NETWORK INTERFACE BOARD
(Machine Code: B430)

TABLE OF CONTENTS

1. INSTALLATION

1.1 HARDWARE INSTALLATION

Refer to the section 1.5 of the printer controller service manual for how to install the network interface board.

1.1.1 SERIAL NUMBER AND MAC ADDRESS

Check the serial number and MAC (Media Access Control) address that are printed on the network interface board (NIB). To do this, remove the rear cover of the main unit.

The serial number is a 6-digit number, and is unique to each board.

The MAC address (LAN ADDR.) is a 12-digit hexadecimal number. The upper 6 digits are always "0040AF" and the lower 6 digits are unique to each board.

1.1.2 STATUS SHEET

By default, the NIB (network interface board) prints a status sheet every time after the machine is turned on or the NIB has reset itself.

NOTE: Connect a network cable to the NIB before turning on the machine or resetting the NIB. Otherwise, the machine will take several minutes to print the status sheet, and the information on it may not be accurate.

Keep the status sheet with the machine, because it has the following information.

- Unit serial number
- Firmware version
- Network (MAC) address
- Network/Protocol information

1.2 PROGRAMMING NETWORK/PROTOCOL PARAMETERS

This section gives summaries of how to set up a network interface board in various network environments.

NOTE: It is not recommended for service representative technicians to program network and protocol parameters. Ask the customer's network administrator to program and manage these parameters.

1.2.1 IPX NETWORK

The following parameters are required for three types of IPX network printing.

Use SmartNetMonitor for Admin, MAP (Management Access Program), or the NetWare Setup utility to program these parameters.

NOTE: 1) The MAP, Smart Net Monitor for Admin and MAP utilities require the Microsoft IPX/SPX Compatible protocol stack on Windows 9x/Me or Windows NT4.0/2000, and a Web browser (Microsoft Internet Explorer 3.02 or later, or any version of Netscape Navigator).
The "World Wide Web Publishing service" must be stopped before starting the MAP utility on the Windows NT server desktop.
2) The NetWare Setup Utility requires the Novell 32-bit Client software on Windows 9x/Me or Windows NT4.0/2000.

Parameter	Peer-to-Peer Serverless Network	Novell 3.x/4.x/5.x Bindery Network	Novell 4.x/5.x NDS Network
Enable NetWare (Default = Yes)	Yes (Check the box)	Yes (Check the box)	Yes (Check the box)
Print Server Name	Yes	Yes	Yes
Print Server Password	No	Optional	Optional
Preferred File Server	No	Yes	No
Preferred NDS Context	No	No	Yes
Preferred NDS Tree	No	No	Yes
Print Queue Scan Rate (Default = 1 s)	No	Yes	Yes
Ethernet Frame Type (Default = Auto-Sense)	Yes	Yes	Yes
Disable Bindery (Default = No)	No	No (Uncheck the box)	Optional

NOTE: 1) The preferred NDS context must be typed in without a starting dot (.).
OU=Development.O=Corp [OK]
.OU=development.O=Corp [NG]
Development.Corp [OK]
.Development.Corp [NG]
2) If the customer uses the Country container on the NetWare Server, the NDS context must be entered as a 'typeful' name.

1.2.2 TCP/IP NETWORK

TCP/IP Parameter Details

The following TCP/IP parameters are required for TCP/IP network printing.

Parameter	Description	How to Change Parameters			
		Operation Panel	SmartNet Monitor for Admin	MAP/Web Browser	Telnet
IP Parameters					
IP Address	IP address of the NIB	Yes	Yes	Yes	Yes
Subnet Mask	Subnet mask for local subnet	Yes	Yes	Yes	Yes
Default Gateway	Gateway IP address	Yes	Yes	Yes	Yes
TCP Parameters					
Base Port Number	Port number to receive print jobs	No	Yes	Yes	Yes
DHCP Parameters					
Enable DHCP (Default = Yes)	**Yes** – The NIB obtains IP parameters from a DHCP server. **No** – IP parameters must be specified manually.	No	Yes	Yes	No
IP Address in NVRAM (Default = Yes)	**Yes** – Once the NIB has been assigned an IP address by a DHCP server, the NIB saves the address in the NVRAM and uses it permanently. **No** – The NIB tries to obtain IP parameters from a DHCP server every time the machine is turned on or the NIB is reset. The assigned IP address may not be the same all the time.	No	Yes	Yes	No
WINS Parameters					
Net BIOS Name	This name is required for establishing a Net BIOS session or sending out a broadcast.	No	No	Yes	No
Net BIOS Name Server	Resolve Net BIOS names to IP addresses.	No	No	Yes	No
LPD Parameters					
Enable LPD Banner (Default = No)	Enables or disables the LPD banner	No	Yes	Yes	Yes
Available PDLs for NIC Port	Available printer languages are automatically selected.	No	Yes	Yes	Yes

Installation

Possible Problems with DHCP Parameter Settings

1. IP address conflicts with an another host
   If DHCP is enabled and an IP Address is saved in NVRAM, and the saved
   address conflicts with an another host, the NIB does not show any errors. As a
   result, the NIB cannot receive any print jobs, because the IP protocol is
   disabled automatically at startup.

   In this case, the other host in conflict with the NIB must have a manually
   assigned IP address. Find the host using the ping and arp commands for
   example, and assign a correct address.

2. IP address changes after restarting the machine
   If DHCP is enabled but an IP address is not saved in the NVRAM, the NIB may
   have a different IP address from the one before restarting the machine. As a
   result, the NIB cannot receive any print jobs, because the jobs are sent to the
   previously assigned IP address.

   There are two solutions for this problem.

   The first one is simply enable the "IP Address in NVRAM" parameter and
   assign a correct IP address. The second one is to reserve the IP address on
   the DHCP server for the NIB's Ethernet (MAC) Address.

1.2.3 ETHERTALK (APPLETALK) NETWORK

The following parameters are required for AppleTalk networks. These parameters
are automatically configured at startup as follows:

Parameter	Default Setting	How to change the parameter
AppleTalk Enable/Disable	Enabled	MAP, SmartNetMonitor for Admin, web browser and telnet.
Printer Name	Plug&Play name (SP5-907)	See Note.
Zone Name	Default zone	See Note.

NOTE: The Printer Utility for Mac utility can change both the printer name and the
zone name. Apple Printer Utility can change the printer name only.

1.3 SETUP FOR VARIOUS NETWORK TYPES

1.3.1 PEER-TO-PEER NETWORK

Windows for Workgroups

There is no guaranteed way to print directly to the NIB port. Share a printer connected to an LPT port on a workstation.

Windows 95/98 Me

The Peer-to-Peer IPX and the Peer-to-Peer IP utilities install redirection to the NIB.

The Peer-to-Peer IPX port appears as "RDP_xxxxx" (xxxxxx is the board's serial number) by default.

The Peer-to-Peer IP port appears as "*IP* Address@10001".

Both work as a local port of the host computer.

Windows NT 4.0

Windows NT supports LPR printing using TCP/IP protocol.

Use the following parameters to set up an LPR port on an NT workstation.

• Name or address of the server providing lpd: *IP Address of the NIB*

After installing a printer connected to the LPR port, share the printer for other workgroup members.

1.3.2 NOVELL NETWARE NETWORK

Bindery Network

Use the SmartNetMonitor for Admin or NetWare Setup utility to set up everything for NetWare printing in a single procedure.

Or, use PCONCOLE to setup printers, print queues, and print servers in the server bindery, then use MAP (Management Access Program) to setup NetWare parameters in the NIB.

NOTE: 1) The NetWare Setup utility requires Novell 32-bit client on Windows 9x/Me or NT 2000. Also, supervisor privileges are required to perform complete setup.
2) The MAP utility requires the Microsoft IPX/SPX SPX compatible protocol stack on Windows 9x/Me or Windows NT4.0/2000, and a Web browser (Microsoft Internet Explorer 3.02 or later, or any version of Netscape Navigator).

NDS Network

Use the SmartNetMonitor for Admin or NetWare Setup utility to set up everything for NetWare printing in a single procedure.

Or, use PCONCOLE or NetWare Administrator to setup printers, print queues, and print servers, then use MAP (Management Access Program) to set up NetWare parameters in the NIB.

NOTE: The NIB does not support the "Notification" function on NetWare NDS networks.

1.3.3 TCP/IP NETWORK

LPR/LPD Printing

The NIB supports standard lpd. If a Windows or UNIX workstation has an lpr spooler, it can send print jobs to the NIB directly.

FTP Printing

The NIB can receive print jobs directly from an ftp client.

Using an FTP Client

1. Login to the NIB as "port1" (ASCII/PCL) user name.

2. Put a file to print.

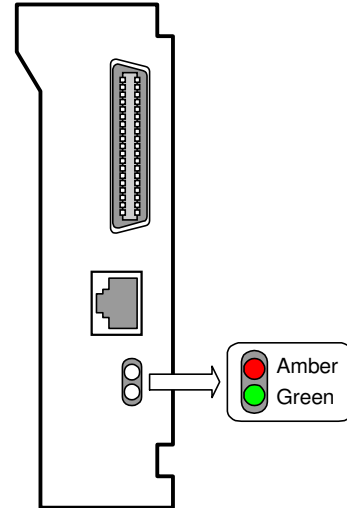#### *Using NetScape Navigator (Version 2.0 or later)*

1. Open one of the following addresses:
    • ftp://port1@<IP Address> (ASCII/PCL)

2. Select [File] – [Upload] to put a print file.

2. TROUBLESHOOTING

2.1 LED INDICATIONS

Two LEDs visible from the outside, one amber and one green, indicate the status of the network interface board (NIB). Refer to the diagram on the right for their location.

B430T501.WMF

Amber (upper)	Green (lower)	Status	Condition(s)
Blinks	On	Normal	• The NIB is receiving a packet from the Ethernet.
---	On	Normal	• The machine has just been turned on. The NIB then initializes itself. • The NIB is waiting for a print job.
---	Blinks 3 times, then stays on	Normal	• The NIB has finished initialization, and will print a status sheet.
---	Blinks rapidly	Error during initialization	• The NIB detected a bad RAM chip during initialization. • Turn the machine off and on. If the NIB detects the same error again, replace the NIB.
Blinks for 10 s, then goes off	Blinks	Initialization Error	• The NIB detected a data error in the flash ROM (firmware) during initialization. • Recover the firmware by downloading it through the network.
---	Blinks rapidly 4 times, then off	Error	• The NIB detected an Ethernet hardware error. • Check the Ethernet connections and restart the machine. If the error is frequent, try replacing the NIB.
---	Blinks rapidly	Error during operation	• The NIB has lost connection to NetWare file server(s). • Check the cable connection and the NetWare server status.
Blinks alternately		NVRAM reset	• The NIB has reset its NVRAM to the factory defaults. (Refer to section 3.1 for how to reset the NVRAM.)

3.   SERVICE TABLES AND PROCEDURES

3.1   FACTORY RESET (NVRAM CLEAR)

When the machine or the network interface board has moved to a different location, reset the NVRAM contents to the factory default as follows.

B430S501.WMF
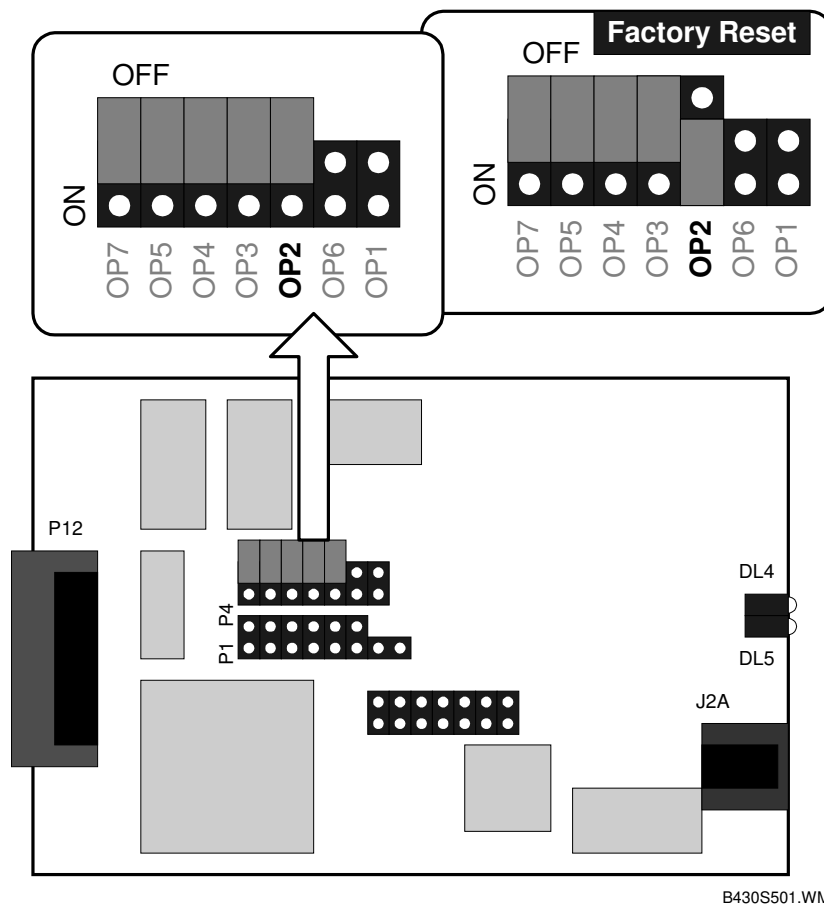
1. Remove the network interface board and change the OP2 jumper setting as shown above.

2. Install the network interface board and turn on the machine.
   NOTE: Do not connect the printer to the network.

3. The green LED flashes 3 times, then the amber and green LEDs light alternately (once per second).

4. Turn off the machine and remove the network interface board.

5. Reset the OP2 jumper setting to the default, and put the board back in the machine.

6. Turn on the machine.

3.2 FLASH ROM UPDATE
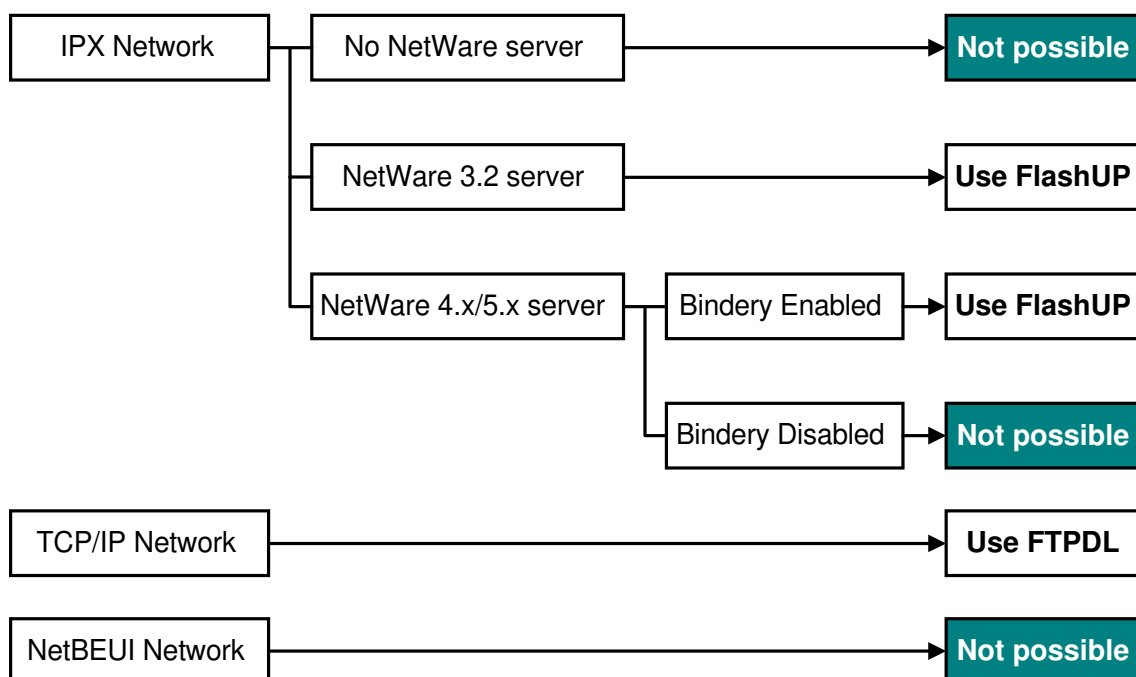
3.2.1 INTRODUCTION

Before you update network interface card firmware, you need to receive the latest firmware file and set up an update utility that is suitable for the network environment.

A firmware file (*.upd, *.upp, *.upt, or *.upu file) is normally distributed as a ZIP file (e.g., RIC221.ZIP). You need to unzip the file to a temporary directory on a host computer, before starting the firmware update utility.

Two types of utility software, FlashUP and FTPDL, are provided as ZIP files. Use the FlashUP utility for Novell server based IPX networks, or use the FTPDL utility for TCP/IP networks. You do not need to install both because they have the same function.

NOTE: Use the FlashUP or FTPDL utility that was made for the model K-C1. Do not use the utilities that were released for type 450E NIB or type 2000 NIB.

NOTE: Before using FTPDL, the NIB must be configured with an IP address and subnet mask,.

IPX Network			
→ No NetWare server	→ **Not possible**		
→ NetWare 3.2 server	→ **Use FlashUP**		
→ NetWare 4.x/5.x server	→ Bindery Enabled → **Use FlashUP**		
	→ Bindery Disabled → **Not possible**		

TCP/IP Network	→ **Use FTPDL**

NetBEUI Network	→ **Not possible**

B430S502.WMF

3.2.2 FLASHUP UTILITY (FOR NOVELL IPX NETWORKS)

System Requirements

- Windows 95/98/Me
- Novell compatible IPX protocol installed
- Novell compatible NetWare client software installed

Network Requirements

- NetWare 3.x/4.x/5.x server running in Bindery mode

Installation Procedure

1. Unzip Flash_up.ZIP to a temporary folder (directory). The following files should be extracted there.

FLASH_UP.ZIP

```
DISK1     ID            5  03-30-00   3:57p DISK1.ID
FLUSH     TXT           0  02-19-01  11:43a flush.txt
README    TXT         766  08-03-00  10:10a Readme.txt
SETUP     PKG         146  03-30-00   3:57p SETUP.PKG
SETUP     EXE      44,608  07-24-96   4:00a SETUP.EXE
SETUP     INI          33  03-30-00   3:57p SETUP.INI
SETUP     INS      64,864  07-31-96  12:50p SETUP.INS
SETUP     ISS         380  03-30-00   3:57p SETUP.ISS
_INST32I  EX_     316,789  07-24-96   4:00a _INST32I.EX_
_ISDEL    EXE       8,192  09-07-95   8:22p _ISDEL.EXE
_SETUP    1       240,103  03-30-00   3:57p _SETUP.1
_SETUP    DLL       5,984  04-29-96   8:25a _SETUP.DLL
_SETUP    LIB     186,320  03-30-00   3:57p _SETUP.LIB
          13 file(s)       868,190 bytes
```

2. Run "Setup.exe" from the folder (directory).

3. Click "Next >" in the "Welcome" dialog box.

4. Read the readme.txt file displayed in the "Readme Information" dialog box, then click "Next >".

5. In the "Destination Location" dialog box, choose a folder (directory) to install the software, then click "Next >".

6. Confirm the program folder (group) name, then click "Next >".

7. After the software has been installed, click "Finish" in the "Setup Complete" dialog box.

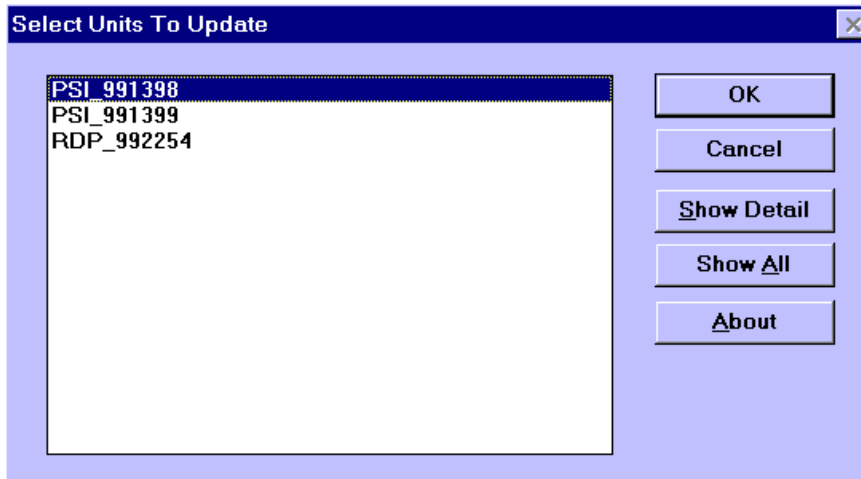**Service Tables**

Firmware Update Procedure

1. Login to the NetWare network as "supervisor" or a user with supervisor privileges.

2. Start the FlashUP utility.

3. Choose a new firmware file and click "OK".
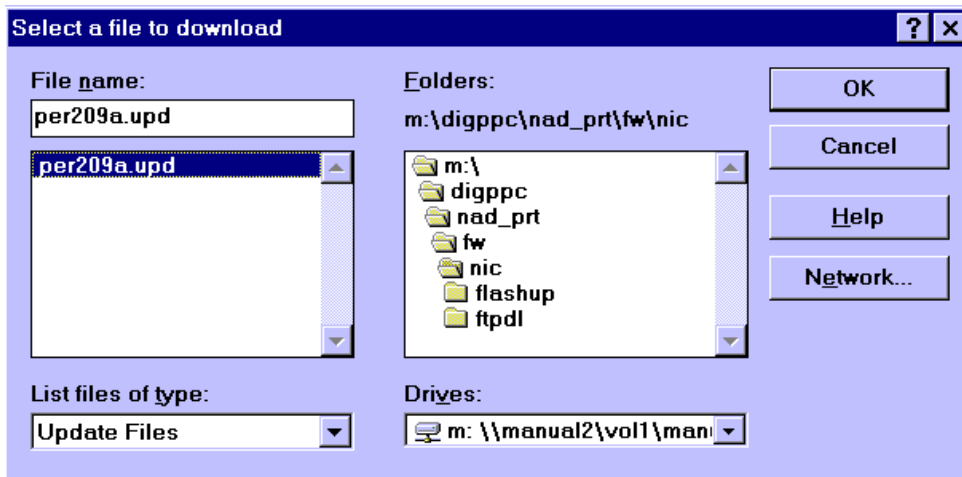
4. Choose a network interface card (or multiple cards) from the unit names listed in the dialog box, then click "OK". Update will start.

5. If you do not see the desired unit in the list, click "Show All" to display all network interface cards that are currently logged in to the server.
   If you still cannot see the unit, click "Cancel", restart the machine (printer), and try again.

6. After the firmware has been downloaded successfully, the following message pops up. Then click "OK" to finish.

```
Update Results                                    [x]

    PSI_991398                    Successful




              [      OK      ]
```
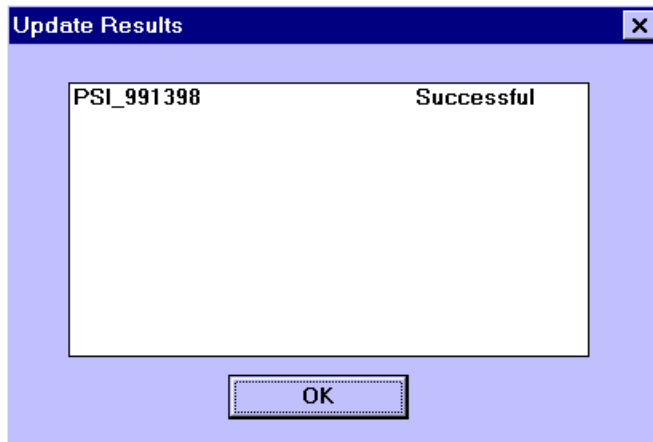
7. The Print Server Card then updates its flash ROM. The machine will print a status report after flash ROM update has finished.

CAUTION: Do not turn off the machine until after it prints a status sheet (after automatic re-initialization). Otherwise, new firmware may not be programmed to the flash ROM successfully.

Recovery from Failed Download

Even if firmware download has failed, firmware download is still possible.

The NIB in "down" status appears as DWN_xxx_xxxxxx in the dialog box in step 4 above. Download the firmware again to the NIB in "down" status using the FlashUp utility.

Service Tables

3.2.3 FTPDL UTILITY (FOR TCP/IP NETWORKS)

System Requirements

- Windows 95/98/Me, Windows NT4.0/2000
- TCP/IP protocol installed

Network Requirements

- The target network interface board (NIB) must have a valid IP address.
  NOTE: If the NIB is in the "DOWN" status, this utility cannot be used because no IP address is assigned to the NIB. Use the "Flashup" utility instead.
- When using Windows 95, Winsock should be installed by running "w95ws2setup.exe".

Installation

1. Unzip ftpdl.ZIP to a temporary folder (directory). The following files should be extracted there.
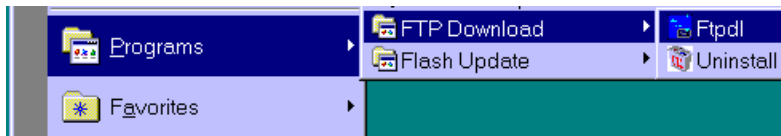**FTPDL.ZIP**

```
FTPDL.ZIP
DATA1     HDR         11,979  11-09-00   3:12p data1.hdr
DATA1     CAB        437,489  11-09-00   3:12p data1.cab
DATA2     CAB      1,304,606  11-09-00   3:12p data2.cab
FTPDL     TXT              0  02-19-01  11:45a ftpdl.txt
IKERNEL   EX_        335,626  05-14-00   6:17p ikernel.ex_
LAYOUT    BIN            416  11-09-00   3:12p layout.bin
README    TXT          1,952  11-20-00   3:12p Readme.txt
SETUP     INX        136,998  11-09-00   1:50p setup.inx
SETUP     EXE         41,472  05-14-00   6:23p Setup.exe
SETUP     INI            101  11-09-00   3:12p Setup.ini
         10 file(s)       2,270,639 bytes
```
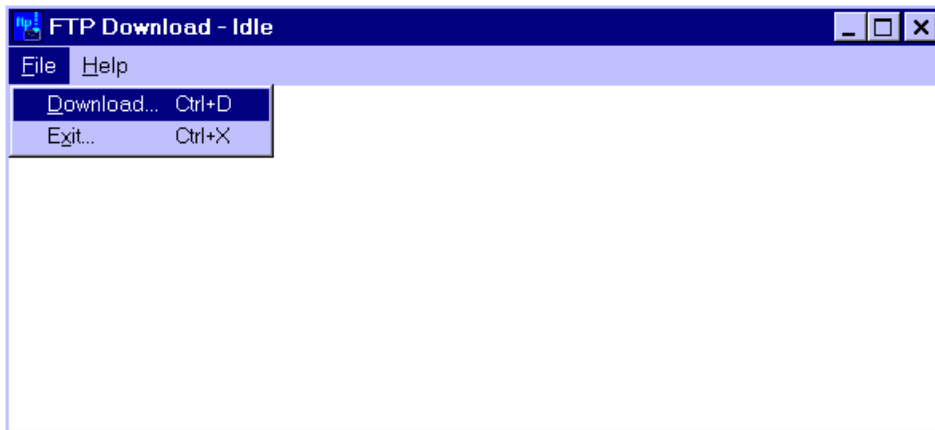
2. Run "Setup.exe" from the folder (directory).

3. Click "Next >" in the "Welcome" dialog box.

4. Read the readme.txt file displayed in the "Readme Information" dialog box, then click "Next >".

5. In the "Destination Location" dialog box, choose a folder (directory) to install the software, then click "Next >".

6. Confirm the program folder (group) name, then click "Next >".

7. After the software has been installed, click "Finish" in the "Setup Complete" dialog box.
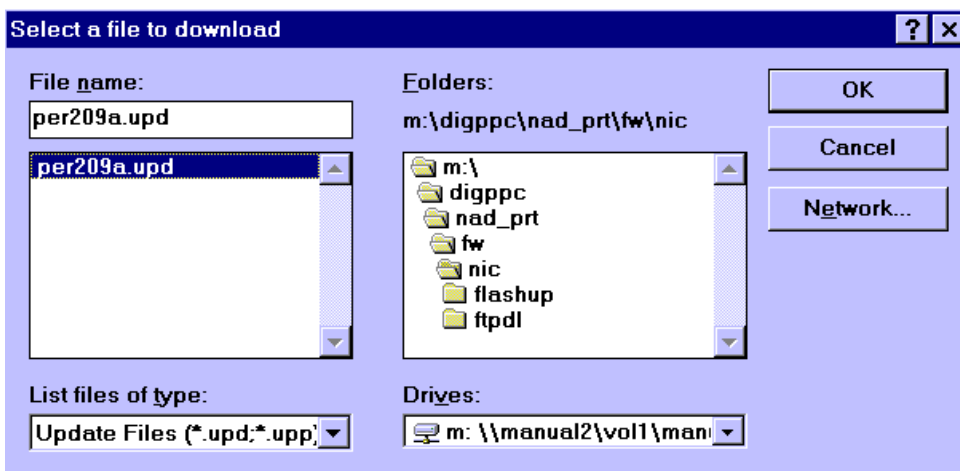
Firmware Update Procedure

1. Start the FTPDL utility.

		FTP Download	▶	Ftpdl
Programs	▶	Flash Update	▶	Uninstall
Favorites	▶			

2. Choose [FIle] - [Download].

   FTP Download - Idle
   File Help
   Download... Ctrl+D
   Exit...   Ctrl+X

3. Choose a new firmware file and click "OK".

   Select a file to download

   File name:
   per209a.upd

   per209a.upd

   List files of type:
   Update Files (*.upd;*.upp)

   Folders:
   m:\digppc\nad_prt\fw\nic

   m:\
   digppc
   nad_prt
   fw
   nic
   flashup
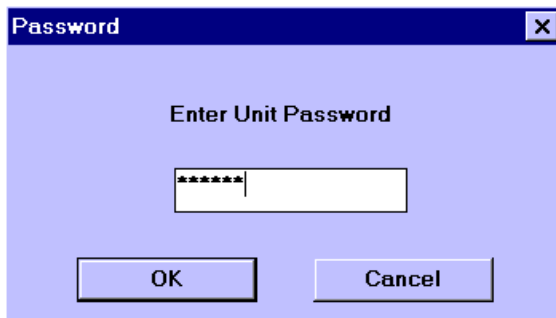   ftpdl

   Drives:
   m: \\manual2\vol1\man

   OK
   Cancel
   Network...

4. Enter the IP address of the network interface card in which you wish to update the firmware, then click "OK".

   IP Address

   Enter Unit IP Address

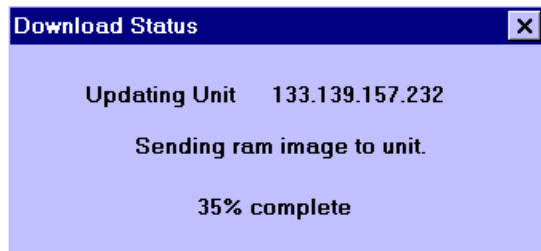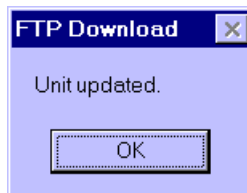   133   139   157   232

   OK   Cancel

Service
Tables
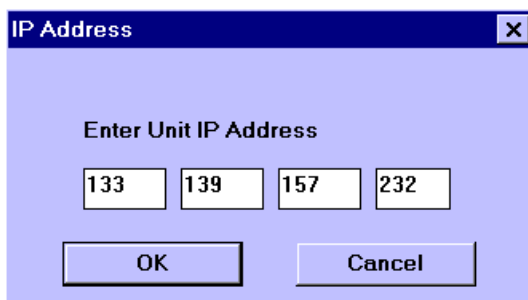
5. Enter the password programmed in the network interface card ("sysadm" is the default), then click "OK".

6. After sending the flash ROM image file to the network interface card, the card updates its firmware.

7. After the firmware has been downloaded, click "OK" to finish.

8. The Print Server Card then updates its flash ROM. The machine will print a status report after the flash ROM update has finished.

CAUTION: Do not turn off the machine until after it prints a status sheet.

Recovery from Failed Download

If firmware download using FTPDL has failed, use the FlashUP utility to recover the NIB. This is because the NIB may not have IP parameters anymore after a failed download.

SPECIFICATIONS

1. SPECIFICATIONS

Type:	Internal Network Interface Board
Network Topology:	Ethernet (10 Base T) and Fast Ethernet (100 Base TX)
Network Interface:	RJ45 x 1
Protocols:	TCP/IP, IPX, EthernerTalk

SNMP Support:
- IP and IPX SNMP support of MIB-2 and proprietary NIC MIB.
- SNMP support of standard MIB, MIB II, proprietary NIB-MIB and proprietary printer MIBs on compatible printers.

Required Cable:
- STP (Shielded Twisted-Pair) cable Category/Type 5 or better
- UTP (Unshielded Twisted-Pair) cable Category/Type 5 or better
  NOTE: A cable is not enclosed with this option.

Utility Software:
- MAP (Management Access Protocol)
- IPX peer-to-peer printing
- IP peer-to-peer printing
- NetWare setup utility

Other:
- Built-in web server
- Built-in Telnet server
- Firmware update over an IPX or IP network
- FTP printing
- IPP (Internet Printing Protocol) printing

Spec.