M202Plus Print Server Quick Installation and Configuration Guide

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Firmware Version 6.0

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TABLE OF CONTENTS

MANUAL OVERVIEW

This manual will help you install and configure an M202Plus on your network. It describes a *basic setup* for each supported network environment. For more detailed information about configuration and management, please see the Portable Document Format (PDF) files provided on diskette with your M202Plus. More information, including the PDF files, is also available at Microplex's Web site, "**http://www.microplex.com**".

PDF File Index

Table 1 outlines the seven PDF files that come on diskette with your M202Plus. *Please refer to these documents if you can't find what you're looking for in this manual*.

Table 1: Microplex PDF Files

Filename	Description
windows.pdf	Print setups for Windows environments other than Windows NT and Windows 95.
unix.pdf	Step-by-step *manual* instructions for some Unix environments.
novell.pdf	RPRINTER/NPRINTER configuration.
apple.pdf	Additional configuration that's optional in AppleTalk environments.
extra.pdf	Details about some of the M202Plus's additional features such as printer logging.

Table 1: Microplex PDF Files

Filename	Description
specs.pdf	Additional specifications for the M202Plus hardware.
command.pdf	In depth look at the M202Plus's internal command shell. For the most common commands, please see *Common npsh Commands* on page 51.

Documentation Conventions

Command syntax and examples are formatted as follows:

• The Courier font in **boldface** indicates commands that you type.

    $ **ping ftp.microplex.com**

• Regular Courier font indicates displayed results.

    ftp.microplex.com is alive

• Example names and numbers described in text are **bold**. **Bold** is also used for emphasis.

    sends data to the M202Plus named **spike**...

    The **model** directory...

• Variable values are shown in *italics* both in command syntax, output, and in text. *Italics* also add emphasis.

    ping *ipname*

    ipname is alive

    Please enter the ***ipname*** at the prompt.

    Make sure you *first* contact...

M202PLUS INTRODUCTION

Overview

The purpose of this chapter is to get you acquainted with the M202Plus's architecture and special features.

What is the M202Plus?

The M202Plus Print Server allows you to locate printers and other peripherals anywhere on the LAN rather than attaching them directly to a host system. Following simple configuration steps, these peripherals can be *simultaneously* shared with users on the network whether TCP/IP, NetBIOS over TCP/IP, IPX (Novell), or EtherTalk (AppleTalk) is utilized. Not only can multiple users print and multiple protocols be supported at the same time, but multiple printers attached to the M202Plus can print *simultaneously* as well.

Note: The M202Plus is compatible with all printers that include a Centronics parallel interface or an RS-232 serial interface.

Non-Printing Uses

The M202Plus's serial ports can be used for other peripherals besides printers. For example, terminals can be directly attached giving them a connection to the M202Plus's network. Terminals can also display information received over the network such as airline and prescription details. Modems can be attached for remote access. Other devices like scales and pill dispensing machines have also been attached to the serial ports so they can be accessed over the network.

How Does the M202Plus Work?

Physical Design

The M202Plus's key physical components are:

- at least one network connector to attach itself and the attached peripherals to the network,

- two parallel ports for parallel printers,

- two serial ports for serial printers or other peripherals,

- Flash to store the firmware code and user-configurable settings,

- RAM to help with print job and network communication processing.

Logical Design

The most important part of the M202Plus's logical design is the **print path** - the path data takes when the host sends a print job to a printer through the M202Plus. This print path can be divided into the three stages illustrated in *Figure 1*.

Figure 1: Print Path Phases
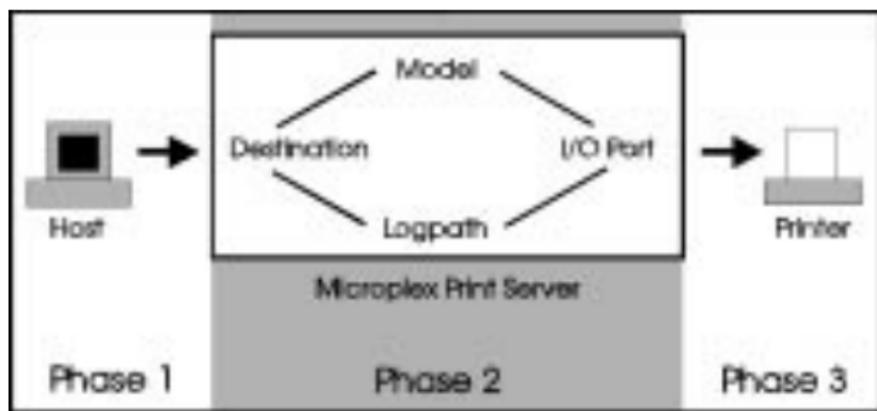
Phase 1 The host sends the job to a pre-defined **destination** (e.g. d1prn1) on the print server, not directly to an I/O port. The destination is one of eight print queus available on the device.

Phase 2   The job passes through the destination's associated **model** (e.g. m1) for optional processing and then continues through the destination's associated **logpath** (e.g. l1) where logging information is recorded. The data then ends up at the destination's associated **I/O port** (e.g. PRN1).

Phase 3   The data passes from the print server's I/O port to the attached printer for output.

There are eight destinations (or logical queues) on the M202Plus, each with its own model and logpath. The **model** determines if any extra processing (e.g. ASCII to PostScript conversion) needs to be done to the data and the **logpath** determines whether any job or printer logging (e.g. user ID) needs to be acquired.

What Special Features are Available?

The M202Plus offers an extensive list of features including:

- Built-in HTML forms for easy cross-platform configuration,

- Ezsetup for automated Unix print configurations,

- a detailed and easy-to-use command shell built in to the firmware - "npsh",

- multi-level configuration security through passwords, permission levels, and access lists,

- WAN-wide communication access,

- numerous printer logging methods (e.g. automatic email) to record printer errors and usage,

- remote management through HTML forms, Telnet sessions, "**rsh/rcmd/remsh**" commands, SNMP, and pre-defined log methods,

- extensive built-in troubleshooting tools,

- built-in "**telnet**" and "**ping**" clients,

- versatile serial ports (e.g. SLIP support for remote access via a modem),

- configurable memory usage by disabling protocols and destination services,

- multiple destinations/queues for versatile printer manipulation and distinct print setups,

- header and trailer strings to instruct printers on tray selection, font, pitch, simplex/duplex, etc.,

- autosensing of job format for ASCII to PostScript conversion or to automatically switch printer emulations,

- flexible naming conventions,

- automatic network connection and frame type sensing,

- free Flash upgrades over TCP/IP networks and through the serial ports,

- multiple speeds on the parallel ports for additional printer compatibility,

- simultaneous printing across all I/O ports and all supported protocols.

M202PLUS INSTALLATION

Overview

This chapter discusses the preparation and installation steps necessary to use the M202Plus on your network.

Unpacking the M202Plus

Upon receiving the M202Plus, check the packaging for any damage or missing pieces. Immediately report problems to the shipping company or vendor. If everything is in acceptable order, fill out the **Warranty Registration/Customer Survey** card and mail it in.

Attaching to the Network

Site Requirements

Prepare to install the M202Plus in a clean, well-ventilated environment protected from extremes of temperature, humidity, mechanical shock, or vibration. Provide enough space at the front and back of the unit for cable connections.

Prepare to install the M202Plus within four meters (13 feet) of a grounded 115 or 230 VAC outlet. Power is supplied to the M202Plus from an external transformer through a two-meter (six-foot) output cord to a 6 position mini din. The external transformer connects through a two-meter (six-foot) line cord to a 3-prong 115 or 230 VAC outlet.

Network Connections

The M202Plus is unique in that different network connection options are available upon purchase. The base M202Plus model provides an RJ45 connector for 10Base-T (UTP) networks only but there are other alternatives as seen in *Figures 2 through 6*.

Note: The front view of all models is identical.

Figure 2: M202Plus Common Front View
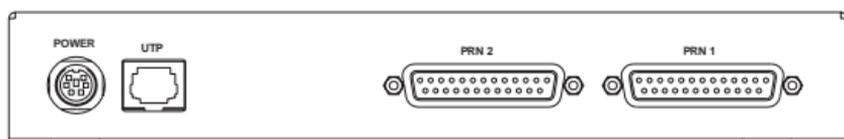

Figure 3: M202Plus Rear View - UTP Only

Figure 4: M202Plus Rear View - UTP + BNC
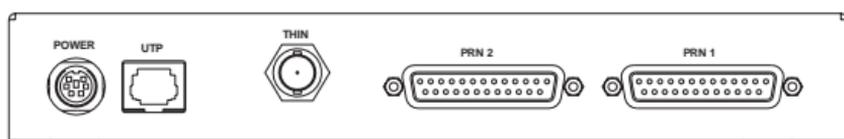
Figure 5: M202Plus Rear View - UTP + AUI
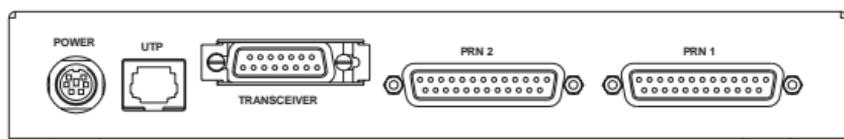
Figure 6: M202Plus Rear View - UTP + Fibre (10Base-FI)
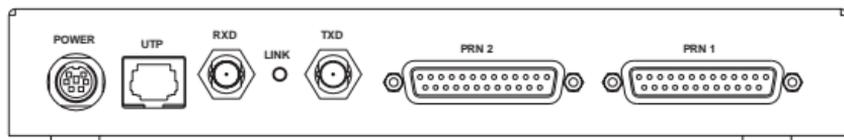
Printer Connections

A maximum of four peripherals can be attached to the M202Plus at the same time: two on the parallel ports and two on the serial ports. These can all print simultaneously.

Parallel Port Connections (PRN1, PRN2)

Two 25-pin female DB-25 connectors with an IBM PC compatible pinout are provided on the rear panel for connection to printers with Centronics interfaces. These ports can be configured with various parameters depending on the attached printer. These parameters include:

- **bbmode** for simulating an attached printer,

- **fastmode** for high-performance parallel interfaces that can handle an increased transfer rate,

- **pcmode** for most printers available today,

- **cenmode** for older printers (usually impact printers),

- **slowmode** for slower parallel interfaces that need a slower transfer rate.

Serial Port Connections (COM1, COM2)

Two 9-pin male DE-9P connectors with IBM PC AT compatible pinouts are provided for connection to printers using serial ports. Each of these ports have various parameters which control attributes such as:

- parity selection, generation, and detection,

- hardware and software flow control,

- character description.

Note: The M202Plus serial ports always act as 9-pin DTE connectors.

For I/O port configuration help, please see *Common npsh Commands* on page 51.

Connecting to the Network

To attach the M202Plus to the network as illustrated in *Figure 7*, you will need to:

1   Connect peripheral(s) to the appropriate I/O port(s).

2   Plug the network cable into the appropriate M202Plus network connector.

3   Unpack and plug in the power supply. The connector plugs into the back of the M202Plus.

Watch the lights on the front panel of the device as they cycle through the power-on self test. When the test is complete, the POWER light is on and STAT is flashing.

Figure 7: Physical Setup
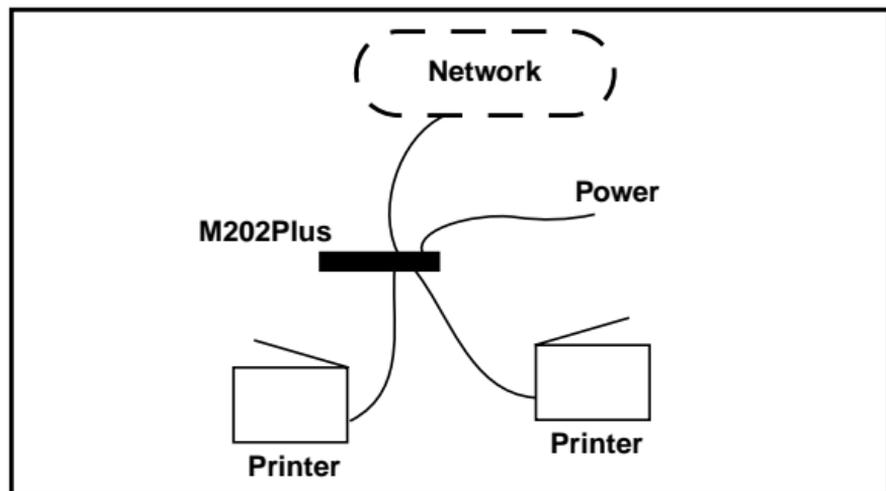
CONFIGURATION TOOLS

Overview

This chapter outlines all of the configuration tools available to you when using an M202Plus.

Two-Part Configuration

When talking about configuration, it's important to understand that there are two parts to an M202Plus setup:

1   Configuring the M202Plus so that it can be seen on the network. This involves network-related settings (e.g. an IP address within TCP/IP environments) configured through the built-in command shell, npsh.

2   Configuring a host with a new printer so it knows how to send data to the M202Plus. Just being able to see the print server on the network doesn't mean you can automatically print to it. A host has to be told where to send the data to.

Note: There are some network environments that do not require any network settings to be configured on the M202Plus. However, *all* network setups require configuration on the host end.

Available Tools

HTML Forms

The M202Plus's settings can be configured over TCP/IP through a standard Web browser. The M202Plus's Web pages provide a user-friendly way to access some of the commands built in to the print server.

To access the M202Plus's home page, you will need to:

1   Make sure the print server has an IP address and sub-

net mask so it is recognizable on your TCP/IP network.

2 Ensure your network station can successfully "**ping**" the M202Plus over the network.

3 Direct your Web browser to the Uniform Resource Locator (URL) "**http://M202PlusIPaddress**" (e.g. "**http://192.75.11.9**").

The M202Plus's HTML structure is divided into several menus as shown in *Figure 8*.

Figure 8: M202Plus HTML Structure
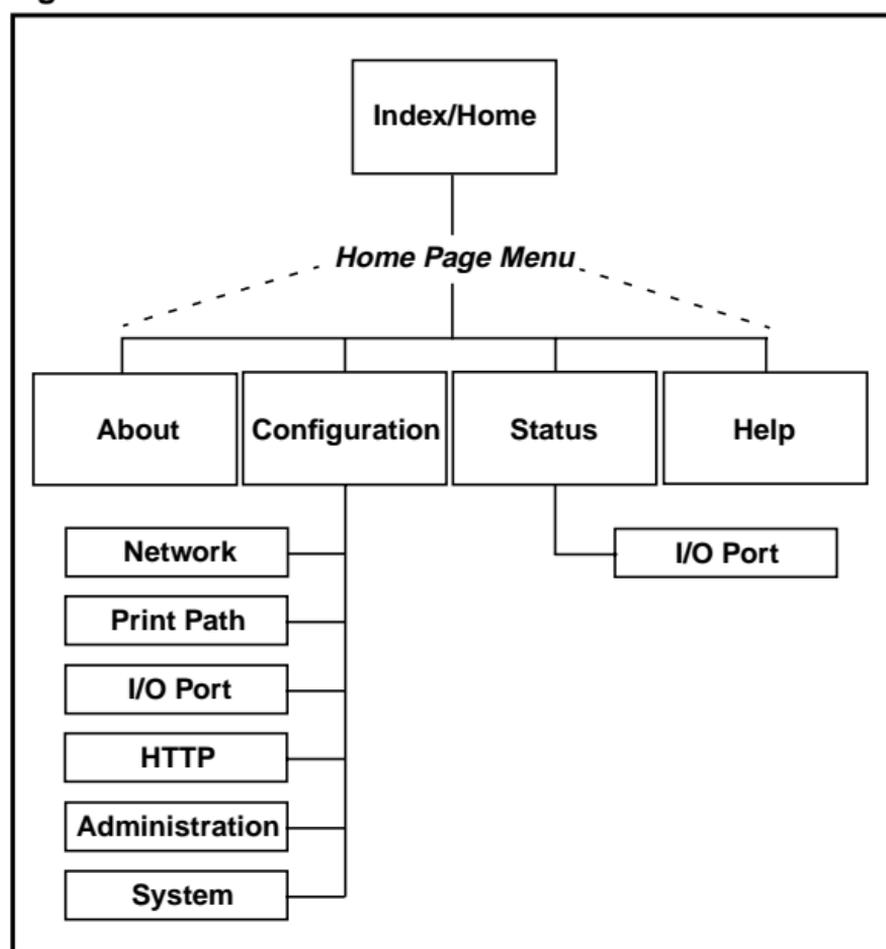
Note: Online help is available for all HTML pages.

IPAssign

This is a Windows utility that helps identify the M202Plus on the network. Relying on TCP/IP as the underlying protocol, the print server can be assigned an IP address and subnet mask once detected on the network. When this is completed, other tools like the HTML configuration forms can be used to do additional M202Plusconfiguration.

Figure 9: IPAssign Sample Interface
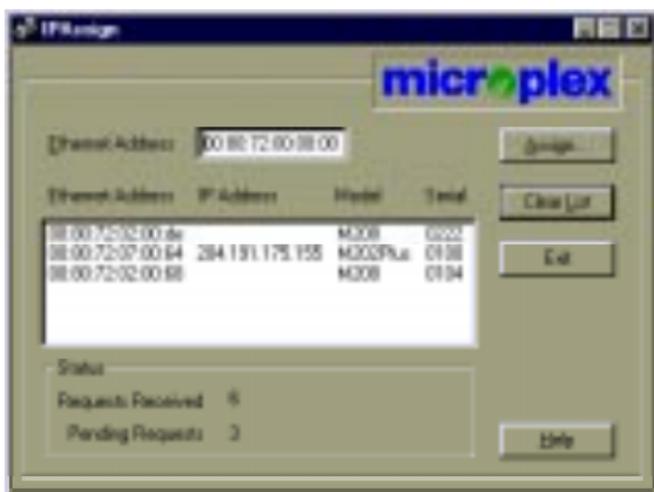
Ezsetup

This is a Unix shell script that helps configure M202Plus settings *and* host print setups. It's compatible with *all* Unix flavours and has a Main Menu similar to *Figure 10*.

Figure 10: Ezsetup Main Menu Screen
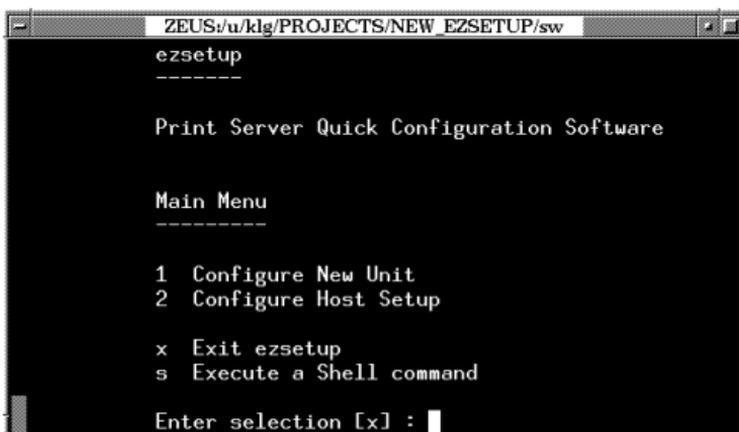
Configuration Alternatives

Besides the HTML forms and software provided by Microplex, the M202Plus's internal command shell, npsh, can also be reached using these more standard methods:

Telnet   A TCP/IP command that helps configure M202Plus settings remotely. A TCP/IP host starts a Telnet session with the print server and logs in to the device's command shell to alter and view settings.

Example:

telnet 192.75.11.9

Remote Shell   (e.g. "**rsh**", "**rcmd**", "**remsh**") A TCP/IP command that helps configure print server settings remotely. A TCP/IP host uses this command to remotely execute a *single* command on the M202Plus.

Example:

rsh spike list prn1

This command remotely executes the npsh command, "**list prn1**" on the M202Plus named **spike**.

Serial Login   A direct login session to the M202Plus's command shell using a PC/laptop/terminal directly off one of the print server's serial ports. This allows print server setting configuration without using the network to communicate with the device.

WINDOWS CONFIGURATION

Overview

This chapter details a complete Windows setup including:

1   Identifying the M202Plus on the network using TCP/IP as the underlying protocol.

2   Configuring the M202Plus with its mandatory TCP/IP settings (i.e. IP address and subnet mask).

3   Configuring a new printer on the Windows station.

Environment Description

The M202Plus supports network printing under Windows environments by utilizing TCP/IP. In a Windows NT setup, pure TCP/IP is used as the network protocol whereas with Windows 95, NetBIOS over TCP/IP is used.

Figure 11 outlines two of the most common Windows setups you will see with the M202Plus. The **ideal configuration** is a network printer defined on the NT server to be shared by Windows 95 clients. However, any Windows station can also go directly to the M202Plus.

Figure 11: Windows Integration
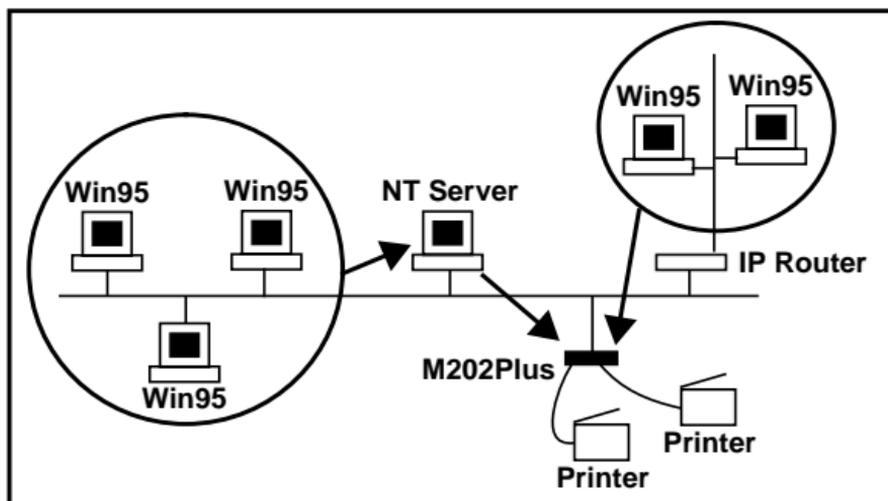
M202Plus Configuration

Mandatory

Since TCP/IP is relied upon for Windows printing, the M202Plus must be configured with an IP address and subnet mask at the minimum before it can be seen on the network.

Optional

Additional settings like routing entries can also be configured allowing for communications across subnets.

Configuration Steps

To configure an IP address and subnet mask on your M202Plus, you will need to:

Note: YOU MUST HAVE THE TCP/IP PROTOCOL AND SERVICES ENABLED ON THIS WINDOWS STATION FIRST.

1 Insert the Microplex diskette labeled "IPAssign" into the floppy drive.

2 Load up the File Manager or WinFile and look under the floppy drive for an IPAssign self-extracting file.

3 Double click on the IPAssign file to launch the install program.

4 When prompted to install, click on YES to load the InstallShield Wizard.

5 Answer the prompts throughout the wizard.

6 Once the install process is complete, you will be prompted to view the "ReadMe" file. Select "Yes" to read this and when done, close the file.

7 Find the new IPAssign program group and double click on the "IPAssign" icon to load the program.

8 At the "IPAssign" main dialogue box that appears, you should see an entry for your M202Plus appear in the

list box. If not, give IPAssign a couple of minutes to find the device on the network or repower the device to speed the process. *Figure 12* shows an example screen.

Figure 12: IPAssign Main Screen
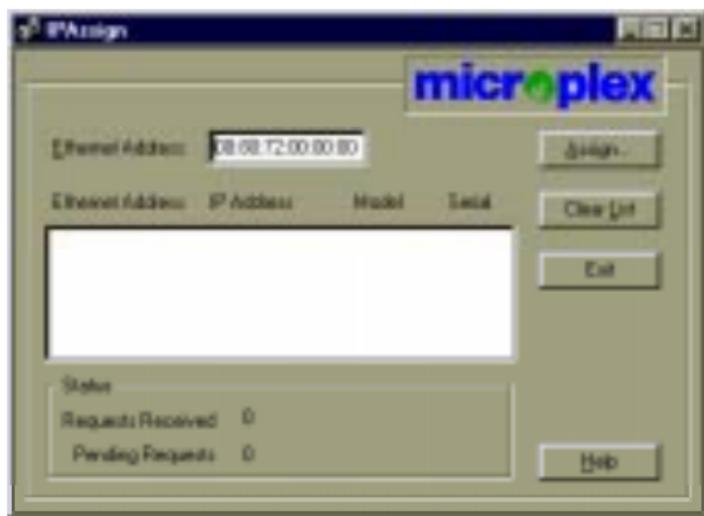
9 Once your M202Plus's Ethernet address appears in the list box, select it and press ASSIGN.

10 At the "Assign IP" dialogue box that displays next, fill in the IP address and subnet mask for this M202Plus.

   Note: You can also assign a default router/gateway entry within this dialogue box allowing your M202Plus to communicate across subnets. This is optional though.

11 Click SET when done to assign these TCP/IP settings to the M202Plus. IPAssign will then display two dialogue boxes informing you of its progress.

12 Once you see the message about successfully assigning the settings, click OK. These TCP/IP settings are now in the M202Plus's current memory to be retained until the next power cycle.

13 Click on LAUNCH BROWSER at the next window

that displays if you want to store the TCP/IP settings into the M202Plus's Flash. This will prevent you from losing the settings after a power cycle.

14 Read the text in the "Configuration Information" window that displays and click OK to launch your Web browser.

Note: If you are taken back to the IPAssign main dialogue box instead, you will be unable to launch your browser this way. Please load it manually and go to the URL, "`http://M202PlusIPaddress/networkConf.html`" (e.g. "`http://192.75.11.9/net-workConf.html`").

15 Once your Web browser is loaded and you're prompted for a "User ID", type "`root`".

16 At the "Password" prompt, press ENTER since there is no password configured by default and click OK.

17 At the "Network Configuration" HTML form that displays, fill in the M202Plus's IP address under the "IP Address" field. *Figure 13* on page 19 shows an example configuration form.

18 Click in the field labeled "Subnet Mask" and fill in the M202Plus's subnet mask.

Note: If you would like to communicate with the M202Plus from across routers, you will need to fill in an entry within the "Routing" section.

19 Click on the SUBMIT button when done.

20 Repower the M202Plus to make the changes take effect. Either physically unplug and plug in the power supply or click on the "System" link at the top of the

"Network Configuration" HTML form. Once at the "System" form, click on the REBOOT button.

Figure 13: Network Configuration HTML Form

At this point, the TCP/IP settings are stored in Flash and you should be able to see the M202Plus on your Windows network. However, you **cannot print to it yet** since you haven't told your Windows station about a new network printer involving the M202Plus. The next section will help you do this.

Host Configuration

Windows NT Host Setup

To configure a new printer on a Windows NT station, you will need to:

1 Open the "Control Panel".

2 Double click on "Printers".

3 Select "Create a Printer" from the "Printer" menu to display the dialogue box in *Figure 14*.

Figure 14: Create a Printer Dialogue Box

4 Define a name to represent this print setup and select the appropriate driver for the printer that will be used in this M202Plus print setup.

5 Under the "Print To" field, select "Other...".

6 Select "LPR Port" from the list that displays and click OK to bring up a dialogue box similar to the one found in *Figure 15* on page 21.

Figure 15: Add LPR Compatible Printer Dialogue Box
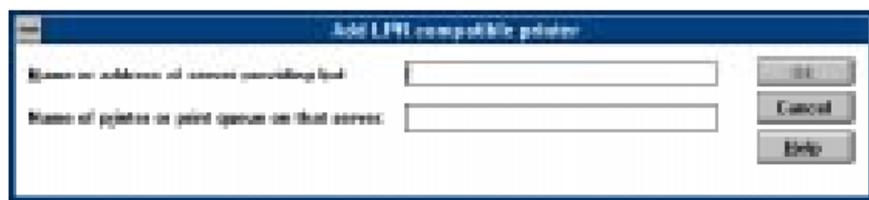
7   Type in the IP address or host name of the M202Plus in the first field.

8   Type in the name of a pre-defined destination/queue on the M202Plus in the second field.

> **Note**:   This name *cannot* be any name you'd like. It must be a name of an existing destination/queue on the M202Plus and it must be *lower-case* by default. You will most likely use "**d1prn1**" for the PRN1 port, "**d2prn2**" for the PRN2 port, "**d3com1**" for the COM1 port, and "**d4com2**" for the COM2 port.

9   Click OK when done specifying these two fields.

You now have a new network printer which relies on the standard TCP/IP print protocol, LPD, to print remotely to a printer off of the M202Plus.

Windows 95 Host Setup

To configure a new printer on a Windows 95 station, you will need to:

1   Select "Settings:Printers" from the "Start" menu.

2   Double click on the "Add Printer" icon.

3   Select "Network Printer" from the second window of the "Add Printer" wizard that loaded.

4   At the next window, click on BROWSE to help fill in the network path of this printer.

5   At the "Browse for Printer" dialogue box that displays, double click on the appropriate workgroup containing the M202Plus. By default, the print server falls under the workgroup, "WORKGROUP".

6   Continue searching the network until you see the M202Plus's name, "M_*xxxxxx*", where "*xxxxxx*" equals the last six digits of the print server's Ethernet address found on the bottom of the device. (e.g. M_001C1A)

7   Once you see the M202Plus, double click on it to display a list of eight pre-defined destinations/queues to choose from.

8   Select a destination/queue that matches with the I/O port you have the printer attached to. Most likely you will use "**d1prn1**" for the PRN1 port, "**d2prn2**" for the PRN2 port, "**d3com1**" for the COM1 port, and "**d4com2**" for the COM2 port.

9   Click OK once you have selected a destination.

10 Back at the network path window, select NEXT since this path should now be filled in for you.

11 At the next window, select the appropriate printer manufacture and model of the printer attached to the M202Plus and click on NEXT.

12 Fill in a name for this new network printer at the next window and decide if you want this to be the default printer. This printer name can be anything you'd like as long as it's unique.

13 When prompted for a test page, select either "Yes" or "No" depending on the state of the attached printer and click on FINISH.

> **Note**: Windows may ask for a disk or CD-ROM to load the appropriate printer driver to complete this new printer setup.

There should now be a new printer icon within the 'Printers" folder. This new network printer relies on NetBIOS over TCP/IP as the underlying protocol to print to the M202Plus.

Troubleshooting Tips

IPAssign Can't Find the M202Plus

- Have you loaded IPAssign onto a Windows station sitting on the *same subnet* as the M202Plus? IPAssign cannot see print servers across routers unless BOOTP broadcast packets can travel from subnet to subnet.

- Have you waited a couple of minutes for IPAssign to recognize the M202Plus or have you tried repowering the print server to speed this identification process?

- Do you have a DHCP, RARP, or BOOTP server running that may be providing the M202Plus with an IP address upon bootup? If so, IPAssign isn't needed to assign an IP address to the print server.

    > **Note**: If the M202Plus has an IP address, it will no longer send out a BOOTP packet. This means IPAssign will not be able to see the device on the network.

M202Plus Won't Talk on the Network

- Have you assigned it a unique and valid IP address which corresponds with the other IP addresses on your network? For example, are you sure no other device is using this IP address?

- Are you sure you are trying to talk to the M202Plus from a Windows station on the *same subnet*? Currently, the print server can only be seen locally unless you configured a routing entry earlier on.

- If you look at the front of the M202Plus, is the STAT LED flashing once a second or is it quicker than that? A slower, once-a-second rate tells you that the print server is in fact configured with an IP address. A faster rate says it knows nothing about this so you may need to try the configuration process again.

- Have you confirmed the network connection to the M202Plus is working correctly? Trying different network cables and locations will help narrow down the problem.

HTML Configuration Forms Won't Display

- Can you "**ping**" the M202Plus from your Windows station? If not, please refer to *M202Plus Won't Talk on the Network* on page 23.

- Have you used the correct URL for the M202Plus's home page? It should be "**http://M202PlusIPaddress**" (e.g. "**http://192.75.11.9**").

Errors Occur When Defining an LPR Printer

- Can you "**ping**" the M202Plus from your Windows NT station? If not, please refer to *M202Plus Won't Talk on the Network* on page 23.

- Did you specified the correct IP address or host name for the M202Plus in the first field of the "Add LPR Compatible Printer" box?

- Did you specify a valid destination/queue on the M202Plus in the second field of the "Add LPR Compatible Printer" dialogue box? If so, did you also enter it in lowercase letters? Please see Figure 20: *M202Plus Default Names* on page 49 for the default destinations.

Can't Browse the M202Plus on the Network

• Have you looked under the right Windows workgroup? By default, the M202Plus will be found under "WORKGROUP".

• Are you able to browse other Windows stations and devices on the network from this same station?

• Has this Windows station been given enough time to update its registry so it can see this newly added work-group device? Sometimes Windows stations can take a while depending on the size of the network and the decision process used to figure out which station will act as the Master Browser. Having a designated Master Browser station can speed this process up since it eliminates any need for negotiation.

Printer Errors When Printing or No Output

• Is there a large job currently printing taking up all of the printer's resources? Usually when printing from Windows 95 stations, a busy printer can cause Windows to display a printer error message. This is because it demands immediate printer attention rather than holding the data until the printer is ready again. The best way around this if it happens quite often is to use a central spooling station like an NT server.

• Have you tried restarting the spooler under Control Panel:Services? Sometimes this is needed to get printing going.

Note: As a last resort, you may want to try rebooting the Windows station. Sometimes this is the only option to completely clear this situation. Usually the M202Plus has nothing to do with this problem so it can be left alone.

UNIX CONFIGURATION

Overview

This chapter details a complete Unix setup including:

1   Configuring the M202Plus with its mandatory TCP/IP settings (i.e. IP address and subnet mask).

2   Configuring a new printer on the Unix station.

Environment Description

The M202Plus supports network printing under various TCP/IP environments including *all* flavours of Unix. Printing can come from multiple hosts directly or through central spooling machines. *Figure 16* illustrates this for you.

Figure 16: Unix Integration
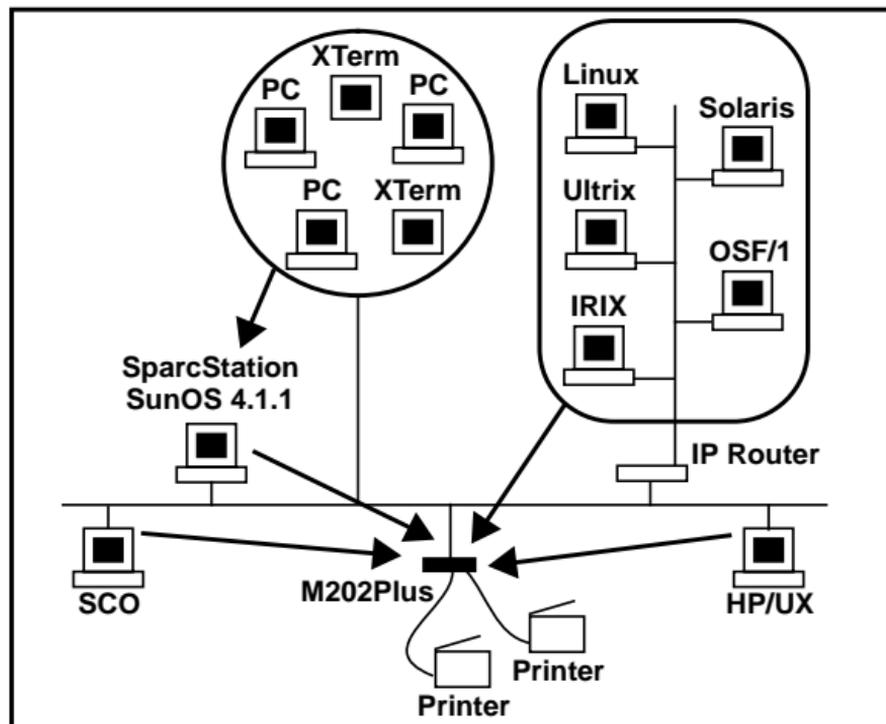
M202Plus Configuration

Mandatory

Since TCP/IP is used, the M202Plus must be configured with an IP address and subnet mask at the minimum before it can be seen on the network.

Optional

Additional settings like routing entries can also be configured allowing for communications across subnets.

Configuration Steps

To configure an IP address and subnet mask on your M202Plus, you will need to:

1. Log in as root or superuser on your Unix host.

2. Insert the Microplex Unix host software diskette into a floppy drive.

3. "**cd**" to a directory with atleast three megabytes of free space.

4. Transfer the compressed tar file from the diskette onto the host.

   tar xvf /dev/*devicename*

   where ***devicename*** is usually "**fd0**" for a diskette.

5. Uncompress this file.

   uncompress npdist.tar.1.Z

6. Untar this file.

   tar xvf npdist.tar.1

   A list of files will display and scroll up the screen. Several files and sub-directories are created including a copy of Ezsetup, the Unix script used for print server *and* host configuration.

7   [Optional] Assign an IP address and host name to the
     M202Plus in the host table (/etc/hosts, host NIS map,
     or DNS name tables).

8   Run Ezsetup from the command line. Use this syntax
     for most Unix operating sytems:

     ./ezsetup

     For HP/UX, use:

     ksh ./ezsetup

9   Answer the prompts that appear (so Ezsetup can learn
     about the Unix host it's running on) and wait for the
     Main Menu to display. It will look like *Figure 17*.

Figure 17: Ezsetup Main Menu

10   Enter "1" for "Configure New Unit" since you want to
     configure an M202Plus with its TCP/IP settings.

11   Follow the prompts on each screen as Ezsetup steps
     through the configuration of the M202Plus's IP
     address, subnet mask, optional default router/gateway,
     and optional root and guest passwords.

Once you receive a message that this configuration com-
pleted successfully, you should be able to communicate
with the print server over the network. However, Ezsetup
will now automatically lead you into the second part of con-

figuration, "Configure Host Setup", since you cannot print to a printer off of the M202Plus until this is completed.

Host Configuration

The second half of Ezsetup helps configure a new printer on your Unix host. Just being able to talk to the M202Plus doesn't mean you can print to it. Therefore, you have to define a printer so the host knows where to send the data to.

Ezsetup will continue prompting you for information about your host and printer. Answer these prompts until the host configuration is complete. If you have any questions about the screens that display, please refer to *Ezsetup Tips* on page 30.

At the end, you will have a new network printer that sends data to a printer off of the M202Plus.

Ezsetup Tips

- When asked for a **print method**, follow these rules:

    1 If your Unix host uses the BSD print system, select "BSD Remote (LPD)" option.

    2 If your Unix host is a System V derivative, select the "System V Interface Script" option.

- When asked for a **printer name**, choose the name of the print setup on this host (i.e. the name entered in the print command). For example, a print setup including an HP III laser printer might be called "laser".

- When asked for a **destination**, choose one of the eight pre-defined destinations/queues on the M202Plus. Normally you would choose "d1prn1" for the PRN1 port, "d2prn2" for the PRN2 port, "d3com1" for the COM1 port, and "d4com2" for the COM2 port.

- When asked which **I/O port** or **port**, choose either "prn1", "prn2", "com1", or "com2" depending on which port the printer is attached to.

- If asked to name an **interface script**, name it something meaningful. For example, the HP III laser printer example might have a script called "laser.if".

- If using an interface script setup, keep in mind that a "**dummy device file**" or "**device file**" is an empty text file that stores data like spooler errors and request IDs of the jobs printing. The name should also reflect the print setup for easy identification. (e.g. "/dev/laser")

- Near the end of Ezsetup's "Configure Host Setup" section, the script mentions **carriage return insertion** and **formfeeds**. Carriage return insertion is needed if Unix text jobs are going to be printed through this setup. Formfeeds are needed only if printing Unix text jobs through a "BSD Remote (LPD)" setup.

Troubleshooting Tips

Ezsetup's Menus are Incomplete

- Are you running Ezsetup on an HP/UX host? If so, did you remember to run Ezsetup with this command:

    ```
    ksh ./ezsetup
    ```

Ezsetup Stops With an Error

- Are you using a common operating system like SCO, Solaris, or HP/UX? If not, you may have run into a compatibility issue. Please see the Microplex PDF file, "unix.pdf" for manual setup instructions. These will step you through a setup without using Ezsetup.

M202Plus Won't Talk on the Network

- Have you configured it with a unique and valid IP address which corresponds with the other IP addresses on your network? For example, are you sure no other device is using this IP address?

- Are you sure you are trying to talk to the M202Plus from a Unix station on the *same subnet*? Currently, the

print server can only be seen locally unless you configured it with a routing entry.

- If you look at the front of the M202Plus, is the STAT LED flashing once a second or is it quicker than that? A slower, once-a-second rate tells you that the print server is in fact configured with an IP address. A faster rate says it knows nothing about this so you may need to try the configuration process again.

- Have you confirmed the network connection to the M202Plus is working correctly? Trying different network cables and locations will help narrow down the problem.

Nothing Prints

- Can you "**ping**" the M202Plus from your Unix station? If not, please refer to *M202Plus Won't Talk on the Network* on page 31.

- Is the M202Plus able to communicate with the attached printer? To test this, you can:

  1   "**telnet**" to the print server (e.g. "**telnet 192.75.11.9**") and log in as "**root**".

  2   Enter the command "**start fox *portname***" where *portname* is either "**prn1**", "**prn2**", "**com1**", or "**com2**".

  3   Execute "**stop *portname***" right after starting the test.

  This FOX test will send the same text line over and over to the attached printer.

- Is the job getting stuck in the Unix host's queue? If so, check that the printer is ready to go. If this looks good, there's a configuration error on the Unix station so creating a new print setup may be needed.

- Is the printer's console or control panel showing any activity like it's receiving data? If so but there's noth-

ing coming out, check to see if a manual formfeed is needed. Also, ensure that the printer can support the type of job coming through. For example, a PostScript printer will choke on a non-PostScript job.

• Do all jobs fail or just certain ones? For example, maybe jobs from a certain application are the only ones to fail. If so, check the type of data it's sending to make sure it matches the printer's emulation and check the application's printer configuration for mistakes.

Stair-Stepped Output

Stair-stepped output is when the output starts at the top left of the page but every line thereafter, starts a little more over to the right. It also refers to Unix jobs that print one line of text at the top of a page followed by a series of blank pages.

This unique output will happen only with Unix text jobs if carriage return insertion is not incorporated into the print setup. The printer may be told to do a linefeed but the Unix job does not specify anything about a carriage return to follow this.

To fix this, carriage return insertion must be enabled somewhere in the print setup. The easiest and most common location is on the M202Plus itself within the appropriate model. The feature is called "onlcr" and the command syntax is:

```
set model modelname stty onlcr

save
```

For example, if printing to the destination, **d1prn1**, the associated model is **m1**. Therefore, the command is:

```
set model m1 stty onlcr

save
```

For default destination-model mappings on the M202Plus, please see *M202Plus Naming Scheme* on page 49.

No Formfeed or Extra Page Comes Out

Unix text jobs may also have problems outputing the last page of a job especially when the BSD Remote (LPD) print method is used. This means the formfeed button has to be pressed right on the printer to get this last page out.

To make this process automatic, tell the M202Plus to handle this task for you by setting this feature on in the appropriate model. The command syntax is:

```
set model modelname trailer $FF

save
```

For example, if printing to the destination, **d2prn2**, the associated model is **m2**. Therefore, the command is:

```
set model m2 trailer $FF

save
```

For default destination-model mappings on the M202Plus, please see *M202Plus Naming Scheme* on page 49.

NOVELL CONFIGURATION

Overview

This chapter details a complete Novell setup including:

1 Identifying the M202Plus on the network.

2 Configuring the M202Plus with its mandatory print setup settings.

3 Configuring a new print queue on the file server.

Environment Description

The M202Plus supports network printing under Novell environments by utilizing IPX. It supports all versions of NetWare including the latest version 4.x level with the Novell Directory Services (NDS) structure. *Figure 18* provides a Novell setup overview.

Figure 18: Novell Integration
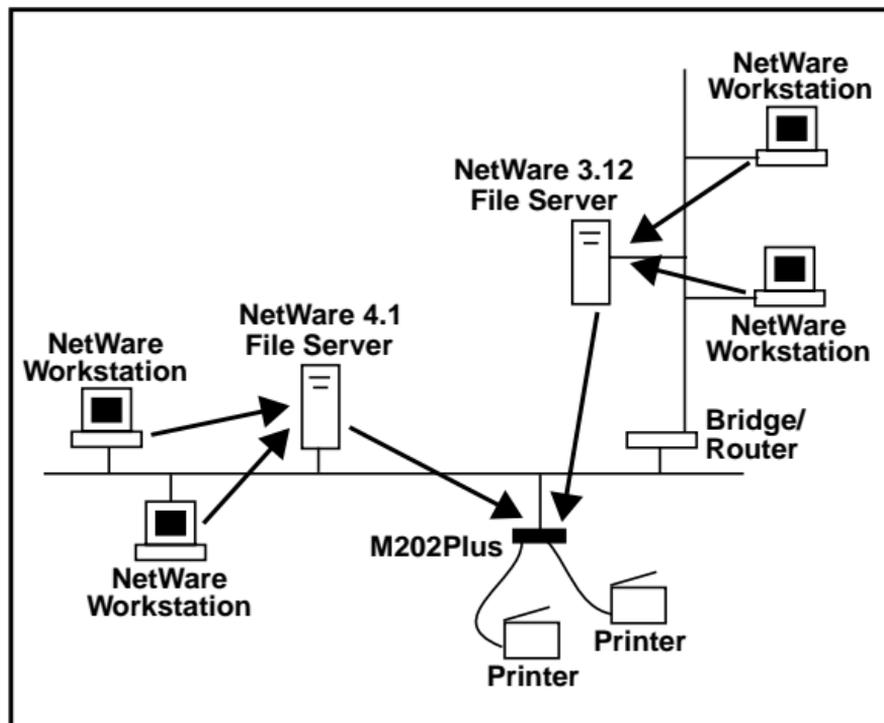
M202Plus Configuration

Mandatory

Under *all* Novell environments, the M202Plus does *not* require any network settings to make it visible on the network. Simply plug it in to your network and power it on. However, with a new print queue setup on a Novell file server, there can be some mandatory settings needed on the M202Plus. Please see *Host Configuration* on page 36 for further details under all NetWare versions.

Host Configuration

Under all versions of NetWare, both PSERVER and RPRINTER setups are supported by the M202Plus. Since a PSERVER setup is the most common though, you will find the necessary steps to configure the M202Plus as a PSERVER within this section. For RPRINTER and NPRINTER setup information, please see the Microplex PDF file, "novell.pdf".

Note: The M202Plus can service up to four printers on one file server. It cannot service multiple file servers at one time.

NetWare Version 3.x PSERVER Setup

To configure a print queue on a NetWare 3.x network, you will need to:

1   Log on to the Novell file server as Supervisor.

2   Enter PCONSOLE.

3   Select "Print Queue Information" from the PCONSOLE Main Menu.

4   Press INSERT to add a new queue to the list of currently-defined queues showing.

5   Type in the name of this new queue when prompted and press ENTER. This can be any name you'd like.

6   Press ESCAPE to return to the Main Menu.

7   Select "Print Server Information" and press ENTER.

8   Press INSERT when the list of existing print servers displays.

9   Type the name of the M202Plus when prompted for a print server name and press ENTER when done. By default, the M202Plus is named "M_*xxxxxx*" where "*xxxxxx*" equals the last six digits of the print server's Ethernet address found on the bottom of the device (e.g. M_071C1A).

10 Back at the print server list, select this newly-defined M202Plus and press ENTER.

11 Select "Print Server Configuration" from the menu that displays.

12 Select "Printer Configuration" from the next menu to display a list of configured printers.

13 Select the first item listed as "NOT INSTALLED" and press ENTER.

14 At the printer configuration window, type in the name for this new printer. This name *must be* one of the pre-defined destinations/queues on the M202Plus. This will normally be "**d1prn1**" for the PRN1 port, "**d2prn2**" for the PRN2 port, "**d3com1**" for the COM1 port, and "**d4com2**" for the COM2 port.

15 Go to the "Type" field and press ENTER to see the possible choices.

16 Select "Defined Elsewhere" from this list.

17 When done, press ESCAPE and select "Yes" to save the changes to this new printer.

18 Press ESCAPE again to return to the "Print Server Configuration" menu.

19 Select "Queues Serviced by Printer".

20 Select this new printer from the printer list that displays and press ENTER.

21 At the empty queue list that displays, press INSERT.

22 Select the queue created earlier in these steps and press ENTER.

23 When prompted for the priority, press ENTER to select the default or select a priority.

24 Press ESCAPE until back at the PCONSOLE Main Menu.

25 Repower the M202Plus by unplugging and plugging in the power supply.

26 Wait two minutes and then select "Print Queue Information" from the PCONSOLE Main Menu.

27 Select this new queue and from the menu that displays, select "Currently Attached Servers" to see which print server is servicing this queue.

At this point, the M202Plus's name (e.g. M_071C1A) should show within this window. This means the M202Plus knows about this new Novell print queue it must service as a PSERVER. Therefore, it will poll this queue regularly looking for jobs to print.

NetWare 4.x NDS Setup

To configure a print queue on a NetWare 4.x network, you will need to:

1 Log in to the M202Plus's command shell, npsh, as root.

   If you have TCP/IP available and this print server already has an IP address stored within it, you can use the built-in HTML configuration forms or a Telnet session. Please see *Available Tools* on page 11 for further

details. If you have only Novell available, you will need to use a PC/laptop/terminal off of COM1 or COM2 on the M202Plus. Please see *Serial Port Login Sessions* on page 57 for more information.

Note: If you use HTML configuration, you will need to go to the "Network Configuration" form (i.e. "**http://M202PlusIPaddress/ networkConf.html**"; e.g. "**http://192.75.11.9/ networkConf.html**") and look under the "Novell" section. The settings in the following two steps are found there. If using a Telnet session or a serial port login session, you will need to manually execute the commands listed in the next two steps.

2   Tell the M202Plus to operate in Novell Directory Services mode rather than Bindery mode.

   store pserver novell mode nds

3   If the M202Plus's NDS context is different from the context of the file server it will be servicing, define its context.

   store pserver novell context NDScontext

   Example:

   store pserver novell context eng.mplex

4   Leave this M202Plus login session and log on to the Novell file server as Supervisor.

5   Load NWAdmin.

6   Select the NDS context in which the M202Plus will fall under.

7   Once selected, click on the right mouse button and select "Create" from the pop-up menu to create a new object within this NDS context.

8   At the "New Object" window that displays, select "Print Queue" and click OK.

9   At the "Create Print Queue" window that displays, type in the name for this new queue. It can be any name you'd like.

10 Make sure "Directory Service Queue" is selected in this dialogue box.

11 Select the file server volume for this queue. Use the browsing button to the right of this field if you don't know the volume off hand.

12 Click CREATE when done to add this queue within the NDS context.

13 Select the NDS context again in which the M202Plus will fall under.

14 Once selected, click on the right mouse button and select "Create" from the pop-up menu to create another new object within this NDS context.

15 At the "New Object" window that displays, select "Print Server" and click OK.

16 At the "Create Print Server" window that displays, type in the name for this new print server. By default, the M202Plus is named "M_*xxxxxx*" where "*xxxxxx*" equals the last six digits of the print server's Ethernet address found on the bottom of the device (e.g. M_071C1A).

17 Click CREATE when done to add this print server within the NDS context.

18 Select the NDS context again in which the M202Plus will fall under.

19 Once selected, click on the right mouse button and select "Create" from the pop-up menu to create another new object within this NDS context.

20 At the "New Object" window that displays, select "Printer" and click OK.

21 At the "Create Printer" window that displays, type in the name for this new printer. This name *must be* one of the pre-defined destinations/queues on the M202Plus. This will normally be "**d1prn1**" for the PRN1 port, "**d2prn2**" for the PRN2 port, "**d3com1**" for the COM1 port, and "**d4com2**" for the COM2 port.

22 Click CREATE when done to add this printer within the NDS context.

23 Select this new printer from the list and double click on it.

24 Press ASSIGNMENTS at the window that displays.

25 At the next window, press ADD.

26 Find the queue created earlier in these steps in the list that displays and click OK when done.

27 Select OK to exit back to the context list.

28 Find the new print server created earlier in these steps and double click on it.

29 Press ASSIGNMENTS at the window that displays.

30 At the next window, press ADD.

31 Find the printer created earlier in these steps in the list that displays and click OK when done.

32 Select OK to exit back to the context list.

33 Repower the M202Plus by unplugging and plugging in the power supply.

34 Wait two minutes and then select the new queue in the context list.

35 Click on the right mouse button and select "Details" from the pop-up menu to show the details for this queue.

At this point, you should see the M202Plus as an authorized print server for this queue. This means the M202Plus knows about this new Novell print queue it must service as a PSERVER. Therefore, it will poll this queue regularly looking for jobs to print.

Troubleshooting Tips

NetWare 3.x - No PSERVER Connection

• Has the M202Plus been power cycled once the PCON-SOLE steps were completed? This will make the print server boot up and realize which print queue and file server it needs to service.

• Is the M202Plus already servicing a queue on another file server? If so, it cannot service another file server at the same time.

• When defining a new "**print server**" within PCON-SOLE, did you use the correct name for the M202Plus (e.g. M_071C1A)? By default, it only recognizes itself as "M_*xxxxx*" where "*xxxxx*" equals the last six digits of its Ethernet address found on the bottom of the device.

• When defining a new "**printer name**" within PCON-SOLE, did you use a pre-defined destination/queue rather than a name of your own? By default, the M202Plus only recognizes names like "**d1prn1**". All else will be ignored by the device. Please see *M202Plus Naming Scheme* on page 49 for a list of all default destination names.

- Is the M202Plus in **Bindery** mode as seen under the "**list pserver**" output on the device? If servicing only a NetWare 3.x file server, it must be set to handle Bindery services rather than NDS. The default setting is Bindery.

- Is there an available NetWare user license for the M202Plus to utilize while it acts as a PSERVER? Every PSERVER takes up one user license since it logs in to the Novell file server.

- Have you given the connection process some time after repowering the M202Plus? In larger Novell environments, sometimes the file server identification and connection process can take several minutes.

NetWare 4.x - No PSERVER Connection

- Has the M202Plus been power cycled once the NWAdmin steps were completed? This will make the print server boot up and realize which print queue and file server it needs to service.

- Is the M202Plus already servicing a queue on another file server? If so, it cannot service another file server at the same time.

- When defining a new "**print server**" within NWAdmin, did you use the correct name for the M202Plus (e.g. M_071C1A)? By default, it only recognizes itself as "M_*xxxxxx*" where "*xxxxxx*" equals the last six digits of its Ethernet address found on the bottom of the device.

- When defining a "**new printer**" within NWAdmin, did you use a pre-defined destination/queue rather than a name of your own? By default, the M202Plus only recognizes names like "**d1prn1**". All else will be ignored by the device. Please see *M202Plus Naming Scheme* on page 49 for a list of all default destination names.

- Is the M202Plus in **nds** mode as seen under the "`list pserver`" output on the device? If servicing a NetWare 4.x file server, it must be set to handle NDS services rather than Bindery. The default setting is Bindery.

- If the M202Plus and file server reside in different NDS contexts, did you specify the context for the M202Plus on the device itself?
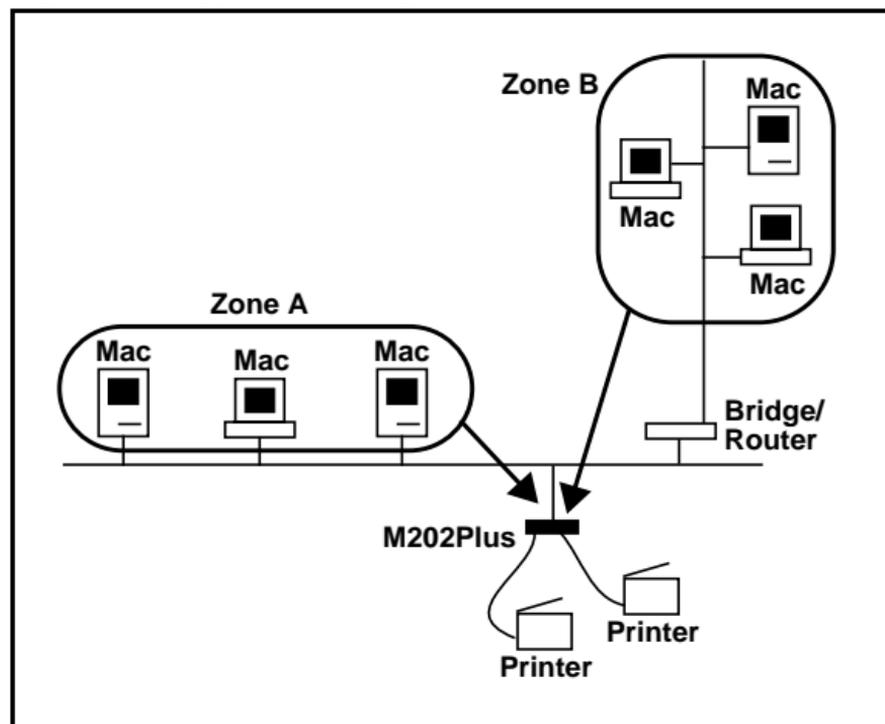
APPLETALK CONFIGURATION

Overview

This chapter details a complete AppleTalk setup including:

1   Configuring a new printer on an Apple station.

Environment Description

The M202Plus supports network printing under AppleTalk environments by utilizing EtherTalk, not LocalTalk. Multiple Apple stations in multiple zones can print simultaneously to the M202Plus as seen in *Figure 19*.

Figure 19: AppleTalk Integration

M202Plus Configuration

Mandatory

Under AppleTalk environments, the M202Plus does *not* require any network settings to make it visible on the network. Simply plug it in to your network and power it on.

Optional

Additional settings are available to fine-tune the M202Plus's AppleTalk functionality. For example, you may want to set a particular zone for the device to come up in or you may want to disable some Microplex printers from showing in the Chooser. Please see the Microplex PDF file, "apple.pdf", for further information on this optional configuration.

Host Configuration

To configure a network printer on an Apple station, you will need to:

1 Select Chooser from the Apple Menu to bring up the Chooser window.

2 Select the LaserWriter icon to produce a list of available printers on the right side of the Chooser window.

By default, these M202Plus-related printers will be in the format "*M202Plusname_papname*" where "*M202Plusname*" is the name of the print server and "*papname*" is the name of an I/O port on the device. The print server name will be "*M_xxxxxx*" where "*xxxxxx*" equals the last six digits of the M202Plus's Ethernet address found on the bottom of the device and the I/O port will be either prn1, prn2, com1, or com2.

Example name for a printer off of the **PRN1** port of an M202Plus named **M_001C1A**:

```
M_001C1A_prn1
```

3   Choose one of these listed printers to print to and click
    on OK to close the Chooser window.

This new printer is now a valid network printer which this
Apple station can print to.

Troubleshooting Tips

Printer Won't Show in the Chooser

- Have you confirmed you are using EtherTalk and not
  LocalTalk? The M202Plus does *not* support LocalTalk.

- Is the M202Plus attached to the network and powered
  on with the STAT LED flashing regularly? Is the ERR
  LED staying on at all? If so, please contact Microplex
  Technical Support using one of the methods listed
  under *Help Methods Available* on page 61.

- Have you clicked on the LaserWriter icon within the
  Chooser window? By default, the M202Plus supports
  the LaserWriter printer driver. To change this, please
  see the Microplex PDF file, "apple.pdf" for details.

- Might the M202Plus need to be configured for a partic-
  ular zone? By default, the print server will come up in
  the default zone. Please see *Common npsh Commands*
  on page 51 for the command syntax to change this.

- Do the M202Plus printers appear correctly within the
  Chooser if you try this from another Apple station?

- Have you tried another network connection to the
  M202Plus to guarantee it can be seen on the network?

M202PLUS REFERENCE PAGES

Overview

This chapter details some of the most common features of the M202Plus including:

- important pre-defined names,

- a description of the built-in command shell, npsh, along with a table of the most common commands,

- the steps to go back to factory default settings,

- the steps for a serial port login session,

- a complete overview of the Flash upgrade procedure.

M202Plus Naming Scheme

Figure 20: M202Plus Default Names
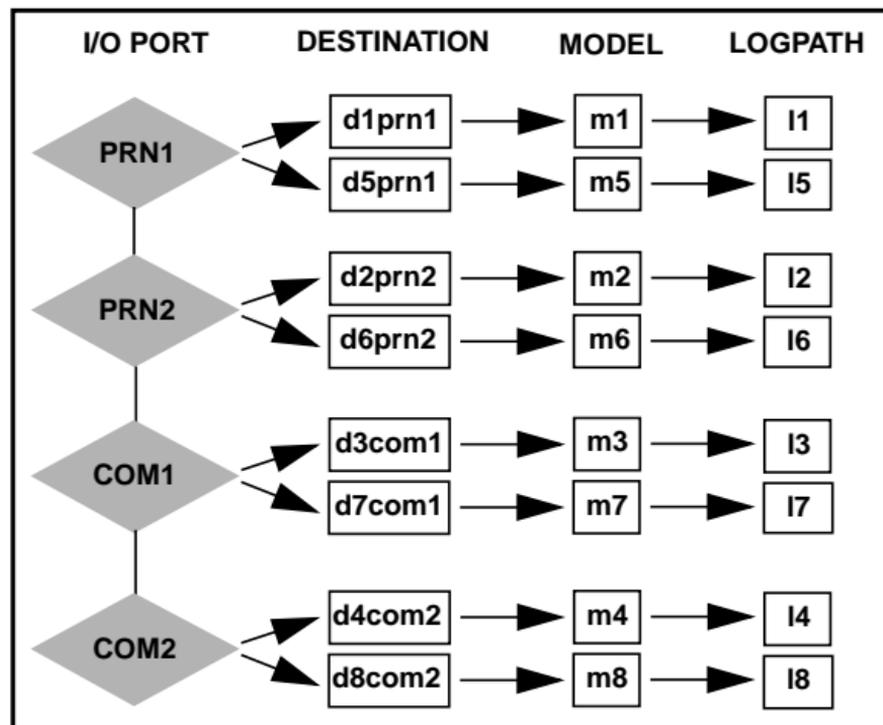
M_xxxxxx (e.g. M_001C1A) Default name of
M202Plus in Windows, Novell, and Apple-
Talk environments. "*xxxxxx*" equals last six
digits of Ethernet address found on bottom of
the print server.

Workgroup Name of default workgroup M202Plus can
be found under in a Windows environment.

M202Plus Command Shell

Within the M202Plus, a command shell is built into the
firmware called "**npsh**". It allows you to manipulate objects
like destinations, models, and I/O ports and provides some
monitoring and troubleshooting capabilities as well.

npsh Access Methods

To access this command shell, these methods are available:

HTML Forms When you configure a setting
using the built-in HTML config-
uration forms, npsh commands
are actually executed remotely
on the M202Plus.

Telnet Session Opening a Telnet session with
the M202Plus allows you to log
in to the device and access the
npsh command shell. (e.g.
"**telnet 192.75.11.9**")

Serial Port Login Using a PC, laptop, or terminal
on one of the M202Plus's serial
ports allows a direct login to the
npsh command shell without
having to go over the network.

Remote Shell Command Remotely executes one npsh
command at a time from your
local TCP/IP station. (e.g.
"**rsh spike list prn1**")

Main npsh Command Prefixes

The four main command prefixes within the npsh command shell are:

1   "**store**" - change settings stored in Flash.

2   "**set**" - change current/working settings in memory.

3   "**list**" - view current/working settings in memory.

4   "**debug**" - view certain debugging information.

Note: If the "**store**" prefix is used, the M202Plus must be repowered to make the changes take effect. Since "**store**" affects Flash settings only, the print server must reset and read the new settings now in Flash.

Note: If the "**set**" prefix is used, a "**save**" command must be executed as well so that the new settings are retained after power cycles. Since "**set**" only affects the settings in memory, they will be lost after a power cycle unless they are told to be saved into Flash ROM.

Common npsh Commands

The npsh command shell is quite complete with more than 50 commands available. Therefore, *Table 2* outlines some of the more common commands you may need to know about. For a complete command reference, please see the Microplex PDF file, "command.pdf".

Note: If you see the word "`ifnum`", substitute in "`1`" to represent the one network interface (i.e. Ethernet) supported by the M202Plus.

Table 2: Common Commands

Command Syntax	Description
`store tcpip ifnum addr IPaddress`	Store the IP address for the M202Plus.
`store tcpip ifnum mask netmask`	Store the subnet mask for the M202Plus.
`store tcpip route add default routerI-Paddress ifnum`	Store a default router/gate-way for the M202Plus to forward remote packets to.
`store tcpip ifnum opts [[-]rarp] [[-]bootp] [[-]dhcp]`	Control RARP, BOOTP, and DHCP requests for IP addresses.
`store pserver name newname`	Configure the M202Plus's name used within Windows, Novell, and AppleTalk setups.
`store pserver novell fserver add fileservername`	Tell the M202Plus about a particular Novell file server.
`store pserver novell type nds|bindery`	Control whether the M202Plus runs under NDS or Bindery mode.
`store pserver novell tree treename`	Tell the M202Plus what NDS tree it falls under.

Table 2: Common Commands

Command Syntax	Description
`store pserver novell user name username`	Define an NDS user name for file server login.
`store pserver novell user passwd password`	Define a password for the NDS user definition.
`store pserver apple zone zonename`	Tell the M202Plus which AppleTalk zone to be in.
`set prn1|prn2 mode slow|cen|pc|fast|bb`	Configure the speed of a parallel port.
`set com1|com2 2400	4800	9600	19200	38400`	Configure the serial port baud rate.
`set com1|com2 [-]ixon`	Control software flow control on a serial port.
`set com1|com2 [-]ctsflow`	Control hardware flow control on a serial port.
`set dest name newname`	Change the name of a destination/queue.
`set sysinfo module [[-]novell] [[-]appletalk] [[-]netbios]`	Control which protocols are enabled on the M202Plus.
`list tcpip`	List the current TCP/IP network settings.
`list prn1|prn2|com1|com2`	List the current settings of an I/O port.

Table 2: Common Commands

| Command Syntax	Description
`list dest`	List the current destination/queue settings.
`list model`	List the current model settings.
`list sysinfo`	List current system information for the M202Plus
`cancel jobID`	Cancel a queued job.
`save`	Save all current settings to Flash.
`reset`	Reset the M202Plus.
`ping IPaddress`	"`ping`" another TCP/IP host on the network.
`telnet IPaddress`	"`telnet`" to another TCP/IP host on the network.
`start fox prn1|prn2|com1|com2`	Start the FOX test on an I/O port testing M202Plus-to-printer communications.
`stop prn1|prn2|com1|com2`	Stop the FOX test on an I/O port.
`quit`	Quit out of the npsh command shell.

Back to Factory Defaults

Sometimes it is beneficial to return the M202Plus to its factory default state. For example, if you are having problems communicating with the print server over the network, you may want to put it back to a default state and reconfigure the network settings. To do this, you will need to:

CAUTION: **The inside of the M202Plus is sensitive to static electricity so be sure to ground yourself to the chassis before touching any internal components.**

1 Unplug the M202Plus, open the casing with a screwdriver, and slide the board out.

2 Turn the board so the serial ports are pointing away from you and look for S2 near the COM2 I/O port as shown in *Figure 21*.

Figure 21: M202Plus Default Jumper Settings
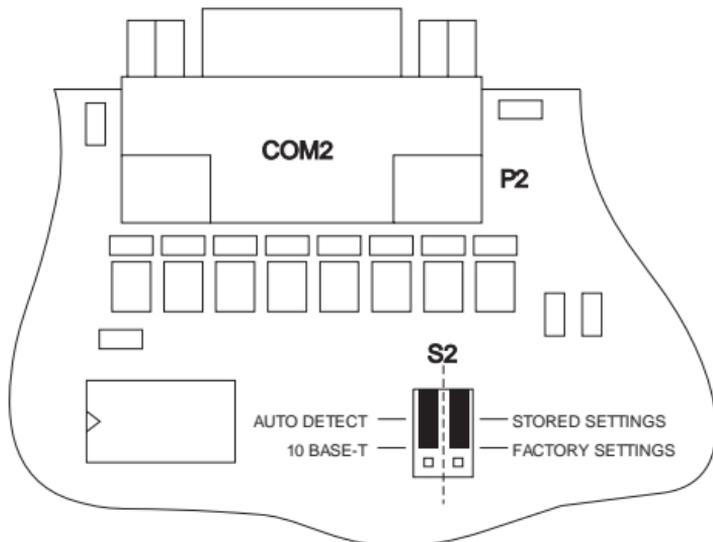
3 Move the right-hand jumper on S2 currently sitting on the two top pins (i.e. the "Stored Settings" position) to the two pins sitting closest to the middle or centre of the board. This position is "Factory Settings".

4   Put the unit back together and plug it in to power it up.

Note: Once you are done with the M202Plus in a factory default state, you will need to move the S2 jumper back to its original "Stored Settings" position. The default state should only ever be temporary since you would normally want the M202Plus to boot up and read the settings you have configured in Flash.

You now have the M202Plus booted up in a default state meaning its current/working settings are those stored at Microplex. For example, the IP address shown under "**list tcpip**" should now show "unconfigured". All settings configured and stored in Flash are ignored while this jumper sits in the "Factory Settings" position.

At this point, you can use npsh commands on the M202Plus to configure certain settings. Here are some common examples of steps taken when the device is in a default state:

1   **Forgotten Password**

    If you have forgotten a password set on the M202Plus, you can reset the user settings using these commands:

    set user from default

    save

2   **Restore All Settings in Flash to Defaults**

    Since this default state is temporary and you may want to make sure *all* settings sitting in Flash are back to their factory default values, you will need to use these commands:

    save default

    store tcpip from default

Note: Remember to place the S2 right-hand jumper on "Stored Settings" once you are done your configuration steps. The M202Plus should *not be kept in a default state for longer than a few minutes*.

Serial Port Login Sessions

At any time, a PC, laptop, or terminal can be attached to either serial port on the M202Plus for configuration and management purposes. It sometimes is the easiest way to accomplish configuration since a network and host are not involved.

To attach a device to COM1 or COM2, you will need to:

1   Attach the device to the M202Plus's serial port using the correct serial cable. The M202Plus acts as a 9-pin DTE meaning a null modem cable will be needed for any serial device with a 9-pin connector (e.g. PC, laptop) and a straight through cable can be used for 25-pin DTE serial interfaces (e.g. some terminals).

2   Configure your terminal settings to match the serial settings on the M202Plus's serial port. *Table 3* outlines the M202Plus's default serial settings.

Table 3: Default Serial Settings

Setting	Value	Setting	Value
Baud Rate	9600	**Parity**	none
Data Bits	8	**Receive Handshake**	XON/XOFF
Stop Bits	1	**Transmit Handshake**	XON/XOFF

3   Once your serial device's communication settings are
    correct, issue a BREAK signal to the M202Plus. Some
    common BREAK sequences on a PC or laptop are
    "CTRL-BREAK" and "ALT-B".

>   **Note**:   If you see garbled characters on
>   the screen, check the baud rate and
>   parity settings. If you aren't get-
>   ting any feedback, try other
>   BREAK sequences or try another
>   serial cable.

4   When prompted for an IP address, press ENTER for
    the local host (i.e. the M202Plus).

5   Log in as "**root**" when asked for a login name.

6   Press ENTER at the password prompt since there is no
    password by default.

You are now logged in to the M202Plus's command shell
where you can execute any npsh command you'd like. To
leave this login session, simply detach the serial device.

Firmware Upgrades

Since the M202Plus's firmware is stored in Flash ROM,
upgrading is easy. Using the File Transfer Protocol (FTP)
on a TCP/IP network, the print server can be upgraded to a
newer firmware version without needing new hardware. An
upgrade can also be performed through the serial ports elim-
inating the need for a network.

Upgrade Files

There are two files involved with the upgrade process:

New Firmware   ("**m202plus.hex**") File contain-
                          ing the new firmware code.

Upgrade Instructions ("**TCPupgrade.txt**") Detailed
                          steps explaining what needs to
                          be done during the upgrade.

These files are always available at Microplex's FTP site ("**ftp.microplex.com**") and at Microplex's Web site ("**http://www.microplex.com/microplex/support/distrib**") or else they can be ordered through Microplex Technical Support. Please see *Help Methods Available* on page 61 for further information.

TCP/IP FTP Upgrade Overview

The M202Plus can use an FTP session in a TCP/IP environment to upgrade its firmware. The basic steps for this process are:

Note: For a serial port upgrade, please see the instructions that come with the upgrade files.

1 Put the firmware file (i.e. "m202plus.hex") onto a TCP/IP host and rename it to "**flashFile**".

 Note: The new name is case sensitive.

2 Start an FTP session with the M202Plus and log in as root.

3 Change to the "firmware" directory once logged in.

 cd firmware

4 Change into "binary" mode.

 binary

5 "**put**" the firmware file, "flashFile", onto the M202Plus so its validity can be verified.

 put flashFile

6 When it's complete, "**put**" it onto the print server again so the new firmware can be written to Flash.

7 When done, close the FTP session. This will cause an automatic reset of the M202Plus so it boots up using the new firmware.

GETTING HELP

Overview

This is an important chapter to read if you are in need of any assistance with the M202Plus.

Help Methods Available

"Troubleshooting Tips" Sections

At the end of each network configuration chapter, you will find helpful troubleshooting tips. The tips listed are the most commonly used ones with the Microplex print servers.

Web Site

Microplex's Web site contains information about the company and its products. The home page, "**http://www.microplex.com**", contains a link to Technical Support which brings up "The Support Shack", a centralized area for technical bulletins, and firmware and software histories and files.

Figure 22: The Support Shack
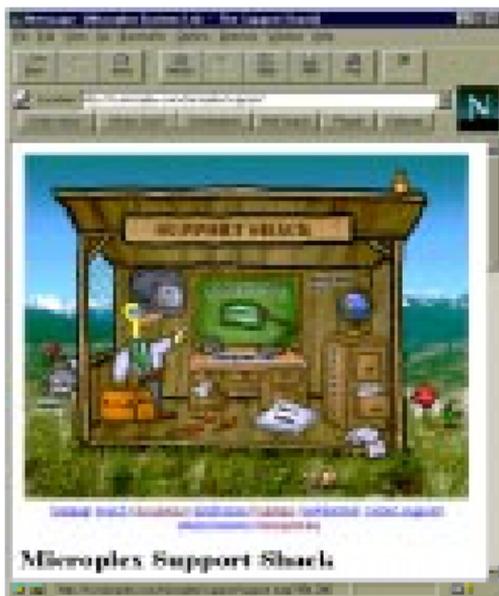
If you cannot find what you're looking for at this site, you can utilize the Support Request Form found at "**http://www.microplex.com/microplex/support/forms/support.html**". Once filled in, a request is sent to Microplex Technical Support.

FTP Site

To obtain firmware and software for the M202Plus, Microplex's FTP site, "**ftp.microplex.com**", provides the best selection. Once logged in anonymously, you will need to change to the directory, **/support/m202plus**. Here, you will find several sub-directories pointing to software, firmware, documentation and miscellaneous files.

Contacting Microplex

If you need technical assistance and you want to contact Microplex, please have this information on hand:

- M202Plus serial number found on the bottom of the print server.

- Description of your network environment and peripherals attached.

- Description of the problem.

Note: The more details you have for the Support technician and the more prepared you are, the better.

Contact Options
☐ Email **support@microplex.com**.
☐ Fax to "Support" at +1 604 444-4239.
☐ Call +1 604 444-4232 or +1 800 665-7798 (in North America) and ask for Technical Support.

Note: Email usually guarantees the *quickest* response.

Repair Procedure

Warranty Description

Microplex Systems Ltd. warrants this product to be free from defects in workmanship and material for the duration of **three** (**3**) **years** from the time of the original purchase date.

Note: This warranty can be extended to **six** (**6**) **years** from the time of the original purchase date if you fill out the **Warranty Registration/Customer Survey card** and mail it back to Microplex.

During this period, Microplex will repair or replace a defective product with a new or rebuilt product at no extra charge except as stipulated below.

At no time shall Microplex's liability exceed the replacement cost of the subject item.

All expressed and implied warranties for this product including all warranties of Merchantability, Suitability, and Fitness for a particular application are limited to **three** (**3**) **years** from the time of the original purchase date. In no event shall Microplex be liable for Loss of Use, Loss of Profits or Revenues, or other Indirect, Incidental, or Consequential Damages. This warranty *does not imply the right to loaner or replacement units during the time required to perform repairs*.

This warranty *does not* cover any losses or damage caused by:

• shipping,

• improper installation, use, or maintenance,

• unauthorized repair, modification, alteration, or replacement of components,

• excessive environmental conditions including electrical power surges, temperature, humidity, or any other

irregularities,

- negligence or abuse.

Returning for Repair

To obtain service under this warranty, you must *first* contact Microplex's Technical Support department to rule out configuration errors. A Support technician will have you do some tests to ensure the problem is definitely hardware-related. If so, a Return Merchandise Authorization (RMA) number will be given to you by the technician. The defective product should then be returned to Microplex for repair.

Please use the following guidelines when shipping goods back for warranty claim:

- Package the product securely, in original packaging if possible, to prevent damage during shipping.

- Indicate the RMA number clearly on the address label of the shipping carton.

- Include a copy of the invoice/receipt.

- Use whichever courier company you prefer. However, we recommend using Federal Express due to its lower charges for customs.

Note: Under a normal warranty repair, Microplex will only pay for the shipping charges to return the M202Plus to you.

- If you ship from a country other than Canada, type (on any paper) a commercial invoice containing the following information:

  - your address,

  - Microplex's address (as "consignee"),

  - country of origin of the product (i.e. Canada),

  - number of packages in the shipment,

- description of the product,
- quantity,
- total value of shipment (i.e. your total purchase price),
- reason for return (e.g. warranty repair),
- a declaration.

This invoice must accompany the returned product to meet Canadian customs requirements and should look like the sample found in *Sample Commercial Invoice* on page 66.

Figure 23: Sample Commercial Invoice

COMMERCIAL INVOICE from
Leslie Smith
ABC Corporation
1234 Western Parkway
Anycity, NC
USA, 27511

DATE OF EXPORT: 22/02/96

AIR WAYBILL NO: 123-12341234

CONSIGNEE:
Microplex Systems Ltd.
8525 Commerce Court
Burnaby, B.C.
V5A 4N3, Canada

IMPORTER (if other than consignee)
same as consignee

COUNTRY OF ORIGIN: Canada

# OF PKGS	DESCRIPTION	QTY	TOTAL VALUE
1	Ethernet Print Server	1	100.00

REASON FOR RETURN: warranty repair

I declare all information contained in this invoice to be
true and correct.

(signature)	Leslie Smith	24/03/96
SIGNATURE	**NAME**	**DATE**

M202PLUS SPECIFICATIONS

Hardware Specifications

Jumpers

Figure 24: Default S2 Jumper Positions
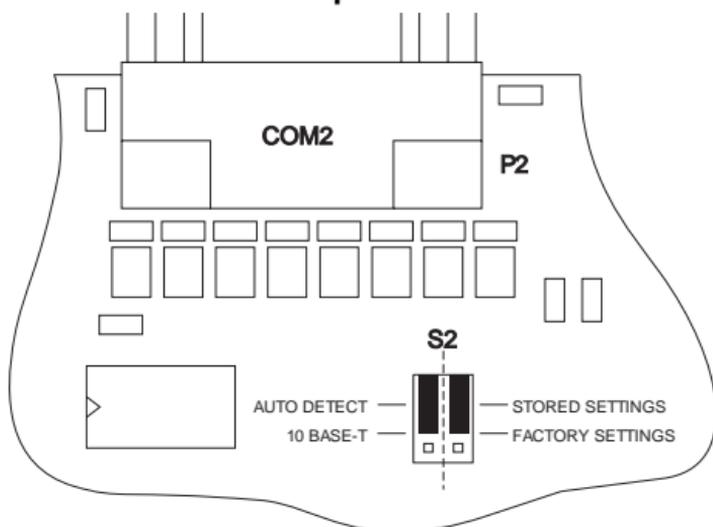
Stored Settings		Powers up the M202Plus so that the stored settings in Flash are utilized. If the jumper is positioned to cover the right-hand two lower pins, **Factory Settings** are enabled and all settings stored in Flash are ignored while operating.
Auto Detect		Automatically senses the link detect signal on the 10Base-T port. If present, the 10Base-T port is enabled and the other network interface is ignored.
10Base-T		10Base-T port to be used even if no link detected. Good for old hubs which do not support link detection pulses.

Network Interface

UTP   IEEE 802.3 10Base-T UTP Ethernet female RJ45 connector.

THIN   IEEE 802.3 10Base2 Thin-wire Ethernet female BNC connector

THICK IEEE 802.3 10Base5 Thick-wire Ethernet female DA15 AUI connector through Transceiver/Tap

FIBRE 10Base-FL

Physical Details

Dimensions:
    Metric - 21.5cm W x 3.3cm H x 13.5cm D
    Imperial - 8.6" W x 1.3" H x 5.4" L

Weight:
    .56 kg or 1.2 lbs without external transformer

Environmental Details

Operating:
    0° C to 50° C

Storage:
    -40° C to 70° C

95% maximum humidity, non-condensing.

Electrical Details

External Transformer Power Requirements:
Typical	115VAC +/- 10% 0.1A, 60Hz
	220VAC +/- 10% 0.05A, 50Hz
Maximum	115VAC +/- 10% 0.2A, 60Hz
	220VAC +/- 10% 0.1A, 50Hz

AC Power Requirements:

Voltage	16 VAC
Current Typical	600mA
Current Maximum	1A (with 10Base-2 option)

Power Consumption (Unit only):

Typical	6.5W
Maximum	11W

Power Supply Options:
External transformer available in 120V/60Hz or 220-240V/50Hz.

FCC Warning

This equipment generates, uses and can radiate radio frequency energy. If it is not installed and used as directed in this manual, interference to radio communications may result. The equipment has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference. In such a case the user will be required to correct the interference at the expense of the user.

CE Mark Conformity Declaration

The M202Plus fulfills the requirements for radiated emission according to limit B of EN55022/1994.

M202Plus LEDs

PWR	Power supply.
STAT	System Status.
ERR	System error.
NET	Data to network

Power-on Self Test

The six-stage power-on self test performs diagnostics on the processor, RAM, ROM, parallel ports, serial ports, and network interfaces. The STAT, ERR, and NET LEDs indicate which test is currently in progress.

Operation Modes

Run Mode is the normal operating state of the M202Plus. In this mode, the STAT LED flashes differently depending on whether the device's IP address is configured.

Table 4: STAT LED Patterns in Run Mode

FLASH RATE	INDICATES
On once per second	Normal Mode, IP address configured
On 2.5 times per second	Monitor Mode, IP address not configured

ERR LED Conditions

License Violation

An invalid license mask and key forces the M202Plus into this mode *after three minutes* of operation. The LED pattern will show STAT off, ERR flashing, and NET on solid. To obtain the license key, you will need to contact Microplex Technical Support using one of the methods listed under *Help Methods Available* on page 61.

Note: Having the S2 jumper in the "Default Settings" position for *more than a few minutes* may also cause this LED state. Repowering the device will clear this situation for another three minutes. Moving the S2 jumper back to the "Stored Settings" position will stop this from happening.

Hardware Exception

Internal errors force the M202Plus into this mode. The LED pattern will show STAT on solid, ERR flashing, and NET on solid. Repowering the device does not clear this mode. Contact your local vendor for help.

Software Specifications

Standards Supported

ARP	(Address Resolution Protocol)
RARP	(Reverse Address Resolution Protocol)
BOOTP	(Bootstrap Protocol)
ICMP	(Internet Address Resolution Protocol)
UDP	(User Datagram Protocol)
LPR/LPD	(Line Printer Daemon Protocol)
FTP	(File Transfer Protocol)
RSHD	(Remote Shell Daemon)
PAP	(Printer Access Protocol)
SNMP	(Simple Network Management Protocol)

SMTP   (Simple Mail Transfer Protocol)
IPX   (Internetwork Packet Exchange)
NetBIOS/SMB   (Network Basic Input Output System/
                Server Message Block)
RFC-1001   (NetBIOS over TCP/IP)
PSERVER/RPRINTER/NPRINTER

TCP Port Numbers Used on the M202Plus

20	TCP Protocol for FTPD (data)
21	TCP Protocol for FTPD (control)
23	TCP Protocol for TELNETD port
68	BOOTP client port
161	UDP port for SNMP
514	TCP Protocol Remote Command daemon port
515	TCP Protocol BSD 4.3 LPD port
4000	TCP Protocol COM1 port
4200	TCP Protocol COM2 port
4400	TCP Protocol PRN1 port
4600	TCP Protocol PRN2 port

Note: Client application software can send raw data to COM1, COM2, PRN1, or PRN2 by opening a socket to the associated TCP port number as defined above. Such connections are queued along with print jobs using other print methods (e.g. LPR/LPD).

GLOSSARY

ARP	Address Resolution Protocol. Associates a selected IP address with a network device's Ethernet address.
bps	Bits per second.
Centronics	Parallel port interface standard found on most printers.
Chooser	Feature within the Apple operating system that controls system devices (e.g. printers).
daemon	A continuously running process that handles system-wide functions like print spooling.
default router	Local device that forwards any IP packets destined for another subnet.
destination	Logical print queue on the M202Plus which hosts send their print jobs to. There are eight destinations (two per I/O port) by default.
DHCP	Dynamic Host Configuration Protocol. Allows a network device to discover its IP address dynamically upon bootup. The IP address doesn't need to be stored within the device itself permanently.
DNS	Domain Name Server. Host providing responses to queries for a given host name's IP address.
Ezsetup	Quick and easy Microplex configuration script that runs on Unix hosts.
factory defaults	Settings shipped with the M202Plus.

Factory Settings	S2 jumper position stating all factory default settings are to be used while the M202Plus is up and running.
Flash	Stores firmware code and configurable settings. Allows for upgrades without replacing hardware inside the M202Plus.
FTP	File Transfer Protocol. Used for transferring files from one TCP/IP host to another and used in the upgrade process.
HTML	HyperText Markup Language. Format used for documents viewable on the World Wide Web.
ifnum	Interface Number. Represents the network interface. With an M202Plus, this will always be "1" for Ethernet.
interface script	Unix host filter file that processes the print job before it is sent over the network to the M202Plus.
I/O port	Port for attaching peripherals to. The M202Plus provides four: PRN1, PRN2, COM1, COM2.
logpath	Determines type of print job and printer logging needed per job. One logpath is associated with every destination.
LPD/LPR	Line Printer Daemon. The most common TCP/IP remote printing protocol that crosses all hardware utilizing IP.
MIB	Management Information Base. A set of variables (database) managed by an SNMP manager application.
model	Defines how a print job should be processed (e.g. banner pages added, ASCII

	to PostScript conversion) as it passes through the M202Plus. One model is associated with every destination.
NDS	Novell Directory Services. Novell's global directory structure for NetWare versions 4.0 and higher.
NetBIOS	Network Basic Input Output System. Common interface among PC networks.
npsh	Extensive built-in command shell within the M202Plus.
PDF	Portable Document Format. Encodes different types of documents enabling them to be read across multiple platforms.
ping	Standard command to test a TCP/IP connection. (e.g. "**ping 192.75.11.9**)
print path	Three-stage path a print job takes when it is sent from a host to a printer through the M202Plus.
PSERVER	Print Server. A Novell print method where the M202Plus continuously polls the Novell file server's print queue looking for print jobs.
RAM	Random Access Memory. Volatile memory within the M202Plus that contains current/working settings. Settings are lost once the power is removed.
RARP	Reverse Address Resolution Protocol. Allows a network device to discover its IP address dynamically upon bootup. The IP address doesn't need to be stored within the device itself permanently.
router	A device that forwards IP packets to

	their destination. Also called a gateway.
RPRINTER	Remote Printer. A Novell print method where the M202Plus waits for jobs to be sent to it from a defined PSERVER.
serial number	Five-digit number found on the bottom of the M202Plus.
SLIP	Serial Line IP. A protocol used to connect two IP hosts using a serial line.
SNMP	Simple Network Management Protocol. A standard protocol used to monitor network devices called "SNMP agents".
socket	TCP connection between two hosts consisting of a source and destination TCP port number at each end.
subnet mask	A binary value used to divide IP networks into smaller sub-networks or subnets. This mask is used to help determine whether IP packets need to be forwarded on to other subnets.
TCP/IP	Suite of protocols that act as the base protocol for the Internet.
TCP port	A logical connection point in the software of a TCP host or device. When two IP devices talk, they establish a socket which consists of a source and destination TCP port number on both ends.
telnet	Command and protocol to establish a terminal connection between two hosts on an IP network.
zone	A pre-defined group of AppleTalk stations which helps divide up larger networks.

INDEX