



**Roland-PrintServer RPS-100  
Installation Manual**

**Roland DG Corporation**

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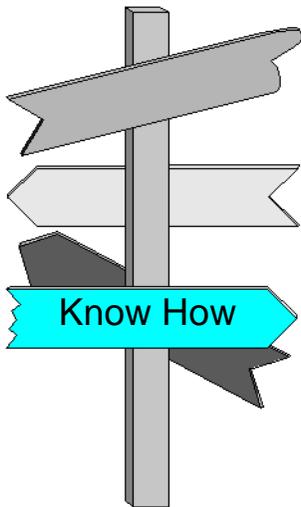
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# Network Know How



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This chapter contains information concerning the following topics:

- ▶ Basic Terminology
- ▶ Basic TCP/IP Terminology
- ▶ DHCP



## 1.1 Basic Terminology

In order to install your print server, you will need various data and parameters. This information will be explained in this section.

### 1.1.1. Hardware Address

#### **Structure of Hardware Address**

A print server is addressable by means of its world-wide unique hardware address. This address is commonly referred to as the MAC or Ethernet address. The manufacturer has defined this address in the hardware of the print server. The address consists of 12 hexadecimal numbers. The first six numbers represent the manufacturer, while the last six numbers represent the individual card.

#### **Where Can I Find the Hardware Address?**

The hardware address of your print server is on a label pasted onto the housing of the print server and can be read easily. On the print server, you will find a hardware address of '00c0eb0001ff.' Here, '00c0eb' identifies the manufacturer, while '0001ff' is the number of your print server. If your print server has already been installed, you can find the hardware address using the print server homepage.

#### **Spelling of Hardware Address**

You must enter the hardware address during the installation of the print server software. The hardware address is spelled 00-c0-eb-00-01-ff.



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## 1.1.2. Print Server Name

**Name Structure**            The print server name is made up of two letters 'IC' and the print server number. The print server number consists of the last six numbers of its hardware address.

Example:            Hardware address:    00:c0:eb:00:01:ff  
                          Print server name:    IC0001FF

**Where Do I Find the Name?**        The print server name can be found using the print server homepage.

## 1.1.3. Logical Printer

**What Are Logical Printers?**        Logical printers are so-called pre-installed print server filters. Print data is interpreted according to the set logical printer. The logical printer 1 is available in your print server.

**Addressing Logical Printer**        In Windows 2000 and Windows NT network environments, the logical printer is addressed with 'lp1'. If the LPD protocol is not available, as is the case of Windows 98 network environments, you may use the TCP/IP ports corresponding to the logical printers instead. Refer to the "TCP/IP Ports" section on page 1-10.



## 1.2 Basic TCP/IP Terminology

In Windows networks, TCP/IP is used for communication between the various participants. In order to install your print server into TCP/IP-based network environments, you must enter certain data and parameters. This information is described in the following section. If you are already familiar with TCP/IP, please read the "Installation in Windows Network Environments" chapter.

### 1.2.1. IP Address

#### **What Is the IP Address?**

The IP address is the unique address of each node in a network: that is, an IP address may occur only once on a local network. The system administrator usually assigns the IP address. The address must be saved in the print server to make sure that it can be addressed within the network. In this user manual, IP address '192.168.0.123' is consistently used as an example.

#### **IP Address Structure**

IP addresses always consist of four address groups. Each group is separated from the next group by a period. Every IP address is divided up into the network ID and the user ID. This division is primarily determined by the network class.



The following network classes can be distinguished:

	1	2	3	8	16	24	32	
Class A	0	Network			User			
Class B	1	0	Network			User		
Class C	1	1	0	Network			User	

Fig. 1-1: TCP/IP network classes



All IP addresses assigned in a logical network must belong to the same class.

### Example

You have applied for a class C network ID and receive network ID '192.168.0.' Due to the fact that user IDs '0' and '255' are reserved for broadcast addresses, a valid IP address must lie somewhere between '192.168.0.1' and '192.168.0.254', such as '192.168.0.123.'

## 1.2.2. Methods of Saving the IP Address in the Print Server

If you use TCP/IP as the network protocol, the IP address must first be saved in the print server.

In this manual, the 'arp' and 'ping' commands are always used for saving the IP address. If your network uses boot protocols, they should preferably be used to save the IP address. This guarantees a network-wide, consistent IP address usage and eliminates a potential source of errors.



The following possibilities for saving the IP address are available:

- ◆ DHCP
- ◆ The BOOTP Boot Protocol
- ◆ The RARP Boot Protocol
- ◆ The 'arp' and 'ping' Commands

### 1.2.2.1. The BOOTP Boot Protocol

If your network uses the boot protocol BOOTP, the '/etc/bootptab' file must be supplemented. This file is located on the host running the BOOTP daemon. The '/etc/bootptab' file contains a permanent copy of the allocation of the host name and the IP address to the hardware address.

#### **Requirements**

Make sure that:

- ✓ The 'BOOTP' parameter has been activated (see print server homepage).

#### **What Happens When the Print Server Is Turned On?**

Once the print server has been turned on, it asks the BOOTP for the IP address and the host name. The answer of the BOOTP host server, which contains the IP address, is sent as a data packet and saved in the print server.

#### **What Happens When Printing?**

During the installation of the print server, its host name is displayed on the monitor of the computer intended for printing. The computer finds the IP address of the print server by means of either the local 'etc/hosts' file or the DNS host. The print data can then be sent to this IP address.



You can also enter the IP address instead of the host name during print server installation. If you have done this, you may then send print data directly to the IP address.

### 1.2.2.2. The RARP Boot Protocol

If your network uses the RARP boot protocol, either the '/etc/ethers' file or the '/etc/rarpd.cf' file must be supplemented.



The choice of which file to supplement depends on how the RARP network service was implemented on your UNIX system. Please read the section concerning 'rarpd' in your UNIX manual if necessary.

Both files are located on the host running the RARP daemon. The files contain a permanent copy of the allocation of the host names and the IP address to the hardware address.

#### Requirements

Make sure that:

- ✓ The 'RARP' parameter has been activated (see print server homepage).

#### What Happens When the Print Server Is Turned On?

Once the print server has been turned on, it asks the RARP for the IP address and the host name. The answer of the RARP host server, which contains the IP address, is sent as a data packet and saved in the print server.

#### What Happens When Printing?

During the installation of the print server, its host name is displayed on the monitor of the computer intended for printing. The computer finds the IP address of the print server by means of either the local 'etc/hosts' file or the DNS host. The print data can then be sent to this IP address.



You can also enter the IP address instead of the host name during print server installation. If you have done this, you may then send print data directly to the IP address.

### 1.2.2.3. The 'arp' and 'ping' Commands

By means of the 'arp' and 'ping' commands, you can save an IP address to the print server in an easy, uncomplicated manner.



The 'arp' and 'ping' commands should be used for saving the IP address only if your network does not use a specific IP address and host name administration, such as DNS and WINS servers.

The 'arp' command is used for editing the ARP table. The 'ping' command sends a data packet with an IP address to the hardware address of the print server. If the data packet has been successfully sent and received, the print server permanently saves the IP address.



The implementation of the 'ping' command depends on the system used. Please read the relevant section in the user manual of your operating system if necessary.

#### Requirements

Make sure that:

- ✓ The 'ARP/PING' parameter has been activated (see print server homepage).

#### Procedure

Proceed as follows:

1. Edit the ARP table:

Syntax: `arp -s <IP address> <hardware address>`

Example: `arp -s 192.168.0.123 00-c0-eb-00-01-ff`



2. Allocate a new IP address to the print server:

Syntax: ping <IP address>

Example: ping 192.168.0.123

## Trouble Shooting

The 'Addition failed' error occurs when you use the 'arp' command. This error informs you that the ARP table is empty and that the new entry cannot be added. This problem occurs in the case of certain operating systems such as all Microsoft Windows versions with the exception of NT 4.0. The solution to the problem is to ping a station in the network before using the 'arp' command for the first time.

## 1.2.3. Host Name

### What Is the Host Name?

The host name is an alias for an IP address. We recommend that you always use a host name. If the IP address changes, only the file containing the allocation of the host name to the IP address must be changed. The host name used to address the print server in your local network may be chosen freely. The chosen name should have some sort of connection to the corresponding card, such as IC0001FF, or to the printer.

### Allocating the Host Name

The host name must be allocated to the IP address. This is carried out either in the 'hosts' file or on the DNS or WINS server. In this manual, only the allocation of the host name to the IP address using the 'hosts' file is described. Please read the relevant section in the user manual of your operating system if necessary.

### What Is the File 'hosts'?

The 'hosts' file is an internal system file in which the allocation of the host names to the IP addresses is stored.

Syntax: <IP address> <host name>

Example: 192.168.0.123 IC0001FF



The 'hosts' file is located in the 'windows' directory in Windows networks.

## 1.2.4. ARP Table

### **What Is the ARP Table?**

The ARP table is an internal system file in which the allocation of IP addresses to hardware addresses is stored. This table is administered by the ARP protocol, whereby the entries expire after approximately 15 minutes and can therefore be forgotten. You can display and edit the ARP table using the 'arp' command.

The ARP table is needed for saving the IP addresses in a print server if no boot protocol is used (see "The 'arp' and 'ping' Commands" section on page 1-8).

## 1.2.5. TCP/IP Ports

### **What Are TCP/IP Ports?**

During the transfer of files between two computers, addressing with the IP address alone generally does not suffice. In addition to the IP address, the port number is used. This number defines a specific computer memory area reserved for a specific communications connection. The combination of an IP address and a port number is unique for every communications connection and is defined as a socket.

### **LPD Protocol and TCP/IP Ports**

If the LPD protocol is used for transferring print data, the corresponding data packet automatically contains a port number of '515' and does not need to be specifically configured. The transferred print data is saved to the memory area corresponding to the port number and then processed.



### **TCP/IP Ports Without LPD Protocol**

If the LPD protocol is not available, as in the case of Windows 95 networks, you must then configure the port number yourself. In order to do this, you must install a printer port and enter the port number. In this case, such a port may also be called a direct printer port. The port number 9100 can be used with your print server.

## 1.2.6. Gateway

Using a gateway, you can address IP addresses from external networks. Your print server is configured not to use gateways by default. If your network does not use gateways, you do not need to take any further steps. If, however, you are using a gateway in your network, you should ask your system administrator for the IP address of the gateway. You can change this parameter using the print server homepage.

## 1.2.7. Subnet Mask

### **What Is the Subnet Mask?**

With the help of the subnet mask, large networks can be split up into subnetworks. In this case, the user IDs of the IP addresses are allocated to the various subnetworks.

### **Example**

If no subnetwork is used, the subnet mask of a class C network is set to '255.255.255.0'. If two subnetworks are used, the subnet mask may be set to '255.255.255.128', for example. Valid IP addresses in this example are '192.168.0.1' to '192.168.0.127' in the first subnetwork and '192.168.0.129' to '192.168.0.254' in the second subnetwork.



## **Subnet Mask Configuration**

Your print server is configured not to use subnetworks by default. If your network is not split into subnetworks, you do not need to take any further steps. If, however, you are using a subnetwork, you should ask your system administrator for the subnet mask. You can configure this parameter using the print server homepage.



## 1.3 DHCP

The print server completely supports DHCP, according to RFC 1542, so that a simple and fast administration via DHCP is provided.

### **Network Structure Using DHCP**

The dynamic administration of IP addresses by means of DHCP requires a system that administers the allocation of IP addresses to host names. This administration is taken over by DNS servers, which can be dynamically configured by the DHCP server. Most systems additionally use a WINS server, which answers name enquiries that the DNS server cannot handle. This constellation, which is common for Windows NT 4.0 networks, is described below.

### **Requirements**

Make sure that:

- ✓ The parameter 'DHCP' has been activated (see print server homepage).
- ✓ The parameter 'WINS registration' has been activated.
- ✓ The parameter 'WINS via DHCP' has been activated.

### **What Happens When the Print Server Is Turned On?**

After the print server has been turned on in a Windows NT 4.0 network, it sends a query to the DHCP server asking for the IP address, the host name, and the IP address of the WINS server. The answer from the DHCP server is sent as a data packet and saved in the print server. The print server is sent as a data packet and saved in the print server. The print server now transmits a name registration request to the WINS server, along with the IP address and host name allocation. The answer from the WINS server contains the period of validity of the name entry in the WINS database. Once this period has expired, the print server renews its registration with the WINS server so that its IP address and host name remain constantly valid.



## What Happens When Printing?

During the installation of the print server, its host name is displayed on the monitor of the computer intended for printing. In order for you to be able to allocate the host name to the IP address, the computer asks the DNS server for the IP address of the print server. If the DNS server cannot answer this request, it forwards the request to the WINS server. Once the computer receives the answer, it sends the print data to the IP address of the print server.

You can also enter the IP address instead of the host name during the print server installation. If you have done this, you may then send print data directly to the IP address.

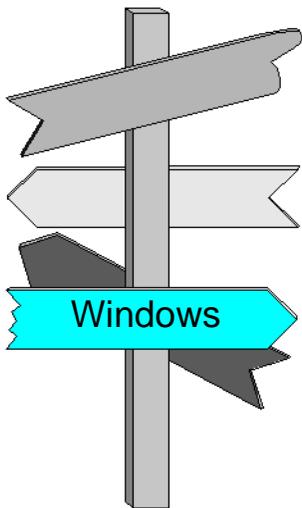


If you wish to configure your print server on a DHCP server, please read the documentation for your specific operating system if necessary.

## WINS Without DHCP

You can also set up the print server in a network only with WINS and without DHCP. In this case, the print server registers with the WINS server directly. In this process, you must configure the IP address of the WINS server manually in the print server. You must first disable the 'DHCP' and 'WINS via DHCP' parameters. You can configure these parameters using the print server homepage.

# Installation in Windows Network Environments



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This chapter contains information concerning the following topics:

- Basic Principles
- Installing in Windows Networks (peer to peer printing via NetBIOS)
- Installing in Windows 2000 Networks (IPP Printing)
- Installing into Windows 98 and 95 Network Environments
- Installing into Windows NT 4.0 Network Environments



## 2.1 Basic Principles

In all Windows networks, the TCP/IP protocol is used as the network protocol. Every computer used for printing should have TCP/IP installed.

In Windows 2000 networks IPP printing is available.

The LPD protocol is used for printing in Windows NT 4.0 networks. The LPD protocol is a special protocol used for print data.

In Windows 98 and 95 networks, the LPD protocol is not available. For this reason, printing is carried out by means of direct TCP/IP ports. You can install and address these ports using the Roland Ethernet Print Monitor.

Peer-to-peer printing via NetBIOS is also available in all Windows networks.

### **Procedure**

Which procedures can be selected?

- ▶ Installing in Windows Networks (peer to peer printing via NetBIOS)
- ▶ Installing in Windows 2000 Networks (IPP Printing)
- ▶ Installing into Windows 98 and 95 Network Environments
- ▶ Installing into Windows NT 4.0 Network Environments



## 2.2 Installing in Windows Networks (peer to peer printing via NetBIOS)

In this section, the installation of the Roland-PrintServer for peer-to-peer Printing based on NetBIOS (SMB) in Windows networks is described. The installation in the different environments is very similar, only the individual steps differ slightly.



Before beginning the actual installation, you should have basic knowledge of TCP/IP. Please read the "Basic Terminology" section on page 1-2 if necessary.

### Procedure

The print server is installed in the following steps:

- ◆ Installing the TCP/IP Protocol
- ◆ Saving the IP Address in the Print Server
- ◆ Configuring the NetBIOS Parameters
- ◆ Setting Up the Printer

### 2.2.1. Installing the TCP/IP Protocol

To install your print server in a Windows network for peer-to-peer printing, first the TCP/IP protocol must be installed on every computer that is used for printing. The procedure differs depending on the Windows system. For the installation in Windows 98 and 95 networks read the "Installing the TCP/IP Protocol" section on page 2-13. For the installation in Windows



NT 4.0 networks read the "Installing the TCP/IP Protocol" section on page 2-20.

## 2.2.2. Saving the IP Address in the Print Server

In order to save the IP address in the print server, the ARP table must be edited first (see also the "ARP Table" section on page 1-10). After that, use the 'ping' command to send the IP address to the print server, where it is saved.



Use the 'arp' and 'ping' commands to save the IP address if your network has no superordinate management of IP addresses and host names, such as a DNS or WINS server. Please read the "Methods of Saving the IP Address in the Print Server" section on page 1-5 if necessary.

### Procedure

Proceed as follows:

1. Open an MS-DOS console.
2. Edit the ARP table:  
Syntax: `arp -s <IP address> <hardware address>`  
Example: `arp -s 192.168.0.123 00-c0-eb-00-01-ff`
3. Allocate a new IP address to the print server:  
Syntax: `ping <IP address>`  
Example: `ping 192.168.0.123`



### 2.2.3. Configuring the NetBIOS Parameters

The NetBIOS parameters for the print server must be configured so that the print server can be seen in the network environment. This can be done using the print server homepage.



The print server can only be set up in an existing workgroup or domain. If necessary, set up new workgroups or domains in advance.

#### Procedure

Proceed as follows:

1. Call the 'Configuration - Microsoft Windows' page from the print server homepage.
2. Select 'NetBIOS' if necessary.
3. Enter an existing workgroup or domain in the 'NetBIOS domain' box.
4. Click 'Save.'

The print server can now be seen in the corresponding workgroup or domain.

### 2.2.4. Setting up the printer

Finally, the printer must be set up.

#### Procedure

Proceed as follows:

1. Click on the print server in the corresponding workgroup or domain.
2. In Windows 98 and 95 networks double-click the desired logical printer. In Windows NT networks do a right click on the desired logical printer.



3. Follow the instructions of the installation routine.



Please read the printer installation instructions in your Windows or printer user manual if necessary.



## 2.3 Installing in Windows 2000 Networks (IPP Printing)

In this section, the installation of your Roland-PrintServer in Windows 2000 networks for IPP printing is described. For IPP printing socket 631 is used.



Make sure that Service Pack 1 or later has been installed.

### Procedure

The installation involves the following steps:

- ◆ Saving the IP Address in the Print Server
- ◆ Setting Up the Printer

### 2.3.1. Saving the IP Address in the Print Server

In order to save the IP address in the print server, the ARP table must be edited first (see also the "ARP Table" section on page 1-10). After that, use the 'ping' command to send the IP address to the print server, where it is saved.



Use the 'arp' and 'ping' commands to save the IP address if your network has no superordinate management of IP addresses and host names, such as a DNS or WINS server. Please read the "Methods of Saving the IP Address in the Print Server" section on page 1-5 if necessary.



## Procedure

Proceed as follows:

1. Open an MS-DOS console.
2. Edit the ARP table:  
Syntax: `arp -s <IP address> <hardware address>`  
Example: `arp -s 192.168.0.123 00-c0-eb-00-01-ff`
3. Allocate a new IP address to the print server:  
Syntax: `ping <IP address>`  
Example: `ping 192.168.0.123`

## 2.3.2. Setting Up the Printer

You must set up your printer in a Windows 2000 network as a network printer. In case of IPP printing Windows searches for the printer using the indicated IP address and sets it up automatically.



Please read the printer installation instructions in your Windows or printer user manual if necessary.

## Procedure

Proceed as follows:

1. Select 'Printers' on the 'Start' menu.
2. Double click 'Add Printer.'  
The Add Printer Wizard appears.
3. Click 'Next >.'  
The following window appears:



## Select network printer

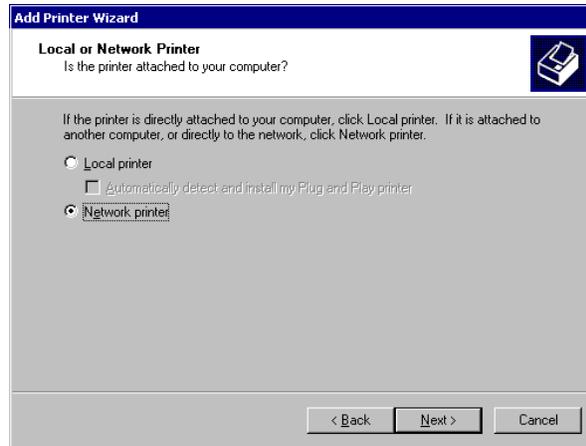


Fig. 2-1: Add Printer Wizard: Network printer



Do not select 'Local printer' under any circumstances because your print server may no longer be properly installed as a result.

4. Select 'Network printer'.

5. Click 'Next >.'

The following window appears:

## Enter IP address

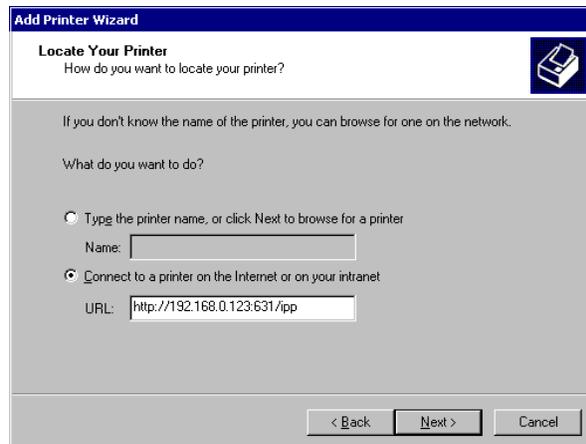


Fig. 2-2: Add Printer Wizard: Locate your printer



6. Select 'Connect to a printer on the Internet or on your intranet.'
7. Enter the IP address of the print server and the socket number for the IPP printing using the following syntax:  
Syntax: `http://<IP address of the print server>:631/ipp`  
Example: `http://192.168.0.123:631/ipp`
8. Enter the name of the logical printer (lp1 - lp8). If no name or an incorrect name has been entered, the print data is automatically routed to the printer through logical printer no. 1.  
Syntax: `/lp1`  
Example: `http://192.168.0.123:631/ipp/lp1`
9. Click 'Next >.'
10. Follow the instructions of the installation routine to set up your printer.



## 2.4 Installing into Windows 98 and 95 Network Environments

In this section, the installation of your Roland-PrintServer into Windows 98 and 95 network environments is described. The installation is identical for both systems, although the outer appearance of the windows may differ slightly.



### Function of Print Server

Before beginning the actual installation, you should have basic knowledge of TCP/IP. Please read the "Basic Terminology" section on page 1-2 if necessary.

Windows 98 and 95 networks are so-called peer-to-peer network environments. All computers have equal rights and may share their resources with other computers. A print server in a peer-to-peer network acts as a network connection for a printer independent of the computer. The print data is transferred from the individual computer to the network using the Roland Ethernet Print Monitor. The print server receives the print data and routes it to the printer.



## Peer-to-Peer Network

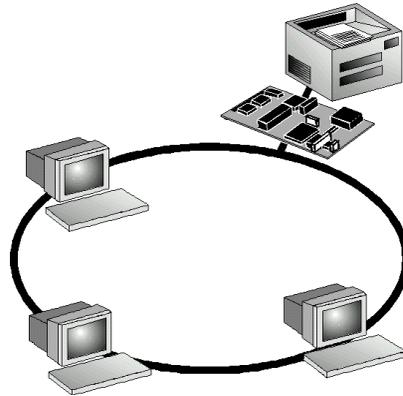


Fig. 2-3: Peer-to-peer network with print server

### What Is the Roland Ethernet Print Monitor?

The Roland Ethernet Print Monitor constitutes the connecting piece between the computer and the print server in Windows 98 and 95 networks. It enables the transfer of print data from the computer to the print server by means of direct TCP/IP ports. The Roland Ethernet Print Monitor must be installed and configured on every computer intended for printing. It is not possible to share the printer.

### Procedure

Install the print server in the following steps:

- ◆ Installing the TCP/IP Protocol
- ◆ Saving the IP Address in the Print Server
- ◆ Setting Up the Printer
- ◆ Installing the Roland Ethernet Print Monitor
- ◆ Setting Up the Roland Ethernet Print Monitor



## 2.4.1. Installing the TCP/IP Protocol

In order to be able to use your print server in a Windows 98 or 95 network, you must first install the TCP/IP protocol into the computer intended for printing. If TCP/IP is already installed, you may skip to the "Saving the IP Address in the Print Server" section on page 2-15.

### Procedure

Proceed as follows:

1. Select 'Control Panel' on the 'Start' menu.
2. Double click 'Network.'
3. Select the 'Configuration' tab.

The following window appears:

### 'Configuration' Tab

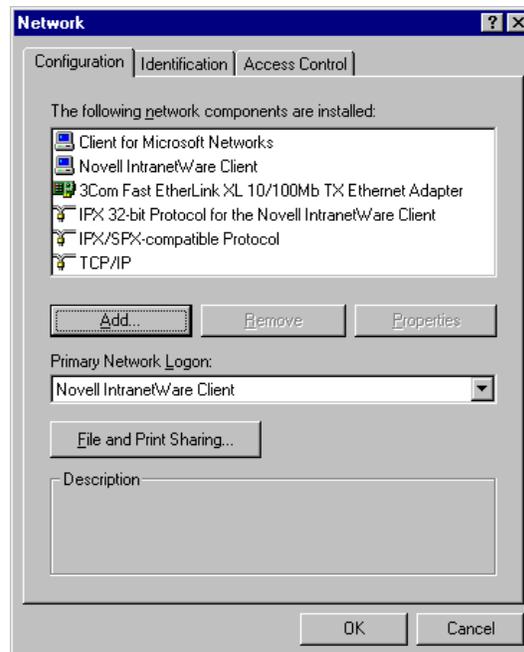


Fig. 2-4: 'Configuration' tab



4. Click 'Add...'
5. Select 'Protocols.'
6. Click 'Add...'  
The following window appears:

### Select Network Protocol

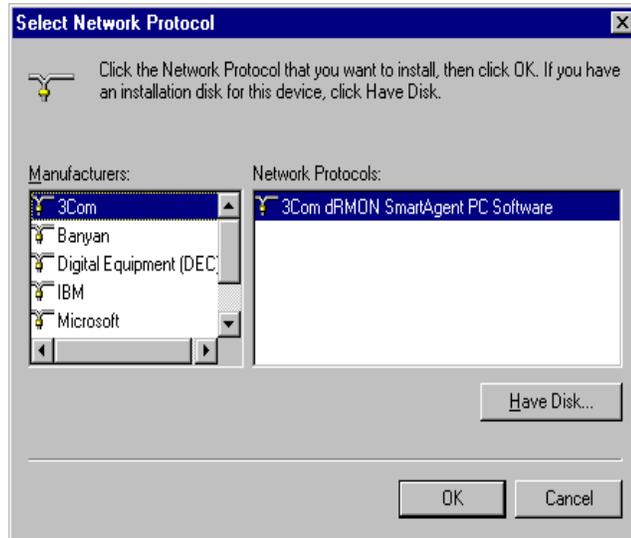


Fig. 2-5: 'Select Network Protocol' window

7. Select 'Microsoft' from the 'Manufacturers' box.
8. Select 'TCP/IP' from the 'Network Protocols' box.
9. Click OK to acknowledge.  
The 'Configuration' tab appears.
10. Select 'TCP/IP' from the box containing the list of installed network components.
11. Click 'Properties.'  
The following window appears:



## Enter IP Address

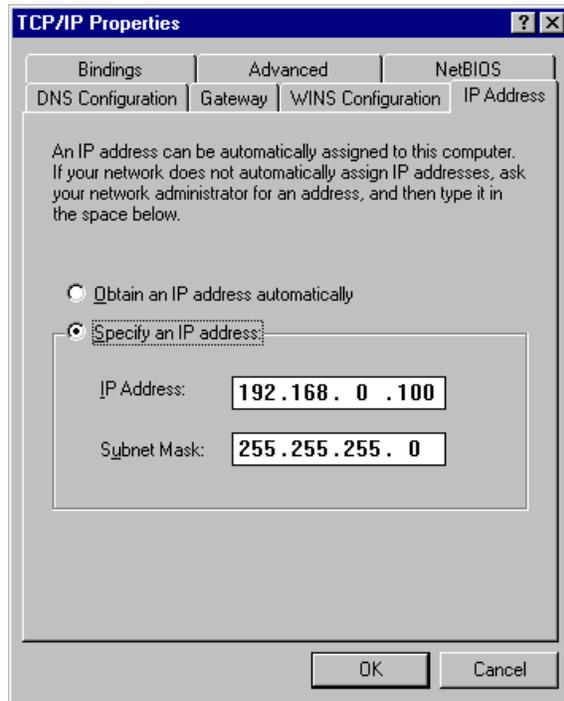


Fig. 2-6: 'TCP/IP Properties' window

12. Type the IP address of your computer.
13. Click OK to acknowledge.

### 2.4.2. Saving the IP Address in the Print Server

In order to save the IP address in the print server, the ARP table must be edited first (see also the "ARP Table" section on page 1-10). After that, use the 'ping' command to send the IP address to the print server, where it is saved.



Use the 'arp' and 'ping' commands to save the IP address if your network has no superordinate management of IP addresses and host names, such as a DNS or WINS server. Please read the "Methods of Saving the IP Address in the Print Server" section on page 1-5 if necessary.

## Procedure

Proceed as follows:

1. Open an MS-DOS console.
2. Edit the ARP table:  
Syntax: `arp -s <IP address> <hardware address>`  
Example: `arp -s 192.168.0.123 00-c0-eb-00-01-ff`
3. Allocate a new IP address to the print server:  
Syntax: `ping <IP address>`  
Example: `ping 192.168.0.123`

### 2.4.3. Setting Up the Printer

Set up your printer as a local printer under Windows 98 or 95. Select LPT1 as the printer port. Do not print out a test page.



Please read the printer installation instructions in your Windows or printer user manual if necessary.

### 2.4.4. Installing the Roland Ethernet Print Monitor

The Roland Ethernet Print Monitor can be found on the Roland-PrintServer CD-ROM enclosed in the product packaging.

**Procedure**

Proceed as follows:

1. Insert the CD-ROM into your CD-ROM drive.
2. Install the Roland Ethernet Print Monitor.

## 2.4.5. Setting Up the Roland Ethernet Print Monitor

The Roland Ethernet Print Monitor is set up by adding a printer port. The host name of the print server or the IP address and the TCP/IP port number must be entered. TCP/IP port 9100 is available. Please read the "TCP/IP Ports" section on page 1-10 if necessary.



If you use a host name, please make sure that this host name has been assigned beforehand. Please read the "Host Name" section on page 1-9 if necessary.

**Procedure**

Proceed as follows:

1. Select 'Properties' on the printer shortcut menu.
2. Select the 'Details' tab.
3. Select 'Add Port...'

The following window appears:



## Add Port

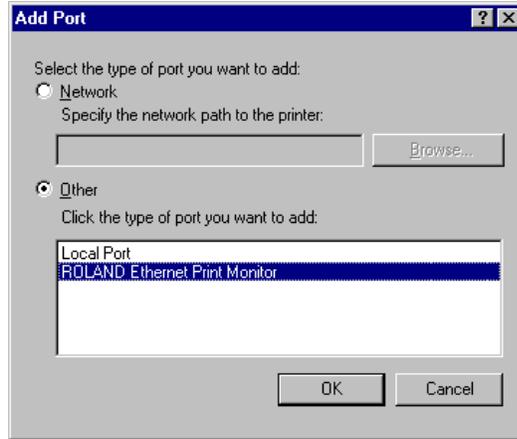


Fig. 2-7: 'Add Port' window

4. Select 'Other.'
5. Select 'Roland Ethernet Print Monitor' from the list.
6. Click OK to acknowledge.  
The following window appears:

## Enter IP Address

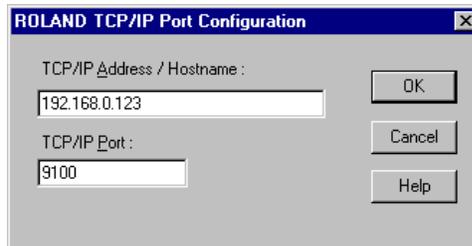


Fig. 2-8: TCP/IP Port Configuration for Roland Ethernet Print Monitor

7. Type the IP address or the host name of the print server into the 'TCP/IP Address / Hostname' box.
8. Type 9100 into the 'TCP/IP Port' box.
9. Click OK to acknowledge.



## 2.5 Installing into Windows NT 4.0 Network Environments

In this section, the installation of you Roland-PrintServer into Windows NT 4.0 networks is described.



### **Function of Print Server**

Before beginning the actual installation, you should have basic knowledge of TCP/IP. Please read the "Basic TCP/IP Terminology" section on page 1-4 if necessary.

Windows NT 4.0 networks are so-called server-based network environments. A server provides workstations located in the network with certain services. Services include, among other things, the administration of jointly used data sources and print services, all of which enable the joint usage of printers in the network.

While printing is being carried out in Windows NT 4.0 networks, the print data is loaded into the network as an LPD protocol by means of the LPR port and sent to the IP address of the print server. The print server receives the print data and routes it to the printer.



## Server-Based Network

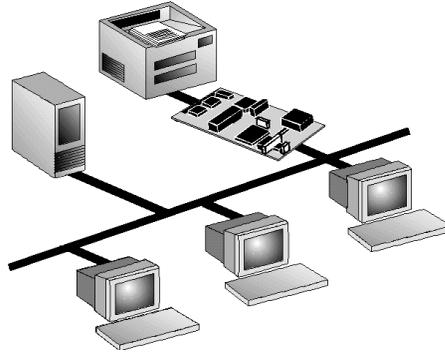


Fig. 2-9: Server-based network with print server

### What Happens During Installation?

In order to install the print server into Windows NT 4.0 networks, you must first install the TCP/IP protocol and the TCP/IP print services.

Due to the configuration of the LPR ports, the LPD protocol will automatically be used for printing.

### Procedure

Install the print server in the following steps:

- ◆ Installing the TCP/IP Protocol
- ◆ Saving the IP Address in the Print Server
- ◆ Installing the Microsoft TCP/IP Print Services
- ◆ Setting Up the Printer and Configuring the LPR Port

### 2.5.1. Installing the TCP/IP Protocol

In order to be able to use your print server in a Windows NT 4.0 network, you must first install the TCP/IP protocol into the NT



server. If TCP/IP has already been installed, you may skip to the "Saving the IP Address in the Print Server" section on page 2-23.

## Procedure

Please proceed as follows:

1. Select 'Control Panel' on the 'Start' menu.
2. Double click 'Network.'
3. Select the 'Protocols' tab.

The following window appears:

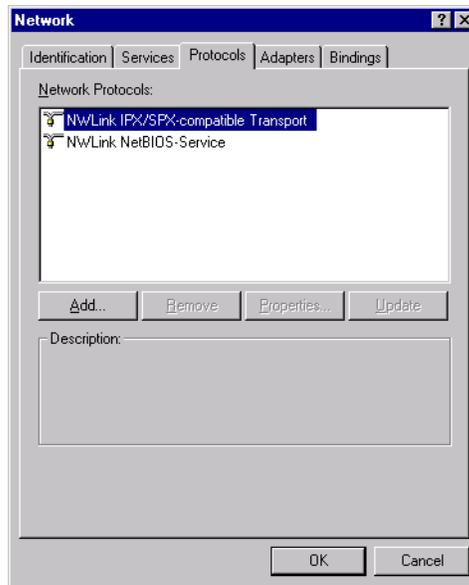


Fig. 2-10: 'Protocols' tab

4. Click 'Add...'

The following window appears:



## Select Network Protocol

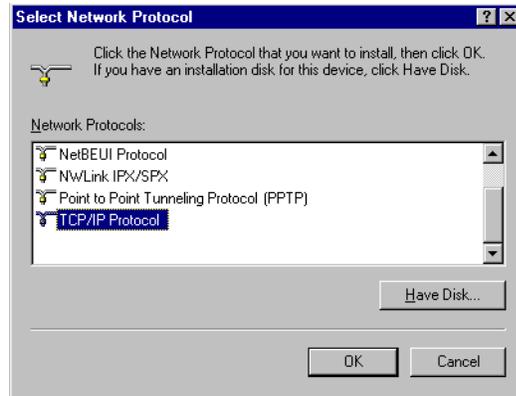


Fig. 2-11: 'Select Network Protocol' window

5. Select 'TCP/IP Protocol' from the list.
6. Click OK to acknowledge.

## Installation Routine

7. Follow the instructions of the installation routine.  
The 'Protocols' tab appears after the installation routine has been completed.
8. Click 'Close.'  
The following window appears:



## Enter IP Address

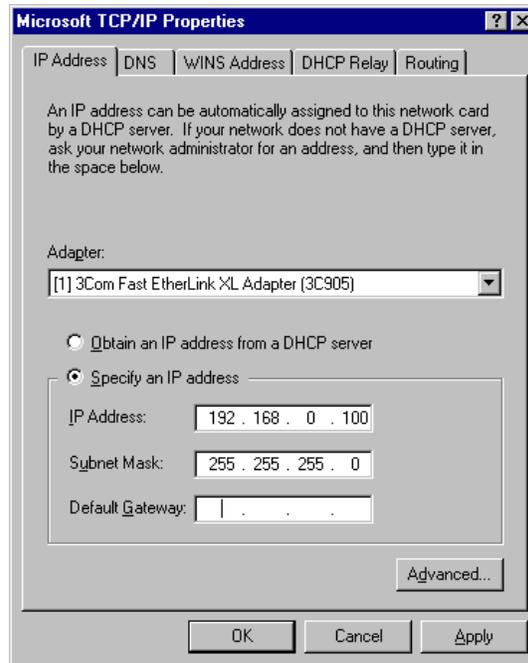


Fig. 2-12: 'Microsoft TCP/IP Properties' window

9. Type the IP address of the computer into the 'IP Address' box.
10. Type the subnet mask into the 'Subnet Mask' box if required.
11. Type the IP address of the gateway into the 'Default Gateway' box if required.
12. Click OK to acknowledge.

### 2.5.2. Saving the IP Address in the Print Server

In order to save the IP address in the print server, the ARP table must be edited first (see also the "ARP Table" section on page



1-10). After that, the 'ping' command is used to send the IP address to the print server, where it is saved.



Use the 'arp' and 'ping' commands to save the IP address if your network has no superordinate management of IP addresses and host names, such as a DNS or WINS server. Please read the "Methods of Saving the IP Address in the Print Server" section on page 1-5, if necessary.

### Procedure

Proceed as follows:

1. Open an MS-DOS console.
2. Edit the ARP table:  
Syntax: `arp -s <IP address> <hardware address>`  
Example: `arp -s 192.168.0.123 00-c0-eb-00-01-ff`
3. Allocate a new IP address to the print server:  
Syntax: `ping <IP address>`  
Example: `ping 192.168.0.123`

## 2.5.3. Installing the Microsoft TCP/IP Print Services

In order to be able to print using TCP/IP, you must install the Microsoft TCP/IP print services. If the Microsoft TCP/IP print services have already been installed, you may skip to the "Setting Up the Printer and Configuring the LPR Port" section on page 2-26.

### Procedure

Proceed as follows:

1. Select 'Control Panel' on the 'Start' menu.
2. Double click 'Network.'
3. Select the 'Services' tab.  
The following window appears:



## 'Services' Tab

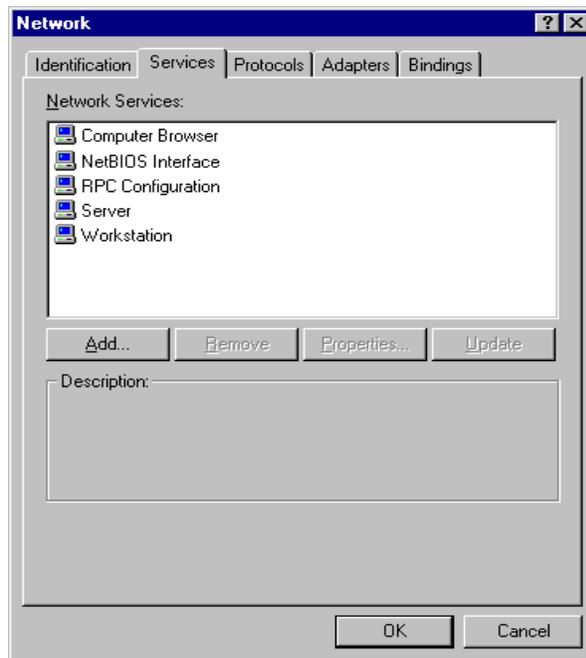


Fig. 2-13: 'Services' tab

4. Click 'Add...'  
The following window appears:



## Select Network Service

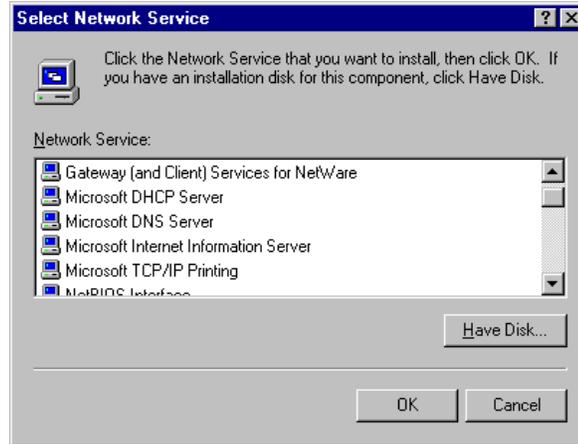


Fig. 2-14: 'Select Network Service' window

5. Select 'Microsoft TCP/IP Printing.'
6. Click OK to acknowledge.
7. Follow the instructions of the installation routine.  
The 'Services' tab appears after the installation routine has been completed.
8. Click 'Close.'

### 2.5.4. Setting Up the Printer and Configuring the LPR Port

You must set up your printer as a printer managed by your computer under and not as a network printer server. Select the LPR port as the printer port. The logical printer is addressed with the LPR port.



Please read the printer installation instructions in your Windows or printer user manual if necessary.



If you use a host name, please make sure that this host name has been assigned beforehand. Please read the "Host Name" section on page 1-9 if necessary.

If you have already set up your printer, you must only configure the LPR port. Call the property sheet of the printer and select the 'Ports' tab. Continue with step 4 on page 2-28 described in the following.

## Procedure

Proceed as follows:

1. Select 'Printers' on the 'Start' menu.
2. Double click 'Add Printer.'

The following window appears:

Select 'My Computer'

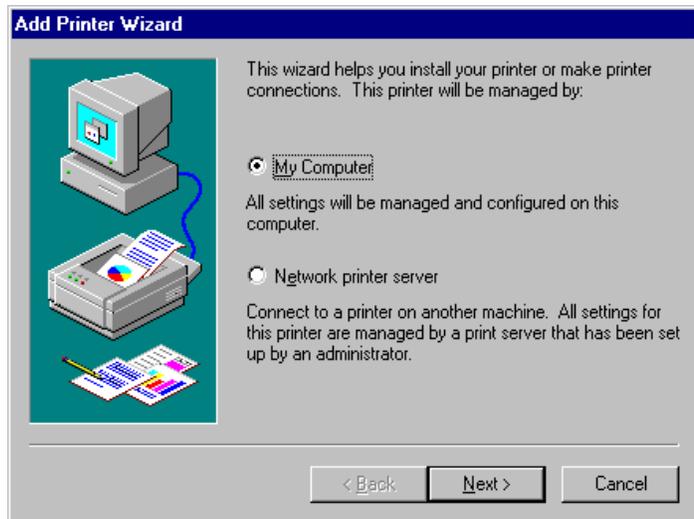


Fig. 2-15: Add Computer Wizard: 'My Computer'



Do not select 'Network Printer Server' under any circumstances because your print server may no longer be properly installed as a result.



3. Click 'Next >.'  
The following window appears:

### Add Port

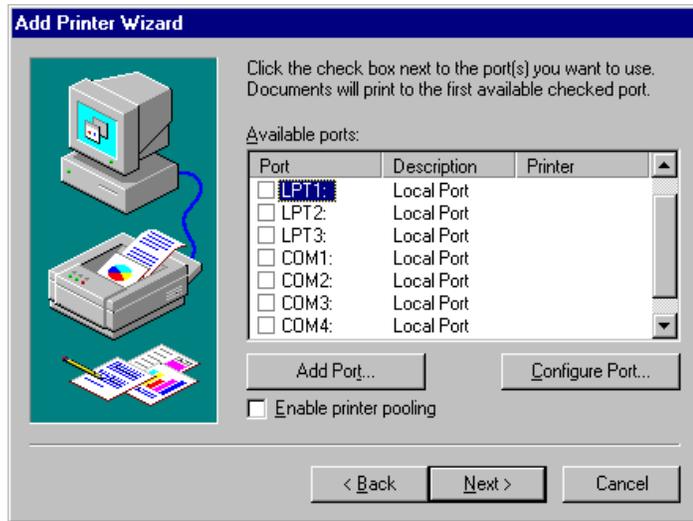


Fig. 2-16: Add Printer Wizard: Available Ports

4. Click 'Add Port...'  
The following window appears:

### Select LPR Port

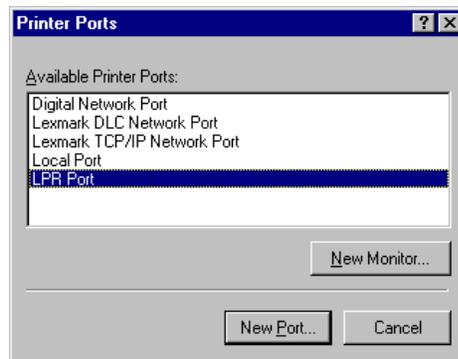


Fig. 2-17: 'Printer Ports' window



If the 'LPR Port' entry is invisible, install the TCP/IP print services first. Read the "Installing the Microsoft TCP/IP Print Services" section on page 2-24 if necessary.

5. Select 'LPR Port.'
6. Click 'New Port...'

The following window appears:

Enter IP Address

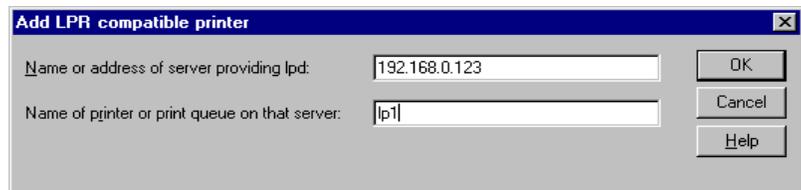


Fig. 2-18: 'Add LPR Compatible Printer' window

7. Type the IP address or host name of the print server into the 'Name or address of server providing lpd' box.
8. Type lp1 into the 'Name of printer or print queue on that Server' box.
9. Click OK to acknowledge.
10. Follow the instructions of the installation routine to set up your printer.



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