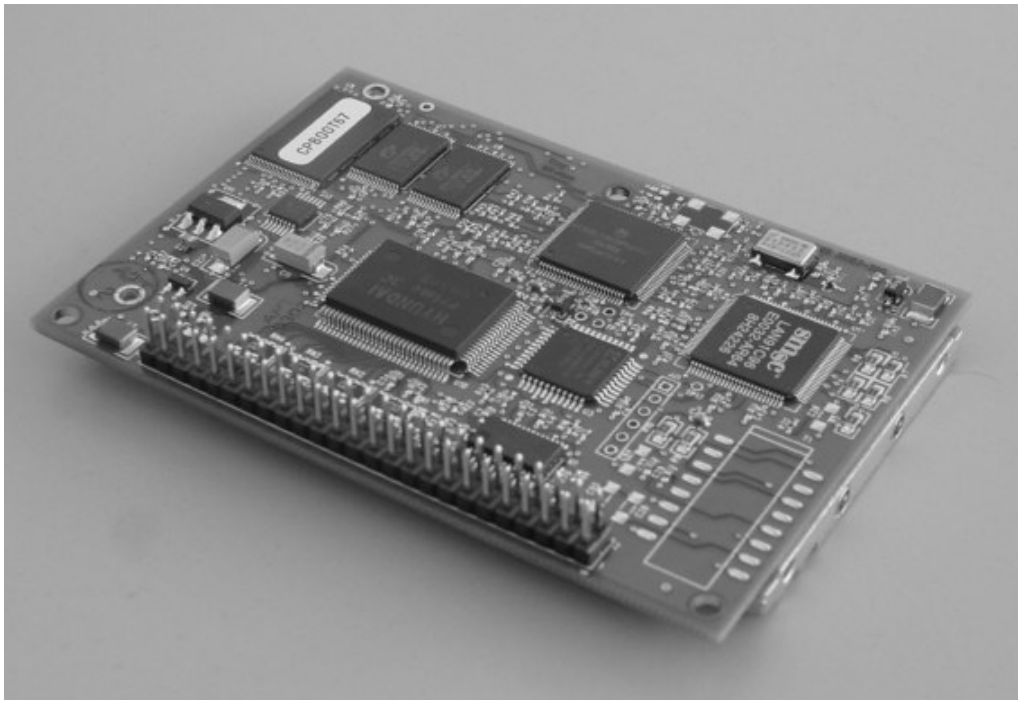
TROY

EtherWind™ Plus

OEM Connectivity Module



Developer's Guide

Document No. xxxxx-xxxx
Revision x.,,,,,,,,`

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Introduction

Welcome, and thank you for taking the time to look at the TROY Wireless EtherWind-Plus OEM Developer's Kit.

The EtherWind-Plus is a SMART module intended for developers who want to add connectivity to their product easily, inexpensively, and want to get to market quickly.

The EtherWind-Plus adds Ethernet and/or 802.11b wireless connectivity operating at speeds of up to 11 Mbps on any IEEE 802.11b wireless compatible network.

The Pins on the EtherWind-Plus include all Input and Output, with a PCMCIA connector for the wireless option, Ethernet, LEDs, Switches for reset or configuration, Parallel Port, Serial Port, and extra pins for other customizable configuration. The firmware in the developer's kit is of course for evaluation purposes, and pretty much everything is customizable to suit your needs. If you keep notes as you are checking out the developer's kit, you can submit it to your account manager and they can begin a customization project with our engineers which provides full support to get you to market quickly.

System Requirements

To evaluate and use the EtherWind-Plus development kit, you need a PC with a terminal emulator (such as Windows Hyperterminal) and an 802.11b wireless network. The wireless network will consist of either of the following:

- An 802.11b wireless enabled PC or Macintosh connecting straight to the EtherWind-Plus (Ad-Hoc or Peer-to-Peer Mode).
- An 802.11b wireless Access point allowing wireless and wired Ethernet enabled computers to connect to the EtherWind-Plus.

To configure the EtherWind-Plus, you need the following:

- The MAC address from the label of the EtherWind-Plus (for example: 004017023F96).

- The following information from your wireless network administrator:

  - Wireless Mode (Infrastructure or Ad-Hoc)
  - The SSID (service set identifier) for your wireless network.
  - The Radio Frequency Channel of the wireless network.
  - If you are using TCP/IP (recommended for Windows Networks) and are not connected to a DHCP server (for obtaining an IP Address automatically), you will need a unique IP Address for the EtherWind wireless print server (for example: 192.168.1.14). If the EtherWind is not on the same IP subnet as the computers you are printing from, you will also need a subnet mask and a router (default gateway) address.

Operating Systems Supported

- Windows 95, 98, ME, NT 4, 2000, XP
- MacOS 7.xx, 8.xx, 9.xx, MacOS X

Network Protocols Supported

- TCP/IP
  - LPD/LPR
  - Raw TCP/IP (port 9100)
  - NetBIOS over IP (with SMB)
- Multiple configurable TCP port numbers
- TELNET
- WINS
- DHCP
- AppleTalk
  - Apple Printer Utility compatibility
  - Binary AppleTalk support
  - AppleTalk spoofing
- IPX/SPX
  - NetWare RPrinter Bindery mode
  - NetWare PServer Bindery mode
  - NetWare NPrinter NDS mode with NDPS support
  - NetWare PServer NDS mode
  - Ethernet II, 802.3, 802.2, 802.2 SNAP Frame types
  - Compatible with PCONSOLE, NWADMIN, PRINTCON, and other Novell utilities
- NetBEUI
- DEC LAT (-N models only)
- Banyan VINES (-N models only)
- PrintraNet Internet Printing

Chapter 1

Hardware Overview

The EtherWind-Plus I/O is comprised of a 50-pin header. The pin-outs for this header are as follows:

Description	Signal	Pin	Pin	Signal	Description
Ethernet	RD-	1	2	GRD	Signal Ground
Ethernet	RD+	3	4		Unused Pin
Ethernet	TD-	5	6	GRD	Signal Ground
Ethernet	TD+	7	8		Unused Pin
Signal Ground	GRD	9	10	GRD	Signal Ground
Serial Data Carrier Detect	DCD	11	12	DSR	Serial Data Set Ready
Serial Receive Data	RXD-	13	14	RTS	Serial Request To Send
Serial Transmit Data	TXD-	15	16	CTS	Serial Clear to Send
Serial Data Terminal Ready	DTR	17	18	RI	Serial Ring Indicator
Signal Ground	GRD	19	20	GRD	Signal Ground
Parallel	STROBEO-	21	22	AUTOFDO-	Parallel Autofeed
Parallel Output data bit 0	PDT0	23	24	FAULTI-	Parallel Fault
Parallel Output data bit 1	PDT1	25	26	PRNINTO-	Parallel Init
Parallel Output data bit 2	PDT2	27	28	SELCTINO-	Parallel Select In
Parallel Output data bit 3	PDT3	29	30	GRD	Signal Ground
Signal Ground	GRD	31	32	PDT5	Parallel Output data bit 5
Parallel Output data bit 4	PDT4	33	34	PDT7	Parallel Output data bit 7
Parallel Output data bit 6	PDT6	35	36	BUSYI	Parallel Busy
Parallel ACK	ACKI-	37	38	SELECTA	Parallel Select Out
Parallel	ERRORI	39	40	GRD	Signal Ground
Signal Ground	GRD	41	42	SWITCH	Switch
Yellow LED	YELDR	43	44	LEDSWT	Optional switch or LED
Red LED	RDLDR	45	46	GRLDR	Green LED
5V Power Input	PWRIN	47	48	PWRIN	5V Power Input
Power Ground	PWRGND	49	50	PWRGND	Power Ground

Chapter 2

Installing the EtherWind-Plus Developer's Kit Hardware

Before You Begin

Before you install the EtherWind-Plus wireless server, make sure that your device and your computer already function properly via a parallel or serial cable. Refer to your device documentation for instructions on using and maintaining locally.

In addition, make sure that you have properly installed the 802.11b wireless equipment and software you are using to communicate to the EtherWind-Plus as described in the documentation that came with that equipment.

Unpacking

Your package should contain the following items:

- EtherWind-Plus PCA
- EtherWind-Plus evaluation daughtercard
- EtherWind-Plus User's Guide (This Book)
- IEEE 1284 Parallel Cable – 25 Pin Male to 36 Pin Male
- RS232 Serial Cable DB9F to DB9F
- Power Supply (international model)
- Installation CD-ROM

If anything is missing from the box, please contact TROY.

EtherWind-Plus Connectors, Switches, and LEDs

Test Switch. Press down this switch for less than 5 seconds to send test data to both the parallel and serial ports. The test data will show the current wireless and network settings of the EtherWind-Plus wireless server. Press it down for more than 5 seconds to reset the EtherWind to its factory default parameters. If you hold the test switch down upon powering up, the print server will power up in Ad-Hoc mode on RF Channel 11 with the SSID of printer.

Power Connector. Plug the power supply into this connector.

LED status indicators. The green light comes on when the unit is powered on, then goes out. The yellow light will come on solid when an Ethernet network link is established. The red light will come on solid when a wireless link is established. The green light blinks during network activity.

```
Yellow LED = Ethernet Link
Green LED = Activity
Red LED = Wireless Link
```

Parallel Port (DB25). This port is used for connecting to a parallel printer.

Serial Port (DB9). This port is used for connecting a serial printer or other serial device. Can also be used to access the command line console of the EtherWind for configuration and diagnostics.

Connecting to a Printer

Follow these steps to connect the EtherWind-Plus server to your device:

Make sure the device is off.
Connect the parallel or serial cable to the server and the device.
Plug the power cord from the power supply into a wall outlet or power strip.
Connect the the power supply to the EtherWind-Plus.
Turn the device on.

Verifying Successful Installation

When the print server is powered on, the EtherWind will go through the following startup sequence:

- It runs through a set of power-up diagnostics for a few seconds. If the EtherWind is operating properly, all three LEDs will blink momentarily and then go out.

```
Yellow LED = Ethernet Link
Green LED = Activity
Red LED = Wireless Link
```

Verifying the Connection

Before attempting to communicate with your device, it is very important to verify the connection between the EtherWind and the printer. If this connection is not good, you will not be able to communicate!

To verify this connection, make sure that both the EtherWind-Plus and the device are powered on and ready. Make sure that the cable is connected securely from the EtherWind to the printer. Then send test-data by pushing the test switch and letting go immediately.

If the test data does not get sent, first make sure all the connections are secure, and make sure the device is operating correctly. If you are using the Serial Port, make sure that you have the console disabled, and that the settings of the EtherWind-Plus serial port match that of your device. Then power the EtherWind-Plus off and then on again, and try sending the self-test data again.

If you cannot send test data to the parallel and/or serial device, refer to the Troubleshooting section of this manual.

Connecting the EtherWind to an RS-232 Serial Device

Note: Skip this section if you are not using the EtherWind-Plus serial port.

The EtherWind-Plus developer's kit has one standard PC-compatible 9-pin female D-connectors. The serial port uses PC-compatible 9-pin male D-connectors. Note that the standard off-the-shelf 9-pin female to 25-pin male PC cables will require a null modem in order to connect to most printers or terminals. The pin-outs are as follows:

DB9	DTE	DCE		
pin	Signal	Signal	pin	pin
1	Not used	Not used	-	-
2	Receive Data	Transmit Data	2	3
3	Transmit Data	Receive Data	3	2
4	DTR out	DSR in	6	20
5	Signal Ground	Signal Ground	7	7
6	DSR in	DTR out	20	6
7	RTS out	CTS in	5	4
8	CTS in	RTS out	4	5
9	Not used	Not used	-	-

Basically, the cable must connect input signals (e.g., Receive Data) on the TROY EtherWind-Plus to the equivalent output signals (e.g., Transmit Data) on the device and vice-versa.

The serial port can be set to operate in console mode to allow you to configure and diagnose the EtherWind via a serial terminal (or PC with a terminal emulation program). To enable the console mode manually, unplug the power supply from the EtherWind-Plus, hold down the Test switch and simultaneously plug in the power supply.

The port will remain in console mode until the unit is power off.

You may also enable console mode by connecting remotely to the EtherWind via WebXAdmin, TELNET, NCP, or XConfig (refer to Chapter 3 for information on how to use these utilities). With WebXAdmin, select Configure Port from the main menu, click on serial port S1, select Console Mode, and click Submit. With TELNET or XCONFIG, use the following command:

```
SET PORT S1 CONSOLE ENABLED
```

You can remotely restore the port to normal serial operation by unselecting Console Mode from WebXAdmin or by using the console command SET PORT S1 CONSOLE DISABLED.

The serial ports are factory set at 115200bps, 8-bit data, CTS/RTS (Hardware) flow control, and no parity. If your printer or serial device requires different settings, you must use WebXAdmin or a console terminal connected to port S1 as described in the previous paragraph. With WebXAdmin, select Configure Port from the main menu, click on S1, choose the desired settings, and click Submit. With the console terminal, use one or more of the following commands:

```
SET PORT S1 SPEED baudrate
SET PORT S1 PARITY parity_type
SET PORT S1 FLOW flowctrl
SET PORT S1 CHARACTER charsize
```

Note that the serial port always operates at 115200bps when in console mode.

Don't forget to set the serial port settings on your printer or other device to match the settings of the EtherWind-Plus. For a complete list of commands, please refer to Appendix A of this manual.

Connecting the Serial Server to Devices other than Printers

The EtherWind-Plus provides a general-purpose method for connecting RS-232 serial devices to Ethernet networks. It provides a transparent bidirectional communications path from the RS-232 device to the computer. In other words, it makes the device look like as though it is directly connected to the serial port of the computer, even though it is actually communicating over the LAN or Wireless LAN.

Before using the serial server in this type of application, you must first make sure that your computer system is running the TCP/IP protocol and has a valid IP address (refer to your computer's documentation if you do not know how to do this). You must also enter an IP address, gateway, and subnet mask into the EtherWind-Plus as described in Chapter 3 of this manual.

To establish the communications path to the EtherWind-Plus (and therefore to the RS-232 device), a program on the computer must open a TCP connection to the IP address of the EtherWind-Plus. If you are using Windows, this can be done by calls to the WINSOCK API. If you are using UNIX or other operating systems, this can be done by using the appropriate TCP/IP API supplied by the operating system.

Chapter 3

Configuring the EtherWind 802.11b and IP Settings

Configuring the EtherWind

There are three basic steps required to configure the EtherWind:

1. Configuring the EtherWind 802.11b settings. To operate on an 802.11b network, you must set the wireless (ad-hoc or infrastructure), SSID, channel, data rate and WEP encryption. All nodes of a wireless network need to have the same settings in order to communicate with each other.

2. Configuring the IP address settings. You will need to set the IP address, subnet mask, and router address if you are using TCP/IP, NetBIOS IP, or PrintraNet, or if you want to use the WebXAdmin web-based management utility.

3. Configuring the EtherWind for operation with the network operating systems. The final step is to configure the EtherWind so that you can print to it using one or more network operating systems (for example, Windows NT/2000, NetWare, AppleTalk, etc.).

Before You Begin

- Make sure that you have properly configured your computer for communication on a wireless network. If you are connecting to the device through an access point, make sure your computer is in infrastructure mode and it is associated with the access point. If you are connecting directly to the device without an access point, you should be in ad-hoc mode. See the documentation for your wireless adapter for instructions.

  Note: If your wireless adapter includes an option for 802.11 Ad-hoc, you must select it if you want to use the printer in ad-hoc mode. If it doesn't include this option, select Ad-hoc Computer-to-Computer, or whatever mode your adapter uses to communicate on a wireless network without an access point.

- If you are using WEP (Wired Equivalent Privacy) encryption on your wireless network, you will need to temporarily disable WEP on your PC in order to configure the print server. If you are using an access point with WEP enabled and it does not allow non-wep clients to communicate with other non-wep clients, then you will also need to temporarily change the wireless mode of your computer to Ad-hoc (802.11) mode.

  Note: If no computers on your network can be set to Ad-hoc mode, you will need to temporarily disable WEP on your access point. When you are done configuring the print server, you can re-enable WEP on your computer and change the wireless mode back if necessary.

- If you are using TCP/IP, note your computer's IP address. The server will need to be on the same IP segment as the other nodes on your network in order to communicate.

- If you are using infrastructure mode, make sure you have a good signal between your computer and the access point. Most wireless adapters have a utility that shows the wireless signal strength. See your wireless adapter's documentation for details.

- If you are using a Macintosh with an Airport® base station or non-Apple access point:

- If your Macintosh has an Airport wireless card installed, make sure that AirPort is enabled in the AppleTalk and TCP/IP Control Panels. If both your Macintosh and the AirPort base station or access point are connected to an existing Ethernet network, select Ethernet in the AppleTalk and TCP/IP Control Panel.
- To use the printer in infrastructure mode, use the Airport application to select the Airport Network name that corresponds to the base station or access point from the AirPort Networks list.
- To use the printer in computer-to-computer (Ad-hoc) mode, use the Airport application to create or join a computer-to-computer network. See your AirPort documentation for details.
- If you are using password protection, you will need to temporarily create a computer-to-computer network with no password protection to configure the print server, then re-join the network with the password protection.
- In order to make the Apple Airport password protection compatible with the 64-bit WEP (Wired Equivalent Privacy) on the EtherWind, you will need to use 0x followed by the 10 digit WEP key.

- If you are using a home gateway or router, you will want to configure the EtherWind from a PC on the same network segment that you want the EtherWind to be on.

Chapter 4

Quick Start Sheet

There are three ways to configure the EtherWind:

1. The EtherWind CD includes WP-Admin, for easy installation over a wireless connection (see chapter 2 of the User's Guide).
2. If you hold down the button while you are powering up, the print server will configure itself to Ad-Hoc (802.11) mode with an SSID of **printer** (lower-case) and an IP address of 192.0.0.192. You can configure your PC to the same settings, and put it on the same TCP/IP subnet (ie: configure your PC to have an IP address of 192.0.0.100), and configure the EtherWind using your web browser (type http://192.0.0.192 in the address bar of your browser).
3. Use a standard null modem DB9F Serial Cable to configure the print server. Below is a quick set of instructions for configuring the basic wireless and network settings. Text might come up while in your console session to show you what the print server and network are doing, you can ignore these and type through these.

To connect to the TROY Wireless Print Server using the Serial Port, use a terminal emulator (like Windows Hyperterminal) with the settings:
Speed: 115200
Data Bits: 8
Parity: None
Stop Bits: 1
Flow Control: None
Hit ENTER a couple times. When you get the "Local>" prompt, you are ready to enter commands.

Local> **set en mo** *mode*
Where *mode* is either **IN** for Infrastructure (Access Point) mode, **AD** for Ad-Hoc (802.11 peer-to-peer) mode (PS for Pseudo Ad-Hoc Mode for older proprietary Ad-Hoc implementations)

Local> **set en ss** *ssid*
Where *ssid* is the SSID (Service Set Identifier) you want the print server to be. Surround the SSID with "" (Double Quotes) if you use a space in it.

Local> **set en wep** xxx
Where xxx is either **DIS** for disabled, **64** for 64-bit WEP (Wired Equivalent Privacy), or **128** for 128-bit WEP. The default value is disabled.

Local> **set en keyval** *wepkey*
Where *wepkey* is the WEP key value for your wireless network. This value should be a 10 (for 40 or 64-bit WEP) or 26 (for 128-bit WEP) characters in hexadecimal format, 0-9 or a-f.

Local> **show en**
This setting shows you're the current 802.11b print server settings. It's usually a good idea to verify your settings.

Local> **set ip addr** xxx.xxx.xxx.xxx
Where xxx.xxx.xxx.xxx is the TCP/IP Address you want the print server to be.

Local> **set ip subnet** xxx.xxx.xxx.xxx
Where xxx.xxx.xxx.xxx is the TCP/IP Subnet Mask you want the print server to be.

Local> **set ip router** xxx.xxx.xxx.xxx
Where xxx.xxx.xxx.xxx is the TCP/IP Router (or Gateway) Address you want the print server to be. This only needs to be set if you want to print to it from across a router.

Local> **show ip**
This setting shows the current TCP/IP print server settings. It's usually a good idea to verify your settings.

When you are finished with your settings, use the following commands to save the settings and re-initialize the print server so the settings will take effect.

Local> **init**

Local> **exit**

After you exit, you are ready to install your printer on your system as described in chapters 4-10 depending on your Operating System.

Chapter 5

Installing the Software

Follow these steps to install the WP-Admin software and configure the print server.

1. Insert the EtherWind Wireless Configuration CD-ROM into your PC or Macintosh.

   Note: There is also a Linux version of the WP-Admin utility available on the TROY website (www.troygroup.com).

2. If you are using a Windows computer, click on Install TROY EtherWind Utilities, then click on Install EtherWind Configuration Utilities and Printing Software. If you are using a Macintosh computer, open the Mac folder (for Mac OS 8.x or 9.x) or the Mac OS X folder.

   Note: If you are using Windows and don't have the Java Runtime installed on your system, you will be prompted to install it, click Continue.

3. Follow the on-screen instructions for installing the utility. When WP-Admin starts, you will see the WP-Admin Wireless Server Search screen, which will look like this:

4. Click START to begin searching for print servers. WP-Admin will get the information from the print server(s) and list the Server Name and Ethernet Address (which should correspond with the label on the back of the print server). It might take a minute or two for the print server to show up, especially if you have a large wireless network. Note that by default the name of the EtherWind print server is XCD_xxxxxx, where xxxxxx is the last six digits of the Ethernet (MAC) address (for example, XCD_08B2C7).

   Note: If you don't see the print server in the list, hold down the button for more than 5 seconds to reset it to factory defaults and try the search again. If you still don't see it, check the troubleshooting section (chapter 11).

5. When you see the print server you want to configure in the list, highlight it and click Configure. If you are using DHCP, wait until the print server gets an IP Address from the DHCP server and is updated on the search screen before configuring (the IP address will change from the default 192.0.0.192 to a new value).

   Note: If the wireless signal is less than 50% on the search screen, printing performance could be affected. To improve the signal strength, try moving the print server closer to the computer or access point and away from other radio devices such as BluetoothTM wireless devices, microwave ovens, or cordless phones.

6. You will be prompted for the configuration password (the default password is **access**), type in the password and click OK to continue. The Wireless Server Configuration screen will come up which will look like this:

   Note: If you are having trouble configuring a print server, click Cancel to get back to the Search screen, click Clear to clear the list of servers, and start again from step 4 above.

7. The settings of the EtherWind you selected in the Wireless Server Search screen will be displayed. Many of the fields will be configured automatically to match the network being used, so you will probably NOT need to change the Wireless Mode, RF Channel, SSID, and Data Rate settings unless you want to want to change the EtherWind to a different wireless network.

- If your network uses WEP encryption, you will need to enable WEP and enter the appropriate WEP key(s). Contact your system manager to determine what information .

- If you are using TCP/IP (recommended for Windows printing) and you do not have a DHCP server (see note below), you will need to manually assign a valid IP Address, Subnet Mask, and Gateway and then set the Boot Method to Static.

- If you are using a Macintosh, no further configuration should be necessary.

When you are done configuring, click OK.

For a Glossary of Terms used for all the settings in WP-Admin, see chapter 11.

> **Note**: If you are using DHCP on your network, the EtherWind may have acquired valid IP settings at this point and no further configuration is necessary. This might work well if your DHCP server allows the print server to keep this address permanently, but in most cases, you will want to use a static address outside the range reserved for DHCP (See your DHCP server documentation for details). This is because when you configure your printer port, it will go to a static IP address.

Your Server should be configured correctly at this point. Configuring the EtherWind to print under various operating systems is covered in chapters 4 through 9.

Chapter 6

Management Methods

TROY offers a variety of ways to configure and monitor the EtherWind. These methods are:

WP-Admin Utility

- This utility runs on Windows and Macintosh computers, and is used for initial configuration of the print server and allows you to set the wireless settings as well as the basic network settings including TCP/IP.
- See the previous section (Configuring the EtherWind 802.11b and IP Settings) for detailed use instructions
- Can be downloaded from our web site (www.troygroup.com)
- After initial installation, this utility can be run from the START menu under START>Programs>TROY Group>EtherWind>WP-Admin
- Default password is ACCESS

XAdmin32

- This utility runs on Windows computers and is used for advanced configuration of the print server; it allows you to configure for Netware, TCP/IP, AppleTalk settings and more.
- A 32-bit graphical utility
- Compatible with Windows PC's running TCP/IP or IPX/SPX Protocols
- Included on CD-ROM
- Can be downloaded from our web site (http://www.troygroup.com)
- After initial installation, this utility can be run from the START menu under START>Programs>TROY Group>EtherWind>XAdmin32
- Default password is ACCESS

WebXAdmin

- Allows the user to configure the EtherWind with a standard web browser like Netscape Navigator or Microsoft Internet Explorer.
- No additional software is needed on the system.
- Can be used on any system that supports web browser capabilities.
- Simply type the IP address into your web browser address bar to connect
- Default password is ACCESS

*Both the EtherWind and the PC must be configured with an IP address and your browser must be configured to work across a LAN in order to use WebXAdmin.

EtherWind Console

- A command-line oriented console
- Contains features not available through WP-Admin, Xadmin32 or WebXAdmin

- Default password is ACCESS.
- Can be accessed via:
  - TELNET
  - DEC NCP
  - DEC NCL
  - ULTRIX ccr
  - TROY XCD XConfig NetWare Utility
  - Serial port
  - WebXAdmin

  Note: In all cases, when you are connected, hit RETURN or ENTER to get the "#" prompt, enter password ACCESS (it will not echo) and type anything in response to the "Enter Username>" prompt. When you get the "Local>" prompt, you are ready to enter commands.

HP JetAdmin

- HP Windows-based utility (TROY EtherWinds work transparently with JetAdmin).
- Can be downloaded from the HP web site (http://www.hp.com)

  Note: The TROY EtherWind will not appear in the list of configured servers unless TCP/IP or IPX is running on the computer.

HP Web JetAdmin

- An HP utility for Windows NT Advanced Server and Windows 2000
- Can be downloaded from the HP web site (http://www.hp.com).

Once it is installed, a web browser on any computer that has access to the Windows NT/2000 server may be used to access the TROY EtherWind.

Chapter 7

Microsoft Windows Network Configuration

The EtherWind includes the easy-to-use ExtendNet Connect IP Monitor software for printing from Windows computers over an 802.11b wireless link. This software creates a network port on the Windows system, which acts like a normal parallel port. As a result, it works transparently with any standard Windows printer driver and application program. Because this software uses the industry-standard TCP/IP protocol, it can be used with IP routers and other IP-based equipment.

Installing the Software

1. Install the ExtendNet Connect IP Port Monitor by inserting the EtherWind CD, selecting Install EtherWind Utilities, then Install ExtendNet Connect Port Monitor. Follow the on-screen instructions to complete this installation.

2. Install the printer driver software according to the documentation for the printer.

3. Click the Windows Start button, select Settings, and then Printers.

4. Right-Click on the printer you wish to associate with the network port, and select Properties.

5. If you are using Windows NT/2000/XP, go to the Ports tab. If you are using Windows 95/98/ME, go to the Details tab.

6. Click on Add Port.

7. If you are using Windows NT/2000/XP system, highlight Troy Group ExtendNet Connect IP Monitor, and click New Port.

8. If you are running Windows 95/98/ME, select Other, highlight Troy Group ExtendNet Connect IP Monitor, and click OK.

9. The search will begin for available print servers, highlight the print server you would like to create the port for, and click ADD.

10. Make sure the port you created is chosen and click Apply.

You are now ready to print.

Additional Windows Configuration Methods

EtherWind servers are also compatible with other methods of printing from Windows. These include the Standard TCP/IP Port option in Windows 2000/XP, and the LPR Port option in Windows NT that are built into the operating system. In addition, you can download the NetBEUI/NetBIOS Port monitor from the TROY Wireless web site (www.troygroup.com), or use TROY's PrintraNet Port monitor for printing across the Internet (see chapter 10).

Chapter 8

AppleTalk Network Configuration

The EtherWind runs over wireless Ethernet (also known as Ethertalk). This capability allows Macintosh computers to print jobs to a printer simultaneously with jobs from Windows, NetWare, and other computers.

The print server will appear as a shareable printer node on an Appletalk Phase 2 network. The print server broadcasts information to Macintoshes on the network and automatically appears in the Chooser on each Macintosh. Application programs can print without any modification or special software on the Macintosh.

Configuring the Macintosh

1. Identify the printer to which the print server is connected, and install the printer driver.

2. Verify that Airport is enabled from the Network Control Panel or AppleTalk Control Panel if you are using an Airport enabled Macintosh. If you are using a Macintosh connected to an Airport base station (or other Wireless Access Point) via the wired Ethernet, you will want to be sure Ethernet is selected.

Setting Up Printing (MacOS 8.x and 9.x)

1. At a Macintosh workstation, from the Apple menu, open the Chooser.

2. If the Chooser window displays an AppleTalk zone list, select the necessary zone.

3. Click on the icon for the printer driver you are going to use. If you have a Postscript printer, you can use the LaserWriter driver.

4. Select the print server name (the default is XCD_xxxxxx_P1_AT, where "xxxxxx" are the last six digits of the Ethernet address.).

5. Close the Chooser. You can now print to the printer using any standard Macintosh application program.

Setting Up Printing (MacOS X)

1. If you haven't done so already, set the name of your computer by going to the Applications folder*, selecting System Preferences, and then Sharing. Type in the computer name in the Network Identity section (you can also set the IP address here if you want).

2. Turn on the Airport and AppleTalk by clicking on the Applications folder and then clicking on Network. Next to Configure: select either Airport or Built-in Ethernet, depending on which network port you are using (you can leave the Location: setting as Automatic).

3. If you are using the Airport card, select the SSID of the wireless network as the Preferred Network. If there is a network password enabled, enter it here.

4. Then click on the AppleTalk tab, make sure that the box next to Make AppleTalk Active is checked. If necessary select the appropriate AppleTalk Zone. You can leave the Configure: setting as Automatically.

5. Now go to the Applications folder, open the Utilities folder, and select Print Center. The Printer List will appear (it will be empty if you have no printers configured). Click on Add Printer... and then select AppleTalk instead of Directory Services.

6. All of the available AppleTalk printers on the network should appear. Click on the one you wish to add, and then click Add. The printer will now appear in the Printer List.

7. To print from an application program, go to File and then Print, select the desired printer, and then click on Print.

   Note: that the Applications folder can generally be reached by double clicking on the Macintosh HD icon on the desktop.

Chapter 9

NetWare Network Configuration

Configuring the Print Server and Print Queue with XAdmin32 (Queue Server Mode)

This section covers installation using the Novell client.

> **Note**: TROY recommends you use the Novell 32-bit client on your Windows workstation instead of the Microsoft NetWare client, because it allows direct configuration of print queues without the need for a Novell utility like NWAdmin or PCONSOLE.

The EtherWind automatically makes itself known on a NetWare network. The default NetWare Print Server name is XCD_xxxxxx_P1, where "xxxxxx" is the last six digits of the Ethernet address (the Ethernet address is on a label that is affixed to the EtherWind). Note that the NetWare Print Server name is used for either NDS or bindery mode configuration.

If you are configuring the first port with XAdmin32, the NDS Printer Name for this port is automatically assigned as "XCD_xxxxxx_P1 Printer". If you are using an alternate configuration method like NWAdmin, you may assign any unique name for the printer.

The Print Server and Printer names are used extensively during the configuration process, so be sure to remember them. Note that these names are actually the names of the print server's NetWare services. If desired, you can change the default names using XAdmin32 or WebAdmin.

Follow these steps to configure the queue server:

1. Make sure you are logged in as ADMIN or equivalent (NetWare 4.xx and above) or SUPERVISOR (NetWare 2.xx and 3.xx).

2. Click Start, select Programs, select the XAdmin32 folder, and then select XAdmin32.

3. Click on the IPX/SPX icon under Filters to set the operating mode to IPX/SPX (TCP/IP mode will not allow you to configure NetWare print queues directly). The EtherWind should appear in the list of available printers. If it does not, try selecting Devices from the menu bar and then Search Active Devices.

4. Double click the printer you want to configure, enter the configuration password (ACCESS is the default), and click OK.

5. A series of index card tabs will be displayed. Click on the NetWare P1 tab.

6. If it is not already selected, select Queue Server as the operating mode.

7. Click on the inverted triangle button and select the NDS tree.

8. Click the Change... button to select the NDS context where the queue will reside. (If you are using the Microsoft client, you must type in the name of the context.)

The box labeled "Print Server" contains the name of the NetWare Print Server. If you are configuring any other port, this box contains the name of the NDS Printer. If desired, you can change these names.

You may now create a print queue. Follow these steps:

1. Click on the Change NDS Queues... button to configure an NDS print queue or click the Change Bindery Queues... to configure a bindery mode queue.

2. Two windows will appear: Available Print Queues and Serviced Print Queues. Go to the Available Print Queues window.

3. If you are configuring an NDS queue, click on the context where the print queue will reside.

4. If you are configuring a bindery queue, click on the volume where the queue will reside (a volume name will have a file server icon next to it).

5. Click on New Queue. Enter any unique name for the Queue name.

    - If you are configuring a bindery queue, click OK and proceed to step 8.
    - If you are configuring an NDS queue, click Browse, select the file server volume where you want the queue to reside (a volume name will have a file server icon next to it), and click OK.

6. The queue name will now appear in the Available Print Queues under the selected volume (for bindery mode) or in the selected context (for NDS mode). Click on the desired queue and click Add.

    The name will now appear in the Serviced Print Queues window.

7. Click Close and then OK. You can now use the print queue from your NetWare workstation.

If you want to configure additional queues and ports, you must use the Novell NWAdmin utility (this program is usually found in the Public directory on the NetWare file server). Follow these steps:

1. Start the NWAdmin utility and make sure you are in the right context. (If not, select NDS Browser from the Tools menu and then browse for the desired context.)

2. Select the container where you want the print queue to reside.

3. Select Print Services Quick Setup from the Tools menu.

4. Browse for the NetWare Print Server by clicking on the button next to the Print Server Name window.

5. Enter the name of the NDS Printer for the desired port in the Name box (for example, XCD_04ECBA_P1).

6. The Type box should be left at the default Parallel setting.

7. Select the desired banner type.

8. Enter any desired name for the print queue.

9. If necessary, browse for the volume.

10. Click Create to create the print queue. You are now ready to use the queue from a NetWare workstation.

Chapter 10

UNIX Network Configuration

The EtherWind print server appears to the network as a UNIX host computer with a unique IP address running the line printer daemon (lpd) protocol. As a result, any host computer that supports the Berkeley remote-LPR command can spool jobs to the print server without the need for any special software on the host computer.

Important Note:
Before configuring a UNIX print queue, the EtherWind must have a valid IP address.

Berkeley UNIX Host Configuration

Berkeley UNIX host computers include Linux, Digital Equipment Corporation Digital UNIX, OSF/1, and ULTRIX; Compaq Tru64 UNIX; SunOS (not Solaris), SCO UNIX; and many others. Sun Solaris, HP/UX, IBM AIX users should skip to the appropriate sections later in this manual.

Important Note:
Do not use the Linux X-Windows graphical user interface printer configuration utility, because it does not work with TROY print servers. Instead, Linux users should follow the configuration steps listed in this section.

Important Note:
SCO UNIX users should use the rlpconf command to create a printer and automatically configure the /etc/printcap file (you will still need to edit the /etc/hosts file). Enter the print server's service name (XCD_xxxxxx_P1) as the name of the printer (refer to the print server self-test for the exact name of this service), and enter the name of the print server that you assigned in the /etc/hosts file as the remote host name; note that because this name must be unique for each printer, we recommend using the XCD_xxxxxx_P1 service instead of the normal BINARY_P1 service.

1. Edit the /etc/hosts file: (or equivalent local host table). For example:

```
192.189.207.33          xcdprinter
```

2. Edit the printcap file: An example of a typical entry in the printcap file is:

```
LaserPrinter:\
        :lp=:\
        :rm=XCD:\
        :rp=BINARY_P1:\
        :sd=/usr/spool/lpd/LaserPrinter:
```

   "LaserPrinter" is the queuename.
   "XCD" matches the name in the hosts file.
   "BINARY_P1" is the print server's service name. (NOTE: Use TEXT_P1 instead of BINARY_P1 for text files.)
   "sd" is the spool directory.

3. Create the spool directory: The lpd spool directory is usually located in the /usr/spool directory. To create a new spool directory, use the mkdir command; for example:

mkdir /usr/spool/lpd/LaserPrinter

4. Print using the standard lpr command:

   lpr –PLaserJet filename

5. For AT&T based UNIX systems, such as SCO, use the standard lp command:

   lp –dLaserJet filename

Sun Solaris Configuration

To use a TROY print server with Sun Solaris, first use the Host Manager in the Admintool utility to add the print server IP address and name to the /etc/hosts file.

1. Click on None - Use /etc files on host
2. Click on Apply
3. Click on Edit and then Add Host
4. Enter the print server name as the Host Name (this name is anything you want, but should not have an "_" character in it).
5. Enter the IP address and Ethernet address of the print server (the Ethernet address has the format aa:bb:cc:dd:ee:ff)
6. Click Add and then close the Host Manager windows

Then use the Printer Manager in the Admintool utility under Open Windows as follows:

- Select Edit
- Select Add
- Select Add Access to Remote Printer
- At the PrinterName prompt, type any desired name for the print queue
- At the Printer Server prompt, type:

  name\!servicename

  (for example, LaserJet\!BINARY_P1), where:
  name matches the print server name as entered in the hosts table.
  servicename is the print service name. For binary graphics files use the service BINARY_P1; for text files use the service TEXT_P1.

- Make sure that the Print Server OS is set to BSD (this is the default setting).
- Select Add
- To print, use the standard lp command; for example:

  lp –dLaserJet filename

  Notes:
- We recommend using the /etc/hosts file for the printer name rather than NIS or other name services.
- Due to a bug in the Sun lpd implementation on Solaris 2.4 and earlier releases, may cause problems printing very long print jobs. The workaround is to configure the EtherWind as an HP JetDirect card using the HP JetAdmin for UNIX software.
- Solaris print queues can also be configured from the UNIX shell using the lpadmin command.

HP/UX Configuration

To configure a print server using HP/UX 10.x, use the sam program and execute the following steps:

1. When you get a list of options, select Printers and Plotters.
2. Select LP Spooler.
3. Select Printers and Plotters.
4. Select Actions and then Add Remote Printer/Plotter.
5. Enter any name as the Printer Name (this will be the name of the print queue).
6. Enter the IP address of the print server as the Remote System Name.
7. Enter the desired print server service name (BINARY_P1 for binary files or TEXT_P1 for text files) as the Remote Printer Name.
8. Check the box next to Remote Printer is on BSD System.
9. You may accept the default values for the remaining items.
10. Click OK to configure the printer.
11. You should now be able to print using the lp -d command with the printer name.

Notes:

- The configuration for HP Distributed Print Services and for earlier versions of HP/UX is slightly different.
- The print server can also be configured as a JetDirect card using HP/UX. To do this, you will need the HP UNIX Host Printing Software (part of HP's JetAdmin for UNIX).

IBM AIX Configuration

To configure a print server on IBM AIX 4.x, use the SMIT program as follows:

1. Enter smit and select Devices
2. Select Printer/plotter
3. Select Manage remote printer subsystem
4. Select Client services
5. Select Remote printer queues
6. Select Add a remote queue
7. Enter the following remote queue settings:
    - Name of queue to add (user selectable)
    - Activate the queue (Yes)
    - Destination host (EtherWind IP address; or if you have configured the /etc/hosts file, use the name of the print server that you specified in that file)
    - Name of queue on remote printer (BINARY_P1 for binary files or TEXT_P1 for text files)
    - Name of device to add (user selectable; for example lp0)
8. You should now be able to print using the normal lp -d command.

Notes:

- The configuration for earlier versions of AIX is slightly different. Refer to the Administrator's Manual on the CD-ROM for details.
- The print server can also be configured as a JetDirect card using AIX. To do this, refer to your AIX documentation.

Configuration on Other Systems

The EtherWind can be used with any computer system that supports either the lpr/lpd protocol or the HP JetDirect card (the EtherWind parallel port is port 9100 while the serial port is port 9101). Refer to your system's documentation for information on configuring lpr/lpd or JetDirect print queues.

Chapter 11

DEC LAT Network Configuration

The EtherWind wireless print server acts as a node on an Ethernet network that offers printing services to other devices. The print server comes preconfigured to run on a LAT network and does not require any additional setup.

Each print server has a default node name of XCD_xxxxxx (where "xxxxxx" are the last six digits of the Ethernet address of the unit). The port name is P1 for the EIO, MIO, or first parallel port; S1 for the first serial port, P2 for the second parallel port, and S2 for the second serial port.

VMS LAT Host Configuration

Use the VMS editor to create a text file with the necessary configuration commands to create a LAT application port and then a VMS print queue. For example:

```
$MCR LATCP
CREATE PORT LTAxx:/APPLICATION
SET PORT LTAxx:/NODE=nodename/PORT=port
SHOW PORT LTAxx:
EXIT
$SET TERM LTAxx:/PASSTHRU/PASSALL/-
TAB/NOBROADCAST/PERM
$SET DEVICE/SPOOL LTAxx:
$INIT/QUEUE/START/ON=LTAxx:/-
PROC=LATSYM queuename
```

Note:
LTAxx is the available LAT port to be used
nodename is the node name of the print server
port is the port, e.g. P1, S1, P2, S2 & LN
queuename is any unique name for the print queue.

Execute the command file. At the VMS "$" prompt type:

```
@filename
```

where filename is the name of the text file created in step 1.

Note: The @filename command can be included in the system startup file so that the procedure is executed automatically when the system is booted.

Use the VMS PRINT command with the name of the queue and the file you wish to print as shown below:

```
PRINT/QUEUE=queuename filename
```

Note:
queuename is the name of the print queue created in step1.
filename is the name of the file to be printed.

For graphics or PostScript jobs, the form MUST be defined for NOTRUNCATE and NOWRAP to prevent printer errors.

```
DEFINE/FORM DEFAULT/NOTRUNCATE/NOWRAP
```

Chapter 12

Banyan VINES Network Configuration

EtherWind wireless print servers support the Banyan VINES IP protocol to allow printers to be shared on a Banyan VINES network. Users on client PC's send their jobs to any VINES file server running the Banyan PCPrint software, which in turn spools jobs to the print server. Printing is transparent to user applications, and the print server can be managed using standard VINES utilities such as MANAGE, MUSER, MSERVICE and Operator Console.

File Server User Configuration

1. From any VINES workstation log in as supervisor and run the MANAGE program.
2. Select Users, and press ENTER.
3. At the Manage Users screen, select Add a User.
4. Type in a StreetTalk name for the print server, (entering a password is optional). Press F10 when finished.
5. From the Add User Profile screen select a blank user profile.
6. Enter NO in response to the message "Do you want to force the user to change passwords on the next login?". Press ENTER
7. Press ESCAPE twice to return to the main menu.

File Server Queue Configuration

1. Run the MANAGE utility, and from the main menu select 1-Services.
2. From the Manage Services menu, select Add a server-based service and press ENTER.
3. From the Add a Service screen type the desired StreetTalk name for the print queue and press ENTER, followed by a description and press ENTER.
4. Select the desired File server and press ENTER.
5. Select the disk where the print service will reside.
6. Press F10 in response to the message "The service is running but not yet available to users."
7. Type in the maximum number of jobs and maximum size of job for the queue at the Configure Queue screen. Or press F10 for unlimited number and size.
8. If desired choose a default paper format at the Configure Paper Formats screen, otherwise press F10 to select the default settings.
9. If desired enter the authorized user names at the Access Lists screen, or press F10 for the defaults.
10. At the Add a Destination screen, select PCPrint and press ENTER.
11. At the Destination Attributes screen, enter the StreetTalk name of the print server. Press F10.
12. At the Output Strings screen, press F10 to accept the output string values.
13. At the Enable Strings screen, press F10 to select the defaults.
14. Select NO in response to the message "Would you like to add another destination at this time?"
15. At the Print Queue Status screen, change both values to Yes to enable the print queue to accept and print jobs. Press F10.
16. Press ESCAPE multiple times to exit the Manage utility.

Print Server Configuration

1. Install the XAdmin software from the CD-ROM provided with the print server.

Note: Use XAdmin, not XAdmin32, when configuring a VINES-only network. You can use XAdmin32 on a VINES network only if the PC is running TCP/IP and both the PC and print server have valid IP addresses.

2. Double-click on the XAdmin icon to start the program under Windows.
3. The print server will show up as "XCD_xxxxxx_P1" where "xxxxxxx" is the last six digits of the Ethernet address.
4. Click on the Configure button.
5. Click on the Banyan tab.
6. If necessary change the hop count (default hop count is 2).
7. Enter the StreetTalk name of the print server, this must exactly match the StreetTalk name of the user that was created using the Manage Users utility.
8. Click on the Services tab.
9. Select the desired service to be configured, (default is BINARY_P1).
10. Enter the StreetTalk name of the queue created using the Manage Services utility.
11. Click on OK, and then OK again to save the configuration.
12. Click OK and OK again to exit XAdmin

Chapter 13

PrintraNet Internet Printing Configuration

TROY's PrintraNet product is a software driver for Windows that allows a PC user at one location to send a print job to a printer connected to an EtherWind wireless print server at a remote location across the Internet in a simple and transparent manner.

For example, a user on a PC in New York could print a document directly from his Microsoft Excel application program to a printer in Chicago. The PC may be attached to a Local Area Network, or it may be connected via a dial-up PPP link to an Internet Service Provider. Because of the low cost of accessing the Internet, the PrintraNet software can save the user a significant amount of money in toll charges, particularly when international communications is involved.

A new PrintraNet feature allows a user at a remote site to send a text E-mail message directly to a printer connected to a TROY print server at a remote site. The E-mail will be automatically printed on the printer without the need to run an E-mail program at the remote site.

There are two parts to the PrintraNet configuration, the configuration of the local Windows PC and the configuration of the remote EtherWind print server.

Installing the Software on a Windows PC at the Local Site

You may configure the local Windows PC to communicate over a LAN using the MAPI or WINSOCK protocol, or to communicate over a dial-up PPP connection to an Internet Service Provider.

To install the PrintraNet software on a Windows PC, execute the following steps:

1. Make sure that the PC is running an E-mail program (for example, Microsoft Outlook) that is capable of sending E-mail messages using either MAPI or WINSOCK. MAPI (Messaging Applications Program Interface) is used by most popular Windows E-mail packages, while WINSOCK is used by TCP/IP-based mail packages and dial-up Internet Service Providers. If you do not know which method you are using, consult your system manager.

2. Make sure that your E-mail server is capable of sending messages across the Internet. Alternatively, if you are communicating directly from the PC via a modem to an Internet Service Provider, make sure that you have an Internet mail account on the ISP, and that the PC is configured to send E-mail using this account.

3. Start the PrintraNet installation program from the CD ROM and follow the step-by-step instructions. You will need to know the following:

    - The mail transport protocol: MAPI or WINSOCK
    - The port name you wish to assign to the PrintraNet port (this port is used to access the remote TROY print server): The name must start with "PNET" and end with a number (for example, PNET3"). Note that each remote EtherWind print server must have a unique port name associated with it.
    - E-Mail Address: Enter any unique legal Internet E-mail address for the remote EtherWind print server (for example, emailprinter@xyz.com). Note: Internet E-mail addresses cannot have spaces in them.

- Service Name: Enter the service name on the remote EtherWind print server that you wish to use for printing. This is normally XCD_xxxxxx_P1 for the first parallel port, XCD_xxxxxx_S1 for the first serial port, XCD_xxxxxx_P2 for the second parallel port, or XCD_xxxxxx_S2 for the second serial port., where "xxxxxx" is the last six digits of the Ethernet address (the exact service names can be found by running the print server self-test). If you do not know the service name, you may leave this field blank and the default binary service will be used.
- Your E-Mail Address (WINSOCK users only): enter your E-mail address (for example, shari@abc.com).
- SMTP E-Mail Server (SMTP users only): Enter the IP address of your SMTP E-mail server (consult your network administrator if you do not know this address).
- Desired Notification: You may optionally have the remote EtherWind print server notify you when the job is complete or when the job fails or both when the job is complete and if it fails. Select the desired option and then enter the E-mail address where you want the notification sent (generally you would want the notification sent to your own E-mail address).

4. You must now create a printer on your Windows system using the standard Windows printer setup procedure. To do this, go the Start button, select Settings and then Printers. Select Add Printer to begin the printer installation and follow the instructions on the screen.

5. Select Local Printer or My Computer (not Network Printer) when you are asked how the printer is connected to your computer.

6. You will also need to know the following

    - The manufacturer and model of the printer at the remote site (for example, Hewlett-Packard LaserJet 5). In some cases, you will need to provide a disk with the appropriate printer driver.
    - The name of the PrintraNet port that you defined for the remote EtherWind print server in step 3 (PNET1 by default).

7. With PrintraNet 2.0, you can also:

    - Click on the Address Book button to configure other remote destinations. This capability lets you send print jobs to more than one destination without having to create a separate printer for each destination.
    - Select the partial E-mail printing option to break up the print job into several small E-mail messages. This allows PrintraNet to work with mail servers that restrict the size of incoming E-mail messages.

8. Select No when asked if you want to print a test page, unless you have already configured the remote EtherWind print server to receive PrintraNet print jobs.

You have now finished installing the PrintraNet software. If you have only one E-mail printer, go to Step 2, Configuring the Remote EtherWind Print Server.

Adding a Second PrintraNet Destination

You should not re-run the install program to add a new E-Mail printer port. Instead, press the Start button, select Settings, and open the Printers window. Click on the icon of a PrintraNet printer, select File from the menu bar, and then choose Properties. Click on the Details tab (or Ports tab) and push the Add Port button.

In the Add Port dialog, select the Other radio button and then "PrintraNet Port". Click on OK and it will give you the Port Name dialog (like in the install program). Any unique name can be given here as long as it starts with "PNET" and another port does not already exist with the same name. Then enter the port settings as described in step 3 of the Installing the Software on a Windows PC at the Local Site section.

Configuring the Remote TROY Print Server

The next step is to configure the EtherWind print server at the remote site. The remote print server can be configured with TROY's XAdmin32 Windows configuration utility, or with the EtherWind WebXAdmin browser-based facility.

Before configuring the print server to receive PrintraNet print jobs, check the following:

1. Make sure that the E-mail server at the remote site (the receiving end) is configured to handle the TCP/IP POP3, and SMTP protocols (SMTP is only required if the notification feature is enabled).

2. Configure the POP3 server on the E-mail server at the remote site with a mail account and password for the remote printer (generally, the mail account name will be the first part of the name that you assigned in step 3 of the previous section; for example, if you assigned the name emailprinter@xyz.com, the account name would be emailprinter). The procedure for configuring a POP3 server varies depending on the operating system of the E-mail server, so consult your operating system documentation for details.

3. Make sure that the EtherWind print server is installed and running with TCP/IP enabled and has a valid IP address assigned to it.

Because access to the E-mail server on most networks is usually restricted, you may need to have your network administrator check the configuration and add the mail account.

WebXAdmin allows the print server to be managed by any standard web browser using the TCP/IP protocol. In order to use WebXAdmin, IP address must be assigned to the print server and to the PC used for configuration.

The steps required to configure the print server to receive print jobs from a Windows PC running the PrintraNet software are as follows:

1. Select the name of the desired EtherWind print server from the list by double clicking on it (XAdmin32) or entering its IP address (WebXAdmin).

2. Click on the Internet tab or button.

3. Enter the IP address of the POP3 server (consult your network administrator if you do not know this address).

4. Enter the mailbox name for the remote EtherWind print server. Usually this will be the first part of the E-mail address that you entered in step 3 of the Installing the Software on the Windows PC at the Local Site section (for example, if the E-mail address of the remote print server is emailprinter@xyz, then the mailbox name would be emailprinter.

5. Enter the password for the mailbox, if any.

6. The print server is configured by default to poll the POP3 server every 30 seconds. You may change this value, if desired.

7. If you have enabled notification, enter the IP address of your SMTP server (consult your network administrator if you do not know this address).

8. Press the OK button., and exit XAdmin32. You have now configured the print server to receive print jobs.

Printing to the Remote TROY Print Server

To print to the remote EtherWind print server from the local Windows PC, you simply select the printer that you created in Step 1 and print to it the normal manner. For example, to print the remote printer named Email Printer, you would select Print from the menu bar, choose the printer named Email Printer, and then click OK.

At this point, the Port Settings dialog box will appear (you may disable this by unchecking the Show this dialog for each Print Job box). You may then use the Address Book capability or change other parameters. Click OK when you are ready to print, and the job will then be sent over the Internet to the remote EtherWind print server.

Troubleshooting

The first step in troubleshooting is to make sure that you have a valid E-mail connection on both the sending PC and the receiving print server. Try sending an E-mail message from the PC to a user at the remote site who can receive mail via the POP3 server. If this does not work, there may be an E-mail configuration problem on the PC, on the local E-mail server, or on the remote POP3 server. Double check to make sure that the E-mail parameters that you configured on the PC and on the remote print server match those that are configured on the E-mail servers.

If you get an SMTP error when using a WINSOCK connection, you may need to configure the hosts file on your Windows system. To do this create a file named HOSTS in the \WINDOWS\SYSTEM directory (or edit this file if it already exists) and add an entry for your mail server similar to the following using the DOS editor (substitute the actual IP address and name of your SMTP mail server):

```
192.189.207.222          mail.troy.com
```

If you can print small files OK but are having trouble printing large files, the problem may be in the E-mail system. Some E-Mail systems have difficulties printing files that are larger than about 400KB in length. To verify this, try sending the large file as an attachment to an E-mail message. If the file does not reach its destination intact, then the problem is with the E-Mail system. The problem can be fixed by using the PrintraNet Partial E-mail Printing option.

Appendix A

Console Commands

Although it is not normally necessary to change the TROY Wireless Print Server default parameters, you can change the configuration through any following methods, if you prefer a GUI (Graphical User Interface) utility, you can use TROY Wireless 's XAdmin32 or WebXAdmin to take advantage of almost all the features in the remote console:

GENERAL SERVER COMMANDS

`CLear FAtal`
Deletes fatal error log

`CLear PAssword`
Remove console password

`CLear POrt` *`portname`* `JOB`
Clears current entry in the print server's internal queue for the specified portname (P1 for the first parallel port, S1 for the first serial port, P2 for the second parallel port, and S2 for the second serial port)

`CLear SERVEr STRing n`
Remove BOT/EOT string (see Appendix B)

`EXIT/^D`
Exits print server console

`HElp`
Provides information on available commands

`SET DEFAULT`
Sets print server parameters to factory defaults

`SET LOAD DIsable`
Disables firmware reload after exit

`SET LOAD ENable`
Enables firmware reload after exit

`SET LOAD HOst <name>`
Sets node name of boot host for (NetWare firmware load)

`SET LOAD IP aa.bb.cc.dd`
Sets IP address of load host (TCP/IP firmware load)

`SET LOAD SOftware <filename>`
Sets host filename of firmware to load

`SET LOAD XModem`
Begins XModem serial download of new firmware

`SET PAssword <password>`

Sets console password (default password is ACCESS)

`SET PORT <parallelportname> BIDir  [EN|DIS]`
Enables/disables bidirectional communications on parallel port, where <portname> is P1 for first parallel port or P2 for second parallel port

`SET PORT <parallelportname> DMA  [EN|DIS]`
Enables/disables DMA support on parallel port (not available on Pony Print Server Plus or XConnect II Lite)

`SET PORT <parallelportname> FSTB [EN|DIS]`
Enables/disables fast strobe mode support on parallel port

`SET PORT <parallelportname> NBUF [EN|DIS]`
Enables/disables no buffer support on parallel port

`SET PORT <serialportname> FLow [NO|XO|CT|DS]`
Set serial port flow control to NONE, XON/XOFF, CTS, or DSR

`SET PORT <serialportname> PArity <parity>`
Set serial port parity to NONE, EVEN, ODD, MARK, or SPACE

`SET PORT <serialportname> SIgnal [EN|DIS]`
Ena
`SET PORT <serialportname> SPeed <baudrate>`
Sets serial port baud rate.

`SET PORT <serialportname>  STop [1|2]`
Sets serial port stop bits per character

`SET PROtect <password>`
Set console protection password to prevent access to SET commands (use UNPROTECT command to access SET commands)

`SET SERVEr DEscription`
Sets node description string displayed with SHOW SERVER command

`SET SERVEr STRing n "..."`
Defines server BOT/EOT string (see Appendix B)

`SET SERVIce <servicename> <protocol>  [EN|DIS]`
Enable or disables specified protocol on the specified service.

`SET SERVIce <servicename> BOT nn`
Set service BOT string to nn (see Appendix B)

`SET SERVIce <servicename> EOT nn`
Set service EOT string to nn (see Appendix B)

`SET SERVIce <servicename> FIlter nn`
Set service filter to nn (see Appendix B)

`SET SERVIce <servicename> FMS nn`
Sets filter 1 match string to nn

`SET SERVIce <servicename> FRS nn`

Sets filter 1 replace string to nn

`SET SERVIce <servicename> NAme <newname>`
Changes service name

`SET SERVIce <servicename> POrt <portname>`
Change service port (<portname> is P1 for the first parallel port, S1 for the first serial port, P2 for second parallel port, and S2 for the second serial port

`SET SERVIce <servicename> RECeive [EN|DIS]`
Set receive only mode on specified service

`SET SERVIce <servicename> TCP nn`
Sets TCP port number of service

`SHow FAtal`
Show fatal error log

`SHow FRee`
Shows memory available

`SHow LOAd`
Shows firmware update parameters

`SHow POP3`
Shows POP3 parameters

`SHow POrt`
Shows port parameters

`SHow POrt <name> STA`
Shows current port status.

`SHow SERVEr`
Shows server and LAT parameters

`SHow SERVEr COunters`
Shows server statistics

`SHow SERVEr QUeue`
Shows print server internal queue

`SHow SERVIce`
Shows service Parameters

`SHow SMTP`
Shows SMTP parameters

`SHow SNMP`
Shows SNMP variables

`SHow TEstpage`
Prints test page

`SHow VErsion`
Shows server firmware version

`UNPROtect`
Allows system manager to temporarily access SET commands when remote console is in protected mode (See SET PROTECTION command). The SET DEFAULT command can be used to permanently disable the protected mode.

`ZEro`
Zeroes statistical counts

AppleTalk Commands

`SET APpletalk [EN|DIS]`
Enables or Disables Appletalk Processing

`SET APpletalk ZOne "<name>"`
Set Appletalk zone name

`SET LOCaltalk [EN|DIS]`
Enables/disables LocalTalk port

`SET APpletalk [EN|DIS]`
Enables/disables Appletalk processing

`SET SERVIce <servicename> APP [EN|DIS]`
Enables or disables AppleTalk jobs on specified service

`SET SERVIce <servicename> ATYPE <string>`
Sets AppleTalk type

`SET SERVIce <servicename> RECEIVE [EN|DIS]`
Enables or Disables bidirectional communications on service.

`SHow APpletalk`
Shows AppleTalk parameters

`SHow LOCaltalk`
Shows LocalTalk parameters

Banyan VINES Commands

`CLEAR BANYAN PAssword <password>`
Clears Banyan login password

`CLEAR SERVIce <servicename> STreettalk`
Disables the Banyan protocol on the specified service

`SET BANyan LOgin <loginname>`
Sets StreetTalk login name of print server

`SET BANyan PAssword <password>`
Sets login password of print server

`SET SERVIce <servicename> STreettalk <queuename>`
Enables the Banyan protocol on the specified print server service and associates this service with the StreetTalk name of a given print queue the VINES file server

`SET BANyan HOp nn`
Sets number of hops between the print server and the Banyan file server (default value is 2)

`SET BANyan [EN|DIS]`
Purpose: Enables or disables Banyan protocol on print server. Banyan is enabled by default

`SET BANyan TImeout` *`nn`*
Sets job timeout (in seconds)

`SHow BANyan`
Shows Banyan protocol settings and statistics

DLC/LLC Commands

`SET DLC [EN|DIS]`
Enables/disables DLC/LLC protocol

`SHOw DLC [EN|DIS]`
Shows DLC/LLC parameters

LAT Commands

`CLear/PUrge/DELete SERVEr GRoup` *`number`*
Removes LAT group membership

`SET LAT RB nn`
Sets LAT receive buffer size (0-5)

`SET LAT TB nn`
Sets LAT transmit buffer size (0-5)

`SET/DEFine/CHange SERVer GRoup mm[-nn]`
Add to current LAT group membership

`SET/DEFine/CHange SERVEr KEepalive nn`
LAT keepalive timer (sec)

`SET/DEFine/CHange SERVEr NAme <name>`
Sets LAT Node name

`SET/DEFine/CHange SERVEr TImeout nn`
LAT inactivity timeout (sec)

`SET/DEFine/CHange SERVEr TRansmit nn`
LAT transmit interval (msec)

`SET/DEFine/CHange SERVIce <servicename> LAT [EN|DIS]`
Enables/disables LAT jobs on specified service

`SHow LAT`
Shows LAT parameters

NetBIOS/NetBEUI Commands

`CLear NETBios DOMain <domainname>`
Clears domain name

`SET NETBios DOMain <domainname>`
Sets NetBIOS domain name

`SET NETBeui [EN|DIS]`
Enables or disables NetBEUI

`SET NETBios MEthod <type>`
Sets method of getting WINS server address

`SET NETBios PRimary aa.bb.cc.dd`
Sets IP address of primary WINS server

`SET NETBios SEcondary aa.bb.cc.dd`
Sets IP address of secondary WINS server

`SET SERVIce <servicename> NETBeui [EN|DIS]`
Enables or disables NetBEUI on service

`SHow NETBios`
Shows NetBEUI/NetBIOS parameters

NetWare Commands

`CLear NETWare SErver <server>`
Removes specified NetWare file server from print server access list.

`CLear NETWare QServer <fileserver> ON <servicename>`
Removes queue server mode on service

`CLear SERVIce <servicename> CONtext`
Remove NDS context

`CLear SERVIce <servicename> TREE`
Remove NDS tree

`SET NETWare ADvertise n`
Sets advertising frequency of print server

`SET NETWare [EN|DIS]`
Enables/Disables Netware protocol on print server

`SET NETWare FRame [802.2|802.3|ETH|AL|AU|SNA]`
Sets Netware frame type to 802.2, 802.3, Ethernet II, ALL, AUTO, or SNAP

`SET NETWare NEtwork n`
Sets Netware internal network number

`SET NETWare NPrinter <pserver> n ON <service>`
Set NPrinter mode on service

`SET NETWare PAssword  <psw>`
Sets print server login password for file server

`SET NETWare POlling n`
Sets queue polling time in seconds

`SET NETWare QServer <fileserver> ON <service>`
Sets Queue Server mode on service

`SET NETWare Rescan`
Rescans file servers for new queues

`SET NETWare SErver <name> [EN|DIS]`
Enables file server

`SET SERVIce <servicename> CONtext <string>`
Sets NDS context

`SET SERVIce <servicename> NETW [EN|DIS]`
Enables or disables NetWare jobs on specified service

`SET SERVIce <servicename> TREE <string>`
Sets NDS tree

`SHow NETWare`
Shows NetWare parameters

PrintraNet Commands

`SET POP3 ADdress aa.bb.cc.dd`
Sets POP3 server IP address

`SET POP3 [ENable|DISable]`
Enables/disables POP3

`SET POP3 POlling nn`
Sets POP3 server polling frequency

`SET POP3 NAme <name>`
Sets POP3 mailbox

`SET POP3 PAssword <password>`
Sets POP3 mailbox password

`SET POP3 TImeout nn`
Sets POP3 message timeout

`SET SMTP ADdress aa.bb.cc.dd`
Set SMTP server IP address

`SET SMTP [ENA|DIS]`
Enables or disables SMTP protocol

SNMP Commands

`CLear SNMP CONtact <string>`
Removes SNMP SysContact

`CLear SNMP LOCation <string>`
Removes SNMP SysLocation

`SET SNMP GETCOMM  <string>`
Gets SNMP community

`SET SNMP SETCOMM1 <string>`
Set SNMP community 1 name

`SET SNMP SETCOMM2 <string>`
Set SNMP community 2 name

`SET SNMP CONtact  <string>`
Set SNMP SysContact

`SET SNMP LOCation <string>`
Sets SNMP SysLocation

`SET SNMP JETADmin [EN|DIS]`
Enables or disables JetAdmin

TCP/IP Commands

`SET IP ACcess [EN|DI|ALL] aa.bb.cc.dd {MAsk ee.ff.gg.hh}`
Allows or prevents specified IP address from accessing print server.

`SET IP ADdress aa.bb.cc.dd`
Sets IP address of print server

`SET IP BAnner [EN|DIS]`
Enables or Disables trailing banner page for lpr/lpd jobs

`SET IP BOot n`
Number of DHCP/BOOTP/RARP tries

`SET IP CHKSUM [EN|DIS]`
Enables or disables IP receive checksum

`SET IP [EN|DIS]`
Enables or Disables IP Processing

`SET IP FTime [EN|DIS]`
Enables or disables fast timeout

`SET IP KEepalive n`
Sets IP keepalive timer in minutes

`SET IP MEthod [AUTO|BOOTP|RARP|STATIC]`
Sets method of getting IP address

`SET IP PIng aa.bb.cc.dd`
Test connection to IP host

`SET IP RArp nn`
Sets procedure used by print server when obtaining its IP address. By default the IP address is set along with a default subnet mask and a router address that is the same as the address of the load host. By setting nn to 1, the subnet mask is not set. If nn is set to 2, the router address is not set. If nn is set to 3, neither the subnet mask nor the router address is set.

`SET IP REtry [EN|DIS]`
Sets lpd retry continuation

`SET IP ROuter aa.bb.cc.dd`
Sets default router address

`SET IP SUbnet aa.bb.cc.dd`
Sets subnet mask

`SET IP TImeout n`
Sets inactivity timeout (minutes)

`SET IP WIndow nn`
Sets LPD/TCP maximum window size

`SET SERVIce <servicename> IP [EN|DIS]`
Enables or disables TCP/IP jobs on specified service

`SET SERVICE <servicename> TCP` *`nn`*
Sets TCP port number (>1023) on service

`SHow IP`
Shows LPD/TCP/TELNET Parameters

`SHow IP ACcess`
Shows IP addresses that are allowed to access print server bles/disables DTR signal check on serial port

802.11b Wireless Commands

`SET ENet MOde[IN|AD|PS]`
Sets the 802.11b wireless mode to Infrastructure, Ad-Hoc (802.11), or Pseudo Ad-Hoc

`SET ENet SSid "<ssid>"`
Sets the 802.11b wireless SSID, sometimes referred to as Network Name. Use double-quotes if you are using a space in the SSID

`SET ENet WEP <DISable|64|128>`
Sets the Wired Equivalent Privacy encryption level to either Disabled, 64-Bit, or 128-Bit

`SET ENet KEY# <1|2|3|4>`
Sets which WEP key number is to be used. Default value is 1

`SET ENet KEYVALue` *`wepkey`*
Sets the 10 digit (for 64-bit WEP) or 26 digit (for 128-bit WEP) WEP Key Value. This key must be a Hexadecimal value

`SET EN CHannel nn`
Sets the 802.11b Wireless Channel to be used

`SET EN SPeed <1|2|5|11>`
Sets the 802.11b wireless speed in Mbps to 1, 2, 5.5, or 11

Appendix B

Troubleshooting and Maintenance

Troubleshooting Wireless Configuration Problems

- Make sure your computer's wireless adapter and/or access point is configured properly and note the settings paying special attention to the wireless mode, SSID or network name, WEP or security, and IP Address settings so you can configure your print server to the same wireless settings.

- Make sure you have a good wireless signal from your PC and from the print server, that the print server is within range (90 meters or 300 feet), and it is away from metal objects and other devices with radio signals (like Bluetooth, Cordless Phones, and Microwave ovens).

- Make sure your computer is set to infrastructure mode if you are connecting through an access point, or ad-hoc (802.11) if you are connecting to the print server without an access point. See the documentation for your wireless adapter for details.

- If you are using WEP (Wired Equivalent Privacy) encryption or security on your wireless network, you will need to temporarily disable WEP on your PC in order to configure the print server. If you are using an access point with WEP enabled and it does not allow non-wep clients to communicate with other non-wep clients, then you will also need to temporarily change the wireless mode of your computer to Ad-hoc (802.11) mode. **Note**: If no computers on your network can be set to Ad-hoc mode, you will need to temporarily disable WEP on your access point. When you are done configuring the print server, you can re-enable WEP on your computer and change the wireless mode back if necessary.

- If you want to use WEP encryption or password protect your wireless network, and your wireless adapter or access point normally uses a password or passphrase instead of WEP, it should allow you to enter 0x followed by a ten digit (for 40-bit or 64-bit WEP) or twenty-six digit (for 128-bit WEP) key in hexadecimal format (0-9 or A-F).

- If you are experiencing slow performance or are having intermittent problems connecting, try changing the RF channel of your wireless network. This can be done in the WP-Admin Wireless Server Configuration screen for the print server. See your wireless adapter and/or access point documentation for more. You will want to change it to at least 3 channels lower or higher than any other wireless networks within range.

Troubleshooting Network Configuration

- If you are using TCP/IP, make sure that your computer and the print server are on the same IP segment or can reach each other with a PING command from the host. The IP Address you assign to the print server must be on the same logical network as your host computers (e.g., if your computer has an IP address of 192.189.207.3, the EtherWind™ print server should have an IP of 192.189.207.x, where x is an integer between 1 and 254), or you must properly configure your router address to work with the print server.

- If your print server is set to Auto or DHCP for obtaining an IP Address, it's possible the print server's IP Address can change. Either configure your DHCP Server to give the print server a

permanent lease, or configure the print server to be on a STATIC address outside the scope of DHCP addresses.

Appendix C

Wireless Server Configuration Screen Fields

Listed below is a description of each of the fields displayed on the Wireless Server Configuration screen and reasonable values for that field. Once these are all set, click OK to close the Configuration Screen and write the changes to the Server. If you decide NOT to CHANGE the values, select CANCEL to close the Configuration Screen and revert to the prior values.

Server Name
This is the name of the wireless print server. The default is XCD_xxxxxx (where xxxxxx are the last six digits of the MAC/Ethernet address). You can choose any name for this setting. Many companies have suggested naming practices; check with your System Administrator or Network Manager for policies and practices.

Serial Number
This is the fixed number which identifies the EtherWind Server. It is set during manufacture and does not change after that.

Password
This is the EtherWind Wireless Print Server configuration password. For security, the password is never shown. (The field displays asterisks (*) if you type characters into it.) You must know the password before WP-Admin will show you the Configuration Screen. Users should only put text into this field if they want to change the password. Ask your System Administrator or Network Manager for the correct password; be sure the Administrator/Manager is informed and concurs BEFORE the password is changed.

Firmware Revision
This is a static string displaying the correct version of the software embedded in the Server. It can not be modified.

IP Address
The IP Address is a set of four bytes, separated by periods. Each byte can have any value between zero (0) and 255 includive. Most company networks have ranges for their IP Addresses. Many have automatic IP set-up, so the IP address may not require configuration. Consult with your network administrator if you are not sure what to put in this field.

WorkGroup/Domain
This is the Microsoft Network WorkGroup or Domain in which you want the print server. If you are using NetBIOS or NetBEUI to print, this value should match the PC from which you are printing.

Subnet Mask
Companies often have ranges of IP Addresses that can be described by one or more Masks. For example, a mask of 255.255.255.0 allows variation in the last position only. (The first three positions are fixed. The last position can be any value between 1 and 255.) Larger organizations may have masks of 255.255.0.0 -- the first two positions are static and the last two positions are variable. If the IP Address is set automatically, this mask may also be defined automatically.

Boot Method
This is the method the wireless print server uses to obtain an IP address. This can be set to Auto, DHCP, BOOTP, RARP, or Static. Auto will try DHCP, BOOTP and RARP, and then set to Static if the IP Address isn't set automatically by the other methods. If your network uses Static configuration, it will be necessary to set the Boot Method to Static and the IP to a particular address.

Gateway (or Router)
The Gateway or Router allows connections between different subnets. For example, if a corporation has separate subnets for the Hardware Department, the Software Department, and the Testing Department, they will need a Gateway between subnets to allow the separate groups to communicate.

RF Channel
The RF Channel is the wireless channel the print server uses to communicate. The EtherWind will be able to automatically configure itself in most cases, but you might need to manually set it to the same RF channel as the 802.11b wireless network. This value must match for all nodes on a network to communicate with each other.

MAC Address
This series of six numbers, separated by periods, defines the Ethernet address of the Server. For the EtherWind Servers, the MAC Address is set during manufacturing and will not change. (This should avoid problems caused by mutlitple devices on an Ethernet network with the same address.)

Data Rate
This is the throughput speed in Mbps of the wireless Ethernet connection (1, 2, 5.5, or 11). In most cases with an 802.11b wireless network, it should be set to 11 Mbps. The Data Rate usually does not need setting as it will automatically negotiate to the highest possible rate.

SSID
This is the Service Set Identifier (Sometimes referred as Network Name or ESSID). This value must match for all nodes on a subnetwork to communicate with each other.

Wireless Mode

- Ad-Hoc (sometimes referred to as Peer-to-Peer, Computer-to-Computer, 802.11 Ad-Hoc, or IBSS compliant Ad-Hoc) modes are used when your wireless enabled PC is printing straight to the printer.
- Infrastructure mode is used when you have an Access point or base station as the hub of your wireless network.
- Pseudo Ad-Hoc is only used for testing and some older 802.11b implementations of Ad-Hoc. Auto mode attempts connection with each of the other methods in turn.

Note: If the options on your 802.11b enabled computer are Ad-Hoc, 802.11b Ad-Hoc, and Infrastructure, use the following to determine the settings of the print server:

Computer	Print Server
Ad-Hoc	Pseudo Ad-Hoc
802.11 Ad-Hoc	Ad-Hoc (802.11)
Infrastructure	Infrastructure

WEP Key
Disabled. The other Options are 64Bit WEP Key Size and 128Bit WEP Key Size. Be careful -- if one part of the wireless network has WEP enabled, they all must have it enabled with the same key or they cannot communicate.

WEP Key Index
This is which WEP key you want to use out of the 4 entered in the 128 / 64 WEP Key field.

128 Bit / 64 Bit WEP Key
This is the 64 or 128 bit WEP key that must match other nodes' encryption keys in order to communicate: 10 characters for 64 bit, or 26 characters for 128 bit. The EtherWind uses a Hexadecimal value for WEP. All 802.11b devices have a way of translating their WEP or Security values to 10 (for 40-bit or 64-bit WEP) or 26 (for 128-bit WEP) digit HEX values. Ask the manufacturer of your wireless product how this is done for your PC and/or Access Point.

Loading the Firmware

1. Run the XAdmin32 utility from the Start menu, it should be found under START>Programs>TROY Group>EtherWind>XAdmin32

2. Right-Click on the print server to be upgraded in the list, and select Load Firmware.

3. If you are using TCP/IP to upgrade, select TFTP PUT from this host. If you are upgrading using IPX/SPX on a NetWare network to upgrade, select Netware GET from a server (If you are using Netware to upgrade, you need to put the .bin firmware file in the LOGIN directory of the Netware server). Click OK.

4. If you selected TFTP PUT from this host in step 3, enter the configuration password (default is ACCESS) and click Browse to find the .bin firmware file you downloaded. Click Load. The firmware on your EtherWind will be upgraded to the new version.

   If you selected Netware GET from a server in step 3, enter the configuration password (default is ACCESS). Enter the name of the Netware server where you saved the .bin file as the Host Name. Enter the name of the firmware file for File. Click OK. The firmware on your EtherWind will be upgraded to the new version.

Uninstalling the EtherWind Wireless Software

On Macintosh Systems, simply delete the directory that you installed the software on. Follow the instructions to uninstall the EtherWind utilities on Windows systems:

1. Click the Start Menu, go to Settings, and select Control Panel.

2. Double-Click Add/Remove Programs.

3. Select EtherWind 802.11b Wireless Print Server from the list and click Change/Remove.

4. Select Remove and follow the on-screen instructions.

The software should now be removed from the system.

Where to Get Help

TROY offers several customer support options to assist you in the event you experience difficulties with your EtherWind-Plus, including telephone support, repair services, extended warranty, and advance replacement.

Worldwide Web Support

The TROY worldwide web site provides a quick and easy way to answer many common technical questions. It includes a wide variety of technical support tips, as well as copies of product manuals, product literature, and firmware load images.

The web site is located at http://www.troygroup.com.

Contacting TROY

United States: (208) 955-1000 (E-mail: support@troyxcd.com)
Germany: 0800-3002210 (E-mail: support@troygroup.de)
Other Europe/Africa: +49 (0) 7032-9454-21 (E-mail: support@troygroup.de)
All Other Countries: +1 (208) 955-1000 (E-mail: support@troyxcd.com)

Before contacting technical support, please check the Troubleshooting chapter of this manual or the TROY site to isolate any problems and be sure to write down any error messages. Also, make sure that you have the serial number of the product (located on the product label on the card).