cable or to a parallel port using a Centronics-compatible cable. Both cables are described in "Cables," in Section 3.

Switch Settings

If the default settings are not appropriate, see the manual supplied with the printer for more information.

HP LaserJet Device Driver

Overview

The HP LaserJet device driver has been tested and qualified on the following Unisys printers:

LZ-5

LZ-12

AP9210

AP9310

AP9312

AP9316

Note: *Unless indicated otherwise, the AP9310, AP9312, and AP9316 printers will be specified as AP9300 series.*

The HP LaserJet device driver has also been tested and qualified on the following Hewlett-Packard LaserJet printers:

HP LaserJet

HP-LaserJet+

HP LaserJet 500

HP LaserJet Series II

HP LaserJet Series lll

HP LaserJet Series 4

This driver has the following capabilities:

- Letter-quality text
- Vector art
- Sheet feeders
- Duplex printing
- Raster Images
- Downloadable fonts
- Resident scalable fonts
- Duplex printing
- Resolution setting 600x600 dpi (dots per inch) support

The HP LaserJet device driver translates print jobs into the Hewlett-Packard PCL language. It supports graphics and landscape printing.

The Font Database contains font device types for the resident fonts that are present on each of these printers.

This driver provides support for the replaceable cartridge font feature of the printer. It downloads fonts, as needed, if instructed by the Font Database or Scaling Font Service. It also maps shades of solid, halftone, and quarter-tone fill patterns to appropriate gray levels. In addition, the driver supports manual and paper tray selection for the HP LaserJet 500 and the 500-sheet auxiliary bin and automatic envelope feeder for the AP9210. If multiple copies are specified in a print job, the HP LaserJet driver is instructed to print each page the requested number of times, allowing the printer to run at full speed.

Device Installation Information

Figure 9-4 displays a sample *Device Installation* form for a device that uses the HP LaserJet device driver. For a detailed explanation of each field, see Table 4-6, in Section 4.

```
Print Manager                      InstDD                           User:  GPS
InstallerFile: [Sys]<Gps>GPS.Printers               Wed Jan 23, 1991 8:05 AM
┌──────────────────────────────────────────────────────────────────────────┐
│ Device Name [            ]          Queue Name [        ]                  │
│ Driver Run File  [Sys]<Gps>HPLaserJetDD.run                                │
│ Port ([ptr]xx[lpt]xx)  [ptr] b      Location [                    ]        │
│ Font Device Type [          ]       Banner Pages  No, Yes                  │
│ Transmit Time Out   90              Printing Process Priority  133         │
│ Normal Print Job Parameters: [    ] Expand Tab Size   8                    │
│ New Line Map Mode: Lf, Cr, CrLf     Chars Per Line   85                    │
│ [ptr]xxParameters                                                          │
│ Baud Rate  9600     Line Control Mode  None, XonXoff, CTS, Both            │
│ Data Bits   8       Stop Bits  1      Parity:  None, Even, Odd, 1, 0       │
│                                                                            │
│ Device Setup                                                               │
│ Sheetfeeder:HP500  Resolution:150                                         │
│ Default Page Dimensions (inches)                                           │
│ Length   11.0       Top Border [        ]     Left Border [        ]       │
│ Width    8.5        Bottom Border [      ]     Right Border [      ]       │
│ Storage Allocation (1K units)                                              │
│ Font/Graphics Work Area   20              Output Buffer   0                │
│                                                                            │
│ [    ][    ][    ]  DevHelp DevSave [    ][    ]  [    ] Admin Home         │
└──────────────────────────────────────────────────────────────────────────┘
```

159.9—4

**Figure 9-4. Sample Device Installation Form for Direct Printing
With an HP LaserJet 500**

Driver Run File

The *Driver Run File* field should display *[Sys]<Gps>HpLaserJetDD.run*

Port Used

Any serial port or parallel port.

Font Device Type

The default font device type is HPLaserJet.

The standard Font Database contains several other font device types for use with the HP LaserJet device driver, in addition to HpLaserJet.

HpDownLoad   Supports the "AD" downloadable font package from Hewlett-Packard (part number 33412AD). It provides fonts similar to Times and Helvetica in various styles and sizes (6, 8, 10, 12 and 14 point in 3 styles; and 18, 24, and 30 point in bold style).

LZ-5   Supports resident fonts on the LZ-5 printer (8 and 12 point Courier).

LZ-12   Supports resident fonts on the LZ-12 printer (8, 10, and 12 point Courier and 10 point Times).

HPScale   (Provided *only* by the Scaling Font Service.) Provides 35 fonts in 11 different families in a wide range of sizes. These fonts are scaled "on-the-fly" and downloaded to the printer as needed. The driver will use downloadable fonts entirely, except when 12 point Courier is required.

AP9300   Supports resident fonts on the AP9310, AP9312, and AP9316 printers.

HPLaserIII   Supports resident scalable fonts on the HP LaserJet Series III printers.

HPLaser4   Supports resident scalable fonts on the HP LaserJet Series 4 printers.

Downloadable and Resident Fonts

The HP LaserJet device driver supports downloadable and resident fonts. You can use the *Dir:* parameter in the *Device Setup* field to specify the location of the downloadable font files. For example, if you have placed font files in the *[D1]<DownLoadFont>* directory, specify **Dir:[d1]<DownLoadFont>** in the *Device Setup* field. Note that the *Dir:* parameter must include a volume name.

If no parameter is given, the device driver searches for files in the *[Sys]<Gps>* directory, which is the default.

Be aware that you may need to make changes in the Font Database and specify an appropriate font device type in order to use downloadable fonts. For example, you would type **HpDownLoad** in the *Font Device Type* field to use the AD soft font package from Hewlett-Packard.

For more information on fonts, see "Font Information," later in this subsection, and the *Using the Font Tool Manual*.

Device Setup

Note: The Device Setup parameters common to all drivers are described in "Device Setup," in Table 4-6, in Section 4.

The *Device Setup* field will accept the following keywords and values:

Keyword	Values	Default
Printer:	AP9210, AP9300, HPLaserlll	
Sheetfeeder: or Feed:	HP500, Ziyad	
Resolution: or Res:	75, 100, 150, 300, 600	300
Duplex:	1, 2, or 3	
Font:	Indicate font family and point size, such as Courier[10]	Courier[12]
Dir:	[vol]<dir> (to specify location of downloadable font files if other than the default)	[Sys]<Gps>

The format for the *Device Setup* field entries is

Printer:*Printer type* Sheetfeeder:*sheetfeeder type* Res:*resolution setting*

Sheetfeeder:*sheetfeeder type* Res:*resolution setting*

Duplex:*Duplex Off; Duplex Book-Bound; or Duplex Flip-Bound*

Font:*FontFamily[PointSize]*

Dir:*[vol]<dir>*

For a description of the values, see "Explanation of Device Setup Parameters," later in this subsection.

For the AP9210, the *Device Setup* field displays a resolution setting and the printer type (AP9210).

For the AP9300 series printers (AP9310, AP9312, AP9316), the *Device Setup* field displays a resolution setting and the printer type (AP9300).

Depending on the printer you are installing, the *Device Setup* field displays a default entry. These entries are as follows:

Printer	Default Device Setup Entry
HPLaserJet	Resolution:75
HPLaserJet+	Resolution:150
HPLaserJet 500	SheetFeeder:HP500 Resolution:150
HPLaserJet Series II	Printer:HPLaserII Resolution:300
HPLaserJet Series III	Printer:HPLaserIII Resolution:300
HPLaserJet Series 4	Printer:HPLaserIII Resolution:300
LZ-5	SheetFeeder:HP500 Resolution:150
LZ-12	SheetFeeder:HP500 Resolution:150
AP9210	Printer:AP9210 Resolution:300
AP9310	Printer:AP9300 Resolution:300
AP9312	Printer:AP9300 Resolution:300
AP9316	Printer:AP9300 Resolution:300

You can specify entries other than the defaults by selecting the desired resolution and sheet feeder when you press **F4** (DevHelp). Alternatively, you can type the desired resolution and sheet feeder in the *Device Setup* field. With the AP9210, if you are using the automatic envelope feeder, you specify a sheet feeder on the Page Attributes menu in OFIS Document Designer. In this case, you must select Bin 3. You must also specify Continuous feed, which is on the Print menu of these applications.

Explanation of Device Setup Parameters

Printer: *printer type*	By default, the AP9210 printer displays *Printer:AP9210*; the AP9310, AP9312, and AP9316 printers display *Printer:AP9300*.
	An HP LaserJet Series 4 or HP LaserJet Series III, displays *Printer:HPLaserIII*.
Sheetfeeder: *sheetfeeder type*	Identifies the type of sheet feeder.
	Note that for the HP LaserJet and HP LaserJet+, no sheet feeder entry is required unless you use a Ziyad sheet feeder. In this case you, should select *Sheetfeeder* when using DevHelp or type **Sheetfeeder:ziyad**
	The HP LaserJet Series II does not require a sheet feeder entry. The printer contains only one bin and cannot use either the Ziyad sheet feeder or the HP500 sheet feeder.
	The types of sheet feeders that can be used are summarized in a table later in this subsection.

Resolution:
resolution setting

Informs the driver what resolution setting (measured in dots per inch) to use for graphics printing. Two variables must be considered when you enter a value for resolution: the amount of memory provided by the device you are using, and the speed at which at which you want images to be printed.

For example, the more memory there is in the HP LaserJet, the greater the resolution you can get on the printed page. In general, documents are printed four times faster at 75 dpi than at 150 dpi. Likewise, documents printed at 150 dpi are printed four times faster than at 300 dpi.

The standard LaserJet contains very little memory (128K bytes); consequently, you can use the setting for 75 dpi only. It is likely that 100 dpi can be used for most images, but it is not recommended that you use anything higher.

The LaserJet+ contains more memory and can print a full page picture at 150 dpi. It can also print many smaller images at 300 dpi. The LaserJet Series II, without extended memory, is identical to the LaserJet+. With extended memory, the LaserJet Series II can print full-page images at 300 dpi.

When you set the resolution to a value that is higher than the printer can produce, the printer displays *20* in the status display and prints the image on two sheets of paper. When this happens, you should reinstall the printer, specifying a lower value for resolution.

Printer:
printer type

By default, the AP9210 printer displays *Printer:AP9210*; the AP9310, Ap9312, and AP9316 printers display *Printer:AP9300*.

An HP LaserJet Series 4 or HP LaserJet Series III, displays *Printer:HPLaserIII*.

Duplex:
Duplex Off
Duplex
Book-Bound
Duplex
Flip-Bound

Allows you to print one or both sides of the paper. If you do not specify a Duplex option, the job will be printed according to the printer panel settings.

To print on one side of the paper only, choose *Duplex Off* in DevHelp, or type **Duplex:1** in the *Device Setup* field. To print on on both sides of the paper choose *Duplex Book-Bound* or type **Duplex:2**. In this case, the top of each side of the page is the same. (This allows for hole punching or book binding.) To print on on both sides of the paper, choose *Duplex Flip-Bound* or type **Duplex:3**. In this case, the reverse side of the page is upside down. (This allows you to flip charts or notebooks that are bound across the top of the page.)

Font:
FontFamily
[PointSize]

For Normal mode ASCII jobs only (where **Normal:GPAM** is specified in the *Device Setup* field).

Informs the driver what default font to use. (Use of a proportional font as the default is not supported.) If the font name has blanks, substitute a slash (/) for the blanks. For example, if the font name is Century Schoolbook, type

Font:Century/Schoolbook[12]

If you do not enter a default font, 12 point Courier is used.

Dir:
Directory

You can specify the location of the downloadable font files if the *[Sys]<Gps>* default directory is not used.

For example, if you have placed font files in the *[D1]<DownLoadFont>* directory, specify **Dir:[d1]<DownLoadFont>**

HP LaserJet Sheet Feeders

Type of Printer	Bin 1	Bin 2	Bin 3
LaserJet	Internal bin	Internal bin	Envelope version, Manual feed slot
LaserJet+	Internal bin	Internal bin	Envelope version, Manual feed slot
LaserJet 500	Upper bin	Lower bin	Envelope version, Manual feed slot
LaserJet Series II	Upper bin	Lower bin	Envelope version, Manual feed slot
LaserJet Series III	Upper bin	Lower bin	Envelope version, Manual feed slot
LaserJet Series 4	Upper bin	Lower bin	Envelope version, Manual feed slot
AP9300 Eeries	Upper bin	Lower bin	Envelope version, Manual feed slot
LaserJet 500	Upper bin	Lower bin	Envelope version, Manual feed slot
Ziyad*	Internal bin	Uppermost external bin	Envelope feeder bin

* Ziyad sheet feeders can be used with the HP LaserJet and HP LaserJet+ printers.

The references to Bin 1, Bin 2, and Bin 3 are values you set from the Page Attributes menu in OFIS Document Designer.

Bin 1 selects the top or internal bin, *Bin 2* selects the bottom or first external bin, and *Bin 3* selects envelope feed. The Ziyad sheet feeder has an automatic envelope feeder that is used when Bin 3 is selected; on other printers the manual feed slot is used for envelopes. When the printer is ready to accept an envelope, it flashes *PE* on the display. Insert an envelope, and it is automatically accepted.

Page length is sent to the HP LaserJet so that it can check for the presence of the correct paper tray. For example, the HP LaserJet displays *UC* and *LL* and waits for the legal tray to be installed (assuming it isn't already installed) if a 14-inch page is printed. Dimensions of individual pages can be specified in OFIS Document Designer. Dimensions specified in the *Device Installation* form are applied to all ordinary ASCII (non-GPAM) documents.

If manual feed is requested in a print job (for example, in the *Paper feed* field of the OFIS Document Designer *Print menu* command form), the device driver does not pause. Instead, the printer displays *L* and *PF* on the display. Simply place paper in the manual feed slot. If you press the Continue key on the printer, it will take paper from the current bin.

Default Page Dimensions

The default borders for the HP Laser device driver are the following "dead zone" margins:

Top Border .20   Left Border .17
Bottom Border .20   Right Border .33

The HP LaserJet device driver offsets the x direction by .17. There is no offset in the y direction.

For more information on page dimensions for Laser device drivers, see the introductory discussion at the beginning of this section.

Font/Graphics Work Area

Printing of raster images and/or vector art requires buffer space. The amount required varies with the size of the raster image and the complexity of the scaling or vector art. You can adjust the amount of memory reserved for such buffers by changing the number in the *Font/Graphics Work Area* field. This number also determines the amount of memory available for font information. A document containing many fonts and scaled raster images and complex vector art requires that a larger Font/Graphics Work Area number be entered when you install the driver. Actually, a larger value in this field results in better performance when printing graphic objects of any type.

Font Information

The information in this subsection is useful if you want to customize font databases for the HP Laser Jet driver. If you are not familiar with certain general principles of the Font Database, see the *Using the Font Tool Manual*.

The default font device type for the LaserJet driver is HPLaserJet. The standard Font Database contains information allowing the immediate use of the HP font cartridges 92286A and 92286B. Font cartridge names (numbers) are included in the alias fields of the LaserJet font keys along with an escape sequence used to select the correct font.

Font Information for Adding a Downloaded Font

The alias is parsed according to the same rules as the alias for the Daisy driver, with the following additions:

/   The string that follows is the name of a portrait font file to download, if the page is printed in the portrait orientation.

-   The string that follows is the name of a landscape font file to download, if the page is printed in the landscape orientation.

\#   The string that follows is the name of a font file to download, regardless of the page orientation.

\+   The string that follows is the name of a font file to download. The character + will appear again in the file name. The + will be replaced with the letter *P* to access the portrait font file, and the letter *L* to access the landscape font file.

If the *Scale By Points* field is set to *yes* in the *Font Key* form, the alias will not be used *at all* by the device driver. Instead, the driver will obtain a scaled font from the Scaling Font Service to download. (The alias must contain the name of the outline file that will be scaled by the Scaling Font Service.)

The alias *must not* include the font orientation escape sequence (&10O or &11O). Orientation in GPS is determined by the order of page dimensions, not by font. Be careful to reference only those fonts that exist in the orientation required. If the requested font does not exist in the requested orientation, the text that is printed will be in the correct orientation but in the wrong font. The spacing of the text will likely be unacceptable since a different set of character widths will have been used by the printer than that which the application (for example, OFIS Document Designer) expected.

Font Information for Adding Fonts on a Font Cartridge

The editable Font Database contains width tables for many of the HP font cartridges. The 92286F font cartridge contains the same fonts as the 92286B cartridge, but the character widths are different. If the *F* widths are desired, the name of the width table in each corresponding font key should be changed.

Generally, there is a lot of overlap between which fonts are available on which cartridge, and it doesn't make much sense to change cartridges often. For this reason, the standard Font Database is configured to map the familiar font families (Times, Helvetica, and Courier) to the closest matching fonts on the most common cartridges. However, in environments using several font cartridges, it makes sense to name font families according to the cartridge (for example, TaxFonts for the 92886T cartridge) to ensure that each document selects from a set of related fonts on a single cartridge.

Status Codes

HP LaserJet Device Driver Status Codes

Decimal Value	Meaning
15300	The name used for the sheet feeder is not recognized in the *Device Setup* field.

Cables and Switch Settings

This subsection contains device-specific information on cable connections and switch settings.

Cable Connections

To connect the HP printer, the AP9210, or one of the AP9300 series printers to a serial port, use a serial printer interface cable. To connect a printer to a parallel port, use a Centronics-compatible cable. Both cables are described in "Cables," in Section 3.

To connect the LZ printer, use one of the peripherals cables supplied by Unisys. The model name, part number, length, and description of the cable end connections are given below.

Printer	Model	Part No.	Ft.	End Connectors
LZ-5 and LZ-12	PC600	99-06312	50	25-pin M/25-pin M serial
LZ-5 and LZ-12	PC630	99-06318	10	25-pin M/36-card edge parallel

Figures 9-5 and 9-6 illustrate serial cable connections and parallel cable connections, respectively.
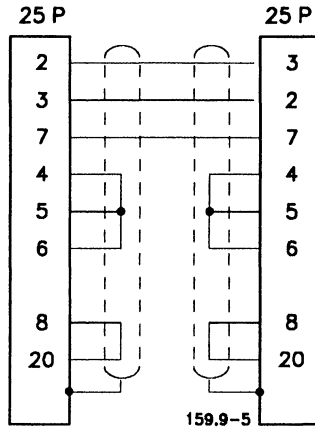
Figure 9-5. Serial Cable Pinouts for the LZ Printers

Switch Settings

The switches on the HP printers are located inside the back cover. Do not change the switch settings. If the switch positions have been changed, use the manual supplied with the printer to reset the switches.

For the LZ printers, use the control panel on the printer to set the switches if the default settings are not appropriate. For more information, see the manual supplied with the printer.

For the AP9210 and AP9300 series printers, see the manual supplied with the printer.

25 P   36 P

14 — 1
15 — 19
1 — 2
15 — 20
2 — 3
15 — 21
3 — 4
9 — 22
4 — 5
9 — 23
5 — 6
9 — 24
6 — 7
10 — 25
7 — 8
10 — 26
8 — 9
10 — 27
16 — 10
15 — 28
17 — 11
11 — 29
21 — 12
11 — 30
22 — 13
12 — 16

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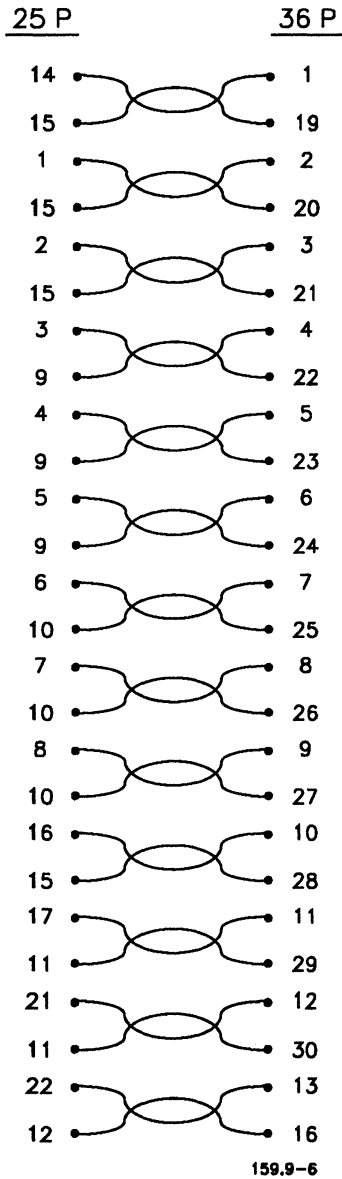
Figure 9-6. Parallel Cable Pinouts for the LZ Printers

PCL5 Device Driver

Overview

The PCL5 device driver has been tested and qualified on the following AP9300 series Unisys printers:

AP9310

AP9312

AP9316

Note: *Unless indicated otherwise, the AP9310, AP9312, and AP9316 printers will be specified as AP9300 series printers.*

The PCL5 device driver has also been tested and qualified on the following Hewlett-Packard LaserJet printers:

HP LaserJet Series III

HP LaserJet Series 4

This driver has the following capabilities:

- Letter-quality text
- Resident scalable fonts
- Raster Images
- Downloadable fonts
- HPGL support (for vector art)
- Duplex printing
- Sheet feeders
- Resolution setting 600 x 600 dpi (dots per inch) support

The PCL5 device driver translates print jobs into the Hewlett-Packard Control Language. It supports graphics and landscape printing.

The Font Database contains font device types for the resident fonts that are present on each of these printers.

This driver provides support for the replaceable cartridge font feature of the printer. It downloads fonts, as needed, if instructed by the Font Database or Scaling Font Service.

The PCL5 driver also maps shades of solid, halftone, and quarter-tone fill patterns to appropriate gray levels. In addition, the driver supports the 500-sheet auxiliary bin and automatic envelope feeder for the AP9300 series printers. If multiple copies are specified in a print job, the PCL5 driver is instructed to print each page the requested number of times, allowing the printer to run at full speed.

Device Installation Information

Figure 9-7 displays a sample *Device Installation* form for a device that uses the PCL5 device driver. For a detailed explanation of each field, see Table 4-6, in Section 4.

```
Print Manager                    InstDD                         User: GPS
InstallerFile: [Sys]<Gps>GPS.Printers              Wed Jan 23, 1991 8:05 AM

  Device Name [              ]        Queue Name [          ]
  Driver Run File [[Sys]<Gps>PCL5DD.run              ]
  Port ([ptr]xx[lpt]xx) [[ptr] b]     Location [              ]
  Font Device Type   [AP9300      ]   Banner Pages [No, Yes]
  Transmit Time Out [180]             Printing Process Priority [133]
  Normal Print Job Parameters: [    ] Expand Tab Size [8]
  New Line Map Mode: [Lf, Cr, CrLf]   Chars Per Line [85]
  [ptr]xxParameters
  Baud Rate [9600]    Line Control Mode [None, XonXoff, CTS, Both]
  Data Bits [8]    Stop Bits [1]    Parity: [None, Even, Odd, 1, 0]

  Device Setup
  [Printer: 9300  Res: 300                          ]
  Default Page Dimensions (inches)
  Length [11.0]       Top Border [      ]      Left Border [      ]
  Width  [8.5]        Bottom Border [      ]    Right Border [      ]
  Storage Allocation (1K units)
  Font/Graphics Work Area [20]           Output Buffer [0]

  [    ] [    ] [DevHelp] [DevSave] [    ]  [    ] [Admin] [Home]
```

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**Figure 9-7. Sample Device Installation Form for Direct Printing
With an AP 9300 Series Printer**

Driver Run File

The *Driver Run File* field should display *[Sys]<Gps>PCL5DD.run*

Port Used

Any serial port or parallel port.

Font Device Type

The default font device type is HpLaserIII.

The standard Font Database contains several other font device types for use with the PCL5 device driver, in addition to HpLaserIII.

HPDownLoad	Supports the "AD" downloadable font package from Hewlett-Packard (part number 33412AD). It provides fonts similar to Times and Helvetica in various styles and sizes (6, 8, 10, 12 and 14 point in 3 styles; and 18, 24, and 30 point in bold style).
HPScale	(Provided *only* by the Scaling Font Service.) Provides 35 fonts in 11 different families in a wide range of sizes. These fonts are scaled "on-the-fly" and downloaded to the printer as needed. The driver will use downloadable fonts entirely, except when 12 point Courier is required.
AP9300	Supports resident fonts on the AP9310, AP9312, and AP9316 printers.
HPLaserIII	Supports resident scalable fonts on the HP LaserJet Series III printers.
HPLaser4	Supports resident scalable fonts on the HP LaserJet Series 4 printers.

Downloadable and Resident Fonts

The PCL5 device driver supports downloadable and resident fonts. You can use the *Dir:* parameter in the *Device Setup* field to specify the location of the downloadable font files. For example, if you have placed font files in the *[D1]<DownLoadFont>* directory, specify **Dir:[d1]<DownLoadFont>** in the *Device Setup* field. Note that the *Dir:* parameter must include a volume name.

If no parameter is given, the device driver searches for files in the *[Sys]<Gps>* directory, which is the default.

Be aware that you may need to make changes in the Font Database and specify an appropriate font device type in order to use downloadable fonts. For example, you would type **HpDownLoad** in the *Font Device Type* field to use the AD soft font package from Hewlett-Packard.

For more information on fonts, see "Font Information," later in this subsection, and the *Using the Font Tool Manual*.

Device Setup

Note: The Device Setup parameters common to all drivers are described in "Device Setup," in Table 4-6, in Section 4.

The *Device Setup* field will accept the following keywords and values:

Keyword	Values	Default
Printer:	AP9300, HPLaserIII	
Resolution: or Res:	75, 100, 150, 300, 600	300
Duplex:	1, 2, or 3	
Font:	Indicate font family and point size, such as Courier[10]	Courier[12]
Dir:	*[vol]<dir>* (to specify location of downloadable font files if other than the default)	*[Sys]<Gps>*

The format for the *Device Setup* field entries is:

Printer:*Printer type* Res:*resolution setting*

Duplex:*Duplex Off; Duplex Book-Bound; or Duplex Flip-Bound*

Font:*FontFamily[PointSize]*

Dir:*[vol]<dir>*

For a description of the values, see "Explanation of Device Setup Parameters," later in this subsection.

For the AP9300 series printers (AP9310, AP9312, AP9316), the *Device Setup* field displays a resolution setting and the printer type (AP9300).

Depending on the printer you are installing, the *Device Setup* field displays a default entry. These entries are as follows:

Printer	Default Device Setup Entry
AP9310	Printer:AP9300 Resolution:300
AP9312	Printer:AP9300 Resolution:300
AP9316	Printer:AP9300 Resolution:300
HP LaserJet Series III	Printer:HPLaserIII Resolution:300
HP LaserJet Series 4	Printer:HPLaserIII Resolution:300

You can specify entries other than the defaults by selecting the desired resolution and sheet feeder when you press **F4** (DevHelp). Alternatively, you can type the desired resolution and sheet feeder in the *Device Setup* field. With the AP9300 series printers, if you are using the automatic envelope feeder, you specify a sheet feeder on the Page Attributes menu in OFIS Document Designer. In this case, you must select Bin 3. You must also specify *Continuous feed*, which is on the Print menu of these applications.

Explanation of Device Setup Parameters

Printer: *printer type*	By default, the AP9210 printer displays *Printer:AP9210*; the AP9310, Ap9312, and AP9316 printers display *Printer:AP9300*. An HP LaserJet Series 4 or HP LaserJet Series III, displays *Printer:HPLaserIII*.
Resolution: *resolution setting*	Informs the driver what resolution setting (measured in dots per inch) to use for graphics printing. Two variables must be considered when you enter a value for resolution: the amount of memory provided by the device you are using, and the speed at which at which you want images to be printed. For example, the more memory there is in the HP LaserJet, the greater the resolution you can get on the printed page. In general, documents are printed four times faster at 75 dpi than at 150 dpi. Likewise, documents printed at 150 dpi are printed four times faster than at 300 dpi. The standard LaserJet contains very little memory (128K bytes); consequently, you can use the setting for 75 dpi only. It is likely that 100 dpi can be used for most images, but it is not recommended that you use anything higher. When you set the resolution to a value that is higher than the printer can produce, the printer displays *20* in the status display and prints the image on two sheets of paper. When this happens, you should reinstall the printer, specifying a lower value for resolution.

Duplex: *Duplex Off* *Duplex Book-Bound* *Duplex Flip-Bound*	Allows you to print one or both sides of the paper. If you do not specify a Duplex option, the job will be printed according to the printer panel settings. To print on one side of the paper only, choose *Duplex Off* in DevHelp, or type **Duplex:1** in the *Device Setup* field. To print on both sides of the paper, choose *Duplex Book-Bound* or type **Duplex:2**. In this case, the top of each side of the page is the same. (This allows for hole punching or book binding.) To print on both sides of the paper, choose *Duplex Flip-Bound* or type **Duplex:3**. In this case, the reverse side of the page is upside down. (This allows you to flip charts or notebooks that are bound across the top of the page.)
Font: *FontFamily* *[PointSize]*	For Normal mode ASCII jobs only (where **Normal:GPAM** is specified in the *Device Setup* field). Informs the driver what default font to use. (Use of a proportional font as the default is not supported.) If the font name has blanks, substitute a slash (/) for the blanks. For example, if the font name is Century Schoolbook, type the following: **Font:Century/Schoolbook[12]** If you do not enter a default font, 12 point Courier is used.
Dir: *Directory*	You can specify the location of the downloadable font files if the *[Sys]<Gps>* default directory is not used. For example, if you have placed font files in the *[D1]<DownLoadFont>* directory, specify **Dir:[d1]<DownLoadFont>**

HP LaserJet Sheet Feeders

Type of Printer	Bin 1	Bin 2	Bin 3
LaserJet Series III	Upper bin	Lower bin	Envelope version, Manual feed slot
LaserJet Series 4	Upper bin	Lower bin	Envelope version, Manual feed slot
AP9300 series	Upper bin	Lower bin	Envelope version, Manual feed slot

The references to Bin 1, Bin 2, and Bin 3 are values you set from the Page Attributes menu in OFIS Document Designer.

Bin 1 selects the top or internal bin, *Bin 2* selects the bottom or first external bin, and *Bin 3* selects envelope feed. The Ziyad sheet feeder has an automatic envelope feeder that is used when Bin 3 is selected; on other printers the manual feed slot is used for envelopes. When the printer is ready to accept an envelope, it flashes *PE* on the display. Insert an envelope, and it is automatically accepted.

Page length is sent to the HP LaserJet so that it can check for the presence of the correct paper tray. For example, the HP LaserJet displays *UC* and *LL* and waits for the legal tray to be installed (assuming it isn't already installed) if a 14-inch page is printed. Dimensions of individual pages can be specified in OFIS Document Designer. Dimensions specified in the *Device Installation* form are applied to all ordinary ASCII (non-GPAM) documents.

If manual feed is requested in a print job (for example, in the *Paper feed* field of the OFIS Document Designer *Print Menu* command form), the device driver does not pause. Instead, the printer displays *L* and *PF* on the display. Simply place paper in the manual feed slot. If you press the Continue key on the printer, it will take paper from the current bin.

Default Page Dimensions

The default borders for the PCL5 device driver are the following "dead zone" margins:

Top Border .20	Left Border .17
Bottom Border .20	Right Border .33

The PCL5 device driver offsets the x direction by .17. There is no offset in the y direction.

For more information on page dimensions for PCL5 device drivers, see the introductory discussion at the beginning of this section.

Font/Graphics Work Area

Printing of raster images and/or vector art requires buffer space. The amount required varies with the size of the raster image and the complexity of the scaling or vector art. You can adjust the amount of memory reserved for such buffers by changing the number in the *Font / Graphics Work Area* field. This number also determines the amount of memory available for font information. A document containing many fonts and scaled raster images and complex vector art requires that a larger Font/Graphics Work Area number be entered when you install the driver. Actually, a larger value in this field results in better performance when printing graphic objects of any type.

Font Information

The information in this subsection is useful if you want to customize font databases for the PCL5 driver. If you are not familiar with certain general principles of the Font Database, see the *Using the Font Tool Manual*.

The default font device type for the PCL5 driver is HPLaserIII.

Font Information for Adding a Downloaded Font

The alias is parsed according to the same rules as the alias for the Daisy driver, with the following additions:

/   The string that follows is the name of a portrait font file to download, if the page is printed in the portrait orientation.

-    The string that follows is the name of a landscape font file to download, if the page is printed in the landscape orientation.

\#   The string that follows is the name of a font file to download, regardless of the page orientation.

\+   The string that follows is the name of a font file to download. The character + will appear again in the file name. The + will be replaced with the letter P to access the portrait font file, and the letter L to access the landscape font file.

If the *Scale By Points* field is set to *yes* in the *Font Key* form, the alias will not be used *at all* by the device driver. Instead, the driver will obtain a scaled font from the Scaling Font Service to download. (The alias must contain the name of the outline file that will be scaled by the Scaling Font Service.)

The alias *must not* include the font orientation escape sequence (&10O or &11O). Orientation in GPS is determined by the order of page dimensions, not by font. Be careful to reference only those fonts that exist in the orientation required. If the requested font does not exist in the requested orientation, the text that is printed will be in the correct orientation but in the wrong font. The spacing of the text will likely be unacceptable since a different set of character widths will have been used by the printer than that which the application (for example, OFIS Document Designer) expected.

Font Information for Adding Fonts on a Font Cartridge

The editable Font Database contains width tables for many of the HP font cartridges. The 92286F font cartridge contains the same fonts as the 92286B cartridge, but the character widths are different. If the *F* widths are desired, the name of the width table in each corresponding font key should be changed.

Generally, there is a lot of overlap between which fonts are available on which cartridge, and it doesn't make much sense to change cartridges often. For this reason, the standard Font Database is configured to map the familiar font families (Times, Helvetica, and Courier) to the closest matching fonts on the most common cartridges. However, in environments using several font cartridges, it makes sense to name font families according to the cartridge (for example, TaxFonts for the 92886T cartridge) to ensure that each document selects from a set of related fonts on a single cartridge.

Status Codes

PCL5 Device Driver Status Codes

Decimal Value	Meaning
15300	The name used for the sheet feeder is not recognized in the *Device Setup* field.

Cables and Switch Settings

This subsection contains device-specific information on cable connections and switch settings.

Cable Connections

To connect an HP printer or one of the AP9300 printers to a serial port, use a serial printer interface cable. To connect a printer to a parallel port, use a Centronics-compatible cable. Both cables are described in "Cables," in Section 3.

Switch Settings

The switches on the HP printers are located inside the back cover. Do not change the switch settings. If the switch positions have been changed, use the manual supplied with the printer to reset the switches.

For the AP9300 series printers, see the manual supplied with the printer.

Imagen8300 Device Driver

Overview

The Imagen8300 device driver has been tested and qualified on the following Imagen laser printers:

Imagen IP2

Imagen IP3

The Imagen8300 device driver has the following capabilities:

- Letter-quality text

- Vector art

- Raster images

This driver translates print jobs into the Impress page definition language. It supports the typographic fonts available for Imagen printers.

The Imagen8300 device driver can print in either portrait or landscape page orientation, and can support manual feed of paper or envelopes through the printer's rear paper feed. It maps colors of solid, halftone, and quarter-tone fill patterns to appropriate gray levels. If multiple copies are specified in a print job, the Imagen is instructed to print each page the requested number of times, allowing the printer to run at full speed.

Device Installation Information

Figure 9-8 displays a sample *Device Installation* form for a device that uses the Imagen8300 device driver. For a detailed explanation of each field, see Table 4-6, in Section 4.

```
Print Manager                    InstDD                      User: GPS
InstallerFile: [Sys]<Gps>GPS.Printers            Wed Jan 23, 1991 8:05 AM

  Device Name [            ]          Queue Name [            ]
  Driver Run File  [[Sys]<Gps>Imagen8300DD.run                        ]
  Port ([ptr]xx[lpt]xx) [[ptr] b]     Location [            ]
  Font Device Type [            ]     Banner Pages  [No, Yes]
  Transmit Time Out [ 90 ]            Printing Process Priority [133]
  Normal Print Job Parameters: [    ] Expand Tab Size  [ 8 ]
  New Line Map Mode: [Lf, Cr, CrLf]   Chars Per Line   [85]
  [ptr]xxParameters
  Baud Rate [9600]   Line Control Mode  [None, XonXoff, CTS, Both]
  Data Bits  [ 8 ]   Stop Bits [ 1 ]   Parity:  [None, Even, Odd, 1, 0]

  Device Setup
  IP2
  Default Page Dimensions (inches)
  Length  [11.0]        Top Border    [      ]   Left Border  [      ]
  Width   [ 8.5]        Bottom Border [      ]   Right Border [      ]
  Storage Allocation (1K units)
  Font/Graphics Work Area  [20]          Output Buffer [ 0 ]

  [    ][    ][    ] [DevHelp][DevSave][    ][    ] [Admin][Home]
```

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**Figure 9-8. Sample Device Installation Form for Direct Printing
With an Imagen IP2**

Note: *You can dramatically reduce printing time by using the preraster-ization procedure described in the Imagen documentation. In fact, you should always use this procedure. Prerasterization should be set to ON.*

You can use the Imagen Console for the Configurator, or you can set up the Basic Asynchronous Terminal Emulator (Basic ATE) to interface with the Imagen. See the *CTOS Basic Asynchronous Terminal Emulator User's Guide* and the Imagen documentation to do this. Basic ATE parameters should be set to the following values:

Parameter	Setting
Baud Rate	9600
Parity	None
Stop Bits	1
Data Bits	8
Transmit Time Out	None
Send XON/XOFF?	Yes

Driver Run File

The *Driver Run File* field should display *[Sys]<Gps>Imagen8300DD.run*

Port Used

Any serial port or parallel port.

Font Device Type

The default font device type is Imagen.

Device Setup

Note: *The Device Setup parameters common to all drivers are described in "Device Setup," in Table 4-6, in Section 4.*

Depending on the printer you are installing, the *Device Setup* field should display one of the following default entries:

IP2 for the Imagen IP2

IP3 for the Imagen IP3

The default is Imagen IP3.

The *Device Setup* field does not recognize the entry Normal:*processing mode*. This means that OFIS Writer and the Word Processor cannot print to the Imagen device driver.

You can specify a default font in the *Device Setup* field by specifying the keyword *Font:* followed by the font family name and point size. The point size is enclosed in square brackets. For example, to specify 10 point Courier, type **Font:Courier [10]**. Note that the use of a proportional font as the default is not supported. This is because most applications assume that all characters are the same width.

If the font name has blanks, substitute a slash (/) for the blanks. For example, if the font name is Century Schoolbook, type **Font:Century/Schoolbook [12]**

If you do not enter a default font, 12 point Courier is used.

Default Page Dimensions

The default borders for the Imagen8300 device driver are the following "dead zone" margins:

Top Border .25	Left Border .01
Bottom Border .25	Right Border .04

There are no offsets for the Imagen8300 device driver.

For more information on page dimensions for Laser device drivers, see the introductory discussion at the beginning of this section.

Font/Graphics Work Area

Printing of raster images and/or vector art requires buffer space. The amount required varies with the size of the raster image and the complexity of the scaling or vector art. You can adjust the amount of memory reserved for such buffers by changing the Font/Graphics Work Area number. This number also determines the amount of memory available for font information. A document containing many fonts and scaled raster images and complex vector art requires that a larger Font/Graphics Work Area number be entered when you install the driver. Actually, a larger value in the Font/Graphics Work Area results in better performance when printing graphic objects of any type.

Font Information

The information in this subsection is useful if you want to customize font databases for the Imagen8300 driver. If you are not familiar with certain general principles of the Font Database, see the *Using the Font Tool Manual*.

The default font device type for the Imagen driver is Imagen. The standard Font Database is built assuming that the optional Times and Helvetica font ROM is installed in the Imagen IP3. This provides Times and Helvetica in three styles (Roman, Bold, Italic) in a range of point sizes from 6 to 36 points. Courier is available in a range of point sizes from 7 to 14 points. Courier Bold is available in 10 and 12 point.

The editable Font Database includes font descriptions for font sizes that were not included in this font ROM, and for Lucida and Lucida Sans fonts. If a user has a different font ROM installed, or has assembled a font diskette for use with the IP2, the reduction table in the Font Database should be modified to map all font descriptions to those actually available. If these families are available, the entry in the *Gen?* field should be changed to *Yes* for Lucida and Lucida Sans font families. If differently configured Imagens are available in the same environment, more than one device type for Imagen should be created.

The font key alias for Imagen fonts contains the name of the font as it is known to the Imagen. This name usually consists of an abbreviation for the family name, followed by a letter indicating the style (r=roman, b=bold, and i=italic), followed by the size, strung together without spaces, such as *helvi18*.

It is possible to specify more fonts than the Imagen printer can print in a single document. This usually results in the text for the overflowed fonts appearing as white areas on the page. If the Imagen job header is enabled, status messages will be listed on a trailer page concerning the fonts that could not be defined and the glyphs (characters) that could not be printed. If this happens, the user should either (1) reduce the number of fonts used in the document or (2) divide the document into a number of smaller documents.

When canceling a job on the Imagen printer, it is sometimes possible to cause a paper jam in the printer. This occurs because of a timing inconsistency between the Imagen image processor and the marking engine. If this happens, open the marking engine by lifting the green lever on the right side of the marking engine and clearing any paper in the paper path.

Status Codes

Imagen8300 Device Driver Status Codes

Decimal Value	Meaning
15300	The document specifies more distinct fonts than can be output in one document by this device driver. Reduce the number of fonts in the document. Note that this error indicates an overflow in the device driver's internal table. The printer usually overflows its own Font/Graphics Work Area long before the device driver does. The device driver makes no attempt to predict when the printer will overflow, and no error message is reported by GPS when the printer overflows its memory.
15301	An erroneous 2nd-level translation value has been encountered in the Font Database font translation data for the Imagen printer. Verify that the Imagen device driver was installed with a valid "Font Device Type" string (leaving this field blank will cause the correct font data to be used if the Unisys-supplied Font Database is being used). Use the Font Tool to correct the Imagen's translation data in the Font Database.
15303	The document requires more Imagen printer families than can be used at one time. Reduce the number of fonts in the document.
15304	The document requires more Imagen printer maps than can be used at one time. Reduce the number of fonts in the document.
15305	The normal job processing method specified in the *Device Setup* field cannot be used.

Cables and Switch Settings

This subsection contains device-specific information on cable connections and switch settings.

IP2 and IP3

Cable Connections

To connect these printers to a serial port, the printers must be connected to the workstation with a serial printer interface cable, which is described in "Cables," in Section 3. One of the 25-pin D-type connectors should be a socket assembly (female-type connector). If you use the Basic Asynchronous Terminal Emulator (Basic ATE) to communicate with the printers, connect the Basic ATE workstation to the Imagen console port with a straight RS-232-C cable.

To connect one of the printers to the parallel port, use the Centronics-compatible cable, which is described in "Cables," in Section 3.

Switch Settings

You must use your Imagen Configurator to set the following parameters. In addition, the Imagen engine type must be selected, and the baud rate should be set at 9600 or 19,200. On the SuperGen Series 2000, the maximum baud rate is 9600.

Switch	Setting
Simple Printer Mode	Off
EOF character	4
Quoting character	2
Data Bits	8
Ignore Nonprinting characters	Off
XON/XOFF	On
Job and document control language	Impress

PostScript Device Driver

Overview

The PostScript device driver has been tested and qualified on the following printers:

AP9415

AP9210 (with the PostScript expansion card)

AP9310

AP9312

AP9316

Note: *Unless indicated otherwise, the AP9310, AP9312, and AP9316 printers will specified as AP9300 series.*

This driver has also been tested and qualified on the following non-Unisys printers:

QMS-PS800

Texas Instruments (TI) 2115

LaserWriter

LaserWriterPlus

LaserWriter II NTX

The PostScript device driver has the following capabilities:

- Letter-quality text

- Vector art

- Raster images

This driver translates print jobs into the PostScript page description language. (PostScript is a rapidly emerging standard language for printers, especially laser printers and typesetters.)

The PostScript device driver is likely to work on other PostScript printers, although the above listed printers are the only ones specifically tested by Unisys.

This driver supports the ability of the AP9415 to use modes of emulation other than PostScript. For example, it supports Diablo emulation, which is required by OFIS Writer and the Word Processor. The PostScript device driver also supports the 500-sheet auxiliary bin and the automatic envelope feeder for the AP9210.

The PostScript driver supports both portrait and landscape printing of graphics and typographic fonts. It supports manual feed and multicopy output. It emulates either OFIS Graphics, Art Designer, or Imagen driver graphic line types. It also maps shades of solid, halftone, and quarter-tone fill patterns to appropriate gray levels. In addition, it provides support for the replaceable font cartridges and dual paper bins on the TI 2115.

Device Installation Information

Note: *If you're installing a PostScript printer for the first time, see "Configuring PostScript Printers," at the end of this section.*

Figure 9-9 displays a sample *Device Installation* form for a device that uses the PostScript device driver. For a detailed explanation of each field, see Table 4-6, in Section 4.

```
Print Manager                    InstDD                    User: GPS
InstallerFile: [Sys]<Gps>GPS.Printers              Wed Jan 23, 1991 8:05 AM

  Device Name [            ]           Queue Name [         ]
  Driver Run File  [[Sys]<Gps>PSDD.run                              ]
  Port ([ptr]xx[lpt]xx)  [[ptr]b ]     Location [               ]
  Font Device Type    [ AP9415   ]     Banner Pages  [ No, Yes ]
  Transmit Time Out [ 60 ]             Printing Process Priority [ 133 ]
  Normal Print Job Parameters: [    ]  Expand Tab Size  [ 8 ]
  New Line Map Mode: [ Lf, Cr, CrLf ]  Chars Per Line   [ 85 ]
  [ptr]xxParameters
  Baud Rate  [ 9600 ]    Line Control Mode  [ None, XonXoff, CTS, Both ]
  Data Bits  [ 8 ]   Stop Bits [ 1 ]    Parity:  [ None, Even, Odd, 1, 0 ]

  Device Setup
  [Printer:AP9415  Emul:PS                                        ]
  Default Page Dimensions (inches)
  Length  [ 11.0 ]        Top Border   [      ]      Left Border  [      ]
  Width   [ 8.5  ]        Bottom Border [     ]      Right Border [      ]
  Storage Allocation (1K units)
  Font/Graphics Work Area  [ 20 ]            Output Buffer [ 0 ]

  [   ][   ][   ]  [DevHelp][DevSave][   ][   ]  [Admin][Home]
```

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**Figure 9-9. Sample Device Installation Form for Direct Printing
With an AP9415**

Driver Run File

The *Driver Run File* field should display *[Sys]<Gps>PSDD.run*

Port Used

Any serial port or parallel port.

Font Device Type

The default font device type is PostScript, except when you install the LaserWriterPlus, LaserWriter II NTX, AP9210, or AP9300 series printers. In these cases, the entry *LaserWriter+* is displayed for the LaserWriter printers; *PostScriptAP* is displayed for the AP9210 and AP9300 series printers.

The LaserWriter + font device type is for PostScript printers that use the standard PostScript 39N font set with Helvetica Narrow.

The AP9415 font device type is for PostScript printers that use the standard PostScript 39C font set with Helvetica Condensed.

The PostScript font device type is for PostScript printers that use the standard PostScript 17 font set.

The PostScriptAP font device type is for PostScript printers that use the Unisys printers.

Note that you should use the AP9415 font device type for AP9415 printers.

Device Setup

> *Note:* *The Device Setup parameters common to all drivers are described in "Device Setup," in Table 4-6, in Section 4.*

The *Device Setup* field will accept the following keywords and values:

Keyword	Values	Default
Printer: or Model:	AP9415	none
Lines:	Imagen	none
Emulation: or Emul: (Only used with AP9415)	PS, Diablo or 630 TI, LaserJet, Plotter	No emulation
Delay: (Only used with AP9415)	Time to wait when changing emulation modes	100 (10 seconds)
Fill:	EO	none
Font:	Indicate font family and point size, such as Courier[10]	Courier[12]
Bin: (only used with TI 2115)	Check printer documentation	

For the AP9415, the format for the *Device Setup* field entries is:

Printer:*printer type* Emul:*emulation mode* Delay:*time setting*

The printer type, emulation mode, and time setting values are used with the AP9415 only. For a description of these values, see "Explanation of Device Setup Parameters for AP9415," below.

The other entries are explained as follows:

Lines:Imagen	By default the PostScript driver emulates the OFIS Graphics or Art Designer line types for graphics. If line types in the style of the Imagen device are desired instead, either select *Imagen style lines* when you use DevHelp, or type **Lines:Imagen** in the *Device Setup* field.
Fill:EO	This entry selects the algorithm used by the PostScript device to fill in areas. To use the even/odd rule for filling patterns, type **Fill:EO** (This is the filling algorithm used by OFIS Graphics and Art Designer.) The default is the "winding number" algorithm, which fills everything to one side as you transverse the closed path of the filled figure.
Font: FontFamily [PointSize]	Informs the driver what default font to use. (Use of a proportional font as the default is not supported.) If the font name has blanks, substitute a slash (/) for the blanks. For example, if the font name is Century Schoolbook, type **Font:Century/Schoolbook[12]**
	Note this entry is for Normal mode ASCII jobs only (where **Normal:GPAM** is specified in the *Device Setup* field).
	If you do not enter a default font, 12 point Courier is used.
Bin:*x* *x*=1,2, so on	This entry indicates the starting bin number for PostScript printers, such as the TI 2115, that do not number their bins starting with 0. For these printers, if you specify a job beginning with 0 or do not indicate a bin number, your job won't be printed. (See your printer documentation for the correct value.)

Explanation of Device Setup Parameters for AP9415

Printer: Identifies the type of printer you are installing.
printer type

Emul: This sets the emulation mode of the device for
emulation mode   normal print jobs (ASCII, GPAM, TIFF, and CGM)
                          to one of the emulations chosen below. It also sets
                          the emulation of image print jobs to Diablo 630.

                          No entry (blank space) or PS indicates PostScript
                          emulation mode. This is the recommended value
                          for use with AP9415. This setting supports both
                          OFIS Writer and OFIS Document Designer simul-
                          taneously.

                          TI indicates Texas Instrument 2115 emulation
                          mode.

                          Diablo or *630* indicates Diablo 630 emulation mode.

                          Plotter indicates HP plotter emulation mode.

                          LaserJet indicates HP PCL emulation mode.

                          If an emulation mode other than PS or TI is
                          specified, then the processing mode *cannot* be
                          GPAM. Instead, it should be Xlatefile or Simple.
                          In this case, specify the keyword Normal and the
                          desired processing mode, for example:

                          Emul:*Diablo* Normal:*Xlatefile*

                          For a discussion of processing modes, see "Default
                          Print Modes for Normal Print Jobs," in the Device
                          Setup discussion in Table 4-6, in Section 4.

Delay:
time setting

Indicates the time to wait between emulation switches. The AP9415 needs time to set the emulation mode before it can begin the next job.

Note that since the AP9415 takes an indefinite time to complete a job (because of complexity or number of copies), you must decide upon a delay value by determining how you will use your printer. If you use the printer primarily in PostScript mode to print GPAM documents only, a small number such as 25 may be sufficient. If you set the printer into a default emulation other than PostScript, a larger number such as 100 may be needed.

Default Page Dimensions

The default borders for the PostScript device driver are the following "dead zone" margins:

Top Border .25	Left Border .25
Bottom Border .25	Right Border .25

There are no offsets for the PostScript device driver.

For more information on page dimensions for Laser device drivers, see the introductory discussion at the beginning of this section.

Font Information

This subsection assumes that you are familiar with certain general principles of the Font Database, which are discussed in detail in the *Using the Font Tool Manual*.

As mentioned previously, the default font device type for the PostScript driver is *PostScript*. The Font Database includes font data for Times, Helvetica, and Courier. These fonts are available in all sizes that can be specified by the application program (they are dynamically scaled by PostScript) and in all style combinations (Roman, Italic, Bold, and Bold Italic). These are the fonts that are available in *all* PostScript devices.

Many PostScript printers now offer a newer and larger standard set of 35 font faces, including several styles of Palatino, ITC Avant Garde Gothic, New Century Schoolbook, Helvetica Narrow, and ITC Bookman, plus ITC Zapf Chancery Italic, and ITC Zapf Dingbats. As mentioned previously, if your PostScript printer supports this larger standard set, enter **LaserWriter+** into the *Font Device Type* field of the *Device Installation* form.

Users who have some other set of fonts available to their PostScript printers should generate a Font Database that includes the relevant font families. The editable Font Database (*.port* files) contains font data for several other Adobe (PostScript) font families besides those available in the two standard sets.

The first word (delimited by a space) of the font key alias is the name of the font as it is known by PostScript. The remainder of the alias (if anything remains) is considered to be the name of a font cartridge that the user will be prompted to mount. If there are replaceable PostScript font cartridges available, the user should modify the appropriate font keys and perform the other necessary steps to generate a Font Database to support these cartridges.

Page length is used to instruct the TI2115 to search for whichever bin has a paper tray of the appropriate size; Letter, A4, and legal sizes are recognized. Dimensions of individual pages can be specified in OFIS Document Designer. Dimensions specified in the *Device Installation* form are applied to all ordinary ASCII (non-GPAM) documents.

The bin number for the TI2115 can be specified in OFIS Document Designer from the Page Attributes menu. *Bin 2* selects the lower tray, and *Bin 3* selects the upper tray. *Bin 1* causes either tray to be used, according to which has the correct paper tray (see the discussion on font information earlier in this subsection). The upper tray is used if there is no difference.

Status Codes

PostScript Device Driver Status Codes

Decimal Value	Meaning
15300	The emulation mode specified is inconsistent with the normal processing method specified in the *Device Setup* field.
15301	An inconsistency was found attempting to output an accented character.
15302	Reserved for future use.
15303	The emulation mode specified in the *Device Setup* field is not recognized.
15304	The emulation mode required for this print job cannot be set. (For example, if an OFIS Writer job is submitted to a PostScript printer that does not have Emul: specified.)
15305	The value specified after the keyword Delay: is not recognized in the *Device Setup* field.

Cables and Switch Settings

This subsection contains device-specific information on cable connections and switch settings.

AP9415

Cable Connections

The procedure that you follow to connect the data cable depends on the hardware interface you are using. Connect only a data cable that is compatible with your system.

CAUTION

Connect only one data cable and system to your printer. If you connect more than one system to your printer and the systems try to communicate with your printer simultaneously, it may lock up the systems.

If you do not have the appropriate cables, you can order them from your Unisys sales or marketing representative. Alternatively, you can connect the AP9415 to a serial port using a serial printer interface cable or to a parallel port using a Centronics-compatible cable. Both cables are described in "Cables," in Section 3.

Switch Settings

The AP9415 has a *Setup/Test* switch that accesses an extensive setup menu. Pressing this switch enables you to set hardware and software interfaces for your application. These interfaces, however, are generally set up prior to installation of the printer. If you decide not to use the default configuration, refer to the *AP9415 Printer Installation and Operations Guide*.

The following are the default configurations:

RS-232-C Serial/9600
8-bit data
No parity
Auto line feed off
Auto carriage return off
XON/OFF busy handling
PostScript (Batch) software interface

If the default settings are not appropriate, see the manual supplied with the printer for more information.

AP9210, AP9300 Series (AP9310, AP9312, AP9316)

Cable Connections

If you do not have the appropriate cables, you can order them from your Unisys sales or marketing representative. Alternatively, you can connect a printer to a serial port using a serial printer interface cable or to a parallel port using a Centronics-compatible cable. Both cables are described in "Cables," in Section 3.

Switch Settings

If the default settings are not appropriate, see the manual supplied with the printer for more information.

LaserWriter, LaserWriterPlus, LaserWriter II NTX

Cable Connections

See the documentation supplied with your printer for the type of cable you should use. If the printer supports DTR protocol, use the serial cable for CTS/DTR communications; otherwise, use the serial interface cable. Both cables are described in "Cables," in Section 3.

The 25-pin serial port on the printer must be used when connecting the printer to a workstation or shared resource processor. The 9-pin port on that printer is used for AppleTalk, *not* for the Unisys cluster cable.

Switch Settings

The protocol switch on this printer has four settings: 1200, 9600, Special, and AppleTalk. Use the setting for 9600 baud unless the cable is unusually long, in which case you should use the setting for 1200.

QMS PS800, Texas Instruments 2115

Cable Connections

Use the CTS/DTR communications cable, which is described in "Cables," in Section 3.

Switch Settings

The wheel switch on this printer has two settings: one for 1200 baud, and another for 9600 baud. Use the setting for 9600 baud unless the cable is unusually long.

Configuring PostScript Printers

If you're installing a PostScript printer for the first time, decide if you want to use DTR protocol or XON/XOFF protocol. (It is recommended that you use CTS/DTR with qualified printers.) Also, change the timeout value, for the reasons explained in "Configuring the Timeouts of PostScript Printers," below. Note that this is not the same timeout that is shown in the *Device Installation* form.

Configuring the Timeouts of PostScript Printers

Just as the device driver will "timeout" after waiting for the device to resend and report *off line*, in a reciprocal manner, PostScript engines wait a timeout period for the device driver.

PostScript printers are designed to abort a print job when data is not received after a period of time. This occurs, for example, if a print job is paused and not restarted in a timely fashion. When restarted, the remainder of the job is ignored by the printer. This feature is intended as a technique for recovering the printer when a job has been canceled by the system where the printer is attached.

The standard period of time that a printer will wait for data (called *waittimeout*) is 30 seconds. The printer will abort the job after 30 seconds when

- The device driver has been paused by a user

- A device driver reports the device offline and is not restarted as soon as (or before) the device is ready again

- The device driver is too slow to keep up with the printer

The last case can occur because the device driver does not have sufficient Font/Graphics Work Area space to efficiently process the document, due to the number of fonts and frequency of font changes. If this occurs, the device driver should be installed with a larger Font/Graphics Work Area space.

The PostScript printer will also abort a print job if it has to wait too long for paper to be inserted into the manual feed slot, or for the paper tray to be loaded. The default value for this parameter, called *manualfeedtimeout*, is 60 seconds.

The standard values for these wait times are probably too short. Unisys recommends changing these values by sending a PostScript program to the printer, as explained below in "Setting Up a PostScript Printer for DTR Protocol," and "Setting Up a PostScript for XON/OFF Protocol," respectively. In step 2 of both procedures, the second parameter sets *manualfeedtimeout* to 15 minutes (900 seconds) and *waittimeout* to 20 minutes (1200 seconds).

Setting Up a PostScript Printer for DTR Protocol

If you want to use the DTR protocol,

*   Check the self-diagnostic sheet for the communication parameters.

*   Use a CTS/DTR serial communications cable (see "Cables," in Section 3).

*   Install the device driver with the CTS protocol.

Procedure

1. Turn on the printer and check the self-diagnostic setup sheet. If the printer is set up for DTR communications, the *25 pin channel* field on the printout should indicate the following:

    9600 baud, parity none, DTR protocol

    a. If the *25 pin channel* field *does not* indicate these settings, follow steps 2 through 6 below to use the DTR protocol.

    b. Retain the setup sheet, as you will use the settings that are specified in the *25 pin channel* field in step 3.

2. Verify that the [*Sys]<Gps>Setup.ps* file has the following two parameters:

    25 9600 7 setsccbatch
    0 900 1200 setdefaulttimeouts

    The first parameter means 25 pin port, 9600 baud rate, 0 parity, and CTS/DTR protocol.

The second parameter, as explained in "Configuring the Timeouts of PostScript Printers," earlier in this subsection, sets *manualfeedtimeout* to 15 minutes (900 seconds) and *waittimeout* to 20 minutes (1200 seconds).

3. Install the printer from the Print Manager, as follows:

   a. From the Admin display, select the printer.

   b. Press **F4** (Install), and then press **GO**.

   c. In the *Device Installation Form*, specify the settings that were indicated in the *25 pin channel* field of the self-diagnostic setup sheet.

   d. Press **GO**.

4. Press **F1** (Print) to print the *[Sys]<Gps>Setup.ps* file in binary mode, so that the PostScript printer will execute the program contained in the file. Note that the printer will not print anything when executing this program.

5. Deinstall the printer, as follows:

   From the Admin display, press **F5** (De-Inst), and then press **GO**.

6. Reinstall the printer, as follows:

   a. Press **F4** (Install), and then press **GO**.

   b. In the *Device Installation* form, specify the communication settings that were indicated in the *[Sys]<Gps>Setup.ps* file; that is, specify *9600* for baud rate, *0* for parity, and *CTS* for line control mode.

The printer is ready for printing.

Setting Up a PostScript Printer for XON/XOFF Protocol

If you want to use the XON/XOFF protocol,

- Check the self-diagnostic sheet for the communication parameters.

- Use a serial printer interface cable (see "Cables," in Section 3).

- Install the device driver with the XON/XOFF protocol.

Procedure

1. Turn on the printer and check the self-diagnostic setup sheet. If the printer is set up for XON/XOFF communications, the *25 pin channel* field on the printout should indicate the following:

    9600 baud, parity none, XON/XOFF protocol

    a. If the *25 pin channel* field *does not* indicate these settings, follow steps 2 through 6, under "Procedure," in the subsection "Setting Up a PostScript Printer for DTR Protocol."

    b. Retain the setup sheet, as you will use the settings that are specified in the *25 pin channel* field in step 3 below.

2. Modify the *[Sys]<Gps>Setup.ps* file so that the following two parameters are indicated:

    25 9600 3 setsccbatch
    0 900 1200 setdefaulttimeouts

    The first parameter means 25 pin port, 9600 baud rate, 0 parity, and XON/XOFF protocol.

    The second parameter, as explained in "Configuring the Timeouts of PostScript Printers," earlier in this subsection, sets *manualfeedtimeout* to 15 minutes (900 seconds) and *waittimeout* to 20 minutes (1200 seconds).

3. Install the printer from the Print Manager:

    a. From the Admin display, select the printer.

    b. Press **F4** (Install), and then press **GO**.

    c. In the *Device Installation* form, specify the settings that were indicated in the *25 pin channel* field of the self-diagnostic setup sheet.

    d. Press **GO**.

4. Press **F1** (Print) to print the *[Sys]<Gps>Setup.ps* file in binary mode so that the PostScript printer will execute the program contained in the file. Note that the printer will not print anything when executing this program.

5. Deinstall the printer, as follows:

    From the Admin display, press **F5** (De-Inst), and then press **GO**.

6. Reinstall the printer, as follows:

    a. Press **F4** (Install), and then press **GO**.

    b. In the *Device Installation* form, specify the communication settings that were indicated in the *[Sys]<Gps>Setup.ps* file; that is, specify *9600* for baud rate, *0* for parity, and *XON/XOFF* for line control mode.

The printer is ready for printing.

Section 10
Dot Matrix Device Drivers

This section describes the following device drivers:

- AP Matrix
- AP Hr Matrix
- CT Matrix
- Epson FX-286
- HP PaintJet

These device drivers have been tested and qualified to work with the devices described in this section. (Figure 10-1 lists the devices and the device drivers they use.)

Note that the dot matrix devices support graphics printing in Portrait mode only. Landscape graphics may print, but the results will be unsatisfactory.

The discussion on each device driver includes the following subsections, when applicable:

Overview Lists the devices that use the driver.

Provides general information about the features of the driver.

Device Installation Information Displays a sample *Device Installation* form.

Provides information on certain key entries in the *Device Installation* form, such as driver run file, ports used, font device type, and device setup entries.

Font Information Discusses the font families implemented for the driver.

Discusses the alias field of the font key in the Font Database.

Explains how to modify the Font Database to use a different sets of fonts with each driver.

Status Codes Lists and defines device-specific status codes. (For GPS status codes, see Section 11, "Troubleshooting.")

Cables and Switch Settings Describes cable connections and switch settings for each device.

Note: *When installing printers, use the Print Manager DevHelp command (F4). With DevHelp, the* Device Installation *form shows the default parameters for the selected device. For information on using DevHelp, follow steps 8 and 9 in "Steps for Installing GPS System Services," in Section 4, "Installing GPS System Services."*

AP Matrix Device Driver

Used by the following printers:
AP1314, AP1327, AP1329,
AP1351/AP1351-1 (treated as AP1351),
AP1354.

AP Hr Matrix Device Driver

Used by the following printers:
AP1324, AP1337, AP1339 in LQ2550
emulation.

CT Matrix Device Driver

Used by the following printers:
CT-2425, CT-2426, CT-2450, CT-2475.

Epson FX-286 Device Driver

Used by the following printers:
AP1371, Epson FX-286.

HP PaintJet Device Driver

Used by the following printer:
HP PaintJet.

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Figure 10-1. Dot Matrix Device Drivers and Devices

AP Matrix Device Driver

Overview

The AP Matrix device driver has been tested and qualified on the following Unisys printers:

AP1314

AP1327

AP1329

AP1351/1351-1 (treated as AP1351)

AP1354

The AP Matrix device driver has the following capabilities:

- Near letter-quality text

- Vector art

- Raster images

The AP Matrix driver translates print jobs into the Prism language. It supports all normal text attributes (bold, underline, and so on) except italic, which is not available on the printers. The driver also handles graphics printing at a resolution of 72 dpi (dots per inch) for all printers except the AP1351, for which it has a resolution of 84 dpi. Color printing is available on the AP1327, AP1329, and AP1351 printers.

Device Installation Information

Figure 10-2 displays a sample *Device Installation* form for a device that uses the AP Matrix driver. For a detailed explanation of each field in the form, see Table 4-6, in Section 4.

```
Print Manager                        InstDD                          User: GPS
InstallerFile: [Sys]<Gps>GPS.Printers                      Wed Jan 23, 1991 8:05 AM

  Device Name  [              ]          Queue Name  [         ]
  Driver Run File  [[Sys]<Gps>APMatrixDD.run                            ]
  Port ([ptr]xx[lpt]xx)  [[ptr] b]       Location  [         ]
  Font Device Type  [              ]      Banner Pages  [No, Yes]
  Transmit Time Out  [ 60 ]              Printing Process Priority  [133]
  Normal Print Job Parameters:  [    ]   Expand Tab Size  [ 8 ]
  New Line Map Mode:  [Lf, Cr, CrLf]     Chars Per Line  [85]
  [ptr]xxParameters _____
  Baud Rate  [9600]     Line Control Mode  [None, XonXoff, CTS, Both]
  Data Bits  [ 8 ]      Stop Bits [ 1 ]   Parity:  [None, Even, Odd, 1, 0]

  Device Setup _____
  Printer:AP1314  CharSet:081                                           
  Default Page Dimensions (inches) _____
  Length  [ 11.0 ]        Top Border    [      ]      Left Border  [     ]
  Width   [ 8.5 ]         Bottom Border [      ]      Right Border [     ]
  Storage Allocation (1K units) _____
  Font/Graphics Work Area  [ 10 ]              Output Buffer  [ 0 ]

  [    ][    ][    ]  [DevHelp][DevSave][   ][   ]  [   ][Admin][Home]
```

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**Figure 10-2.   Sample Device Installation Form for Direct Printing
With an AP1314**

Driver Run File

The *Driver Run File* field should display *[Sys]<Gps>APMatrixDD.run*

Port Used

Any serial port or parallel port.

Font Device Type

The default font device type is APDMatrix.

Device Setup

Note: *The Device Setup parameters common to all drivers are described in "Device Setup," in Table 4-6, in Section 4.*

The *Device Setup* field will accept the following keywords and values:

Keyword	Values	Default
Printer:	AP1314, AP1327, AP1329, AP1351, AP1354	AP1351
CharSet:	81, 82, 83	81
Ribbon:	Black, Process, Primary	Black
Font:	Indicate Font family and point size	12 point Courier

The format for the *Device Setup* field entries is:

Printer:*printer type* CharSet:*character set* Ribbon:*ribbon type*

Font:*FontFamily[PointSize]*

For a description of the values, see "Explanation of Device Setup Parameters," below.

Explanation of Device Setup Parameters

Printer:
printer type

Indicates the type of printer you are installing.

CharSet:
character set

Informs the driver what character set to select for GPAM file printing.

81 = draft-quality
82 = memo-quality
83 = letter-quality

Ribbon:
ribbon type

Informs the driver what ribbon is installed on the printer.

> Black = black
> Process = black, cyan, yellow, and magenta
> Primary = black, red, green, and blue

Note that if an AP1314 or AP1354 is specified, and a color ribbon is selected, an error is returned.

Note too that for an AP1327, AP1329, AP1351 and AP1351-1, only the process ribbon is supported when printing color graphics. If the primary ribbon is used, the colors printed will not be the desired ones. This driver supports graphics in seven colors. The color printed will be the color closest to the requested color.

Font:
FontFamily
[PointSize]

For Normal mode ASCII jobs only (where **Normal:GPAM** is specified in the *Device Setup* field).

Informs the driver what default font to use. (Use of a proportional font as the default is not supported.) If the font name has blanks, substitute a slash (/) for the blanks. For example, if the font name is Century Schoolbook, type **Font:Century/Schoolbook[12]**

If you do not enter a default font, 12 point Courier is used.

Font Information

The information in this subsection is useful if you want to customize font databases for the AP Matrix driver. If you are not familiar with certain general principles of the Font Database, see the *Using the Font Tool Manual*.

Font Families

The following families have been defined for the AP Matrix device driver:

Courier   (Near letter-quality)
Draft   (Draft-quality)
CourierWide (Wide near letter-quality)
DraftWide   (Wide draft-quality)

Font Keys

Twelve font keys have been defined providing you with the four font families defined in three different point sizes: 9, 10, and 12. The same font keys have been duplicated with Bold set to *Yes*, and the alias string containing the required information. As a result, the total font keys defined are 24. Italic is set to *No* for all the font keys since this attribute is not available on the printers. The Alias string information is discussed in "Font Alias," later in this subsection.

Character Sets

The name of the character set for the AP Matrix driver is APMatrix.

The names of the translation tables, *ctToAPDMatrix* and *APDMatrixL1ToAPDMatrixL2,* have already been entered here.

Translation Tables

ctToAPDMatrix is the name of the first level of translation table. *APDMatrixL1ToAPDMatrixL2* is the name of the second level translation table.

Font Alias

The following strings, if they exist in the alias string, are recognized by the driver. The order of the strings is of no importance, unless two strings having an opposite effect on the same attribute exist, in which case the second string overrides the effect of the first. You are advised to select, at most, one of the strings from each of the headings below to get the correct results.

Normally, the alias strings contain escape codes required to command the device to switch to the selected font. For some devices, however, simple commands are issued using font attribute strings, which are described in Table 10-1, below.

Table 10-1. Examples of Font Key Font Alias String Values

Font Attributes	String	Interpretation
Character Quality	DRAFT	Use draft-quality letters for printing. This is the default.
	LETTER	Use letter-quality letters for printing.
	MEMO	Use memo-quality letters for printing.
Bold	BOLD	The bold attribute is turned on for the font. If this string is not there, bold is *not* turned on.
Pitch	10	Set the pitch to 10 CPI. This is also the default.
	12	Set the pitch to 12 CPI.
	17	Set the pitch to 17 CPI. On certain printers, this is 17.1. The width factor for the font key should be set appropriately.
Additional	DOUBLE	Print double-wide characters. This is also dependent on the pitch selected, since this operates on the current pitch. This command is sent to the printer after setting the pitch the user specifies, or the default of 10 CPI. The width factor should be set correctly to avoid positioning problems. This does not have any effect on the height of the characters.

Both uppercase and lowercase are valid for the strings. Spaces and commas are treated as delimiters. Any other strings are collected together and treated as a wheel name. That is, if you specify an alias that doesn't match the valid string, the driver pauses, and the message *Load print wheel xxx* is displayed, where *xxx* is the alias you entered.

Status Codes

AP Matrix Driver Status Codes

Decimal Value	Meaning
15300	The type of printer indicated is not a recognized string.
15301	The character set indicated is not a valid character set.
15302	The ribbon indicated is not a recognized string. Or, a color has been selected for a printer that does not have the capability.

Cables and Switch Settings

This subsection contains device-specific information on cable connections and switch settings.

AP1314, AP1327, AP1329, AP1351, AP1351-1, AP1354

Cable Connections

If you do not have the appropriate cables, you can order them from your Unisys sales or marketing representative. Alternatively, you can connect a printer to a serial port using a serial printer interface cable or to a parallel port using a Centronics-compatible cable. Both cables are described in "Cables," in Section 3.

Switch Settings

If the default settings are not appropriate, see the manual supplied with the printer for more information.

AP Hr Matrix Device Driver

Overview

The AP High Resolution (Hr) Matrix device driver has been tested and qualified on the following dot matrix printers sold by Unisys:

- AP1324 in LQ2550 emulation only
- AP1337 in LQ2550 emulation only
- AP1339 in LQ2550 emulation only

This driver has the following capabilities:

- Letter-quality text
- Vector art
- Raster images
- Sheet feeders

The AP Hr Matrix driver translates print jobs into escape sequences required by printers emulating the LQ2550 24-pin printer. This driver supports all normal text attributes such as bold, underline, and so on. It handles both color and monochrome printing, as well as graphic printing at three resolutions: 90, 180 and 360 dpi (dots per inch). This driver also supports color printing on AP1324 devices equipped with 4-color ribbons. In addition, it will print vector graphics from a palette of over 150 colors.

Device Installation Information

Figure 10-3 displays a sample *Device Installation* form for the AP1324. For a detailed explanation of each field in the form, see Table 4-6, in Section 4.

```
┌─────────────────────────────────────────────────────────────────────────┐
│  Print Manager                    InstDD                    User:  GPS    │
│  InstallerFile: [Sys]<Gps>GPS.Printers              Wed Jan 23, 1991 8:05 AM │
│  ┌──────────────────────────────────────────────────────────────────────┐ │
│  │ Device Name [            ]        Queue Name [          ]             │ │
│  │ Driver Run File  [[Sys]<Gps>APHrMatrixDD.run]                        │ │
│  │ Port ([ptr]xx[lpt]xx)  [[ptr] b]     Location [           ]          │ │
│  │ Font Device Type     [            ]   Banner Pages [No, Yes]         │ │
│  │ Transmit Time Out  [ 90 ]            Printing Process Priority [133] │ │
│  │ Normal Print Job Parameters: [     ] Expand Tab Size  [ 8 ]          │ │
│  │ New Line Map Mode: [Lf, Cr, CrLf]    Chars Per Line   [85]           │ │
│  │ [ptr]xxParameters                                                    │ │
│  │ Baud Rate [9600]   Line Control Mode [None, XonXoff, CTS, Both]      │ │
│  │ Data Bits [ 8 ]    Stop Bits [ 1 ]   Parity: [None, Even, Odd, 1, 0] │ │
│  │ Device Setup                                                         │ │
│  │ [Res:180  Ribbon:Black  CharSet:0]                                   │ │
│  │ Default Page Dimensions (inches)                                     │ │
│  │ Length [ 11.0 ]    Top Border    [      ]  Left Border  [      ]     │ │
│  │ Width  [ 8.5  ]    Bottom Border [      ]  Right Border [      ]     │ │
│  │ Storage Allocation (1K units)                                        │ │
│  │ Font/Graphics Work Area [ 30 ]        Output Buffer [ 0 ]            │ │
│  └──────────────────────────────────────────────────────────────────────┘ │
│  [    ][    ][    ][DevHelp][DevSave][    ][    ]    [Admin][Home]        │
└─────────────────────────────────────────────────────────────────────────┘
```

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**Figure 10-3. Sample Device Installation Form for Direct Printing
With the AP1324**

Driver Run File

The *Driver Run File* field should display *[Sys]<Gps>APHrMatrixDD.run*

Port Used

Any serial port or parallel port.

Font Device Type

The default font device type is AP1324.

Device Setup

Note: *The Device Setup parameters common to all drivers are described in "Device Setup," in Table 4-6 in Section 4.*

The *Device Setup* field will accept the following keywords and values:

Keyword	Values	Default
Resolution: or Res:	90, 180, 360	180
Ribbon:	Black, Process	Black
CharSet:	0 to 12	0
Sheetfeeder: or Feed:	Yes, No	No
Printer:	AP1324 AP1337	LQ2550
Font:	Indicate Font family and point size	12 point Courier

The format for the *Device Setup* field entries is:

Res:*resolution setting* Ribbon:*ribbon type* CharSet:*character set* Sheetfeeder:*sheetfeeder type*

Font:*FontFamily[PointSize]*

For a description of the values, see "Explanation of Device Setup Parameters," below.

Explanation of Device Setup Parameters

Res:
Resolution setting

Selects the resolution to be used for graphics printing.

Ribbon:
ribbon type

Informs the driver what ribbon is installed on the printer.

Black = black
Process = black, cyan, yellow, and magenta

CharSet: *character set*	Informs the driver what character set to select for GPAM file printing. The list of valid character sets is given in the printer reference manual.
Sheetfeeder: *sheetfeeder type*	The AP1324 sheet feeder has two bins. You select a bin number from OFIS Document Designer using the Page Attributes menu. *Bin 1* maps to the first bin of the sheet feeder; *Bin 2* and *Bin 3* map to the second bin. The default bin is *Bin 1*. When installing this printer, type **Sheetfeeder:Yes** in the *Device Setup* field.
	The AP1337 and AP1339 sheetfeeders have one bin. When installing these printers, type **Sheetfeeder:Yes** in the *Device Setup* field.
Font: *FontFamily* *[PointSize]*	For Normal mode ASCII jobs only (where **Normal:GPAM** is specified in the *Device Setup* field).
	Informs the driver what default font to use. (Use of a proportional font as the default is not supported.) If the font name has blanks, substitute a slash (/) for the blanks. For example, if the font name is Century Schoolbook, type **Font:Century/Schoolbook[12]**

Font Information

The information in this subsection is useful if you want to customize font databases for the AP Hr Matrix driver. If you are not familiar with certain general principles of the Font Database, see the *Using the Font Tool Manual*.

Font Families

The following families have been defined for the AP Hr Matrix device driver:

Courier	CourierCondensed
Prestige	PrestigeCondensed
Roman	RomanCondensed
Draft	DraftCondensed
OCR-A	OCR-ACondensed
OCR-B	OCR-BCondensed
Script	ScriptCondensed
SansSerif	SansSerifCondensed

Font Keys

Two hundred and forty eight font keys have been defined providing you with the font families in different sizes. The noncondensed families are available in 8, 10, 12, 16, 20, and 24 points. An 8-point size is not available for the OCR-A and OCR-B families. The condensed families are available for 10 and 12 points. These keys have been duplicated to provide both bold and italic attributes. The Alias string information is discussed in "Font Alias," later in this subsection.

Character Sets

The name of the character set is AP1324.

Since two translation tables are required, the names of both the tables have already been entered. The two tables are *ctToAP1324* and *AP1324L1ToAP1324L2*.

Translation Tables

The driver makes use of the extended graphics character set on the printer (see the printer manual). This gives it the ability to print the graphics characters also.

The name of the first level translation table is *ctToAP1324*. The second level translation table is *AP1324L1ToAP1324L2*.

Font Alias

For the format of the alias string, you can enter the escape sequences and/or ask for a wheel change. Space is used as a delimiter. The escape sequences must start with \e or \E. Any string not starting with these two characters is treated as a word for the wheel name. All the words are collected and used to pause and display for a wheel change, and then all the escape sequences collected are output to the printer.

Two aspects special to this case are described below.

1. The printer changes its Horizontal Motion Index (HMI) for letter- and draft-quality. The driver looks for the escape sequence to select one of the type style families. Based on this, the driver selects letter-quality or draft HMI. If none of the type style families is selected, then draft HMI is used. As a result, just setting the overall printing style to letter-quality will cause positioning problems.

2. Some of the escape sequences require you to enter characters in the lower ASCII range of 00h to 20h. Since some of these are control characters for the Font Tool, you cannot enter them directly. Characters can be put in the alias string as a character code for the control character (correct character code + 30h) preceded by ^. If you want to use just ^, it must be preceded by ^. Another advantage of this is that you don't have to figure out what keys to press simultaneously to generate codes. If, for example, one escape sequence requires you to Space (20h) a delimiter, it must be entered as \e---^P. The character code for P is 50h. The driver removes the ^, subtracts 30h from P which gives the Space (20h) character, and sends the escape sequence to the printer.

For the escape sequences, refer to the *AP1324 Printer Epson LQ2550 Emulation Programming Reference Manual.*

Status Codes

AP Hr Matrix Driver Status Codes

The following status codes apply to parameters specified in the *Device Setup* field.

Decimal Value	Meaning
15301	The character set indicated is not a valid character set.
15302	The ribbon indicated is not a recognized string. Or, a color has been selected for a printer that does not have the capability.
15303	The resolution indicated is not a valid resolution.
15304	Sheet feeder value must be *Yes* or *No*.
15305	Printer ID not recognized.

Cables and Switch Settings

This subsection contains device-specific information on cable connections and switch settings.

AP1324, AP1337, AP1339

Cable Connections

If you do not have the appropriate cables, you can order them from your Unisys sales or marketing representative. Alternatively, you can connect a printer to a serial port using a serial printer interface cable or to a parallel port using a Centronics-compatible cable. Both cables are described in "Cables," in Section 3.

Switch Settings

If the default settings are not appropriate, see the manual supplied with the printer for more information.

CT Matrix Device Driver

Overview

The CT Matrix device driver has been tested and qualified on the following dot matrix Unisys printers:

CT-2425

CT-2426

CT-2450

CT-2475

The CT Matrix device driver has the following capabilities:

* Letter-quality text
* Vector art
* Raster images

The CT Matrix driver uses the DPL24C printer language, and may work with other dot matrix printers that use this printer language, such as those manufactured by Fujitsu. These printers are 24-pin printers with 180 dpi resolution in both dimensions. They have a wider variety of fonts than are available on the Epson FX-286 printer, including double height, double width fonts (that is, 20 or 24 point), and proportional fonts.

This driver provides Courier and Draft fonts in six sizes of four styles each, and a proportional font in three sizes of four styles. (From OFIS Document Designer, select *Cubic PS* or any other proportional font to get the proportional font when printing.) The larger sizes (20 and 24 point) are double the height of the standard sizes (10 and 12 point), which is accomplished with multiple passes of the print head.

This driver also supports underlining, strikeout, and alternate ribbon (red). In addition, it handles color printing on devices equipped with a 4-color ribbon. It prints vector graphics from a palette of over 150 colors.

Device Installation Information

Figure 10-4 displays a sample *Device Installation* form for a device that uses the CT Matrix driver. For a detailed explanation of each field, see Table 4-6, in Section 4.

```
Print Manager                    InstDD                          User: GPS
InstallerFile: [Sys]<Gps>GPS.Printers              Wed Jan 23, 1991 8:05 AM

 Device Name  [          ]          Queue Name  [          ]
 Driver Run File  [Sys]<Gps>CTMatrixDD.run
 Port ([ptr]xx[lpt]xx)  [ptr] b     Location  [          ]
 Font Device Type  [          ]     Banner Pages  [No, Yes]
 Transmit Time Out  [90]            Printing Process Priority [133]
 Normal Print Job Parameters: [  ]  Expand Tab Size [8]
 New Line Map Mode: [Lf, Cr, CrLf]  Chars Per Line [85]
 [ptr]xxParameters
 Baud Rate [9600]   Line Control Mode [None, XonXoff, CTS, Both]
 Data Bits  [8]     Stop Bits [1]    Parity: [None, Even, Odd, 1, 0]

 Device Setup
 Model:CT2425
 Default Page Dimensions (inches)
 Length [11.0]      Top Border [    ]      Left Border [  ]
 Width  [8.5]       Bottom Border [    ]   Right Border [  ]
 Storage Allocation (1K units)
 Font/Graphics Work Area [20]       Output Buffer [0]

 [  ][  ][  ]  DevHelp DevSave [  ][  ]   Admin Home
```

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**Figure 10-4. Sample Device Installation Form for Direct Printing
With a CT 2425**

Driver Run File

The *Driver Run File* field should display *[Sys]<Gps>CTMatrixDD.run*

Port Used

Any serial port or parallel port.

Device Setup

> *Note:* The Device Setup parameters common to all drivers are described in "Device Setup," in Table 4-6, in Section 4.

The *Device Setup* field will accept the following keywords and values:

Keyword	Values	Default
Model: or Printer:	CT2425, CT2450, CT2475	CT2425
Color	No value	Not Used

The format for the *Device Setup* field entries is:

Model:*model type*

where

model type indicates which of the 2400 series is in use. Note that for a CT-2426 printer, the *Device Setup* field entry is *CT2425*.

To obtain color output on those CT printers equipped with a color ribbon, either select *Color Ribbon* when you use DevHelp, or type **Color** after the model number entry, as shown below:

> *Model:CT2425* **Color**

Font Graphics Work Area

Printing of raster images and/or vector art requires buffer space. The amount required varies with the size of the raster image and the complexity of the scaling or vector art. You can adjust the amount of memory reserved for such buffers by changing the Font/Graphics Work Area number. This number also determines the amount of memory available for font information. A document containing many fonts and scaled raster images and complex vector art requires that a larger Font/Graphics Work Area number be entered when you install the driver. Actually, a larger value in the Font/Graphics Work Area results in better performance when printing graphic objects of any type.

Font Information

This subsection assumes that you are familiar with certain general principles of the Font Database, which are discussed in detail in the *Using the Font Tool Manual*.

The default font device type for the CT Matrix driver is *CT-2400*. This driver parses the font key alias for keywords in order to determine the necessary escape sequences to send to the printer. Keywords *Font1*, *Font2*, and so forth, select the various resident fonts in the printer (omit this keyword for font 0). Keyword *Card* selects a cartridge font; in this case, keyword *Font1* or *Font2* selects an alternate cartridge font. Keywords *Bold* and *Italic* cause the font to be bolded or italicized, respectively. Keyword *Double* causes the font to be printed double height and double width. Keyword *Compressed* causes the font to be compressed horizontally. Keyword *Pica* causes the font to be printed at 10 pitch (unless doubled or compressed), and keyword *Elite* causes the font to be printed at 12 pitch (unless doubled or compressed). Keyword *PS* selects proportional spacing (the correct width table must be supplied).

The keyword *BoldFace* calls for resident font 4 (the proportional font) on the models 2450 and 2475, and for the boldface cartridge on the model 2425. Any unrecognized keyword is considered to be part of a cartridge name which the user should be prompted to mount.

Conventions in the standard Font Database for selecting various resident fonts on the 2400 series printers are as follows:

Size	Courier	Draft	Cubic PS	Modifiers
24 pt	font 0	font 2	BoldFace	Pica, Double
20 pt	font 1	font 3	-	Elite, Double
12 pt	font 0	font 2	BoldFace	Pica
10 pt	font 1	font 3	-	Elite
9 pt	font 0	font 2	BoldFace	Pica, Condensed
8 pt	font 1	font 3	-	Elite, Condensed

The fonts selected under Courier and Draft are printed monospaced, and the BoldFace font is printed proportionally. The BoldFace font is used if any of the proportional fonts (such as Times) is selected from OFIS Document Designer. The user may be prompted to mount the Scientific 12 cartridge if characters not present in the resident fonts are used, or if the Greek font family is selected.

If no family is specified, the Draft family is used. Therefore, an unformatted document sent to the printer is printed using the faster draft fonts (fonts 2 and 3). Courier is the default family specified by OFIS Document Designer documents, so those documents are, by default, printed using the higher quality fonts (fonts 0 and 1).

Status Codes

CT Matrix Driver Status Codes

Decimal Value	Meaning
15300	The printer name specified in the *Device setup* field is not recognized.
15303	The resolution indicated is not a valid resolution.

Cables and Switch Settings

This subsection contains device-specific information on cable connections and switch settings.

CT-2425, CT-2426, CT-2450, CT-2475

Cable Connections

Use one of the peripherals cables supplied by Unisys. The model name, part number, length, and description of the cable end connections are given below.

Printer	Model	Part No.	Ft.	End Connectors
CT-24xx serial	PC600	99-06312	50	25-pin M/25-pin M
CT-24xx parallel	PC630	99-06318	10	25-pin M/36-card edge

Figures 10-5 and 10-6 illustrate serial cable connections and parallel cable connections, respectively.
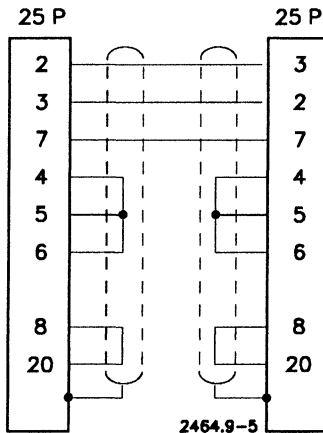
Figure 10-5. Serial Cable Pinouts for the CT Printers

25 P   36 P

14 ⟩⟨ 1
15 ⟩⟨ 19
1 ⟩⟨ 2
15 ⟩⟨ 20
2 ⟩⟨ 3
15 ⟩⟨ 21
3 ⟩⟨ 4
9 ⟩⟨ 22
4 ⟩⟨ 5
9 ⟩⟨ 23
5 ⟩⟨ 6
9 ⟩⟨ 24
6 ⟩⟨ 7
10 ⟩⟨ 25
7 ⟩⟨ 8
10 ⟩⟨ 26
8 ⟩⟨ 9
10 ⟩⟨ 27
16 ⟩⟨ 10
15 ⟩⟨ 28
17 ⟩⟨ 11
11 ⟩⟨ 29
21 ⟩⟨ 12
11 ⟩⟨ 30
22 ⟩⟨ 13
12 ⟩⟨ 16

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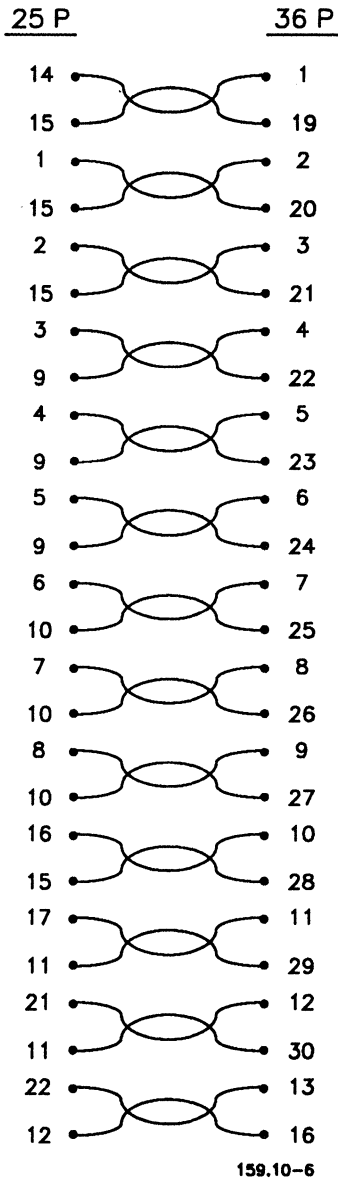
Figure 10-6. Parallel Cable Pinouts for the CT Printers

Switch Settings

Use the control panel on the printer to set the switches if the default settings are not appropriate. (See the manual supplied with the printer for more information.)

Epson FX-286 Device Driver

Overview

The Epson FX-286 device driver has been tested and qualified on the following printers:

Epson FX-286

AP1371

Note: *There are many different Epson printer models and many other printers that claim Epson compatibility. Only the FX-286 and Honeywell Bull 4/41 models have been fully tested with this device driver. Other printers are not guaranteed to work.*

The Epson FX-286 device driver has the following capabilities:

• Near letter-quality text

• Vector art

• Raster images

The Epson FX-286 driver handles various fonts with different pitches. This driver also supports monochrome and color graphics.

Device Installation Information

Figure 10-7 displays a sample *Device Installation* form for installing the Epson FX-286. For a detailed explanation of each field, see Table 4-6, in Section 4.

```
Print Manager                        InstDD                            User: GPS
InstallerFile: [Sys]<Gps>GPS.Printers                      Wed Jan 23, 1991 8:05 AM

  Device Name  [            ]            Queue Name  [            ]
  Driver Run File [[Sys]<Gps>EPFX286DD.run                            ]
  Port ([ptr]xx[lpt]xx)  [lpt]           Location  [            ]
  Font Device Type  [            ]       Banner Pages  [No, Yes]
  Transmit Time Out  [90]               Printing Process Priority  [133]
  Normal Print Job Parameters:  [   ]   Expand Tab Size  [8]
  New Line Map Mode: [Lf, Cr, CrLf]     Chars Per Line  [85]
  [ptr]xxParameters _____
  Acknowledge Delay  [0]
  Device Setup _____
  [                                                               ]
  Default Page Dimensions (inches) _____
  Length  [11.0]          Top Border  [      ]      Left Border  [   ]
  Width   [8.5]           Bottom Border [      ]    Right Border [   ]
  Storage Allocation (1K units) _____
  Font/Graphics Work Area  [20]         Output Buffer  [0]

  [    ] [    ] [    ] [DevHelp] [DevSave] [    ] [    ] [Admin] [Home]
```

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**Figure 10-7. Sample Device Installation Form for Direct Printing
With an Epson FX-286**

Driver Run File

The *Driver Run File* field should display *[Sys]<Gps>EPFX286DD.run*

Port Used

Any parallel port. If modified for serial communications, use any serial port *except* the FSA port.

Font Device Type

The default font device type is EpFx286.

Device Setup

Note: *The Device Setup parameters common to all drivers are described in "Device Setup," in Table 4-6, in Section 4.*

The *Device Setup* field will accept the following keywords and values:

Keyword	Values	Default
Color	No value	Not Used
Sheetfeeder: or Feed:	4/41	Not Used
Font:	Indicate Font family and point size For Normal mode ASCII jobs only (when **Normal:GPAM** is specified).	12 point Courier

The format for the *Device Setup* field entries is:

Color Sheetfeeder:*4/41*

Font:*FontFamily[PointSize]*

To obtain color output on those Epson-compatible printers with a 4-color ribbon, either select *Color Ribbon* when you use DevHelp or type **Color** in the *Device Setup* field.

The Epson FX-286 driver also supports certain Epson printers equipped with sheet feeders. To use a sheet feeder, type **SheetFeeder:4/41**. *Bin 1* or *Bin 0* selects the first bin, and *Bin 2* selects the second bin. Selecting the manual feed option on the *Print* form invokes semiautomatic mode, in which the printer waits until you press the feed button on the printer to print. Specifying *Bin 3* invokes semiautomatic mode on specific individual pages of a document. These features have been qualified only with the Honeywell Bull 4/41 model printer and are not warranted to work with other printers.

To indicate a default font, type the font family and point size. For example, if the font name is Century Schoolbook, type the following: **Font:Century/Schoolbook[12]** If the font name has blanks, substitute a slash (/) for the blanks. (Use of a proportional font as the default is not supported.) If you do not enter a default font, 12 point Courier is used. Note that the font entry is for Normal mode ASCII jobs only (where **Normal:GPAM** is specified in the *Device Setup* field).

Font Graphics Work Area

Printing of raster images and/or vector art requires buffer space. The amount required varies with the size of the raster image and the complexity of the scaling or vector art. You can adjust the amount of memory reserved for such buffers by changing the Font/Graphics Work Area number. This number also determines the amount of memory available for font information. A document containing many fonts and scaled raster images and complex vector art requires that a larger Font/Graphics Work Area number be entered when you install the driver. Actually, a larger value in the Font/Graphics Work Area results in better performance when printing graphic objects of any type.

Font Information

This subsection assumes that you are familiar with certain general principles of the Font Database, which are discussed in detail in the *Using the Font Tool Manual.*

The default font device type for the Epson FX-286 driver is *EpFx286*. This driver parses the font key alias for keywords in order to determine the necessary escape sequences to send to the FX-286. Keywords include Bold, Italic, Pica or Elite, Draft, or Nlq (near letter-quality), Wide, or Cond (condensed). A combination of keywords may be entered, but not every combination is recognized by the Epson FX-286 device. Some combinations result in one or more keywords being ignored. Consult the appropriate printer manual for specific information.

The Epson FX-286 prints various character pitches but only in one character height (12 point). Different selected point sizes are reduced to fonts of different pitches, which are (relatively) appropriate. Bold and Italics are available in each pitch.

Two font families, Draft and Courier, are implemented for the Epson FX-286. The Draft family is used to select low-quality fonts which print faster. Nlq Epson fonts are used when the Courier family is selected. If no family is specified, the Draft family is used. Therefore, a nonformatted document sent to the Epson is printed using the faster draft mode. Courier is the default family specified by OFIS Document Designer documents, so those documents, by default, are printed using the Epson higher quality fonts.

Status Codes

Epson FX-286 Driver Status Codes

Decimal Value	Meaning
15300	Characters were sent to the Epson device driver in the wrong y (vertical) order. (That is, a character with a lesser y coordinate was received by the driver after it had printed a character with a greater y coordinate.) This status code indicates an error in the application sending data to the GPS system.
15301	A font has been defined in the Font Database that cannot be selected by the Epson device driver. The combination of keywords in the font key alias cannot be processed by the device driver.

Cables and Switch Settings

This subsection contains device-specific information on cable connections and switch settings.

Cable Connections

Use a Centronics-compatible parallel interface. If modified for serial communications, use a standard serial cable. Both cables are described in "Cables," in Section 3.

Switch Settings

To run properly, the Epson FX-286 must be set up in Epson mode. Improper setting of dip switches can produce results that might be interpreted as Font Database problems, since many of the escape sequences are ignored in other modes.

For more information on appropriate switch settings, see the printer documentation for the Epson FX-286 or AP1371.

HP PaintJet Device Driver

Overview

The HP PaintJet device driver translates print jobs into the PCL language required by the Hewlett-Packard PaintJet printers.

The HP PaintJet device driver has the following capabilities:

Monochrome and color graphics

Note that the HP PaintJet device driver *does not* support landscape printing.

Device Installation Information

Figure 10-8 displays a sample *Device Installation* form for installing a device using the HP PaintJet driver. For a detailed explanation of each field, see Table 4-6, in Section 4.

**Figure 10-8. Sample Device Installation Form for Direct Printing
With the HP PaintJet**

Driver Run File

The *Driver Run File* field should display *[Sys]<Gps>HpPaintJetDD.run*

Port Used

Any serial port or parallel port.

Font Device Type

The default font device type is HpPaintJet.

Device Setup

> ***Note:*** *The Device Setup parameters common to all drivers are described in "Device Setup," in Table 4-6, in Section 4.*

In the *Device Setup* field, you can specify a default font by specifying the keyword *Font:* followed by the font family name and point size. Note that this entry is for Normal mode ASCII jobs only (where **Normal:GPAM** is specified in the *Device Setup* field).

The point size is enclosed in square brackets. For example, to specify 10 point Courier, type **Font:Courier [10]**. Note that the use of a proportional font as the default is not supported. This is because most applications assume that all characters are the same width.

If the font name has blanks, substitute a slash (/) for the blanks. For example, if the font name is Century Schoolbook, type **Font:Century/Schoolbook [12]**

If you do not enter a default font, 12 point Courier is used.

Font Information

This subsection assumes that you are familiar with certain general principles of the Font Database, which are discussed in detail in the *Using the Font Tool Manual.*

The default font device type for the HP PaintJet driver is *HpPaintJet.* The HP PaintJet offers only two fonts (Courier and Gothic), which are tied to three print pitches (10, 12, and 18). Therefore, use of special font key alias keywords is unnecessary. The two fonts may be accessed by simply changing the point size for a document (for example, 18 pitch equals 7 point). Bold is available in each pitch.

The HP PaintJet driver supports color printing via the cyan, yellow, magenta, and black ink jets that come standard with the printer. The driver has been optimized to take advantage of the printer's run length encoding option for fast output.

Cables and Switch Settings

This subsection contains device-specific information on cable connections and switch settings.

Cable Connections

To connect a printer to a serial port, use a serial printer interface cable. To connect a printer to a parallel port, use a Centronics-compatible cable. Both cables are described in "Cables," in Section 3.

Switch Settings

If the default settings are not appropriate, see the manual supplied with the printer for more information.

Section 11
Troubleshooting

This section provides suggestions for tracking down and solving problems that may arise with your GPS installation. This includes problems with a new GPS installation or with a GPS installation that previously worked but is not working now. If you're installing a device on a shared resource processor, see also "Troubleshooting a Shared Resource Processor," later in this section, for additional help.

This section also shows you how to use the Asynchronous Terminal Emulator (ATE) to troubleshoot a serial device. In addition, it lists error codes that can occur with the printing system.

If you're having trouble checking the cables and switch settings *before* you install GPS, see "Problems Checking the Cable," below.

For information on how to use the Print Manager to correct common device problems, see Section 3, "What Should I Do If...?" in the *Using the Print Manager Manual*.

Diagnosing Problems

You can track down GPS problems by using the PLog command, which displays the system error log. (GPS, along with other applications, records installation messages in the system error log.)

To view the system error log, type **PLog** on the Executive command line; then, press **GO**. Enter the type of error you want to display and the name of the volume whose log file you want to examine. (For a shared resource processor, specify [!Sys] in the *Volume name* field.)

Each entry in the error log contains the date and time of the error, the error type, and additional information about the error. As the log file fills, newer entries replace older ones. For more information on PLog, see the *CTOS Executive Reference Manual* and the *CTOS System Administration Guide*.

Problems Checking the Cable

Before you install GPS, you should make sure the cable works by using the Copy command procedure. (This procedure does not work with all devices. For example, it will not work with the Imagen and PostScript printers or certain HP Laser printers.) This procedure is described in step 6 under "Connecting Devices to a Workstation," in Section 3, "Connecting a Device."

It may happen that when you use the Copy command to check the cables and switch settings, you get error code 2344, Invalid Configuration File. This means that you don't have the configuration file that specifies device-specific parameters for the device you're using. If this is the case, use the Create Configuration File command to create the needed configuration file. (The Create Configuration File command is explained in detail in the *CTOS Executive Reference Manual*.)

To create the configuration file that you need, first verify that your path is set to *[Sys]<Sys>*; then, follow the steps below.

1. In the Executive command line, type **create configuration file** (or a unique abbreviation, such as **cr con fil**).

2. Press **RETURN**. The *Create Configuration File* command form is displayed, as shown below.

    Create Configuration File
       Configuration file name   _____
       Device type (com, parallel lpt, serial ptr, or tape) _____

3. Type the configuration file name in the *Configuration file name* field.

    For example, if a serial port cable is connected to serial port A, type **PtrAConfig.sys**

    For a parallel port, type **LptConfig.sys**

4. Type the device type in the *Device type* field. For example, type **serial** or **parallel.**

5. Press **GO**.

    The appropriate subcommand form is displayed with the defaults listed.

6. Check the settings (parity, baud rate, and so on) on your device to determine if you have to change any of the defaults.

7. Press **GO** again.

8. Try using the Copy command again to check the cable and switch settings. (See step 6 in "Connecting Devices to a Workstation," in Section 3.)

Problems With the New Installation

If you've just installed a device using the Print Manager and you encounter any of the problems listed below, follow the recommended guidelines under each heading to remedy the problem.

Note: *If you're using a client workstation that boots locally, be sure to perform a GPS distribution installation before trying to print from an application that use fonts, such as OFIS Document Designer. When you perform a GPS distribution installation, you're copying files from the server. To do this, issue the* Submit *command (from the Executive); press* **RETURN** *and type the following:* [!Sys]<Gps>LfsInstall.sub. *Press* **GO***, and select the Font Service.*

The Device Doesn't Work When You Try to Print

• Check to see that the power is on.

• Run the device self-test again, as described in the documentation supplied by the manufacturer. If the test printout sheets indicate the communication protocol settings for the device, verify that these parameters match those specified in the *Device Installation* form.

• Check to see that the cables are properly seated.

- Check to see that you have the correct cable. If you have a serial device, test it with Basic ATE. (See "Using Basic ATE to Troubleshoot a Serial Device," later in this section.) If you don't have Basic ATE, use the Executive Copy command to copy [*KBD*] directly to [*xxx*], where *xxx* is the device name. Press **GO**, type in several lines of text, and press **FINISH**. Depending on the device configuration, all the characters you type should print on the device. If this doesn't work, the problem is probably in your cable. (This procedure does not work for all devices. For example, it does not with the Imagen and PostScript printers, or certain Hp Laser printers.)

- Try using a different port.

- Reread the installation procedure that pertains to your device (see Section 4, "Installing GPS System Services"); make sure that you followed all the steps correctly.

- Check to see that the *Device Installation* form is filled in correctly. That is, make sure that the entries in the switch setting fields (baud rate, parity, and so on) match the switch settings on the device. Many devices have a test page that displays the current switch settings on the device. You can use this test page to make sure the device and *Device Installation* form settings match. See Sections 8 through 10 for switch setting information. If necessary, see also the documentation that comes with the printer.

  In addition, be sure that the port you used to attach the device matches the entry in the *Port* field of the *Device Installation* form. For example, if you attached the device to port [ptr]A, make sure *[ptr]A* is indicated in the *Port* field.

- After the Print Manager installation, you may have forgotten to change your *SysInit.jcl* file and reboot your system. If this is the case, see "Adding GPS to Your SysInit.jcl File," in Section 4.

- With older real mode operating systems (versions lower than BTOS 8.2.1 and CTOS 9.8), you may have the wrong *[Sys]<Sys>Request.Q* request file. To make sure you have the correct request file, copy *Request.Q.sys* from the current GPS distribution diskette onto your workstation; then reboot the workstation. Note that with all current operating system versions you have to merge *Request.Q.sys* with the existing *Request.sys* file by doing a List Request Set on *Request.sys* and *Request.Q.sys* followed by a Make Request Set.

- Try reinstalling GPS with the system as a standalone printing system, and then test it.

- Try the installation at a different workstation.

- Remove installation and configuration information from memory by following the steps for your particular problem, as outlined below.

  1. **If a device driver installs but doesn't print,**

     a. From the Admin display, press **F5** (De-Inst) to deinstall the Print Service. (Deinstalling the Print Service also deinstalls all device drivers at the workstation.)

     b. At the server, use the Print Manager to deinstall the Queue Manager.

     c. Use the Executive's Delete command to delete the following files: .

        [!Sys]<Gps>.queue*
        *[Scr]<$Gps>**

        The jobs that have been queued, but not printed, are lost.

     d. From the Print Manager, reinstall the Queue Manager at the server and the device driver at the workstation.

     e. Send a print job to the device.

2. **If device drivers don't install,**

    a.   From the Admin display, press **F5** (De-Inst) to deinstall the Print Service. (Deinstalling the Print Service also deinstalls all device drivers at the workstation.)

    b.   Use the Executive Delete command to delete the following files:

       [Sys]<Gps>*.config
       [Sys]<Gps>*.state

       The device setup information for particular devices is lost and has to be reentered.

    c.   From the Print Manager, reinstall the device drivers.

3. **If the Print Manager display is inaccurate (for example, it indicates incorrect node names or shows devices listed twice),**

    a.   Using the **DELETE** key on the keyboard, delete all devices on the Home display.

    b.   Press **F2** (Update) to display an updated list of devices that are listed at the server.

    c.   Press **F7** (Setup) to add devices from elsewhere in the network to the *Device Name* field of the Home display.

4. **If GPS system services do not install properly,**

    a.   Deinstall the Font Service, Queue Manager (at the server), and Print Service.

    b.   Use the Executive Delete command to delete the following files:

       [Sys]<Gps>*Gps.printers*

       The installation parameters for the GPS system services are lost.

       The Print Manager Home and Admin displays no longer list devices. However, typing a previously used device name in the *Device Name* field of the *Device Installation* form will bring up information from the *.config* file, if it exists.

    c.   From the Print Manager, reinstall the Font Service, Queue Manager, and Print Service. If you do not want to install the system services with default parameters, specify the desired values in the appropriate forms.

    d.   Reinstall the device drivers.

5.   **If all else fails, you may want to start again from a "clean" state (where all installation and configuration information is removed from memory).**

    Note: *You should only do this if all attempts at correcting the problem have failed.*

    a.   At the server, deinstall the Queue Manager.

    b.   At each client workstation where GPS services are running, deinstall the Print Service and device drivers.

    c.   Use the Delete command (from the Executive) to delete the following files:

       [Sys]<Gps>*Gps.printers*
       [Sys]<Gps>*.config
       [Sys]<Gps>*.state
       [!Sys]<Gps>*.queue
       [Scr]<$Gps>*

    d.   From the Print Manager, reinstall the Queue Manager, the Print Service, and device drivers.

The Printer Works, But It Isn't Printing Correctly

- Be sure that you are attempting to print a printable document.

- Try to narrow down the problem to the area where it is occurring. If you're having trouble printing from an application, try printing from the Print Manager or from the Executive. If you're having trouble with spooled printing, try setting up the printer for direct printing.

- Check to see that the switch settings and installation parameters (baud rate, parity, stop bits, and so on) you set are appropriate for the device. If you have a daisy wheel printer, certain switch settings must be changed for different types of print wheels; check your printer documentation.

- Check to see that you have used the device driver recommended for the device, as described in Sections 8 through 10. Be sure that you know the capabilities of that device driver. For example, *LptSimpleDD.run* doesn't configure a device to print boldface or underlined text.

- Check to see that you made the correct entry in the *Font Device Type* field of the *Device Installation* form.

Problems With a GPS Installation That Has Stopped Working

The Device Was Working, But It Isn't Working Now

- Check the Admin display to see if GPS is installed. If it isn't, reinstall GPS by rebooting your workstation. (Check to be sure you edited your *SysInit.jcl* file so that it contains the entry *[Sys]<Gps>GpsInstall.run*.) You can also reinstall GPS by using the Executive command Install Generic Print System. (If necessary, see "Reinstalling GPS System Services," in Section 4.)

- Check to see that the device is properly connected to the workstation and that the power is on.

- Check your printer documentation and rerun the self-test to see that the device itself is working.

- If the system hangs, you might have encountered a problem in server communications timing. Try rebooting the system. If this is a frequent problem, try changing the order of servers in your *SysInit.jcl* file, or add other jobs between server installations.

Troubleshooting a Shared Resource Processor (SRP)

Note: *The information below only applies if you're running CTOS/XE 3.0 with Standard Software 12.0 or later.*

You can verify and debug the correct installation of GPS by running Cluster View and selecting one of the Debugger options from the Cluster View menu. For detailed information on Cluster View, see the *CTOS System Administration Guide*.

As mentioned in "Diagnosing Problems," at the beginning of this section, you can track down problems by using the PLog command. (When filling in the command form, be sure to specify **[!Sys]** in the *Volume name* field.) Note that in the error log entries for shared resource processors reference a type of processor and a slot number. The slot number identifies the processor on which the error occurred. For more information on PLog, see the *CTOS Executive Reference Manual* and the *CTOS System Administration Guide*.

Shared Resource Processors Running Earlier Operating System Versions

Note: *The information below only applies if you're running XEBTOS 7.2 or CTOS/SRP 1.4.*

Editing Your Configuration Files

If you're installing GPS on a serial device, you need to edit the *CPxx.cnf* and/or *TPxx.cnf* files, where *xx* indicates the processor board number you're using to install GPS.

To edit the configuration file(s), remove the lines beginning with

```
Async n, Speed 9600...,
```

where *n* corresponds to the port on each board where a device is connected.

For example, if you're installing a device using the (ptr)A port, you must remove the entire Async 1 line; if you're using the (ptr)B port, remove the entire Async 2 line, and so on.

Verifying and Debugging the Installation of GPS

You can verify and debug the correct installation of GPS on particular processor boards by monitoring the shared resource processor as it boots.

To verify and debug the installation of GPS as the shared resource processor boots,

1. Plug a crossed RS-232-C cable from the workstation into the board you want to monitor. Look in the *.cnf* file for that board for the line ending with the entry *Connect=CTOS*. Plug the cable into the RS-232-C port that's specified in that line. For example, if the Async 3 line contains the entry *Connect=CTOS*, plug the RS-232-C cable into the port designated as channel 3. If the Async 1 line contains this entry, plug the cable into the (ptr)A port; if the Async 2 line contains this entry, use the (ptr)B port.

2. Use ATE to troubleshoot the shared resource processor, as follows:

   a. Type **A T E** in the Executive command line, and press **RETURN**.

   b. When the *A T E* form is displayed, change the defaults, if necessary. For example, if you're using channel A, type **[comm]A** in the *[Comm channel]* field.

   c. Press **GO**; then reboot the shared resource processor.

As the shared resource processor is initializing, your screen indicates the contents of the JCL file of the processor board you're monitoring. Your screen will also show error codes, if any.

For detailed information on ATE, see "Using ATE to Troubleshoot a Serial Device," later in this section.

Preventing GPS From Being Installed

If you need to prevent GPS from being installed for troubleshooting purposes, "deinstall" each driver and GPS system services with the Print Manager in server mode, and then reboot the shared resource processor.

Alternatively, you can prevent GPS from being installed by having two sets of JCL files: one for the M key switch position, which doesn't install GPS; and one for the N key switch position, which does. To avoid installing GPS, reboot in the M position; to install GPS, boot in the N position. For more information on key switch positions, see the *CTOS System Administration Guide*.

Using Basic ATE to Troubleshoot a Serial Device

You can use the Basic Asynchronous Terminal Emulator (Basic ATE) to troubleshoot a serial device. For more information on Basic ATE, see the *CTOS Basic Asynchronous Terminal Emulator (ATE) User's Guide*.

For this procedure, your workstation is connected to the device using a crossed serial input/output (SIO) cable. Attach one end of the cable to the device and the other end of the cable to communications channel B of your workstation.

Note: *Certain print spoolers must be deinstalled before Basic ATE can run. To be sure that these spoolers are not installed, deinstall GPS before you begin the procedure below.*

To troubleshoot a serial device with Basic ATE, turn the device on and run the self-test. (Refer to the documentation that comes with the device.)

Most serial devices are set as follows:

9600 baud
1 stop bit
Even parity
8 data bits

Next, check that the switch settings on the device match these values. If they don't, change the values, as described in the following steps, to match those of the device.

1. Sign on to your workstation.

2. Enter the Executive; type **B A T E** on the Executive command line, and press **RETURN**.

   Note: *If you accidentally press* **GO** *instead of* **RETURN**, *Basic ATE will start running. Press* **ACTION-FINISH** *to return to the Executive, and then start over.*

3. The Basic ATE command form appears on your screen. (If you are using pre-12.0 Standard Software, the command form displays *ATE* only, without the word *Basic*.)

4. Fill in the fields with the values shown below. If the switch settings on the device differ from these values, change the values in the form to match the settings on the device. Note the entry *hdx* (half-duplex mode) in the *Display mode* field. In half-duplex mode you can see on the screen the characters that you're typing.

   Basic ATE
       [Recording filename]   _____
       [Comm channel]   [comm]b_____
       [Baud rate]   9600_____
       [Stop bits]   1_____
       [Parity]   even_____
       [Data Bitsl]   8_____
       [Display mode]   hdx_____
       [Auto linefeed?]   _____
       [Recognize escape code?]   _____
       [Receive Timeout]   _____
       [Send Xon/Xoff?]   _____
       [Script filename]   _____
       [Open mode]   _____
       [Originate?]   _____
       [Dial string]   _____
       [Dial time out]   _____
       Half duplex modem?]   _____

5.   Press **GO**; then type a few characters at your keyboard.

If the characters don't print correctly, there are a number of things you can do, as described below. If one of these suggestions doesn't work, go on to the next one.

a.   Try a new SIO cable; you might have the wrong type, or your cable may not be working properly. Then, repeat steps 1 through 5 above.

b.   Connect the SIO cable to channel A instead of channel B. Repeat previous steps (steps 1 through 5), but change the *[comm]b* option to *[comm]a* in the *[Comm channel]* field. If the characters print correctly, you have a bad channel B port (communications connector).

c.   Check the switches (baud rate, parity, and so on) on the device again to make sure the settings match those shown at the beginning of this subsection. If they don't match, change the option values. Also, make sure the spooler is not installed at your workstation. Then, repeat previous steps (steps 1 through 5).

d.   Try another device. Or, use a "pseudo" device by using one workstation as a transmitter (use the one where your device is attached) and the other one as a receiver: use an SIO cable to connect both workstations; run Basic ATE on each workstation by following steps 2 through 5. Be sure you specify the correct ports.

Error Codes

The following list includes error codes that can occur with the printing system.

Pre-GPS Spooler

Decimal Value	Meaning
700	A ConfigureSpooler operation attempted to free a printer that was not attached.
701	A SpoolerPassword operation attempted to enter a password when the spooler was not waiting for a password.
702	Invalid printer name specified in a SpoolerPassword operation. Specify O, A, or B.
703	Invalid channel number specified in a ConfigureSpooler operation.
704	A ConfigureSpooler operation attempted to add a new printer to a channel that is not free.
705	Invalid printer spooler configuration file specified in a ConfigureSpooler operation.
706	A spooler was installed with a printer name that was already in use. Printer names must be unique.
707	Invalid printer configuration file specification. The *cbConfigureFile* field of the ConfigureSpooler operation exceeds 91 characters.
708	Invalid queue name. The *cbQueueName* field of the ConfigureSpooler operation exceeds 50 characters.
709	Current print request canceled.
710	Printer restarted.
711	Printer is freed and needs to be configured.

GPS Spooler

Decimal Value	Meaning
712	The device handle in the request was not recognized.
713	An attempt was made to supply a password when the Print Service was not waiting for one.
714	Reserved for future use.
715	Job entry data is inconsistent.
716	The device is not in a state where it can print. For Network Gateway virtual printer device drivers, this means that the printer is off line. This can happen if the device is out of paper, out of ribbon, or there's a paper jam or cable separation.
717 to 718	Reserved for future use.
719	Request path is inconsistent.
720	The Delete request failed. (The job may have already been completed or deleted.)
721	GPS Print Service: An attempt was made to process a job with an unrecognized job index.
722	GPS Print Service: The Print Service was unable to handle a new spooling job. If this error occurs frequently, reinstall the Print Service and increase the value in the *Number of simultaneous spool jobs* field.
723	GPS Print Service already installed.
724	The Print Service was unable to complete a request because contact with the Queue Manager was lost.
725	The Print Service received an illegal command.
726 to 799	Reserved for future use.

Queue Management

Decimal Value	Meaning
900	One of the following operations was invoked with an invalid queue entry handle (qeh): • RemoveMarkedQueueEntry • UnmarkQueueEntry • RewriteMarkedQueueEntry The queue entry handle specified was for an entry that is not marked.
901	A RemoveKeyedQueueEntry operation specified an entry that was previously marked.
902	One of the following operations was invoked for which no matching entry was found: • RemoveKeyedQueueEntry • ReadKeyedQueueEntry • MarkKeyedQueueEntry
903	A MarkNextQueueEntry operation was invoked when no entries were available.
904	The ReadNextQueueEntry operation specified an entry that was deleted, since its queue entry handle was returned.
905	The *pb/cbQueueName* fields of an operation specified an invalid or non-existent queue.
906	An EstablishQueueEntry operation was invoked when 100 server processes were already established.
907	A Marking operation was invoked by a server process that had not invoked an EstablishQueueServer operation.
908	An AddQueueEntry operation was involved with the fQueueIfNoServers flag set to False when no server processes were established.
909	One of the following operations was invoked with an invalid queue entry handle: • DeleteMarkedQueueEntry • UnmarkQueueEntry • RewriteMarkedQueueEntry

Queue Management

Decimal Value	Meaning
910	One of the following operations was invoked by a server process other than the server process that marked the entry:
	• DeleteMarkedQueueEntry
	• UnmarkQueueEntry
	• RewriteMarkedQueueEntry
911	A syntax error was found in the Queue Index file.
	This error is reported if there are spaces at the end of the line, or the last line is not followed by a carriage return.
912	An AddQueueEntry operation specified a queue type that does not match the queue type in the Queue Index file.
913	An AddQueueEntry operation was invoked with an invalid date/time specification.
914	The server process specified in an EstablishQueueServer operation is already established as a server.
915	The queue table is full. Either reduce the number of queues or reinstall the Queue Manager with a larger maximum number of queues.
916	The queue handle in the request was not recognized.
917	An attempt was made to remove a queue that is no longer in service.
918	An attempt was made to install a queue with a file specification matching that of a queue already in service.
919	An attempt was made to install a queue with a name matching one already in service.
920	DeterminQueNum marked as net-routable a request that ReRouteCommand refuses to reroute across the net.
	This is an internal error that indicates a software problem. Contact Technical Support.
921	An attempt was made to install the Queue Manager with an illegal installation parameter.
922	An attempt was made to deinstall the Queue Manager running in a single partition environment.
923	The loadable request file is either missing or is the wrong version.
924 to 999	Reserved for future use.

Generic Print Access Method (GPAM)

Nonfatal errors are recoverable conditions, such as a direct (unspooled) printer being offline or a printer needing more paper. If a nonfatal error occurs, GPS will not respond to a write request from GPAM, but will simply hang. If you specify a value for wTimeout in the call to GPAMOpen, then GPAM will return to the application (with an ercTimeout) in wTimeout tenths of a second if this hang occurs.

If the application gets an ercTimeOut from a GPAMWriteRecord, it checks cbRet to see how much data was successfully written. If the application gets an ercTimeOut from any other GPAM routine, the application determines that this GPAM routine escape sequence was not successfully transmitted to GPS, and calls the GPAM routine again when the condition is corrected.

In the case of a fatal error, GPS immediately returns the error to GPAM, which returns the error to the calling application. Therefore, it is possible that an ercOk can be returned from a GPAM call even though the output device has not yet received the escape sequence sent out by GPAM. (An ercOk implies only that the data has been successfully written to GPAM or GPS buffers, but not necessarily to the output device.) An application that receives an error from GPAM, other than ercTimeOut, calls GPAMRelease and not GPAMClose (this is similar to error handling in byte streams).

The following error codes describe errors that are returned to applications using GPAM.

Decimal Value	Meaning
4500	Invalid GPAMWA.
	An invalid GPAMWA has been passed to a GPAM routine.
4501	Invalid bypass.
	bBypass value passed to GPAMBeginOverstrike or GPAMBeginUnderscore is out of range.
4502	Invalid underscore parameter.
	bUnderscore value passed to GPAMBeginUnderscore is out of range.
4503	Too many parameters.
	cbParams value passed to GPAMBeginPage or GPAMOpen is too large.
4504	Invalid sides specification.
	bSides value in GPAMBeginPage parameter block is out of range.
4505	Invalid form name specification.
	Form name in GPAMBeginPage parameter block is too long.
4506	Invalid aspect.
	bAspect value in GPAMBeginPage parameter block is out of range.
4507	Invalid page number specification.
	Page number in GPAMBeginPage parameter block is too long.
4508	Invalid montage specification.
	Montage name in GPAMBeginPage parameter block is too long.
4509	Invalid quality.
	bQuality value in GPAMBeginPage parameter block is out of range.

GPAM

Decimal Value	Meaning
4510	User name too long.
	User name in GPAMOpen parameter block is too long.
4511	Document name too long.
	User name in GPAMOpen parameter block is too long.
4512	Font name too long.
	Font name passed to GPAMSetFont is too long.
4513	Translate table name too long.
	Translate table name passed to GPAMSetTranslateTable is too long.
4514	GPAMWA too small.
4515	Timeout value set in GPAMOpen has been reached.
4516	A GPAM text routine has been called while in graphics mode, or a graphics routine has been called while in text mode.
4517	Invalid vertical offset level.
	intLevel (passed to GPAMSetVerticalOffset) is out of range.
4518	Invalid color specification.
	pb/cbColors (passed to GPAMGrColorTable) either contain too many colors, or do not contain exactly one red, green, and blue value per color.
4519	Bad specification of points.
	cbPoints passed to GPAMGrPolyLine or GPAMGrPolygon is too large or does not contain exactly one x value and one y value for each point.
4520	Amount to write is too large.
	cb passed to GPAMWriteRecord is too large.
4521 to 4525	Reserved for future use.

Print Service

Decimal Value	Meaning
4526	Bad header in DevHelp file.
4527	DevHelp file is corrupted.
4528	Print request timed out.
4529	*Gps.printers* file is corrupted.
4530	Installation error. Unable to find the operating system tables.
4531	Stack Overflow. Returned by BuildAsyncRequest or BuildAsyncRequest Direct if the request block to be built would overflow the stack. The context should be created with a bigger stack. Use the *[Increment stack size by]* parameter when installing the Print Service in the Print Manager to increase the stack space. An increase of 50 bytes should be sufficient.
4532	Context Not Found. Returned by ResumeContext if the request block pointed to by pRq does not belong to a context that is waiting for a request. This is an internal error.
4533	No Heap Memory Available. Returned by HeapAlloc if there is not enough contiguous memory available in the heap to satisfy the allocation request. A context has run out of heap space. Use the *[Increment heap size by]* parameter when installing the Print Service in the Print Manager to increase the heap space. An increase of 1000 bytes should be sufficient.
4534	Invalid Heap Block. Returned by HeapFree if the pointer to the block to free is not valid. Either the address is out of range or the header of the heap block has been corrupted. For example, one heap block might have been overwritten into the next.

Device Driver

Decimal Value	Meaning
4535	Invalid "Hex" string. A hexadecimal string of byte values entered into the *Device Installation* form is invalid because it contains nonhexadecimal digits or an odd number of hexadecimal digits.
4536	GPAM data, or "NORMAL image-mode" data has been sent to the Binary Mode device driver that is provided with the Generic Print System. Only "IMAGE image-mode" data or "BINARY image-mode" data will be processed by the Binary Mode driver.
4537	An attempt was made to acquire a GPS device that is paused (a direct-print GPS device may be paused when it is not acquired to prevent its use by GPS). The device must be restarted before it can be acquired for output.
4538	Reserved for future use.
4539	More than one SetGPSParams request was sent to a GPS device driver for a single document. Or the SetGPSParams request was made after a WriteGPSFile request had already been made. For direct printers, the SetGPSParams request must occur between the OpenGPSFile request and the first WriteGPSFile request. For spooled printers, the SetGPSParams request will be accepted any time between the OpenGPS file request and CloseGPSFile request.
4540	The GPS device driver output port is not currently acquired, and this request cannot be executed when the port is not acquired. If the device driver is installed for direct printing (not spooled), some other application may be currently printing to the device driver's "shared" port.
4541	Reserved for future use.
4542	An Align or Restart command was attempted on a device that is not paused. A GPS device must be paused before it can process an Align or Restart command.
4543	Incorrect graphics data was received in the input stream.
4544	An invalid Image mode value was specified.
4545	The supplied data buffer was too small for the requested data.
4546	An invalid value was specified for "Beginning-Page" class.
4547	An invalid value was specified for "Ending-Page" class.
4548	An invalid value was specified for the Control command.
4549	An invalid value was specified for the Control subcommand.

Device Driver

Decimal Value	Meaning
4550	Can't find OS tables. This occurs if the AsyncServer procedures can't access the tables in the operating system to get the tables it needs to build request blocks. The operating system may be too old to work with the AsyncServer procedures.
4551	Reserved for future use.
4552	The specified restart location could not be found in the document.
	(This is a change to the previous documentation of this error value.)
4553	The command (such as Cancel) cannot be executed when GPS is not processing a document.
4554	Device is requesting Print Service to rewind to the beginning of the file.
4555	Reserved for future use.
4556	Request cannot be serviced because the device driver for the requested device is currently being deinstalled from memory.
4557	This job has been canceled. This data will not be output.
4558	The specified file does not exist.
4559	Heap is full.
	Increase the size of the Font/Graphics Work Area.
4560	Driver is proceeding to the next band.
4561	Reserved for future use.
4562	The TIFF data being processed by the GPS device driver contains malformed TIFF records.
4563	The CGM data being processed by the GPS device driver contains malformed CGM records.
4564	The GPAM data being processed by the GPS device driver contains malformed GPAM records, or is not a supported version of GPAM.
	This is an internal error that indicates a software problem. Consult Technical Support.

Device Driver

Decimal Value	Meaning
4565	Control process of the GPS device driver has received an invalid request.
	This is an internal error that indicates a software problem. Consult Technical Support.
4566	Data process of the GPS device driver has received an invalid request.
	This is an internal error that indicates a software problem. Consult Technical Support.
4567	Device driver cannot access the device output port because
	1. GPS has already accessed this port, or
	2. Some application is currently using the port
4568	The GPS device driver is unable to get the correct information to allow its deinstallation.
	This is an internal error that indicates a software problem. Consult Technical Support.
4569	A Job Change command was received by the wrong process at the GPS device driver.
	This is an internal error that indicates a software problem. Consult Technical Support.
4570	File to be downloaded (such as a font file) does not exist.
4571	Reserved for future use.
4572	Invalid GPAM operation encountered while in Transparent mode.
4573	Invalid pre-GPS spooler escape sequence encountered processing an ASCII file.
4574	No such font.
4575	Job command error.

Print Service

Decimal Value	Meaning
4576	An attempt was made to access a device (in the Print Service tables) that was marked uninstalled.
4577	A bad request file.
	Verify that a correct version of the loadable request file *Request.9.sys* is in *[Sys]<Sys>*. Be sure to reboot the system after installing GPS.
4578	Print Service run file is not compatible with this operating system.
4579	Case data bad in Delete request.
4580	The request was held at the server for a cluster uplink.
4581	The request was routed but an error occurred during the Print Service uplink.
	This is an internal error that indicates a software problem. Consult Technical Support.
4582	The request has been forwarded for remote processing.
4583	This request cannot be serviced because the Print Service is terminating.
4584	Cannot deinstall GPS when running on a single partition operating system
4585	Device driver has not yet been installed.
4586	Duplicate device specification.
	An attempt was made to add a device that already exists.
4587	An attempt was made to use spooling services for a direct print device.
	On direct print devices, document information is available only for the document currently printing.]
4588	An attempt was made to read beyond the end of a device scheduling queue by GetGPSDocInfo.
	This is a normal error code for reaching the end of the list of queued jobs.
4589	Bad job handle found while attempting to route a printing request.
	Possibly caused by termination of GPS on another workstation or deletion of the print job.

Print Service

Decimal Value	Meaning
4590	A direct print device is already opened by another user request.
4591	The Print Service was unable to handle a new request. There are no job handles available.
4592	Network device table is full (on the server only).
	Reinstall the Print Service and increase the size of the *Total number of devices monitored* field.
4593	Unbalanced brackets on device specification.
	Invalid Device Spec: Device names should be less than 12 characters. Invalid Device Spec: Node name must be less than 12 characters.
4594	Invalid node specification.
4595	Bad type case.
	This is an internal error that indicates a software problem. Consult Technical Support.
4596	Bad update case.
	This is an internal error that indicates a software problem. Consult Technical Support.
4597	The user has specified invalid device configuration data.
	This is an internal error that indicates a software problem. Consult Technical Support.
4598	The device name is not recognized.
4599	Local device table is full.
	Reinstall the Print Service and increase the size of the *Number of devices installed locally* field.

Graphics

Decimal Value	Meaning
7601	Internal error within the device driver's graphics processing. Contact Technical Support.
7646	Invalid CGM-graphics formats encountered in the document being processed by the device driver, or an internal error detected within the driver's raster scaling.
7649	Insufficient memory allocated within the device driver to perform the required processing of some graphics object within a document. Try reinstalling the device driver with a larger number in the *Font/Graphics Work Area* field in the Print Manager *Device Installation* form. If that doesn't solve the problem, and the graphics object is vector art (for example, from Art Designer), try to reduce the complexity of the vector art.
7680	Internal error within the device driver's graphics processing. Contact Technical Support.
7681	Invalid CGM-graphics formats encountered in the document being processed by the device driver.
7686	Internal error within the device driver's graphics processing. Contact Technical Support.
7694	Invalid CGM-graphics formats encountered in the document being processed by the device driver.
7695	Invalid CGM-graphics formats encountered in the document being processed by the device driver.
7696	Invalid CGM-graphics formats encountered in the document being processed by the device driver.

Raster Images

Decimal Value	Meaning
13411	Invalid or unsupported formats encountered in TIFF raster image data.
13451	Invalid or unsupported formats encountered in TIFF raster image data.

Font Service

Decimal Value	Meaning
13900	Font Service Not Running. This is returned by Deinstall Font Service if there is no Font Service to deinstall.
13901	Incorrect Version Font Database. The Font Service returns this status code when it fails to install. The version of the runtime Font Database is incompatible with the version of the Font Service. Future releases of the font system will require that you regenerate the runtime Font Database, using the rereleased Font Tool, to obtain a version of the Font Database compatible with the rereleased Font Service. Verify that you have the correct version of Font Service software installed, and regenerate the runtime Font Database if necessary. It is also possible that the file provided to the Font Service is not a valid runtime Font Database at all.
13902	Font Database Inconsistency. The Font Service returns this status code when it discovers an internal inconsistency in the process of serving a request. If regenerating the Font Database does not solve the problem, contact Technical Support.
13903	Font Key Not Found. The Font Service returns this status code when the reduced font key is not found in the Font Database. Verify that the regeneration of the runtime Font Database does not result in errors (for example, records flagged as invalid). If the problem persists, contact Technical Support.
13904	Insufficient Font Service Buffer Space. The Font Service returns this status code when it does not have sufficient buffer space to service the request. Reinstall the Font Service, specifying a larger amount of buffer space. (The default buffer size is 8K bytes.)
13905	Insufficient Space to Return Font Information. The Font Service returns this status code when the client of the Font Service calls it with less than minimal space to return the font data.

Font Service

Decimal Value	Meaning
13906	Cannot Install. This is returned by the Font Service when it fails to install because the Font Service request codes are already being served by some service. Verify that the Font Service has not already been installed.
13907	Cannot Deinstall. This is returned by the Deinstall Font Service under a single partition operating system.
13908	Font Data Unavailable. This is returned by the Font Service when the reduced font key does not refer to the type of data requested. For example, this status code is returned if a raster font is requested for a device type for which rasters are inapplicable or otherwise unavailable. Examine the returned font key. If the data should be available, check for an error in the editable Font Database (for example, the raster font is not named in the font key, or the corresponding font file is not present in that path) and regenerate the Font Database.
13909	Invalid Font Character Set Id. The Font Service returns this status code when the request parameters contain a character set id which is generally invalid for the particular request (for example, 0 is invalid on requests for the device alias), or invalid for the particular font key (for example, 82 hexadecimal, when the font key refers to only two character sets).
13910	No Such Font Device Type. GetFontDeviceList returns this status code when iDevice in the request is greater or equal to the total number of device types.
13911	No Such Font Family. GetFontFamilyList returns this status code when iFamily in the request is greater or equal to the total number of font families.
13912	Invalid Font Key. The font key that passed on the Font Service request is invalid. For example, it may be an incorrect size.
13913	Invalid Font Handle. Handle passed on the Font Service request does not match the handle for any item of the type (raster font or translation table) requested.
13914	Scaling Font Service required. The Font Service returns this status code if the reduced font key in a request for the font data indicates that the font should be scaled on the fly. This status code is also returned if the application (such as the HP LaserJet Device Driver) requires a font in a format that can only be supported by the Scaling Font Service.

Scaling Font Service

The Scaling Font Service can return any of the error codes returned by the standard Font Service (which are listed above). In addition, the Scaling Font Service can return the following error codes.

Decimal Value	Meaning
13915	An error was encountered when opening an outline file.
	Be sure that all the outline files are present in the directory specified when installing the Scaling Font Service (*[Sys]<Gps>,* by default). Also, verify that no access violations or disk errors are encountered when accessing each outline file.
13916	Invalid parameters.
	For example, the parameters passed to the Scaling Font Service are incomplete or specify a font that is out of range.
13917	Scaling keys too complex.
	The Font Database names more scaling font keys or outlines than the Font Service can uniquely identify. Deinstalling the Font Service and deleting the metrics cache, before reinstalling the Scaling Font Service, will temporarily work around the problem. The permanent solution is to reduce the number of font keys in the Font Database that reference distinct combinations of outlines, character sets, and device type.
	The Scaling Font Service caches highly compressed (binary) representations of the device type, outlines, and character sets indicated by various font keys referenced in calls to the Scaling Font Service. Each of these is assigned a unique 8-bit id that makes up half of the unique 16-bit handle used to identify each font in the small and medium format cells. (The other bits indicate the point size of the font.) These handles are used to reaccess fonts on successive calls to the Scaling Font Service (by OFIS Document Designer, for example) and to obtain font metrics cached in prior calls.
	This error indicates that the space for identifying distinct fonts has been exhausted. It is impossible to assign a unique font handle for reaccessing the font. You cannot reference more than 256 distinct scaling font keys, or more than 256 outline files qualified by distinct character sets.
13918	An invalid outline file was accessed.
	If this occurs, reinstall the outlines from the distribution media and renationalize them, if necessary.

Scaling Font Service

Decimal Value	Meaning
13919	An unanticipated error was detected in the *Speedo* portion of the Scaling Font Service supplied by Bitstream, Inc.
13920	An unanticipated error was detected in the portion of the Scaling Font Service implemented by Unisys.
13921	Outline names too long. The Scaling Font Service caches the names of outlines used for scaled fonts in a fixed area of the metrics cache file, which is mirrored in memory. If the 12-character naming conventions in the released product are followed, this area has room for 194 outline names. If you are adding more outlines than this, rename them to use shorter names (for example, omit the .SFO suffix), and modify the Font Database accordingly. There is an architectural limit of 256 outlines that can be accommodated with 8-character names.

Device Driver Font and Graphics Error Codes

Decimal Value	Meaning
15305 to 15319	Reserved for use by the device-dependent portion of GPS device drivers. The meanings of these error codes depend on which GPS device driver is being used. Refer to the device driver descriptions in Sections 8 through 10.
15320	The font device type specified by the GPS device driver does not exist in the Font Database accessed by the device driver. All GPS device drivers have a default font device type. A different font device type may be specified at installation time. Each installed GPS device driver must have access to an installed Font Database that contains font data designed for that device driver.
15321	This is an internal error that indicates a software problem. Consult Technical Support.
15322	The GPS device driver has detected a bad font handle. This is an internal error that indicates a software problem. Consult Technical Support.

Device Driver Font and Graphics Error Codes

Decimal Value	Meaning
15323	Reserved for future use.
15324	This is an internal error that indicates a software problem. Consult Technical Support.
15325	An invalid font handle was present in a call to DdFntHandles within the GPS device driver.
	This is an internal error that indicates a software problem. Consult Technical Support.
15326	The recipient data structure specified in a call to DdFntKey within the GPS device driver was too short.
	This is an internal error that indicates a software problem. Consult Technical Support.
15327	Reserved for future use.
15328	An invalid font handle was present in a call to DdGetAlias within the GPS device driver.
	This is an internal error that indicates a software problem. Consult Technical Support.
15329	Applies to overlaid device drivers only. The swapping zone with which the driver was installed is too small to support one of the following: any printing, vector art processing, or raster image processing. This might occur when you attempt to print documents containing vector art or raster images.
	Reinstall the device driver using the default swapping zone size, or explicitly specify a larger swapping zone size on the *Device Setup* field of the Print Manager *Device Installation* form.
15330	An invalid font handle was present in a call to DdGetChSet within the GPS device driver.
	This is an internal error that indicates a software problem. Consult Technical Support.
15331	Reserved for future use.
15332	The recipient data structure specified in a call to DdChXlate within the GPS device driver was too short.

Device Driver Font and Graphics Error Codes

Decimal Value	Meaning
	This is an internal error that indicates a software problem. Consult Technical Support.
15333	Out of memory for font tables or raster image work area. To print the document, reinstall the device driver and specify a larger amount under Storage Allocation in the *Font/Graphics Work Area* field.
15334	Insufficient font data table space was allocated when installing the driver. The default value is 4K bytes. 2K bytes is the minimum allowed by most device drivers.
15335 to 15342	Reserved for future use.
15343	There is not enough memory within the device driver to store the font definitions or raster image work area required by this document. Additional memory may be allocated within the device driver by reinstalling it with a larger number specified in the *Font/Graphics Work Area* field in the Print Manager *Device Installation* form.
15344 to 15345	Reserved for future use.
15346	An invalid font handle was present in a call to DdChWidth within the GPS device driver.
	This is an internal error that indicates a software problem. Consult Technical Support.
15347	An invalid font handle was present in a call to DdFntKey within the GPS device driver.
	This is an internal error that indicates a software problem. Consult Technical Support.
15348 to 15349	This is an internal error that indicates a software problem. Consult Technical Support.
15350	Error encountered while initializing the device driver's memory heap manager. This may be caused by entering a number greater than 64 in the *Font/Graphics Work Area* field in the Print Manager *Device Installation* form. Otherwise, it indicates an internal error, and Technical Support should be consulted.
15351	Internal error. The device driver memory heap has been corrupted. Contact Technical Support.
15352	Bounds of raster memory were exceeded.

Device Driver Font and Graphics Error Codes

Decimal Value	Meaning
15353	There is not enough memory within the device driver to store the font definitions or raster image work area required by this document. Additional memory may be allocated within the device driver by reinstalling it with a larger number specified in the *Font/Graphics Work Area* field in the Print Manager *Device Installation* form.
15354	An invalid font handle was present in a call to DdChXlate within the GPS device driver.
	This is an internal error that indicates a software problem. Consult Technical Support.
15355	Cannot scale graphic.
	The device driver does not have sufficient memory to scale an image. Reinstall the printer with a larger value in the *Font/Graphics Work Area* field. If the maximum value in the *Font/Graphics Work Area* field (64K) has already been specified, rescan the image at the size to be printed (or some smaller size than before).
15356 to 1559	Reserved for future use.
15360	The timeout period specified has expired for the Network Printing Gateway to wait for a response from across the network.
15361	The timeout period specified has expired for the Network Printing Gateway to wait for a response from a CTOS application or service.
15362	No message blocks are available for communication to a Network Printing Gateway session process.
15363	Network Printing Gateway session not available.
15364	Network Printing Gateway process not available.
15365	Bad parameters passed to a Network Printing Gateway call.
15366	Network Printing Gateway request is not known.
15367	Network Printing Gateway request is being forwarded.
15368	Print Service version should be updated.
15369	Print Service is not available.
15370	Bad session Id.

Device Driver Font and Graphics Error Codes

Decimal Value	Meaning
15371	Network Printing Gateway cannot deinstall.
15372 to 15412	Reserved for future use.
15413	The normal mode setting is incompatible with your other settings.
15414	An invalid *Page-Portrait String* was specified in the *Device Setup* field of the *Device Installation* form. Page-portrait strings must contain only hexadecimal digits, are limited to 20 digits, and must contain an even number of digits.
15415	An invalid *Page-Landscape String* was specified in the *Device Setup* field of the *Device Installation* form. Page-landscape strings must contain only hexadecimal digits, are limited to 20 digits, and must be an even number of digits.
15416	An invalid *Reset String* was specified in the *Device Setup* field of the *Device Installation* form. Reset strings must contain only hexadecimal digits, and must be an even number of digits.
15417	This is an internal error that indicates a software problem. Consult Technical Support.
15418	The GPS 2.0 (or later) loadable requests have not been installed. The system must be rebooted after installing the correct GPS loadable request file.
15419	The version of the installation parameters data and the GPS device driver are incompatible. Verify that the GPS 2.0 Installer (*GpsInstall.run*) is being used. Consider deleting the existing *.state* and *.config* files for the affected device before repeating the installation process.

Appendix A
Installing GPS on Shared Resource Processors (SRPs) Running XEBTOS 7.2 or CTOS/SRP 1.4

Use this appendix only if you're installing GPS on shared resource processors running XEBTOS 7.2 or CTOS/SRP 1.4. Otherwise, see "Installing GPS on a Shared Resource Processor," in Section 4, "Installing GPS System Services."

How GPS Installation Works on a Shared Resource Processor

You install certain GPS system services on certain processor boards of the shared resource processor. This is done by making specific entries in the various processor board initialization files and then rebooting the shared resource processor.

Server Mode

During the GPS "installation" process, you must use the Print Manager in Server mode. The word *installation* is in quotation marks because GPS system services are not actually installed through the Print Manager as they are when you install them on a workstation. Instead, when in Server mode, the Print Manager prepares the initialization files so that the GPS installation can take place when you reboot the shared resource processor.

Note that when the Print Manager is in Server mode, all the Print Manager installation commands are still accessible to you. You go through the normal steps of installing or deinstalling a device, but instead of actually installing GPS system services, you're recording changes to the *Gps.printers* file at the server. The contents of this file determine which GPS system services are to be installed on the shared resource processor when you reboot the server.

GPS System Service Placement on a Shared Resource Processor

SRP (Rear View)

Print Service
Device Driver

Queue Manager
Font Service

F C C
P P P
0 0 0
0 0 1

2355.A

Spooled
Printer
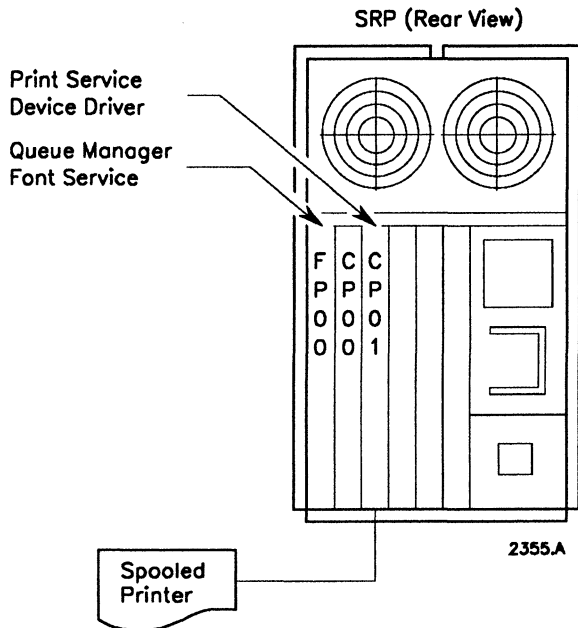
GPS services may be installed on any combination of boards; however, the recommended SRP installation sequence is to install the Font Service and the Queue Manager on the Master File Processor (FP) board, because both system services access disks frequently and operate more efficiently when executing directly on an FP. The Font Service and Queue Manager must be installed before the other GPS system services.

The other GPS system services (the Print Service and device drivers) may be installed on any combination of Cluster Processor (CP) and Terminal Processor (TP) boards. Only one Print Service should be installed on the shared resource processor; the Print Service is generally on the board where the most frequently used devices are attached.

Installing GPS

The following procedure involves two steps and shows you how to install GPS by

- Editing your initialization files and adding the GPS system services

- Using the Print Manager in Server mode

Note: *To minimize any problems you may have with your GPS instal-*
lation, check your shared resource processor configuration file to
see if it needs to be edited. For more information, see "Editing
Your Configuration Files," in Section 11, "Troubleshooting."

Editing the Shared Resource Processor Initialization Files

When editing the shared resource processor initialization files, you can install a single device driver or multiple device drivers.

If you have one device connected to the shared resource processor, you can install the device driver on either the CP or TP board.

From the Executive,

1. Type **Editor** on the Executive command line.

2. Edit the *[!Sys]<Sys>Initbpxx.jcl* file for each processor board to indicate which boards will contain the system services. (See Figure A-1 for sample shared resource processor initialization files.)

   In the file specification, above, *bp* refers to the processor board you're using, such as FP, TP, or CP; *xx* refers to the number of the board. If *xx* is two zeros (00), this indicates the first board; if *xx* is 01, this indicates the second board, and so on.

   For example, if you install the Font Service and Queue Manager on the first FP board,

   a. type **[!Sys]<Sys>InitFP00.jcl** in the *File name(s)* field of the *Editor* command form, and press **GO**.

      Note the use of the *Sync* program in the examples below. *Sync* is used to ensure that both the Queue Manager and the Font Service complete their respective installations before *GpsInstall.run* installs the rest of the GPS system services. For more information on the *Sync* program, see "Sample Shared Resource Processor Initialization Files," later in this section.

    b.   Add the following entries:

        $Run [Sys]<Gps>GpsInstall.run
        $Run [Sys]<Sys>Sync.run,1
        $End

    c.   Press **FINISH**; then press **GO**.

3.   If your device is attached to the second CP board, install the Print Service and device driver, as follows.

    a.   Type **[!Sys]<Sys>InitCP01.jcl** in the *File name(s)* field of the *Editor* command form, and press **GO**.

    b.   Add the following entries:

        $Run [Sys]<Sys>Sync.run,1
        $Run [Sys]<Gps>GpsInstall.run
        $End

    c.   Press **FINISH**; then press **GO**.

    d.   Log out; then sign on as **GPS**, and press **GO**.

The GPS Installer uses the *Gps.printers* file to determine which GPS system services to install on the CP01 board. The subsection "Using the Print Manager in Server Mode," later in this section, describes how to set up the *Gps.printers* file.

If you have several devices connected to the shared resource processor, you can install device drivers on multiple boards. In the sample files below, the *Sync* program causes the Queue Manager and Font Service to be installed first. Then *GpsInstall.run* is executed on the CP00 and CP01 boards, respectively. The Print Service is installed when the first *GpsInstall.run* file is executed (which is on the CP00 board in the sample files below).

```
InitFP00.jcl


;**The next statement installs the Queue Manager and Font
;Service.**
$Run   [Sys]<Gps>GpsInstall.run
$Run   [Sys]<Sys>Sync.run,1
$End

InitCP00.jcl

$Run   [Sys]<Sys>Sync.run,1
;**The next statement installs the Print Service and Device
;Driver #1.**
$Run   [Sys]<Gps>GpsInstall.run
$Run   [Sys]<Sys>Sync.run,2
$End

InitCP01.jcl

$Run   [Sys]<Sys>Sync.run,2
;**The next statement installs Device Driver #2.**
$Run   [Sys]<Gps>GpsInstall.run
$End
```

Using the Print Manager in Server Mode

As mentioned earlier, when the Print Manager is in Server mode, it pre-
pares the initialization files so that GPS system services installation can
take place when you reboot the shared resource processor.

To use the Print Manager in Server mode, press **F7** (Server) from the
Print Manager Admin display. (To turn off Server mode, press **F7**
again.) Then follow the steps for installing system services in "Steps For
Installing GPS System Services," in Section 4.

Note: *In the* Board ID *field of the* Device Installation *form, be sure to
specify the name of the board where the device is connected. For
example, if the device is connected to the second CP board, type*
CP01.

Checking Your Installation

To check your installation,

1. From either the Home or Admin display, mark the name of your newly installed device.

2. Press **F1** (Print) and type the name of one of your files in the *File list* field. For example, type **[Sys]<Sys>.user**

3. Press **GO**.

Sample Shared Resource Processor Initialization Files

When you set up your own initialization files, you may want to use additional system services. However you set up your files, remember that the Font Service and Queue Manager must be installed before the other GPS services. As mentioned earlier, they may be installed on the FP board, which is recommended, or on the same board as the other GPS services. The Print Service and device driver must be installed on the CP or TP board where you have attached the printer.

All system services must be installed before the Administrative Agent. (The Administrative Agent, also called *MFAdminAgent*, is a system service that permits execution of run files on the shared resource processor from workstations.) The last entry in each file should be the entry **$End**.

The sample initialization files below include entries that run the program *[Sys]<Sys>Sync.run*. *Sync* is used to synchronize the installation of servers. Basically, the first instance of a sync pair encountered (for example, *sync.run,1*) causes the processor board on which it is run to hold the installation until *sync.run,1* has been executed on a different processor board.

Note that in the sample files below, the initialization process begins with CP01, since it is the only file that doesn't begin with a *Sync.run* entry.

The sample files in Figure A-1 show GPS-specific entries in boldface text.

```
InitFP001.jcl
;**The next statement mean "wait for CP01."
$Run [Sys]<Sys>Sync.run,1
$Run [Sys]<Sys>Net.agent.run, , , , ,3000
$Run [Sys]<Sys>Net.server.run
$Run [Sys]<Sys>MCreatePartition.run, 150k,QIC

;**The next statement installs the Queue Manager and Font
;Service.**
$Run [Sys]<Gps>GpsInstall.run

;**The next statement means "allow CP01 to proceed."**
$Run [Sys]<Sys>Sync.run,2
$End

InitCP01.jcl

$Run [Sys]<Sys>Net.run,Rocky,1
$Run [Sys]<Sys>Hdlc.run,1

;**The next statement means "allow FP00 to start."**
$Run [Sys]<Sys>Sync.run,1

;**The next statement means "begin after FP00."**
$Run [Sys]<Sys>Sync.run,2
$Run [Sys]<Sys>Nac.run

$Run [Sys]<Sys>MCreatePartition.run,136k,Mserv
$Run
[Sys]<Sys>MInstallServer.run,MServ,[Sys]<Sys>MailServer.run
$Run [Sys]<Sys>MCreatePartition.run,80k,ms
$Run [Sys]<Sys>MInstallServer.run,ms,[Sys]<Sys>ModemServer.run
$Run [Sys]<Sys>MCreatePartition.run,25k,CommM
$Run [Sys]<Sys>MInstallServer.run,CommM,&
[Sys]<Sys>CommunicationsManager.run,SwSlave

;**The next statement means "allow CP00 to proceed."**
$Run [Sys]<Sys>Sync.run,3
$End
; (then)

InitCP00.jcl

;**The next statement means "wait for CP01 to finish."**
$Run [Sys]<Sys>Sync.run,3

;**The next statement installs the Print Service and Device
;Driver."**
$Run [Sys]<Gps>GpsInstall.run
$Run [Sys]<Sys>MfAdminAgent.run
$End
```

Figure A-1. Sample Shared Resource Processor Initialization Files

Appendix B
Notes for Pre-GPS Printing

Before the Generic Print System was introduced, workstation printing was managed differently from the way it is described in the body of this guide. If you have an application system that has not been modified to work with the Generic Print System, or if you are using a pre-GPS system and you have not installed GPS, you need the following information about this pre-GPS system.

If you are using GPS but have an application system that has not been modified to work with GPS, for example, OFIS Writer or the Word Processor, you need to follow the GPS procedures for installing a new printer. Then you need to make an entry for that device in the *Sys.printers* file. These details are described in Section 7, "Using GPS With Pre-GPS Applications."

Note: *If you're using GPS, the GPS spooler has been combined with the routing switch into a single program called the Print Service. References to the spooler in this section apply to pre-GPS systems only.*

Pre-GPS Overview

A pre-GPS system offers either direct or spooled printing for a serial or parallel printer, just as GPS does. Printers can be installed for standalone or clustered systems.

However, there are some differences between GPS systems and pre-GPS systems:

* Since a pre-GPS system does not provide for the generic use of printers or plotters, special procedures are used to define printers for the application systems.

- The system services used for spooled printing, the Queue Manager, and the Print Service are revised for GPS to include additional functionality.

- Direct printing works differently with GPS.

- A pre-GPS system requires that you manually edit more configuration files than does a GPS system.

Printing with a pre-GPS system can be done through an application or through the Executive commands Format, Copy, and Print (for spooled printing). The Spooler Status command is used for status inquiries and to control the printer for such control operations as Pause and Restart. These commands are described in the *CTOS Executive Reference Manual.*

Configuring Pre-GPS Direct Printing

For pre-GPS direct printing, follow the steps below. Each of these steps is described in detail later in this section.

1. Attach the device to the workstation (usually a server), and verify that the device and the workstation are communicating.

2. Create a printer configuration file (for example, *LptConfig.sys* or *PtrBConfig.sys*), or use the default file distributed with Standard Software. This file includes information such as baud rate and time out and is located on the workstation where the device is attached.

3. Create a *Sys.printers* file, or use the default file distributed with the application systems. The *Sys.printers* file is only necessary if you want to print from application systems, such as OFIS Document Designer.

Direct printing differs in function from a pre-GPS system, in that printing can only occur when the file to be printed is located at the workstation where the printer is attached. In addition, a direct printer attached to a client workstation can be used *only* by that workstation.

As with GPS, a printer set up for direct printing can handle only one print request at a time and can not maintain a queue. Direct printing is rarely used for shared printers.

Configuring Pre-GPS Spooled Printing

For pre-GPS spooled printing, follow the steps below. Each of these steps is described in detail later in this section.

1. Attach the device to the workstation (a server or a client workstation), and verify that the workstation and device are communicating.

2. Create a printer configuration file (for example, *LptConfig.sys* or *PtrBConfig.sys*), or use the default file distributed with Standard Software. This file includes information such as baud rate and time out and is located on the workstation where the device is attached.

3. Add the queue name to be used for the new device to the *[Sys]<Sys>Queue.index* file on the server, or use the default file distributed with Standard Software.

4. Install the Queue Manager on the server of the cluster (if clustered).

5. Create a spooler configuration file (for example, *SpoolerConfig.sys*, or with Standard Software earlier than 12.0, *SplCnfg.sys*), or use the default file distributed with Standard Software. The spooler configuration file is called *[Sys]<Sys>*QueueName*Config.sys*, where *QueueName* is the name of the spool queue to be used for the device.

6. Install the spooler on the workstation where the device is attached.

7. Create a *Sys.printers* file, or use the default file distributed with application software packages. The *Sys.printers* file is only necessary if you want to print from application systems, such as the Word Processor.

Spooled printing with a pre-GPS system differs from printing with GPS in that the spooler is not as sophisticated and keeps complete control of the serial I/O channel even when you are not printing.

In addition, with the old spooler you must create a special spooler configuration file and add entries for a *Queue.index* file that is used by the Queue Manager. Entries in these two files must be coordinated with each other and with the printer configuration file.

Cluster and Installation Considerations for Configuring Pre-GPS Printing

Direct Printing

With pre-GPS direct printing, files can be printed only on a workstation directly attached to the printer, or on the server where the printer is directly attached. Thus, a printer attached to a client workstation is used only by that workstation.

Spooled Printing

A cluster can be configured several different ways for spooled printing:

- One printer can be shared by all workstations. It can be attached to one workstation, either a client workstation or a server.

- Two printers attached to the same workstation can be shared by all workstations in two ways:

  - They can use the same queue, if you do not want to differentiate between printers.

  - They can use different queues.

- Printers can be attached to more than one workstation and can use the same queue, or they can use different queues.

Figures B-1 and B-2 show examples of two possible spooler configurations. Note the location of the Queue Manager, spooler configuration file(s), and printer configuration file(s) for each configuration. Requirements for each are discussed in more detail later in this section.
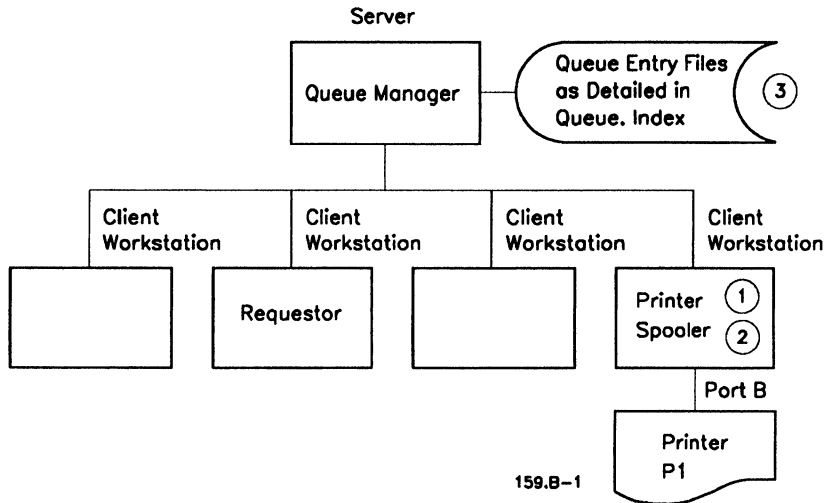
Server

Queue Manager

Queue Entry Files
as Detailed in
Queue. Index ③

| Client Workstation | Client Workstation | Client Workstation | Client Workstation |

Requestor

Printer ①
Spooler ②

Port B

Printer
P1

159.B-1

Note the corresponding entries for printer P1 and queue SPLA in the Queue.Index and the Spooler Configuration File. Note too that if you are using a version of Standard Software earlier than 12.0, the Spooler Configuration File is *[Sys]<Sys>SPLCnfg.sys.*

① Printer Configuration File
   [Sys]<Sys>PTRBConfig.sys

② Spooler Configuration File
   [Sys]<Sys>SpoolerConfig.sys
      B/P1/SPLB/[Sys]<Sys>PTRBConfig.sys/65/y

③ Queue Index File
   [Sys]<Sys>Queue.Index
      SPLB/[Sys]<Sys>SPLB.QUEUE/1/1
      P1CONTROL/[Sys]<Sys>P1CONTROL.QUEUE/1/1
      SPOOLERSTATUS/[Sys]<Sys>SPOOLERSTATUS.QUEUE/1/1

**Figure B-1.   Sample Spooler Configuration With One Printer
and One Queue**
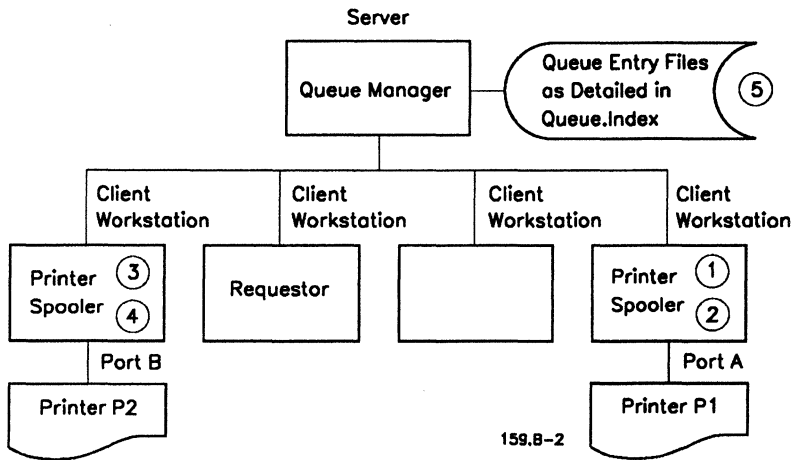
Server

Queue Manager

Queue Entry Files
as Detailed in
Queue.Index ⑤

| Client Workstation | Client Workstation | Client Workstation | Client Workstation |

Printer ③
Spooler ④

Requestor

Printer ①
Spooler ②

Port B

Printer P2

Port A

Printer P1

159.8-2

Note the corresponding entries for printer P1 and queue SPLA in the Queue.Index and the Spooler Configuration File for the first printer. The Queue.Index entries for P2 and SPLB similarly correspond to the entries in the Spooler Configuration File for the second printer. Note too that if you are using a version of Standard Software earlier than 12.0, the Spooler Configuration File is *[Sys]<Sys>SPLCnfg.sys.*

① Printer Configuration File for First Printer
    [Sys]<Sys>PTRAConfig.sys

② Spooler Configuration File for First Printer
    [Sys]<Sys>SpoolerConfig.sys
        A/P1/SPLA/[Sys]<Sys>PTRAConfig.sys/65/y

③ Printer Configuration File for Second Printer
    [Sys]<Sys>PTRBConfig.sys

④ Spooler Configuration File for Second Printer
    [Sys]<Sys>SpoolerConfig.sys
        B/P2/SPLB/[Sys]<Sys>PTRBConfig.sys/65/y

⑤ Queue Index File
    [Sys]<Sys>Queue.Index
        SPLA/[Sys]<Sys>SPLA.QUEUE/1/1
        SPLB/[Sys]<Sys>SPLB.QUEUE/1/1
        P1CONTROL/[Sys]<Sys>P1CONTROL.QUEUE/1/1
        P2CONTROL/[Sys]<Sys>P2CONTROL.QUEUE/1/1
        SPOOLERSTATUS/[Sys]<Sys>SPOOLERSTATUS.QUEUE/1/1

To make both printers share the same queue, SPLA, change the content of ④ SpoolerConfig.sys to B/P1/SPLA/[Sys]<Sys>PTRBConfig.sys/65/y and remove the second entry in Queue.Index ⑤.

**Figure B-2. Sample Spooler Configuration With Two Printers
and Two Queues**

Names of Scheduling Queues and Printers

The system administrator names each printer and each scheduling queue (waiting list) to be used in the system. The printer name is used in the spooler configuration file and in the *Queue.index* file to identify a control queue (where printer control commands for each printer are sent before being directed to the printer) for each printer. A printer name is also used in the *Sys.printers* file. The printer name should be unique within the system.

The association between the printer name and the scheduling queue name is defined by the spooler configuration file. When a printer becomes idle, its spooler obtains the next queue entry from the scheduling queue associated with that printer in the *Sys.printers* file.

Printers can share the same scheduling queue if they are the same kind of printer. If several printers share the same scheduling queue, files are printed on the first printer to become available.

The names used for scheduling queues and printers should not be the same unless a single printer is associated with a scheduling queue. In this case, the name of the scheduling queue and the printer can be the same. Entries for *Printer Name* and *Queue Name* in all the files should agree.

Specifying Banner Page/Notice File

The spooler continuously transfers text from disk files to printers in the sequence of queue entries for that scheduling queue. The continuous printing results in a single stack of paper by each printer, which consists of text from many disk files. To provide a visual indication of the beginning of each file, the spooler can print a banner page before printing the file.

The *banner page* is visually distinctive and identifies the file being printed. The banner page can also contain the text of a notice file. The notice file is called *Spooler.notice* and must be an unformatted ASCII file.

You specify whether the banner page is to be printed through a parameter in the spooler configuration file or in the Executive *Print* command form.

Configuring Pre-GPS Printing: Details

Attaching a Device to the Workstation

For information on physically attaching the printer to the workstation, see the *BTOS Hardware Installation Guide*, the *BTOS Hardware Network Planning and Installation Guide*, and the *CTOS Workstations Installation Guide*. Cabling is discussed in "Cables," in Section 3, "Connecting a Device." Details for each device are presented in Sections 8 through 10.

Input/Output channels are referred to in the same way for pre-GPS installations as for GPS. You can verify that a parallel printer is communicating with the workstation by using the Executive Copy command to copy a file to [lpt] after the printer is attached to the workstation (see step 6 under "Connecting Devices to a Workstation," in Section 3).

Creating and Changing the Printer Configuration File

A configuration file, defining the printer characteristics, must be established for each new printer or plotter. Some characteristics that must be defined include the number of characters printed per minute, baud rate, and line control mode. All the commands used for printing need to use this file to communicate correctly with the printer. Use the Executive command Create Configuration File to create or change a printer configuration file. The Create Configuration File command is described in the *CTOS Executive Reference Manual.*

Printer Configuration File Location

For pre-GPS printing, there must be a printer configuration file for *each* printer located on the workstation where the printer is attached. The printer configuration file is called *[Sys]<Sys>*Port*Config.sys*, where *Port* is the name of the input/output channel where the device is connected, for example, *PtrAConfig.sys*.

Note that the name of this file is used as an entry in the spooler configuration file and for direct printing in the *Sys.printers* file.

Printer Configuration Files Provided With Standard Software

Three default printer configuration files are installed with Standard Software. These can be used for a new printer and can be customized if necessary. The names for these files are as follows:

[Sys]<Sys>PtrAConfig.sys   for [ptr]A

[Sys]<Sys>PtrBConfig.sys   for [ptr]B

[Sys]<Sys>LptConfig.sys   for [lpt]

For more information on these files, see the discussion on the Create Configuration File command in the *CTOS Executive Reference Manual*.

Overriding the Printer Configuration File

While you are installing the printer, you can override the current printer configuration file with a different file, as shown below, by appending *[volname]<dirname>filename* to the device specification, where *volname*, *dirname*, and *filename* specify the configuration file to be used, as in the following example:

Copy
> File from   [D0]<Documents>Mymemo_____
> File to   [ptr]B&[Sys]<Sys>NewConfig.sys____
> [Overwrite ok?]   _____
> [Confirm each?]   _____

You might want to do this to test the changes you made to a configuration file or to test whether a problem is occurring because of a faulty configuration file.

Creating and Editing the Queue.index File

The *Queue.index* file is a text file used by pre-GPS versions of the Queue Manager to define those queues that the Queue Manager must maintain, including the queues for spooled printing. (This file is only required for pre-GPS spooled printing.) The GPS Queue Manager does not need this information for spooled printing. Entries in the *Queue.index* file must exist for each queue required. Placing an entry in the *Queue.index* file is all that is required to create the queue. Three types of queues are defined in the *Queue.index* file, as follows:

- Scheduling queues for each print queue to store the list of files waiting to be printed

- Control queues for each printer to store the control commands issued for it (for example, the spooler status subcommand Pause)

- A spooler status queue, a single queue, to store status information about every spooled printer in the cluster

For each queue, the *Queue.index* file assigns a queue entry file for storing queue entries and indicates the size of the queue entry and the queue type. After the Queue Manager is installed, it creates the queue entry files defined in the *Queue.index* file. You can create or edit the *Queue.index* file using the Editor.

Scheduling Queues

When you submit a print request, the Queue Manager places the file specification for the file to be printed and the control information about the request (number of copies, and so on) in a scheduling queue entry file, like a waiting list of jobs to be printed.

The *Queue.index* file must have an entry for each scheduling queue used. There must be at least one scheduling queue for each type of printer, but if two printers have the same characteristics, and you do not want to differentiate between them, they may use the same scheduling queue. The association between a scheduling queue and its printer is defined in the spooler configuration file.

When giving the Copy, Format, Print, or Spooler Status command, specify the name of the scheduling queue. When the command is executed, a queue entry is automatically generated by the printer spooler and sent to the Queue Manager. The Queue Manager places the entry in the appropriate scheduling queue entry file. When the printer becomes idle, the spooler obtains a queue entry for the printer from the Queue Manager.

Control Queues

The *Queue.index* file must contain an entry for a *control queue* for each printer in the system. Control queues store the printer control requests required by the spooler for processing.

For example, when you execute the Spooler Status command using its printer control subcommands, entries are automatically placed in the associated control queue entry file. The spooler queries the control queue entry file periodically to check for printer control entries.

The name of the control queue is the name of the printer appended by the string "Control." For example, if printer Harold and printer Sam share the same scheduling queue, named Diablo, the printer spooler requires the queues *HaroldControl* and *SamControl*.

Spooler Status Queue

The *Queue.index* file also contains an entry to define a single, system-wide status queue, named *SpoolerStatus*, which stores information about each spooled printer in the cluster configuration. Each spooler periodically updates the information for each printer under its control.

Queue.Index File Location

The *[Sys]<Sys>Queue.index* file is provided with Standard Software. For clustered printing, the *Queue.index* file must be located in the *<Sys>* directory on the server and must have the name *[Sys]<Sys>Queue.index*. Note that this file contains the name of the spooler configuration file to be used for each queue.

Queue.index File Format

Note that the entries in the *Queue.index* file must end with a carriage return without other data (spaces) at the end of each line. If this is not the case, error code 911 is returned.

The *Queue.index* file contains at least one entry for each of the following:

* The name of a system-wide status queue, named *SpoolerStatus*, which stores information about each spooled printer in the cluster configuration. The spooler status queue is updated regularly by the spooler. Only one spooler status queue name entry is needed.

* The name of each scheduling queue. Each class of printers must have one scheduling queue entry.

* The name of the control queue associated with each printer. The control queue is used to store printer control requests invoked through the Spooler Status command. Each printer must have an associated control queue name entry. Each queue entry must start on a new line and must have the following format:

Queuename / Filespec / Entrysize / Queuetype

where

Queuename

   is the name of the print queue.

Filespec

   is the name of the file specification for the queue named in *Queuename*. These files must be located at the server, as must the *Queue.index* file, and should be stored in an unprotected directory, for example *<SPL>*.

Entrysize

   is number of sectors per entry. For spooled printing, this value is always *1*.

Queuetype

   is the type of queue. For spooled printing queues, use *1*.

Examples:

Scheduling queue entry for print queue SPLB:

```
SPLB/[Sys]<Spl>SPLB.queue/1/1
```

Control queue entry for printer named DIABLO:

```
DiabloControl/[Sys]<Spl>DiabloControl.queue/1/1
```

Spooler status queue entry:

```
SpoolerStatus/[Sys]<Spl>SpoolerStatus.queue/1/1
```

Using the Queue Manager Across Network Nodes

Note: *If non-GPS applications have not been specifically tested to print to a remote queue, printing across the network is not supported from those applications.*

To access a remote queue, the queue must be defined in the local *Queue.index* file as well as in the *Queue.index* file at the remote node. The only difference in the local and remote queue definition is that the local queue name must include the node name of the remote node. Installation of the Queue Manager at both locations then allows programs to use the following operations:

```
AddQueueEntry
```

```
ReadKeyedQueueEntry
```

```
ReadNextQueueEntry
```

```
RemoveKeyedQueueEntry
```

The local Queue Manager forwards requests with node specifications to the Queue Manager at the remote node specified in the queue name.

The following steps describe how to define a remote queue:

1. At the local node, create an entry in the *Queue.index* file; enter the node specification of the queue preceding the queue name.

    Note that since the Queue Manager at this node will forward any requests to use this queue, the remaining elements of the entry (queue file specification, queue type, and queue size) are not used; however, they must be present for the installation of the Queue Manager to succeed.

2. At the remote node, set up an entry in the *Queue.index* file using the same queue name, but omit the node name. (Omission of the node means that the queue is to be served locally [at this node].)

    Include the remaining elements of the entry, using the same queue file specification, queue type, and queue size.

3. Install the Queue Manager at the local and remote nodes. (Use the Executive command Install Queue Manager.)

Once the Queue Managers are installed, they are provided the required information for recognizing and processing requests across the network. Subsequent use of a remote queue is totally transparent to programs using the subset of Queue Management operations listed above.

An example of the local and remote *Queue.index* file entries is provided below.

In the server at the local node, the *Queue.index* file contains the following entry:

```
{Ranger}RmtQueue/[d0]<Queues>Rmt.Queue/1/8
```

This local entry requires that the *Queue.index* file in the server at the remote node (Ranger) contain the corresponding entry:

```
RmtQueue/[d0]<Queues>Rmt.Queue/1/8
```

As stated previously, the information in the local *Queue.index* file following the queue name (/[d0]...1/18) is unused by the local Queue Manger, but it must be present and must match the information in the *Queue.index* file at the remote mode.

Note that including a node name in the queue file specification is not recommended. By doing so, the Queue Manager servicing the queue is required to perform multiple reads and writes of data across the network, even when performing a single Queue Manager function. This could lead to poor system performance.

Installing the Queue Manager

The Queue Manager is an installed system service used for spooled printing. The Queue Manager is also used by Batch, SNA, and RJE. It is not necessary for direct printing. The Queue Manager is installed with the Executive command Install Queue Manager. Usually this command is also included in the *SysInit.jcl* file for installation whenever your system is rebooted. (The *SysInit.jcl* file entry is *[Sys]<Sys>InstallQMgr.run,y,20.*) The pre-GPS Queue Manager can only be deinstalled by removing this parameter from your *SysInit.jcl* file, and then rebooting.

Queue Manager Location

For cluster printing, the Queue Manager must be installed at the server. The pre-GPS Queue Manager must be able to access the following file: *[Sys]<Sys> Queue.index.*

Standard Software

A copy of the Queue Manager run file is installed on your system with Standard Software. You must use the Install Queue Manager command, however, to install the Queue Manager in memory as a system service, or, if the command is included in your batch install file *SysInit.jcl*, the Queue Manager is installed when you boot. No modifications should be made. For more information on the Queue Manager, see the *CTOS Programming Guide Volume II.*

Creating and Editing the Spooler Configuration File

The spooler configuration file defines which printer is associated with which queue, gives the name of the printer configuration file used for that printer, the priority for the printer, and whether or not a banner page is printed. One spooler configuration file is required for each spooler you install. The spooler configuration file is an ordinary text file that can be created and modified using the Editor.

Spooler Configuration File Location

A spooler is installed at any workstation where a spooled printer is attached. The spooler configuration file must be accessible from that workstation when the spooler is installed. It is usually placed on the workstation where the printer is attached.

The spooler configuration file is *[Sys]<Sys>SpoolerConfig.sys*. (If you are using a version of Standard Software that is earlier than 12.0, the configuration file is *[Sys]<Sys>SplCnfg.sys*.) A default spooler configuration file with this name is provided when Standard Software is installed.

Note that the printer name entry in this file is the same one used in the printer configuration file and in the *Sys.printers* file. The spooler queue name also appears in the *Sys.printers* file, as well as in the *Queue.index* file.

Spooler Configuration File Format

When the spooler is installed, the spooler configuration file must contain at least one entry for each printer channel to be controlled by the spooler (even if the printer is not configured at this time). The number of entries tells the spooler how much memory space to allocate for printer data structures. The following additional information is required for each printer:

- The name of the printer
- The name of the scheduling queue
- The printer configuration file specification
- The priority of the printer control process
- Whether or not a banner page is printed between files

You should include all the information in the spooler configuration file when the spooler is installed, but you can change the spooler configuration later with the Spooler Status command. The format for the spooler configuration file is:

PrinterChannel / Printername / Queuename / PrinterConfigurationFile / Priority / Banner(y / n)

where

PrinterChannel

> is a single-character code that specifies the printer channel where the printer is connected:

- 0 (zero) is the parallel channel
- A is channel A
- B is channel B

If the entry consists of the printer channel only, data structures will be allocated for future use of the specified channel, but the printer will not be allocated for use by the spooler.

Printername

> is the name of the printer connected to the printer channel. If a printer name is specified, the spooler allocates buffers and initializes the channel only for its own use.

Queuename

> is the name of the scheduling queue where entries for printing requests are stored until the printer is available.

PrinterConfigurationFile

> is the file used to specify the printer configuration file that describes the device parameters.

Priority

> Is the priority (10 to 254, with 10 the highest) of the printer spooler process for the printer. A priority greater than 128 (that is, lower than the default priority of the interactive application system) ensures that the printer spooler does not impact the interactive application system.

Banner

> *Y* or *N* (the default). *N* indicates that the banner page is not printed at the beginning of each file. *Y* indicates that the banner page is printed. (See "Specifying Banner Page/Notice File," earlier in this section.) For example:

> `b/qume/[SPLQ]/[Sys]<Sys>SPLBConfig.sys/128/Y`

Installing the Spooler

The spooler is an installed system service used for spooled printing. It services print requests and can simultaneously control the operation of several printers attached to a single workstation. Each spooler consists of a set of processes that manage spooled printing of disk files. One process is assigned for each printer under control of the spooler.

The spooler is installed with the Install Spooler Executive command and must be installed after the Queue Manager. Usually this command is also included in the *SysInit.jcl* file for installation whenever your system is rebooted. (The *SysInit.jcl* file entry is *[Sys]<Sys>InstallSpl.run*) The pre-GPS spooler can only be deinstalled from memory by removing this parameter from your *SysInit.jcl* file, and then rebooting your system.

When a spooler has been installed at a workstation for a printer, that printer channel is generally no longer available for direct printing. However, you can release a printer channel for direct printing or other use through the Free Printer Channel spooler status subcommand.

Spooler Location

The spooler must be installed at *each* workstation where you have a printer attached. Note that you may have more than one spooler at each workstation.

Creating and Editing the Sys.Printers File

Because pre-GPS printing is not *generic*, workstation application systems, such as OFIS Writer and the Word Processor, send special commands to each device to tell it how to print. In addition, the text or picture to be printed is sent along with these special commands.

The *[Sys]<Sys>Sys.printers* file is used, in addition to the other printing configuration files, to describe your printers and plotters, so that at print time the application can reference the file, find the printer type, and tailor the print request accordingly. The *Sys.printers* file describes printers configured for direct or spooled printing; it is an ordinary text file that you can edit with the Editor. The *Sys.printers* file contains the printer name, printer configuration file name or queue name, printer type or plotter type, and sheet feeder name.

Sys.Printers File Location

By default, application systems look for the file *[Sys]<Sys>Sys.printers*; however, you can include an entry in your user configuration file to point to a file of a different name. (Your user configuration file is specified as *[Sys]<Sys>*UserName.*user*, where *UserName* is your signon name.) The *Sys.printers* file must be accessible from each workstation from which you want to print with an application system. For example, for OFIS Writer or the Word Processor, most installations have a *Sys.printers* file at the server and on each workstation that has local storage.

Standard Software

A default *Sys.printers* file is not distributed with Standard Software, but it is distributed with each application that uses it. The standard *Sys.printers* file contains entries for each printer in the standard printer configuration. When a new printer is added, or if your configuration is not standard, then you must modify the file to describe your configuration.

Sys.Printers Format

Note that the entries in the *Sys.printers* file must agree with the entries in your spooler configuration file and with the entries in your *Queue.index* file. In addition, if you have installed a printer using the Print Manager and GPS, you must add an entry for that printer in the *Sys.printers* file, making sure that the entry for the queue name matches the entry you made for queue name in the *Device Installation* form when you installed the printer.

Each printer has at least one entry in the *Sys.printers* file. Each entry begins on a new line. The first entry in the *Sys.printers* file determines which printer is used by default. Since the Word Processor uses your *Sys.printers* file during operation, you cannot open the file to make changes. However, you can make a copy of the *Sys.printers* file and edit the new file. You can also use the Editor to edit the *Sys.printers* file. Figure B-3 shows a sample *Sys.printers* file.

```
DIABLO:[Splb],[Ptr]B6[Sys]<Sys>WpPtrBConfig.Sys: Diablo630:
LPT:    [Lpt]&[Sys]<Sys>WpLptConfig.Sys,[Spl]:    Draft:
```

Figure B-3.   Sample Sys.printers file

The format for each entry in the *Sys.printers* file is:

Printername: Device or Queue Name: Format: Graphics Type: Sheet Feeder

where

Printername

is the name used to refer to the printer. This field determines the name supplied in the *Printer* field of the *Print* command form. The name should be kept short for ease of entry.

Device Name, Queue Name

> are the printer configuration file specifications or the spool queue name [SPLB], for example,

> `[ptr]B&[Sys]<Sys>PtrBConfig.sys`

> If the device can be attached directly and spooled, you can enter the correct configuration file specification and the queue name, separated by commas. For example,

> `[ptr]B&[Sys]<Sys>PtrBConfig.sys,[SPLB]`

When you issue a Print command, OFIS Document Designer checks the file to determine if the device is installed as a spooled device; if it is, the file is spooled. If not, the file is printed directly. This field can be as long as necessary.

Format

> is the printer format in which the document is to be generated from the Word Processor. Five entries are valid:

> - Draft
> - Diablo630
> - QumeSprint9
> - Envision
> - NEC3515

For OFIS Writer, the valid entries are as follows:

- AP92Laser
- AP9215
- AP9208
- PrismPlus

If you are configuring another printer, use the one of the names above that most closely describes your printer's format.

Graphics type

> is the plotter type. This field is ignored by OFIS Document Designer, but the colons must be included in the file even if you have no entry here. For example,

```
B: [SPLB]: Diablo630: : DiabloF32
```

Sheet Feeder

> is the type of sheet feeder. If you have a NEC SpinWriter 2000/3500 series single bin cut sheet feeder, enter **NECSingle**. If you have added the 2000/3500 dual bin adapter, enter **NECDual**. Other valid entries are as follows:

- DiabloF32

- DiabloF33

- Ziyad200

- Ziyad300

> OFIS Writer recognizes BDT.

Operation Notes for Using a Pre-GPS System

Spooled Printing of Password-Protected Files

A pre-GPS system allows for printing in security mode, as described below. The Format, Print, and Spooler Status commands expand a file specification but do not append the logged-in (default) password before sending the queue entry to the Queue Manager. To permit the spooler to read a read-protected file, you must either specify security mode or append an in-line password to the file specification when you give the Print or Spooler Status command. If file security is a concern, security mode should be used.

If security mode is specified, the printer spooler pauses before printing the file and waits for a password to be entered. The printer spooler remains paused until you do either of the following:

- Use the Spooler Status command to enter the password, and then execute the command from the workstation where the printer is connected, or

- Cancel the print request with the Cancel subcommand of the Spooler Status command

If the password is entered from the workstation where the request originated, the spooler completes the printing.

Printing Modes

For information on printer spooler escape sequences, see the *CTOS Programming Guide Volume II*.

Any of the following three printing modes can be specified in the Format, Print, or Spooler Status command.

Normal mode	Prints a banner, converts tabs into spaces, converts end-of-line characters into device-dependent codes, and recognizes the escape sequences for manual intervention.
Image mode	Prints a banner and recognizes the escape sequences, but performs no code conversion. Normally, characters such as tab and end-of-line are converted to the form expected by the particular kind of printer as specified by the printer configuration file.
	In some cases, it is necessary to override this conversion because sophisticated application systems sometimes contain more information about the specific printer than is encoded in the printer configuration file. For example, OFIS Writer or the Word Processor can print proportionally spaced text on certain kinds of daisy wheel printers.

Image mode is provided to suppress all character conversions (except recognition of printer spooler escape sequences). Image mode can be specified to spooler (or printer) byte streams through the SetImageMode Byte Stream operation. For compatibility between spooled and direct printing, the SetImageMode operation should be used *before* the first WriteBsRecord or WriteByte Byte Stream operation.

Binary mode   Does not print a banner, send any extra code not in the file to the printer, or recognize the escape sequences.

Manual Intervention in Spooled Printing

A printer under control of the spooler may require manual intervention for either intentional or unintentional reasons. Unintentional reasons include out-of-paper, offline, and paper-jam conditions. Intentional reasons include forms change, print wheel change, and generic printer pause.

Whenever a printer requires manual intervention, use the Spooler Status command to determine the cause. In a cluster configuration, you can use the Spooler Status command from any workstation.

After determining and correcting the need for manual intervention, restart printing using the Restart Printer subcommand of the Spooler Status command.

Modifying Files After the First Installation

When the Queue Manager or spooler is installed, and you modify the *Queue.index* file, the spooler configuration file, or a printer configuration file, you must reinstall the Queue Manager or spooler for the change to be in effect.

Appendix C
Tuning Device Driver and Font Service Buffers

Probably the most important decision you must make when installing a device driver is how much memory to allocate to that device driver in the *Font/Graphics Work Area* field of the *Device Installation* form. The default value for this field is 4K. Larger amounts, up to 64K, are appropriate under various circumstances.

In 2.4 or later GPS, this memory is used not only for font data, but also for processing of graphics. On some devices, certain types of graphics must be processed in memory. Because the entire graphic will probably not fit into this memory at one time, even if the maximum of 64K is allocated, the portion of the page occupied by the graphic is divided into bands. When a larger number is specified in the *Font/Graphics Work Area* field, the band is larger, and consequently the page must be divided into fewer bands. In many cases, much work (such as rereading of temporary files) must be repeated for each band.

Large amounts of memory can be effectively used to increase band size and device driver speed in the following cases:

- Complex vector graphics (for example, from OFIS Graphics or Art Designer) will be printed on the HP LaserJet or Epson device. The vector list is reread for each band as the driver converts the image to raster form.

- Raster images (for example, from OFIS Imager or Image Designer) will be printed in landscape orientation on the HP LaserJet. The device driver must rotate the image for the LaserJet. The entire raster image must be reread for each band as the image is rotated.

- Raster images will be printed on the dot matrix devices. Since text and graphics must be processed simultaneously, the image is reprocessed for each band of text and graphics.

The size of the band is affected by the width of the graphic object and the resolution of the printer. Given the same amounts of memory, the HP LaserJet needs 16 times as many bands to rasterize a graphic when a resolution of 300 dpi is specified in the *Device Installation* form as is required when a resolution of 75 dpi is specified. When printing color images, the Dot Matrix drivers require 4 times as many bands to rasterize an image as when the driver is installed for monochrome printing. All vector graphics on a page are rasterized as one image, so if images are present on both the left and right edges of the page, the band is the full width of the page.

If raster images must be scaled by the device driver, memory must be allocated for both the band of the page to be filled and the corresponding band of the image to be expanded or shrunk to fill that band of the page. Consequently, even more memory is appropriate when raster image scaling is expected.

It may be appropriate to increase band size for reasons other than speed in the following cases:

- Images will be scaled down by a large amount by the Dot Matrix device driver. The Imagen has a minimal band height of 32 pixels, and the CT Matrix printer has a minimal band height of 24 pixels. If the corresponding slice of the source image does not fit into memory, the print job will fail with error code 15355.

- Quality of images scaled by graphical device drivers is important. The scaling is more uniform when larger bands are used.

Little additional memory is required by the PostScript driver for handling of graphics. The PostScript interpreter in the printer handles scaling of images. The driver requires only enough memory to pass one line of the original image at a time to the printer.

No additional memory is required by the Imagen and PCL5 drivers if vector graphics *only* will be printed.

Controlling the Efficiency of Access to Font Data

If it is necessary to install the device driver with a large amount of memory for the sake of graphics, this memory will also be used to buffer font data when handling text. This results in much better performance when documents contain a variety of fonts. The remainder of this section discusses these efficiencies. If you have already determined that you need a large *Font/Graphics Work Area*, you probably need not bother with the rest of this discussion. But if you don't need the space for graphics, you may still need to optimize the installation for font usage.

Decisions to the following three questions must be made to control this efficiency of access to font data.

1. Should the Font Service be installed at the client workstation, or only at the server, when the device driver is installed on a client work-station?

2. How much buffer space should be allocated to the Font Service when installing it? The default is 8K, which is a *minimal* allocation. A larger amount can be specified, in bytes, as the second parameter to the program.

3. How much font and graphics work space should be allocated to the device driver when installing it? The default is 4K, which is a *minimal* allocation for most device drivers. A larger amount can be specified, in K bytes, at the bottom of the Print Manager *Device Installation* form.

With respect to the first question above: It is *not* advisable to install the Font Service on a client workstation unless the Font Database file also resides on the client workstation, or a very large buffer (for example, 32K) can be allocated to the Font Service. Otherwise, the cost of disk reads over the cluster channel will probably exceed the cost of font service accesses over the cluster channel.

The decisions to questions 1 and 2 influence all font service clients (GPS device drivers and OFIS Document) on the workstation. If several font clients exist on a workstation, installing the Font Service locally with a larger amount of buffer space benefits all clients and may be the most effective use of resources. However, the decision to question 3 has a greater influence on the performance of an individual device driver. Giving more font and graphics work space to the device driver is more beneficial than installing the Font Service locally, when the device driver is the only font client on the workstation.

Increasing Font Service Buffer Space and/or Font Graphics Work Space

The default buffer size of 8192 bytes is generally sufficient if you're at a client workstation with a local file system (and the font data base is at the local workstation). Unless an unusually large number of fonts are used in a document, device driver performance is not likely to improve perceptibly when the buffer size of the Font Service is increased beyond 10 to 12K. Increasing the Font/Graphics Work Area size of the device driver is generally the best way to improve printing performance.

The amount of Font/Graphics Work Area space needed for efficient performance varies depending on the device driver used as well as on the document printed.

Part of the Font/Graphics Work Area space is used for buffering character translation tables. Typically, translation tables use 0.75K bytes. Some drivers need two (1st level and 2nd level) translation tables to be present most of the time. Some drivers use different translation tables, depending on the font used.

Much of the Font/Graphics Work Area space is used for buffering character width tables. Each uses 0.5K bytes, and all drivers require two (1st and 2nd level) to be present most of the time, unless the font is monospaced. The PostScript driver uses the same width table for all sizes of a font, while other drivers use separate width tables for each size.

Part of the Font/Graphics Work Area space is used for storing information about the fonts in use in the current document. This varies approximately from 15 to 30 bytes per font. This space cannot be reclaimed until the end of the document. If a document contains a great number of fonts, the space for this information will be stolen from the space used for holding width and translation tables. This will slow down the device driver until the job aborts with error code 15333, because no room is left for the minimal requirement of width and translation tables.

Recommended Memory Allocations

The following uses of memory resources are recommended:

- If the device driver will be printing graphics, give the device driver *at least* 10K of font data table space. More, up to the maximum of 64K, should be allocated depending on the resolution of the printer, color capability, and the nature of the graphics.

- If a device driver will typically print jobs without graphics and with multiple proportional fonts, install the device driver with a 6K or 8K Font/Graphics Work Area space, if this amount can be spared.

- If a device supports many fonts of different families, types, or sizes (for example, PostScript), and documents utilizing a large number of fonts will be printed, give the device driver an additional 1K of Font/Graphics Work Area space.

- If more than one font client exists on a workstation, or the workstation has memory and disk to spare, install the Font Service at that workstation. For example, if printers are attached to a workstation, consider installing the Font Service at that workstation.

- On protected-mode systems with large amounts of unused or underutilized memory, consider larger allocations of memory for the Font Service and/or device drivers.

Appendix D
Tuning Networked Print Services

The information in this appendix is important if you are installing GPS onto a network with more than three nodes. The most important performance tuning adjustment for networked Print Services is done with the installation parameters of BNet or CT-Net. To understand how to make this adjustment, you should understand how GPS manages network printing, as described below.

Each Print Service at a server CPU polls network remote printers once each minute for their status. This polling continues if the error returned to the status request is 0, "ercOK," or 4576, "ercDeviceNotInstalled." For all other error codes, the polling wait time is doubled until a maximum of one hour is reached. Print Services at client workstations do not poll remote printers, but instead get the status of network remote printers and other cluster printers from the server every 3 seconds. The design strategy is to maintain reasonably up-to-date status of remote printers while holding network traffic to an acceptable level.

BNet or CT-Net is able to support this strategy; however, the default installation parameters provide an environment that can severely restrict network performance when many nodes are using GPS for remote printing. In particular, using the default value of 60 seconds for the session timeout parameter (parameter 5) of the Net Agent has this effect. This parameter is the time that BNet or CT-Net holds a connection open after a client has completed a transaction. (A *connection* is a communication link pairing a Net Agent session at the source node with a Net Server session at the destination node.) The purpose of this lag in ending the connection is to have a connection in operation in case a client process issues a subsequent transaction to the same "from-to connection pair," thus saving the overhead of establishing new sessions for the new transaction. Unfortunately, no transactions to other from-to node pairs can use the connection while it is being held open. Error codes 5110 or 8923 are returned to client processes when BNet or CT-Net is unable establish a connection for them.

A long Net Agent timeout period restricts performance in a network with many nodes and bidirectional traffic between nodes. Note that a network with N nodes has N(N-1) from-to node pairs.

A Net Agent session timeout period of 5 to 15 seconds is a far more reasonable value for networks where more than 3 nodes communicate with one another on a frequent basis as GPS does. This allows more than adequate time for applications to issue subsequent transactions and reuse an open session. Timeout periods as low as 3 to 5 seconds may be used successfully.

To maximize network performance, set *Max # Connections*, parameter 6, in the Net Transport Service to *16*, and set the sum of the Net Agent and Net Server sessions to be greater than or equal to 16. Generally, you set the number of Net Server sessions and Net Agent sessions so their sum is the number of Net Transport connections. If there are more senders at the node than receivers, then there should be more Net Agent sessions than Net Server sessions and vice versa. A printer that is accessible from other nodes will be a receiver for each node that lists it as a remote printer. A Print Service at a server will be a sender for each remote printer that it has listed and a receiver for each printer on its cluster. (Use the Print Manager Update command (**F2**) to see the list of printers.) GPS generally requires a balanced mix of Net Agent and Net Server sessions.

For optimum GPS and BNet or CT-Net performance,

1. Review the printer lists at the server at each node, and remove the remote printers that are *never* used.

    a. Use the **DELETE** key to delete the obsolete remote printer at all workstations in the cluster that have the remote printer listed. This removes the obsolete remote printer from the *Gps.printers* files.

    b. Deinstall, then reinstall the Print Service. This removes the obsolete remote printer from memory at the workstation.

2.   Modify the installation parameters for BNet or CT-Net, as follows:

   a.   In the installation of the Net Agent, set parameter 1, *Max # sessions*, to *8*, and set parameter 5, *Session timeout*, to *10*.

   b.   In the installation of the Net Server, set parameter 1, *Max # sessions*, to *8*.

   c.   In the installation of the Net Transport Server, set parameter 6, *Max # connections*, to *16*.

Appendix E
Using Pipe Drivers

Pipe drivers are programs that translate an input file (data printed to a file on a disk) into a file containing device-specific language. More specifically, pipe drivers process a disk file as input (ASCII or GPAM file) and output the device-dependent code for a particular device as an output file. For each device driver, except the binary mode driver, there is a corresponding pipe driver.

Generally, only programmers developing new device drivers use pipe drivers, but there are circumstances when other users may find them useful. For example, suppose you wanted to create a PostScript file from your BTOS/CTOS system to be used on another system, such as a UNIX system. You would use OFIS Document Designer to "print to a file," which creates a GPAM file. You would then use the Pipe PostScript command to transform the GPAM file to PostScript. You could then transport the file to a the non-BTOS/CTOS system and print it there.

Pipe driver programs are executed in the foreground as normal applications rather than installed as system services by the Print Manager. Pipe driver programs require that the Font Service be installed.

There are a number of pipe drivers:

- Pipe APLaser
- Pipe APVLaser
- Pipe APHrMatrix
- Pipe APMatrix
- Pipe CTMatrix
- Pipe Daisy
- Pipe Epson

- Pipe Imagen
- Pipe HpLaserJet
- Pipe HpPaintJet
- Pipe HpPlotter
- Pipe PostScript
- Pipe PCL5
- Pipe Simple

To obtain input for processing by a pipe driver, you type a file name in place of a GPS device name in the *Print* form of OFIS Document Designer. Because these applications cannot determine which device the document will eventually be printed on, it is essential to review the document and specify the correct font device type next to the *Device type* field *before* you print the document to a file. (If you are using OFIS Document Designer or OFIS Document Writer, specify the font device type in the *Font device type* field of the Document Attributes menu.)

To use a specific pipe driver, you must issue the appropriate pipe driver command. For example, if you want to convert an input file to an output file that is in the PostScript format, type **Pipe PostScript** at the Executive command line; then, press **RETURN**. The PostScript command form is shown below.

```
Pipe PostScript
   [Input File]                              _____
   [Output File]                             _____
   [New Line Map Mode (LF, CR, CRLF)]        _____
   [Expand Tab Size (8)]                     _____
   [Characters per line (85)]                _____
   [Font Device Type (PostScript)]           _____
   [Device Setup]                            _____
   [Page Width and Length (8.5  11)]         _____
   [Top and Bottom Borders (0  0)]           _____
   [Left and Right Borders (0  0)]           _____
   [Storage Allocation - - 1K units (4)]     _____
```

Apart from the *[Input File]* and *[Output File]* fields found in the pipe driver command form, each pipe driver has parameters that are similar to the ones in the *Device Installation* form of the Print Manager.

The output of a pipe driver can later be printed by specifying Binary mode from the Print Manager or by using the Print command from the Executive.

The font device type normally used by each pipe driver is displayed in parentheses in the pipe driver command form. For example, the entry shown in the command form above contains an entry for *PostScript* next to the *Font Device Type* field. Unless a document contains only 12 point Courier type (a 10-pitch font), acceptable results can be expected only when the font device type (and the Font Database) used when the GPAM file was created matches the font device type in the pipe driver command form.

Example: Obtaining a Simple ASCII Text File from OFIS Document Designer

The Simple pipe driver implements a draft output application, which converts GPAM files into page images that you can edit. The *[New Line Map Mode]* option in the pipe driver command form allows you to select whether lines will be terminated by a linefeed, as in BTOS/CTOS (LF), or by a carriage return and line feed, as in MS-DOS (CRLF).

To output a printed draft image of a document to a file,

1. Install the Simple pipe driver when installing GPS.

2. Open the document from which you want to create a printed draft image.

3. If you're running OFIS Document Designer or OFIS Document Writer, access the Document Attributes menu. In the *Device type* field, type **Simple**; then press **GO**.

4. Access the Print menu, and type a file name in the *Printer name* field. For example, **MyDoc.gpam**

5. Press **GO**.

    A GPAM file is created. (At this point, you could print the GPAM file to any device driver installed with the Simple font device type from the Print Manager.)

6. Issue the Pipe Simple command from the Executive command line.

7. In the *Input File* field, enter the GPAM file name you used as input; in the *Output File* field, specify the draft file name you want as output. For example,

    Pipe Simple
        [Input File]   MyDoc.gpam_____
        [Output File]   MyDoc.text_____
        [New Line Map Mode (LF, CR, CRLF)]   _____

8. If you're going to send the print image to a DOS system (this requires a carriage return and a line feed at the end of each line), enter **CRLF** in the *New Line Map Mode* field. Otherwise, leave this field blank. The default is a linefeed at each line, which is required by BTOS and CTOS systems.

9. Press **GO**. The ASCII file is created from the GPAM file.

Glossary

A

ASCII

An acronym for American Standard Code for Information Interchange. ASCII is a code for representing letters, numbers, and punctuation that is used for exchanging information among data processing systems, data communications systems, and peripheral devices, such as printers.

B

baud rate

The speed at which data is transmitted.

BTOS

A workstation operating system. *See also* CTOS.

buffer

An area in memory used to store information temporarily.

C

carriage return

The ASCII character (0Dh) that signals the device to return to the left side of the page.

CGM (Computer Graphics Metafile)

A standard file format for picture storage used widely for transferring images between systems.

channel

A connector where a device can be attached.

character set

The set of symbols that can be printed on a given output device.

client workstation
A workstation within a cluster configuration that is connected to a server. It replaces the term *cluster workstation*, which was formerly used both in Unisys and Convergent Technologies documentation.

cluster
A number of workstations connected to a server or SRP in a Local Area Network that share data, programs, and disk storage.

CP (Cluster Processor)
The name of one of the processor boards on a shared resource processor.

CTOS
A workstation operating system. CTOS is also an umbrella term that encompasses all varieties of the BTOS, CTOS, and CTOS/XE operating systems.

D

daisy wheel printer
A character printer that uses interchangeable metal and plastic print wheels. Daisy wheel printers generally produce letter-quality printing. Diablo and Qume are examples of daisy wheel printers.

data bits
The number of bits per character that are transmitted to the device.

default value
A value that is used when no other value is specified.

device
A printer or plotter.

device driver
A system service that controls a printing device and translates print jobs into the language of a specific printer or plotter. Device drivers are usually unique for each type of device. The appropriate device driver must be installed at each workstation that has a device attached.

direct printing
Prints a file directly from the workstation to a device attached to that workstation. The device must be idle before any direct printing job can be started.

dot matrix printer
> A printer that prints each character as a group of dots within a matrix, rather than using a print wheel.

DP (Data Processor)
> The name of one of the processor boards on a shared resource processor.

draft printing
> Simple printing that does not produce character formats, such as underline, boldface, proportional spacing, and so on. Draft printing depends on the capabilities of the printer and on the device driver used for the printer installation.

E

editable Font Database
> The storage facility for all font data. The editable Font Database is not accessed by any system service. When you edit your Font Database, you're working with the editable Font Database.

F

font
> A collection of characters that have a distinct, unified appearance. Sometimes a font is called a typeface.

font configuration file
> A file used to define character spacing and, for daisy wheel printers, to define character spoke position.

Font Database
> A set of files that contains the information needed to format, display, or print documents in multiple fonts. There are two font databases: the editable font database, which can be modified with the Font Tool; and the runtime font database, which is created from the editable database and is read by the Font Service or Scaling Font Service.

Font Service
> The system service that accesses the Font Database to provide font information (and occasionally the fonts themselves) for client applications. The Font Service must be installed before the device driver. It may be installed at the server or at each client workstation that has a printer attached to it.

Font Tool
> An application program that gives the user the ability to edit and organize the editable font database.

FP (File Processor)
> The name of one of the processor boards on a shared resource processor.

Function Key menu
> The Print Manager shows a Function Key menu as a row of blocks on the bottom of the screen that indicate what command is assigned to each of the function keys. Each block of the menu corresponds to one of the keys and shows either the command name or an abbreviation for it.

function keys
> The row of keys marked **F1** to **F10** at the top of the keyboard. The Print Manager commands are executed by pressing function keys.

G

Generic Print Access Method (GPAM)
> A library of printing routines that are used to access a GPS printer, as well as to print text and/or graphics.

Generic Print System (GPS)
> A set of software programs that provide printing services for applications using the CTOS operating system. GPS manages all communications between your workstation and the printers attached to it.

GP (General Processor)
> The name of one of the processor boards on a shared resource processor.

GP/CI (General Processor with a Communications Interface board)
> The name of one of the processor boards on a shared resource processor.

GP/SI (General Processor with a SCSI Interface board)
[*SCSI* means Small Computer Systems Interface]
> The name of one of the processor boards on a shared resource processor.

H

handshake.
>*See* protocol.

HPGL
>Hewlett-Packard's vector graphics language. The PCL5 command language supported by the HP LaserJet Series III and HP LaserJet Series 4 printers provides access to HPGL.

I

integrated workstation
>Replaces model names for Convergent Series i and Unisys B39 workstations.

L

laser printer
>A non-impact printer that produces high-resolution output.

letter-quality printing
>Reproduces all the formatting you can assign from applications such as Document Designer or OFIS Designer, for example, boldface text, underline, and proportional spacing. Letter-quality printing depends on the capabilities of a printer and on the device driver used at installation.

line device
>A high-speed printer that usually produces draft-quality printing.

low-cost workstation
>Replaces model names for Convergent CWS and Unisys LCW workstations.

M

matrix printer
>*See* dot matrix printer

modular workstation
>Replaces model names for Convergent NGENs and Unisys B26, B27, B28, and B38 workstations.

N

network
A collection of nodes, which provides access to the interconnected cluster
configurations and standalone systems. A network uses high-speed local
data lines, leased telephone lines, and packet-switched networks. GPS
works when the CT-Net or BNet network is installed. *See also* node.

Network Printing Gateway
A program that allows users to send print jobs from a CTOS environment
to remote systems (non-CTOS systems) that are connected by networks,
such as Unix systems.

node
A number of junctions in a network where communication lines termin-
ate and/or originate. A node can be a server or a standalone workstation.

P

parallel mode
When a device is functioning in parallel mode, bits are transferred to the
device simultaneously over separate lines. *See also* serial mode.

parallel port
A connection used for devices that communicate in parallel mode. *See
also* parallel mode.

parity
Acts as a check on the data bits that are transmitted to the device.

PCL
Hewlett-Packard's Printer Command Language. PCL commands are
used to change margins, fonts, bins, and so on.

pipe drivers
Programs that translate ASCII or Generic Print Access Method (GPAM)
files into a disk file in the language of the corresponding device.

point size
A measurement of 1/72 inch. Type height is measured in points.

port
Communications outlets, which are used to connect workstations with
other devices, such as printers. A port can also be referred to as an
input/output (I/O) channel.

PostScript
> A page description language developed by Adobe Systems, which is used to print a wide variety of type fonts and graphics on laser printers.

Print Service
> A system service that routes print requests to the designated device and coordinates the work of the entire Generic Print System. In addition, the Print Service receives print requests for devices set up for spooled printing. It passes on these print requests to the Queue Manager to place in the print queue. The Print Service must be installed at the server and at each workstation that has a device attached. (The Print Service performs the tasks that were formerly performed by the routing switch and spooler.)

protocol
> The hardware and software settings that control the flow of data between a workstation and a device. Protocol is sometimes referred to as handshake.

Q

Queue Manager
> A system service that handles all waiting print jobs for devices set up for spooled printing. The Queue Manager is also used by nonprinting applications, such as Batch. The Queue Manger must be installed on the server of each cluster where spooled devices are installed or on any standalone workstation where you want to have spooled printing.

R

raster image
> Objects scanned by OFIS Imager and Image Designer.

release documentation
> Refers to the document or electronic file that accompanies the distribution media and contains the most current information about the product. In most cases, it includes software installation instructions. Depending on the application, release documentation is called Release Notes, Release Notices, or Release Information Files.

resident fonts
> Fonts that are programmed into the printer's memory.

S

scalable fonts
Fonts that can be scaled to any point size.

Scaling Font Service
A set of files that has all the capabilities of the standard Font Service but provides a wider selection of fonts and sizes. The Scaling Font Service is used in place of the standard Font Service. This means that only one of the two services can be installed on the same system.

serial input/output channel
A connection where a serial device can be attached for communications.

serial mode
When a device is functioning in serial mode, data bits are transferred to the device one at a time over a single line. *See also* parallel mode.

server
Describes the workstation or shared resource processor that controls resources within a cluster, such as printing and communications. Co-workers can share the files and applications that are stored on disks located on the server. It replaces the term *master*, which was formerly used both in Unisys and Convergent Technologies documentation.

Server mode (formerly known as Master mode)
The mode that is used when installing GPS on an SRP. The Print Manager command Server is used to perform this installation.

Shared Resource Processor (SRP)
Describes the multiprocessor, floor-model computer that functions as a server. It encompasses the "XE" model names, such as XE-520 and XE-530.

spooled printing
Sends each document to a temporary queue before sending it to the device. With spooled printing, workstations in a cluster can print to a locally attached device or to devices attached to other workstations in the cluster system.

SRP
See shared resource processor.

Standard Software
> A set of commands and applications you use to perform basic tasks, such as copying files or backing up a disk.

stop bits
> A serial communication protocol to indicate when one character ends and the next one begins.

system initialization file
> The *[Sys]<Sys>SysInit.jcl* file, executed when a user signs on, that installs on the current workstation the system services you want resident in memory at all times.

system service
> Provides special services to the system. For example, GPS provides a printing service.
>
> System services are modular parts of the operating system that reside in workstation memory. Some system services can be dynamically installed (added or removed at any time). System services are not a part of the operating system when it is first installed, nor are they resident after a system is bootstrapped unless you make special entries in your system initialization file for their installation.

T

TIFF (Tagged Image File Format)
> A standard file format for raster images. OFIS Imager and Image Designer offer TIFF options that users can apply to their work.

TP (Terminal Processor)
> The name of one of the processor boards on a shared resource processor.

type style
> The general variation of a font, such as italic or bold, that is applicable to many different font families.

U

user configuration file
> The file *[Sys]<Sys>*UserName.*user*, where *UserName* is a unique name to be used at signon. This file is also referred to as a user file, user profile file, or *Name.user* file.

V

vector art
> Includes pictures and charts created by OFIS Graphics, Art Designer, and Chart Designer.

Virtual Printer device driver
> A GPS device driver that has been configured to send output to Network Printing Gateways.

W

WYSIWYG
> Means What-You-See-Is-What-You-Get; pronounced "wizzywig." On high-resolution monitors with the WYSIWYG capability, OFIS Document Designer screen fonts match their corresponding printer fonts. For example, when you specify 36 point Helvetica, the text on the screen is displayed in 36 point Helvetica.

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Software Release Announcement

Generic Print System (GPS)
Version R2.7.0
Basic Package
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Contents

Section 1
Description of Programs

The basic *GPS* package includes the *Print Manager*, the *Print Service*, the *Font Service*, various *Device Drivers*, *Pipe Drivers* and the *Font Tool*.

The *Print Manager* is the user interface to *GPS*. The *Print Manager* is an application program that is used to:

* Configure a *GPS* installation. That is, install or deinstall into memory the following *GPS* services: *Font Service*, *Queue Manager*, *Print Service*, and one or more *GPS* device drivers.

* Queue files to be printed.

* Monitor status of print jobs and print queues.

* Pause or restart jobs currently being processed.

* Delete jobs queued for printing or currently being processed.

The *Print Service* is the interface between application programs and the device drivers. Application requests for printing services are served by the nearest *Print Service* (either local to the workstation or at the server, checked for validity, and then are processed or forwarded to another *Print Service* as required for processing. The *Print Service* provides simultaneous access by different users to shared devices by spooling - that is, queueing print jobs to temporary disk storage. The *Print Service* also has the capability to re-send the job to the printer multiple times, when the printer does not have its own multiple copy capabilities, or when a job needs to be restarted because of a paper jam or a print ribbon failure.

A *Print Service* must be installed wherever a device driver is installed and must also be installed at the server workstation if *GPS* devices are to be shared within the cluster or across *B-Net* or other compatible network software. The *GPS* install program, *GPSInstall.run*, automatically launches the correct run file for the workstation (based on the user name used when installing *GPS* services and/or drivers).

The *Font Service* is the central repository of font information. The *Font Service* retrieves font data from the font database for use by device drivers and applications such as *OFIS Document Designer* or *OFIS Designer*.

Device Drivers translate print jobs into the language of a specific printer. They also enable human interaction in the processing of print jobs, including the ability to monitor, pause, resume, or cancel jobs. *GPS* provides device drivers for thirteen device classes. Most *GPS* device drivers are also able to print to or from *UNIX* systems through the separately available *Network Printing Gateway* (NPGW) software interface from the *FTP* package with *TCP/IP*. The *Basic Printer* package contains the following device drivers:

- The *Universal Device Driver, UniversalDD.run,* is installed on the *CTOS* server and passes *GPS* print jobs to the separately packaged *Generic Print Agent* running under *VPC* or *PC* systems. This provides a much wider range of printers and fonts through PC-based third-party device drivers which also operate under *VPC* or *PC* systems. *PC* systems and *VPC* can also print to all other *GPS* device drivers through *PC* network software interfaces.

- The *Simple Device Driver, LptSimpleDD.run*, is intended for all of the ordinary monospaced, data processing class printers. Any printer that can recognize and interpret the ASCII character set and the ASCII control codes - line feed (LF), carriage return (CR), and form feed (FF), can be controlled by this driver.

- The *HP Plotter Driver, HpPlotterDD.run,* translates print jobs into the *Hewlett-Packard Graphics Language (HPGL)* required by the *Hewlett Packard HP7470A, HP7475A,* and *HP7550A* plotters. This driver supports both color and monochrome graphics. Up to 10 pen colors, A4 paper, and landscape and portrait orientation are supported.

- The Daisy wheel printer driver, *DaisyDD.run,* translates print jobs into a sequence of commands recognized by the *AP1302, AP1303, AP1305, AP1307* printers sold by Unisys. The driver also supports several popular daisywheel printers, such the *Diablo 630*, the *Qume Sprint 9* and *Sprint 11*, and the *NEC 3515*. (The *AP1302, AP1303, AP1305* and *AP1307* printers are no longer available for sale.) The Daisy driver may also be used with some laser printers that emulate the *Diablo 630*. The Daisy driver does not support graphics.

- The Binary Mode device driver, *BinaryModeDD.run*, is provided to make a device driver of minimal size (27Kb) available for use with applications that have printer-specific code embedded within them. The Binary Mode driver prints jobs, which must be created in binary

mode or image mode, without translation. All the other device drivers support binary or image mode for a given print job. The binary mode driver is considerably smaller than other device drivers because it *only* supports binary or image mode.

Note: *GPS R2.7.0 also supports other device drivers. See the GPS Dot Matrix Printer package and the GPS Laser Printer package. Vendors other than Unisys also supply GPS device drivers.*

Pipe Drivers also do the work of translating ASCII or GPAM files into the language of a particular printer, but with output directed to a disk file. There is one pipe driver included corresponding to each of the standard device drivers, except for the binary mode and universal device drivers. You may use *Pipe Drivers* to generate print jobs suitable for printing to non-*CTOS* networks such *DOS* or *UNIX* where print jobs are often required to be in the printer's binary language (except when using the *Universal Device Driver* or NPGW interfaces).

The *Font Tool* is used to modify the font database and to create runtime font databases. The *Font Tool* is an interactive application program. Use of the *Font Tool* is described in the *Using the Font Tool* Manual.

Section 2
Changes from Prior Versions

Problems closed listed below are specific to the software in the *GPS Basic Package* except when the problem closed affects all device drivers, including those in the *GPS Dot Matrix* and *GPS Laser Packages*. For the list of problems closed specifically related to one of these packages, please refer to the respective SRA document, Section 2, "Problems Closed".

2.1 Problems Closed from GPS R2.6.5

PLE: 15976641
  UCF: 26436443
  Description:
  Jobs of size multiples of 2048k less 1 (e.g., 2047, 4095, etc.) do not print the end data of a job due to unflushed buffers on BTOS II 3.2.

PLE: 16106411
  UCF: 16106411
  Description:
  Device drivers may fail to install on CTOS III systems, reporting no error condition.

PLE: 16134619
  UCF: 26532345, 26595649
  Description:
  A blank page is output when the first byte of an ASCII job is a form feed. The Device Setup *SuppressFF*: key now handles this correctly.

PLE: 16148741
  UCF: 26529352
  Description:
  Multiple copies does not work for print jobs to *UNIX* through the *GPS Network Print Gateway* (NPGW).

PLE: 16150983
  UCF: 26546851, 26568498
  Description:
  GpamOpen() always sets the priority of jobs to 5 instead of the passed value for bPriority.

PLE: 16173878
  UCF: 26543991
  Description:
  BinaryModeDD does not implement *XlateFile*: Device Setup key.

PLE: 16176141
  UCF: 26521246
  Description:
  Printing *UNIX* print jobs to *GPS* through the *Network Print Gateway* (NPGW) on very heavily tasked *CTOS* servers intermittently results in lost jobs and *Print Service* error 220 (file in use).

PLE: 16195324
  UCF: 26553601, 77912647
  Description:
  GPS installation fails with misleading error 17408 on *BTOS II* real mode systems.

PLE: 16215414
  UCF: 77918332
  Description:
  A blank page may be ejected following mainframe PPT jobs containing embedded device reset escape codes when the device driver is configured with *Normal:XLateFile* or *Normal:Simple*. *SuppressFF*: now handles this correctly (please refer to the restrictions section).

PLE: 16223573
  UCF: 31258600
  Description:
  Print Service spools files in the *[!Sys]<SPL>* directory instead of the *[!SCR]<SPL>* directory.

PLE: 16224910
  UCF: 31257727
  Description:
  GpamOpen() fails with error 8 (inconsistency) for device names longer than 14 characters. Device names up to 22 bytes are now supported (length 22 is a bytestream limitation).

PLE: 16265187
  UCF: 26578566
  Description:
  LPTSimpleDD outputs null bytes to printer to flush port buffer.

PLE: 16325953
 UCF: 31273161
 Description:
 Print Service aborts print jobs with erc 4589 (Bad Job Handle) when the *Print Service* resides on, or *GPS* requests are routed through a processor board that is indexed 4 or higher (job handle bit 12 set).

PLE: 16041823
 UCF: 16041823
 Description:
 2.6.0 *GPS* install scripts for *Dot Matrix* and *Laser Packages* are not independent of *GPS Basic Package*.

PLE: 16062138
 UCF: 16062138
 Description:
 GPSStatus.run overlays request merging information on screen. *GPSStatus.run* now no longer uses the *GPSStatusMsg.bin* file, returns all status information directly to the installation script and deinstalls selected *GPS* services from memory.

2.2 Problems Closed from GPS 2.6.0

PLE: 15778636
 UCF: 26385601
 Description:
 Protecting the *<GPS>* directory causes erc 219 (access denied) errors during *GPS* installation.

PLE: 15916508
 UCF: None
 Description:
 Font Tool reports *FontISAM.run* file is missing if the *FontISAM.config* file is missing instead.

PLE: 15994967
 UCF: None
 Description:
 Print Service logs binary debugging data and request processing information to PLog. It also logs that it is deallocating a device that has been temporarily out of communication with the *Print Service*.

PLE: 16015105
  UCF: 26489377
  Description:
  Font Tool aborts with Erc 400 while generating a font database on
  CTOS III and sometimes for a very large font database on *CTOS II*
  systems.

PLE: 16065048
  UCF: none
  Description:
  The *Font Tool* adds 1/2 the multiplier value to width values when the
  divide by (denominator) is 1 using the Resize function on a width table.

PLE: 15896256
  UCF: none
  Description:
  The local *GPS Print Service* does not deallocate print job handles for
  direct print devices at another *Print Service*.

PLE: 15942835
  UCF: none
  Description:
  Printing a job to a busy direct print device will abort the print job in
  progress and begin printing the new job.

PLE: 16032565
  UCF: none
  Description:
  Add support for parallel printing on *SG4000, SG6000* and *SG7000*
  processors.

PLE: 16063703
  UCF: none
  Description:
  Add support for IOP board recognition on *SG4000, SG6000* and
  SG7000 processors.

PLE: 16064173
  UCF: 26501873
  Description:
  Print Service crashes with error 4534 if non-default values are used for
  the Context Allocation Heap Size and Stack Size parameters in
  conjunction with a large value for Number of Simultaneous Spool Jobs.
  Erc 400 is now correctly returned.

PLE: 16062456
  UCF: 77839166
  Description:
  The *2.6.0 GPS* SRA is unclear about compatibility and support for SRP
  processors, most notably the XE520 and XE530.

2.3   Changes from GPS 2.6.0

The **Deinstall GPS Device Driver** command is provided with the Basic
Package. The command has been changed in this release to enable the
addition of the [*GPS Workstation Prefix*] parameter feature (please see
section 2.4, below). The new command appears as follows:

```
Deinstall GPS Device Driver
  [GPS Workstation Prefix]
  Device name(s)
```

To remove this command, follow these steps:

1.   Type **Command File Editor** on the Executive command line and
      press **GO**.

2.   Locate the **Deinstall GPS Device Driver** command using the
      arrow keys and highlight the command.

3.   Press **F3 Remove** to remove the command.

4.   Press **FINISH**; save the changed command file.

By using this command, users will be able to deinstall locally installed
GPS device driver(s). Once one or more driver(s) have been deinstalled
in this manner, they can then be re-installed via the Executive command
line using the **Install Generic Print System** command.

The **Make Font Database** command will now correctly generate
intermediate port files for all font device types and font families present
in the *GPS>*.port* files, regardless of if they are the released port file
versions or not. The new *<Sys>GPSMakeFontDB.run* program reads the
GPS>FontKey.port file to determine which font families must be
generated for each font device type.

GPS queue files are now created and maintained by the *Print Service* in the *[!SCR]<SPL>* directory. Previous to *GPS R2.6.5*, *GPS* queues were created in the *[!Sys]<GPS>* directory, however this has been changed to permit read-only protection of the *GPS* files and directory. *GPS 2.5* and *2.6.0* versions of the *Print Service* are compatible with *GPS R2.6.5* or later, however these versions of the *Print Service* will continue to create queue files in *[!Sys]<GPS>*.

GPS temporary files are now created by *Print Manager* and *GPSInstall.run* in the *[SCR]<$000>* directory, where they may be deleted after each time *GPS* system services are installed into memory. These include only files with .config and *.tmp* suffixes. Previous to *GPS R2.6.5*, these files were created in the *<GPS>* directory. The location of *.state* device driver configuration files and the *GPS.Printers* files remains unchanged from previous releases.

2.4   New features added to GPS R2.7.0

NFS PLE: 15946849
 NFS UCF: 26452945, 26586666, 26590299
 Description: [*GPS Workstation Prefix*] parameter has been added to the **Install Generic Print System** and **Print Manager** commands. The default is to read the signed-on user file for the *:GPSWorkstationPrefix:* entry as in earlier releases of *GPS*. Providing this parameter in installation JCL files and Executive commands overrides this default and eliminates the need for *GPS* to refer to the user file for this parameter.

NFS PLE: 15692952
 NFS UCF: 26258855, 26265886
 Description: Multiple-line device driver Device Setup field has been implemented to permit longer device driver configurations. The *Print Manager* device driver install form Device Setup field may be scrolled for up to three lines of configuration information. *GPS* device drivers or device drivers built with the *GPS Driver Development Kit* earlier than version *R2.7.0* will be unable to read the second and third device setup lines, however. When saving Device Help information to the DevHelp file, only the first line of non-selectable configuration tokens from the Device Setup fields can be stored.

Section 3
Distribution Installation Procedures

3.1   Preparing for Installation

The *Generic Print System* should only be used on Unisys Information Processing Systems that are equipped with hard disk, or in clusters where the server is equipped with a hard disk. The *Generic Print System R2.7.0* and later is supported on *B26, B27, B28, B38,* and *B39 (CWS, NGEN, 286i* and *386i)* workstations, Series *2000, 3000* and *5000* workstations, Series *7000, 6000* and Series *4000* multiprocessor systems, and *XE530* multiprocessor system.

_____ **CAUTION** _____

The Generic Print System R2.7.0 has not been qualified for operation with versions of Standard Software earlier than revision level 12.0 (CTOS II). It is strongly recommended that a Queue Manager at revision level 12.1 or later be used, since several bug fixes affecting GPS have been made. (Queue Manager is a component of Standard Software). If you have not yet installed Standard Software at such a revision level, do so before installing the Generic Print System.

The Generic Print System R2.7.0 has not been qualified for operation with versions of the Operating System revision levels earlier than CTOS I 3.3 (real mode), CTOS II 3.4, CTOS III 1.1 or CTOS VM 3.4 (XE530).

_____

Note: *If GPS 2.5 or 2.6 has been installed previously, it is not necessary to remove any files from the <GPS> directory in preparation for installation of GPS R2.7.0, however the device driver configuration files (suffixed with " .state") should be deleted for printers no longer in use.*

GPS R2.7.0 should be installed at the server or Public to the server before performing the installation at client workstations. Merging the *GPS* requests is strongly recommended even if they have been merged from previous releases of *GPS* to enable the expanded device configuration capability the *R2.7.0* device drivers. The *GPS R2.7.0 Print Manager* is not compatible with *GPS 2.6.0* or earlier versions of the *Print Manager* and should not be operated together on the same cluster to avoid corruption of the *GPS.Printers* files or other unpredictable results. *GPS R2.7.0* device drivers may not operate properly in earlier *GPS* environments.

Note: *The GPS R2.7.0 installation procedure will automatically shutdown local GPS services and the Queue Manager operating in memory, if necessary. When installing GPS to the server from a client workstation the Queue Manager must first be manually deinstalled using the Deinstall Queue Manager command at the server workstation.*

The GPS R2.7.0 installation procedure will optionally remove obsolete GPS software to regain disk space for you if instructed to do so. Any remaining device driver configuration files, workstation GPS configuration files (suffixed with ".printers") and font database files (suffixed with ".dbs") will be automatically saved and reinstated for you should you decide to perform the <GPS> directory cleanup.

GPS R2.7.0 maintains GPS queue files in the [!SCR]<SPL> directory instead of the [!Sys]<GPS> directory in order to permit directory protection. If you had spooled print jobs in progress at the time of deinstallation, these will be automatically relocated for you if at all possible in order to preserve any incomplete print jobs.

The *Font Service* and the *Font Tool* are included in the *GPS R2.7.0* distribution installation. The *Font Service* is required by nearly all device drivers and by many applications. The *Font Service* requires a *runtime* font database, usually called *[Sys]<GPS>Font.dbs*, that contains information about the fonts and about the devices that use them. The *Font Tool* is the program that can create a runtime font database customized for the devices present in the user's environment. The *Font Tool* is required when printing from workstations using the Microsoft Windows environment printer drivers. In this case, the *Font Tool* is used to generate a custom font database using font information obtained from the *CTOS Desktop Plus Print Services Font Export Tool*. In most cases, when not using Windows workstations, the user will not want to install the *Font Tool*, but will want to install the *Font Service*.

The *Generic Print System R2.7.0* installation may be made to a server, cluster or standalone workstation. Normally, only one installation from diskettes is made to the server, then the cluster workstations are installed from the server. An installation to a server is called a *Public* installation.

Note: *A Public installation will optionally invoke the Font Tool to create a new customized runtime font database for the set of device drivers chosen. When creating this database, you should choose Font Device Types for every type of printing device to which users will print - even those you plan to use not present within the cluster, but located at remote network nodes. This is necessary so that applications such as OFIS Document Designer may format and print to printers located at remote network nodes.*

    Installations of GPS R2.7.0 to a client workstation from the server will give you the option to either copy the server's runtime font data base created during the Public installation to the cluster workstation, or to create a new local runtime font database. Copying the server's database is recommended so that all users of the cluster will be using a consistent font database, regardless of where the Font Service is being run.

CAUTION

If you have made an editable font database that you want to preserve, perform an "export" batch command parameter with the *Font Tool* and rename the resulting ".port" files with any prefix except *"GPS>"*. The installation will copy updated ".port" files prefixed with *"GPS>"* to the directory where your editable font database is and merge with it. Duplicate information will be overwritten with the new information. However, if you do not like the corrected and updated runtime font database that is created, you then may use the "Import:YourPrefix" batch command parameter with the *Font Tool* to overwrite the undesirable information.

3.2 Installing GPS from Diskettes

The complete *Generic Print System R2.7.0* is distributed in three separate packages, the *Basic Package, Dot Matrix Package* and *Laser Package*. Each package must be installed separately, however the *Basic Package* must be installed first. The *Basic Package* installation procedure is outlined below. Please refer to the *Dot Matrix* and *Laser Package* SRA documents for their installation procedures. The *Basic Package* is distributed on one 3½" diskette or two 5¼" diskettes and contains software used by all *GPS* installations.

Installing to the server remotely from a client workstation: Before installing the *GPS Basic Package* remotely to the server, be sure to deinstall the *Queue Manager, Font Service* and *Print Service* at the server. If *Print Manager* is running it must also be exited.

Installing to a client workstation or at the server itself: No action is required if you are installing the *GPS Basic Package* at the workstation receiving the software except you must exit the *Print Manager* if you are running *Context Manager*. The *Queue Manager, Font Service, Print Service* and device drivers, if operating in memory, will be deinstalled for you.

Install the *Generic Print System R2.7.0* as follows:

Note: *The Generic Print System R2.7.0 installation procedure requires version 12.0 or later versions of the Installation Manager and Standard Software. The standard Installation Manager features will be followed.*

*If the installation fails for any reason, or you press **Action-Finish**, the Install Manager will allow you to resume the installation at a point just prior to the place where the abort took place.*

The installation begins by displaying some general information about installing the product, much of which has just been described above. Volume Status will be invoked to display the available disk space and the disk usage of any existing *<GPS>* and *<Sys>* directory files.

The next window displayed is labeled "**Multiple Menu Selection**". It contains a list of *GPS R2.7.0* items for selection. Any or all of these items may be selected by pressing the *MARK* key while the choice is highlighted. Once an item is selected, the box preceding the selection remains highlighted. Pressing *CODE-MARK* deselects an item.

Installing from the product diskettes displays the following entries:

```
Server system installation package (required if Public)
Client workstation installation package
Stand-alone workstation installation package
Standard Font Database - contains Laser and Dot Matrix fonts
Font Data for HP font cartridges, AP9210 font cards, Imagen
Basic Package Pipe Device Drivers (outputs to disk files)
Application Program Interface (API) for software developers
Language Product Localization Kit (PLK) to change languages
Copy GPS R2.7.0 SRA DEF format document to <Gps> directory
```

Note: *The API (Application Program Interface) is only needed if you plan to write your own software to interface with GPS services. The API Library consists of Gpam.lib, a library of Gpam procedure calls to be linked with application programs, SamGenGPS.asm, a template to create a customized SamGen module for the application, and several sample programs fragments written for a C compiler and a Pascal compiler. (You may need to edit the sample programs somewhat to achieve a successful compile for the compilers installed on your system.)*

Note: *The PLK (Product Localization Kit) is only needed if you plan to change the GPS software package to use another written language other than English.*

Make your selection using the *MARK* key as described above, and press *GO*. Depending on your selections above, the windows to follow will vary. You will be prompted with various questions and options before the *GPS R2.7.0* software is loaded onto your system. Follow the prompts carefully and wait while the software you have selected is installed.

If you decided to generate a new run-time font database, the installation will pause with a message window titled "**Generate a New Run-Time Font Database**" along with some additional information about selecting font device types.

Pressing GO starts *GPSMakeFontDB.run,* which displays a window labeled "**Select Font Device Type**" and contains two columns: the first enumerates the list of supported printers with specific font requirements; the second column contains a Yes/No selection for each printer type. The table contains the following entries (for example):

```
LaserWriter+        Yes
Postscript          No
HPLaserJet          Yes
HPPaintJet          No
    .
    .
    .
AP 1374             Yes
APDMatrix           No
```

Use the Arrow key to move through this second column, selecting Yes or No for each printer by typing a Y or N as the leftmost character in the field and then pressing Down Arrow. When this table is complete, press *GO*.

Note: *Refer to the Generic Print System Administration Guide to determine the correct font device types for the printing devices used by the users on this cluster.*

Note: It is important to be accurate with font device types. Omitting a font device type means that the printing device that uses that font device type will not install properly (error status 15320 will be reported when attempting to install it) or users will not be able to format their documents for the device if it is located on a remote network node. On the other hand, choosing font device types that are not needed will make the runtime font database unnecessarily large (this will not impede correct operation of the software, however).

Some printers can use either of two or more Font Device Types (LaserWriter+ and Postscript, for example), but never at the same time by the same GPS device driver. It is generally best to select the Font Device Types with the featured fonts you plan to use most widely for the printers you have.

The following message is displayed in reverse video. It is an estimate of the maximum time required on the slowest processor and hard disk, indicating that a significant amount of time is needed to create the runtime font database:

```
Creation of your customized runtime Font Database will
take time - perhaps 2 to 60 minutes, depending upon the
speed of your CPU and hard disk.
```

3.3   After Installing GPS from Diskettes

If you have installed *GPS* to the server (Public installation), you may want to install *GPS* on your local workstation (local file system) following this installation. You may do so by using *Installation Manager* to perform an "**Install from Server**" and selecting the desired *GPS* software packages.

Installing from the server after *GPS R2.7.0* has already been installed to the server displays the following abbreviated entries instead of the menu displayed when installing from the installation diskettes:

```
Client workstation installation package
Stand-alone workstation installation package
Standard Font Database - contains Laser and Dot Matrix fonts
Font Data for HP font cartridges, AP9210 font cards, Imagen
Basic Package Pipe Device Drivers (outputs to disk files)
```

If the installation was public or the Client or Stand-alone packages were selected, the command **Make Font Database** was installed. This command does not require parameters. It enables you to create customized runtime font databases without knowledge of how to use the *Font Tool*.

The **Make Font Database** command runs the *Font Tool* and creates a runtime font database for the font device types that were selected. The resulting *.port* files contain the complete font database information but are configured to generate a runtime database for the selected font device types only.

For users unfamiliar with the *Font Tool*, it is recommended that they use the command **Make Font Database** to add or delete font device types to a runtime font database.

Section 4
Required Files

The installation procedure creates the directory *<GPS>* on the system volume with room for 150 files. It copies the files required for correct *GPS* operation into this directory.

Request.GPS.txt is the loadable request text file (use **List** and **Make Request** set commands to merge *Request.sys (Request.txt)* with *Request.GPS.txt* to make a new Request.sys file to be loaded by the operating system at system initialization time in order to enable the operating system to include any of the *GPS* services facilities (*Print Manager, Print Service Font Service, Device drivers* and *Pipe drivers*). It is only used during the installation process.

BasicGPS.cmds contains the Executive commands for *GPS* and is used only during the installation process.

GPSStatus.run is used only during the installation process. It determines the status of any installed *GPS* services and the *Queue Manager*, and deinstalls these services if necessary.

GPSPm.run is the run file for the *Print Manager*, the user interface to *GPS*. This program is used to install or deinstall *GPS* services and to monitor their functions.

If the *Print Manager* is to be executed from the workstation, the following files are required in the *<GPS>* directory

```
GpsForms.lib              GpsPmMsg.bin
GpsPm.run
```

GPSInstall.run is the run file for the program that implements the **'Install Generic Print System'** command that installs the *Generic Print System* in system memory, given the desired system configuration as recorded in the file *[Sys]<Gps>GPS.Printers,* built by the *Print Manager.* The file *GPSPmMsg.bin* is also used by *GPSInstall.run.*

FontService.run is the run file for the *Font Service. Font.dbs* is the runtime version of the font database that contains the font information that may be accessed through the *Font Service. DeinstallFS.run* is a

utility program which will cause the font database and *Font Service* to be removed from memory.

The following files are required to run the *Font Service*:

<GPS>Font.dbs (or a runtime font database by another name)
<Sys>FontService.run　　　　　　*<Sys>DeinstallFS.run*

GPSPsMstr.run, GPSPsClstr.run and *GPSPsStndAln.run* are the run files for the *Print Service*, a system service that accepts *GPS* requests from application programs and routes them to the proper service, whether on the same workstation, another workstation in the cluster, or over B-Net to a remote node. The program also spools and despools files for printing.

If the *Print Service* is to be installed at a workstation, the following files are required in the *<GPS>* directory:

One of the above run files, plus　　*GPSPsMsg.bin*

If a device driver is to be installed at a cluster workstation, the following files are required in the *<GPS>* directory:

The files that allow execution of the *Print Manager*
The files that allow installation of the *Print Service*
The Device Driver run files and support files, if any, plus
GPSDdMsg.bin

The various Basic Package Device Driver run files and support files are:

BinaryModeDD.run	binary mode only - jobs are not translated by the device driver.
LptSimpleDD.run	generic - for draft printing
DaisyDD.run	*AP1302, AP1303, AP1305, AP1307* Other *Diablo*-compatible printers
HpPlotterDD.run	*HP7470A, HP7475A, HP7550A*
UniversalDD.run	the "gateway" device driver to the PC environment Generic Print Agent

If you want to operate a pipe driver, they must reside in the *<GPS>* directory. The file *GPSDdMsg.bin* is required for Pipe Driver operation. The various Pipe Driver run files and support files are:

LptSimplePipe.run	draft image file
DaisyPipe.run	*Diablo* file
HpPlotterPipe.run	*HP* plotter HPGL file

The following files are required for the *Font Tool* in the *[Sys]<Sys>* directory:

FontForms.lib	*FontIsam.config*
FontTool.run	*FontToolMsg.bin*
FontISAM.run	*MakeFontDatabase.sub*
GPSMakeFontDB.run	

The following files are initially required for the *Font Tool* in the directory you specify at install time (the default suggested by the installation procedure is the *[Sys]<FontDB>* directory):

GPS>FontCharacterSet.port	*GPS>FontDevice.port*
GPS>FontFamily.port	*Gps>FontKey.port*
Gps>FontPseudoFamily.port	*Gps>FontRaster.port*
Gps>FontReduction.port	*Gps>FontTranslate.port*
Gps>FontWidth.port	*TextSet.Font*
VM003TextSet.Font	

The file *FontWidthTest.Script* (installed with the font database port files) is not required but is useful for determining correct font widths when customizing a font database.

The file *BasicGps.sra* in the *<Gps>* directory is not required but is the editable form of this document in *Document Exchange Format* (DEF). *OFIS Document Designer 3.0* can open and read this file directly without pre-translation.

Section 5
System Software Compatibility

The *Generic Print System* is backward compatible with previous *Convergent/Unisys* printing products. That is, it supports the *Spooler* and *Queue Manager* operations previously used in applications and therefore can support spooled printing in the former fashion. Nevertheless, version 12.1 or later of the *Queue Manager* is recommended with this release of *GPS* because of several bug fixes related to *GPS*. Also version 3.3 or higher of *CTOS I* and *CTOS II 3.4* is required for compatibility with bytestreams.

Many 2.x *GPS* device drivers are compatible with *GPS R2.7.0*. However, it is advisable to rebuild independently developed device drivers with the separately available *GPS R2.7.0 Device Driver Kit*. *GPS* 2.4 device drivers have not been qualified with *GPS R2.7.0*. Device drivers based on versions of PrintGen or DDK prior to 2.5 are not compatible with *GPS R2.7.0*.

5.1   Workstation Environment

GPS R2.7.0 has been qualified to run with the following operating systems: *CTOS I 3.3* and later, *CTOS II 3.3* and later, *CTOS III 1.0* and later, and *CTOS/XE 3.4* and later. *GPS R2.7.0* has not been qualified with *BTOS II* software environments and is not supported on these systems, however it should operate correctly under most circumstances. Installing *GPS* on *BTOS II* systems will require the *CTOS Installation Manager* software be copied from *CTOS Standard Software 12.0* or later.

GPS R2.6.5 and 2.6.0 was qualified to run under the following operating systems which are no longer supported by Unisys: *BTOS II 3.2, CTOS II 3.3*, and all *XE520* levels. Continued use of the *GPS 2.6.0* release is at the customer's discretion. If you are using one of these operating systems and wish to upgrade to *GPS R2.7.0*, you are strongly advised to upgrade your operating system prior to installing the *R2.7.0* release. Use of *GPS R2.7.0* on an unqualified operating system is at the customer's own risk.

5.2   Diskless Workstations

The *Generic Print System* builds an installation configuration file for
each workstation where *GPS* is installed (e.g, **GPS.printers*), and a
unique configuration file (e.g., **.state*) for each printer at a workstation
where *GPS* is installed. These files are located in the *GPS* working
directory, *[Sys]<GPS>*, at each workstation. Diskless workstations
share the *GPS* directory at the server workstation, requiring some
method of distinguishing these files as unique to a particular
workstation. *GPS* uses an alphanumeric workstation prefix specified
either in the signed-on user file *:GPSWorkstationPrefix:*"xxxx" parameter
or passed as a parameter to the *GPSInstall.run* program or *Print
Manager*, to uniquely distinguish these files. Each diskless workstation
that supports a printer should have a unique *GPS* Workstation prefix.
For a user at a diskless workstation to have *GPS* Administration
capabilities, a *GPS* workstation prefix must also be supplied. For more
information on installing *GPS* on diskless workstations, see the *CTOS
Generic Print System Administration Guide*.

5.3   Shared Resource Processors

GPS R2.7.0 has been qualified to run on *XE530 Shared Resource
Processors,* and Series *7000, 6000* and *4000* multiprocessors for all
supported operating system levels.

GPS R2.6.5 was qualified to run on *XE520* and *XE530 Shared Resource
Processors*, and Series *7000, 6000* and *4000* multiprocessors for all
supported operating system levels.

Section 6
Hardware Information

6.1 Hardware Configurations Supported

The *R2.7.0 Generic Print System* can run on *B26, B27, B28, B38, B39* (*CWS, NGEN, 286i*, and *386i*) workstations and Series *5000* , Series *3000* and Series *2000* workstations with hard disk or sharing the hard disk at the server. The workstations equipped with a port expander (XC-002) may use the additional ports for support of *GPS* devices. *GPS* also runs on the *SG7000, SG6000, SG4000* and *XE530* multiprocessors.

6.2 Special Hardware Requirements

The Generic Print System can run on the full range of Unisys workstation products provided they are equipped with at least 512K memory, and that they have access to 5Mb of disk either locally or elsewhere on their cluster LAN.

Section 7
Resource Requirements

7.1   Memory Requirements

The *Print Manager* executes as an application program and will work under the *Context Manager* version 4.0 or later.

The memory requirements of the *GPS* components are summarized in the table below.

Component Size (Kb)

Print Service (Server)	190 *
Print Service (Cluster)	128 *
Print Service (Stand-alone)	67 *
Font Service	44
Binary Mode Driver	64
Daisy Driver	97
LptSimple Driver	95
Universal Device Driver	121
GPS Installer	50
Print Manager	288

* The memory sizes above are the minimums required to support one device driver. Add 2.0 Kb for each additional installed local printer and 1.9 Kb for each additional simultaneous spool job.

The memory sizes shown for the device drivers include a *Font / Graphics Work Area* size equal to that obtained from DevHelp.

The *Print Service* must be installed at each workstation which has a printer attached to it as well as at the server workstation.

A device driver must be installed at the workstation to which the printer is attached.

The *Font Tool* requires 500K to generate most runtime font databases. Large font databases may require additional memory.

7.2   Disk Requirements

The directory *<GPS>*, created with room for 150 files on the *[Sys]* volume by the installation procedure, is the working directory for *GPS*. A similar directory is required for each workstation which has installed *GPS* components. The directory *<$GPS>* is created on the *[SCR]* volume when the *Print Service* is run, where local spool files are kept. For files spooling at the server, the *[!SCR]<SPL>* directory is created with room for 300 files if it was not already created by the installation of Standard Software.

The installation procedure requires about 50 sectors of disk space.

A Public installation creates a directory you specify on the *[!Sys]* volume. The default is *[!Sys]<FontDB>*. This is where the portable font database files are placed for the editable font database. It requires about 2100 sectors to hold the portable font database files.

If the *Font Tool* is installed, a minimum of 5400 sectors will be required to build an editable font database and generate a runtime font database. If the *Font Service* is not installed, about 400 sectors can be conserved.

The *Print Manager* requires 620 sectors of disk space.

A typical installation on a client workstation equipped to install a device driver, including *Font Service*, one device driver, *Print Service* and *Print Manager* will require approximately 1600 sectors.

Scratch (temporary) disk files are created by *R2.7.0 GPS* device drivers that print raster images. Scratch disk files are also created when vector graphics are printed by drivers that must rasterize the image (i.e., the *CT Matrix*, *Epson* and *HP LaserJet* drivers). The scratch files are created on the workstation's "scratch" volume (*[SCR]*). The *[SCR]* volume is equivalent to *[Sys]* by default, but can be redirected to another volume. See the *CTOS System Administration Guide* for information about how this may be accomplished.

7.3   OS Resource Requirements

GPS installed services request operating system resources as needed for their execution. Since these resources are allocated from a fixed pool whose size is determined when the operating system image is built, it may sometimes be necessary to build a new system image with more resources in order to install *GPS* when there are a significant number of other system services installed at the same workstation.

If an error code is reported which indicates insufficient system resources were allocated at the time of system build, consult the Software Release Announcement relevant to the operating system for further details.

Section 8
Restrictions

GPS R2.7.0 has not been qualified to run on *BTOS* operating systems nor *CTOS* operating system levels earlier than *CTOS I 3.3, CTOS II 3.4* and *CTOS III 1.0.* *GPS R2.7.0* may not execute properly on earlier operating systems. Workstations running *GPS* 2.6, *GPS* 2.5 or *GPS* 2.4 device drivers may still be compatible with other cluster and server workstations running *GPS R2.7.0*, however this configuration has not been qualified and is not supported.

9-pin PC-style serial ports do not support CTS/RTS (hardware) flow control.

3-wire serial cables are not supported for *XON/XOFF* serial flow control to maintain full *RS-232* compatibility across hardware platforms. Please refer to the *2.6 GPS Administration Guide* for the correct serial cable to use with *GPS XON/XOFF* control.

Concurrent use of the *Normal: XLateFile* or *Normal: Simple* keys and the *SuppressFF:* key in Device Setup may result in certain print jobs "sticking" in the printer until a subsequent job is printed. Using *SuppressFF:* instructs device drivers to assume that any job not marked with a specific print job mode are expected to provide their own page handling.

GPAM documents printed to the Postscript device driver that have a page that selects bin 1 followed by page that selects the GPAM default bin 0 will print the second page from bin 1 also. This highly unlikely problem is unavoidable due to the implementation of printer-panel default setting of GPAM bin 0. Most GPAM documents specify a GPAM bin explicitly for all pages.

Print jobs to be printed after a specified date and time will commence based on the clock of the system where the queue manager is installed, not the clock of the workstation that queued the print job. These two clocks may vary if the printer is attached to a remote network node.

Graphical objects that exceed page dimensions will not print correctly. It is possible with *Document Designer* or *OFIS Designer* to create a page of

graphical objects whose dimensions exceed that of the page dimensions. In such cases, a graphics device driver may produce unexpected results.

Documents containing raster images which must be scaled may fail to print with error code 15355. This error indicates that there was insufficient space to hold the unscaled portion of an image that maps to one band of the printer. This occurs most often when scaling an image down by a significant amount. It occurs on the Imagen and CT Matrix printers, because they have a fairly large minimum band height (32 and 24 pixels, respectively). Reinstall the device driver with a larger *Font/Graphics Work Area*. A 300 dpi image 8 inches wide cannot be scaled to less than 1.5 inches wide on the Imagen, even with the maximum *Font/Graphics Work Area* of 64K. In that case, the image should be rescanned at the smaller size with *Image Designer* or *OFIS Imager*.

PostScript printers may fail to print documents containing images which contain a very large amount of data, and which must be scaled. This appears to be due to a memory overflow in the printer. In this case, a subsequent job may also be lost before the printer recovers.

Page Dimensions specified in GPAM documents are assumed to be correct, unless they exceed the maximum dimensions predetermined for each device driver. Because different paper bins or different forms may be utilized with various printers, the page dimensions are assumed to describe the paper source that will be used. Page dimensions for unformatted documents are specified in the *Print Manager's* device installation form (page width and length) and must correctly describe the standard paper source. Tractor-fed printers (with CT Matrix, Epson or Daisy drivers) will advance paper the distance equal to the page length specified in the document. Daisy wheel printers with sheet feeders will not be able to locate the left edge of the paper if the page width is incorrect. Laser printers may misalign the image on the printed page if page dimensions are incorrect.

Typethrough is not implemented in this release of *GPS*.

If a device driver installed locally is unable to access the Font Database at the server, problems will occur. Forcing the installation of a local *Font Service* through the Admin form of the *Print Manager* will prevent such problems and improve driver performance, at the cost of less available memory on the local system.

ASCII files cannot be printed in binary mode to printers configured for Impress or PostScript. If an ordinary ASCII file (instead of a job in printer-specific language) is queued in binary mode it will usually print, since most printers will accept ASCII. However, printers configured for Impress (Imagen) or PostScript will only print jobs which are in the Impress or PostScript page description languages. If you are printing ordinary text files to these printers from a PC or VPC via LANce or ClusterShare, you must select ASCII print streams. See the VPC and ClusterShare Release Notice for more information about printing to GPS devices via ClusterShare and LANce

Printers which use the Canon CX marking engine, such as the most commonly used models of Imagen, HP LaserJet and PostScript printers, are incapable of printing to the edges of the paper. These drivers have default values for the size of the dead zones on the top, bottom, left and right borders of the paper. For other marking engines, the dead-zone value for any of the four edges can be entered in the appropriate Border field of the device driver installation form. The default borders for these drivers result in a portrait-orientation page length of approximately 10.5 inches, or 63 lines per page at 6 lines per inch. This should be taken into account when using applications that generate formatted output.

Many printers which support font cartridges have significant restrictions concerning the removal of font cartridges. It is commonly necessary to turn the printer off-line before removing the cartridge, in order to avoid damaging the font cartridge. On some printers, removing the font cartridge will cause the current page or print job to abort. The prompt to mount a particular wheel or font cartridge, which is issued by the device driver, is provided without regard to actual restrictions that may exist on various printers concerning font cartridge replacement. For some printers, this prompt should be regarded as providing information only, concerning which cartridge that the job expects to be present in the printer. For such printers, print jobs should avoid depending upon more than one font cartridge, and if the cartridge does require changing, the user should restart the print job from the beginning, or from the top of the first page that requires the font cartridge, after powering off the printer and replacing the font cartridge.

Device drivers track the mount of only one font cartridge at a time. For printers which have two or more font cartridge slots, only one slot should be designated by user convention for cartridge replacement. The other slots should be reserved for the permanent installation of designated font

cartridges. The font database should be modified so that no cartridge name prompt is issued for those fonts which are present in the permanently mounted font cartridges.

Drivers that share the same queue must run on the same workstation or be booted from the same server. When drivers that share the same queue have different [SCR] volumes, then one may report erc = 203 (no such file) for the files it is supposed to print. This is because files are spooled on the [SCR] volume of the driver whose device name was used in submitting the job. (Drivers on different SRP or XE boards may share queues without restriction.) Drivers that share the same queue must also be installed with the same run file and use the same Font Device Type.

Time required for raster image processing: Due to the very large amount of data contained in a raster image, printing a job that contains raster images may take significantly longer than printing one without raster images. Images that require scaling by the device driver will require more processing time than raster images that do not require scaling. In most cases parallel connections will pass data to the printer faster than serial connections. If you use serial connections, you should use the fastest baud rate the workstation and printer can mutually support.

The HPLaserJet devices have the following point size limitations for downloading fonts:

HPLaserJet Series II	255 Pt.
HPLaserJet 500	30 Pt.
HPLaserJet +	30 Pt
HPLaserJet	18 Pt.

Note: OFIS Document Designer allows you to go as large as 255 Pt.

Section 9
Supplementary Information

9.1   Nationalization

To nationalize *GPS R2.7.0*, it is necessary to have several of the *CTOS Development Utilities* installed on your system. The required tools are the Forms Editor (*FormsEditor.run*), the Librarian (*Librarian.run*), the Editor (*Editor.run*), the Create Message File utility (*CreateMsgFile.run*) and the Product Localization Tool (*PLT.run*).

The *GPS* nationalization method has been changed in the *R2.7.0* release. This release now requires the full *GPS* Basic Package be installed on a clean system prior to performing the nationalization procedures with the *Product Localization Tool* (PLT). The *Product Localization Kit* (PLK) is packaged with the *GPS Basic Package*.

A *Product Localization Guide* (PLG) has been included to provide a step-by-step guide for localizing *GPS*. The guide describes the use of batch JCL files that, used in conjunction with the PLT, will:

- o Select the files for localization
- o Display the order in which files must be translated
- o Keep a record of translation work performed and work in progress
- o Rebuild form libraries and message files, and
- o Repackage the translated software for distribution to customers

For complete details, please refer to the file *<GPSPLK>GPSPLG.doc*.

9.2   Common Misunderstandings

o Border Settings in the *GPS* coordinate system (0,0) refers to the extreme upper left edges of the page. Most Postscript devices agree with this placement of the origin. However, devices manufactured by Hewlett-Packard, Canon, and others typically use a point approximately 3/8" to 1/4" from the left edge of the page as the origin. For these devices, this point is also the leftmost point of the printable

area. That is, a coordinate shift as well as clipping to the printable area is required for these devices if the formatting of GPAM applications is to be faithfully reproduced on the printer. Prior to release 2.5.4, the left border and top border settings in the Device Driver Installation form were used as the origin offset for these devices. For the other devices not requiring an offset, the Border settings were simply the dead zones around the edges of the page. Thus experimenting with different Border settings could produce strikingly different results when comparing, say, the PSDD with HpLaserJetDD. When the Border settings correctly described the dead zones of each device, there was no discrepancy. However, many users expect the border setting to function as margins and so have been disappointed with the implementation for the devices requiring origin shifts.

The origin offset is internal for those device drivers requiring an origin offset (HpLaserJet, APLaser, APVLaser, APHrMatrix, HpPaintJet). The border settings, as before, describe the printable region of the device, and will clip all text that extends into the border areas. That is, the border settings function as absolute margins for all jobs except binary jobs. The appearance of this "absolute margin limit" should be uniform on all devices. For example, if border settings of 1 inch are used, then no GPAM or ASCII job will print in the regions within 1 inch of the edges. As before, if the Border settings are left blank, the device driver will use the published dead zones (nonprintable areas) of the printer. (Note: *blank* means default settings. The value 0 means no dead zones and the driver will then expect that the device can print to the extreme edge of the page.) If border settings less than the actual dead zone of the printer are used, the results will differ from the expected formatting.

Most laser printers have dead zones. Dead zones are nonprintable areas around the edges of the page. Most dot matrix printers with tractor feed paper drives are unable to print at the perforations and thus have left and right dead zones. Also, dot matrix and daisy wheel printers with sheet feeders will have dead zones at the top edge of the page. Refer to the documentation that comes with the printer to determine the correct dead zone border settings. Border settings are not intended to be default margins for documents; their purpose is to allow you to accurately describe the limits of the printable areas on your printer.

o The *GPS* workstation prefix is intended for use on workstations with no local file system. Using the *GPS* workstation prefix at the server or at a workstation with a local file system hard disk will yield unpredictable results.

o Three-conductor serial cables are not supported for *GPS* device drivers to maintain full RS-232C compatibility with XON/XOFF flow control. Please refer to the *CTOS Generic Print System Administration Guide* for the correct serial cable.

o 9-pin serial port CTS/RTS (hardware) flow control is not supported for *GPS* device drivers on *SuperGen* or *PC* style *CTOS* workstations.

o Relocating editable font database files (*.ISAM, *.Ind, *.data) to a volume or directory named differently than those where they were created may make them inaccessible to the *Font Tool* due to ISAM data set errors. If, however, you have ISAM utilities installed they can be used to safely copy the font database ISAM data sets from one location to another.

o Using the *SuppressFF*: device setup key together with *Normal:XLateFile* or *Normal:Simple* may result in pages "sticking" in the printer until a subsequent print job starts. The *SuppressFF*: key tells the device driver to assume the print jobs will control their own page handling in Normal mode, however text files, text screen prints and printer pass-through (PPT) jobs from mainframes are not always formatted with page handling or conclude with a binary code for device resets.

o When using the HPScale or HpDownload font device type and printing documents containing multiple fonts and vector graphics, often the graphics may fail to print and erc 15353 is returned by the device driver.

o LptSimple or APMatrix jobs with the first line positioned at 0,0 using GPAMReposition results in the printout missing the first line of the intended printout.

o Postscript jobs canceled or restarted from non-current page locations sometimes causes one or more subsequent print jobs to be lost. PostScript printers sometimes fail to recognize the end-of-file character (04) after a job terminates abnormally, causing the next job to be processed (without printing it) before the printer returns to an idle state, ready to process additional jobs.

To correct this problem: Pause the device driver, power the printer off and on, wait a few moments for the printer to indicate that it is waiting for data, and then issue the restart or cancel command.

Restart from a location other than current will fail if a job was created by an application which does not paginate the document, such as *Art Designer* or *OFIS Graphics*. Applications that do not provide logical page names cannot relocate their current printing position.

o If the server is rebooted diskless workstations having the *Font Service* installed may give an error code of 13903 when attempting to print because the font database file is no longer accessible. Deinstall the *Font Service* and reinstall it to reopen the font database file.

When printers are powered off, not connected or off-line, the *time-out* period must elapse before printer commands can be completed.

Reinstalling device drivers at remote client workstations may be delayed up to 60 seconds if it was just deinstalled. This is due to polling changes introduced in *GPS 2.5* for higher job performance. If an attempt is made to reinstall the device before the driver tables throughout the cluster have been updated the user may experience an error (device already installed).

o The HPPlotter does not print graphic images sized for A4 paper properly. For A4 landscape jobs to print leave at least 8mm (.4") between the object and the right hand paper boundary. For A4 portrait, use the letter size setting from *Art Designer* or *OFIS Graphics*.

o Installing a Plotter as a direct device for *OFIS Graphics* may cause the system to hang.

o In configurations with a large number of printers, erc 4533 may be displayed for printers near the bottom of the *Print Manager* list. This error is normal and reports that *Print Service* has temporarily run out of heap memory. If the increases suggested for this error in the manual do not alleviate all 4533 errors, try a larger increase of heap memory (e.g., 8000 or 10000) when installing the *Print Service*.

o Printers installed for use with pre-*GPS* applications should not be installed with 'Normal:Simple' under Device Setup. 'Normal:XLateFile' may be entered under the Device Setup if desired, but this entry is not mandatory.

o Using the 'I' character to draw vertical lines in applications such as *Enhanced Multiplan* or *OFIS Spreadsheet* may result in staggered vertical lines if fonts with a non-integer pitch are used. This is a known limitation which especially occurs when the 8 point Lineprinter font is used. In *OFIS Spreadsheet*, you may specify a pitch and force the vertical bars to align with each other.

o Printing unprintable data to the PostScript driver will print a blank page or may not print anything at all (e.g. text printed in binary mode or text marked for non-printing in *OFIS Document Designer*) is sent to the printer.

o Canceling print jobs processing graphics data may require the printer be manually reset from graphics mode to text mode. Some devices, such as the AP1329 or AP9215, are unable to respond to software commands to reset themselves. Should this be the case with your printer, it is necessary to reset the printer manually by turning it off and then on.

o If a job is sent to a device that has just been installed and the *Print Manager* reports an error 2 it will be necessary to do the following to correct this condition. Deinstall the *Queue Manager* and *Print Service*, delete the affected drivers .queue entry in the *[!SCR]<SPL>* directory, reinstall the *Queue Manager*, followed by the device driver.

o The *Font Tool* will not run on SG 4000/6000/7000 IOP boards. It will only run on the host board EP00.

Section 10
Documentation Updates

10.1   Standard Documentation

The following *CTOS Generic Print System* manuals are available :

CTOS Generic Print System Administration Guide (43582147-100)

CTOS Generic Print System Using the Print Manager (09-02448)

CTOS Generic Print System Using the Font Tool (09-02449)

Use of the *Print Manager* for configuration of the print system is described in the *CTOS Generic Print System Administration Guide*. Use of the *Print Manager* for everyday tasks, such as printing and monitoring printers, is described in the *CTOS Generic Print System Using the Print Manager* manual. Use of the *Font Tool* is described in *CTOS Generic Print System Using the Font Tool* manual.

Note: The following manuals are included in the *GPS* Device Driver Kit for use by developers:

CTOS Generic Print System Programming Guide (3914833-801)

CTOS Generic Print System Device Driver Manual (39148341-810)

The *CTOS Generic Print System Programming Guide* documents *GPS* and GPAM interfaces for use by application programmers. The *CTOS Generic Device Driver Manual* documents how to create device drivers for *GPS* for use by application programmers.

10.2   CTOS GPS Administration Guide

Serial Interface Cables, Figure 3-19 Modify the figure on page 3-32. The connection from DCE pin 2 to pin 6 should be drawn from pin 1 to pin 6.

Laser Device Drivers, Figure 9-1 Modify the figure on page 9-3. Add the printers DU2210 and DU2217 to the box for printers supported by the Postscript Device Driver.

PCL5 Device Driver Modify the Device Setup keywords and values table on page 9-34. Add the lines "Sheetfeeder: HP500" and "Bin: 2,1" (see the *GPS R2.7.0* Laser Package SRA new features for a description of these keywords and values).

Postscript Device Driver Modify the list of qualified printers on page 9-49. Add the printers DU2210 and DU2217 to this list.

Postscript Device Driver Modify the Device Setup keywords and values table on page 9-53. Change the line "Bin: (only used with TI 2115) Check printer documentation" to "Bin: N (N = single digit of starting postscript bin number, check printer documentation". Add the line "Bin: 2,1" (see the *GPS R2.7.0 Laser Package* SRA section 2.3, "New features added to GPS R2.7.0", for a description of this keyword and value).

Dot Matrix Device Drivers, Figure 10-1 Modify the figure on page 10-3. Add the printers AP1357 and AP1359 to the box for printers supported by the AP Hr Matrix Device Driver. Add the printer AP1374 to the box for printers supported by the Epson FX-286 Device Driver.

Device Driver Font and Graphics Error Codes Modify the table on page 11-35. Change the line "15372 to 15412 Reserved for future use" to read "15372 to 15411 Reserved for future use" and insert the line "15412 Invalid font point size configured in device driver Device Setup field *Font:FontFamily[ptSize]* key".

10.3　CTOS GPS Programming Guide

The current level of this manual is marked 2.4. The *CTOS Generic Print System Programming Guide* requires the following information to be updated for *GPS R2.7.0.*

GpamTextDirection: Add page 3-37A.

Procedural Interface
> *GPAMTextDirection (pGPAMWA, b1stDir, b2ndDir, wDistance,*
> *fPrevPosition) ercType ;*

Parameters

pGPAMWA POINTER	pb to Gpam workarea of BsGpamType
b1stDir BYTE	primary escapement direction
b2ndDir BYTE	secondary escapement direction
wDistance WORD	NewLine distance
fPrevPosition FlagType	Use previous position

Description

Sets the direction to position a character stream and the distance to use for NewLine.

The first parameter is the pointer to the GPAM BSWA.

The second parameter (byte) indicates the primary escapement direction, that is, the direction moved to place the next character when room remains on the same "line". The third parameter (byte) indicates the secondary escapement direction, that is, the direction moved to the next "line". Four directions are possible for each parameter, with the only restriction that one parameter must be horizontal and one must be vertical.

The values for *b1stDir* and *b2ndDir* must be:

Left-to-Right	0
Right-to-Left	1
Top-to-Bottom	2
Bottom-to-Top	3

The fourth parameter (word) is the NewLine distance (in the secondary direction) that will be used. If the secondary escapement direction is vertical, then this value is used for wSLDDistance. Otherwise, (horizontal secondary escapement direction) wSCDDistance is set.

The fifth parameter (byte) is a flag to indicate whether the change of direction should proceed from the current (ending) position, or from the ending position of the previous escapement. This is a feature so that alphabets like Kanji, that at times temporarily change escapements, can do so without explicit repositioning.

If invalid or inconsistent parameters are used, error code 4521 is returned.

For example: GPAMTextDirection(pBswa, 2, 0, 240, 0) sets the escapement for Kanji. Suppose we then write "XYZ", then call GPAMTextDirection(pBswa, 0, 2, 240, 0), then write "1234", then call GPAMTextDirection(pBswa, 2, 0, 240, 0FFh) - *or alternatively* call GPAMTextDirection(pBswa, 2, 0, 240, **0**), and then write "ABC", this is what would appear on the page for each case:

GPAMTextDirection (pBswa, 2, 0, 240, **0FFh**)	GPAMTextDirection (pBswa, 2, 0, 240, **0**)
X	X
Y	Y
Z	Z
1234	1234A
A	B
B	C
C	

GpamSetAttribute Add page 3-36A

Procedural Interface

GPAMSetAttribute (pGPAMWA, wAttrClass, wAttrId, wAttrValue)
ercType;

Parameters

pGPAMWA POINTER	pb to Gpam workarea of BsGpamType	
,wAttrClass WORD	Identifier (seal)for attribute class	
,wAttrId WORD	Identifier of the attribute	
,wAttrValue WORD	Value of the attribute	
;		

Description

Sets a value for an attribute belonging to a particular class of device drivers.

The first parameter is the pointer to the GPAM BSWA.

The second parameter (word) is the attribute class. Since this call is used to employ special characteristics of specific printers and GPAM is a device independent language, this apparent contradiction is resolved by the *attribute class*. At print time, the device driver will verify that it services the class of attributes intended by the application. Since the device driver defines and maintains the size, identifiers and number of special attributes, there must be agreement between application and device driver on the meaning of the parameters in this call.

The third parameter (word) is the attribute identifier.

The fourth parameter (word) is the value.

GetGPSNodeConfig Modify page 4-32

Request Block

The request code for GetGPSNodeConfig request is 8043h, update table 4-14 as shown below:

Table 4-14. GetGPSNodeConfig Request Block

Offset	FieldSize	Contents
0	sCntInfo1	8
1	RtCode1	0
2	nReqPbCb1	0
3	nRespPbCb1	2
4	userNum2	
6	exchResp2	
8	ercRet2	
10	eqCode2	8043h
12	iDevice2	
14	pbNodeID4	
18	cbNodeID2	
20	pBufferRet4	
24	sBufferMax2	
26	psBufferRet4	
30	ssBufferRet2	2

DeleteGPSFile Add page 4-5A

Procedural Interface
   DeleteGPSFile (jh) ercType ;

Parameters
   jh WORD   Job handle returned from
                              OpenGPSFile.

Description
   This call deletes by the job handle, a job in progress that is currently spooling or printing to a direct printer. The request is routed by the job handle and has a quicker and more accurate routing path than DeleteGPSJob. DeleteGPSJob is routed by devSpec and requires more processing to match the request with the job in progress.

GPAMBeginPage: The wPgLength and wPgWidth parameters were incorrectly documented in reverse order. The correct **BeginPage** record is shown below:

Table 3-2. Page Parameters Data Structure

Offset	Field	Size	
0	bSides	1	
1	fStagger	1	
2	wBinIn	2	
4	sbFormName	13	
17	fAlign	1	
18	bAspect	1	
19	sbPageNum	13	
32	sbMontage	13	
45	bQuality	1	(Not Implemented)
46	wPgLength	2	
48	wPgWidth	2	
50	wBinOut	2	

GPAMOpen: Modify page 3-27

The record structure in Table 3-3. Format of Document Parameters is incorrect. The correct record structure is:

Table 3-3. Format of Document Parameters

Offset	Field	Size	
0	sbDocName	93	
93	sbUserName	31	
124	fSecurity	1	
125	fSuppressPage	1	
126	fSuppressBanner	1	
127	fTypeThrough	1	(Not Implemented)
128	fImmediate	1	Only for direct print jobs
129	qTimeCreated	4	
133	qReqOutputStartTime	4	
137	wcCopies	2	
139	wTimeout	2	
141	fSingleSheet	1	
142	wTimeToPrint	2	
144	bPriority	1	

fSuppressPage:
> The default is to have this field false. In this case, the device driver assures that each new print job begins on a fresh page. That is, it

will eject any half printed job remaining in the printer. Also, at the completion of the job, it will eject the last page of the job.

The effect of fSuppressPage = TRUE is to concatenate a sequence of jobs of any print mode (GPAM, Simple, ASCII, etc.) continuously on the page. Page ejects are only issued when indicated by the data. That is, when a GPAMBeginPage call is made or when 0C hex is embedded in the data. Data requests for page ejects will always be processed, even when that data occurs as the first or last item in the job.

Should a print job with fSuppressPage = FALSE, that is merely default job parameters, be interjected amongst the above job stream, it will cause the job preceding it to be ejected from the printer and will eject itself from the printer.

GPAMReposition: No change to the parameters. Modify page 3-31

The bottom paragraph discussing if GPAMReposition is not used the print position is determined by the page boundaries needs to be amended. An application that does not use GPAMReposition must not use GPAMWhiteSpace nor GPAMPlaceCharacter, either, in order to correctly format the text using the device driver's configured page boundaries. If either of the calls are made during a print job, GPAMReposition must be called with non-zero coordinates at least once during the job prior to either of the other calls to inform the device driver to use GPAM formatting instead of plain text formatting.

GPAMSetFont: No change to the parameters. Add to page 3-35:

Normally one passes 0 as the wWidth parameter. This allows the true character width to be extracted from the font database and is used in printing the character. When a non-zero value is used for wWidth, that value is used for all characters in the font - even when the font is a proportionally spaced font. This is called *pitch coercion.* When the escapement direction is vertical (see GpamTextDirection) a non-zero value for wWidth will specify the vertical pitch, that is coerce pitch in the vertical direction.

SetGPSParams: No change to the parameters. Modify page 4-59

fSuppressPage has been implemented. The record structure is:

Table 4-25. Job Parameters Data Structure

Offset	Field	Size	
0	sbDocName	93	
93	sbUserName	31	
124	fSecurity	1	
125	fSuppressPage	1	
126	fSuppressBanner	1	
127	fTypeThrough	1	(Not Implemented)
128	fImmediate	1	Only for direct print jobs
129	qDocCreationTime	4	
133	qReqOutputStartTime	4	
137	wcCopies	2	
139	rgbStartLocation	29	
168	rgbEndLocation	29	(Not implemented)
197	fSingleSheet	1	
198	wTimeToPrint	2	
200	bPriority	1	
201	bSides	1	

fSuppressPage:

The default is to have this field false. In this case, the device driver assures that each new print job begins on a fresh page. That is, it will eject any half printed job remaining in the printer. Also, at the completion of the job, it will eject the last page of the job.

The effect of fSuppressPage = TRUE is to concatenate a sequence of jobs of any print mode (Gpam, Simple, ASCII, etc.) continuously on the page. Page ejects are only issued when indicated by the data. That is, when a GPAMBeginPage call is made or when 0C hex in embedded in the data. Data requests for page ejects will be always processed, even when that data occurs as the first or last item in the job.

Should a print job with fSuppressPage = FALSE, that is merely default job parameters, be interjected amongst the above job stream, it will cause the job preceding it to be ejected from the printer and will eject itself from the printer.

SetImageModeGPS: No change to the parameters. Add to page 4-66:

SetImageModeGps specifies the *print mode* that will be used when the device driver processes the job. Part of this process includes setting the *port mode* that bytestreams uses in processing its part of the job. The following table shows the port mode settings implied in setting the print mode.

Value	Print Mode	Port Mode	
0	Normal	Normal:value	default = device driver choice, usually Binary.
1	Image	Image	WP, SWP and OFIS Writer
2	Binary	Binary	
3	SDP	Image	Cannot be used without Bull Transac SAM server
4	GPAM	DD choice	Usually Binary
5	CGM	DD choice	Usually Binary
6	TIFF	DD choice	Usually Binary
7	XlateFS	Normal	(Not Implemented)
8	XlateFile	Normal	jobs may contain embedded escape codes for printer
9	Simple	Normal	simple ASCII is assumed

When the Port mode is Normal (print modes Simple and XlateFile) the device setup parameter, XlateFile:*[vol]<dir>filename*, will be used by bytestream code to translate the data. Otherwise, the translation file is ignored.

WriteGpsFile: No change to the parameters. Correct page 4-73

The parameter, psDataRet, is of type Pointer (not word).

GetFontData: No change to the parameters. Add to table 5-5 on page 5-9

The contents of the wPointSize field should also describe the values returned from the *Font Service* in this field. When the font key for the requested font is marked with Yes for the Scale By Points? field in the font database, the value of the wPointSize field in the font key returned by the *Font Service* is a scale representing the number of GPAM units per point in the returned font information, which for all GPAM clients will be 20 (one point). When the Scale By Points? field in the font database font key is No, the wPointSize field of the returned font key is equal to the GPAM units for the font height, and will be the same value passed to the *Font Service* in the original request.

10.4 CTOS GPS Using the Font Tool Manual

The manual was updated for *GPS* 2.4.1. The *CTOS Generic Print System Using the Font Tool* manual requires the following information to be updated for *GPS* 2.7.0.

Table 4-1 Modify the table on page 4-17 line 10. Read "s caron" instead of "caron".

Appendix E Add to page E-4

011h   Write the following n bytes. The n bytes following will be substituted for the character that indexed this entry. A single character token will be created.

012h   Read the next n bytes from the input stream. That is, this is the first byte of an $n+1$ multi-byte character code. A single character token will be created.

Section 11
Known Errors and Omissions

PLE: 16034746
Description:
The *Font Tool* may abort runtime font database generation with the error message "Hash bucket allocation failed" for certain large font databases. Usually adding or removing one or more font device types will permit a complete runtime font database to generate.

PLE: 15978520
UCF: 26475929
Description:
Printing an *OFIS Graphics* image with at least one single embedded polygon containing 1022 or more coordinate points will GP fault crash the workstation.

PLE: 16232840
UCF: 52470340
Description:
HPPlotterDD prints graphs that are about 6% too wide.

The point size of a pseudo font family is not mappable to printer-scalable substitution fonts when a point size other than 12 is used.

Duplicate printer entries in *Print Manager* can occur when configuring network printers. This usually happens when configuring printers on the local node after having referred to the server first as "{Master}" or "{Server}" and then referring to the server with its actual node name when using the Setup function. If when this occurs and the extraneous printers cannot be deleted, deinstall the *Print Service* and then delete the extra printer entries.

Section 12
Support

12.1 Introduction

This section describes Unisys warranty, support category, and assistance provided by GPS *R2.7.0*.

12.2 Warranty

GPS R2.7.0 is a warranted Unisys software product.

Unisys warrants that *GPS R2.7.0*, in its unaltered form, will substantially conform to Unisys current published functional specifications when used in Unisys supported configurations. The customer is responsible for reporting suspected deviations using the User Communication Form (UCF) process within ninety (90) days following delivery. The product is neither field repairable nor field modifiable. Corrections to reported deviations are provided to the user via updated code files.

This standard warranty is not a substitute for Unisys Service Agreement offerings.

12.3 Support Category

GPS R2.7.0 is fully supported by Unisys.

Support services for *GPS R2.7.0* are offered under the SURETY (United States) or A la Carte (International) support programs and are consistent with the support services offered for the entire CTOS Hardware and Software family of products.

Unisys SureNet is an electronic bulletin board service, providing customers in the United States access to technical information seven days a week, 24 hours a day. SureNet Technical Information Services are available at no additional cost to customers with a current Unisys service agreement or software license and include access to system alerts, customer technical bulletins and online UCF entry. Registration is required. SureNet Support Services are available on an annual subscription basis. For more information, contact Unisys Direct at 1-800-448-1424, prompt 5. You may register for Technical Information Services and/or Support Services either online (by dialing 1-800-828-8796 (8 data bits, 1 stop bit, no parity, asynchronous, VT100 emulation) or by calling Unisys Direct.

If you need further assistance or information regarding support services, please contact your Unisys representative or your local Unisys office.

12.4   Support Discontinuance

UNISYS supports the current release level and one level back. Prior levels are not supported. *GPS R2.7.0*, R2.6.5 and 2.6.0 are supported release levels.

12.5   Product Assistance

The following sections describe how to get assistance if you need help and information you should provide if you experience a problem.

12.5.1   Instructions

Should you encounter a problem with a Unisys product, please contact your local Customer Service Center. Your Customer Service Center representative will have a more definitive set of problem reproduction requirement guidelines specific to the application you are running. So that your questions may be answered in a timely manner, please collect all information which applies to your problem. A guideline for gathering information is listed below or you may reference the Product Validation Profile (PVP) in the PRIMUS database for more product specific UCF submission requirements.

12.5.2   Environment

In order to assist us in determining the nature of your problem, please be prepared to describe the environment in which the problem occurs.

12.5.3   Software Components

If you suspect the problem is software related, be prepared to answer the following questions concerning the software being used:

1. The version number of the software in which the problem occurs.

2. The version of the operating system software.

3. Installation parameters used for the failing software.

4. Configuration files used.

5. Other software installed at the time of failure.

6. Recent changes to the system software (updates, other)

7. Any messages associated with the failure that appear in the system log file (accessed through the **Plog** command).

8. The connectivity of the software (is your system part of a network?).

12.5.4   Hardware Components

If you suspect the problem is hardware related, be prepared to answer the following questions concerning your hardware platform:

1. The type of processor being used (B38, B39, SG2000, SG5000, other, etc.).

2. The workstation components (hard drives, communication modules, CD-ROM drive, other).

3. Any peripherals attached to the workstation (printers, scanners, modems, plotters, other).

4. The connectivity of the hardware (is your system part of a network?).

5. Recent changes to the hardware platform.

6. The amount of memory installed.

12.5.5 Circumstances

Be prepared to describe the circumstances under which the failure occurs. The description should include:

1. Is the problem reproducible?

2. What are the exact steps required to reproduced the problem?

3. Under what circumstances does the problem not occur?

Section 13
Contents of Distribution Diskettes

The *Generic Print System* Distribution Diskettes are your master copies, and have been shipped write-protected. They should not be write-enabled, nor should they be used as working copies.

The following *Generic Print System* components are contained in the Basic *GPS* distribution set:

The Basic GPS Package:
B25 GP2

Print Manager
Print Service
Font Service
Font Tool

Device Drivers:
  DaisyDD
  HpPlotterDD
  LptSimpleDD
  BinaryModeDD
  UniversalDD

Pipe Drivers:
  DaisyPipe
  HpPlotterPipe
  LptSimplePipe
  BasicGPSPipe.cmds

Font database source files for all the Unisys device drivers. That is the above device drivers as well as all the device drivers in the Dot Matrix and Laser Printer packages.

Additional font database source files for the Imagen, AP9210 font cards and HP Laserjet font cartridges.

Application Programmer's Interface kit (API) containing the GPAM object library and source files for example programs.

Language Product Localization Kit (PLK) to Nationalize *GPS* for non-English languages.

Contents of Basic GPS 5¼" media diskette 1 of 2:

<Sys> Directory:

Install.ctrl	Installation file
Install.jcl	Installation file
BasicGPS.run	Installation file

Contents of Basic *GPS* 5¼" media diskette 2 of 2:

<Sys> Directory:

BasicGPS.run	Installation file

Contents of Basic *GPS* 3½" media diskette 1 of 1:

<Sys> Directory:

Install.ctrl	Installation file
Install.jcl	Installation file
BasicGPS.run	Installation file

The BasicGPS.run installation files are NLS-compatible self-extracting executable compressed archive files. All the *GPS R2.7.0* product software is contained within these two files on the 5¼" media or within the one file on the 3½" media. Product files may be manually extracted from these archives using the Executive Run command. The parameters used are similar to the Restore Archive command:

<u>Run command form</u>   <u>Example parameters</u>   <u>Parameter descriptions</u>

```
Run
  Run file        [f0]<Sys>BasicGPS.run  Archive file name
  [Case]                                 (unused)
  [Command]                              (unused)
  [Parameter 1]   '<Gps>*.run'           [File list from (<*>*)]
  [Parameter 2]   '[Sys]<Gps>*.run'      [File list to (<*>*)]
  [Parameter 3]   yes                    [Overwrite okay?]
  [Parameter 4]   no                     [Confirm each?]
  [Parameter 5]   no                     [List files only?]
  [Parameter 6]   no                     [Suppress display?]
  [Parameter 7]   {AnyNode}              ["Restore To" prefix]
```

The [File list from (<*>*)] and [File list to (<*>*)] parameters 1 and 2 both accept wildcards and default to <*>* (indicating all files are to be restored). No volume name should be specified in the [File list from (<*>*)] parameter 1. Please note that when using the Run command, you must enclose any wildcard expressions in single literals (') to prevent the Executive from expanding the wildcards.

To see the contents of the archive file without restoring any files, set the [List files only?] parameter 5 to 'Yes'. The [Suppress display?] parameter 6 suppresses all video display of file restoration progress. Parameter 7, [Restore to file prefix], accepts optional {node}[Volume] or [Volume] prefix specifications to where the files are to be restored, however this may instead be specified in [File list to (<*>*)].

Section 14
Ordering Procedure

Please complete and return the attached Update Service Request form to order this product. Media provided by Unisys Corporation may not be returned for credit.

You can order manuals from the following address:

Unisys Corporation
Publications Distribution Center
13250 Haggerty Road North
Plymouth, Michigan 48170

UNISYS

Software
Release
Announcement

**Generic Print System (GPS)
Version R2.7.0
Laser Package
Style ID:B25-D42**

To order additional copies of this document

- United States customers, call Unisys Direct at 1-800-448-1424.
- All other customers, contact your Unisys Sales Office.
- Unisys personnel, use the Electronic Literature Ordering (ELO) system.

Contents

Section 1
Description of Programs

Device Drivers translate print jobs into the language of a specific printer. They also enable human interaction in the processing of print jobs, including the ability to monitor, pause, resume or cancel jobs. GPS provides device drivers for thirteen device classes.

The following device drivers are included in the *GPS Laser Printer Package*. For each device driver there is a corresponding pipe driver included.

•   The **PostScript driver**, *PSDD.run,* translates print jobs into the **PostScript** page description language. This driver supports the AP9210 and AP9300 series (AP9310, AP9312, AP9316) and DU2210 series laser printers sold by Unisys. PostScript is a rapidly emerging standard language for printers, especially laser printers and typesetters. PostScript provides a high level of graphic and font capabilities to raster printing devices. The Postscript driver supports the 500-sheet auxiliary bin and the automatic envelope feeder for the Unisys AP9210. It also supports alternate bin numbering.

The PSDD device driver may be configured to support *OFIS Document Designer* and simple ASCII printing in a manner completely transparent to the user.

The PostScript driver has been qualified on the following printers: AP9210, AP9415, AP9300 series printers (AP9310, AP9312, AP9316), DU2210, DU2217, Texas Instruments 2115, LaserWriter, LaserWriter Plus, and LaserWriter II NTX. It is likely to work on other PostScript printers, although the above listed printers are the only ones specifically tested by Unisys. The Postscript Level II printer language is not fully supported with this device driver, however many Postscript II printers will work when the PSDD device driver is configured as the DU2210 printer.

- The **HP LaserJet driver,** *HPLaserJetDD.run,* translates print jobs into the Hewlett-Packard Printer Control Language (PCL) language required by the Hewlett Packard LaserJet and LaserJet Plus printers. This driver supports the AP9300 series printers (AP9310, AP9312, AP9316) and AP9210 laser printers sold by Unisys. The device driver provides support for the replaceable cartridge font feature of the printer. It will download fonts, as needed, if instructed by the font database. The LaserJet driver supports duplex, graphics and landscape printing. It maps colors of solid, halftone, and quarter-tone fill patterns to appropriate gray levels. The LaserJet driver supports the 500-sheet auxiliary bin and the automatic envelope feeder for the Unisys AP9210. It also supports manual feed and paper tray selection for the LaserJet500. If multiple copies are specified in a print job, the LaserJet is instructed to print each page the requested number of times, allowing the printer to run at full speed.

  This device driver has been qualified with the AP9300 series printers and AP9210 printers sold by Unisys. The font database contains font device types for the resident fonts that are present on each of these printers.

- The **PCL5 driver,** *PCL5DD.run,* translates print jobs into the Hewlett-Packard Printer Control Language (PCL5 language supported by the Hewlett Packard LaserJet III and LaserJet 4 printers. This driver supports the AP9300 series laser printers (AP9310, AP9312, AP9316) sold by Unisys. The device driver provides support for replaceable cartridge font feature of the printer. It will download fonts, as needed, if instructed by the font database. The PCL5 driver supports HPGL graphics language for vector graphics. duplex printing, and landscape printing. It maps colors of solid, halftone, and quarter-tone fill patterns to appropriate gray levels. The driver supports the 500-sheet auxiliary bin and the automatic envelope feeder for the Unisys AP9300 series printers and the HP Laserjet 4. It also supports manual feed and paper tray selection for the LaserJet printers If multiple copies are specified in a print job, the printer is instructed to print each page the requested number of times, allowing it to run at full speed.

This device driver has been qualified with the AP9316, AP9312, AP9310 printers sold by Unisys. The font database contains font device types for the resident fonts that are present on each of these printers.

- The **AP Laser drivers**, *APLaserDD.run* and *APVLaserDD.run,* translate print jobs into a sequence of commands recognized by the extended Diablo 630 Graphics language used by the 9200 series of printers sold by Unisys. The AP9206, AP9208, AP9215, and AP9230 support 6, 8, 15, and 30 page per minute printing and 75, 100, 150, or 300 dpi resolution of graphics. The AP9215-1 and AP9230 are dual-bin 300 dpi printers. These device drivers have graphic capabilities, supports all normal text attributes such as bold, underline, etc. and support the typographic fonts available for the AP9200 series printers. Color printing is not available with these devices and drivers.

  The *APVLaserDD.run* device driver supports the 9215-1 printer only. It handles all the normal text attributes that the APLaserDD does but handles graphics printing at 300 dpi only. This driver does not rasterize the vector data like the APLaser driver, but makes use of the rasterizing capability of the printer. Vector graphics data is sent directly to the printer. This driver also makes use of the gray scales available on the printer. Since the printer cannot handle a polygon of more than 128 points, it is sent as a polyline to the printer. Hence only the perimeter of the polygon will be drawn.

- The **Imagen driver**, *Imagen8300DD.run,* translates print jobs into the **Impress** page definition language used by Imagen laser printers. The Imagen device driver has graphic capabilities and supports the typographic fonts available for Imagen printers.

  The Imagen device driver can print in either portrait or landscape page orientation, and can support manual feed of paper or envelopes through the printer's rear paper feed. It maps colors of solid, halftone and quarter-tone fill patterns to appropriate gray levels. If multiple copies are specified in a print job, the Imagen is instructed to print each page the requested number of times, allowing the printer to run at full speed.

Section 2
Changes from Prior Versions

Problems closed listed below are specific to the software in the *GPS Laser Package*. For a list of problems closed common to all device drivers, please refer to the *GPS Basic Package SRA* Problems Closed Section 2.

2.1   Problems Closed from GPS R2.6.5

PLE: 15544805
 UCF: 77849452
 Description:
 PSDD does not pause AP9210 for paper size changes.

PLE: 16040304, 16093378
 UCF: 26532337, 31243114, 43153188, 52181810, 52212413, 77831081, 77836785, 31242436, 77860557
 Description:
 AP9300, HPLaserIII, HPLaser4 and AP9208 Font Device Types are not included in the Standard Font Database.

PLE: 16114227
 UCF: none
 Description:
 PSDD cannot select bins on the DU2210 / DU2217 printers.

PLE: 16201049
 UCF: 26557771
 Description:
 APLaserDD does not reset AP9206 and AP9208 printers to the default bin following print jobs that select bin 2 (optional sheet feeder).

PLE: 16242594
 UCF: 52411793
 Description:
 PCL5DD horizontal text and underline positions are inconsistent for multiple underlined font changes on a single page.

PLE: 16041823
UCF: 31235553
Description:
2.6.0 *GPS* install scripts for Dot Matrix and Laser Packages are not independent of *GPS Basic Package.*

PLE: 16076295
UCF: 26580366, 52295513
Description:
PCL5DD box and rule fill shading is not consistent for mixed fill shades around the perimeter of a box in *OFIS Document Designer* documents.

PLE: 16326208
UCF: none
Description:
PSDD prints A5 pages incorrectly with a vertical offset on the AP9210.

PLE: 16333077
UCF: none
Description:
APLaserDD prints monospaced fonts with proportional spacing.

2.2   Problems Closed from GPS 2.6.0

PLE: 16000442
UCF: 52247098, 77839457, 77846674
Description:
PCL5DD driver printed half-tone and quarter-tone shades are exchanged.

PLE: 16000655
UCF: 52245044
Description:
PCL5DD legal bin 2 selection reverts to the printer's front panel configured default bin after printing the first page of a document.

PLE: 16010545
UCF: 52259045
Description:
PCL5DD clips graphics at 0.5" from top of page in a portrait, or at the left in landscape orientation.

PLE: 16010588
  UCF: 52192609, 52255431
  Description:
  PCL5DD misplaces text 0.05' within graphic boxes. The printable area defaults have been corrected to 0.25" for left, right, top and bottom margins.

PLE: 16017094
  UCF: 52240751
  Description:
  PCL5DD underline position places underline characters on top of characters on next line below. The PCL5DD and HPLaserJetDD double underline separation has also been increased slightly to enhance their visible resolution by 3% of the character cell height.

PLE: 16041611
  UCF: 52266521
  Description:
  PCL5DD half-tone and quarter-tone shades are too dark. These have been adjusted to match the shading currently used for HPLaserJetDD.

PLE: 16047325
  UCF: none
  Description:
  PCL5DD color-to-grayscale levels from OFIS Graphics are inconsistent.

2.3   New features added to GPS R2.7.0

NFS PLE: 16201081
  NFS UCF: 49189753
  Description: Logical paper source swapping for bins 1 and 2 has been implemented in the *GPS Laser Package* for the HP Laserjet, PCL5 and Postscript device drivers. The exchange of bins 1 and 2 at the printer by software configuration of the Device Setup using the Bin: keyword permits you to use letterhead in the smaller bin 1 and draft paper in the larger (usually 500 sheet) bin 2. To logically swap bins 1 and 2 on these drivers, enter Bin:2,1 in the Device Setup field under Print Manager's device driver installation form. For Postscript driver configurations already using the Bin:X keyword (where X is the bin number currently used), use Bin:2,1:X.

NFS PLE: 16114243
  NFS UCF: 26485274
  Description: Duplex Postscript printing support has been added to the Postscript device driver for the AP9300 series and DU2210 printers equipped for duplex printing. Collation and copies functions are also implimented with this. This feature may permit limited use of unqualified Postscript Level II printers when the driver is configured as the DU2210 printer.

Section 3
Distribution Installation Procedures

3.1   Preparing for Installation

The *Generic Print System* should only be used on Unisys Information
Processing Systems that are equipped with hard disk, or in clusters
where the server is equipped with a hard disk. The *Generic Print System*
R2.7.0 and later is supported on B26, B27, B28, B38, and B39 (CWS,
NGEN, 286i and 386i) workstations, Series 2000, 3000 and 5000
workstations, Series 7000, 6000 and Series 4000 multiprocessor systems,
and XE530 multiprocessor system.

CAUTION

The Generic Print System R2.7.0 has not been qualified for operation with
versions of Standard Software earlier than revision level 12.0 (CTOSII). It is
strongly recommended that a Queue Manager at revision level 12.1 or later
be used, since several bug fixes affecting GPS have been made. (Queue
Manager is a component of Standard Software). If you have not yet installed
Standard Software at such a revision level, do so before installing the
Generic Print System.

The Generic Print System R2.7.0 has not been qualified for operation with
versions of the Operating System revision levels earlier than CTOS I 3.3 (real
mode), CTOS II 3.4, CTOS III 1.1 or CTOS VM 3.4 (XE530).

GPS R2.7.0 should be installed at the server or Public to the server
before performing the installation at client workstations. The *GPS*
R2.7.0 Print Manager is not compatible with *GPS 2.6.0* or earlier
versions of the Print Manager and should not be operated together on
the same cluster to avoid corruption to the GPS.Printers files or other
unpredictable results.

Note: *The GPS R2.7.0 Laser Package installation procedure will*
automatically shutdown the local GPS Print Service and device
drivers operating in memory, if necessary.

The *GPS R2.7.0* Laser Package installation may be made to a server, cluster or standalone workstation. Normally, only one installation from diskettes is made to the server, and the cluster workstations are installed from the server. An installation to a server is called a *Public* installation.

3.2 Installing GPS from the Installation Diskettes

The complete *Generic Print System R2.7.0* is distributed in three separate packages, the Basic Package, Dot Matrix Package and Laser Package. Each package must be installed separately, however the Basic Package must be installed first. The Laser Package installation procedure is outlined below.

Installing to the server remotely from a client workstation: Before installing the *GPS Laser Package* remotely to the server, be sure to deinstall the Print Service at the server. Deinstalling the server Print Service will automatically deinstall any operating device drivers at the server.

Installing to a client workstation or at the server itself: No action is required if you are installing the *GPS Laser Package* at the workstation receiving the software. The Print Service and device drivers, if operating in memory, will be deinstalled for you.

The installation procedure follows.

Note: *The GPS R2.7.0 Laser Package installation procedure requires version 12.0 or later versions of the Installation Manager and Standard Software. The standard Installation Manager features will be followed.*

If the installation fails for any reason, or you press Action-Finish, the Install Manager will allow you to resume the installation at a point just prior to the place where the abort took place.

The installation begins by displaying some general information about installing the product, much of which has just been described above. Volume Status will be invoked to display the available disk space and the disk usage of any existing *<Gps>* and *<Sys>* directory files.

The next window displayed is labeled "Multiple Menu Selection". It contains a list of *GPS R2.7.0* Laser Package items for selection. Any or all of these items may be selected by pressing the *MARK* key while the choice is highlighted. Once an item is selected, the box preceding the selection remains highlighted. Pressing *CODE-MARK* deselects an item.

Installing from the product diskettes displays the following entries:

```
Laser Device Drivers package (all device drivers)
Laser Pipe Device Drivers package (all pipe drivers)
Copy GPS R2.7.0 SRA DEF format document to <Gps> directory
```

Make your selection using the *MARK* key as described above, and press *GO*. Depending on your selections above, the windows to follow will vary. You will be prompted with various questions and options before the *GPS R2.7.0* software is loaded onto your system. Follow the prompts carefully and wait while the software you have selected is installed.

3.3 After Installing GPS from the Diskettes

You may want to install GPS on your local workstation (local file system) following this installation. You may do so by using Installation Manager to perform an "Install from Server" and selecting the desired GPS software packages.

Installing from the server after the *GPS R2.7.0* Laser Package has already been installed to the server displays the following entries instead, allowing you to specify individual devices for installation:

```
Complete Laser Device Drivers package (all drivers)
Complete Laser Pipe Device Drivers package (all pipes)
HP PCL5 Printer Language    Device Driver ( PCL5DD.run        )
Postscript Language         Device Driver ( PSDD.run          )
HP PCL2 Laserjet II Series Device Driver ( HPLaserjetDD.run )
Unisys AP Laser Series      Device Driver ( APLaserDD.run     )
Unisys AP9215-1 Laser       Device Driver ( APVLaserDD.run    )
Imagen 8300 Series          Device Driver ( ImagenDD.run      )
```

If you do not select the *Complete Laser Pipe Device Drivers package* option, the following menu will also be displayed allowing you to specify additional individual Pipe Driver items to install:

```
HP PCL5 Printer Language   Pipe Driver ( PCL5Pipe.run        )
Postscript Language        Pipe Driver ( PSPipe.run          )
HP PCL2 Laserjet II Series Pipe Driver ( HPLaserjetPipe.run )
Unisys AP Laser Series     Pipe Driver ( APLaserPipe.run     )
Unisys AP9215-1 Laser      Pipe Driver ( APVLaserPipe.run    )
Imagen 8300 Series         Pipe Driver ( ImagenPipe.run      )
```

Section 4
Required Files

If a device driver is to be installed at a client workstation, the following files are required in the <GPS> directory:

The files that allow execution of the Print Manager.
    (See Section 5 of *GPS Basic Package SRA*)
The files that allow installation of the Print Service.
    (See Section 5 of *GPS Basic Package SRA*)
The Device Driver run files and support files, if any, plus *GpsDdMsg.bin*

The various Device Driver run files and support files are:

PCL5DD.run	PCL5 (Hewlett Packard printers HPLaserIII and HPLaser4) UNISYS AP9300 series printers
PSDD.run	Unisys AP9210, and AP9415 UNISYS AP9300 series printers Other PostScript-compatible printers
	PSDD.run and may also require the *PSDD>SerialSetup.ps* file to configure the printer for serial printing
APLaserDD.run *APVLaserDD.run*	Unisys AP9200 series printers Unisys AP9215-1 printers
	APLaserDD.run and *APVLaserDD.run* also require the *BTOSCharSetDLF.font* file.
HPLaserJetDD.run	PCL2 (Hewlett Packard) printers CT's LZ-5 and LZ-12, AP9210 UNISYS AP9300 series printers
Imagen8300DD.run	Impress (Imagen) printers

If you want to operate a pipe driver, they must reside in the *<Gps>* directory. The file *GpsDdMsg.bin* is required for Pipe Driver service operation. The various Pipe Driver run files and support files are:

PCL5Pipe.run	PCL5 file
PSPipe.run	PostScript file
HPLaserJetPipe.run	PCL file
APLaserPipe.run	Unisys AP92xx file
APVLaserPipe.run	Unisys AP9215-1 file
Imagen8300Pipe.run	Impress file

Section 5
System Software Compatibility

Please refer to the *Generic Print System Basic Package SRA* System Software Compatibility Section 5.

Section 6
Hardware Information

Please refer to the *Generic Print System Basic Package SRA* Hardware Information Section 6.

Section 7
Resource Requirements

7.1   Memory Requirements

The memory requirements of the *R2.7.0 GPS Laser Package* components are summarized in the table below.

Component Size (Kb)

PCL5 Driver	128
PostScript Driver	121
PostScript Driver (AP9415)	131
HpLaserJet Driver	128
APLaser Driver	129
APVLaser Driver	128
Imagen Driver	124

The memory sizes shown for the device drivers include a *Font/Graphics Work Area* size equal to that obtained from DevHelp.

The following table presents reasonable *Font/Graphics Work Area* numbers used during installation of device drivers that are to print raster or vector graphics images.

Device Driver Font/Graphics Work Area (Kb)

APLaser	25
APVLaser	25
Imagen	15
PostScript	8
HpLaserJet (75 DPI)	8
HpLaserJet (100 DPI)	10
HpLaserJet (150 DPI)	15
HpLaserJet (300 DPI)	48

If raster images will typically be scaled by the device driver, larger values will be required for all of the device drivers except the PostScript driver. Scaling occurs only when a job is printed to a different resolution printer than the user selected when scanned by *Image Designer* or *OFIS Imager*, or when the image has been resized in *OFIS Document Designer*.

Add at least 12K to each recommended value above (except for PostScript) to handle image scaling. If large images will be scaled down to very small, install the Imagen with the maximum Font/Graphics Work Area of 64.

The Print Service must be installed at each workstation which has a printer attached to it as well as at the server workstation.

A device driver must be installed at the workstation to which the printer is attached.

7.2   Disk Requirements

The directory <GPS>, created with room for 150 files on the [Sys] volume by the installation procedure, is the working directory for GPS. A similar directory is required for each workstation which has installed GPS components. The directory <GPS>, is created on the [Scr] volume when the Print Service is run. Spool files are kept in this directory.

A typical installation on a cluster workstation requires approximately 1600 sectors. This type of installation includes one device driver, the Font Service, the Print Service, and the Print Manager.

If all the device drivers are chosen, 3650 sectors will be required. Space can be saved by installing only those device drivers which will be needed.

If all the pipe drivers are chosen, 3100 sectors will be required. Space can be saved by installing only those pipe drivers which will be needed.

Scratch (temporary) disk files are created by *2.5 GPS* device drivers that print raster images. Scratch disk files are also created when vector graphics are printed by drivers that must rasterize the image (i.e. HP LaserJet drivers). The scratch files are created on the workstation's "scratch" volume *[Scr]*. The *[Scr]* volume is equivalent to *[Sys]* by default, but can be redirected to another volume. See the *CTOS System Administration Guide* for information about how this may be accomplished.

7.3   OS Resource Requirements

GPS installed device drivers request operating system resources as needed for their execution. Since these resources are allocated from a fixed pool whose size is determined when the operating system image is built, it may sometimes be necessary to build a new system image with more resources in order to install GPS when there are a significant number of other system services installed at the same workstation.

If it is necessary to generate a new system image, consult the Software Release Announcement for instructions for the version of CTOS in use.

Section 8
Restrictions

Please refer to the *Generic Print System Basic Package SRA* Restrictions Section 8 for a complete description of existing restrictions.

PostScript printers may fail to print documents containing images which contain a very large amount of data, and which must be scaled. This appears to be due to a memory overflow in the printer. In this case, a subsequent job may also be lost before the printer recovers.

ASCII files cannot be printed in binary mode to printers configured for Impress or PostScript. If an ordinary ASCII file (instead of a job in printer-specific language) is queued in binary mode it will usually print, since most printers will accept ASCII. However, printers configured for Impress (Imagen) or PostScript will only print jobs which are in the Impress or PostScript page description languages. If you are printing ordinary text files to these printers via ClusterShare, you must select ASCII print streams. See the *ClusterShare* Release Notice for more information about printing to GPS devices via CluserShare.

Printers which use the Canon CX marking engine, such as the most commonly used models of Imagen, HP LaserJet and PostScript printers, are incapable of printing to the edges of the paper. These drivers have default values for the size of the dead zones on the top, bottom, left and right borders of the paper. For other marking engines, the dead-zone value for any of the four edges can be entered in the appropriate Border field of the device driver installation form. The default borders for these drivers result in a portrait-orientation page length of approximately 10.5 inches, or 63 lines per page at 6 lines per inch. This should be taken into account when using applications that generate formatted output.

Many printers which support font cartridges have significant restrictions concerning the removal of font cartridges. It is commonly necessary to turn the printer off-line before removing the cartridge, in order to avoid damaging the font cartridge. On some printers, removing the font cartridge will cause the current page or print job to abort. The prompt to mount a particular wheel or font cartridge, which is issued by the device driver, is provided without regard to actual restrictions that may exist on

various printers concerning font cartridge replacement. For some printers, this prompt should be regarded as providing information only, concerning which cartridge that the job **expects** to be present in the printer. For such printers, print jobs should avoid depending upon more than one font cartridge, and if the cartridge does require changing, the user should restart the print job from the beginning, or from the top of the first page that requires the font cartridge, after powering off the printer and replacing the font cartridge.

Device drivers track the mount of only one font cartridge at a time. For printers which have two or more font cartridge slots, only one slot should be designated by user convention for cartridge replacement. The other slots should be reserved for the permanent installation of designated font cartridges. The font database should be modified so that no cartridge name prompt is issued for those fonts which are present in the permanently mounted font cartridges.

The HPLaserJet devices have the following point size limitations for downloading fonts:

HPLaserJet Series II	255 Pt.
HPLaserJet 500	30 Pt.
HPLaserJet +	30 Pt
HPLaserJet	18 Pt.

Note: *OFIS Document Designer* allows you to go as large as 255 Pt.

Section 9
Supplementary Information

Please refer to the *Generic Print System Basic Package SRA* Supplementary Information Section 9.

Section 10
Documentation Updates

Please refer to the *Generic Print System Basic Package SRA* Documentation Updates Section 10.

Section 11
Known Errors and Omissions

For a complete listing of known errors and omissions applying to the entire GPS package, please refer to the *R2.7.0 GPS Basic Package SRA* Section 11.

PLE: 16164674
   UCF:
   Description:
   The widths of certain characters of AP9300 and HPLaser4 font device types is incorrect.

PLE: 15352027
   UCF: 26239231
   Description:
   If the APLaser driver is installed with an output buffer value of 2k or more, certain documents, when printed to the AP9215-1, may cause the system to crash. Use the default (blank value) buffer size.

PLE: 15771313
   UCF: 43059998
   Description:
   The APLaser driver may rarely repeat output raster lines in graphic screen prints.

PLE: 15863803
   UCF: 26440564
   Description:
   Certain Postscript fonts, such as Times, print underline scoring slightly higher or lower in boldface than in non-boldface.

PLE: 15865873
   Description:
   In some rare cases a TIFF image embedded in an *OFIS Document Designer* document will not be printed.

PLE: 15969083
  Description:
  APBoldPS and APBoldItPS font widths are incorrect on the AP9215
  and AP9215-1 printers unless the AP9415 font device type is also
  generated in the runtime font database.

PLE: 15881534
  Description:
  The GPS GpamGrLineColor() API call will draw black when the default
  white color index 0 is selected on Postscript printers.

PLE: 16021792
  UCF: 26459796
  Description:
  APLaser driver misplaces graphics 0.5" to the right in landscape in a
  multi-column *OFIS Document Designer* document when printed on the
  AP9215-1 printer using A4 paper and the printer has firmware 5.52.

PLE: 15974966
  UCF:
  Description:
  HPLaserjetDD may rarely repeat raster lines in screen print jobs.

Printing raster graphics at 600 DPI on the AP9300 series printers with
the PCL5 driver may result in corrupt images when the printer binary
mode is on or if the printer firmware level is later than Engine 11.02 /
Base 5.22B.M due to a firmware bug in the printer for PCL2 raster
commands. The printer must also be set to 600 DPI and the binary mode
set to OFF. Users still encountering problems printing at this resolution
may want to upgrade their printer firmware to that of the newer AP9312
(AP9300 Series "PLUS").

The AP9210 envelope feeder will behave differently under the Postscript
and HPLaserJet device drivers. The HPLaserJet will print with the
indicated direction shown on the envelope tray. PostScript will print in
the reverse direction, so simply put the envelopes in the reverse direction
for the PostScript mode.

The HPPlotter does not print graphical images sized for A4 paper
properly. For A4 landscape jobs to print, leave at least 8mm (.4")
between the object and the right hand paper boundary. For A4 portrait,
use the letter size setting from *Art Designer* or *OFIS Graphics*.

Under Postscript mode, the AP9210 and AP9316 will not automatically change paper sizes if the paper in the tray has changed (i.e. from Letter to A4). The following statement is made in the *AP9210 Installation and Operations Guide*: "When you change the paper size in the tray, except when you are prompted by the printer to do so, you must remember to change the active paper size at the operator panel." This is most apparent when printing ASCII jobs or printing to the AP9300 Series "PLUS" Postscript firmware printers.

The PostScript driver will print a blank page if a page of unprintable data (e.g. text marked for non-printing in *OFIS Document Designer*) is sent to the printer.

When a print job is cancelled while the printer is processing graphics data, the printer may need to be reset from a graphics mode to a text mode. Some devices, such as the AP1329 or AP9215, are unable to respond to software commands to reset themselves. Should this be the case with your printer, reset the printer manually by turning it off, and then on.

The default page borders for the PSDD and PCL5 device drivers is 0.25" for top, bottom, left and right borders for both Portrait and Landscape modes. If users want to use a different values for borders, they should specify so when installing the device driver.

Section 12
Support

Please refer to the *Generic Print System Basic Package SRA* Support Section 12.

Section 13
Contents of Distribution Diskettes

The *Generic Print System* Distribution Diskettes are your master copies, and have been shipped write-protected. They should not be write-enabled, nor should they be used as working copies.

The Laser Printer Driver Package:
B25 D42

Device Drivers:
APLaserDD
APVLaserDD
PSDD
Imagen8300DD
HpLaserJetDD
PCL5DD

Pipe Drivers:
APLaserPipe
APVLaserPipe
PSPipe
Imagen8300Pipe
HpLaserJetPipe
PCL5Pipe
LaserPipe.cmds

Contents of Laser GPS 5¼" media diskette 1 of 2:

<Sys> Directory:
Install.ctrl   Installation file
Install.jcl   Installation file
LaserGps.run   Installation file

Contents of Laser GPS 5¼" media diskette 2 of 2:

<Sys> Directory:
LaserGps.run   Installation file

Contents of Laser GPS 3½" media diskette 1 of 1:

<Sys> Directory:

Install.ctrl	Installation file
Install.jcl	Installation file
LaserGps.run	Installation file

The LaserGps.run installation files are NLS-compatible self-extracting executable compressed archive files. All the *GPS R2.7.0* product software is contained within these two files on the 5¼" media or within the one file on the 3½" media. Product files may be manually extracted from these archives using the Executive Run command. The parameters used are similar to the Restore Archive command:

Run command form	Example parameters	Parameter descriptions

```
Run
   Run file         [f0]<Sys>LaserGps.run  Archive file name
   [Case]                                  (unused)
   [Command]                               (unused)
   [Parameter 1]    '<Gps>*PCL5*.run'      [File list from (<*>*)]
   [Parameter 2]    '[Sys]<Gps>*PCL5*.run' [File list to (<*>*)]
   [Parameter 3]    yes                    [Overwrite okay?]
   [Parameter 4]    no                     [Confirm each?]
   [Parameter 5]    no                     [List files only?]
   [Parameter 6]    no                     [Suppress display?]
   [Parameter 7]    {AnyNode}              ["Restore To" prefix]
```

The [File list from (<*>*)] and [File list to (<*>*)] parameters 1 and 2 both accept wildcards and default to <*>* (indicating all files are to be restored). No volume name should be specified in the [File list from (<*>*)] parameter 1. Please note that when using the Run command, you must enclose any wildcard expressions in single literals (') to prevent the Executive from expanding the wildcards.

To see the contents of the archive file without restoring any files, set the [List files only?] parameter 5 to 'Yes'. The [Suppress display?] parameter 6 suppresses all video display of file restoration progress. Parameter 7, [Restore to file prefix], accepts optional {node}[Volume] or [Volume] prefix specifications to where the files are to be restored, however this may instead be specified in [File list to (<*>*)].

Section 14
Ordering Procedure

Please complete and return the attached Update Service Request form to order this product. Media provided by Unisys Corporation may not be returned for credit.

You can order manuals from the following address:

Unisys Corporation
Publications Distribution Center
13250 Haggerty Road North
Plymouth, Michigan 48170