NetPrint

User's Guide

Version 2.24

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WELCOME TO NETPRINT

NetPrint, the host-based network print spooler that extends HP3000, Unix, and Windows NT spooling to networked printers. NetPrint also makes HP3000, Unix-based, and Windows NT printers accessible to network clients.

NetPrint runs as a background job on the HP3000 host, where it prints HP spoolfiles to network printers and receives print files from other systems to print on printers connected to the HP host. NetPrint also includes NetWare Loadable Modules (NLMs) that allow bi-directional spooling between Novell servers and HP3000s, Unix, or Windows NT systems.

NetPrint is controlled by control language statements entered in a configuration file. The open design of NetPrint allows you to define multiple sets of spoolfile selection criteria and then specify NetPrint action statements to be performed on the selected spoolfiles.

This manual explains system requirements for running NetPrint, installation and configuration process, operation of NetPrint, including information on the configuration file, control language, and files included on the NetPrint installation tape.

TABLE OF CONTENTS

NP92CONF
Configuration File 3-1

Troubleshooting 7-1

Using NMMGR A-1

1 SYSTEM REQUIREMENTS

NetPrint resides on the HP3000 host and runs as a background job, where it sends HP3000 spoolfiles to network print destinations and receives print files from other systems to send to the HP spool queue.

NetPrint has certain HP3000 operating system and network requirements. These requirements are summarized in this chapter.

HOST REQUIREMENTS

NetPrint operates on any HP3000 running the MPE/iX operating system, version 5.5 Express 4 (c.55.04) or later.

If you want to employ the BOOTP or SYSLOG utility (see *HP3000 to TCP/IP-equipped network printers* in chapter 5), your operating system must be MPE/iX 4.0 or later, and you must have version B.05.00 of HP SOCKET/XL CLIB.

If you wish to transfer print files between the HP3000 and a Novell server, NetPrint includes its own NetWare Loadable Modules (NLMs), which act as a print gateway to the Novell server. This allows you to spool directly to and from the Novell server which is the recommended method of communicating with the server. However, if your site is equipped with HP's NetWare/iX, portable NetWare for the HP3000, you may use it as an alternative to the NetPrint NLMs.

NetPrint requires that NetWare have version 3.11d of CLIB and the TCP/IP protocol.

NETWORK REQUIREMENTS

The network requirements for NetPrint vary according to how you wish to print. If you are implementing NetPrint over a Novell server, however, there are some general requirements that apply.

NOVELL SERVER REQUIREMENTS

♦ NetWare, version 3.11 or later.

♦ TCP/IP support: Novell's NLM that supports the TCP/IP protocol (see Novell's *TCP/IP Transport Supervisor's Guide*).

♦ CLIB, version 3.11d or later.

NETWARE *4/5.x* SUPPORT

NetPrint's NLMs now support NetWare Directory Services on 4/*5.x* NetWare servers. The NLMs automatically recognize 4/*5.x* servers and run with Directory Services instead of Bindery Emulation. This means that the NLMs can address print queues anywhere in your directory environment instead of just where the 3.*x* Bindery is being emulated.

REQUIREMENTS ACCORDING TO IMPLEMENTATION

NetPrint allows you to spool files to network printers in several ways. The network requirements for using NetPrint vary according to how you wish to print:

♦ from an HP3000 to network printers equipped with a TCP/IP interface

♦ between an HP3000 and LPD protocol systems (Unix or Windows NT)

♦ from an HP3000 to a Novell server via NLM or NetWare/iX

♦ from an LPD protocol system to a Novell server

♦ from a Novell server to HP3000s, LPD protocol systems, or TCP/IP-equipped network printers

The diagram below illustrates these various methods of network printing as if they were set up on a single network.

The following sections of this manual that pertain to a specific method of printing are indicated by isolated portions of this diagram:
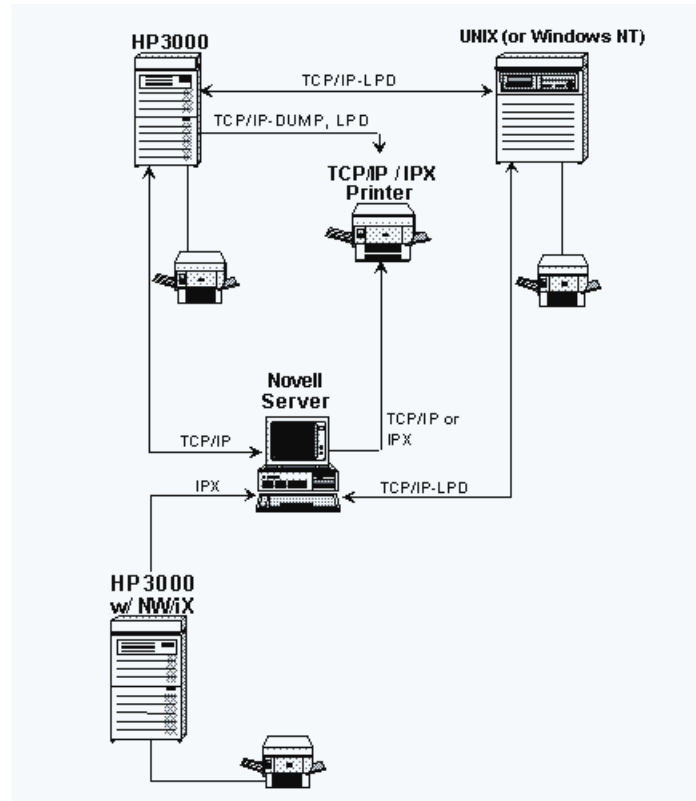
The following section of this chapter describes system requirements for each method of printing. For information on implementing each of these printing methods, see chapter 5.

HP3000 TO TCP/IP-EQUIPPED NETWORK PRINTERS
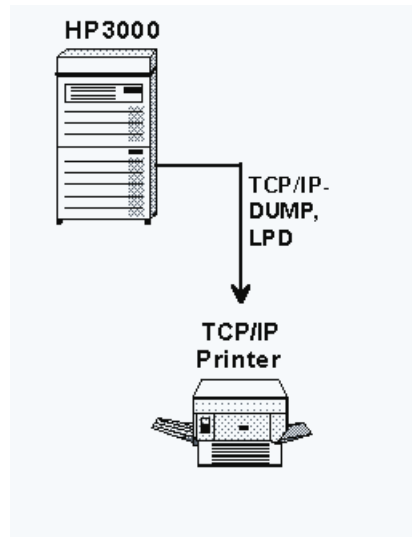
In order for NetPrint to spool directly to a network printer, the printer must have a network interface card that supports the TCP/IP networking protocol and either the connect-and-dump or LPD printing protocol.

An example of such a setup would be an HP LaserJet with an HP JetDirect network interface card in the printer's MIO slot. The HP JetDirect interface maintains a direct TCP/IP connection to the HP3000 and employs a simple connect-and-dump protocol to print files. If the printer shares network connections between the HP3000 and other network operating systems, such as NetWare or LAN Manager, the printer's network interface card must support multiple protocols.

Besides the JetDirect card from HP, multi-protocol print servers are available from Intel, Emulex, Milan, GoldKey, XCD, and Extended Systems. When selecting a network interface for a printer, be sure it supports all network operating systems you employ — including TCP/IP — and that it is able to switch automatically from one protocol to another as it receives connections.

Configuration of the printer interface on the network is handled independently of NetPrint. Set IP addresses at the printer's control panel, or use the configuration utility provided with the printer's network card or print server.

For printer interfaces requiring BOOTP support, NetPrint includes a BOOTP utility. This utility works on MPE/iX 4.0 and later, and is discussed in detail in the implementation instructions in chapter 5.

HP3000 TO AND FROM LPD PROTOCOL SYSTEMS
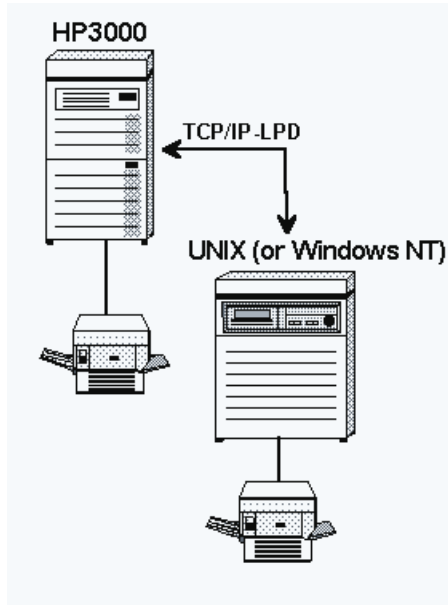
NetPrint spools to and from a Unix or Windows NT system's spooler via the LPD (line printer daemon) protocol over a TCP/IP connection. LPD is a standard remote printing protocol used by Unix and Windows NT systems to send and receive print files from other Unix and Windows NT systems. NetPrint makes the HP3000 appear as if it were a remote LPD protocol system for bi-directional printing between the HP3000 and the actual LPD protocol system.

The LPD is built into most Unix and Windows NT systems.

HP3000 TO NOVELL SERVERS VIA NLM OR NETWARE/IX
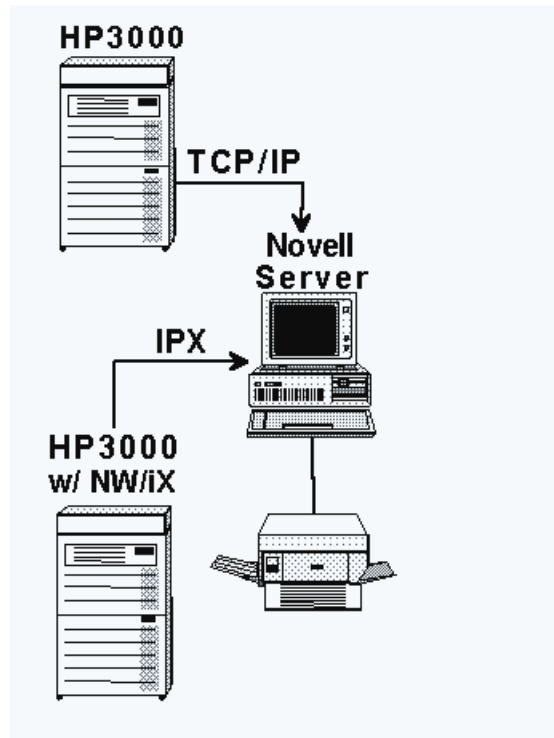
Network printers that are connected directly to the Novell server or whose network interface does not support TCP/IP cannot be reached by the TCP/IP protocol. In this case, you can print to Novell server print queues via NetPrint's NetWare Loadable Module (NPNLMIN.NLM) or HP's NetWare/iX. The server's print queues then take care of printing to the network printer(s).

VIA NETPRINT NLM
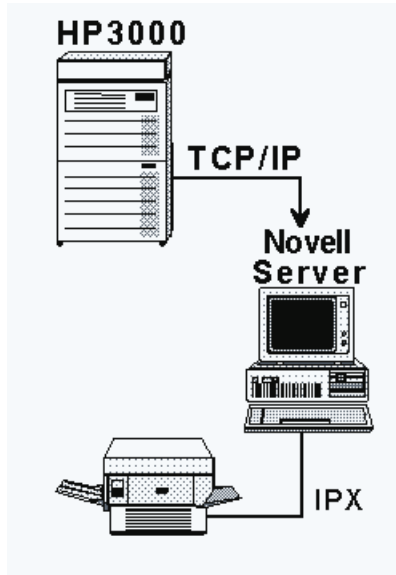
NetPrint's built-in NLM acts as a print gateway to the Novell server. The NLM runs on the server and communicates directly with the HP3000 via TCP/IP. No gateway PC or other hardware is needed. The NetPrint NLM supports NetWare 3.11 and later. Novell's TCPIP.NLM and version 3.11d or later of CLIB.NLM are also required.

Note: Minisoft highly recommends using the NLM to spool directly to the Novell file server. However, this manual also includes instructions for installing HP's NetWare/iX, should you instead choose this method of spooling to the server.

VIA HP NETWARE/IX
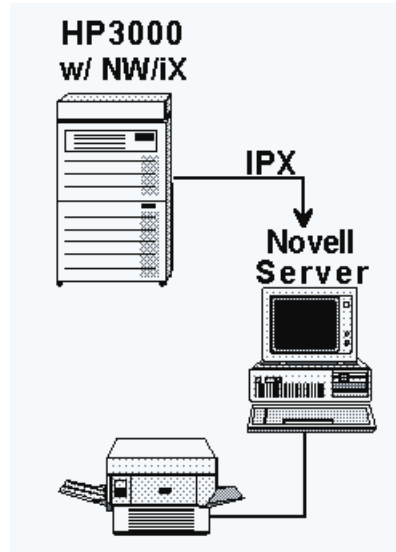
HP's NetWare/iX, portable NetWare for the HP3000, allows you to print to the NetWare server's print queues without any sort of gateway or extra software on the server. NetPrint uses the NetWare/iX transport resident on the HP3000 to communicate with any NetWare server on the network via the   protocol. NetWare/iX must be purchased separately from HP.

Note: Support for printing to NetWare servers via HP's NetWare/iX portable NetWare for the HP3000 is discontinued on MPE/iX 5.0. Any users who are currently using this feature should contact Minisoft tech support to discuss your options.

LPD PROTOCOL SYSTEM TO NOVELL SERVERS
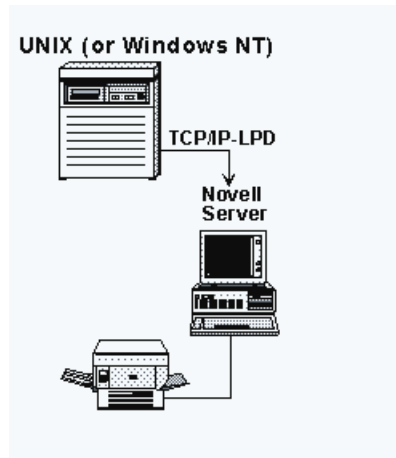
Besides providing a link between the HP3000 and the Novell server, NetPrint's NLMs also act as a print gateway from Unix or Windows NT systems to the Novell server. The NLMs run on the server and communicate directly with the Unix or Windows NT system via TCP/IP and the LPD protocol. No gateway PC or other hardware is needed. The NetPrint NLMs support NetWare 3.11 and later. Novell's TCPIP.NLM and version 3.11d or later of CLIB.NLM are also required.

NOVELL SERVER TO HP3000, LPD, OR TCP/IP PRINTERS
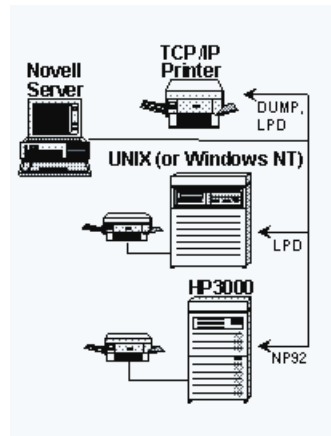
A second NetPrint NLM allows for printing from a Novell server to printers attached to an HP3000, a Unix or Windows NT system, or network printers equipped with a TCP/IP interface card. This NLM supports NetWare 3.11 and later. Novell's TCPIP.NLM and version 3.11d or later of CLIB.NLM are also required. If you plan to use this NLM, you must create a configuration file for it on the server. Instructions for creating this file appear in chapter 4.

2 INSTALLATION

OVERVIEW

SUMMARY OF SETTING UP NETPRINT

The summary steps described below are explained in detail in the rest of this chapter and in chapter 3:

1. Build the account and group on the HP3000.

2. Restore the tape.

3. Configure dummy spooled ports using NMMGR to print from (see appendix A).

4. Set up target printers or servers to print to.

5. Edit the configuration file, defining:

    ♦ spooler to monitor
    ♦ target to print to
    ♦ type of target, and
    ♦ specific options.

SUMMARY OF PRINTING METHODS

You set up printing options on your network according to whether you will be sending print files directly to network printers, to Unix or Windows NT systems, or to a Novell server via the NetPrint NLM or HP's NetWare/iX.

Refer to the table below for a brief summary of the steps involved for each method of printing described in chapter 1. The far right column tells you where you can find detailed information for each step.

Note: For a more detailed description of the steps involved for implementing each method of printing, turn to chapter 5.

Printing method	Steps to take	Refer to
HP3000 to TCP/IP-equipped printer	Install NetPrint	Chapter 2
	Configure printers; install BOOTP if nessessary	Chapter 5
	Modify network configuration via NMMGR.	Appendix A
	Edit NetPrint configuration file, NP92CONF*.	Chapter 3
HP3000 to LPD protocol system	Install NetPrint.	Chapter 2
	Modify network configuration via NMMGR.	Appendix A
	Edit NetPrint configuration file, NP92CONF*.	Chapter 3
	Enable LPD on the destination system.	Chapter 5

Printing method	Steps to take	Refer to
HP3000 to Novell server via NLMs	Install NetPrint.	Chapter 2
	Modify network configuration via NMMGR.	Appendix A
	Edit NetPrint configuration file, NP92CONF*.	Chapter 3
	Load NPNLMIN.	Chapter 4
HP3000 to Novell server via NetWare/iX	Install NetPrint.	Chapter 2
	Set up dummy device classes.	Appendix A
	Edit NetPrint configuration file, NP92CONF*.	Chapter 3
	Configure server(s).	Chapter 5
LPD protocol system to HP3000	Install NetPrint.	Chapter 2
	Modify network configuration via NMMGR.	Appendix A
	Edit NetPrint configuration file, NP92CONF*.	Chapter 3
	Enable LPD/LPR on source system.	Chapter 5
LPD protocol system to Novell server	Configure target printer.	Chapter 5
	Load NPNLMIN.	Chapter 4
Novell server to HP3000	Install NetPrint.	Chapter 2
	Modify network configuration via NMMGR.	Appendix A
	Edit NetPrint configuration file, NP92CONF*.	Chapter 3
	Configure node names on server.	Chapter 5
	Edit NPNLM configuration file, NPNLMOUT.CFG	Chapter 4
	Load NPNLMOUT.	Chapter 4

Printing method	Steps to take	Refer to
Novell server to LPD protocol system	Enable incoming LPD.	Chapter 5
	Configure node names on server.	Chapter 5
	Load NPNLMOUT.	Chapter 4
Novell server to TCP/IP-equipped printer	Configure node names on server.	Chapter 5
	Edit NPNLM configuration file, NPNLMOUT.CFG	Chapter 4
	Load NPNLMOUT.	Chapter 4

* NetPrint used to be named NP92, with *92* coming from HP terminals 2392 and 700/92. Though the NP92 name has now changed to a more descriptive *NetPrint*, a hold-over is seen in some of NetPrint's filenames, such as NP92CONF.

INSTALLING NETPRINT ON THE HP3000

Before you install the software, you must set up the HP3000 host. Begin by logging on as system manager. Type the following at the system prompt:

HELLO MANAGER.SYS

and press RETURN. Type the password for this logon when prompted to do so.

TO SET UP THE HP3000 HOST

The way you set up the account structure for NetPrint on your HP3000 host depends upon whether or not a MINISOFT account already exists there.

*NEW **MINISOFT** ACCOUNT*

If you do not already have a MINISOFT account, create a user and account structure for NetPrint on the HP3000 host as follows:

1. Create a MINISOFT account by typing the following command at the system prompt. Press the spacebar after NEWACCT only, and do not press RETURN until you have typed the entire command:

    NEWACCT MINISOFT,MANAGER;PASS=<*password*>;
    CAP=IA,BA,AM,AL,GL,OP,DS,MR,ND,SF,PH,PM;
    ACCESS=(X:ANY;R,W,A,L:AC)

2. Modify the PUB group in the MINISOFT account by typing the following command at the system prompt. Press the spacebar after ALTGROUP only, and do not press RETURN until you have typed the entire command:

    ALTGROUP PUB.MINISOFT;PASS=<*password*>;
    CAP=IA,BA,PM,PH,DS,MR;
    ACCESS=(X:ANY;R,W,S,A,L:AC)

Note: If you add passwords, you must also add them to the NetPrint jobstream (NP92JOB).

3. Create an MGR user in the MINISOFT account by typing the following command at the system prompt. Press the spacebar after NEWUSER only, and do not press RETURN until you have typed the entire command:

    NEWUSER MGR.MINISOFT;PASS=<*password*>;
    CAP=IA,BA,SF,PM,PH,DS,AM,AL,ND,GL,OP;HOME=PUB

EXISTING **MINISOFT** *ACCOUNT*

If you already have a MINISOFT account, modify it as follows:

1. Modify the account capabilities by typing the following command at the system prompt. Press the spacebar after ALTACCT only, and do not press RETURN until you have typed the entire command:

    ALTACCT MINISOFT;CAP=IA,BA,AM,AL,GL,OP,DS,
    MR,ND,SF,PH,PM

Note: Instead of PUB, you may wish to create a separate group, such as NP92 (refer to the ALTGROUP parameters in step 2, previous page, for capabilities and access). If you do this, or if you add passwords, you must modify the NetPrint jobstream (NP92JOB).

2. Modify the PUB group capabilities in the MINISOFT account by typing the following command at the system prompt. Press the spacebar after ALTGROUP only, and do not press RETURN until you have typed the entire command:

    ALTGROUP PUB.MINISOFT;ACCESS=(X:ANY;R,W,S,A,
    L:AC);CAP=IA,BA,PM,PH,DS,MR

3. Modify the MGR user in the MINISOFT account by typing the following command at the system prompt. Press the spacebar after ALTUSER only, and do not press RETURN until you have typed the entire command:

    ALTUSER MGR.MINISOFT;CAP=IA,BA,SF,PM,PH,DS,
    AM,AL,ND,GL,OP;HOME=PUB

RUNNING NETPRINT FROM ANOTHER ACCOUNT

When the MINISOFT account is set up as described in the previous sections, NetPrint can be run from within the MINISOFT account only. If you wish to run NetPrint from outside the MINISOFT account, you must relax the security of this account, as follows:

1. Logon as MANAGER.SYS.

2. Use the ALTACCT command to change the access to the MINISOFT account, as shown:

    ALTACCT MINISOFT;ACCESS=(R,X,A:ANY;W,L:AC)

3. Use the ALTGROUP command to change the access to the PUB group, as shown:

    ALTGROUP PUB.MINISOFT; ACCESS=(R,X,A;ANY;W,L,S:AC)

If you choose to alter the MINISOFT account in this way, you are responsible for protecting any MPE passwords hard-coded in the jobs in this account. To protect a job after editing its password, use the following command:

ALTSEC <jobname>;ACCESS=(X:ANY;R,W,A,L:AC)

where <jobname> is the name of the job whose password you edited.

TO INSTALL THE SOFTWARE

To install NetPrint, you must restore the tape, copy the installation file to PUB.SYS, and run the installation program:

1. At the system console, copy the files from the NetPrint tape to the HP3000, as follows:

    Create a file equation by typing:

    FILE T;DEV=TAPE

    and pressing RETURN.

    Copy the files from the tape by typing:

    RESTORE *T;@.@.MINISOFT;SHOW

    and pressing RETURN.

    The console requests an LDEV number. Respond by pressing CTRL-A and typing the following, where *pin* is the number that appears after the second slash mark (/) in the console's request, and *ldev* is the device number of your tape drive:

    REPLY *pin, ldev*

2. Copy the file INSTOS to PUB.SYS:

    Logon as system manager by typing the following at the system prompt:

    HELLO MANAGER.SYS

    and pressing RETURN. Type the password for this logon when prompted to do so.

Use the COPY command to copy the file by typing the following:

COPY INSTOS.PUB.MINISOFT

and pressing RETURN.

3. Run the installation program by typing the following:

RUN NP92DRV.PUB.MINISOFT,INSTALL

and pressing RETURN.

This process runs quickly and does not interact with you. When it is done, NetPrint is installed and ready for configuration.

TO UPGRADE THE SOFTWARE

Prior to upgrading Netprint to a newer release, you must first make a backup copy of your configuration file (NP92CONF) before preceding with the restore. Should you leave out this step, the default examples found in the original configuration file will overwrite your table entries and a restore from a previous backup tape will be necessary. Note: we also suggest backing up your job file (NP92JOB), as special JCW settings may have been set which are site specific.

1. Log on as MGR.MINISOFT

2. Shutdown NetPrint

:NP92CNTL STOP

3. Create a backup copy of your configuration and job files:

:COPY NP92CONF , NP92CBUP
:COPY NP92JOB , NP92JBUP

4. At the system console, copy the files from the Netprint tape to the HP3000, as follows:

    :FILE T;DEV=TAPE
    :RESTORE *T;@,@.MINISOFT;SHOW

    Reply to the tape device message.

5. Once the restore is complete, copy your original configuration back.

    :COPY NP92CBUP , NP92CONF

    We now recommend a visual comparison of your backup job file (NP92JBUP) and the new job file (NP92JOB). Be sure to add back any passwords and/or special JCW settings.

6. NetPrint is now installed and ready to be activated.

    :NP92CNTL START

3 NP92CONF
CONFIGURATION FILE

To configure NetPrint for your site, you must edit the configuration file, NP92CONF.PUB.MINISOFT so that it identifies the device classes, node names and other site-specific variables at your site. The configuration file, discussed below, also defines any custom options for your site, such as page banners.

The configuration file has its own control language, which is discussed in the *Using the control language* section of this chapter.

EDITING THE NP92CONF CONFIGURATION FILE

NP92CONF.PUB.MINISOFT, the NetPrint configuration file, contains control language statements that are executed by NetPrint. The file is unnumbered and can be created with any editor. Statements in the file can be up to 255 bytes long and may be continued over multiple lines with the & continuation character. After editing the file, remember to keep it *unnumbered.*

This file is included with NetPrint on the installation tape; you must customize it for your site by editing it according to the information in the section *Using the control language* in this chapter.

In order to implement changes you make to the configuration file, you must stop and then restart the NetPrint job (see the NetPrint Job section of chapter 6 for more information on running the NetPrint job).

THE **NP92CONF** FILE

Think of the NP92CONF file as a template from which you create a NetPrint configuration for your site.

The section that follows, *Using the control language*, is a command reference for the configuration file. For specific examples of statements used to configure NetPrint, turn to the section of chapter 5 that describes your method of printing.

Here is the NetPrint configuration file, as it is supplied on the NetPrint installation tape:

```
                    * This is a sample NetPrint Configuration file
                    *
Global              RESCAN=FINISH
options             INTERVAL=300
statements:         LOGDETAIL=HIGH
                    *
                    * This file causes NetPrint to wake every 5 minutes and
                    * print spoolfiles on devices specified to the network
                    * printers until all files are printed. Then it goes back to
                    * sleep. Each file * that is printed has the banner
                    * attached.
                    *
                    * The first example assumes an HP JetDirect printer
                    * interface. The second example assumes printing to a queue
                    * on a NetWare server via the NetPrint NLM.
                    *
NETPRINT            NETPRINT D=DEVCLASS
statements            NODE PRINTER
with                  OPTIONS PURGE;RESET
selection             BANNER MYBANNER
criteria              NETLOG
and                 END
action
statements:         NETPRINT D=DEVCLASS
                      NODE SERVER
                      QUEUE QUEUE_NAME
                      OPTIONS PTYPE=NLM;PURGE;RESET
                      BANNER MYBANNER
```

```
          NETLOG
        END
```

Banner **BANNER-PAGE MYBANNER**
definition **LINE $LARGE "JOB NUMBER"**
statements **LINE !JSNUM**
(optional): **LINE $SPACE 1**
　　　　　　LINE $LARGE "JOB NAME"
　　　　　　LINE !JSNAME
　　　　　　LINE $SPACE 1
　　　　　　LINE $LARGE "OWNER NAME"
　　　　　　LINE !USER.!ACCT
　　　　　　LINE $SPACE=1
　　　　　　LINE *
　　　　　　LINE * File Id# : !DFID!50*
　　　　　　LINE * Created : !SPFDATEL!50*
　　　　　　LINE * Job#   : #!JSNUM!50*
　　　　　　LINE * Job Name : !JSNAME!50*
　　　　　　LINE * Owner   : !USER.!ACCT!50*
　　　　　　LINE * File Name: !FNAME!50*
　　　　　　LINE * Lines   : !LINES!50*
　　　　　　LINE * Device   : !DEV!50*
　　　　　　LINE * Bannered : !DATEL!50*
　　　　　　LINE *
　　　　　　END

USING THE CONTROL LANGUAGE

The statements of NetPrint's control language are in the form "KEYWORD object" where the keyword and object are separated by an equal sign (=) or a blank space. Comment lines begin with an asterisk (*).

NetPrint consists of several types of statements:

Global option statements: These statements set parameters which control how NetPrint functions, such as the length of time between each scan of the HP3000 spool queue.

NETPRINT statement: This statement queues selected spoolfiles for transfer to a remote system.

NETRECEIVE statement: (not shown in template) This statement receives print files from other systems and sends them to HP spoolfile queues.

Selection criteria: These specifications identify attributes and values that are used to select the spoolfiles to be printed (NETPRINT) or received (NETRECEIVE).

Action statements: These statements specify the actions that NetPrint is to perform against spoolfiles selected by the selection criteria. Action statements are for either NETPRINT or NETRECEIVE.

Banner definition statements: These statements define a custom banner layout.

Scanmode statement: With this statement, NetPrint scans the queue only when new spoolfiles have been created.

The remainder of this chapter provides a command reference for each statement type, along with examples.

GLOBAL OPTION STATEMENTS

These statements control NetPrint's overall operation. They are parsed and set at the start-up of the NetPrint job and do not change while it is running.

DRIVERPRI pri
Sets an MPE priority queue (CS, DS, ES) or fixed priority number at which the NetPrint driver processes will execute while performing scans of the spool queue.

Examples: DRIVERPRI DS, DRIVERPRI 240

FILTER=[mpe LISTSPF command seleq]

Allows you to filter or reduce the number of spool files that NP92MGR must process during a spool queue scan. The object of this statement is a spoolfile selection equation as defined for the 'seleq' parameter of the MPE LISTSPF command. The selection equation is applied to the scan of the spool queue by NetPrint and only those spoolfiles that meet the selection criteria are considered by NetPrint. You can use the FILTER statement when there is a significant subset of spoolfiles on your system that you do not want to be processed by NetPrint. You do this by limiting the queue scan to only those files that are to be printed.

Note that the FILTER statement is ignored if SCANMODE=NEWSPF is used.

INTERVAL seconds

Sets the amount of time in seconds that NetPrint pauses between scans of the HP3000 spool queue. The default is 5 minutes.

Examples: INTERVAL 60, INTERVAL 600

LIST OFF | ON

Turns off/on listing of the configuration file statements to the NetPrint log file during start-up of the NetPrint job.

LOGDETAIL NONE | HIGH

Sets the level of detail logged to the NetPrint log file. NONE logs only errors. HIGH logs confirmation of printing.

MGRPRI pri

Sets an MPE priority queue (CS, DS, ES) or fixed priority number at which the NetPrint manager program executes.

Examples: MGRPRI DS, MGRPRI 240

MPE mpe command

Executes specified command during NP92JOB's startup. Useful for setting file equations and JCWs.

Examples: MPE FILE=MYFILE, MPE SETJCW MYJCW=1

NOCONSOLE
> Minimizes console messages; error messages still go through.

RESCAN NORMAL | FINISH | NO
> Sets the action that NetPrint takes after processing a spoolfile. NORMAL tells NetPrint to start a new scan of the spool queue. FINISH tells NetPrint to continue processing the spoolfile list obtained on the last scan. NO tells NetPrint to sleep after every scan of the spool queue instead of after a scan that yields no files to print. The default setting is FINISH.

SCANMODE TIMED | NEWSPF | NEWONLY | NOQUEUE | HIDEALL
> SCANMODE controls NetPrint's scanning of the spool queue. TIMED tells NetPrint to repeatedly scan the spool queue. Under NEWSPF, NetPrint scans the queue only if new files are present. Under NEWONLY, NetPrint scans only the new files, if any. With NOQUEUE files are not queued for a printer driver process unless it is idle; this means that files are 'alterable' right up to the point that they enter the PRT (print) state. Using HIDEALL as an option will 'hide' all print files after the initial scan. This will help reduce cpu consumption in environments with large numbers of non-Netprint spoolfiles. (See *SCANMODE statement* later in this chapter.)

UNTIL hh:mm
> Sets a time, in 24-hour format, that NetPrint will shut down automatically.

> Examples: UNTIL 24:00, UNTIL 17:30

NETPRINT STATEMENT

NetPrint can handle up to 6144 spoolfiles on any one scan of the spool queue.

Using selection criteria and action statements, a NETPRINT statement selects spoolfiles, then sends those spoolfiles to a remote destination. The remote destination can be a network printer, a Novell or Windows NT file server's print queue, a Unix system, or another HP3000. You may have as many NETPRINT statements as you like. Each will create its own server process to deliver spoolfiles to the

remote destination. You may also have multiple NETPRINT statements send spoolfiles to the same server or queue.

If a printer is busy or some other error occurs (for example, the network is down), the NetPrint driver waits 60 seconds and tries again until it can successfully deliver the spoolfile. Note that once a spoolfile is selected by a NETPRINT statement, no further processing of that spoolfile is done by NetPrint.

The format of the NETPRINT statement is:

NETPRINT selection criteria
  action statement
  action statement
    .
    .
END

For a list of valid selection criteria, see *Selection criteria* later in this chapter. For a list of valid action statements, see *Action Statements* later in this chapter.

NETRECEIVE STATEMENT

NETRECEIVE causes NetPrint to go into receive mode, listening on the network for LPD or NLM connections from other systems. A 'son' process engages in an exchange with the sending system and transfers the print file to the HP3000 spool queue, while the main process goes back to listening for new connections. The format of the NETRECEIVE statement is:

NETRECEIVE selection criteria
  action statement
  action statement
    .
    .
END

For a list of valid selection criteria, see *Selection criteria* later in this chapter. For a list of valid action statements, see *Action Statements* later in this chapter.

SELECTION CRITERIA

You may specify selection criteria for the NETPRINT and/or NETRECEIVE statements in your NetPrint configuration file. There are separate sets of selection criteria for NETPRINT and NETRECEIVE.

NETPRINT SELECTION CRITERIA

The selection criteria you specify for the NETPRINT statement determine which spoolfiles will be acted upon by the action statements for that NETPRINT statement. The selection criteria identify a specification or a range with the equal sign (=), greater-than sign (>), or lesser-than sign (<).

Use combinations of these symbols to express inclusive and exclusive sets of criteria. For example "< >" means "not equal to" and "< =" specifies a range inclusive of the range's upper limit ("lesser than or equal to").

To specify ranges on numeric values, specify the keyword twice with the AND logical operator. For example, the following selection criteria specifies $STDLIST spoolfiles between priorities 3 and 5 inclusive, or from aborted jobs:

(F=$STDLIST AND (P>=3 AND P<=5)) OR ABORTED

Note: NetPrint handles spoolfile lines up to 1007 bytes in length, which is the maximum record length of a spoolfile on MPE.

Selection criteria are as follows:

COPIES/COP/C=copies
> Selects on copy count, 1-127
>
> Examples: COPIES>1, C=1

DATE/DT/READY/RDY=mm/dd/yy | +-nn
> Selects on spoolfile ready date. +-*nn* computes a date that is plus or minus *nn* days from the current date.
>
> Examples: DATE=06/01/97, RDY<=12/31/97

DAY/DT/READY/RDY<relop> dow | dom | -nn
> Selects on spoolfile day by day of week (*dow*), day of month (*dom*), or number of days from the end of the month (-*nn*).
>
> Examples: DAY=15, DAY<=FRI, DAY=-2

DEVICE/DEV/D=class | num
> Selects on spoolfile output device class or number. Class may have wildcards.
>
> Examples: DEVICE=LP, D=6, DEV< >LP2

FILE/F=filename
> Selects on spoolfile's filename (8 character maximum). Wildcards are accepted.
>
> Examples: FILE=MYFILE, F=PAY@, F< > $STDLIST

FORM=formid | YES | NO
> Selects on presence of a specific form ID (Native Mode Spooler only) or if file has (YES) or has not (NO) a special form ID or forms message assigned.
>
> Examples: FORM=FORM1099, FORM=YES

JOB/J=+~num | +~name
> Selects on spoolfile job number or name. Job name may have wildcards. Normally, NetPrint ignores jobs with the apostrophe flag ('), which means the

spoolfile is not an "original" file, but a copy. The + before the job name/ number matches only spoolfiles with the apostrophe flag, while the ~ matches files with or without the apostrophe flag.

Examples: JOB=125, J=PAY@, J=+GLREPT

OWNER/O/USER/U=user.acct
Selects on spoolfile owner. Wildcards are accepted.

Examples: OWNER=@.SYS, U=MGR.PAYROLL, U=M@.??X

PAGES/PG=pages
Selects on the number of pages in the spoolfile (Native Mode Spooler only).

Examples: PAGES=100, PG>100

PRIORITY/PRI/P=pri | OUTFENCE
Selects on output priority, 0-14, or selects on how the spoolfile's priority value compares to the current value of the system outfence.

Examples: PRI=6, P>1, P<=5, P>OUTFENCE

SESSION/SES/S=<+ | >~num | <+ | ~>name
Selects on spoolfile session number or name. Session name may have wildcards. Normally, NetPrint ignores jobs with the apostrophe flag ('), which means the spoolfile is not an "original" file, but a copy. The + before the session name/number matches only spoolfiles with the apostrophe flag, while the ~ matches files with or without the apostrophe flag.

Examples: SES=36, S=TEST, S=~140

SIZE=lines
Selects on spoolfile line count.

Examples: SIZE=1000, SIZE>5000, SIZE<=100

STATE/STA/ST=state
> Selects on spoolfile state, which may be one of: READY/RDY, XFER/XFR, DEFER/DEF, PROBLEM/PRB, SPSAVE, SAVE, ABORTED.

> Examples: STATE=RDY, STA=ABORTED, ST=SAVE

TIME<relop>hh:mmxx
> Selects on spoolfile by time of day. The xx is for am or pm.

> Examples: TIME=11:59PM, TIME<=5:00PM

NETRECEIVE SELECTION CRITERIA

NETRECEIVE selection criteria are as follows:

LPD
> Receives print files from systems that employ the Line Printer Daemon protocol. Listens on the network port 515.

NLM
> Receives print files from the Novell server via the outgoing NLM, NPNLMOUT. Listens on the network port 3000.

ACTION STATEMENTS

You may specify action statements for the NETPRINT and/or NETRECEIVE statements in your NetPrint configuration file. There are separate sets of action statements for NETPRINT and NETRECEIVE.

NETPRINT ACTION STATEMENTS

The action statements that can be used with NETPRINT are:

ALIAS name

Assigns a name to the NETPRINT job. The ALIAS name can then be used as the printer name parameter for NP92CNTL. Instead of using IP addresses to identify and control your printers, you can assign meaningful names to them. The ALIAS name is used in the log spoolfile and on console messages instead of the NODE value.

ALIAS also controls the allocation of printer driver processes. This means that two NETPRINT jobs with the same NODE value (IP address), but with different ALIAS names, have two drivers and can be controlled independently.

BANNER banner-name

Specifies a banner-page definition.

Examples: BANNER MYBANNER, BANNER BAN1

CLASS name

Assigns the NETPRINT job to the named class. Using the CLASS statement allows for load balancing between printers.

If a NETPRINT job has a class name assigned, NetPrint checks the printer to see if it is busy before queuing this new job for the printer.

♦ If the printer is not busy, the job is queued and printed by the printer.
♦ If the printer is busy, NetPrint searches the other NETPRINT jobs for a job with the same class name whose printer is not busy. If an idle printer is found, the print job is queued to that printer. If no idle printers are found, the print job is skipped and will be reconsidered on the next scan of the spool queue.

CONSOLE "message"

Sends message to the console.

Example: CONSOLE "Printing to Novell"

EXECPRI pri

Sets execution queue (CS, DS, ES) or fixed priority number for NetPrint driver process execution.

Examples: EXECPRI CS, EXECPRI 242

LOG "message"

Writes message to the NetPrint log file.

Example: LOG "Print on lp1 complete."

NETLOG

Causes the NetPrint driver to copy the print log generated by the driver process to the NetPrint log file. This gives a complete record of driver activity and spoolfiles printed. Driver errors are always logged.

NODE nodename

Specifies the node name of the network printer or network server, or IP address of the target printer or system.

Examples: NODE NSERVER1, NODE 192.6.1.12

NOSHAREDRIVER

Causes NetPrint to not share the driver process with any other printer.

OPTIONS options

Specifies a list of options, separated by semicolon. Recommended options are PURGE and RESET.

Example: OPTIONS PURGE;PTYPE=GC;RESET

See *NETPRINT options*, below, for a list of options.

OUTFENCE n

Sets NetPrint's outfence value for this NETPRINT statement's network printer. This value is not related to the MPE system outfence, and defaults to zero.

Example: OUTFENCE 8

QUEUE queuename

Specifies print queue when using the NetPrint NLM or when printing to an LPD protocol system. For queue names that must be transmitted in lowercase, surround the queue name with double quotes.

Examples: QUEUE LJ_56_#002, QUEUE "lpt1"

QUEUE server/queuename

Specifies the target Novell server and print queue name when using NetWare/iX.

Example: QUEUE MYSERVER/N1Q1

SETVAR

Sets spoolfile's attributes to MPE variable names. These variables can then be substituted on CONSOLE, LOG, TELL and OPTIONS statements. MPE variables are as follows:

SPFDFID	spoolfile device file ID
SPFNAME	spoolfile file name
SPFJOBNAME	spoolfile job name
SPFJOBNUMBER	spoolfile job number
SPFJOBTYPE	spoolfile job type (S, S', J, or J')
SPFUSER	spoolfile owner user name
SPFACCOUNT	spoolfile owner account name
SPFDEVICE	spoolfile output device
SPFSTATE	spoolfile state
SPFFORMID	spoolfile form ID
SPFFORMMSG	spoolfile forms message
SPFDISPOSITION	spoolfile disposition (S for save)
SPFPRIORITY	spoolfile output priority
SPFCOPIES	spoolfile copies
SPFLINES	spoolfile lines
SPFPAGES	spoolfile page count
SPFRDYTIME	spoolfile ready time
SPFRDYDATE	spoolfile ready date

Example: The following example of a NETPRINT statement uses the

SETVAR action statement to make the spoolfile's device file ID available to the CONSOLE action statement:

```
NETPRINT D=MYDEVICE
    NODE LJ5
    SETVAR
    OPTIONS PURGE;RESET
    CONSOLE "File !SPFDFID has been printed."
END
```

Note: The spoolfile device file ID number can be up to 8 digits in length.

TELL string

Executes MPE TELL command with string. String must conform to MPE TELL command syntax.

Example: TELL MANAGER.SYS;Printing to NQ1

TRAILER banner-name

Specifies a trailer-page definition.

Examples: TRAILER MYBANNER2, TRAILER BAN2

NETPRINT OPTIONS

A=file

Print MPE flat file after each spoolfile.

Examples: A=ORGTEXT.PUB.ADMIN, A=INFOFILE

B=n

Sets the buffer threshold used by NetPrint for network transmissions.

By default, NetPrint uses a threshold of 1024 which results in packets less than the HP3000's normal media size of 1411. This works fine with most network interfaces. However, some interfaces, such as those on Data Products printers, want a packet size of 1000 bytes or less. If a buffer greater than 1000 bytes is submitted to the HP3000 TCP/IP, the buffer is broken up into

two packets, which is normal TCP/IP protocol. However, this breaking up of the buffer into multiple packets triggers a bug in the HP3000 TCP/IP stack and results in slow transmission and slow printing.

You can use the B= option to set a lower buffer threshold (800 bytes for Data Products) so that the buffers sent by NetPrint are not broken up.

BSD

Specify only when Unix system is a BSD system.

DEFERED

Selects only those spoolfiles with a priority below the system outfence for the device.

DEST="name"

Name of printer class or device on Unix system. This or the QUEUE action statement is required when printing on a Unix host.

Examples: DEST="lp1", DEST="DEV1"

DUPLEX=n

Adds the duplex escape sequence ESC%InS to the end of any environment file processed. An environment file must be present in the spoolfile or explicitly specified with the E= or EK= option for DUPLEX=n to work. The n value is 0-2 and controls the type of duplexing performed (consult your PCL or LaserJet manual).

E=envfile

Use specified environment file to obtain printer initialization string. Any environment files that were associated using the MPE *ENV* option will be ignored. Use this option or the EK option (below), but not both.

Examples: E=LASENV, E=ENV1.PUB.SALES

EK=envfile

Send specified environment file first, followed by any environment file specified in the print file. Any environment files that were associated using the MPE *ENV* option will be kept. Use this option or the E option (above), but not both.

Examples: EK=LJ132D, EK=LAND4UP

F={filename}

Use this option to copy your spoolfile to a disk file.

In place of the filename, you may use one of the variable names below:

$FNAME - disk file name matches that of spoolfile name.

$DFID - create a file with the name 'Snnnn' where nnn is the spoolfiles device file id number.

$DATE - create a file with the name 'Sdddhhmm' where dddhhmm is the day of year, hour and minute.

$JNAME - create a file with the spoolfiles job name.

$JNUM - create a file with the name 'Jnnn', where nnn is the spoolfiles job/session number

When specifying the F= option, the NODE statement and PTYPE option need to be excluded.

I=file

Print MPE flat file ahead of each spoolfile.

Examples: I=SALESTXT.PUB.SALES, I=INFOFILE

M="text" | $PRINT

A common use for this feature is to allow fax phone numbers assigned to spoolfiles in the forms message to be sent to server print queues or disk files as the first record in the print file.

If the option M=text or M="text string" is used on the options line, the text will be written to the network printer after environment file processing and before any user data. If M=$PRINT is used and the form contains a special forms message, the message is sent to the network printer (operator is not prompted). If both M=text and M=$PRINT are specified, the text is printed first, followed by the forms message text from the spoolfile.

NETOPT="option,option" | "string string"

Lists options to send to Novell server, or options for handling print formatting for the LPD protocol. See *NETOPT options,* below, for a list of NETOPT options.

Examples: NETOPT="BANNER=YES,OH,PS=LJ1", NETOPT="BSDo BSDh"

NOFF

Suppress form feed after each spoolfile.

PAGES=range

Print only the specified page range from each spoolfile.

Examples: PAGES=1/2, PAGES=2/L

PCL

Modifies the way the HP carriage control codes are expanded into PCL control codes. When PCL is present, the skip-over perf escape sequence is sent to the printer in response to the %2xx series cctl codes and the %100-103 and %400-403 codes. Without PCL, a skip-over perf sequence is not generated, and skip-over perf must be set on the printer or via an environment file.

PORT=number

Defines the TCP/IP port where NetPrint is to send spoolfiles. Omitting the PORT option causes NetPrint to send print files to the default port number at this IP address.

Example: PORT=2502

PTYPE=type

Defines type of the destination system. Values, and their default ports, are:

Type	Description	Port
EX	Extended Systems	9100
FP	Milan Fast Port	2000
GC	GoldKey Gold Card III	
JD	HP JetDirect (default if PTYPE is not used)	
LPD	Line Printer Daemon (any LPD-capable interface) - Cannon multi-print device (incl. SPORT=721) - Intel Netport Express - Lexmark Marknet Pro3 - Netgear Baynetworks - Window's NT server	
NJ	Emulext NetJet	2501
NLM	NLM gateway	
NP	Intel NetportXL with TCP/IP support	9100
NQ	Emulex NetQue	2501
NWIX	NetWare/iX	
UNIX	Unix systems	

PURGE

Purge spoolfile after printing.

RANGE=range

Print only the specified line range from each spoolfile.

Examples: RANGE=1/20, RANGE=15/L, RANGE=1/L-2

RESET

Send hard reset (esc E) to printer at end of each spoolfile. This option sets printer settings such as page orientation and fonts back to the printer's default.

READY

The READY option checks the priority of any file it is directed to print against the system outfence. The file will only print if the file's priority is above the outfence. If the file is at or below the outfence it will not be printed. NetPrint will then wait 60 seconds and recheck the file's priority against the outfence until the output priority is greater than the system outfence.

SAVE

Causes successfully printed files to be placed into the SAV (save) state (NetPrint92 ignores spoolfiles in the SAV state when selecting files to print). This allows copies of printed files to be saved after printing.

SC=copies

Sets the number of copies of the source spoolfile after printing. Assumes that PURGE option is not used.

Example: SC=2

SD=device

Sets the device of the source spoolfile after printing. Assumes that PURGE option is not used.

Example: SD=lp1

SP=priority

Sets the priority of the source spoolfile after printing. Assumes that PURGE option is not used.

Example: SP=8

SPORT=range

Sets the range for the source port, which is a fixed number assigned to the connection for responses from the remote host to NetPrint. (For more information, see *Source port* in chapter 5.)

TRIM

Removes trailing blanks. Using this option may effect format of reports, but can also reduce transfer time and overhead on the HP3000 and the network.

X=

Performs a character translation on the print file by invoking the MPE CTRANSLATE intrinsic. HP's Native Language subsystem is supported. Values are:

filename	MPE file to use as translation table
1	convert EBCDIC to ASCII
2	convert ASCII to EBCDIC

Examples: X=XLAT1.PUB, X=2

NETOPT OPTIONS

NETOPT is a NETPRINT option (see previous section).

Example: OPTIONS PURGE;RESET;NETOPT="BANNER=YES,OH"

Novell options are in the form NETOPT="*option,option*", as follows:

BANNER=YES

Turns on NetWare bannering for the new file.

FORM=formid

Sets a NetWare form ID for the new file.

FORM=n

Sets a NetWare form number for the new file.

FORM=NONE

Overrides auto setting of form ID from HP3000 form ID.

OPERHOLD/OH

Turns on the NetWare operator hold flag for the new file.

PSERVER/PS=name

Sets the new file so it will be printed only by the print server specified.

USERHOLD/UH
> Turns on the NetWare user hold flag for the new file.

LPD options are in the form *NETOPT="string string"*, as follows. Default format is plain text file, adding page breaks as needed.

BSDh	Do not print banner page.
BSDc	The print file contains cifplot output.
BSDd	The print file contains text output (DVI format).
BSDf	The print file contains standard Fortran carriage control.
BSDg	The print file contains output from the standard plot library.
BSDl	Do not filter control characters (print as-is). Note that the last character is a lowercase L, not the numeral one.
BSDn	The print file contains output from ditroff.
BSDp	Use the pr utility to format the file.
BSDt	The print file contains output from troff.
BSDv	Print file contains a raster image (print as-is).
BSDk	The print file contains kerberized data.
BSDo	The print file contains Postscript data.
BSDz	The print file contains data from the Palladium print system.
BSDR	Print with troff R font (Times Roman).
BSDI	Print with troff I font (Times italic).
BSDB	Print with troff B font (Times bold).
BSDS	Print with troff S font.
BSDi*nn*	Set indent to nn columns (pr utility).
BSDw*nnnn*	Set width to nnnn cols (pr utility).
BSDP*user*	Set originating user name.
BSDC*class*	Set class name.
BSDJ*job*	Set job name.
BSDN*name*	Set the spoolfile's filename.
BSDT*title*	Set title for pr utility.

NETRECEIVE ACTION STATEMENTS

The action statements that can be used with NETRECEIVE are:

NETLOG

Causes the NetPrint driver to copy the print log generated by the receiver process to the NetPrint log file. This gives a complete record of receiver activity and spoolfiles received. Driver errors are always logged.

OPTIONS options

Specifies a list of options, separated by semicolon.

Example: OPTIONS LOG;NOCCTL

See *NETRECEIVE options,* below, for a list of options.

NETRECEIVE OPTIONS

LOG creates a detailed log of each file received.

NOCCTL creates all spoolfiles received as an exact image of what was sent, with no conversion to HP carriage control.

X= Performs a character translation on the print file by invoking the MPE CTRANSLATE intrinsic. HP's Native Language subsystem is supported. Values are:

filename	MPE file to use as translation table
1	convert EBCDIC to ASCII
2	convert ASCII to EBCDIC

Examples: X=XLAT1.PUB, X=2

BANNER DEFINITION STATEMENT

BANNER-PAGE defines custom banner page layouts. The 'name' specified is the banner page's unique identifier (8 character maximum) and is used to link the banner page definition to the BANNER action statement. You may define multiple banners in NP92CONF.

Any banner definition may contain a maximum of 250 lines, each of which can be up to 254 characters long.

The format of BANNER-PAGE is:

BANNER-PAGE name
 LINE *banner specification line*
 LINE *banner specification line*
  .
  .
END

The LINE statements define a single line in the banner specification, according to the following banner commands and banner substitution keywords shown in the following section, *Banner commands*.

If the *banner specification line* begins and ends with quotation marks, the case of the characters is preserved. Without quotes, the data on the LINE statement is uppercase. This allows escape sequences to be used on banner lines.

  Example: *Result:*
  LINE "A Banner Line" A Banner Line
  LINE A Banner Line   A BANNER LINE

BANNER COMMANDS

Banner commands begin with a $ in column 1. Lines that do not start with a $ are copied to the new spoolfile literally. Literal lines may contain substitution keywords, which begin with an ! (see list, following). On any literal line, the ^ character will be replaced by an escape character (octal 33).

Valid banner commands are as follows:

$COMMENT

    Comment lines, not executed.

$SPACE=*n*

    spaces the banner page forward *n* lines.

$SPACE=0

    Next literal line prints with no advance.

$SPACE=PAGE

    Inserts page break in banner page.

$SPACE=NOPAGE

    Does not insert page break at the end of the banner.

$LARGE "*label*"

    Causes the next literal line to be printed in large block letters. These letters are 10 normal lines high and 12 characters wide. The label is optional and specifies a 1-10 character label where each label character is printed vertically in the first column of the 10 expanded lines.

BANNER SUBSTITUTION KEYWORDS

Substitution keywords begin with an exclamation point (!). They specify a data value to be inserted in the banner line. Valid keywords are as follows:

!nnn	sets column where next character will print.
!DFID	spoolfile device file ID number.
!FNAME	spoolfile file name.
!JSNAME	spoolfile job/session name.
!JSNUM	spoolfile job/session number, preceded by S or J.
!USER	spoolfile owner's user name.
!ACCT	spoolfile owner's account name.
!DEV	spoolfile output device.
!LINES	spoolfile line count.

!DATEL	current date and time, dateline format.
!DATELS	current date, dateline format.
!DATE	current date in MM/DD/YY format.
!MO	current month as MM.
!DY	current day as DD.
!YR	current year as 19YY.
!DW	current day of week as XXX (MON, TUE, etc.).
!TIME	current time in HH:MM XX (am/pm) format.
!TIME24	current time in HH:MM 24 hour format.
!HR	current hour as HH.
!HR24	current hour as HH (24 hour format).
!MIN	current minute as MM.
!AMPM	current AM/PM indicator as XX.
!SPFDATEL	spoolfile ready date and time, dateline format.
!SPFDATELS	spoolfile ready date, dateline format.
!SPFDATE	spoolfile ready date in MM/DD/YY format.
!SPFFORMID	spoolfile form ID
!SPFMO	spoolfile ready month as MM.
!SPFYR	spoolfile ready year as 19YY.
!SPFDW	spoolfile ready day of week as XXX (MON, TUE, etc.).
!SPFTIME	spoolfile ready time in HH:MM XX (am/pm) format.
!SPFTIME24	spoolfile ready time in HH:MM 24 hour format.
!SPFHR	spoolfile ready hour as HH.
!SPFHR24	spoolfile ready hour as HH (24 hour format).
!SPFMIN	spoolfile ready minute as MM.
!SPFAMPM	spoolfile ready AM/PM indicator as XX.
!name	JCW or MPE/XL variable name (substitutes contents of jcw/var as a character string).

SCANMODE STATEMENT

NetPrint includes an alternative to the repetitive scanning of the spool queue, which is CPU-intensive. Using features in MPE/iX 5.0, NetPrint can determine when new spoolfiles have been created and scan the queue only then. NetPrint can further determine which files are the new files and scan only those files instead of the entire queue.

This feature is controlled by a statement in the NP92CONF configuration file. The statement is:

SCANMODE=TIMED|NEWSPF|NEWONLY|NOQUEUE|HIDEALL

SCANMODE is issued at the top of the config file, right after the INTERVAL statement. It controls how NetPrint scans the spool queue for new files.

NetPrint works using repeated scans of the spool queue on a timed (TIMED) basis. Starting at the point where NetPrint wakes up from sleeping, NetPrint makes a list of all spoolfiles in the spool queue. It then takes each file from the list and compares it to the NETPRINT statements in the config file. If the file matches a NETPRINT statement, it is processed by that statement. NetPrint must then decide what to do next. That is controlled by the RESCAN statement.

 ♦ If RESCAN=NORMAL, NetPrint discards the current list of spoolfiles and makes another (starts the scan over). This option is most responsive in terms of picking up new files in the queue in their order of appearance in the queue, but is most costly in terms of CPU.
 ♦ If RESCAN=FINISH or NONE, NetPrint continues with the next spoolfile on the existing scan list.

When NetPrint reaches the end of the list of spoolfiles:

 ♦ if any spoolfiles were selected from the list for printing and RESCAN=NORMAL or FINISH, NetPrint starts a new scan of the spool queue.
 ♦ if no files were found to print or RESCAN=NONE, NetPrint sleeps for the number of seconds set on the INTERVAL statement.

When NetPrint wakes, the entire process starts again.

The SCANMODE statement gives options in terms of what NetPrint does when it reaches the end of the list of spoolfiles on a scan.

- ♦ If SCANMODE=TIMED (the default), then NetPrint operates as described above.
- ♦ If SCANMODE=NEWSPF, when the end of the file list is reached *or* when NetPrint wakes up from sleeping, it determines if any new spoolfiles have been allocated on the system since the last list of spoolfiles was made. If no new files are present, NetPrint goes to sleep. If new files are present, then a scan of the entire queue is performed as described above. In this manner, the queue is only scanned when new files are present and wasted scans are avoided.
- ♦ If SCANMODE=NEWONLY, NetPrint operates just as described above for NEWSPF, but when new files are allocated, it does not scan the entire queue, just the new files themselves.

There are two limitations to SCANMODE:

- ♦ You must be on MPE/iX 5.0 to use the scan modes.
- ♦ If you use NEWONLY, NetPrint will never see existing files you have altered. This is not a big problem since the processing of new files (unaltered) accounts for about 98% of NetPrint processing. However, to mitigate this problem, a command has been added to NP92CNTL.

   This command, SCAN, causes the NP92MGR process to wake up immediately and perform a full scan of the spool queue. The syntax is NP92CNTL SCAN.

   If you are using SCANMODE=NEWSPF or NEWONLY and you alter a file for printing, simply issue the NP92CNTL SCAN command to cause the file to be picked up.

When using SCANMODE=NEWSPF or NEWONLY, NetPrint detects when the current spoolfile dfid number is set backwards with the MPE SETCOUNTER command, and adjusts itself accordingly.

INTERVAL SETTING

NetPrint tracks candidate files in the CRE (create) state and continues to scan them until they become ready. This allows the scan modes to be used without missing files, but watching for CRE state files to become RDY means the job scans on each interval until all CRE files have become RDY and queued for printing.

Because of this, the interval should be the longest value you can live with, balancing CPU consumption and printer response. The interval should be at least 30 seconds.

NOQUEUE OPTION

An additional scan mode, SCANMODE=NOQUEUE, makes NetPrint behave more like the MPE spooler. Normally, NetPrint queues all qualifying files to a printer driver process as soon as they are found in the spool queue. This can be a problem if files are waiting to be printed and the operator changes attributes of the file that would effect queuing, such as priority.

With SCANMODE=NOQUEUE, files are not queued for a printer driver process unless it is idle. This means that files are 'alterable' right up to the point that they enter the PRT (print) state. The behavior more closely follows that of the MPE spooler. However, if you are using the scan modes and a file is not queued due to a driver process being busy, the job will scan again the next time it wakes up to see if the driver has become idle and the waiting file can be queued. This means that the job will scan more often than it would otherwise.

Note: NetPrint places a spoolfile into the PRT state while it has the spoolfile open. This placement makes the files being printed more visible to system users.

Note: NetPrint's maximum number of printer driver processes is 254.

HIDEALL OPTION

With SCANMODE=HIDEALL, all spoolfiles are hidden when scanned. This is useful for environments that keep large numbers of spoolfiles in the queue that are not NetPrint candidates. NetPrint will hide or block out the non-candidate files and ignore them. With this method SCANMODE=HIDEALL will reduce cpu consumption considerably.

Files that are not selected for printing and are not "hidden" remain candidates for printing each time NetPrint scans the spool queue. This allows you to alter non-candidate files at any time to qualify them for printing on the next scan. The same holds true for using outfences in NetPrint. Files below the outfence are not hidden and checked on each scan to see if they are now over the outfence. You can erase the hidden files list with the NP92CNTL REFRESH command, causing all files on the spool queue to be reconsidered for printing. Please consult Minisoft technical support if you think HIDEALL is appropriate for you.

SAMPLE CONFIGURATION FILES

Here is a sample configuration file, NP92CONF, that contains one NETPRINT configuration statement. This file causes NetPrint to wake every 5 minutes and send spoolfiles that have been equated to MPE device class DEVCLASS to NetWare Print Queue MYQUEUE on server MYSERVER. Note that the PTYPE option is specified as 'NLM,' since the files are being sent to a NetWare file server.

```
RECSCAN=FINISH

INTERVAL=300
LOGDETAIL=HIGH

NETPRINT D=DEVCLASS
  NODE MYSERVER
  QUEUE MYQUEUE
   OPTIONS PTYPE=NLM;PURGE;RESET
  NETLOG
END
```

Here is another sample NP92CONF file, containing three NETPRINT configuration statements, as explained in the comment lines of the file.

```
RESCAN=FINISH

INTERVAL=180
LOGDETAIL=HIGH

* The following NETPRINT statement selects spoolfiles from
* the MPE device class LASERA ...
NETPRINT D=LASERA
* ...and sends them to queue LJ4 on the server
* NOVELLSERVER, with a PTYPE of NLM:
  NODE NOVELLSERVER
  QUEUE LJ4
  OPTIONS PTYPE=NLM;PURGE;RESET
  BANNER MYBANNER
* All activity (not just error messages) will be recorded
* in the NP92LOG log file:
  NETLOG
END

* The following NETPRINT statement sets up NetPrint to
* receive print files via the LPD protocol:
NETRECEIVE LPD
* All activity (not just error messages) will be recorded
* in the NP92LOG log file:
  NETLOG
* There will be no conversion to HP carriage control:
  OPTIONS NOCCTL
END

* The following NETPRINT statement selects spoolfiles
* that have been equated to the MPE device class 200 ...
NETPRINT D=200
* ...and sends them to the network node NETLJ, with a PTYPE
* of NP, indicating the target printer is attached to an
* Intel Netport XL print server:
  NODE NETLJ
  OPTIONS PTYPE=NP;PURGE
* All activity (not just error messages) will be recorded
```

```
* in the NP92LOG log file:
 NETLOG
END

BANNER-PAGE MYBANNER
    LINE $LARGE "JOB NUMBER"
    LINE !JSNUM
    LINE $SPACE 1
    LINE $LARGE "JOB NAME"
    LINE !JSNAME
    LINE $SPACE 1
    LINE $LARGE "OWNER NAME"
    LINE !USER.!ACCT
    LINE $SPACE 1
    LINE **************************************
    LINE * File ID#  : !DFID!50*
    LINE * Created   : !SPFDATEL!50*
    LINE * Job#      : #!JSNUM!50*
    LINE * Job Name  : !JSNAME!50*
    LINE * Owner     : !USER.!ACCT!50*
    LINE * File Name : !FNAME!50*
    LINE * Lines     : !LINES!50*
    LINE * Device    : !DEV!50*
    LINE * Bannered  : !DATEL!50*
    LINE **************************************
END
```

4   NETPRINT'S NLMS

NetPrint includes its own NLM for submitting spoolfiles into NetWare print queues on the Novell server. This NLM, NPNLMIN, is for *incoming* files to the server. Also included with NetPrint is an NLM for sending spoolfiles from the Novell print queue to TCP/IP destinations on the network. This NLM, NPNLMOUT, is for *outgoing* files from the server.

Note: For information on editing the AUTOEXEC.NCF file, see *Editing AUTOEXEC.NCF* at the end of this chapter.

Both NLMs are included on the NetPrint installation tape, and must be installed on the server. They are executed on the server with the LOAD command. You may issue this command manually, at the console, or you may include it in the server's AUTOEXEC.NCF file to load the NLM(s) automatically, when the server is booted up.

To shut down the NLMs, issue the command UNLOAD NPNLMIN and/or UNLOAD NPNLMOUT at the server console.

Whether you issue the LOAD command manually or include it in AUTOEXEC.NCF, you may specify options for the NLM with one or more switches.

For example, to load NPNLMIN so that you can send print files from a Unix system to the NetWare print queues, your LOAD command or statement should look like the following:

   load npnlmin /lpd

In addition, the outgoing NLM, NPNLMOUT, requires a configuration file, NPNLMOUT.CFG.

LOADING NLMS FOR NETWARE 3.11

On some 3.*x* servers, the NLMs may not run because of a missing library called AFTER311.NLM. This library is included with NetPrint as AFTER311.PUB.MINISOFT. If you do not already have the file AFTER311.NLM, download the library (binary transfer) to the SYSTEM directory of your server as AFTER311.NLM.

LOADING NLMS FOR NETWARE 4/5.*x*

Note: When installing a new NPNLMOUT over an old one on a 4/*5.x* server, purge the NPNLMOUT Print Server object from the directory. This allows the new NPNLMOUT to create the Print Server object in the directory context you set for the NLM in the .CFG file.

When the NLMs run under Directory Services on a 4/*5.x* server, you must specify a Directory Context in which each NLM executes. You can make these specifications when you load the NLMs (see *NPNLMIN options* and *Set statement* for NPNLMOUT, later in this chapter). It is recommended that you use the highest container object in your directory tree, which is typically the Organization object. All references to print queues in the NP92CONF file and in the NPNLMOUT.CFG file must be qualified according to the context assigned to the NLMs.

For example, to set up a reference to the queue *MYQ* in an organizational unit called *DEV*, which is in the organization *MINISOFT*, the NLMs would be loaded

to the context MINISOFT (/context=MINISOFT for NPNLMIN and set
context=MINISOFT for NPNLMOUT), and the queue name in NP92CONF on
the HP3000 would be MYQ.DEV.

NPNLMIN

NPNLMIN OPTIONS

The incoming NLM, NPNLMIN, allows the following options, which you can
specify as switches in the LOAD command or statement:

/ac
> Causes the NLM screen to close automatically at shutdown, instead of waiting
> for the console user to press a key. This is intended to facilitate the automated
> shutdown of these NLMs.

/be
> Forces bindery emulation on 4/5.x servers.

/context=*name*
> Specifies context to load the NLM for NetWare 4/*5.x*.

/db
> Forces NetWare banners on JetDirect protocol files.

/dp=*port*
> Sets the port on which the NLM listens for JetDirect (connect-and-dump)
> connections (normally 9100).

/dq=queue
> Enables JetDirect protocol and assigns a queue name to the TCP/IP port
> number (9100) used by JetDirect cards. The NLM receives print files using
> the connect-and-dump protocol and places them in the specified print queue.

/eb

> Forces NetWare banners on files received from HP3000. You may also enable
> Novell bannering from the HP3000 by including the ;NETOPT option in the
> OPTIONS line of a NETPRINT statement in NP92CONF, the NetPrint
> configuration file (see *NETPRINT options* in chapter 3).

/ep=*port*

> Sets the port for the NLM to listen for HP3000 connections (normally 3000).

/h

> NLM displays this list of options and then stops.

/l

> Logs all files received in file SYS:\NPNLMIN.LOG.

/lb

> Forces NetWare banners on file received via LPD. You may also enable
> Novell bannering from a Unix or Windows NT system by including the -o
> banner option in the LP command (see *Printing from an LPD protocol
> system via NLM* in chapter 5).

/lbin

> Forces binary mode on all files received via LPD.

/lnoff

> Prevents form feeds from being appended to the new file when receiving LPD
> files in text or binary modes.

/lp=*port*

> Sets the port on which the NLM listens for LPD connections (normally 515).

/lpcancel or /lpcancels

> When LPD protocol is enabled in NPNLMIN with the /lpd load switch, UNIX
> systems can request that print jobs waiting in the remote queue be canceled
> (deleted). Add the /lpcancel or /lpcancels switch when loading NPNLMIN to
> enable cancel requests. If NPNLMIN receives a cancel request for a queue,
> the job number sent by the UNIX system is removed from the NetWare queue.
>
> If you use /lpcancel, no security is applied. If you use the /lpcancels switch,

the UNIX user must be the user who created the queue file by sending it from the UNIX system to NPNLMIN. UNIX user name root can cancel any file in the NetWare queue.

/lpd

Enables incoming LPD protocol connections. This switch is *required* if you are sending print files from a Unix or Windows NT system.

/lpstatus

When LPD protocol is enabled in NPNLMIN with the /lpd load switch, /lpstatus enables remote queue status reporting. With remote queue status request, UNIX systems using the LPR remote printing protocol can request that the remote system report the status of the contents of the NetWare queue and that the status information be displayed on the local system to the requesting user. No security is applied.

/lr

Forces a reset (esc E) at the end of all LPD files.

/ow

When printing to a disk file instead of a print queue, NPNLMIN normally will not overwrite a disk file that already exists. The /ow load switch will overwrite an existing disk file with the new print file and no error is generated.

/s

Silent mode (does not log received files to the NLM's server console screen).

/t

Traces to the NPNLMIN.TRA disk file.

/tb

Includes tcp/ip data buffers in trace.

/tc

Traces to the server console.

When NPNLMIN runs, the server console screen appears as follows:

```
NETPRINT/92-NLM (IN) - Version 3.0          Wed May  3 10:06:11 1995
(c) 1994-95 RAC Consulting, (c) 1994-95 Minisoft  All Rights Reserved

Up time  :   2:06:24:35   Files rcvd:  2        Kbytes rcvd :       1.12
Blks rcvd:   3            Recv time :    0.66s   Avg rcv rate:    1.69 Kbs

Licensee: NetPrint/92 for HP3000

Initialization begins...
Netware version is 4.2 - Using Bindery Emulation
Waiting for NP92 connections on port 3000...
Connection accepted from M917 on 3000 at Wed May  3 11:57:37 1995
L by ,MGR.MINISOFT on M917
Print job 320 ranked 1 created in queue LASERA
115 bytes (1 blks) received from M917 in 0.60 sec (0.19 kbs)
Connection accepted from M917 on 3000 at Wed May  3 11:57:38 1995
L by ,MGR.MINISOFT on M917
Print job 608 ranked 2 created in queue LASERA
1030 bytes (2 blks) received from M917 in 0.06 sec (16.76 kbs)

press ESC to shutdown NLM
```

PRINT TO DISK

NPNLMIN can print incoming print files to disk files on the server as well as into print queues.

If the queue name sent to NPNLMIN contains at least one \ character, the name is assumed to be a disk directory name or full disk file name. If it does not end in a backslash, underscore, or period (\, _, or .) it is assumed to be a full disk file name and is created as such. If the name ends in \, _, or . a disk file name is generated automatically by NPNLMIN in the server disk directory specified in the queue name.

♦ When the queue name ends in \, a disk file name of the form ########.PPN will be created. The numeric part will be one higher than the highest name already on disk. If there are no files of this form already in the specified directory, the name 00000001.PPN is assigned.

♦ If the name ends in _, the disk file name will have the form PPN_####, with the numeric portion assigned in the same manner, starting with PPN_0001.

♦ If the disk file name ends in a period, NPNLMIN will autogenerate a file name with an extension of .000 to .999, depending on how many disk files

with that same name are already present in the target directory. This feature allows multiple disk files to have the same name, but a different extension. An example is:

;Q="SYSTEM\MYFILES\MYNAME."

The resulting file would be named SYSTEM\MYFILES\MYNAME.001 if SYSTEM\MYFILES\MYNAME.000 already existed.

Note that drive letters have no meaning for NLMs but you may use volume names. Some examples:

QUEUE MYQUE print queue
QUEUE \MYDIR\MYFILE print to file MYFILE
QUEUE \MYDIR\MYSUBDIR\ print to file n.PPN
QUEUE \MYDIR_ print to file PPN_n

NETWARE PRINT JOBS

NPNLMIN supports the use of NetWare print jobs created with the NetWare PRINTCON utility. You may specify a jobs name in place of a queue name when sending files to NPNLMIN. The job definition contains the name of the queue where the print file will be sent.

The job may also contain a device mode or printer initialization string. If a device mode is present, NPNLMIN extracts the escape sequences that make up the device mode and writes them to the new queue file. This becomes an alternative way to control print formatting.

You may also use the special job name 'default' to select the default print job defined with PRINTCON.

You select a print job with a queue name with the following form:

$<user/>jobname

On 3.x servers, print jobs are owned by users and on 4/5.x servers, print jobs are owned by directory objects. You must specify the print jobs owner or take the

default owner name of SUPERVISOR (3.x) or ADMIN (4/5.x). Some examples are:

QUEUE MYQUEUE print to queue
QUEUE $MYJOB use job myjob
QUEUE $BILL/JOB1 use Bill's job JOB1

TEXT OR BINARY

When a job is used, any form or banner information defined is applied to the new queue file. If printing from a UNIX system to NPNLMIN with a job, the text/byte-stream flag in the job sets the text or binary mode used to receive the print file. Text selects text mode, byte-stream selects binary mode.

USING PRINT JOBS

To use print jobs, you must load the printer services library NLM before loading NPNLMIN. Load NWPSRV3X on 3.x servers or NWPSRV on 4/5.x servers. NWPSRV3X is provided on the NetPrint installation tape.

You do not have to load these NLMs to use NPNLMIN, but if they are not loaded, job names *cannot* be processed.

Further, to use NWPSRV3X on 3.x servers, you need to have the current versions of CLIB.NLM and AFTER311.NLM loaded on your server. A current version of AFTER311 is supplied on the installation tape. Note that AFTER311 has been split into two NLMs, AFTER311.NLM and A3112.NLM. Both are supplied on the tape and should be downloaded to your server.

PRINTING TO ALIASES

When using NPNLMIN to receive print files from UNIX systems, long queue names or queue names with special characters can be a problem since UNIX systems typically limit the length and character content of queue names. To solve this problem, NPNLMIN supports queue name aliases.

You can create a disk file in the server's SYSTEM directory called

NPNLMIN.ALI that contains aliases. Each line in the file contains one alias of the form: queuename=alias. This allows you to define a short or non-special character name on the UNIX system and have it expanded at the NLM end into the name you need. Some examples are:

MYQ=myqueue.ou.ou.ou.ou.org	long NDS name
MYJOB=$myjob	special char
disk_file=system\mydir	special char

NPNLMOUT CONFIGURATION

The outgoing NLM, NPNLMOUT, uses the configuration file SYS:\SYSTEM\ NPNLMOUT.CFG. You can use the SYSCON or INSTALL programs on the Novell server to create this file.

NPNLMOUT.CFG contains SET and EXPORT statements that control the operation of NPNLMOUT. The file may also contain comment lines, which have an asterisk (*) in column 1.

The SET statement establishes settings for the NLM, such as how frequently the NLM scans the print queue, number of retry attempts, where to send error messages, etc. At most sites, the default settings work fine; the SET statement is typically used to adjust NPNLMOUT's behavior for special circumstances.

SET STATEMENT

The format of the SET statement is:

SET option=value;option=value

The options are as follows:

CLOSEDELAY=*sec*

Specifies the number of seconds to pause before disconnecting after each print file (defaults to 1).

Example: CLOSEDELAY=5

CONTEXT=*name*

Specifies context to load the NLM for NetWare 4/*5.x*.

NOTIFY=CONSOLE

Sends error notification messages to the server console.

NOTIFY=*user*

Sends error messages to the specified user. Can be used up to 5 times.

Examples: NOTIFY=SUPERVISOR, NOTIFY=EVERYONE

PRINTDELAY=*sec*

Specifies the number of seconds to pause between each file printed (defaults to 5).

Example: PRINTDELAY=10

QSCANDELAY=sec

Specifies the number of seconds to pause between scans of the NetWare print queue (defaults to 30).

Example: QSCANDELAY=60

RETRYCOUNT=*n*

Specifies the number of retry attempts for connects, sends, and receives with one second pause between each retry (defaults to 30).

Example: RETRYCOUNT=10

EXPORT STATEMENT

The EXPORT statement specifies a destination for a print queue on the server. There should be one EXPORT statement for every print queue you want the NLM to process.

The format of the EXPORT statement is:

EXPORT queuename;option=value;option=value

The *queuename* is the actual name of a NetWare print queue on the file server whose files you wish to have sent to the HP3000, LPD protocol system, or TCP/IP printer. It is required.

The options are as follows:

BSD
> Sets the BSD option for BSD-based Unix systems.

COP/C=*n*
> Specifies the copy count to be assigned to the new spoolfile on the HP3000. Defaults to the copy count set on the NetWare queue file. Valid for LPD.
>
> Examples: COP=2, C=4

DEVICE/D=*name | num*
> Specifies the HP3000 output device class or number where the exported queue files will be sent. Defaults to the queue name. For LPD, this is the print destination on the Unix or Windows NT system.
>
> Examples: DEVICE=LDEV23, D=lpt1

ENV/E=*filename*
> Specifies the name of an HP3000 environment file to be assigned to the new spoolfile. The NetPrint installation tape includes many environment files. Be sure to specify one that is compatible with MPE serial printers (see Appendix B: Environment Files).
>
> Examples: ENV=LJ132, E=ENV1

FORM/F/FO=*formid*

Specifies the form ID to be assigned to the new spoolfile. Form IDs other than STD will be assigned to the new spoolfile on the HP3000 (MPE/iX only). You can also use this option to control MODE (see below) on a file-by-file basis. To do so, set up a form ID of BINARY, and then assign this form ID to the NetWare print file(s) you wish to send to the HP3000 as a binary image. The NLM will drop the form ID of BINARY, but will turn on the MODE=BINARY option for that queue file only.

Examples: FORM=MYFORM, F=UXFORM

MODE/MO=TEXT | BINARY

Sets the carriage control option that the new HP3000 spoolfile will have. TEXT indicates the file is converted to HP carriage control (default). BINARY indicates the new file will be a binary image of the queue file, which is desirable when spooling word-processing files.

MSG/M=*text | $PRINT*

Creates a message to be assigned to the new file.

If M=text is used, the text will be written to the network printer after environment file processing and before any user data. If M=$PRINT is used and the form contains a special forms message, the message is sent to the network printer (the operator is not prompted). If both M=text and M=$PRINT are specified, the text is printed first, followed by the forms message text from the spoolfile.

A common use of this feature is to allow fax phone numbers assigned to spoolfiles in the forms message to be sent to server print queues or disk files as the first record in the print file. This allows the print file to be sent to a network fax server for transmission.

Example: MSG=FORM1099

NODE/N=*nodename | ipaddress*

Specifies the node name or IP address of the target HP3000, LPD protocol system, or TCP/IP printer (node name assumes the node name and IP are set

up in the server's HOSTS file). This option is required.

Example: NODE=HP3000, N=192.6.1.4

OPT/O=*LPR option*

Specifies a single LPR print format option (LPD protocol). You may specify this option as many times as you wish. For a list of print formatting options, see *NETPRINT options* in chapter 3.

Example: O=BSDv;OPT=BSDh

PORT=*n*

Sets the TCP port number for communication with the host/printer. Defaults to 3000 for NetPrint's NLM service, 515 for LPD service, and 9100 for DUMP service.

Example: PORT=515

PRI/P=*n*

Specifies the output priority to be assigned to the new spoolfile on the HP3000. Defaults to 8 (Defaults to 1 for LPD).

Example: PRI=13, P=8

SERVICE/S=NP92 | LPD | DUMP

Specifies the service name (protocol) to be used. Use NetPrint's NLM to go to the HP3000, LPD for Unix or Windows NT systems, and DUMP for TCP/IP printers. Defaults to NetPrint's NLM if this option is not specified.

SPORT=*port*

Sets the source TCP/IP port number used by NPNLMOUT. This is useful when sending print files to UNIX systems that require the sending system to use a 'privileged' source port for security reasons. A privileged source port is typically any port number below 1024, but in some cases may have to be between 721 & 725. Normally, the source port in a TCP/IP conversation is not important and NPNLMOUT uses a randomly assigned port above 1024.

Example: SPORT=723

SPSAVE

Sets the SPSAVE flag on the new HP3000 spoolfile when queue files are sent to the HP3000.

EXAMPLE

Here is a sample NPNLMOUT.CFG file:

```
SET QUEUESCANDELAY=60;NOTIFY=SUPERVISOR
EXPORT QUEUE_A; NODE=MYHP;D=LP;P=13
EXPORT QUEUE_B;NODE=MYHP;D=LASERJET;P=13;MO=BINARY
EXPORT NETLJ_Q;NODE=192.161.25.2;S=DUMP;SPSAVE
EXPORT UXLP;NODE=UX;SERVICE=LPD;P=6;O=BSDo;BSDh
```

Note: There is no device specified in the NLM-to-Unix EXPORT statement, above. The destination will default to the printer attached to the specified queuename (UXLP).

NPNLMOUT OPTIONS

The outgoing NLM, NPNLMOUT, allows the following options, which you can specify as switches in the LOAD command or statement:

/ac

Causes the NLM screen to close automatically at shutdown instead of waiting for the console user to press a key. This is intended to facilitate the automated shutdown of these NLMs.

/be

Forces bindery emulation on 4/5.x servers.

/h

NLM displays this list of options and then stops.

/l

Logs all files sent in the file SYS:\NPNLMOUT.LOG.

/s

Runs in silent mode (does not log each file sent to the NLM's server console screen).

/t

Execution trace to file SYS:/SYSTEM/NPNLMOUT.TRA.

/tb

Includes tcp/ip data buffers in trace.

/tc

Execution trace to server console.

When NPNLMOUT runs, the server console screen appears as follows:

EDITING **AUTOEXEC.NCF**

You may use the AUTOEXEC.NCF file on the Novell server to load the NetPrint NLMs automatically every time the file server is restarted. You may edit this file via the SYSCON or INSTALL programs on the server.

In general, this file includes instructions for the following:

- ♦ Naming the file server.
- ♦ Identifying the IPX internal network.
- ♦ Loading the LAN driver for the Network Interface Card.
- ♦ Binding IPX protocol to the LAN driver.
- ♦ Establishing Ethernet II as the frame type. If you are using 802.3 frame type for IPX, your AUTOEXEC.BAT must load a second driver with frame type of Ethernet II.
- ♦ Loading the NetWare TCP/IP NLM.
- ♦ Binding the IP protocol to the LAN driver, assigning the IP address the server will use (must be unique on the network).

You may also include any other NLMs or services, such as the NetPrint NLMs, NPNLMIN and/or NPNLMOUT, including options as desired.

Here is a sample AUTOEXEC.NCF for a microchannel or EISA file server:

```
file server name MYSERVER
ipx internal net AD
load c:EXP16 slot=3 frame=ETHERNET_802.3
bind ipx to EPX16 net=1
load c:EXP16 slot=3 frame=ETHERNET_II name=ipnet
load tcpip
bind IP to IPNET addr=192.210.17.10
load monitor
load npnlmin
load npnlmout
```

5   IMPLEMENTING NETPRINT

Your implementation of NetPrint depends upon the origin and destination of your print files, as well as the configuration of your network in terms of the type of host computers, servers, and printers (refer to the figure in chapter 1 for all possible configurations).

This chapter outlines the procedures for implementing NetPrint at your site, according to your method of printing:

- General notes on printing from an HP3000
- HP3000 to TCP/IP-equipped network printer(s)
- HP3000 to LPD protocol system (such as Unix or Windows NT)
- HP3000 to Novell print queue via NLMs on a Novell server
- HP3000 to Novell print queue via NetWare/iX and Novell server
- LPD protocol system (such as Unix or Windows NT) to HP3000
- LPD protocol system (such as Unix or Windows NT) to Novell print queue via NLMs on a Novell server
- Novell print queue to HP3000 via NLMs
- Novell print queue to LPD protocol system (Unix or Windows NT)
- Novell print queue to TCP/IP-equipped network printer via NLMs

NOTES ON PRINTING FROM AN HP3000

- **MPE/iX 5.0:** Support for printing to NetWare servers via HP's NetWare/iX portable NetWare for the HP3000 is discontinued on MPE/iX 5.0. Any users who are currently using this feature should contact Minisoft tech support to discuss your options.

♦ **Channel skip:** NetPrint supports the 'channel skip' carriage control codes %300-%317. These codes are mapped to the channel skip escape sequence ESC&l*nn*V, where *nn* is the cctl code - %320 + 1. This escape sequence is recognized and executed by PCL printers but is not documented in the PCL standard and may not work in the future.

♦ **Printing a spoolfile:** When printing a spoolfile, the NetPrint printer driver can detect a change in the MPE output device of the spoolfile being printed. If the output device is changed externally—with the MPE SPOOLER or ALTSPOOLFILE commands, for instance—the driver detects this change, stops printing the file, and returns it to the spool queue to be rescanned or processed external to NetPrint (see the RELEASE command in the *Controlling individual network printers* section of chapter 6).

♦ **Printing a spoolfile:** When printing a spoolfile, the NetPrint printer driver can detect an external request to purge the spoolfile being printed. This means if you try to purge the spoolfile with the MPE SPOOLER or DELETESPOOLFILE commands, the NetPrint driver will detect this, stop printing the spoolfile, and then purge it.

♦ **Printing a spoolfile:** When printing a spoolfile, the NetPrint printer driver can detect a change in output priority of the file being printed and if the priority falls below the outfence assigned to the network printer, the driver will stop printing the spoolfile and return it to the spool queue for reprocessing (see the RELEASE command in the *Controlling individual network printers* section of chapter 6).

♦ **Electronic forms package:** NetPrint supports the FlexForm electronic forms package. Contact your Minisoft sales representative for more information.

FlexForm uses prepackaged form files and also has a PC-based forms design tool. NetPrint can automatically merge spoolfiles being network printed with FlexForm form files to produce formatted output.

If you are interested in using the FlexForm package with NetPrint, contact Minisoft technical support for details.

HP3000 TO TCP/IP-EQUIPPED PRINTERS
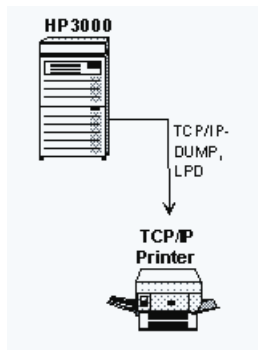
In order for NetPrint to access network printers, you must configure the printers, update the HP3000 network configuration to include the printers' node names, and modify the NetPrint configuration file:

1. On the network, assign node names and IP addresses to the network printers, and configure the printers' network interface cards according to the manufacturer's instructions. If the printer's IP address cannot be set at the printer control panel, and you have no software utility to do so, you must incorporate a BOOTP server on the network. NetPrint includes its own BOOTP utility, which is discussed below.

2. On the HP3000 host, modify the network configuration by running NMMGR. For instructions, see appendix A.

3. On the HP3000 host, edit the NetPrint configuration file, NP92CONF.PUB.MINISOFT. A sample NETPRINT statement appears below; for details on editing this file, see chapter 3.

PRINTING SPECIAL FORMS

NetPrint supports printing of special forms directly to TCP/IP-equipped network printers. If a spoolfile with a special forms message or forms ID is to be printed on a TCP/IP-equipped printer, the HP3000 console displays a prompt to mount

the special form on the printer. If you refuse the forms mount request, the spoolfile becomes deferred and will not be printed until it is un-deferred. If you accept the mount request, NetPrint prints the file, then prompts you to dismount the form before continuing to send more spoolfiles to the printer.

During the forms mount and dismount prompting, NetPrint does not own the printer. If other network entities connect to the printer during this time, they may print on the special form or interfere with the special form printing (see *Special forms* in chapter 7). For this reason, special forms printing is not recommended for network printers accessed by entities other than the HP3000 on the network.

The special forms prompt is visible with the MPE recall command.

SETTING UP THE **BOOTP** UTILITY

Some TCP/IP network printer interfaces do not support setting the printer's IP address at the printer control panel and provide no software utility to set the IP. These interface devices rely on the network Boot Protocol—or *BOOTP*. An example of such a network interface device is the HP JetDirect for the LaserJet Series II.

BOOTP is a protocol whereby the network interface device, at power-up, broadcasts a special request on the network that contains its hardware address. A BOOTP server listening on the network receives the request and searches a table for the hardware address. This table maps hardware addresses to IP addresses and other options. If a match is found, the BOOTP server sends a reply to the network interface which contains the IP address and other options. Once the reply is received, the network interface is ready to receive output.

The BOOTP server normally runs on a Unix system or PC, but NetPrint provides a BOOTP server for the HP3000. BOOTP for the HP3000 runs on MPE/iX 4.0 and later. Its files reside in PUB.MINISOFT, and consist of:

- ♦ a background job (BOOTPJOB)
- ♦ a program (BOOTPD)
- ♦ and a configuration file (BOOTPTAB). The configuration file contains the mapping of hardware to IP addresses and is self-documenting.

On MPE/iX systems *before* 5.0, the first line of BOOTPTAB must contain the HP3000's IP address. On 5.0 systems, BOOTP can determine the IP address of the HP3000 on its own.

If you wish to have your HP3000 act as a BOOTP server, do this:

1. Edit the configuration file BOOTPTAB.

2. Stream the job file BOOTPJOB.

3. Turn the power to the printer off and then on again.

To shut down BOOTPJOB, run the program STOP.PUB.MINISOFT. This sends a clean shutdown command to BOOTPD.

INACTIVITY TIMER

The BOOTP utility allows you to set the inactivity timer for JetDirect interface cards (keyword 'it' in the BOOTPTAB) and Unix systems (keyword 'T145' in BOOTPTAB). A setting of 0 disables the timer.

SETTING UP SYSLOG PROTOCOL SUPPORT

If you are using the HP JetDirect interface on your network printer(s), you can have the JetDirect card(s) log status messages on the HP3000 host via the SYSLOG protocol. HP JetDirect network printer interface devices support this protocol, which is a Unix-based protocol that allows a Unix system to function as a central logging facility for network devices. Under this configuration, JetDirect cards send status messages to a SYSLOG server on the network. These messages reflect such status as power on, paper out, etc. Ordinarily a Unix-based protocol, the SYSLOG utility supplied with NetPrint runs on the HP3000.

SYSLOG for the HP3000 runs on MPE/iX 4.0 and later. It resides in PUB.MINISOFT and consists of the job SYSLGJOB and the program SYSLOGD. The SYSLGJOB is self documenting. You may set SYSLOGD to send its messages to the system console, to the job $STDLIST, or to a specific user.

To implement SYSLOG on your HP3000, edit the SYSLGJOB file and then stream the job. To shut down SYSLGJOB, run STOP.PUB.MINISOFT. This sends a clean shutdown command to the SYSLOGD program.

SAMPLE **NETPRINT** STATEMENT FOR **TCP/IP** PRINTERS

When printing directly to network printers, you must include the PTYPE option (If you do not specify PTYPE, the default setting for HP JetDirect is used.).

Valid values for PTYPE when printing directly to network printers are as follows. For a description of these codes, see *NETPRINT options* in chapter 3:

```
EX GC    LPD    NP
FP JD    NJ     NQ
```

Here is a sample NETPRINT statement for printing directly to network printers:

```
NETPRINT D=NETLJ
   NODE NETLJ
    OPTIONS PTYPE=NP;PURGE;RESET
   NETLOG
END
```

THE **NOCONSOLE** OPTION

When printing to TCP/IP network interfaces in shared printer environments, it is not unusual to get a large amount of *network printer unavailable* errors. These errors are relayed to the system console by NetPrint and can become disruptive to console operations.

However, you can specify the NOCONSOLE statement after the INTERVAL statement in the NP92CONF configuration file to cause error messages from the printer driver processes to *not* be relayed to the system console. (The NOCONSOLE option is listed under *Global options* in chapter 3.)

All other error and notification messages will continue to be sent to the console.

HP3000 TO LPD PROTOCOL SYSTEM

Note: You may also send print files from the HP3000 to a Windows PC that is running an LPD server (such as RNSW), just as you would print to a Unix system.
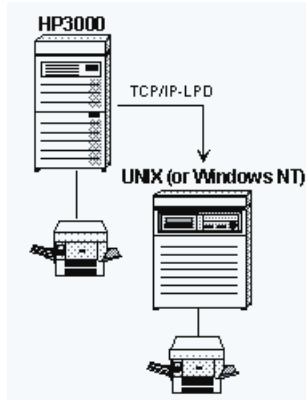
In order for NetPrint to spool from the HP3000 to a Unix or Windows NT system, it uses the Line Printer Daemon (LPD) remote printing protocol on the Unix or Windows NT system.

To configure NetPrint to transfer print files from the HP3000 to an LPD protocol system, you must update the HP3000's network directory to include the LPD protocol system's node name and IP address, and you must enable LPD on the Unix or Windows NT system:

1. On the HP3000 host, modify the network configuration by running NMMGR. For instructions, see appendix A.

2. On your Unix or Windows NT system, enable LPD. You may need to adjust the LPD configuration to allow incoming LPD connections from your HP3000. Depending on your LPD configuration, you may have to identify the HP3000 by node name or IP address as a host from which LPD will be accepted.

3. On the HP3000 host, edit the NetPrint configuration file, NP92CONF.PUB.MINISOFT. A sample NETPRINT statement appears below; for details on editing this file, see chapter 3.

LPD PROTOCOL LIMITATIONS

The LPD protocol has a number of limitations, which you should keep in mind when printing to a Unix or Windows NT system.

♦ On HP/UX machines only, a log file, /usr/spool/lp/lpd.log, is generated. This file contains a log of LPD transfers and errors that occur during transfers and can prove useful in solving LPD problems.

♦ LPD protocol systems have a maximum priority of 7. Any priority values above 7 are reduced to 7. You may override this limitation by specifying a *priority* option with the LP command (see *LPD protocol system to HP3000*, later in this chapter).

♦ The new print file on the LPD protocol system is named based on the device file ID number of the HP3000 source file. This means that the same file cannot be sent more than once, unless the new file on the target system is printed or deleted.

♦ The error-handling protocol under LPD is limited. An incorrect destination name causes a known error value to be returned to the HP3000 and a useful error message is displayed to the user. All other error conditions result in a generic error indication, or in the LPD protocol system dropping the connection. This can make troubleshooting LPD problems difficult.

♦ When printing to a Berkeley Software Division (BSD) Unix system, use the BSD option in the NETPRINT statement (see the list of options in the control language section of chapter 3).

SAMPLE **NETPRINT** STATEMENT FOR **LPD** PROTOCOL SYSTEMS

The NETPRINT statement you use for sending spoolfiles to an LPD protocol system varies slightly according to the specific type LPD system at the destination:

♦ Unix
♦ LPD server software on a PC running Windows
♦ Windows NT

SAMPLE **NETPRINT** STATEMENT FOR **UNIX**

When printing to Unix systems, specify the ;NODE=*name* option with the Unix system's node name and the ;PTYPE=UNIX option. By default, the output device name is used as the destination name on the Unix system. If the output device is numeric, a destination of lp is used. You may define a specific destination name with the QUEUE queue*name* statement.

Here is a sample NETPRINT statement for printing to Unix systems. The format of the printed file will be postscript, with no bannering:

```
NETPRINT  D=UXLP
   NODE S827
   QUEUE="lpt1"
    OPTIONS PTYPE=UNIX;PURGE;NETOPT="BSDo BSDh"
   END
```

NETPRINT STATEMENT FOR AN **LPD** SERVER

To configure NetPrint for printing to an LPD server, such as RNSW, specify the queue name defined in RNSW's LPD setup on the QUEUE statement in NP92CONF (or use the ;DEST="name" option). Use ;PTYPE=LPD and ;NETOPT= "BSDv" to set the correct print formatting option to be used by the PC (see chapter 3).

NETPRINT STATEMENT FOR WINDOWS NT

To configure NetPrint for printing to a Windows NT server, specify the node name of the NT server. We recommend the following option statements (see chapter 3): ;PTYPE=LPD ;BSD ;DEST="*printer class*" ;NETOPT="BSD1" ;PURGE and ;RESET.

HP3000 TO NOVELL PRINT QUEUE VIA NLM
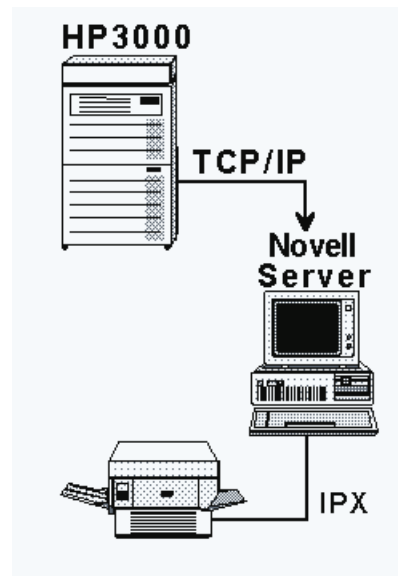
NetPrint's NLM is a software print gateway that runs on the Novell server. It allows the HP3000 to spool directly to print queues on Novell servers. No gateway PC or other hardware is needed.

The NetPrint NLM comes on the tape that is installed on the HP3000.

The NLM communicates directly with NetPrint on the HP3000, moving spoolfiles from the HP3000 to print queue files on the file server. From there, normal Novell

print services print the files on network printers. The NLM sets Novell print file characteristics such as copies, banners, and forms from the equivalent HP3000 spoolfile attributes. The NLM can receive print simultaneously from multiple NetPrint processes on multiple HP3000s.

To set up the HP3000/Novell interface, you must update the HP3000's network configuration to include the Novell server's node name, and then install the NLM:

1. On the HP3000 host, modify the network configuration by running NMMGR. For instructions, see appendix A.

2. Using your terminal emulator from a client PC, download the file NPNLMIN.PUB.MINISOFT to SYS:\SYSTEM\NPNLMIN.NLM on the server. Download the file as a binary file.

3. Make sure that the Novell NLM that supports TCP/IP (TCPIP.NLM) is loaded on the server. See the Novell *TCP/IP Transport Supervisor's Guide* for instructions on loading TCPIP.NLM.

4. From the server's console, type LOAD NPNLMIN to execute the NetPrint NLM. Append any options you wish to include when you type the command. (The NetPrint NLM server program has several options that you can enable with switches when you execute the LOAD command at the server console. These options are listed in the section, *NPNLMIN options* in chapter 4.)

    Note: To receive print from a Unix or Windows NT system to the NLM, you *must* load NPNLMIN with the /lpd switch (in the *NPNLMIN options* section of chapter 4).

5. Edit the NetPrint configuration file, NP92CONF.PUB. MINISOFT. A sample NETPRINT statement appears below; for details on editing this file, see chapter 3.

SAMPLE **NETPRINT** STATEMENT FOR **NLM**

When using the NetPrint NLM to print to a Novell print queue, use ;NODE=*name* to specify the node name assigned to the server. Use the ;PTYPE=NLM option to

indicate that you are printing to the NLM, and use the ;QUEUE=*name* option to specify the target print queue name on the server.

You may also use the ;NETOPT="*option,option*" option to send special commands to the NetWare server. Here is a list of valid options. For a description of these options, see the *NETOPT options* section of chapter 3:

BANNER=YES
FORM=*formid*
FORM=*n*
FORM=NONE
OPERHOLD/OH
PSERVER/PS=*name*
USERHOLD/UH

Here is a sample NETPRINT statement for printing to Novell servers via the NLM:

```
NETPRINT D=NQ1
   NODE NSERVER1
   QUEUE NQ1
    OPTIONS PTYPE=NLM;PURGE;NETOPT="BANNER=YES"
   BANNER NWBAN1
END
```

HP3000 TO NOVELL PRINT QUEUE VIA NETWARE/iX
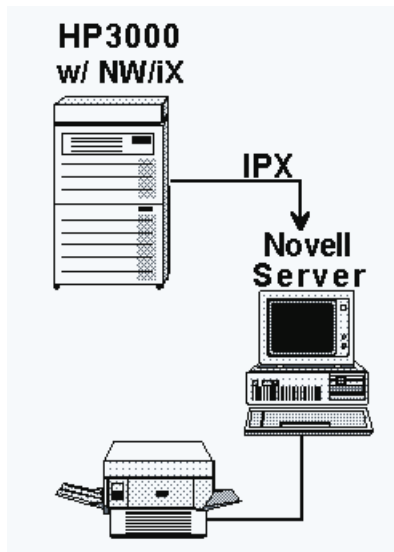
Note: Support for printing to NetWare servers via HP's NetWare/iX portable NetWare for the HP3000 is discontinued on MPE/iX 5.0. Any users who are currently using this feature should contact Minisoft tech support to discuss your options.

NetPrint accesses the HP3000's NetWare/iX transport to send spoolfiles to print queues on any Novell server (including the HP3000 running NetWare/iX). Novell's printing services then print these files on network printers.

Configure your network to interact with NetPrint over NetWare/iX as follows:

1. Add the user NP92 to each Novell server to which you plan to send spoolfiles. The NP92 user must have the non-expiring password MS83C.

2. Add the user from step 1 as a queue user to any print queues you plan to access. If you have a user group associated with your print queues (such as EVERYONE), attach the NP92 user to that group.

   Note: At this point, you may wish to set up a dummy device class to map

spoolfile output devices to the Novell server and queue names in the NetPrint configuration file. For instructions, see the section, *Step Three: Set up dummy devices* in appendix A.

3. On the HP3000 host, edit the NetPrint configuration file, NP92CONF.PUB.MINISOFT. A sample NETPRINT statement appears below; for details on editing this file, see chapter 3.

SAMPLE **NETPRINT** STATEMENT FOR **NETWARE/iX**

When using NetWare/iX to send spoolfiles to a Novell print queue, do not specify the ;NODE= option in the NETPRINT statement. Instead, specify ;PTYPE=NWIX and QUEUE=*server/queue*. The server is the name of the NetWare server and the queue is the target print queue on the specified server.

Here is a sample NETPRINT statement for printing to a Novell print queue via NetWare/iX:

```
NETPRINT U=@.payables
   QUEUE PAYSERVER/LJQ1
    OPTIONS PURGE;PTYPE=NWIX;E=LJ132.HPENV.SYS
END
```

LPD PROTOCOL SYSTEM TO HP3000

Note: When NetPrint is enabled to receive LPD print files (NETRECEIVE LPD), it can receive print files from Windows PCs running an LPD server (such as RNSW).
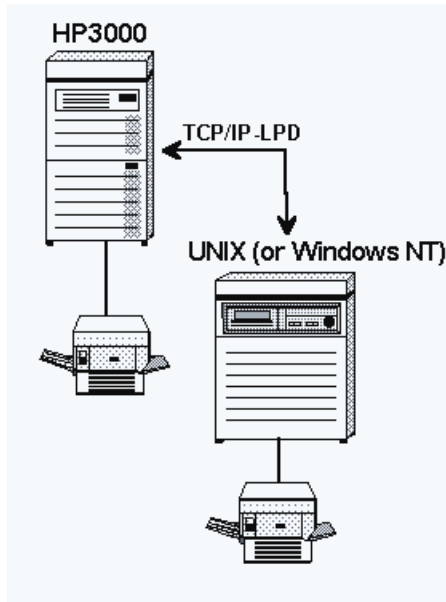
NetPrint allows the HP3000 to act as an LPD server, receiving print files from a Unix or Windows NT system.

To configure NetPrint to transfer print files from an LPD protocol system to the HP3000, you must update the HP3000's network directory to include the Unix or Windows NT system's node name and IP address, and you must enable LPD on the Unix or Windows NT system:

1. On the HP3000 host, modify the network configuration by running NMMGR. For instructions, see appendix A.

2. On your Unix or Windows NT system, enable LPD.

3. On the HP3000 host, edit the NetPrint configuration file,
    NP92CONF.PUB.MINISOFT. A sample NETRECEIVE statement appears
    below; for details on editing this file, see chapter 3.

USING THE LP COMMAND TO PRINT FROM AN LPD SYSTEM

When you print from a Unix or Windows NT system to the HP3000, you can use
the LP command to set options on the LPD protocol system's print file that
override some of the limitations of the LPD protocol.

♦   By using the -o p=*n* option, you can specify a priority outside the LPD
    range of 0-7.
♦   By using the -o c=*n* option, you may send a copy count, which LPD may
    not support (defaults to 1).

These options supply values for *priority* and *copies* on the MPE spoolfile that is
created when the file is sent to the HP3000.

Here is an example of an LP command, which prints the Unix file *myfile* to device
HP3KLP (HP3000), with a priority of 9 and copy count of 4:

lp -d HP3KLP -o p=9 -o c=4 myfile

RECEIVING LPD PROTOCOL PRINT FILES ON HP3000

Using the LPD protocol to receive print files, NetPrint can accept incoming
connections from Unix or other LPD capable systems. For files received via LPD,
the LPD header sets spoolfile attributes such as job name, owner, priority, copies,
file name, and output device. When such information is not available, the at-
tributes are defaulted to those of the NetPrint job.

The incoming LPD service is implemented via the NETRECEIVE statement in the
NetPrint configuration file (see chapter 3).

LPD FILE LIMITS

NPNLMIN can handle an LPD control file of up to 2048 bytes in length. Jobs with a control file longer than 2048 bytes will be rejected. You may send multiple data files in an LPD print job to NPNLMIN as long as the control file does not exceed 2048 bytes.

It is hard to predict how many files will fit in this limit as the amount of data in the control file varies not just by number of data files but by several other factors as well. Where possible, limit the number of data files in an LPD print job to 10.

SAMPLE **NETRECEIVE** STATEMENT FROM **LPD** SYSTEM

Here is a sample NETRECEIVE statement, which you might include in NP92CONF if you wanted to print from Unix systems on printers attached to the HP3000:

```
NETRECEIVE LPD
   OPTIONS LOG;NOCCTL
   NETLOG
END
```

LPD SYSTEM TO NOVELL PRINT QUEUE VIA NLM
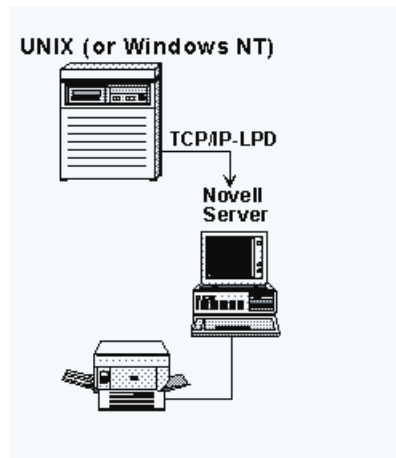
NetPrint's NLM is a software print gateway that runs on the Novell server. It allows the Unix or Windows NT system to spool directly to print queues on Novell servers. No gateway PC or other hardware is needed.

The NLM receives print files from a Unix or Windows NT system via the LPD protocol. With the Novell print queue configured on the LPD protocol system as a remote printer, the Unix or Windows NT system uses LPD to send files to the server as if the server were a remote LPD protocol host. The NLM transfers the attributes of the LPD protocol print file to the new NetWare queue file.

To set up the LPD/Novell interface, you must create a remote print destination on the Unix or Windows NT system, and then install the NLM:

1. On the Unix or Windows NT system, configure the target NetWare print queue as if it were a remote LPD protocol printer. The name of the remote system should be the name or IP address of the NetWare server. The name of the remote printer must match the NetWare queue name to which you plan to send print files.

2. Using your terminal emulator from a client PC, download the file
   NPNLMIN.PUB.MINISOFT to SYS:\SYSTEM\NPNLMIN.NLM on the
   server. Download the file as a binary file.

3. On the Novell server, add the node names and IP addresses of the host
   system(s) that will be communicating with the NetPrint NLM to the file
   SYS:\ETC\HOSTS.

4. Make sure that the Novell NLM that supports TCP/IP (TCPIP.NLM) is
   loaded on the server. See the Novell TCP/IP Transport Supervisor's Guide for
   instructions on loading TCPIP.NLM.

5. From the server's console, type LOAD NPNLMIN to execute the NetPrint
   NLM. Append any options you wish to include when you type the command.
   (The NetPrint NLM server program has several options that you can enable
   with switches when you execute the LOAD command at the server console.
   These options are listed in the section *NPNLMIN options* in chapter 4.)

   Note: To receive print from a Unix or Windows NT system to the NLM, you
   must load NPNLMIN with the /lpd switch (discussed in the section
   NPNLMIN options in chapter 4).

PRINTING FROM AN LPD PROTOCOL SYSTEM VIA NLM

When printing from an LPD system to the Novell print queue via the NetPrint
NLM, there are several options for printing, which you may control at the sending
or receiving end of the process. Options you control at the sending end are speci-
fied at the print queue on the LPD system. Options you control at the receiving
end are specified with switches when NPNLMIN.NLM is loaded on the server.

A discussion of options available with the LP command on the LPD system begins
below. Options available when loading NPNLMIN.NLM are discussed in the
section *NPNLMIN options* in chapter 4.

The following printing options can be controlled from either the sending or
receiving end of the process:

   ♦   Banner

- ♦ Reset
- ♦ Mode (text or binary)

Banner: You may turn on NetWare bannering for the LPD file by specifying the -o banner option with the LP command on the Unix or Windows NT system or by the /lb switch when loading NPNLMIN.NLM on the server.

Reset: You may send an escape sequence to reset the printer (esc E) after each LPD file by specifying the -o reset option with the LP command on the Unix or Windows NT system or by the /lr switch when loading NPNLMIN.NLM on the server.

Mode: The NLM receives LPD files in either text or binary mode. The default mode is text. In text mode, the NLM converts the normal LPD file format into a format compatible with NetWare printers. It does this by transforming single occurrences of carriage returns and single occurrences of line feeds into pairs of carriage return and line feed, and by adding a form feed to the end of the file. If the file coming from the LPD system is already correctly formatted or you do not wish the NLM to modify the file contents, use binary mode.

You may specify binary mode by appending the suffix _bin to the LPD system's print queue name (the remote printer name that is sent to the NLM). By adding the _bin suffix to the Unix or Windows NT print queue name, the NLM will strip off the _bin suffix and treat the file as binary. The NLM will treat LPD files from an LPD system's print queue without the _bin suffix as text.

A benefit to setting up the MODE option in this way is that you can set up two printer names on the LPD system for the same NetWare print queue, one with the _bin suffix and one without. In this way, you can send LPD files to the same NetWare print queue in either text or binary mode.

You may also specify binary mode by loading NPNLMIN.NLM on the server with the /lbin switch. Doing so, however, causes the NLM to treat all incoming LPD files as binary. Unless you want the NLM to treat all LPD files as binary, use the _bin suffix method.

SPECIFYING OPTIONS WITH LP COMMAND

You can set certain NetWare queue file attributes by adding options to your Unix or Windows NT print file when you submit it to the spooler. Options specified on the -o switch of the LP command are sent to the NLM. The following options are supported:

BANNER
    Turns on the NetWare banner for the queue file.

USERHOLD
    Turns on the user hold flag for the queue file.

OPERHOLD
    Turns on the operator hold flag for the queue file.

RESET
    Adds a reset sequence to the end of the queue file.

FORM=*name*
    Sets the form name of the queue file.

FORM=*n*
    Sets the form number of the queue file.

PSERVER=*name*
    Sets the print server name of the queue file.

COPIES=*n*
    Sets the copy count of the queue file.

An example of submitting a file to the Unix spooler with options is:

lp -d nwprtq -o banner -o form=3 myunixfile

NOVELL PRINT QUEUE TO HP3000 PRINTERS
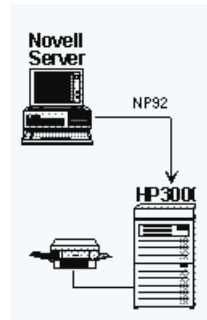
NetPrint includes a NetWare Loadable Module, NPNLMOUT, that allows work-stations on the network to print to printers attached to an HP3000. Rather than receiving print files to the Novell print queue, this NLM exports files from the NetWare print queue to remote destinations on the network.

This NLM comes on the tape that is installed on the HP3000, and communicates directly with NetPrint on the HP3000.

To set up the HP3000/Novell interface, you must update the HP3000's network configuration to include the Novell server's node name, and then install the NLM:

1. Using your terminal emulator from a client PC, download the file NPNLMOUT.PUB.MINISOFT to SYS:\SYSTEM\NPNLMOUT.NLM on the server. Download the file as a binary file.

2. Make sure that the Novell NLM that supports TCP/IP (TCPIP.NLM) is loaded on the server. See the Novell *TCP/IP Transport Supervisor's Guide* for instructions on loading TCPIP.NLM.

3. On the Novell server, add the node names and IP addresses of the host system(s) that will be communicating with the NetPrint NLM to the file SYS:\ETC\HOSTS.

4. On the Novell server, create the configuration file, SYS:\SYSTEM\ NPNLMOUT.CFG for the NPNLMOUT NLM. For instructions on creating this file, see *NPNLMOUT configuration* in chapter 4.

5. From the server's console, type LOAD NPNLMOUT to execute the NLM. Append any options you wish to include when you type the command. (The outgoing NLM server program has several options that you can enable with switches when you execute the LOAD command at the server console. These options are listed in the section *NPNLMOUT options* in chapter 4.)

6. To receive spoolfiles from the server, include the statement NETRECEIVE NLM in the NetPrint configuration file. A sample NETRECEIVE statement appears below; for details on editing this file, see chapter 3.

NPNLMOUT DEFAULTS

By default, carriage control of print files sent from the server is converted to HP standard carriage control. This enables the files to be printed on system printers that are not PCL-compatible, such as 2608s, 2563s, and 2680s. This default mode is text mode.

The NLM may also send print files in binary mode. In binary mode, no conversion of carriage control is performed, resulting in an HP3000 spoolfile that is an exact image of the server print file. The attributes of the new spoolfile on the HP3000 (such as user name, job name, copies) are set from the NetWare attributes of the queue file.

SAMPLE NETRECEIVE STATEMENT FOR NLM

When using the NPNLMOUT NLM to print from the Novell print queue, you must include the statement NETRECEIVE NLM in the NetPrint configuration file. Specifying NLM as the selection criteria causes NetPrint to go into receive mode, listening on network port 3000 for connections from NPNLMOUT programs on your NetWare server(s).

When a connection is received, NetPrint creates a new process to handle the new connection. This new 'son' process engages in an exchange with NPNLMOUT on the file server, while the main process goes back to waiting for connections. The son process transfers the print file to the HP3000 spool queue. If the transfer is successful, the queue file on the server is purged.

The HP3000 processes the incoming print file, converting carriage controls to HP format unless the EXPORT statement in the NPNLMOUT.CFG file includes the ;MODE=BINARY option, or the NETRECEIVE command specifies ;NOCCTL.

Here is a sample NETRECEIVE statement for printing from a Novell print queue via the NLM:

```
NETRECEIVE NLM
   OPTIONS LOG
   NETLOG
END
```

NOVELL PRINT QUEUE TO LPD SYSTEM
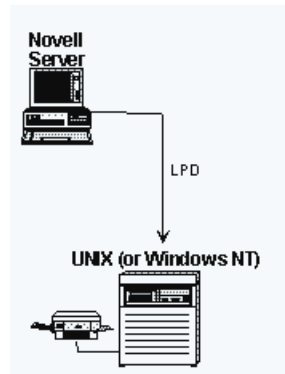
NetPrint includes a NetWare Loadable Module, NPNLMOUT, that allows work-stations on the network to print to printers attached to a Unix or Windows NT system. This NLM exports files from the NetWare print queue to remote destinations on the network.

The NLM sends files from a NetWare print queue to a Unix or Windows NT system via the LPD printing protocol. An LPD server must be running on the target LPD protocol system.

To set up the LPD/Novell interface, you must identify the LPD protocol system on the Novell server, and then install the NLM:

1. Using your terminal emulator from a client PC, download the file NPNLMOUT.PUB.MINISOFT to SYS:\SYSTEM\NPNLMOUT.NLM on the server. Download the file as a binary file.

2. Make sure that the Novell NLM that supports TCP/IP (TCPIP.NLM) is loaded on the server. See the Novell *TCP/IP Transport Supervisor's Guide* for instructions on loading TCPIP.NLM.

3. On the Novell server, create the configuration file, SYS:\SYSTEM\NPNLMOUT.CFG for the NPNLMOUT NLM. For instructions on creating this file, see *NPNLMOUT configuration* in chapter 4.

4. From the server's console, type LOAD NPNLMOUT to execute the NLM. Append any options you wish to include when you type the command. (The outgoing NLM server program has several options that you can enable with switches when you execute the LOAD command at the server console. These options are listed in the section *NPNLMOUT options* in chapter 4.)

SOURCE PORT

Some UNIX systems—RS/6000 in particular—require that the sending system (the HP3000) use a source TCP port number less than 1025. The HP3000's automatic TCP port assignment (used by NetPrint) assigns port numbers greater than 32000. This would cause the RS/6000 to reject LPD transmissions from NetPrint with the *target device rejected by remote host* error message.

You can explicitly assign the TCP source port with the SPORT=*number* option on the options line in the NP92CONF configuration file. You must select and assign the port number, using a different port number for each target system that requires

the low port numbers. This port number issue is a security feature of the LPD protocol that is not implemented on many UNIX systems, but is on some.

If you have questions or get target device rejection on non-HPUX UNIX systems, call Minisoft tech support for assistance in using SPORT= to correct the problem.

NOVELL PRINT QUEUE TO TCP/IP-EQUIPPED NETWORK PRINTERS
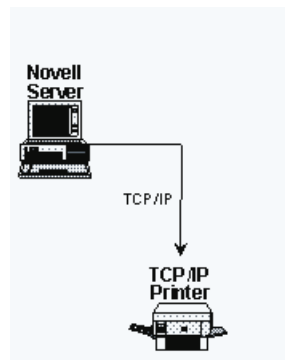
NetPrint includes a NetWare Loadable Module, NPNLMOUT, that allows work-stations on the network to print to network printers equipped with their own TCP/IP interface (such as HP's JetDirect). Rather than receiving print files to the Novell print queue, this NLM exports files from the NetWare print queue to remote destinations on the network.

The NLM sends files using the connect-and-dump or LPD protocol.

To set up the LPD/Novell interface, you must identify the TCP/IP printer on the Novell server, and then install the NLM:

1. Using your terminal emulator from a client PC, download the file NPNLMOUT.PUB.MINISOFT to SYS:\SYSTEM\NPNLMOUT.NLM on the server. Download the file as a binary file.

2. Make sure that the Novell NLM that supports TCP/IP (TCPIP.NLM) is loaded on the server. See the Novell *TCP/IP Transport Supervisor's Guide* for instructions on loading TCPIP.NLM.

3. On the Novell server, create the configuration file, SYS:\SYSTEM\NPNLMOUT.CFG for the NPNLMOUT NLM. For instructions on creating this file, see *NPLNMOUT configuration* in chapter 4.

From the server's console, type LOAD NPNLMOUT to execute the NLM. Append any options you wish to include when you type the command. (The outgoing NLM server program has several options that you can enable with switches when you execute the LOAD command at the server console. These options are listed in the section *NPNLMOUT options* in chapter 4.)

6 OPERATION

NetPrint operates as a job in the background on the HP3000 host. Its Print Manager program processes the configuration file, scans the HP3000 spooler, and uses its own printer driver to send spoolfiles to network printers.

You can control how NetPrint handles the HP3000 spoolfiles by editing the NetPrint configuration file, NP92CONF.PUB.MINISOFT. The configuration file contains control language statements, which you may edit with any text editor. For information on the configuration file and control language statements, see chapter 3.

When NetPrint scans the spool queue, it takes a snapshot of the queue and makes a list of all spoolfiles it has not processed during its current execution. NetPrint then processes each spoolfile according to the NETPRINT statements in the configuration file.

When a spoolfile's processing is complete, NetPrint continues with the next spoolfile on its list or makes a new list (scan) of the spool queue. Making a new list is the default, but you can make NetPrint process the complete current list before scanning the spool queue again by including in the configuration file the Global Option statement RESCAN=FINISH.

After a spoolfile is processed, NetPrint records it in an internal list and will not process it again during the current NetPrint job. If NetPrint finds no spoolfiles to process on a scan of the spool queue, it pauses the amount of time specified in the configuration file's INTERVAL option statement before performing another scan of the spool queue.

Configuration of NetPrint is discussed in chapter 3. This chapter explains how to run the NetPrint job and provides a file reference listing of the files that comprise NetPrint.

THE NETPRINT JOB

When you have NetPrint configured the way you want it, you are ready to start the NetPrint job, which runs in the background until you stop or suspend it. The NetPrint job is stored as NP92JOB.PUB.MINISOFT. While it is running, the NetPrint job generates a log report, NP92LOG, in the HP3000 spooler. This file reports any messages generated by the job.

Control the job with the command NP92CNTL, in the following syntax:

NP92CNTL *action*

where *action* is one of the following:

RESUME
> Awakens NP92JOB from a suspended state. Use it after issuing the NP92CNTL SUSPEND command (see below).

START
> Starts NP92JOB.
>
> (To start, you can also use the NP92STRT command, discussed later in this chapter under *Command files*.)

STOP
> Terminates NP92JOB. Since NetPrint may still have spoolfiles queued up to print, it may take several minutes for printing to cease. NetPrint finishes any current printing activity and then shuts down until you issue the NP92CNTL START command again.
>
> One reason for stopping NP92JOB would be to re-configure the NetPrint

configuration file. In order for your new configuration to take effect, you must stop NP92JOB, edit NP92CONF, and then start NP92JOB again.

(To stop, you can also use the NP92STOP command, discussed later in this chapter under *Command files*.)

SUSPEND

Suspends NP92JOB, preventing NetPrint from making a new scan of the spoolfile queue. However, NetPrint will finish printing all current spoolfiles and then stop until you issue the NP92CNTL RESUME command (see above).

One reason for suspending NP92JOB would be to work directly with spoolfiles without NetPrint scanning the queue.

UNLOCK

Sets PRT-state (print) files to RDY state (ready).

This command is used to recover spoolfiles left in the PRT state if NetPrint terminates unexpectedly.

USING SEPARATE COMMANDS

Previous versions of NetPrint utilized separate commands for each of the NP92CNTL actions discussed above. For backward compatibility, these commands are still valid, but they will be phased out in future releases. The separate commands correspond to NP92CNTL actions as follows:

To execute this command file:	Use this NP92CNTL action:
NP92RESU.PUB.MINISOFT	RESUME
NP92STRT.PUB.MINISOFT	START
NP92STOP.PUB.MINISOFT	STOP
NP92SUSP.PUB.MINISOFT	SUSPEND

CONTROLLING INDIVIDUAL NETWORK PRINTERS

You can control individual network printers from an on-line session by running the command file NP92CNTL.PUB.MINISOFT. The syntax for running this command is as follows:

NP92CNTL printername,action

where *printername* corresponds to the printer's NODE value in the NETPRINT statement of the NP92CONF configuration file, and where *action* is any one of the following:

ALARMOFF

Ignores the current alarm on the printer, which ordinarily sends a warning to the console every 60 seconds until the error is cleared. Any *new* warnings will be displayed after the current alarm condition is resolved.

CLOSEQ

Suspends the addition of new spoolfiles to the network printer driver's input queue.

DELETE

Stop printing and purge the file currently being printed.

OPENQ

Resumes queuing of the spoolfiles to the network printer driver's input queue.

OUTFENCE [,*n*]

Displays (no parameter) or sets (where *n* is a value from 0 to 14) the outfence for a network printer driver process. This outfence value is not related to the MPE system outfence, and defaults to zero.

Example: NP92CNTL LJ2,OUTFENCE,2 sets the NP92 outfence to 2 for the network printer LJ2.

PAUSE

Pauses printing of current file. Driver process retains ownership of network

printer (JetDirect printers will release the printer after a 90-second time out, unless their activity timer of 90 seconds is changed).

Note: To use the *startpage* parameter on an LPD printer, you must SUS-PEND, not PAUSE the printer.

PSTATUS

Displays printer state (PAUSE, SUSPEND, or BUSY). This command does *not* require the *printername* parameter. Printer driver processes that have not been started (no spoolfile sent), that are idle, or that are in the connection phase do not respond to this request.

PSTATUS also reports the percentage completed for jobs in progress. The percentage is computed from total lines in the spoolfile and lines sent to the printer.

RELEASE [*newdevice*]

The RELEASE command causes the NetPrint printer driver to release the currently printing spoolfile back to the spool queue to be rescanned or pro-cessed outside of NetPrint. You can optionally assign a new print device.

RESUME [, [+/-] *startpage*] [,*pagelen*]

Resumes printing of a PAUSEd or SUSPENDed print file, where *startpage* is the page number at which to restart printing and + or - indicates a page offset from the page at which printing was stopped. Use *pagelen* to specify the number of lines that defines a page, or the number of lines between page breaks (defaults to 66). This helps you when using the +/- parameter to back up or skip ahead pages when resuming the job.

Example: NP92CNTL LJ2,RESUME,-1 resumes the job on printer LJ2 one page prior to the page at which the job was PAUSEd or SUSPENDed.

Example: NP92CNTL LJ2,RESUME resumes the job on printer LJ2 at the point at which the job was PAUSEd or SUSPENDed.

SKIP

Stop printing the file currently being printed and skip over it. File is not purged even if the ;PURGE option appears in the NETPRINT statement. File is ignored for the duration of the NP92JOB in which it is skipped.

SUSPEND

Suspends printing of current file. Driver process releases network printer.

USING **SUSPEND** VS. **PAUSE**

There is an important difference between the PAUSE and SUSPEND commands. PAUSE stops printing to a network printer, but keeps the connection to the printer active, retaining ownership of the printer. SUSPEND, however, releases the connection to the printer, making the printer available to other users.

Issuing the RESUME command to a PAUSEd printer resumes the job at the point at which it was paused, unless a different starting point is specified with the *startpage* parameter. Issuing the RESUME command to a SUSPENDed printer causes printing to start over from the beginning of the file.

Different printing protocols handle SUSPEND and PAUSE differently, too.

- ♦ JetDirect: Network printers with a JetDirect network interface have an inactivity timer defaulted to 90 seconds. If you PAUSE the printer longer than this timer, you will lose the connection. You may wish to set the printer's timer to a longer interval or disable the printer's inactivity timer altogether.
- ♦ LPD: For network printers that use the LPD protocol, you cannot use the *startpage* parameter with the RESUME command if the printer is in a PAUSE state. The printer resumes printing where it was paused. If you wish to resume printing on the page of your choice, you must SUSPEND rather than PAUSE the printer.

TIMING CONSIDERATIONS WHEN USING **NP92CNTL**

Several seconds may elapse from the time you issue the NP92CNTL command until the printer receives the command. This is because, when you issue NP92CNTL, a message is sent to the NP92MGR process, where it is dispatched to the appropriate NetPrint print driver process for action. When the driver process receives the command, it sends a message to your session acknowledging receipt of the command.

Even after the printer receives the NP92CNTL command, the printer continues to print for some time due to the buffering in the network, the network interface card, and the memory in the printer. The speed at which your printer responds depends on the size of the buffers involved. Large buffers take longer to clear.

SENDING A FAX

You can use the M=*text* statement (discussed under *Export statement* in chapter 4) to direct fax numbers that have been assigned to spoolfiles in a forms message. The fax numbers can be sent to server print queues or to disk files as the first record in the print file. In this way the print file can be sent to a network fax server for transmission.

NetPrint has been tested with Castelle's FaxWare product for NetWare servers. FaxWare will monitor a print queue on the server and fax print files submitted to the queue. FaxWare server-based phone books can be used with NetPrint.

FILE REFERENCE

The following files are included on the NetPrint installation tape, and should be restored to PUB.MINISOFT on the HP3000 host:

GENERAL FILES

Six of the following files are the main engine of NetPrint; the seventh file is a text file:

NP92CONF
> This is the NetPrint configuration file. Use a text editor to customize it for your site, including specifying node names for your network printers.

NP92DRV

This is a printer driver program that scans the HP3000 spool queue and prints spoolfiles to network printers.

NP92JOB

This is a job file that runs NetPrint. You may run one of the command files to control it. Command files are listed in the *Command Files* section, following.

NP92MGR

This is NetPrint's print manager program. Executed by NP92JOB (see above), NP92MGR processes the configuration file (NP92CONF: see above), scans the HP3000 spooler and creates the driver NP92DRV (see above). This driver spawns processes for each node that is to receive spoolfiles.

NP92NL

This file is a native mode library, required for the printer driver.

NP92NWI

This is NetPrint's interface program for printing via NetWare/iX.

NPREADME

This is a text file containing the revision history of NetPrint.

NLM FILES

AFTER311

NLM library file that may be missing on some 3.*x* Novell servers. Download the file in binary mode to the SYSTEM directory as AFTER311.NLM if this library is missing from your server.

NPNLMIN

This is a NetPrint NetWare Loadable Module which resides on the Novell server, where it receives print files from the HP3000 or LPD protocol system.

NPNLMOUT

This is a NetPrint NetWare Loadable Module which resides on the Novell server, where it sends print files from the NetWare print queue to HP3000s,

LPD protocol systems, or TCP/IP printers with the connect-and-dump (such as the HP JetDirect) or LPD protocol.

COMMAND FILES

The following files control NP92JOB, allowing you to start, stop, suspend, and resume the job:

NP92CNTL

This is a command file that allows you to control the NP92JOB for individual network printers dynamically. See *Controlling Individual Network Printers*, earlier in this chapter.

NP92RESU

In earlier versions of NetPrint, this was the command file to resume processing by NP92JOB. The preferred method is to use NP92CNTL RESUME.

NP92STOP

In earlier versions of NetPrint, this was the command file to stop NP92JOB. The preferred method is to use NP92CNTL STOP.

NP92STRT

In earlier versions of NetPrint, this was the command file to start NP92JOB. The preferred method is to use NP92CNTL START.

NP92SUSP

In earlier versions of NetPrint, this was the command file to suspend the processing of new files from the spool queue by NP92JOB. The preferred method is to use NP92CNTL SUSPEND.

ENVIRONMENT FILES

NetPrint includes environment files that are both compatible and not compatible with MPE serial printers. Use of environment files is discussed in detail in *Appendix B: Environment Files*.

ENVINFO

Text file that lists the environment files included with NetPrint, and their compatibility.

LAND2UP

Prints in landscape orientation, 2-up format. Not compatible with MPE serial printers.

LAND4UP

Prints in landscape orientation, 4-up format. Not compatible with MPE serial printers.

LJ132

Laser environment file that can be modified via the TTUTIL program on the HP3000. Prints in landscape orientation, 132-column mode, simplex.

LJ132D

Laser environment file that can be modified via the TTUTIL program on the HP3000. Prints in landscape orientation, 132-column mode, duplex.

LJ132DGB

Prints in landscape orientation, 132-column mode, with 'green bar' shading, in duplex. Not compatible with MPE serial printers.

LJ132GB

Prints in landscape orientation, 132-column mode, with 'green bar' shading. Not compatible with MPE serial printers.

LJ170

Laser environment file that can be modified via the TTUTIL program on the HP3000. Prints in landscape orientation, 170-column mode, simplex.

LJ80

Laser environment file that can be modified via the TTUTIL program on the HP3000. Prints in portrait orientation, 80-column mode, simplex.

LJ80D

Laser environment file that can be modified via the TTUTIL program on the HP3000. Prints in portrait orientation, 80-column mode, duplex.

PORT2UP

Prints portrait orientation, 2-up format. Not compatible with MPE serial printers.

PORT4UP

Prints portrait orientation, 4-up format. Not compatible with MPE serial printers.

VFC132

VFC (vertical format control) file associated with LJ132, above.

VFC132D

VFC file associated with LJ132D, above.

VFC170

VFC file associated with LJ170, above.

VFC80

VFC file associated with LJ80, above.

VFC80D

VFC file associated with LJ80D, above.

CATALOG FILES

The following files contain messages used by the NetPrint print manager, print driver, and job file:

NP92COMM

Message file used to send commands to NP92JOB.

NP92DCAT

Message catalog for printer driver.

NP92MCAT

Message catalog for print manager.

INSTALLATION PROGRAM

The following file is used to install NetPrint:

INSTOS

This is Hewlett Packard's installation program for architected interfaces. You must copy it to PUB.SYS before using it to install NetPrint.

PROTOCOL SUPPORT FILES

The following files allow the HP3000 to support the Boot Protocol and SYSLOG protocol, network utilities that ordinarily run on Unix systems.

BOOTPD

This is a program file run by BOOTPJOB (see below) that supports the Boot Protocol on the HP3000.

BOOTPJOB

This is a background job that runs the BOOTP program, BOOTPD (see above).

BOOTPTAB

This is a configuration file that contains hardware-to-IP address mappings. Edit it and then stream the job BOOTPJOB (see above) to support the BOOTP protocol on the HP3000.

STOP

This file, when executed, sends a clean shutdown command to the SYSLOGD or BOOTPD program.

SYSLGJOB

This is a background job that receives printer syslog messages from an HP JetDirect network interface. The messages may be sent to the system console, to the job $STDLIST, or to a specific user. To implement SYSLOG service on your HP3000, edit SYSLGJOB and then stream the job.

SYSLOGD

> This is a program file run by SYSLGJOB (see above), that allows the
> HP3000 to support the SYSLOG protocol.

YEAR 2000 TESTING

NetPrint relies on MPE's Native Language Subsystem for date editing and formatting. Native Languages are installed and maintained by the HP program LANGINST.PUB.SYS. The default language is NATIVE-3000.

NetPrint uses the Custom Date format defined by the Native Language for editing and formatting dates. The default Custom Date format for NATIVE-3000 is MM/DD/YY. The year is determined by MPE's fixed-date window (currently 50) when the custom date format year is less than 4 digits in length.

Year 2000 issues are covered by the Minisoft and NetPrint standard product warranty and limitation of liability. NetPrint's Year 2000 compliance has been established by our internal testing according to standards we have developed. NetPrint is not warranted to meet any Year 2000 performance specification that has been established by *your* organization. You are responsible for testing and determining if NetPrint meets the Year 2000 performance standards in use by your organization.

7   Troubleshooting

NP92LOG

The NetPrint job file, NP92JOB, generates a log report on the HP3000's spooler, called NP92LOG. This file is created each time NetPrint is started, and is the first place you should check for problems.

To view NP92LOG:

1. At the system prompt, type LISTSPF to see a list of all the spoolfiles.

2. Find the spoolfile number for the NP92LOG file that is in the CREATE state (for example, #O1234).

3. At the system prompt, enter:

    PRINT *spoolfile number***.OUT.HPSPOOL**

    (for example, PRINT O1234.OUT.HPSPOOL). The contents of the spoolfile are displayed.

When viewing the file, expect to see the following:

- ♦ the NP92CONF file in use
- ♦ the message, "Start-up completed successfully, now processing spoolfiles..."

♦ a transaction message that specifies which spoolfiles were selected by NetPrint
♦ a record of where each spoolfile was sent
♦ error messages (if applicable)

ERROR CODES

You can also check the NP92LOG for possible error codes on a specific NetPrint job.

1. At the system prompt, type SHOWJOB to find the job number of the particular NP92JOB.

2. Once you have the job number, type SHOWOUT JOB=*jobnumber.*

Here is a list of possible error codes that can be returned:

824   Connection refused.

♦ After socket error 59, 824 means the NetWare server is busy. Try NETPRINTRETRYPAUSE to speed up the retry.
♦ After socket error 68, 824 means you entered a bad name or the queue on the LPD host is dead.
♦ The connection may have been aborted remotely. Some UNIX/LPD systems (Sun, IBM, LWP) require that a specific range of port numbers be used. Try the SPORT parameter (see *NETPRINT options* in chapter 3).

871   A name in the NODE parameter is not defined. Add the node name to NMDIR or use the IP address.

873   The IP address in the NODE parameter does not respond or is bad. Verify the IP address.

874   The name in the NODE parameter does not respond. Try changing the node name to an address.

        The network cable is bad.

875   JetDirect times out. Increase the JetDirect time-out or set NP92DRV into CQ.

877   Duplicate IP address, the other device responds first. Verify that only one device has this IP address.

NLM is not loaded or stopped. Load the NPNLMIN and check for error messages.

WinNT LPD service is not loaded or stopped. Check services to verify that LPD has started.

1208   Device rejected print job. Some UNIX/LPD systems (Sun, IBM, LWP) require a specific range of port numbers be used. Try the SPORT parameter (see *NETPRINT options* in chapter 3).

ERROR MESSAGES

Occasionally, you may encounter error messages while running NetPrint. Depending on the problem, a message may also be displayed to the HP3000 host console or to the Novell server.

HP3000 ERROR MESSAGES

Errors on the HP3000 usually have to do with a conflict in the way NMMGR and the network are identifying nodes and/or IP addresses. However, not all errors involve NMMGR. Here is a list of common error messages and suggestions for correcting the problem:

Destination unreachable (Error 873)
The IP address of the target device must match the IP address defined for that device in the Network Directory screen of NMMGR. Check NMMGR and correct the IP address for the device, if necessary. To verify the address, use

the HP PING utility (Sometimes, you cannot PING on a node name, whereas you can on an IP address).

This error may also mean that the device at the specified IP address is off line. Check the printer and turn it on or clear any errors and reset it.

Network printer (server, etc.) is unavailable (Error 877).
The printer (and/or print server) is either busy or is specified incorrectly. If the printer is off line, bring it back on. Check the NP92CONF file and make sure that PTYPE is defined properly (see list of PTYPE under *NETPRINT options* in chapter 3) for this printer. If you specify no PTYPE, NetPrint defaults to the JetDirect setting, which is erroneous if the printer is not a JetDirect.

If you get this error when the PTYPE is specified as NLM, it may mean that NPNLMIN is either not loaded or not running, or that NPNLMOUT was loaded instead. Check to make sure that NPNLMIN.NLM is loaded and running on the server.

Time-out on connection attempt to network printer (Error 873).
This error is unusual. Most likely, it means that the IP address assigned to a network printer or server is a duplicate of some other device on the network. Check IP address assignments and correct as necessary.

Unknown node.
The node name you specify in NMMGR must be fully qualified in the *name.domain.organization* format, where *domain.organization* matches that of your HP3000, and *name* matches the name in the NODE statement in NP92CONF. If these names do not match, edit accordingly.

This problem can also occur if the *Name Search Methods and Order* field on the Global Transport Configuration Screen in NMMGR does not include the Network Directory.

If everything seems to be configured correctly, stop and restart the network.

NOVELL SERVER ERROR MESSAGES

You may encounter error messages when loading the NetPrint NLM. One of the most common of these has to do with running an old version of CLIB.

If, upon typing LOAD NPNLMIN at the network console, you encounter a series of *Could not load ...* messages, chances are that CLIB.NLM from Novell is out of date. You should update to version 3.11d or later of CLIB.NLM.

For an updated version of CLIB.NLM, see your Novell dealer or download the newest LIBUP*x* file from the Novell webpage, www.novell.com. This self-extracting file contains the updated CLIB.NLM.

The other error you may encounter is when loading NPNLMOUT and failing to login to the server:

Error: LoginToFileServer failed (193 or 197)
> Occurs when attempting to load NPNLMOUT. This error indicates that the print server needs attention. Call Minisoft for technical support.

NLMS NOT RUNNING

Rarely, you may have trouble running one of the NLMs. Most likely, the problem has to do with your version of the NetWare operating system. Be sure that the following are up to date:

- ♦ NetWare is version 3.11 or later.
- ♦ The server is running Novell's NLM that supports TCP/IP (TCPIP.NLM).
- ♦ The server is running version 3.11d or later of CLIB.

PROBLEM RUNNING ON 3.*X* SERVER

On some 3.*x* servers the NLMs may not run because of a missing library called AFTER311.NLM. This NLM library is included with NetPrint, as AFTER311.PUB.MINISOFT.

If you do not already have AFTER311.NLM, download the file AFTER311.PUB.MINISOFT to the SYSTEM directory of your server, using binary mode for the transfer.

PROBLEM RUNNING **NPNLMOUT** ON *4/5.X* SERVER

When installing a new NPNLMOUT on a 4/*5.x* server where a previous version of NPNLMOUT was in use, purge the NPNLMOUT Print Server object from the directory before running the new NPNLMOUT for the first time. This allows the new NPNLMOUT to create the Print Server object in the directory context you have set for the NLM in NPNLMOUT.CFG.

LOSING CONNECTION TO PRINTER

There are many reasons NetPrint's connection to the printer might be dropped. For TCP/IP-equipped printers on the network, the reason often has to do with the printer timing out.

SPECIAL FORMS

During the forms mount and dismount prompting, NetPrint relinquishes ownership of the printer. If another entity on the network connects to the printer, it may print on the special form or interfere with the special form printing operation. (See *Printing special forms* in chapter 5.)

NetPrint's support of special forms is really designed for printers that are not shared.

A USING NMMGR

This appendix explains how to configure your HP3000 host for communicating with NetPrint, using HP's Node Management Configuration Manager, NMMGR. For additional background in understanding how to use NMMGR, you may wish to consult the following documentation from Hewlett Packard:

- ♦ *Using the Node Management Services (NMS) Utilities* (32022-61005)
- ♦ *NS3000/XL NMMGR Screens Reference Manual* (36922-61003)
- ♦ *Configuring Systems for Terminals, Printers, and Other Serial Devices* (32022-61000)

Your HP3000's networking configurations are stored in the file NMCONFIG.PUB.SYS. In using NMMGR, you are modifying this file.

The overall process of using NMMGR to configure the HP3000 for communicating with NetPrint is outlined below. For instructions on performing these steps, turn to the appropriate section of this appendix.

1. Determine your current network configuration, and enable Ethernet.

    If your HP3000 is already running on a network, you will use NMMGR to modify the existing configuration. You can use NMMGR to determine what your current configuration settings are. You must enable Ethernet if your system is not already running with Ethernet enabled.

2. Configure node names for the destination(s) of HP spoolfiles.

    Using NMMGR, you will create a node name and IP address for each spoolfile destination (network printer, LPD protocol system, or Novell server) you wish to use.

3. Set up dummy device classes on a DTC (Datacommunications and Terminal Controller).

A dummy device serves as an output device for the HP3000's spool queue. NetPrint can then act as a spooler process, processing the spoolfiles according to the specifications set forth in the NetPrint configuration file, NP92CONF. You must configure dummy devices by configuring a profile and a dummy DTC in NMMGR.

4. Validate the configuration.

In some systems, cross-validation of SYSGEN and NMCONFIG.PUB.SYS is done automatically within NMMGR. In other systems, you must run SYSGEN independently in order to cross-validate.

5. Edit SYSSTART and restart the system.

You must edit the file SYSSTART.PUB.SYS to open the queue on the dummy *ldev* you configure, and you must shut down and restart the system to activate the changes you make in NMMGR.

NETWORK SHUTDOWN

If you are setting up NMMGR for NetPrint for the first time, you must shut down the network and then restart it for your settings to take effect. You can do this at the end of the entire process (see section *Step Five: Edit SYSSTART and restart the system* later in this chapter).

If you have already set up NMMGR for NetPrint (Ethernet enabled and dummy devices configured), and you are merely adding another node name for a spoolfile destination, you do not need to shut down the network. After exiting from NMMGR, you may run NETCONTROL to update your system (see the section *Step Five: Edit SYSSTART and restart the system* later in this chapter).

The following pages explain each step of the process of configuring your HP3000's networking settings with NMMGR. The section titles correspond to the steps of the process.

Note: Illustrations of NMMGR screens were captured in version B.04.06 of NMMGR. Other versions of NMMGR may vary slightly from that pictured here. These captures were made on a PC via the terminal emulation software Minisoft 92 for Windows. The NMMGR screens appear within the Minisoft 92 window (WIN92 DEFAULT.C92).

STEP ONE:
DETERMINE CURRENT CONFIGURATION

Run NMMGR to determine your current network configuration, as follows:

1. Logon to the HP3000 host as system manager:

    :HELLO MANAGER.SYS

    Type the password for this logon when prompted to do so.

2. Run NMMGR:

    :RUN NMMGR.PUB.SYS

    The Open Configuration/Directory File screen is displayed:
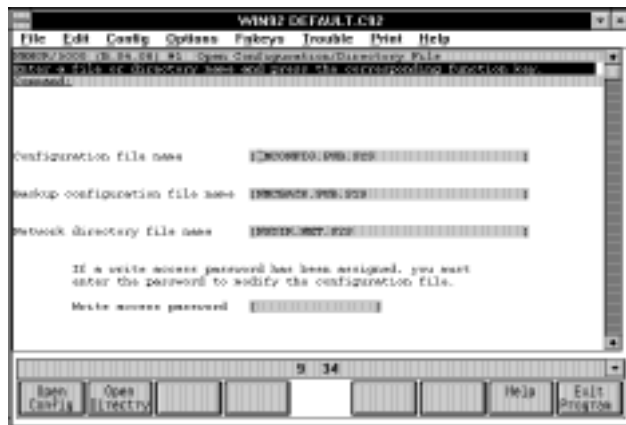
3. Press F1 *Open Config* to display the main screen (shown below).

    Note the local HP3000 node name. It is in a three-part format:
    node.domain.organization. When you create a new node name for your
    spoolfile destination (network printer, LPD protocol system, or Novell server),
    it will follow the same format, and must use the same domain and organiza-
    tion names as those shown on your screen:
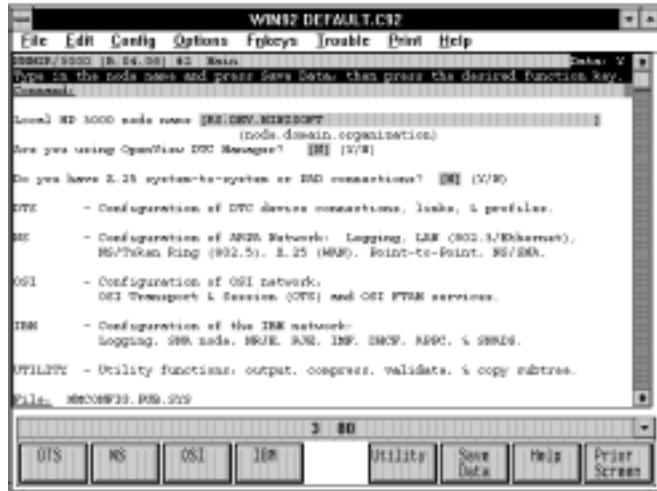
4. Press F2 *NS* to display the NS Configuration screen:
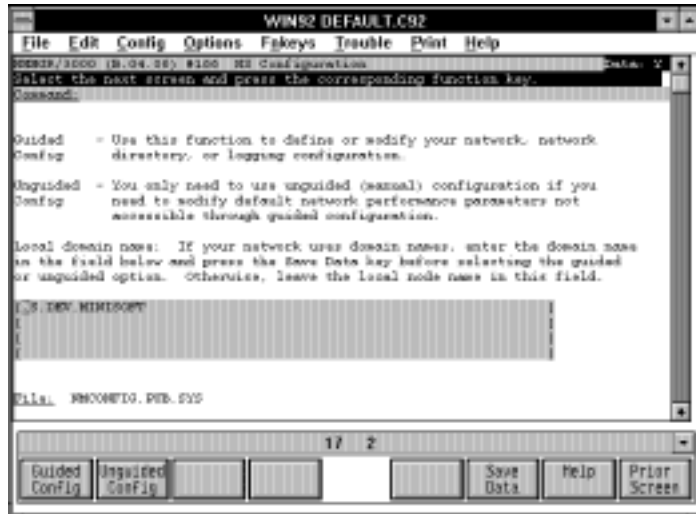
5. Press F1 *Guided Config*. The Network Transport Configuration screen is displayed:

6. If you know the name and type of your network interface, enter them in these
    two fields. Otherwise, press F5 *List Networks* to display the Network Inter-
    face Configuration screen. Network interfaces configured for your system are
    listed in the read-only fields. The current network interface name appears
    where your cursor is blinking:
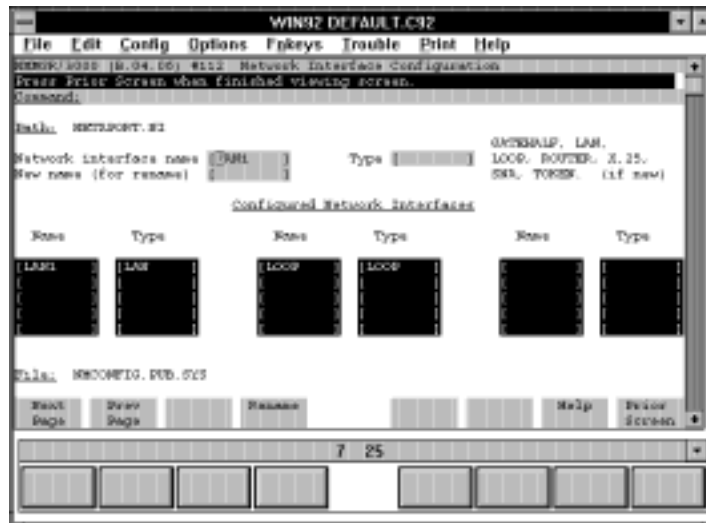
7. Note the name and type of your current network interface; then press F8 *Prior
    Screen* to go back to the Network Transport Configuration screen.

8. Enter the network interface name as it appeared in the Network Interface Configuration screen; press TAB to move to the next field, and enter a number from the right that corresponds with your network type, as displayed in the Network Interface Configuration screen. Your screen should look similar to this example:

Press F1 *Config Network* to display the configuration screen for your type of network (in this case, LAN):

9. If *Enable Ethernet?* is set to N, change it to Y. Then press F6 *Save Data.* If *Enable Ethernet?* is already set to Y, just leave it.

With Ethernet enabled on your HP3000 host, you are ready to configure node names for spoolfile destinations, as explained in the next section.

STEP TWO:
CONFIGURE NODE NAMES

You must now create new node names in NMMGR for the destination(s) of the HP3000 spoolfiles.

1. If you are still in NMMGR, press F8 *Prior Screen* until the Open Configuration/Directory File screen appears. This is the initial screen of NMMGR:
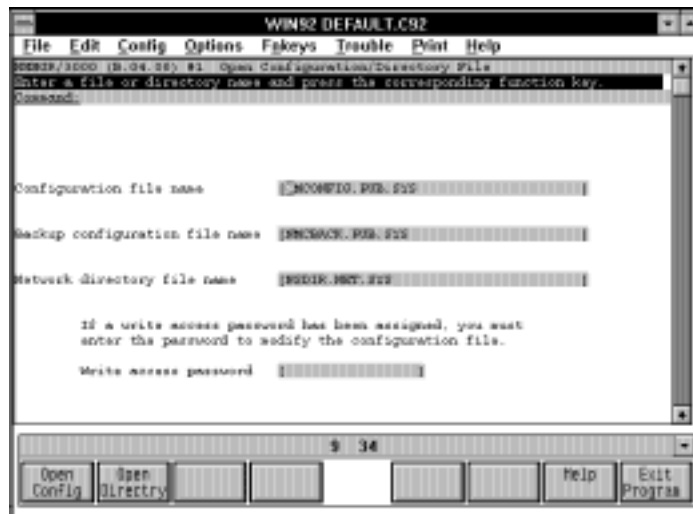
2. Press F2 *Open Directory* to open the Network Directory main screen:
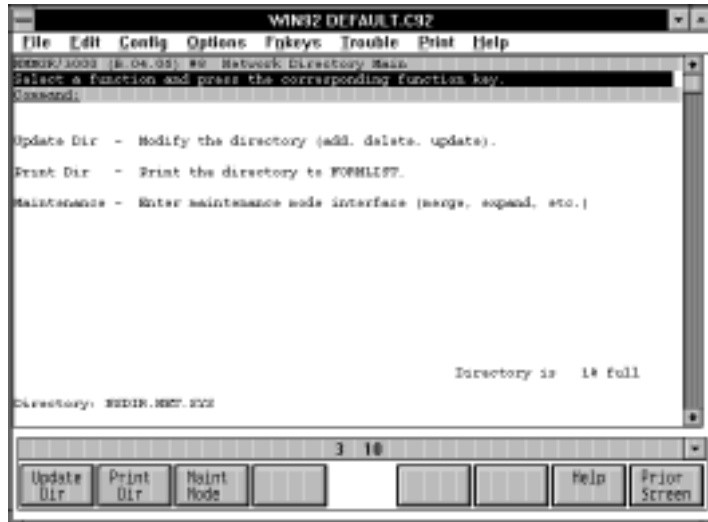
3. Press F1 *Update Dir* to display the Network Directory Select Node Name
    screen (shown below). Create a node name for the spoolfile destination
    (network printer, LPD protocol system, or Novell server).

    Remember, the *domain* and *organization* portions of the name must match
    those of the HP3000 (see step 3 in section *Step One: Determine current
    configuration* later in this chapter). In addition, the *node* portion must match
    the NODE statement you use to identify the node in NP92CONF (see chapter
    3).

    When you have created a node name, press TAB and set the *Global?* flag to
    Y. Your screen should look similar to this example:
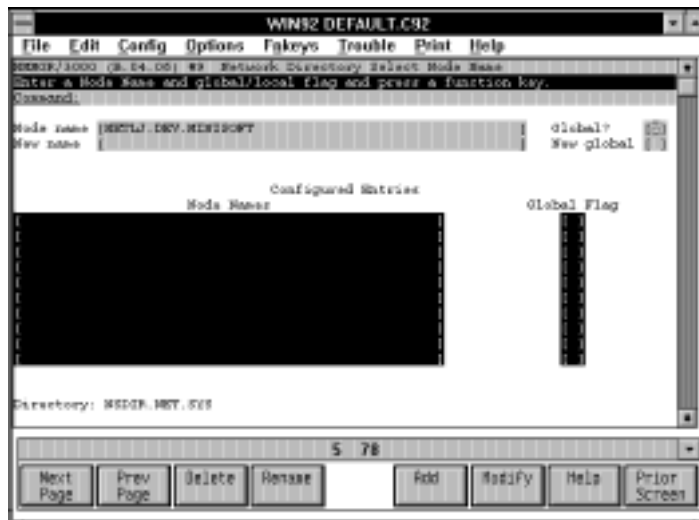
4. Press F5 *Add*. In the Network Directory Data screen, enter the IP address of the spoolfile destination. Set *TCP* to Y, *Checksum* to N, *PXP* to N, and *Address Type* to 1. Then press F6 *Save Data*. Your screen should look similar to this example:

5. Press F8 *Prior Screen* to return to the Network Directory Select Node Name screen:
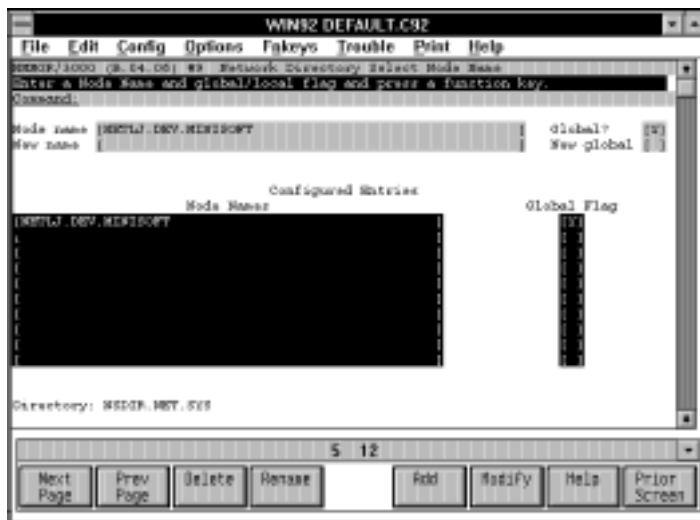
6. If you have more node names to create, do so from here, repeating the process of steps 3 through 5. The example below shows node names configured for a network printer, a Novell server, and a Unix system. Note that the *node* portion of the *node.domain.organization* matches sample NODE statements shown in chapter 5:
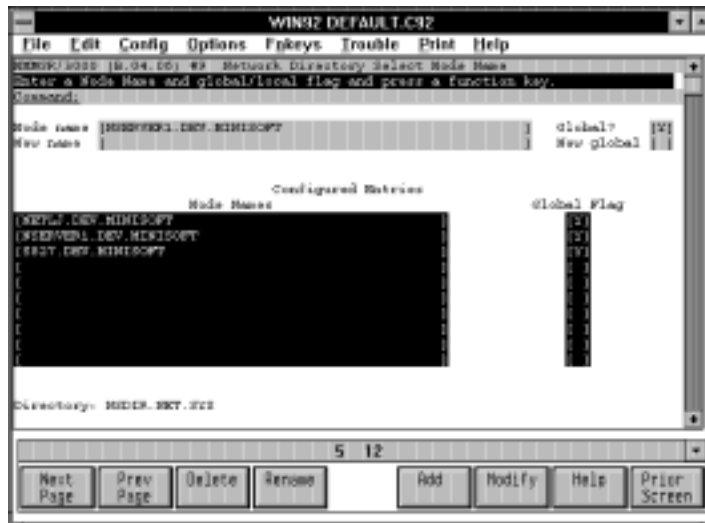
When you have configured new node names for spoolfile destinations, you should set up dummy device classes, as explained in the next section.

STEP THREE:
SET UP DUMMY DEVICE CLASSES

Setting up dummy device classes allows the HP3000's operating system to queue up files as if they were being sent to a standard serial printer device. NetPrint can then be configured to process spoolfiles according to their output device class or number (see chapter 3 for more information on configuring NetPrint).

You can set up dummy device classes via dummy DTCs (Datacommunications and Terminal Controllers) by configuring the Distributed Terminal Subsystem (DTS) in NMMGR. DTS is the link between the HP3000 and all the DTCs that are connected to the LAN, as well as the LAN interface card (LANIC) and the LAN cable.

In order to set up dummy device classes, you must create a new DTS profile to store the dummy device class names, and you must configure a dummy DTC, as follows:

1. If you are still in NMMGR, press F8 *Prior Screen* until you return the NMMGR initial screen.

2. Press F1 *Open Config* to display the Main screen; then press F1 *DTS* to display the Host Configuration screen:

3. Press F2 *Go To Profiles* to display the DTS Profile Selection screen. Enter a name for the new profile, such as PRNETPR, in the *Profile name* field, and define the *Type* as PRINTER. Then press F5 *Add Profile*:
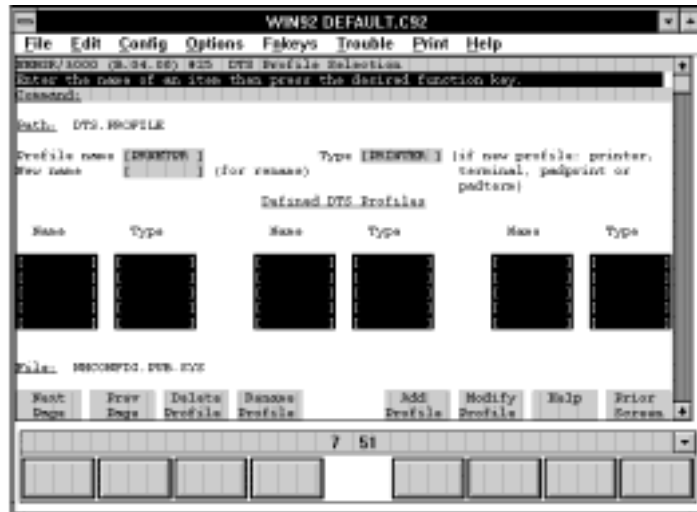
4. In the Printer Profile screen (shown below), set *Initially Spooled?* to N so that the files will wait in the queue for NetPrint to print them out. Then, enter the device class names you wish to use for the network printing destinations in the *Device class names* fields. You can enter up to 458 device class names by pressing F1 *Go To Classes.*

   You will later map these device classes to the network printing destinations with NETPRINT statements in NP92CONF, using the DEVICE selection criteria (see chapter 3).

   Note: If your dummy device class identifies a network printer, use the printer's node name (such as NETLJ). If your dummy device class identifies a destination on a Unix or Windows NT system or a Novell server, however, use a name that identifies a print queue on the target system (such as UXLP for a Unix printer, or NQ1 for a Novell print queue). NMMGR does not support the long names or non-alphanumeric characters that may appear on the Novell server, so this name may be different.

Generally, it is best to configure a single printer profile with many device classes, rather than to create many profiles that identify single devices. However, some third-party products require that devices be identified by logical device number rather than by device class name. NetPrint also supports this type of configuration.

When you have entered the necessary information in the Printer Profile screen, press F6 *Save Data.* The screen should look similar to this example:
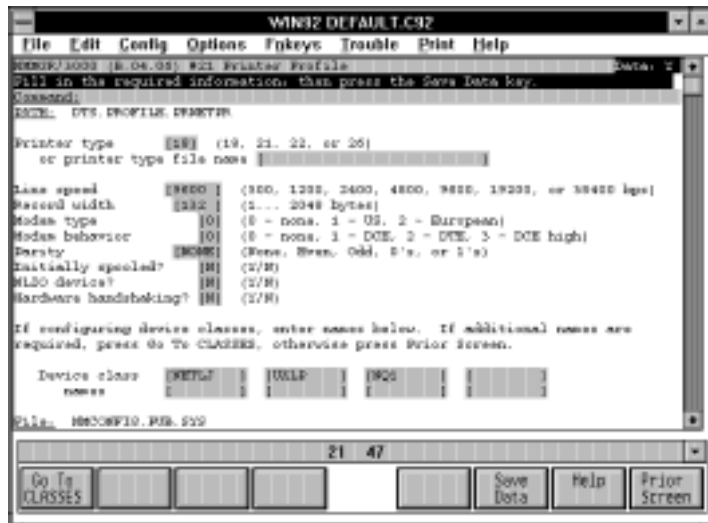
5. Now you must configure a DTC. Press F8 *Prior Screen* twice to display the Host Configuration screen. Then, press F1 *Go To DTC* to display the DTC Configuration Selection screen:

6. Press F4 *DTC16*. In the DTC16 Configuration screen, assign a DTC name, which should be incremented at least one step higher than any DTCs already configured on your system (in fact, you may wish to leave a large gap, so that the dummy DTC occupies a range beyond that which you set for genuine DTCs).

    You should also enter a dummy LAN station address, such as 00-80-00-00-00-00. Set the card type to D.

    Finally, set levels 2 through 6 of *Enable logging?* to N (level 1 is always set to Y).

When you are finished, press F6 *Save Data*. Your screen should look similar to this:
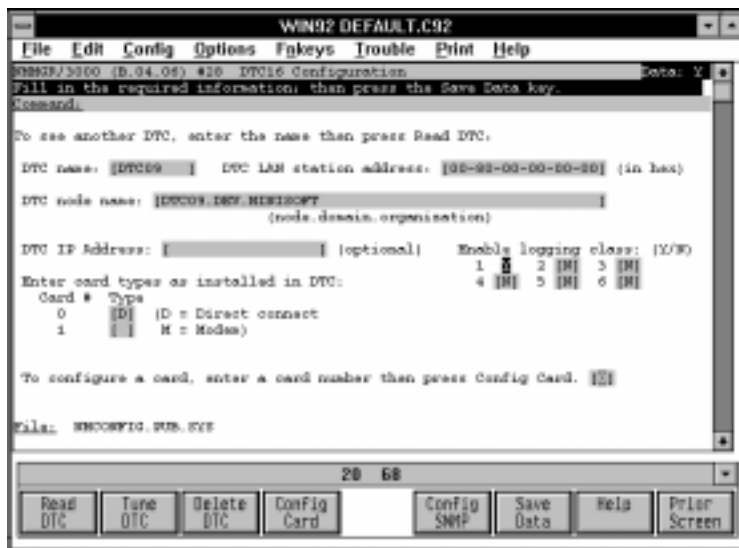
7. Now, configure a card by entering its number (0) in the field towards the bottom of the screen and pressing F4 *Config Card*. In the DTC Direct Connect Card Configuration screen (shown below), enter a number for an *ldev* not already configured, and enter the profile name you just created (in this case, PRNETPR).

    Note: When creating an *ldev* number, the convention is to use three digits, where the first digit is the DTC number, the second digit is the card number, and the third digit is the port number (hence, "900" in the example below, for port 0 on card 0 on DTC09).

When you are finished, press F6 *Save Data.* Your screen should look similar to this example:
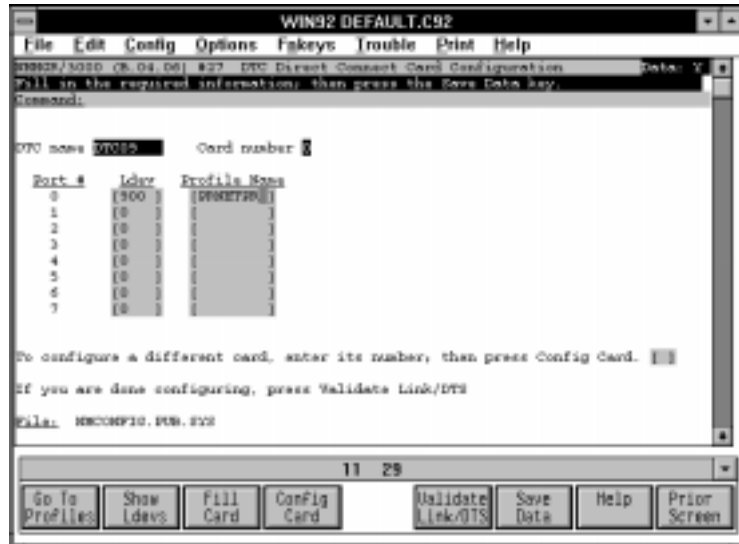
Your dummy device classes are now configured, and your configuration within NMMGR is nearly complete. You must now validate the configuration, as explained in the next section.

STEP FOUR:
VALIDATE THE CONFIGURATION

In some systems, the validation you perform within NMMGR automatically includes a cross-validation between NMCONFIG.PUB.SYS and the HP3000's system configuration. In other systems, you must perform the cross-validation as a separate step.

Information on running SYSGEN to perform the cross-validation appears at the end of this section.

VALIDATING **NMCONFIG**

NMMGR includes a utility that allows you to validate your configuration settings before restarting the network. Use it as follows:

1. After you have made changes within NMMGR, press F8 *Prior Screen* until you return to the Main screen.

    Then press F5 *Utility*, then F3 *Go To VALIDATE* to display the Validate Configuration File screen:

2. Press F1 *Validate NETXPORT*. NMMGR runs a validation routine on NMCONFIG.PUB.SYS and prints any messages to the screen. When it is finished, press RETURN.

3. If you set up dummy device classes, press F2 *Validate DTS/LINK*. NMMGR runs a validation routine on NMCONFIG.PUB.SYS and prints any messages to the screen. When it is finished, press RETURN.

4. If the validation routine encountered errors, go back to the necessary NMMGR screen and correct them, and revalidate. Otherwise, exit NMMGR: Press SHIFT-TAB to move the cursor to the *Command* line. Type EXIT and press the block-mode ENTER key.

If your system does not run SYSGEN from within NMMGR's validation utility (you will see it scrolling on the screen), you must run it separately. Turn to the instructions for *Cross-validating with SYSGEN*, below.

If your system does run SYSGEN from within NMMGR, you have completed the configuration process within NMMGR. Proceed to the section, *Step Five: Edit SYSSTART and restart the system*.

CROSS-VALIDATING WITH SYSGEN

Note: This section on SYSGEN applies only to those systems with a version of MPE/iX *older than 4.0*.

For systems that do not run SYSGEN from within NMMGR, you must run SYSGEN after you complete the NMMGR validation, as explained above.

Note: After you run the cross-validation, SYSGEN will prompt you for whether or not you want to purge the old configuration. If you have any concerns about purging these files, make a backup of the files in CONFIG.SYS before proceeding with SYSGEN.

After exiting from NMMGR, do the following:

1. At the system prompt, type SYSGEN and press RETURN.

2. At the sysgen> prompt, type SYSFILE and press RETURN.

   A list of SYSFILE configuration commands appears.

3. At the sysfile> prompt, type the command RDCC to perform the cross validation.

   SYSGEN cross-validates the changes made to NMCONFIG.PUB.SYS with other system files, writing messages to the screen. When it is finished, the sysfile> prompt appears.

4. At the prompt, type HOLD and press RETURN; then type EXIT and press RETURN.

    The sysgen> prompt appears.

5. At the prompt, type KEEP and press RETURN to retain the settings.

    SYSGEN prompts you for whether or not you want to purge the old configuration. Type Y and press RETURN.

6. Type EXIT and press RETURN to exit from SYSGEN.

You have completed the configuration process. Now, you must edit SYSSTART and restart the system, as explained in the next section.

STEP FIVE:
EDIT **SYSSTART,** RESTART THE SYSTEM

If you set up dummy device classes, you must open the spool queue on them. You can accomplish this by editing the file SYSSTART.PUB.SYS. In addition, if you set up dummy device classes or enabled Ethernet in NMMGR, you must shut down, then restart *both* the HP3000 and the network in order for your changes to take effect.

If NMMGR was already configured on your system, however, and you merely added a node name, you *do not* need to shut down the HP3000 or the network. All you need to do is update the network directory, which you can do from the system prompt with the NETCONTROL command:

After you exit from NMMGR, type the NETCONTROL command at the system prompt, using parameters to update your network directory. For example:

> **:NETCONTROL NET=LAN1;UPDATE=NETDIR**

EDIT SYSSTART

When you set up a dummy device class, you created a new *ldev* number on your system. To make use of the device classes associated with this new *ldev*, the classes must be spooled. You can spool them by opening the queue on the *ldev* you created, and you can automate the opening of this spool queue by adding the OPENQ command to your SYSSTART.

Edit the file SYSSTART.PUB.SYS by adding the following line, where *ldev#* is the *ldev* number you created (see section *Step Three: Set up dummy device classes*):

OPENQ *ldev#*

RESTART THE SYSTEM

In order for the changes you made to take effect, you must shut down the HP3000 and the network, and then restart them.

Restart the HP3000 with this command:

ISL>START NORECOVERY

B ENVIRONMENT FILES

This appendix explains how to use the environment files included with NetPrint. For a list of these files, see *Environment files* in the *File reference* section of chapter 6.

Environment files set parameters for print jobs. These parameters can control such variables as page orientation (portrait or landscape), column width, font choice, paper source (bins), and single-sided versus double-sided printing (simplex vs. duplex).

Users can specify environment files for their spoolfiles with the ENV= MPE keyword when making a FILE equation. The contents of the specified environment file are attached to the beginning of the user data as the spoolfile is created. Additionally, NetPrint can send specific environment files to the printer. These environment files can either supersede or augment an environment file that is 'built into' the spoolfile, depending upon the NETPRINT option used.

SPECIFYING ENVIRONMENT FILES

NetPrint's environment files can be used on the MPE file equation's ENV= parameter; however, the resulting spoolfile may not be compatible with MPE's serial printer driver (see *Environment files compatible with MPE serial printers*, below). Files incompatible with MPE serial printers must be printed by NetPrint.

NetPrint allows you to specify environment files in the following ways:

- ♦ as a NETPRINT option when printing to a network destination
- ♦ as an EXPORT option when printing from a Novell server to the HP 3000

NETPRINT OPTION FOR ENVIRONMENT FILES

The NETPRINT options E=*envfile* and EK=*envfile* in the NP92CONF file specify the name of an environment file to send with the selected spoolfile (for more information on NETPRINT options, see *NETPRINT options*, chapter 3).

You may use *either* the E or the EK option, but not both:

- ♦ Use the E option to *supersede* any MPE-specified environment file for this spoolfile
- ♦ Use the EK option to *augment* the effect of any MPE-specified environment file.

The EK option 'keeps' the MPE-specified environment file, while the E option ignores it.

EXPORT OPTION FOR ENVIRONMENT FILES

When configuring NPNLMOUT, you can use the E=*filename* option in the EXPORT statement to specify an environment file for the file being printed on the HP 3000 (for more information on configuring NPNLMOUT, see *NPNLMOUT configuration*, chapter 4).

The environment file you specify in this option must be compatible with MPE serial printer drivers.

ENVIRONMENT FILES INCLUDED WITH NETPRINT

NetPrint ships with several environment files (for a list of these files, see *Environment files* in the *File reference* section of chapter 6). A summary of these files is listed in the text file ENVINFO.PUB.MINISOFT.

ENVIRONMENT FILES COMPATIBLE WITH MPE SERIAL PRINTERS

Environment files that were created or that can be edited with the TTUTIL program are compatible with MPE serial printer drivers. When TTUTIL creates an environment file, it builds a pair of files:

- ♦ an actual environment file that can be sent to a printer, and
- ♦ a Virtual Format Command (VFC) file.

To determine whether or not an environment file is compatible with MPE serial printers, look for this pair of files. For example, the NetPrint environment file LJ80 has a companion VFC file, VFC80, whereas there is no VFC file that corresponds to the environment file PORT2UP. LJ80 is compatible with MPE serial printers, and PORT2UP is not.

PRINTING ENVIRONMENTS

NetPrint's environment files support the following printing environments:

Portrait and landscape orientation
> Environment files whose names begin with PORT print in portrait (vertical) orientation; files whose names begin with LAND print in landscape (horizontal) orientation.

2-up and 4-up printing
> Use PORT2UP and LAND2UP for 2-up format (two logical pages per physical page), and PORT4UP and LAND4UP for 4-up format (four logical pages per physical page).

GreenBar paper simulation

Use the environment files ending in GB to simulate the green bar effect on PCL printers. These files are not compatible with the MPE serial printer driver.

Simplex vs. duplex

Environment files with a D in their name print duplex, if the destination printer supports duplex printing. If the destination printer does not support duplex printing, the duplex option is ignored.

MPE serial-compatible

Environment files whose names begin with LJ (and that have a corresponding VFC file; see above) can be printed on MPE serial printers.

EXAMPLES

On the following pages are examples of some of the feature printing environments listed above.

LAND2UP

PORT4UP

LJ132GB

C   JOB CONTROL WORDS (JCWS)

JCW name	Input/Output	Meaning
ASPSTATUS	output	Set to 0 if ASP terminates normally, 1 if not.
ASPEXECSIZE	input	Sets size of ASPEXEC temp file in records. Defaults to 1000. Use when NP92CONF file exceeds 1024.
ASPSTOPWAIT	input	Sets number of minutes ASP waits for its son processes to terminate normally before it kills them. Defaults to 10.
ASPTRACE	input	Enables ASP internal trace.
ESPULFOPENCCTL	input	Set to 1 causes Netprint to issue a CR/LF pair for FOPEN/FCLOSE records in a spoolfile. These records are ignored by default.
ESPULLPDCRNS	input	Set to 1 to cause Netprint not to change a carriage return received in a text mode LPD transfer into a CR/LF pair. Leaves the CR as a CR.
ESPULLPDPRI	input	Sets the output priority of spoolfiles received via LPD. Does not override priority set on the Unix system with the op=n lp command option.

JCW name	Input/Output	Meaning
ESPULLPFFFOK	input	Set to 1 disables the discard of an initial form feed when network printing.
ESPULNETIPCTIMEOUT	input	Sets the time-out in seconds for all network calls made by Netprint. Defaults to 30.
ESPULNETPRTATTNMAX	input	Controls the *Printer Needs Attention* message sent to the system console when a printer has an alarm condition. Set to the number of times the console alert should be issued for an alarm. The console message count resets if an alarm clears and then another one starts. Set to zero to disable console reporting of the *Printer Needs Attention* alarm.
ESPULNETPRTCLOSEDELAY	input	Sets a delay in seconds before closing the connection to a network printer after the last page is sent. Defaults to 1.
ESPULNETPRTCOPYPAUSE	input	Sets a pause in seconds between the transmission of each copy of a multi-copy spoolfile. Use to slow down PRINTPATH if the copies are sent too fast.
ESPULNETPRTDELAY	input	Sets a minimum delay in tenths of a second between packets sent over the network.
ESPULNETPRTFILEPAUSE	input	Sets a pause in seconds between the printing of files waitng for a printer. Use to slow down PRINTPATH if it is sending print files too fast.

JCW name	Input/Output	Meaning
ESPULNOSPCFRM	input	Set to 1 to disable special forms mount dialog on the system console when network printing.
ESPULRETRYPAUSE	input	Set to the number seconds Netprint waits before retrying a failed print job. Defaults to 60.

INDEX

A

Action statements 3-4, 3-11
AFTER311.NLM file 6-8, 7-6
AFTER311.NLM library 4-2
AFTER311.PUB.MINISOFT 4-2, 7-6
ALIAS 3-12
ALTGROUP 2-6, 2-7
ALTSEC 2-7
Asterisk
  on comment lines 3-3
AUTOEXEC.NCF file 4-1
  editing 4-16

B

Banner commands 3-24
Banner definition statements 3-4, 3-24
  in NP92CONF 3-3
Banner substitution keywords 3-25
Banner-page definition 3-12
Binary mode 4-8, 4-12
Bindery Emulation 1-2
Boot Protocol 5-4
BOOTP protocol 1-1, 5-4
BOOTPD file 6-12
BOOTPJOB file 6-12
BOOTPTAB file 6-12
BSD system 3-16, 4-11
Buffer threshold 3-15

C

Catalog files 6-11
Channel skip 5-2
CLASS statement 3-12

CLIB 1-1
CLIB.NLM 1-7, 1-9
  out of date 7-5
Column width B-1
Command files 6-9
Configuration
  validating A-19
Configuration files
  samples 3-30
Console messages
  minimizing 3-6
Control language
  form of statements 3-3
Copy count selection 3-9

D

Datacommunications and Terminal Controller
    (DTC) A-2, A-13
Date selection 3-9
Day of week selection 3-9
Device selection 3-9
Directory Services 1-2
Distributed Terminal Subsystem (DTS) A-13
Double-sided printing B-1, B-4
Driver process 3-13
Dummy device classes
  setting up A-12
Dummy LAN station address A-17
Duplex printing B-4

E

Electronic forms package 5-2
Emulex 1-4

T

TCP/IP 1-1
TCPIP.NLM 1-7, 1-9, 5-24, 5-26, 7-5
Text mode 4-8, 4-12
Time of day selection 3-11
Trailer-page definition 3-15
Trim trailing blanks option 3-21
TTUTIL program 6-10
Two-up printing B-3

U

UNTIL command 3-6

V

Vertical format control files 6-11
VFC132 file 6-11
VFC132D file 6-11
VFC170 file 6-11
VFC80 file 6-11
VFC80D file 6-11
Virtual Format Command. *See also* VFC

W

Wildcards 3-9

X

XCD 1-4