User Manual

Tektronix

Network Utilities for Phaser™ Color Printers

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Contents

Chapter

1 Introduction

How to use this manual

This manual provides information needed by system administrators and others who need to install Tektronix color printers equipped with an internal Ethernet interface. Tektronix printers that do not support the internal Ethernet interface can be attached to Ethernet networks by using the Tektronix 4511A Network Interface. The 4511A Network Interface supports the TCP/IP protocol (Transmission Control Protocol/Internet Protocol). See your authorized Tektronix representative for 4511A ordering information.

- Before using this manual, you should unpack and set up your Tektronix printer. You should also install the appropriate drivers on any PC and Macintosh computers on your network. Instructions for these unpacking, set-up, and installation tasks are contained in your printer's user manual and the manual that is shipped with your Tektronix printer's drivers and utilities diskettes.

- After your printer is set up, use this network manual in conjunction with your printer's network utilities diskettes to configure the printer for network operation.

Chapter 2 of this manual contains general information about the internal network interface in Tektronix color printers. Whether you are installing the printer into an EtherTalk, NetWare, TCP/IP, or mixed environment, you should read this chapter.

Chapters 3, 4, and 5 explain configuration for EtherTalk, NetWare, and TCP/IP respectively. Read the chapter(s) appropriate for your network.

Related documentation

Several manuals and other documents are included with your printer. In most cases, you will need to use some or all of these documents before you use this manual for network configuration.

- **Network upgrade kit installation instructions.** These instructions describe how to install the circuit board that provides your printer with network capability. *These instructions are for upgrades only; if you order your printer from Tektronix with networking capability, the circuit board is already installed and you do not receive these instructions.*

- **Printer user manual.** This manual describes how to set up and use your printer. Printer setup includes installing transfer rolls, loading paper trays, and connecting cables (except Ethernet). Other topics include installing drivers, power up, printing, printer cleaning, and troubleshooting.

- **Printer drivers and utilities manual.** This manual describes how to use the software on your printer's drivers and utilities diskettes. This software includes Tektronix printer drivers and other useful files. Important topics in this manual include driver installation and use, color correction, and printer configuration through PostScript files.

- **Supplies information sheet.** Use this sheet to order accessories and supplies for Tektronix printers.

Whom to call for help

Customer support

Call your dealer or a Tektronix sales representative for assistance, or in the U.S.A. and Canada, call the Customer Support Hot Line: **1-800-835-6100**.

Automated information by fax

As an alternative to calling the Customer Support Hot Line, call HAL, our automated information system. HAL faxes you information immediately. Topics include:

- The latest technical hints and tips
- Solutions to most common technical problems
- Application notes (for example, QuarkXpress, CorelDRAW!)
- Product information such as data sheets and sales literature

To order a complete technical support catalog listing all available articles offered by HAL, from any touch-tone phone call **(503) 682-7450** directly, or call **1-800-835-6100** (6:00 am - 5:00 pm, PST). For complete instructions on using HAL, refer to your printer's user manual.

Printer service and repair

If your printer needs service or repair, call **1-800-547-8949** (in the U.S.A., from 5:00 am to 5:00 pm PST). Outside the U.S., contact your nearest Tektronix dealer.

Typographical conventions

The typographical conventions used in this manual are described in the following topics.

File names, directory names, folder names

File names, directory names, and folder names in text are represented in *italics*. For example:

- */etc/hosts* (Unix)
- *AUTHRIZR.EXE* (DOS)
- *Reset Printer* (Macintosh)

Menus and command names in menus

Menus and command names in a menu-driven interface are represented in **bold**. For example:

Select **Print Configuration Page** from the **File** menu.

Sample lines from ASCII files

Sample lines from ASCII files are represented in `Courier` font. For example:

- Go to the 9th line; it looks like this:

```
NAME="Tektronix Phaser III PXi"
```

Command line syntax

Bold type is used to indicate characters you must type exactly as shown. For example:

COPY B:\ACT-TOOL\ACT.EXE C:\UTILITIES

Note *Extra spaces are added between command elements for clarity; you need only type a single space.*

Italic type indicates variable elements. For example:

arp -a *printer-name printer-Ethernet-address*

Optional command parameters are indicated within [square brackets]. For example:

- To extract the files from the diskette, enter this command:

  tar xvf /dev/*devicename* [*dir*]
  [*file*]

  where specifying *dir* extracts an entire directory, specifying *file* extracts a single file, and no arguments extracts the contents of the entire disk.

Chapter

2 Network Printing with Tektronix Color Printers

Many Tektronix color printers are equipped with a rear panel Ethernet connector. However, to make the connector active, internal hardware is required. The internal hardware can be purchased initially with the printer as an option or later as an upgrade kit. The internal hardware is a small circuit board installed inside the printer.

How to tell if the Ethernet internal hardware is installed in your printer

To determine if the Ethernet internal hardware is installed, look for the label near the Ethernet port on the printer's rear panel. If the Ethernet option is installed, a label showing the word "INSTALLED" is attached; otherwise, "Not Installed" is visible.

If the Ethernet internal hardware is installed, the printer's startup page and configuration page list the following fields:

Startup page	Configuration page
Ethernet Protocols Ethernet Address Authorization Code	Ethernet Address Authorization Code EtherTalk NetWare PrintServer TCP/IP LPR AppSocket Syslog SNMP

If the Ethernet internal hardware is not installed, the fields listed in the table do not appear; instead, a field reading "Ethernet: Not Installed" is listed.

Refer to your printer's user manual for more information on the startup page. For more information on the configuration page, see "Your printer's configuration page" on page 2-3.

How to tell which protocols are enabled in your printer

All protocols can be enabled and disabled. However, TCP/IP must first be authorized by sending the printer an authorization code (see "TCP/IP authorization code" on page 2-4). Once TCP/IP is authorized, it can be enabled or disabled like the other protocols.

The configuration page reports which protocols are enabled. If a protocol is enabled, the field for that protocol lists the current parameters. If the protocol is disabled, the field for that protocol contains an entry reading "Disabled."

For more information on the configuration page, see the next topic.

Your printer's configuration page

Your printer can generate a configuration page that lists the following types of information:

- General printer information
- TekColor settings
- Communication and network parameters for all ports
- SCSI disk settings (if the printer has a SCSI port)

The information supplied on the configuration page is very helpful when you are installing and configuring the printer on a network.

There are two ways to print the configuration page:

- Use the printer's rear-panel DIP switches. See your printer's user manual for instructions on printing the configuration page by setting DIP switches. Use this method if your printer is not yet configured on the network.
- Send a PostScript language file from your printer's network utilities diskettes to the printer. You will not be able to send PostScript language files to the printer over Ethernet until your printer is configured on the network. See "Your printer's network utilities diskettes" on page 2-9 for more information on your printer's network utilities diskettes.
  - From a Macintosh, send the file *Print Configuration Page*. The file is self-sending. Select the printer in the **Chooser**, then double-click the self-sending arrow icon to send the file to the printer.
  - From a PC, send the file *PRNTCNFG.PS* in the *NET-UTIL* directory. Use the DOS **COPY** command to send the file to the printer.
  - From a UNIX workstation, send the file *prntcnfg.ps*.

Note *Do not attempt to use the* ***Print Configuration Page*** *command in the LaserWriter* Utility's ***Utilities*** *menu to print the configuration page.*

TCP/IP authorization code

When the Ethernet option is installed, the EtherTalk and NetWare protocols are immediately active. To acquire TCP/IP capability, another option is required. Upon purchasing the TCP/IP option, you receive an *authorization code*, which is sent to the printer to activate the TCP/IP protocol. *If you purchase the TCP/IP option initially with the printer, the authorization code is sent to the printer at the factory (TCP/IP is active when you receive the printer).* If you add the TCP/IP capability later with a printer upgrade kit, you must send the authorization code to the printer to activate TCP/IP. For specific instructions on sending the authorization code to the printer, see "Authorizing the TCP/IP protocol" on page 5-7.

The authorization code is printed on a certificate. The certificate is included with your printer (if the TCP/IP option is factory-installed) or with the upgrade kit (if the TCP/IP option is added later).

Note *Retain the certificate as proof-of-purchase for the TCP/IP option. Tektronix service personnel may need to refer to this number if your printer requires service.*

Network installation overview

The following diagram summarizes the process of installing a Tektronix printer on a network.

Step 1, unpacking and setting up your printer, must be done before attempting to configure the printer on a network. Printer setup includes installing transfer rolls, loading paper trays, and turning on the printer. See your printer's user manual for information about printer setup. "Ethernet connection" on page 2-6 provides information about physically connecting the printer to an Ethernet network.

Step 2 is done at the factory when the Ethernet interface is purchased initially with your printer.

Step 3 is also done at the factory if the TCP/IP option is purchased initially with the printer. When the Ethernet interface is purchased later as an upgrade kit, instructions for installing the internal hardware are provided in an instruction sheet supplied with the circuit board. For specific instructions on Step 3, sending the authorization code to the printer, see "Authorizing the TCP/IP protocol" on page 5-7.

Step 4 is configuration for any of the supported network protocols. See Chapter 3 for EtherTalk, Chapter 4 for NetWare, and Chapter 5 for TCP/IP.

Ethernet connection

Ethernet is a communication standard that supports very high speed data transmission. Ethernet offers significant speed improvement compared to serial, parallel, and LocalTalk connections. Speed improvement varies greatly depending on network traffic, computer hardware, and other factors.

The printer's Ethernet port conforms to the IEEE 802.3 and Ethernet II standards, but it uses the smaller AAUI connector (developed by Apple Computer, Inc.) instead of the 15-pin AUI connector described in these standards. Ethernet AAUI adapters, available from Tektronix and other sources, connect the printer to the network cable or a conventional AUI cable.

If you are connecting both EtherTalk and LocalTalk

If you have both LocalTalk and Ethernet cables *as part of the same Apple internet* (EtherTalk), it is recommended that you connect only the Ethernet cable. There is no benefit to making both LocalTalk and Ethernet connections to the printer *if both cables are part of the same Apple internet*. For information on printer behavior in this configuration, see "Printer name and AppleTalk zones" on page 3-6.

Ethernet adapters

Note *Make sure that the printer is turned* off *before making any Ethernet connections.*

Your printer's Ethernet connector allows you to connect to one of three standard Ethernet cable types by using an Ethernet adapter. The Ethernet adapters shown on the next page are available through Tektronix or your dealer. Contact your dealer for Ethernet cables.

1. Twisted pair (10BASE-T) adapter (Tektronix order number 011-0162-00)

   a. Printer connection

   b. Twisted pair connection

2. Thin coax (10BASE2) adapter (Tektronix order number 011-0161-00)

   a. Printer connection

   b. Ethernet cable connection

3. Thick coax (10BASE5/AUI) adapter (Tektronix order number 011-0160-00)

   a. Printer connection

   b. Thick AUI connection

   c. AC power connection

Ethernet cables and termination

10BASE-T (Twisted Pair)

Do not use "silver satin" telephone extension cables for 10BASE-T networks, either as drop cords or as patch cables in the wiring closet. (Silver satin cables are flat, usually silver or gray, with 28-gauge stranded or tinsel conductors.) Do not use shielded twisted pair cable intended for IBM token ring networks or voice-grade (level 1 or 2) unshielded twisted pair cable for wiring runs. **These cables do not meet the requirements for 10BASE-T and will lead to unreliable operation.**

10BASE2 (Thin Ethernet)

Depending on the type of Ethernet cables you use and your network configuration, you may need to use terminators at certain points in the installation. Refer to the documentation for your Ethernet adapters and cables for details.

Tektronix and Apple 10BASE2 Ethernet adapters have built-in terminators and do not require additional terminators. Adapters from other manufacturers may not have built-in terminators and may require terminators and connectors such as those listed in the following table.

10Base2 BNC terminators and connectors

Part	Tektronix order number
50-ohm BNC	011-0123-00
BNC T-connector	103-0030-00
50-ohm BNC receptacle-to-receptacle barrel connector	103-0028-00
50-ohm BNC plug-to-plug barrel connector	103-0029-00

10BASE5 (Thick Ethernet)

Contact your network administrator to obtain an approved AUI drop cable.

Your printer's network utilities diskettes

Note *Do not confuse the printer's network utilities diskettes with the standard printer utilities diskettes. The standard utilities diskettes contain PostScript files for printer configuration not related to networking.*

Your printer's network utilities diskettes contain programs for authorizing TCP/IP and for configuring your printer on a network. Use the appropriate diskette for your network:

- For EtherTalk networks, use the software on the Macintosh version of the printer's network utilities diskettes.
- For NetWare networks, use the software on the PC version of the printer's network utilities diskettes.
- For TCP/IP networks, use the software on the UNIX workstation version of the printer's network utilities diskettes. This diskette contains shell scripts that create PostScript files for TCP/IP authorization and configuration. It also contains PostScript files that you can send directly to the printer to perform various configuration tasks.

  This diskette can be read by any workstation that can read **tar** format. If your workstation cannot read **tar** format, you can download the files from the Tektronix Color Printer Information Server. For instructions on downloading files, see "Downloading files from the Tektronix Color Printer Information Server" on page 5-4.

The following table lists the Tektronix printer networking software according to the tasks required for network configuration.

Tektronix printer network software

Task	Macintosh file	PC file	UNIX file
Add/remove CTRL-D characters to/from PostScript files	None	ADDCTRLD.BAT CTRLD.PS	addctrld delctrld
Authorize TCP/IP protocol	Authorizer	AUTHRIZR.EXE	authorize-feature*
Change printer's name	LaserWriter Utility	None	None
Download PostScript Error handler to printer	Tek Error Handler	TEKEHAND.PS	tekehand.ps
Enable and disable filtering of control characters from files	None	FILTER.PS NOFILTER.PS	None
Enable and disable protocol operation	Enable EtherTalk Disable EtherTalk Enable NetWare Disable NetWare Enable TCP-IP Disable TCP-IP	ETALKON.PS ETALKOFF.PS NWAREON.PS NWAREOFF.PS TCPIPON.PS TCPIPOFF.PS	ethertalk-on.ps ethertalk-off.ps netware-on.ps netware-off.ps tcp-ip-on.ps tcp-ip-off.ps
Perform NetWare configuration	None	Advanced Configuration Tool (ACT.EXE)	None
Print configuration page	Print Configuration Page	PRNTCNFG.PS	prntcnfg.ps
Reset printer	Reset Printer	RESET.PS	reset.ps
Set EtherTalk zone	LaserWriter Utility	None	None
Set TCP/IP device parameters	None	None	config-IP* config-LPR* config-SNMP* config-sockets* config-syslog*

*These files require that the file job-error-handler be installed in the same directory. The file job-error-handler is supplied on the UNIX diskette.

Resetting your printer

Several of the procedures in this manual require you to reset the printer. There are three ways to reset the printer:

- Turn the printer off, then back on again.
- Use the printer's rear-panel DIP switches. See your printer's user manual for details.
- Use a PostScript language file from the printer's network utilities diskettes. Resetting the printer with a PostScript file restarts the printer as soon as all the jobs in its queue are finished. You will not be able to use this method until your printer is configured on the network. For more information see the specific instructions for Macintosh, PC, and workstations, which follow.

Resetting the printer by any of these methods restores the printer to its power-on conditions (*not* its factory default conditions). The power-on conditions include any custom changes made to the printer that are stored in the printer's non-volatile memory and are therefore persistent across printer power cycles. For example, the printer's name and serial port configuration are power-on conditions that are not altered by resetting the printer.

Resetting your printer using PostScript files

Macintosh users

Note *Do not use the **Restart Printer** command in the LaserWriter Utility's **Utilities** menu. Follow this procedure to reset the printer using the LaserWriter Utility to download the **Reset Printer** utility file.*

1. Select the printer in the **Chooser**.
2. Locate the *LaserWriter Utility* on the Macintosh version of the printer's network utilities diskettes.
3. Double-click on the *LaserWriter Utility* icon.
4. Choose **Download PostScript File** from the **Utilities** menu.
5. Select the *Reset Printer* file in the list; then click **Open**.
6. At the prompt

   ```
   Save PostScript output as:
   ```

   you are prompted to name the log file that the *LaserWriter Utility* creates for PostScript errors. Use either the default name given in the edit box or type in a new name. Click **Save** to send the file to the printer.

Note *The process of resetting the printer takes a few minutes to complete. You will receive a message on your screen indicating that the connection has been interrupted during the reset. The connection is re-established after the reset, so you can ignore this message; click the **Continue** button.*

7. If the printer reports no PostScript errors, the *LaserWriter Utility* displays a dialog box. Click **OK** in the box to continue.

PC users

This procedure resets the printer by sending a PostScript language file over a serial or parallel connection. You can also reset the printer by sending a PostScript language file over a NetWare connection, after you have finished the NetWare configuration described in Chapter 4.

1. Locate the *RESET.PS* file in the *NET-UTIL* directory on the PC version of the printer's network utilities diskettes or copy the file to your hard disk.

2. Change to the directory containing the file. For example, type:

   CD NET-UTIL

3. Use the DOS **COPY** command to send the file to the printer. For example, type:

   COPY RESET.PS LPT1:

Workstation users

This procedure resets the printer by sending a PostScript language file over a TCP/IP connection. You will not be able to use this method until you have completed the TCP/IP configuration described in Chapter 5.

Before performing this procedure, you must install the files from the UNIX version of your printer's network utilities diskettes on to your host computer (see "Installing files from your printer's network utilities diskettes" on page 5-3).

1. Change (**cd**) to the directory where you placed your printer's network utilities.

2. Send the file to the printer. For example, type:

   lpr -P*queue-name* **reset.ps**

Chapter

3 EtherTalk Configuration (Macintosh)

Before you begin

Before you begin the EtherTalk configuration, make sure that you have completed the following steps:

- Your printer should be set up, connected to the network, and turned on. See your printer's user manual for information about setting up and turning on the printer. For information about connecting the printer to the network, see "Ethernet connection" on page 2-6.
- The Tektronix driver for your printer should be installed on every Macintosh and PC that will send print jobs to the printer. For details on driver installation, see the manual that is shipped with your printer drivers and utilities diskettes.

Using AppleTalk Phase 2

If you connect the printer using EtherTalk, your computer must have AppleTalk Phase 2 software. If you connect the printer using LocalTalk, AppleTalk Phase 2 is not required (Phase 1 will work).

EtherTalk configuration overview

The following diagram summarizes the steps of the EtherTalk configuration procedure.

Print out the configuration page

Your printer's configuration page reports the printer's default name, which you will need for EtherTalk configuration. For information on printing out a configuration page, see "Your printer's configuration page" on page 2-3.

Finding your printer's name in the Chooser

1. Select the **Chooser** from the **Apple** menu.

2. In the upper-left corner of the **Chooser**, find the printer driver icon for your Tektronix printer. (If the printer driver icon does not appear in the **Chooser**, you need to install the printer driver.) Click on the printer driver icon for your Tektronix printer.

3. Select the proper zone in the list of **AppleTalk Zones** in the lower-left portion of the **Chooser**.

Note *The printer's default zone is listed in the **EtherTalk** field on the configuration page. For more information on the configuration page, see "Your printer's configuration page" on page 2-3.*

4. A list of printers appears in the right portion of the **Chooser**. Find the name of your printer in the list. The printer's default name is listed on the configuration page (see "Your printer's configuration page" on page 2-3). If the name does not appear, check the cable connection between your printer and the network.

Changing your printer's zone

Use the *LaserWriter Utility* to change the printer's zone.

1. Select the printer in the **Chooser**.
2. Locate the *LaserWriter Utility* on the Macintosh version of your printer's network utilities diskettes.
3. Double-click on the *LaserWriter Utility* icon.
4. Select **Change Zone** from the **Utilities** menu. The currently selected zone is listed in the dialog box. Type the new zone name in the edit box.
5. Click **OK**.

The printer changes its zone name and dynamically changes to the new zone (the printer appears on the new zone as if it were just turned on).

Changing your printer's name (optional)

The name selected here prints on the startup page and configuration page; the name also appears in the **Chooser** on a Macintosh. The name can be up to 31 characters long and may contain any printable characters except @ (at sign) and : (colon). A change is persistent across printer power cycles.

Use the *LaserWriter Utility* to change the printer's name.

1. Select the printer in the **Chooser**.
2. Locate the *LaserWriter Utility* on the Macintosh version of your printer's network utilities diskette.
3. Double-click on the *LaserWriter Utility* icon.
4. Select **Name Printer** from the **Utilities** menu. The currently selected printer is listed in the dialog box. Type the new name in the edit box.
5. Click the **Rename** button.
6. At the confirmation dialog box, click **OK**.
7. Open the **Chooser** to reselect the printer with its new name.

Note *If you have more than one printer in the same zone and you choose a name for one printer that is already assigned to another, the second printer registers itself on the network with the number "1" appended to the name. For example, if you attempt to assign a printer the name "TekPhaser" and another printer in the zone already has the same name, the printer you are naming will appear on the network as "TekPhaser1."*

Printer name and AppleTalk zones

In general, the printer uses the same printer name on both LocalTalk and EtherTalk ports. (The printer name is the name you see in the list of printers when you select the **Chooser**.) If you change the name on one port, the change affects both ports to keep them identical. This avoids confusion for users because they always see the same printer name regardless of the port selected.

If you connect the printer using both LocalTalk and Ethernet cables as part of the same Apple internet, and if you set the EtherTalk zone to be the same as the LocalTalk zone, the printer automatically modifies the name as seen on the LocalTalk network to be different from the name as seen on the Ethernet network. For example, the default printer name **Phaser 480** would be changed to **Phaser 480 (via LocalTalk)**. (If necessary, the name is truncated to the 32-character limit.) This automatic renaming allows users to distinguish the high-speed Ethernet connection from the slower LocalTalk connection.

Disabling protocols

After your EtherTalk configuration is complete, you may want to disable protocols that you are not using to avoid unnecessary network traffic. To disable protocols, send the appropriate PostScript language file to the printer. The files are listed in the following table.

PostScript files for enabling and disabling protocols

Protocol	To disable protocols	To enable protocols
NetWare	Disable NetWare	Enable NetWare
TCP/IP	Disable TCP-IP	Enable TCP-IP

To send the files to the printer:

1. Select the printer in the **Chooser**.
2. Locate the appropriate file on the Macintosh version of the printer's network utilities diskettes.
3. The files to enable and disable protocols are self-sending. Double-click on the file to send it to the printer.
4. Reset the printer. (For more information about resetting the printer, see "Resetting your printer" on page 2-11).

Chapter

4 Novell NetWare Configuration

Your Tektronix printer's internal NetWare interface implements the PSERVER model. Under this model, print jobs are stored in queues (directories) on a file server. A print server takes print jobs from the queues and sends them to printers. In your Tektronix printer, the print server resides within the internal interface of the printer, so in effect, the print server and the printer are one. The printer logs in to a file server using a login connection to service specified queues.

Your Tektronix printer's internal NetWare interface supports NetWare versions 2.2, 3.11, and 4.0. It supports up to 32 queues and 8 file servers in any combination. No additional VAPs (Value Added Procedures), NLMs (Network Loadable Modules), or TSRs (Terminate Stay Resident programs) are required to install your Tektronix printer on the network.

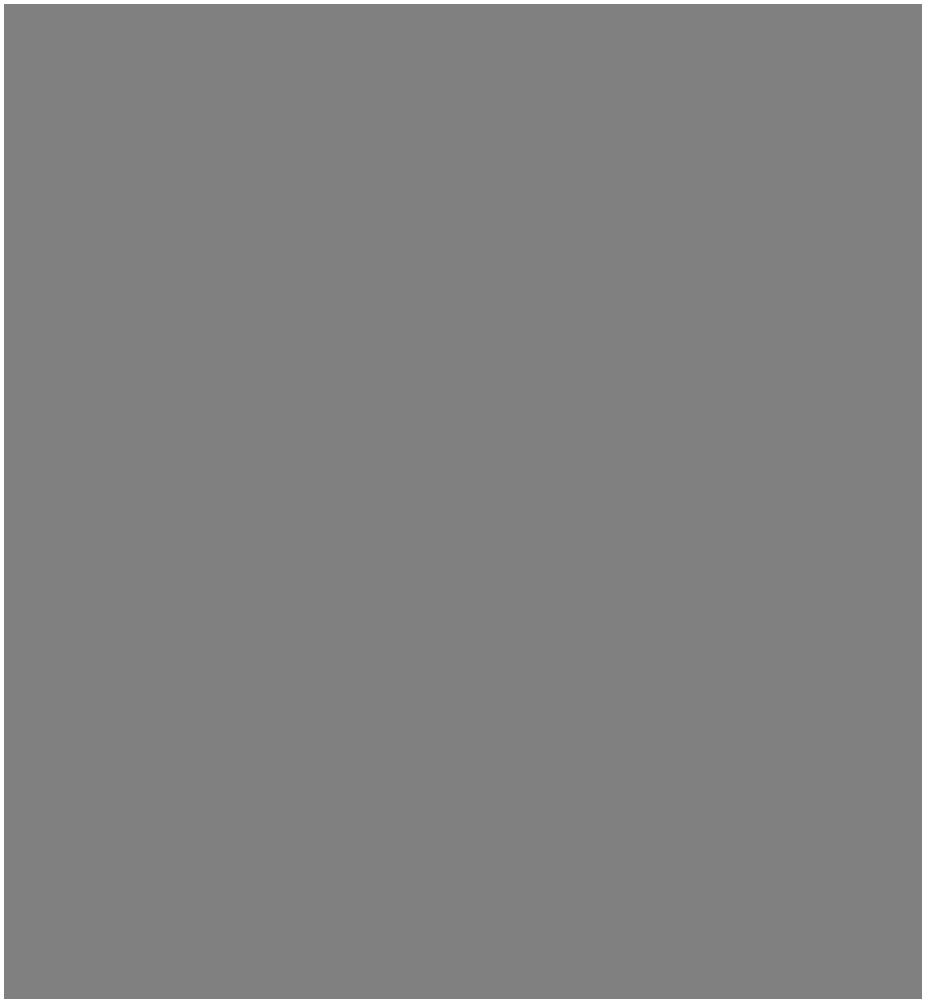
Before you begin

Before you begin the NetWare configuration, make sure that you have completed the following steps:

- Your printer should be set up and connected to the network. See your printer's user manual for information about setting up and turning on the printer. For information about connecting the printer to the network, see "Ethernet connection" on page 2-6.
- If you are using Windows, the Tektronix driver for your printer should be installed on every PC that will be sending print jobs to the printer. For details on driver installation, see the printer's user manual.

NetWare configuration overview

The following diagram summarizes the steps of the NetWare configuration procedure.



Allowing unencrypted passwords

To get jobs from a file server's print queues, the printer logs on to the file server. However, the printer cannot store an encrypted password. If encrypted passwords are used on your system (the NetWare default), the printer will not be able to log on to the servers, even if no password is required for the printer to log on.

For NetWare versions 3.1 and later, the default is to *not* allow unencrypted passwords. Changing this setting to allow unencrypted passwords does not restrict the use of encrypted passwords elsewhere; it just allows the printer to log on to a file server without an encrypted password.

You must allow unencrypted passwords on each file server that will have queues to be serviced by the printer.

1. Type the following command from the NetWare console:

   set allow unencrypted passwords=on

2. This command takes effect immediately, but the change is not retained when you restart the system. To ensure that the command remains in effect after a restart, add the command to the *AUTOEXEC.NCF* file on each file server that has queues serviced by the printer.

Printer configuration using the Advanced Configuration Tool

The Advanced Configuration Tool allows you to configure and administer your Tektronix printer and the queues it services without using **PCONSOLE**. The tool allows you to control parameters that can be set from **PCONSOLE**. It also allows you to control the following printer-specific parameters not supported by **PCONSOLE**:

- Setting the Ethernet frame type
- Setting the queue scan interval
- Setting the configuration file server
- Enabling and disabling error notification
- Resetting the print server
- Changing the print server's name
- Setting the printer's login password
- Selecting users to be notified of printer errors
- Controlling banner printing on a per-queue basis

The Advanced Configuration Tool is compatible with NetWare 4.0, but it uses the bindery to configure the printer and queues. Instead of accessing the entire network, individual file servers are viewed and selected.

Note *It is recommended that you use the Advanced Configuration Tool on networks with more than 50 file servers.*

The Advanced Configuration Tool creates and maintains a configuration file for each printer. Configuration files contain the names of the queues and file servers the printer will service.

Configuration files created by the Advanced Configuration Tool reside in the directory *SYS:LOGIN\TEK*.

Configuration files are named according to the following syntax:

TK*xxxxxx*

where *xxxxxx* represents the last six hexadecimal digits of the Ethernet address of the printer being configured.

Installing the Advanced Configuration Tool

The Advanced Configuration Tool (*ACT.EXE*) is in the *ACT-TOOL* directory on the PC version of the printer's network utilities diskettes. You can run the tool from the diskette, but it is recommended that you install it on the hard disk of a NetWare file server or client.

To install the advanced configuration tool, copy it from the *ACT-TOOL* directory of the diskette to a directory on a NetWare file server or client. For example, if the network utilities diskette is in drive **B:** and the destination directory is *F:\PUBLIC*, type this command:

COPY B:\ACT-TOOL\ACT.EXE F:\PUBLIC

Choosing items in the Advanced Configuration Tool

Choosing menu items

To choose menu items in the Advanced Configuration Tool:

1. Select the desired menu item:
   - Use the arrow keys to highlight the desired selection.

     or

   - If the first letter of the menu item is red, press the key corresponding to the first letter of the menu item.
2. When the desired menu item is highlighted, press the **Enter** key.
3. Press the **Escape** key to go back to the previous menu.

List boxes

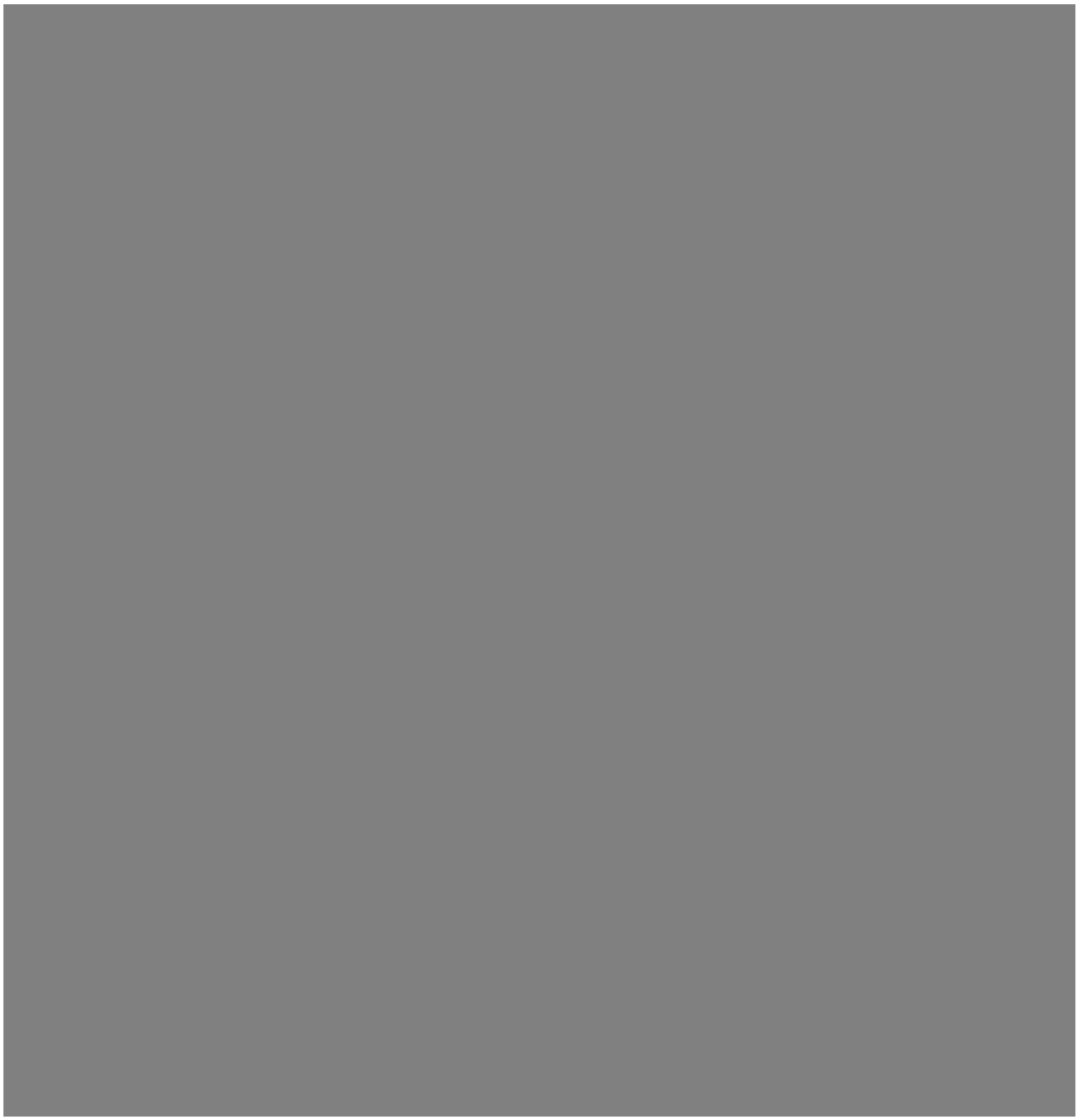
To choose items from a list box (such as a list of queues):

1. Use the arrow keys to highlight the desired selection.
2. When the desired menu item is highlighted, press the **Enter** key.

- If the list is too long to be displayed in the box, the last item in the box indicates that there are more items in the list (for example, in a list of queues the last item is **More queues).** To see the rest of the list, select the last item and press **Enter**.
- To insert an item into a list, press the **Insert** key. To delete an item, press the **Delete** key.
- To close the list box and return to the previous menu without making a choice, press the **Escape** key.

Advanced Configuration Tool menu map

The following menu map shows the overall structure of the Advanced Configuration Tool. To quickly configure the printer using default settings, use the **Quick configuration** menu. The next topic provides instructions for the quickstart procedure. For complete control of all Advanced Configuration Tool settings, use the **Advanced configuration** menu. See "Advanced configuration" on page 4-14 for details.



NetWare quickstart procedure (Quick Configuration)

Before beginning this procedure, make sure that the printer is connected to the network and turned on.

1. Log on with supervisor privileges.
2. Start the Advanced Configuration Tool:
   a. Change (**CD**) to the directory that contains the tool. For example, if the tool is in *F:\PUBLIC*, type:

      CD F:\PUBLIC

   b. Type:

      ACT
3. Select **Quick configuration** from the **Configure** menu.
4. The available Tektronix printers are displayed. Select the Tektronix printer you wish to configure and press **Enter**. The factory default print server name is in the following syntax:

   TEK*xxxxxx*

   where *xxxxxx* are the last six hex digits of the printer's Ethernet Address.

Note *If the printer does not show up in the list of available printers, you could have a network hardware problem or an incorrect frame type (see "Printer does not appear in the Advanced Configuration Tool" on page 4-25).*

5. When you have selected the Tektronix printer, a list of file servers is displayed. Select the file server you wish to configure and press **Enter**.
6. You may be prompted to log in to the server. Log on with supervisor privileges.

7. After you log in to the file server, a list of queues is displayed. Select an existing queue or create a new queue. To create a new queue, press **Insert**, type the name of the queue, and press **Enter**.

8. You can now configure more queues or finish the quick configuration.

   If you want to configure more queues:

   a. Select **Save configuration** and press **Enter**.

   b. Select the name of the file server that will hold the configuration file for this printer and press **Enter**. (This step is only needed after configuring the first queue.)

   c. A list of queues for the current file server is displayed. To add queues to a different file server, press **Escape** and return to Step 5. To configure a queue from the current file server, select an existing queue from the displayed list or create a new queue. To create a new queue, press **Insert**, enter the name of the queue, and press **Enter**.

   If you want to finish the quick configuration:

   a. Select **Save configuration and restart print server**.

   b. Select the name of the file server that will hold the configuration file for this printer and press **Enter**. This saves the configuration file and restarts the print server portion of the printer (not a complete printer reset).

9. Use the **Escape** key to exit the menus and return to the main menu.

10. Select **Exit** to exit the Advanced Configuration Tool.

Default parameters set up by quick configuration

The quickstart procedure uses the default print server and queue parameters listed in the following two tables. If these default parameters are not acceptable, use the Advanced Configuration Tool for further configuration as described in the next topic, "Advanced configuration" on page 4-14.

Advanced Configuration Tool default print server parameters

Parameter	Default value
Print server name	**TEK**xxxxxx where xxxxxx represents the last six hex digits of the printer's Ethernet address
Ethernet frame type	Adaptive (printer uses the frame type of the first file server that responds to a broadcast from the printer)
Queue scan interval (sec)	15
Configuration server	Automatically set during quick configuration
Error notification	Disabled
Full name	None
Print server operators	SUPERVISOR or ADMIN (NetWare 4.0)
Notify list	Empty
Login password	None
File server(s) to service	Set during quick configuration
Queue (s) to service	Set during quick configuration

Advanced Configuration Tool default queue parameters

Parameter	Default value
Queue name	Set during quick configuration
Queue operators	SUPERVISOR or ADMIN (NetWare 4.0)
Queue servers	Set during quick configuration
Queue users	EVERYONE or ADMIN (NetWare 4.0)
Allow new print jobs	Yes
New servers allowed	Yes
Service current jobs	Yes
Suppress banners	No (default). The printer determines whether to print banners based on the user's selection for NetWare banner options. (If you select Yes, the printer does not print banners for any jobs in the queue, regardless of the user's selection for NetWare banner options.)

Advanced configuration

To perform advanced configuration:

1. Log on with supervisor privileges.
2. Start the Advanced Configuration Tool:
   a. Change (**cd**) to the directory that contains the tool. For example, if the tool is in *F:\PUBLIC*, type:

      CD F:\PUBLIC

   b. Enter:

      ACT
3. Select **Advanced configuration** from the **Configure** menu.

The following tables summarize the choices available under the **Advanced configuration** menu and its submenus.

Configure print server (printer) menu

With this menu, you can configure printer-specific parameters.

Advanced Configuration: configure print server (printer) menu

Submenu	Description	Choices
Print server name	Name for print server portion of printer's NetWare interface	Any valid NetWare print server name
Ethernet frame type	Ethernet frame type for packet transmission	Adaptive* DIX Ethernet II IEEE Ethernet 802.3 IEEE Ethernet 802.2 IEEE Ethernet SNAP
Queue scan interval (sec)	Interval (in seconds) to scan queues	1 – 3600 seconds
Error notification**	Enable/disable notify list	Enable Disable
Configuration server	File server to search for configuration file	Any valid NetWare file server
Login password	Password used when logging in to a file server	Any valid unencrypted password (limited to 47 characters)
Configure queues	Allows configuration of queues for selected printer to service.	Can select, add, or delete queues from the list
Reset print server	Resets print server portion of printer's NetWare interface	

*If the frame type is set to **Adaptive**, the printer uses the frame type of the first file server that responds to a broadcast from the printer. The printer broadcasts packets in the following order: IEEE Ethernet 802.3, IEEE Ethernet 802.2, DIX Ethernet II, IEEE Ethernet SNAP. The new frame type is not used until the print server or printer is reset.

If you enable error notification, you must create a notify list using the **Notify list command in the Configure print server (File Server) menu.

Configure print server (file server) menu

Use this menu to configure file-server-specific parameters for the printer.

Advanced Configuration: Configure print server (file server) menu

Submenu	Description	Choices
Print server name	Name for print server portion of printer's NetWare interface	Any valid NetWare print server name
Full name	User-supplied name for the print server	Any valid NetWare print server full name
Print server operators	List of authorized print server operators	Select users from the list to be print server operators
Notify list	List of users to notify if there is a printer error*	Select users from the list to be notified of printer errors
Login password	Password used when logging in to a file server	Any valid unencrypted password (limited to 47 characters)

*The printer sends messages such as: out of paper, paper jam, cover open. If you create a notify list, be sure to enable notification using the **Notify** command in the **Configure print server (printer) menu**.

Configure queue menu

With this menu, you can add or delete queues on a selected file server. You can also modify queue parameters.

Advanced Configuration: Configure queue menu

Submenu	Description	Choices
Queue name	Name of the print queue	Any valid NetWare print queue name
Queue operators	List of queue operators	Any valid NetWare queue operator name
Queue servers	List of queue servers	Any valid NetWare queue server name May be automatically set during configuration. If you have already configured the printer to service a queue, the Tektronix print server is automatically enabled.
Queue users	List of queue users	Any valid NetWare queue user name Under NetWare 4.0, ADMIN is automatically assigned, but you must add all other users.

Obtaining print server and queue status

The **Status** menu allows you to view the status of print servers and queues.

Print server status menu

The **Print server status** menu displays the following print server status information:

- **Current job**
- **Configured queues**
- **Printer status**

Queue status menu

The **Queue status** menu displays queue information and allows you to control certain operator flags:

- **Allow new print jobs** (set this operator flag to allow new print jobs)
- **New servers allowed** (set this operator flag to allow new servers to be assigned)
- **Service current jobs** (set this operator flag to enable servicing of current jobs)
- **Current print jobs** (displays a list of current print jobs in the selected queue)
- **Currently attached servers** (displays a list of currently attached queue servers)

The three operator flags correspond to the operator flags listed in **PCONSOLE** under the **Current Queue Status** submenu of the **Print Queue Information** menu (**Queue Server** in NetWare 4.0).

Monitoring print server activity

The **Monitor** menu enables you to view a print server's current and logged activity. You can view one print server at a time.

The **Monitor** menu has the following selections:

- **Begin monitor** displays a list of Tektronix printers. Select the printer you wish to monitor from the list and press **Enter**.
- **Monitor log** (controls logging of print server activity to a file using three submenus:)
  - **Enable logging** (starts and stops the log session)
  - **Select log file** (allows you to specify the name of the log file, including the path)
  - **Set log file size** (controls the size of the selected log file)

Changing the print server name or password

If you configured NetWare using the Advanced Configuration Tool

When you change the print server name or password using the Advanced Configuration Tool, the print server name or password is automatically changed on all file servers listed in the configuration file, if a configuration file exists for that printer. There will be a configuration file if you set up queues using the Advanced Configuration Tool's **Quick configuration** menu.

If an error occurs during the update, the change may not take place on all file servers and the printer will not be updated. In this case, you must correct the error and change the name or password again.

If you configured NetWare using PCONSOLE

If you used **PCONSOLE** for your initial configuration, there will be no configuration file. Use the Advanced Configuration Tool to change the print server name or password.

1. Select the **Configure print server (file server)** from the **Advanced configuration** menu.
2. Select the Tektronix printer to be changed.
3. Select a file server that will be serviced by the printer.
4. Use the **Print server name** or **Login password** commands to make the change.
5. If the printer will service additional file servers, repeat Steps 3 and 4 for each file server.
6. When you have made the change on the last file server, answer **yes** to the prompt:

   ```
   Have you made this change on all of the file
   servers serviced by this printer?
   ```

   The change is stored in the printer's memory.

Note *If you leave out a file server during this procedure, you must use **PCONSOLE** to make the change on that server.*

Exiting the Advanced Configuration Tool

The **Exit** menu quits the Advanced Configuration Tool and returns you to DOS.

Printer configuration using PCONSOLE

Adding a print server

1. Log in with supervisor privileges.

2. Enter **PCONSOLE** by typing:

   PCONSOLE

3. From the **Available Options** menu, select **Print Server Information** (**Print Servers** in NetWare 4.0). The **Print Servers** menu is displayed.

4. Press the **Insert** key, then enter the printer's default print server name and press **Enter**. The default print server name is in the following syntax:

   TEK*xxxxxx*

   where *xxxxxx* are the last six hex digits of the printer's Ethernet Address. The printer's print server name is listed on the configuration page. For information about printing the configuration page, see "Your printer's configuration page" on page 2-3.

   When you have entered the default print server's name, press **Enter**. The new name is added to the **Print Servers** menu.

5. Press **Escape** to return to the **Available Options Menu**.

Selecting queues for the printer

1. From the **Available Options** menu, select **Print Queue Information**. A list of queues is displayed.
2. Insert a new queue or select an existing queue.
   - To insert a new queue, Press **Insert**, type the queue name, and press **Enter**. Select the new queue and press **Enter**. The **Print Queue Information** menu is displayed; go on to Step 3.
   - To use an existing queue, select the queue and the **Print Queue Information** menu is displayed; go on to Step 3.
3. Select **Queue Servers** from the **Print Queue Information** menu.
4. Press the **Insert** key to display the list of **Queue Server Candidates**.
5. Select the server you created in Step 4 of "Add a print server" and press **Enter**.
6. Use the **Escape** key to exit the menus and return to the **Available Options Menu**.
7. Press **Escape** to exit **PCONSOLE**.
8. Turn the printer on or reset it. (For more information about resetting the printer, see "Resetting your printer" on page 2-11).

Modifying other print server parameters (optional)

You can continue to use **PCONSOLE** to modify the following print server parameters (in the **Printer Server Information** menu):

- **Full Name**
- **Print Server Operators**

Use the Advanced Configuration Tool to modify other print server parameters. See "Printer configuration using the Advanced Configuration Tool" on page 4-4.

Note *Do not use the **Change Password** function in **PCONSOLE** to set a password for the printer. If you use **Change Password** in **PCONSOLE**, the password is not sent to the printer. Use the Advanced Configuration Tool to set the printer password.*

How to disable protocols

After your network configuration is complete, you may want to disable protocols that you are not using to avoid unnecessary network traffic. To disable protocols, send the appropriate PostScript language file to the printer. The files are on the PC version of the printer's network utilities diskettes.

1. Send the appropriate PostScript file to the printer. (Use the following table to determine the appropriate PostScript files for disabling and enabling protocols.)

2. Reset the printer. (For more information about resetting the printer, see "Resetting your printer" on page 2-11).

PostScript files for disabling and enabling protocols

Protocol	To disable protocols	To enable protocols
EtherTalk	NET-UTIL\ETALKOFF.PS	NET-UTIL\ETALKON.PS
TCP/IP	NET-UTIL\TCPIPOFF.PS	NET-UTIL\TCPIPON.PS

Troubleshooting

Printer does not appear in the Advanced Configuration Tool

1. Make sure that the printer is turned on and properly connected to the network.

2. Verify that the Ethernet frame type used by the printer is supported by the file server. The configuration page reports the frame type used by the printer. For information on printing the configuration page, see "Your printer's configuration page" on page 2-3.

   If the frame type is set to **Adaptive**, the printer uses the frame type of the first file server that responds to a broadcast from the printer. The printer broadcasts packets in the following order:

   - IEEE Ethernet 802.3
   - IEEE Ethernet 802.2
   - DIX Ethernet II
   - IEEE Ethernet 802.3-SNAP

   See the *NetWare Administrator's Manual* for more information on frame types.

Testing the file server-to-printer connection

1. To test the file-server-to-printer connection, first use the **CAPTURE** command to redirect output sent to a port to a network queue. For example:

   CAPTURE NB NFF NT Q=PHASER L=1

   where:

   NB specifies **NO BANNER**
   NFF specifies **NO FORM FEED**
   NT specifies **NO TABS**
   L=1 specifies port **LPT1**
   Q=PHASER specifies **PHASER** as the queue name

2. Use any text editor to create a two-line ASCII file with the following contents:

   ```
   %!
   showpage
   ```

3. Use the **COPY** command to send the file to the printer. For example, if the file is called *SHOWPAGE*, and the printer is assigned to LPT1, type:

   COPY SHOWPAGE LPT1:

   If the file server-to-printer connection is good, the printer ejects a blank page.

Cannot submit job to a queue

Use the Advanced Configuration Tool to verify that you are a queue user.

1. Select **Configure queue** from the **Advanced configuration menu**.
2. Select the file server and queue that you are trying to print to.
3. In the next menu, select **Queue users**. A list of current queue users will be displayed. Press the **Insert** key to add additional users. (You can also use **PCONSOLE** to add queue users.)

Job appears in queue, but printer does not to service it

Check the following items:

1. Verify that the printer has been set up to service the queue:

   a. Using the Advanced Configuration Tool, select **Configure queue** under **Advanced configuration**. Select the appropriate file server and queue; then select **Queue servers**.

   b. Using **PCONSOLE**, see "Selecting queues for the printer" on page 4-22.

2. Check that the printer was able to log in to the file server:

   a. At the file server's console, type:

      load monitor

   b. Select **Connection Information** from the **Available Options** menu.

   If the printer has logged in, its print server name is displayed in the list. If the print server name is not on the list, continue with Steps 3 through 6.

3. Verify that there was an available connection slot for the printer. Since the printer consumes a login connection, the file server may need an available connection for the printer to log in.

4. Verify that the password the printer saved (if one was set) is the same as the one on the file server. Mismatched passwords can result if **PCONSOLE**, rather than the Advanced Configuration Tool, is used to set the password. Use the Advanced Configuration Tool to enter a new password to ensure that they are the same. To set a password, choose **Login password** from the **Configure print server (printer)** menu (**Advanced configuration**).

5. Verify that the printer's print server name matches the one created on the file server. The configuration page reports the printer's print server name. For information on printing the configuration page, see "Your printer's configuration page" on page 2-3.

6. Verify that **set allow encrypted passwords=on** has been set. See "Allowing unencrypted passwords" on page 4-3.

7. Verify that the frame type the printer is using is supported by the file server. See "Printer does not appear in the Advanced Configuration Tool" on page 4-25.

Job is serviced, but does not print

- Use the Advanced Configuration Tool to check the printer's status. Select **Print server status** under the **Status** menu.

- You can use **PCONSOLE** to check the print job. Select the queue where the job was sent, then select the Current Print Job entries to view the jobs. If the job is being serviced it will indicate this along with the name of the print server servicing the job.

- If the file contains control characters, make sure that control character filtering is enabled (the factory default). If necessary, enable filtering by sending the PostScript file *FILTER.PS* to the printer. *FILTER.PS* is in the *NET-UTIL* directory on the PC version of your printer's network utilities diskettes.

Chapter

5 TCP/IP Configuration

The Tektronix implementation of TCP/IP supports the following capabilities:

- **Print jobs.** The interface can accept print jobs sent via **lpr** or **lp** with **lpr** extensions.
- **Printer status.** The interface can report printer status through the following protocols:
  - **Syslog.** This protocol functions like a remote printer front panel for reporting printer status.
  - **SNMP (Simple Network Management Protocol).** The printer's interface responds to status queries from host-resident SNMP utilities.
  - **AppSocket.**
  - **lpq/lpc**. (BSD systems).

Before you begin

- Do not turn on the printer yet. Your printer should be set up and connected to the network. See your printer's user manual for information about setting up the printer. For information about connecting the printer to the network, see "Ethernet connection" on page 2-6.
- Install the files from the UNIX version of your printer's network utilities diskettes on the hard disk of the workstation you will be using for the TCP/IP configuration. For more information, see "Installing files from your printer's network utilities diskettes" on page 5-3 or "Downloading files from the Tektronix Color Printer Information Server" on page 5-4.
- Obtain the information listed in the following table. It might be helpful to write this information down so you can refer to it later when you are performing the configuration.

Required information for TCP/IP configuration

Information	Comments
Internet (IP) address for the printer	Format is x.x.x.x, where x represents a decimal number from 0 - 255.
Network mask	If you are unsure, leave this blank; the printer will choose an appropriate mask.
Broadcast address	This is the address the printer uses to **send** broadcast packets. Regardless of how this parameter is set, the printer **accepts** broadcast packets from any of the commonly used broadcast address conventions.* If you are unsure, leave this blank; the printer will select an appropriate broadcast address.
Gateway IP address	You need this address if you want to communicate with the printer from anywhere other than the local network segment.

* The printer accepts packets with any "old" ("all zeros") or "new" ("all ones") style broadcast addresses. It also accepts the IP "all hosts" multicast address and user-specified broadcast addresses.

Installing files from your printer's network utilities diskettes

Use the UNIX version of your printer's network utilities diskettes for TCP/IP installations. The files are on the diskette in UNIX **tar** format.

To list the contents of the diskette, type this command:

tar tvf /dev/*devicename*

For example, on a Sun workstation, type:

tar tvf /dev/fd0

To extract the files from the diskette:

1. Change (**cd**) to the directory on your workstation where you want the files to reside.

2. Type this command:

   tar xvf /dev/*devicename* [*dir*]
   [*file*]

   where specifying *dir* extracts an entire directory, specifying *file* extracts a single file, and no arguments extracts the contents of the entire diskette, while retaining the directory structure of the diskette.

3. Eject the diskette. For example, on a Sun workstation, type:

   eject floppy

Downloading files from the Tektronix Color Printer Information Server

If you don't have the means of transferring files from the UNIX diskette, you can request files from the Tektronix Color Printer Information Server, an automatic file serving program that responds to requests for files.

If you can exchange electronic mail with other Internet sites, you can access the Tektronix Color Printer Information Server. From this server you can retrieve driver and utility files and color printer information.

Send your requests for files to the following electronic mail address:

color_printer_info@TEKTRONIX.TEK.COM

Type the address at the **To** prompt:

```
To: color_printer_info_@TEKTRONIX.TEK.COM
```

To receive help and a list of information available on the server, type the following at the **Subject** prompt:

send index

On the screen, it looks like this:

```
To: color_printer_info_@TEKTRONIX.TEK.COM
cc:
Subject: send index
```

The index provides a list of library names containing information on various topics.

To examine the full index for any library, type the following at the **Subject** prompt:

send index from *library-name*

To request a single file from a directory, type the following at the **Subject** prompt:

send *filename* **from** *library-name*

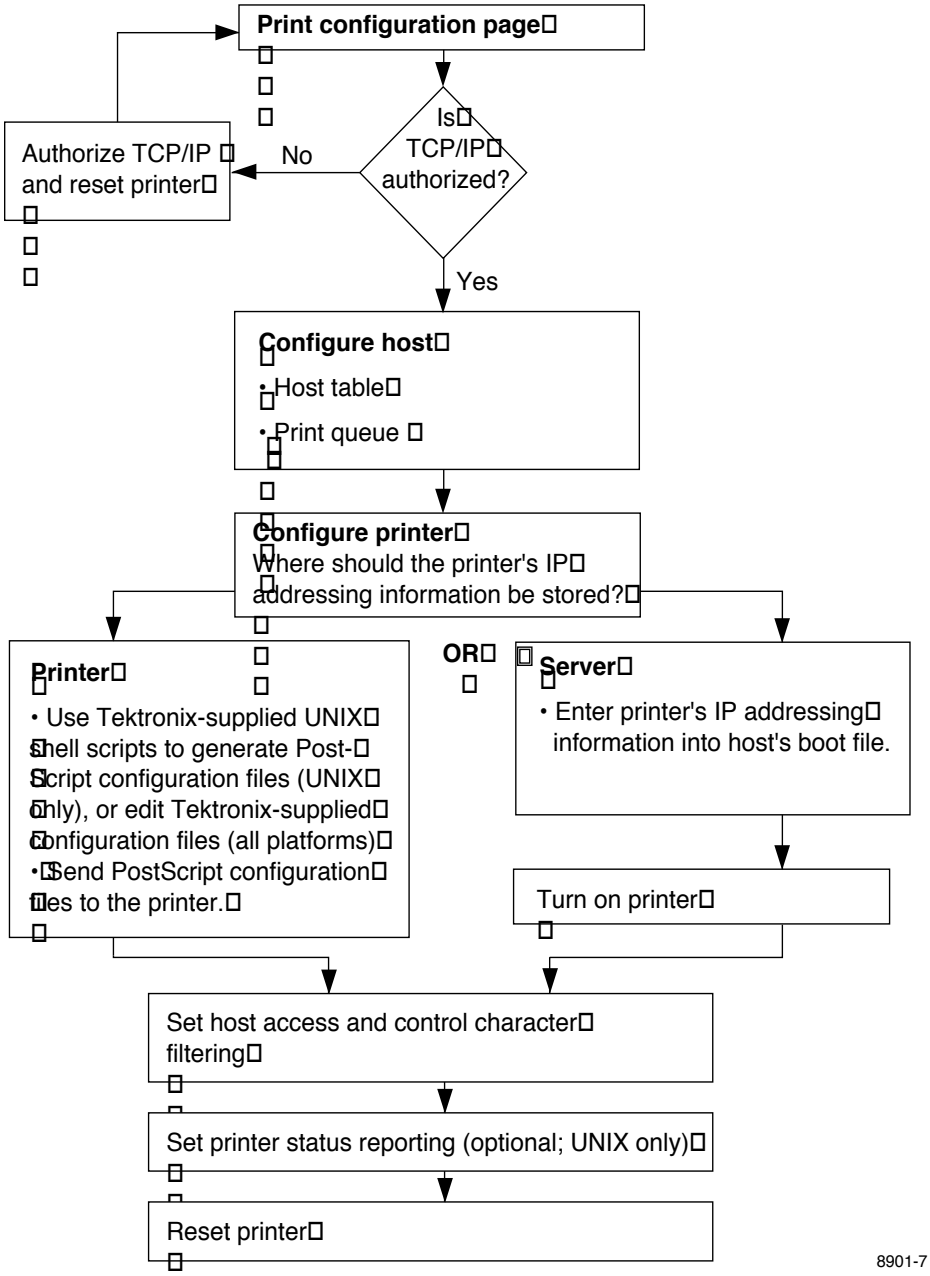
To determine file size, type the following at the **Subject** prompt:

send list of *filename* **from** *library-name*

To request all of the files needed for TCP/IP configuration, type the following at the **Subject** prompt:

send utilities from tcpip

TCP/IP configuration overview.



Printing out the configuration page

Your printer's configuration page reports important information that you will need for TCP/IP configuration. For information on printing out a configuration page, see "Your printer's configuration page" on page 2-3.

Authorizing the TCP/IP protocol

If you purchased TCP/IP capability initially with the printer, the printer is shipped with the protocol already authorized. If this is the case for your printer, turn immediately to "Configuring your host" on page 5-16. If you are adding TCP/IP capability to your printer, you need to send the *authorization code* to the printer to authorize the TCP/IP protocol.

How to tell if TCP/IP is authorized on your printer

To find out if the TCP/IP protocol is authorized, check the startup page or the configuration page. If TCP/IP is authorized, the authorization code is listed. If TCP/IP is not authorized, the authorization code is listed as all zeros. For information on how to print the configuration page, see "Your printer's configuration page" on page 2-3.

Sending the authorization code to your printer

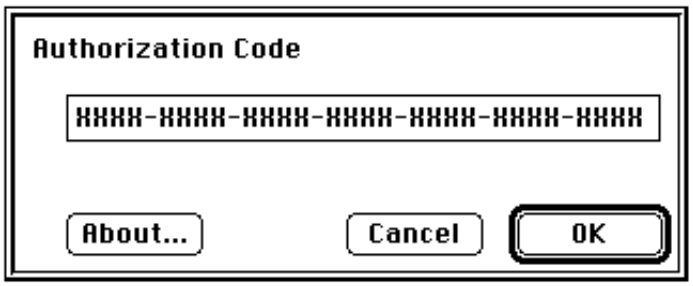
The authorization code is derived from the printer's Ethernet address, therefore, each authorization code is valid for only one specific printer. If you are installing several Tektronix printers on your network, be careful to send each authorization code only to the printer for which it has been issued.

Note *If a Tektronix printer receives a valid authorization code that is not its own, TCP/IP will not be authorized. Furthermore, if TCP/IP is already authorized on the printer, the authorization will be canceled if the printer is reset after receiving another printer's authorization code. TCP/IP can be re-authorized by sending the correct authorization code to the printer.*

You can send the authorization code to the printer from a PC, a Macintosh, or a UNIX host. The next three topics describe how to send the authorization code to the printer.

Authorizing TCP/IP from a Macintosh

1. Connect a Macintosh to the printer via LocalTalk or EtherTalk.
2. Turn on the printer.
3. Use the *Authorizer* utility to create a PostScript file containing the authorization code:
   a. Locate the Authorizer on the Macintosh version of your printer's network utilities diskettes or copy it onto your hard disk.
   b. Double-click on the *Authorizer* icon. The **Authorization Code** dialog box appears.



   c. Enter the authorization code, including the hyphens (–), in the dialog box.
   d. Click **OK**. A dialog box appears. Type in a name for the PostScript file that will contain the authorization code. Choose a location for the file and click **OK**.

4. Use the *LaserWriter Utility* to send the PostScript file containing the authorization code to the printer:

   a. Select the printer in the **Chooser**.

   b. Locate the *LaserWriter Utility* on the Macintosh version of your printer's network utilities diskettes.

   c. Double-click on the **LaserWriter Utility** icon.

   d. From the **Utilities** menu, select **Download PostScript File**. Select the name of the file you created in Step 3d from the list, then click the **Open** button.

   e. At the prompt

      ```
      Save PostScript output as:
      ```

      you are prompted to name the log file that the *LaserWriter Utility* creates for PostScript errors. Use either the default name given in the edit box or type in a new name. Click **Save** to send the file to the printer.

   f. If the printer reports no PostScript errors, the *LaserWriter Utility* displays a dialog box. Click **OK** in the box to continue.

5. Reset the printer. (For more information about resetting the printer, see "Resetting your printer" on page 2-11).

Authorizing TCP/IP from a PC

To authorize TCP/IP from a PC, use the *AUTHRIZR.EXE* utility on the PC version of your printer's network utilities diskettes. When using the utility, keep in mind the following information about the user interface:

- You can work with the *AUTHRIZR.EXE* utility using a mouse or the keyboard.
- When using the keyboard, the following conventions apply:
  - The **Tab** key moves the selection from one screen element to another.
  - If a screen element has a white letter, you can select that element by holding the **Alt** key and typing the white letter.
  - If a button is highlighted, press **Enter** to execute that function.
  - Use the arrow keys to scroll through lists and select the item you want. Press **Enter** to make your selection.

The following procedure describes how to use the *AUTHRIZR.EXE* utility to authorize TCP/IP. This procedure assumes that the files have been copied into a directory called *PHASER* on the **C:** drive of your PC. It also assumes that the directory structure on the diskette has been retained (as it is when you use the DOS **XCOPY** command with the **/S** option):

- *AUTHRIZR.EXE* is in the *TEK-TOOL* directory
- *ADDCTRLD.BAT* and *CTRLD.PS* are in the *NET-UTIL* directory.

Note *ADDCTRLD.BAT is a batch file that adds a CTRL-D to the beginning and the end of a file. ADDCTRLD.BAT calls the file CTRLD.PS, which contains the CTRL-D character. These files must reside in the same directory. You must change (**CD**) to the directory containing these files before running ADDCTRLD.BAT.*

1. Connect a PC to the printer via the parallel or serial port (see your printer's user manual for details).
2. Turn on the printer.
3. Use the *AUTHRIZR.EXE* utility to create a PostScript file containing the authorization code.

   a. Change to the directory containing the files you copied from the printer's network utilities diskette. Type:

      CD C:\PHASER

   b. Run the *AUTHRIZR.EXE* utility, which is in the directory *TEK-TOOL*. Type:

      TEK-TOOL\AUTHRIZR

   c. The **Authorization Code** dialog box appears.

   d. Enter the authorization code, including the hyphens (–), in the dialog box and click **OK**.

   e. A save dialog box appears. By default, the file is saved in the current directory (*C:\PHASER*) with the name *AUTHRIZE.PS*. Click **OK** to save the file.

4. Since you are sending the file to the printer via a serial or parallel interface, you must add CTRL-D characters to the beginning and end of the file. Use the file *ADDCTRLD.BAT* to do this:

   a. Change (**CD**) to the directory containing *ADDCTRLD.BAT*. Type:

      CD NET-UTIL

   b. To run *ADDCTRLD.BAT* type the following command:

      ADDCTRLD C:\PHASER\AUTHRIZE.PS

      This adds CTRL-D's to the file containing the printer's authorization code, *AUTHRIZE.PS*.

5. Use the DOS **COPY** command to send the file containing the authorization code to the printer. For example, if the printer is connected via LPT1, type:

   COPY C:\PHASER\AUTHRIZE.PS LPT1:

6. Reset the printer. (For more information about resetting the printer, see "Resetting your printer" on page 2-11).

Authorizing TCP/IP from a UNIX host

The *authorize-feature* script on the UNIX version of the printer's network utilities diskettes creates a PostScript language file that you can send to the printer to authorize the TCP/IP protocol. However, since TCP/IP is not yet authorized, you cannot send the file to the printer using a TCP/IP connection. You must use another connection to send the file to the printer. For example, you can send the file through the serial port on a Sun workstation.

Before performing this procedure, you must install the files from the UNIX version of your printer's network utilities diskettes on to your host computer. If you have not already installed the files, see "Installing files from your printer's network utilities diskettes" on page 5-3.

1. Connect the printer to the host computer's serial port using a null-modem cable.
2. Make sure that the serial communication parameters of the host and the printer are the same. The printer's configuration page reports the printer's current serial communication parameters. Refer to the printer's user manual for default values and information on how to configure the printer's serial port.
3. Turn on the printer.
4. Run the script *authorize-feature*:
   a. Change (**cd**) to the *bin* subsubdirectorydirectory in the directory where you placed your printer's network utilities.
   b. Type the name of the script, redirecting the output to a file:

      authorize-feature > *filename*

   c. When prompted, enter the authorization code, including the hyphens (–).

5. Since you are sending the file to the printer via a serial or parallel interface, you must add CTRL-D characters to the beginning and end of the file. Use the script *addctrld* to do this.

   a. Change (**cd**) to the *bin* subdirectory in the directory where you placed your printer's network utilities.

   b. To add CTRL-D characters to the beginning and end of a file, type the following command:

      addctrld *filename1.ps* *filename2.ps*

      where *filename1.ps* is the file you want to add CTRL-D characters to, and *filename2.ps* is the revised file with a new name. (Both *filename1.ps* and *filename2.ps* can have the same name, but the original file will be overwritten by the revision.)

6. Send the file with CTRL-D's named in Step 5b to the printer via the commands **tip** or **uc**. If you need host-specific instructions, see Appendix A for information on how to get them from the Tektronix Information Server (via Internet) or HAL, the Tektronix automated fax system.

7. Reset the printer. For more information, see "Resetting your printer" on page 2-11.

Note *You can **remove** control characters from files using the script **delctrld**. Use this script in the same way as **addctrld**.*

Configuring your host

1. Add the printer's name to the host table and assign an IP address to the printer's name. Depending on your host system, you may use NIS (Name Information Server, formerly yellow pages) or, on a system without NIS, you may have to edit a file (for example, */etc/hosts*).

2. Assign a print queue to the printer:

   - For BSD systems, edit the */etc/printcap* file and add a spool directory (for example, to */usr/spool/lpr*).

   - For System V hosts, configure the queue as a remote BSD print queue (support for TPC/IP **lpr** is required).

Note *Some UNIX hosts report an error when you configure a print queue that is not currently on the network. Ignore this message.*

If you need host-specific instructions, see Appendix A for information on how to get them from the Tektronix Information Server (via Internet) or HAL, the Tektronix automated fax system.

Configuring your printer

There are two steps to printer configuration:

1. Set the printer's IP address and other addressing information.
2. Set the printer's other TCP/IP parameters:
   - Set host access and control character filtering
   - Receiving printer status (Syslog or SNMP)

Setting your printer's IP address

There are two methods to accomplish these printer configuration steps:

- **Server-based printer configuration.** This method uses RARP (Reverse Address Resolution Protocol) or BOOTP (Boot Parameter Protocol). When turned on or reset, the printer receives its IP addressing information from a boot server.

- **Printer-based printer configuration.** This method can be used on hosts that do not have RARP or BOOTP. You store the IP addressing information in the printer's internal memory, where the printer reads it when reset.

Setting your printer's IP address using RARP or BOOTP (server-based configuration)

With this method, configuration information is sent to the printer over the Ethernet connection via RARP or BOOTP, depending on which protocol your host supports.

The advantage of server-based configuration is that it provides centralized administration. You can configure a number of printers from a central location. The disadvantage is that if the server is down, the printer will not appear on the network after a reset or power cycle, because the printer gets its boot information from a boot server and does not retain it in non-volatile memory.

You store the printer's configuration information in a configuration file such as an *ethers* or *bootptab* file on a boot server. On power up, the printer issues RARP and BOOTP requests and receives the configuration information from the server in the RARP or BOOTP response.

The RARP and BOOTP responses contain only network address information. After the printer has its address information, you can set other TCP/IP parameters by sending PostScript files to the printer using your host spooler. Shell scripts for creating the PostScript files are provided on the UNIX version of the printer's network utilities diskettes.

1. Store the printer's configuration information in an *etc/ethers* or *bootptab* file. For more information on these files, see Appendix B.

2. Make sure that the printer is connected to the network.

Note *The printer's BOOTP and RARP implementations do not support booting across a gateway or router. The BOOTP or RARP server (host) and client (printer) must be connected to the same Ethernet segment, or to segments interconnected only by repeaters and/or bridges.*

3. Turn on the printer. At power up, the printer issues RARP and BOOTP requests and receives the configuration information from the host in the RARP or BOOTP response.

If you need to set more IP addressing parameters than your host's implementation of RARP or BOOTP supports, you can use the *config-IP* script. The *config-IP* script is provided on the UNIX version of your printer's network utilities diskettes. Keep the following points in mind when running the *config-IP* script:

- You must be logged in as **root**.
- The output of the script is PostScript code, which you must send to the printer. When you run the script, redirect the output to a file. Then send the file to the printer.
- The script prompts you to provide certain information. For information about these prompts, see the table "IP parameters" on page 5-21.

Setting your printer's IP address information in the printer's internal memory (printer-based configuration)

With this method, you can set the printer's IP address information and other TCP/IP parameters by sending PostScript files to the printer. Shell scripts for creating the PostScript files are provided on the UNIX version of the printer's network utilities diskettes.

The advantage of this method is that each printer has a permanent setup stored in its non-volatile memory and is not dependent on a boot server for boot information. The disadvantage is that you must configure each printer individually.

Before performing this procedure, you must install the files from the UNIX version of your printer's network utilities diskettes on to your host computer. If you have not already installed the files, see "Installing files from your printer's network utilities diskettes" on page 5-3. Your host spooling system must also be configured (see "Configuring your host" on page 5-16).

The printer-based configuration procedure is on the next page. In this procedure, you use a script provided on the UNIX version of the printer's network utilities diskettes to set the IP parameters listed in the following table.

IP parameters

Parameter	Description
Use RARP/BOOTP	Yes/no. Specifies whether the printer should get it's IP address from a RARP or BOOTP response at power-up. The default is **yes**. Answer **no** for a printer-based configuration; this prevents RARP or BOOTP packets from appearing on the network when the printer is turned on or reset.
IP address	Format is x.x.x.x, where x represents a decimal number from 0 - 255.
Network mask	If you are unsure, leave this blank; the printer will choose an appropriate mask.
Broadcast address	This is the address the printer uses to send broadcast packets.
Default gateway (router)	The address the printer uses to communicate with devices not on the same network segment.
Allow adaptive encapsulation	Yes/no. The printer always expects to receive packets in DIX (Ethernet II) encapsulation. This parameter specifies whether the printer should try IEEE 802.3 encapsulation (with IEEE 802.2 LLC and SNAP headers) if DIX fails. The default is **on**. If you specify **off**, the printer does not try IEEE 802.3 encapsulation if DIX fails.

1. Make sure that the printer is connected to the network. ARP (Address Resolution Protocol) requires that the printer be connected on the same physical network segment as the host.
2. Log in as **root**.
3. Run the script *config-IP*:
   a. Change (**cd**) to the *bin* subdirectory in the directory where you placed your printer's network utilities.
   b. Type the name of the script, redirecting the output to a file. Type:

      config-IP > *filename*
4. When prompted:

   ```
   Will the printer be using either RARP or
   BOOTP?
   ```

   press **Enter** to accept the default (**n** for **no**).
5. When prompted, enter the IP addressing information.
6. When prompted:

   ```
   Should the printer use adaptive encapsulation?
   ```

   enter your choice; for most systems, you should enter **y** for **on**.

7. Make an entry into the host's ARP (Address Resolution Protocol) table defining the printer's IP/Ethernet address pair. In general, this requires a command corresponding to one of the following syntax examples:

   arp -s *printer-name Ethernet-address* (for BSD systems)

   or

   arp -s ether *printer-name Ethernet-address* (for System V)

   See the documentation for your host system for specifics of this command.

8. Turn on the printer.

9. Use the **ping** command to force the printer to accept the IP address set in the ARP table. This is a special configuration mode allowed by Tektronix printers. Type:

   ping ***IP-address***

Note *Some systems may not accept the **ping** command the first time; if this occurs, send it again.*

10. Use the host spooling system (for example, **lpr** or **lp**) to send the file you created in Step 3b to the printer. This stores the IP addressing information in the printer's internal memory, where it is retained over a reset or power cycle.

11. Reset the printer. For more information about resetting the printer, see "Resetting your printer" on page 2-11.

Controlling host access and control character filtering

LPR (BSD systems)

By sending the appropriate PostScript file to the printer, you can control which hosts can access the printer through **lpr**. You can also control whether **lpr** will filter out CRTL-D characters from the files it sends the printer. The printer has the following factory defaults:

- All hosts have access to the printer.
- No control character filtering.

To create a PostScript file to control these parameters, use the script *config-LPR* provided on the UNIX version of the printer's network utilities diskettes.

1. Make sure that the printer is connected to the network.
2. Run the script *config-LPR*:
   a. Change (**cd**) to the *bin* subdirectory in the directory where you placed your printer's network utilities.
   b. Type the name of the script, redirecting the output to a file:

      config-LPR > *filename*

3. When prompted, enter the IP addresse(s) of the host(s) that will have access to the printer. You can enter addresses for multiple hosts by separating them with spaces. If you do not enter any addresses, all hosts will have access to the printer.

4. When prompted, indicate if you want the host to filter out control characters from the files it sends to the printer. If your PostScript driver inserts CTRL-D's in the PostScript print files as end-of-transmission characters, then enter **y** for yes, to allow filtering.

5. Send the file named in Step 2b to the printer; type:

   lpr **-P***queue-name* *filename*

AppSocket (TCP Sockets)

By sending the appropriate PostScript file to the printer, you can control which hosts can access the printer through **AppSocket**. You can also control whether **AppSocket** will filter out CRTL-D characters from the files it sends the printer. The printer has the following factory defaults:

- All hosts have access to the printer.
- No control character filtering.

To create a PostScript file to control these parameters, use the script *config-sockets* provided on the UNIX version of the printer's network utilities diskettes.

1. Make sure that the printer is connected to the network.
2. Run the script *config-sockets*:
   a. Change (**cd**) to the *bin* subdirectory in the directory where you placed your printer's network utilities.
   b. Type the name of the script, redirecting the output to a file:

      config-sockets > *filename*
3. When prompted, indicate if you want the host to filter out control characters from the files it sends to the printer. If your PostScript driver inserts CTRL-Ds in the PostScript print files as end-of-transmission characters, then enter **y** for yes, to allow filtering.
4. When prompted, enter the IP addresse(s) of the host(s) that will have access to the printer. You can enter addresses for multiple hosts by separating them with spaces. If you do not enter any addresses, all hosts will have access to the printer.
5. Send the file named in Step 2b to the printer. Type:

   lp -d*queue-name filename*

Receiving printer status (optional)

Syslog

The Syslog facility provides a dynamic path for printer status information that allows administrators to collect information from the printer.

By sending the appropriate PostScript file to the printer, you can set a threshold indicating which priority level of message from the printer will be sent to the listed log host.

The threshold is a number listed in the following table. The priorities listed in the table conform to BSD and SunOS conventions.

Syslog priorities

Priority	Number	Description
Emergency	0	Printer is no longer available
Alert	1	Printer needs immediate attention
Critical	2	Critical error message
Error	3	Error message
Warning	4	Warning message
Notice (printer's default)	5	Normal but significant message
Information	6	Informational message

To create a PostScript file to control these parameters, use the script *config-syslog* provided on the UNIX version of the printer's network utilities diskettes.

1. Make sure that the printer is connected to the network.
2. Run the script *config-syslog*:
   a. Change (**cd**) to the *bin* subdirectory in the directory where you placed your printer's network utilities.
   b. Run the script, redirecting the output to a file. Type:

      config-syslog > *filename*
3. When prompted, enter the log host's IP address and the priority level of the threshold you want to set.
4. Send the file named in Step 2b to the printer. Type:

   lpr -P*queue-name* *filename*

SNMP

SNMP allows you to use an SNMP monitoring station to query the printer remotely for its status.

By sending the appropriate PostScript file to the printer, you provide the following information for the printer to send to your SNMP utility:

- Printer's name
- Name of contact person for printer problems
- Printer's location
- Trap host's IP address and community name. Members of this list receive asynchronous SNMP traps (error and status messages) from the printer.
- Private host's IP address. Private members are allowed read and write access to all SNMP objects on the printer. Hosts that are members of the *public* community are allowed read-only access to all SNMP variables.
- Enable Authentication Failure Trap. Enable this if you want to be notified if unauthorized users attempt to set SNMP variables.

To create a PostScript file to control these parameters, use the script *config-SNMP* provided on the UNIX version of the printer's network utilities diskettes.

1. Make sure that the printer is connected to the network.
2. Run the script *config-SNMP*:
   a. Change (**cd**) to the *bin* subdirectory in the directory where you placed your printer's network utilities.
   b. Run the script, redirecting the output to a file. Type:

      config-SNMP > *filename*
3. When prompted, provide the information for the SNMP utility.
4. Send the file named in Step 2b to the printer using **lp** or **lpr**.

Troubleshooting

Testing the network connection

Execute the **ping** command from the host. For example:

ping *printer-name*

If the **ping** test to the *printer-name* fails, try issuing the **ping** command again, specifying the printer's IP address explicitly:

ping *printer-IP-address*

If the **ping** test succeeds using the printer's IP address, but fails using the printer's name, check the NIS or */etc/hosts* file to make sure that you are using the correct name for the printer. If the **ping** test fails using the printer's IP address, check the cabling and any gateways to make sure that the printer has a good connection.

Solving printing problems

- If you receive a `file too large` error message when sending large bitmaps, check the */etc/printcap* file; **mx** should be set to **0**.
- If you receive a `file system full` message, use the **-s** option to **lpr**. Refer to your workstation's documentation for more information.
- Make sure that you used a valid remote printer (**rp**) name and remote machine (**rm**) name in the */etc/printcap file*.
- Check the directories and spool files named in the */etc/printcap* file; make sure that the directories and files have the correct ownership and permissions.
- Try restarting the **lpd** daemon. Sometimes you have to restart the daemon when you edit the */etc/printcap* file.

  If the printer is turned off or disconnected, the system administrator (or user logged in as *root*) may need to restart the queue.

How to disable protocols

After your network configuration is complete, you may want to disable protocols that you are not using to avoid unnecessary network traffic. To disable protocols, send the appropriate PostScript language file to the printer. The files are on the UNIX version of the printer's network utilities diskettes.

1. Send the appropriate PostScript file to the printer (see the following table).

2. Reset the printer. (For more information about resetting the printer, see "Resetting your printer" on page 2-11.)

PostScript files for disabling and enabling protocols

Protocol	To disable protocols	To enable protocols
EtherTalk	ethertalk/ethertalk-off.ps	ethertalk/ethertalk-on.ps
NetWare	netware/netware-off.ps	netware/netware-on.ps

Appendix

A Unix Host Configuration for TCP/IP

A variety of host-specific TCP/IP configuration information is available from the Tektronix Information Server (via Internet) or from HAL, the Tektronix automated information system (via fax).

Requesting information from the Tektronix Information Server

To get host-specific TCP/IP configuration information from the Tektronix Information Server, request an index of the **tcpip** library, then request the articles you want from those listed in the index. For more information, see "Downloading files from the Tektronix Color Printer Information Server" on page 5-4.

Requesting information from HAL

You can call HAL 24 hours a day, 7 days a week, from anywhere in the world. HAL faxes you information immediately.

To use HAL, from any touch-tone phone call **(503) 682-7450** directly, or call **1-800-835-6100** (6:00 am - 5:00 pm, PST) and ask to be transferred to HAL. For complete instructions on using HAL, refer to your printer's user manual.

The table on the next page lists articles relating to host configuration for TCP/IP. Use the number in the table when ordering these articles.

HAL articles for TCP/IP host configuration

Number	Title
9480	Using **tip**
9481	Using **cu**
9482	Spooler configuration for SPARC platforms
9483	Spooler configuration for SGI platforms
9484	Spooler configuration for DEC platforms
9485	Spooler configuration for HP platforms
9486	Spooler configuration for IBM RS/6000

When you call HAL, you can order a complete catalog listing all available articles, including new, additional articles related to networking.

Appendix

B RARP and BOOTP

Enabling RARP

RARP can be used to establish communications. The printer broadcasts its Ethernet address across the network, and receives its internet address from the first host to respond.

1. If the **rarpd** daemon is started within the */etc/rc.local* file or a similar startup file, it is always running and waiting for RARP broadcasts. If the **rarpd** command line does not exist in your */etc/rc.local* file, you need to add it. To verify that the **rarpd** startup command is in the file, type:

   grep rarpd /etc/rc.local

   If the **rarpd** startup command is in the file, this line is displayed:

   ```
   /usr/etc/rarpd -a ;echo -n ' rarpd'
   ```

2. Verify that **rarpd** resides where it is specified in */etc/rc.local*. For the preceding examples, **rarpd** would be located in */usr/etc*. If there is a mismatch between the actual location and the specified location, either move the **rarpd** binary or change the */etc/rc.local* file.

3. Edit the */etc/hosts* file to add the printer internet addresses and names. This example adds two Phaser 480 printers to the */etc/hosts* file:

   ```
   128.07.60.30    P480-mktg
   128.07.60.31    P480-sales
   ```

4. Edit the */etc/ethers* file to add the printer Ethernet addresses and names:

```
08:00:11:01:00:45    P480-mktg
08:00:11:01:00:46    P480-sales
```

5. Some hosts require an explicit update to the **arp** table to add new entries. This command is host-specific; check your host documentation for details. For example, the following command lines add the Ethernet addresses of two Phaser 480 printers to the **arp** table:

arp -s ether P480-mktg 08:00:11:01:00:45
arp -s ether P480-sales 08:00:11:01:00:46

The *ether* switch indicates an Ethernet address. The **arp** command can be run with a **-f** *filename* option, where *filename* is a file of the printer entries to set.

6. Restart the **rarpd** daemon without rebooting the system to put the changes you have made into effect. Use one of the following methods.

For BSD systems

a. Find out the process ID number for the **rarpd** daemon; type:

ps -aux | grep rarpd

This command produces the following output:

```
root    193  0.0  0.0  48    0   ?  IW  Oct 24  0:12  rarpd
root  12366  0.0  0.3  32  196  pb  S   11:55   0:00  grep rarpd
```

b. Restart the **rarpd** daemon, which is process ID number 193 in this example. Type:

kill -HUP 193

For System V

a. Find out the process ID number for the **rarpd** daemon; type:

ps -ef | grep rarpd

This command produces the following output:

```
root  6206  3112   0   Nov 06      -  0:00 /etc/rarpd
root 13177 12135   2 06:36:22  pts/3  0:00 grep rarpd
```

b. Restart the **rarpd** daemon, which is process ID number 6206 in this example. Type:

kill -HUP 6206

7. If **rarp** is not running, type:

/usr/etc/rarpd -a &

BOOTP

Bootstrap protocol, BOOTP, is the recommended way to establish communications from the host to the printer in an internet protocol environment. BOOTP obtains booting data from the *bootptab* file. With the proper information stored in the *bootptab* file, the printer can find its own name and IP address and boot from the network without any intervention, even for a first time boot.

1. Verify that the *bootpd* and *bootptab* files are in the */etc* or */usr/etc* directory:

   ls bootp*

2. Edit the */etc/hosts* file to add the printer internet addresses and names:

   ```
   128.07.60.30   P480-mktg
   128.07.60.31   P480-sales
   ```

3. Some hosts may require an explicit update to the **arp** table to add the new entries. This command is host-specific; check your host documentation for details.

   arp -s ether P480-mktg 08:00:11:01:00:45
   arp -s ether P480-sales 08:00:11:01:00:46

The *ether* switch indicates you are providing an Ethernet address. The **arp** command can also be run with a **-f** *filename* option, where *filename* is a file of all the printer entries to set.

1. Set up the *bootptab* file.

2. Start or restart the **inetd** or **bootpd** daemon.

Here is a sample *bootptab* file; check your host system documentation to see which fields your implementation of BOOTP supports.

```
# Global entries for all hosts
global:     :sm=255.255.255.0:\
            :bf=dummyfile:
# Master entries for each subnet template
subnet60:   :tc=global:gw=128.07.60.100:
subnet61:   :tc=global:gw=128.07.61.150:
# Individual printer entries
P480-mktg:  :tc=subnet60:ht=ethernet:\
            :ha=080011010045:\
            :ip=128.07.60.30:
P480-sales: :tc=subnet60:ht=ethernet:\
            :ha=080011010046:\
            :ip=128.07.60.31:
```

The printer recognizes the BOOTP fields listed in the following table:

BOOTP fields

Field	Description	Values
gw	Gateway address list	List of IP addresses separated by spaces.
ha	Host hardware address	Hexadecimal; the ha tag must be preceded by ht tag.
ht	Host hardware type (see Assigned Numbers RFC)	Unsigned decimal, octal, or hexadecimal integer or one of the following symbolic names: ethernet or ether for 10 Mbit Ethernet; ether3 for 3 Mbit experimental Ethernet; ieee802 for IEEE 802
ip	Host IP address	A single IP address.
sm	Host subnet mask	A single IP address.

Running BOOTP

There are two ways to run BOOTP:

- If the **bootpd** daemon is started within the */etc/rc.local* file or a similar startup file, it is always running and waiting for BOOTP requests. This method uses system resources at all times.
- If the **bootpd** daemon is started within the */etc/inetd.conf* file, it starts **bootpd** only when a BOOTP request arrives, conserving system resources.

BOOTP always running

1. If the **bootpd** command line does not exist in your */etc/rc.local* file, you need to add it. To verify that the **bootpd** startup command is in the file, type:

   grep bootpd /etc/rc.local

   If the **bootpd** startup command is in the file, the following line is displayed. The **-s** option specifies continuous execution.

   ```
   /etc/bootpd -s ;      echo -n ' bootpd'
   ```

2. Verify that **bootpd** resides where it is specified in */etc/rc.local.* For the preceding examples, **bootpd** would be located in */etc*. If there is a mismatch between the actual location and the specified location, either move the **bootpd** binary or change the */etc/rc.local* file.

3. The port numbers for BOOTP listening and replying must be set in the */etc/services* file. If they are not set, edit the file and add them. To verify that the ports are set in the file, type:

   grep bootp /etc/services

   If the ports are set in the file, the following line is displayed:

   ```
   bootps 67/udp
   bootpc 68/udp
   ```

4. To start the **bootpd** daemon without rebooting the system, type:

   /etc/bootpd -s &

BOOTP running only on request

1. If the **bootpd** command line does not exist in your */etc/inetd.conf* file, you need to add it. To verify that the **bootpd** startup command is in the file, type:

   grep bootpd /etc/inetd.conf

   If the **bootpd** startup command is in the file, the following line is displayed:

   ```
   bootps dgram udp wait root /etc/bootpd bootpd
   ```

2. Verify that **bootpd** resides where it is specified in */etc/inetd.conf*. For the preceding examples, **bootpd** would be located in */etc*. If there is a mismatch between the actual location and the specified location, either move the **bootpd** binary or change the */etc/inetd.conf* file.

3. The port numbers for BOOTP listening and replying must be set in the */etc/services* file. If they are not set, edit the file and add them. To verify that the ports are set in the file, type:

   grep bootp /etc/services

   If the ports are set in the file, the following line is displayed:

   ```
   bootps 67/udp
   bootpc 68/udp
   ```

4. Restart the **inetd** daemon without rebooting the system to put the changes you have made into effect. Use one of the following methods.

For BSD systems

a. Find out the process ID number for the **inetd** daemon; type:

ps -aux | grep inetd

This command produces the following output:

```
root    193  0.0  0.0  48    0   ?  IW  Oct 24  0:12  inetd
root  12366  0.0  0.3  32  196  pb  S   11:55   0:00  grep inetd
```

b. Restart the **inetd** daemon, which is process ID number 193 in this example. Type:

kill -HUP 193

For System V

a. Find out the process ID number for the **inetd** daemon; type:

ps -ef | grep inetd

This command produces the following output:

```
root  6206  3112   0   Nov 06      -  0:00 /etc/inetd
root 13177 12135   2 06:36:22  pts/3  0:00 grep inetd
```

b. Restart the **inetd** daemon, which is process ID number 6206 in this example. Type:

kill -HUP 6206

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