



# Tech Info Library

## LaserWriter Pro 810 and NetWare 3.1x (7/96)

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TOPIC -----

This article describes an incompatibility when connecting a LaserWriter Pro 810 to a NetWare 3.1x server, and a workaround configuration.

DISCUSSION -----

Apple Computer's LaserWriter Pro 810 can work with Novell NetWare networks, but you'll find that a combination of software compatibility problems and documentation shortcomings make it challenging to configure for this environment using the information supplied with the printer. This document covers NetWare 3.11 and 3.12 using NetWare for Macintosh 3.011 or 3.12. Since most users will be connecting NetWare 3.1.X servers, we will focus on this configuration.

Configuring a NetWare 4.x server is not discussed in this document; however, most of the issues are the same. The configuration of printers and print queues in a 4.x environment is handled with different utilities.

### Background

NetWare 3.1x servers can drive printers in one of two ways in the DOS/Windows environment:

- Use a PC on the network as a "Remote Print Server" with printers directly attached through serial or parallel connections.
- Locally attach a printer to the file server.

The "front end" remains the same with either of these configurations. You select a "print queue" to use on your DOS workstation that is defined and managed by the NetWare server. Your print job is spooled on the server and fed directly to the printer or remote print server. The capture of a print queue on a workstation is accomplished in a number of ways depending on the operating system and user configuration of the workstation.

When an AppleTalk printer is attached to a NetWare network, a Macintosh may print to this printer:

- Directly to the printer in the traditional fashion, with no interaction

with NetWare.

- Print via NetWare's ATPS (AppleTalk Print Spooler) which is part of Novell's NetWare for Macintosh product. This behaves much as Apple's AppleShare Print Server does by advertising a spooler in the Chooser and accepting print jobs from a Macintosh. ATPS normally sends spooled jobs directly to AppleTalk printers or it can pass the job to the DOS/Windows queues for processing on non-AppleTalk printers.

#### Incompatibility

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The incompatibility, caused by a "half-open" PAP (Printer Access Protocol) session being created, is due to the implementation of the AppleTalk PAP protocol used in the LaserWriter Pro 810. The LaserWriter Pro 810 uses a different implementation of the AppleTalk stack and PAP protocol than was used in previous LaserWriter printers. NetWare uses a version of AppleTalk designed for most of Apple Computer's LaserWriter printers. A more in-depth description of a "half-open" PAP session follows.

The behavior of the NetWare ATPapOpenConn() call is to try one PAP OpenConn ATP TReq transaction for four seconds, then to give up and try an OpenConn on a new ATP (AppleTalk Transaction Protocol) transaction and PAP conn ID. The wait time field of the OpenConn request is only incremented when a new transaction is issued. This behavior was designed to allow for incrementing the OpenConn wait time without violating the internal boundaries between PAP and ATP in our protocol stack.

If a printer responds to an OpenConn request after the ATP transaction has expired, and ATPS has moved on to a new connection session, it can lead to a half open connection which takes two or three minutes to time out. The printer will not accept any other connections during this period. Due to this potential weakness in PAP, Inside AppleTalk recommends allowing twelve seconds before using a new ATP transaction and PAP conn ID to issue the OpenConn requests (5 tries at two second intervals).

As of April 1994, ATPS' behavior is to transmit one retry at two second intervals, for a total of only four seconds. ATPS is technically within the AppleTalk specification, but these intervals don't work with the LaserWriter Pro 810. This is not an issue with other Apple LaserWriters as they do not use the LaserWriter Pro 810 implementation of AppleTalk.

The result is the LaserWriter Pro 810 will look at one PAP connection session, while ATPS has moved on to another PAP session requesting attention on a new connection session. The printer will report its status as idle, but it's still busy (looking at the incorrect PAP connection). When that session finally times out, the LaserWriter Pro 810 will then try to service other PAP sessions that may have been waiting for its attention, but by that time, the newly created ATPS PAP session has timed out, and it has moved on to creating another PAP session. The two versions of AppleTalk will then continue to chase each others out of sync "half open" PAP sessions endlessly.

#### SOLUTION

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Configure NetWare print services to spool jobs to a LaserWriter Pro 810 from DOS and/or Windows computers, perform the following steps:

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- 1) Determine if the DOS computers need to print to PCL4 (HP emulation) and/or Postscript printers.
- 2) PSERVER must be configured and run on the NetWare server using PCONSOLE from a DOS workstation. A print server must be defined, new printers must be defined, and the printers must be connected to queues. The PSERVER process will think it is using a remote print server when it prints to the LaserWriter Pro 810.
- 3) Ensure the server is configured to support the 802.3 frame type on the interface card that will provide IPX traffic to the LaserWriter Pro 810. The printer will not respond to 802.2 packets.
- 4) ATPS must be configured and loaded on the NetWare server to accept print jobs from Macintosh computers and pass the spooled print jobs to non-AppleTalk printers using NetWare's PSERVER NLM.

Configure the LaserWriter Pro 810 for DOS/Windows Use

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- 1) Start by resetting the printer to factory defaults using the control panel on the front. This assures the factory printer setup is pristine and ready for NetWare use.
- 2) Print the Printer Status pages from the control panel on the front of the printer. This provides a list of default virtual printers. Make note of the two that begin with PSL20N.. and LJL20N..

Modify File Server Configuration

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- 1) Edit the AUTOEXEC.NCF file on the server to change or add a frame type of ETHERNET\_802.3 to the Ethernet interface that the printer traffic will flow through. Without IPX bound to this frame type the PSERVER NLM on the NetWare server will never connect to the printer.

Creating & Configuring PSERVER

- 2) Log into the NetWare server from a DOS workstation as Supervisor and run the PCONSOLE utility.
- 3) Select "Print Server Information"
- 4) You may use an existing print server or press the Insert key to create a new print server.
- 5) After selecting the print server to configure select the "Print Server Configuration" option.

Configure the Printers

- 6) Select "Printer Configuration" option. You'll be presented with an empty list if this is a new print server configuration, otherwise you'll see a list of existing configured printers.
- 7) Select an unused printer number, unconfigured printers are labeled "Not Installed".
- 8) Name the printer with the appropriate name that appears on the printout of the virtual printers you obtained earlier. It will be the "LJL20N....." for HP Emulation, and/or "PSL20N....." for a Postscript printer.
- 9) Select the "Remote Parallel, LPT1" as the printer type. You can use this same type for all the printer definitions. There is no need for different IRQs or LPTs.
- 10) Retain the defaults for the rest of the settings and save changes by pressing the Esc key.
- 11) Repeat these steps for a second printer if you are configuring both HP and Postscript printers.

#### Creating the Print Queues

- 12) If you intend to add the configured printers to existing queues then skip to step 16.
- 13) Escape back to the main menu of PCONSOLE and select the "Print Queue Information" option.
- 14) Press the Insert key to create and name a new print queue. This name is the one the DOS stations will see when they capture the queue to print to so select a useful name.
- 15) Repeat the process to create a second queue if you are using both the HP and Postscript printers.

#### Attaching the Printers and Queues

- 16) Escape back to the main menu and select the "Print Server Information" option.
- 17) Select the print server you previously created and then select the "Print Server Configuration" option.
- 18) Select the "Queues Serviced by Printer" option. You'll see a list of the printers you created in the previous section.
- 19) Select each printer and use the Insert key to bring up a list of defined queues and attach the queue to the appropriate printer. You should be attaching one queue to one printer. Use the Esc key to save each one.

20) Escape back to the main menu and exit PCONSOLE.

At this point PSERVER is configured and ready to go. It will support DOS/Windows computers printing to Postscript or PCL4 virtual printers through NetWare queues.

If PSERVER is not currently running, it needs to be loaded at the System Console with a "load pserver [the name of your PSERVER]" command. If one is already running it needs to be unloaded and reloaded to run with the new name. After it loads you'll get a new screen on the console that shows the status of each of the defined printers. You'll notice that the initial status will be "Not Connected". Be patient! Eventually the status will change to "Waiting for job" as the server connects to the LaserWriter Pro 810 over the network. This can take several minutes.

Don't forget to edit your AUTOEXEC.NCF file if you want the PSERVER to load automatically at server boot time.

Configure the LaserWriter Pro 810 for Macintosh Printing Through NetWare

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These steps are only needed when Macintosh computers will be printing through NetWare queues to the LaserWriter Pro 810. If printing straight to the printer the next section can be skipped.

Configure ATPS

ATPS is a NetWare module that drives AppleTalk printers and advertises a NetWare print queue in the Macintosh computer's Chooser. Because of the incompatibilities mentioned earlier, ATPS can't be used to print to the AppleTalk virtual printers in the LaserWriter Pro 810. Therefore, the Macintosh computer's print jobs must be routed from ATPS to PSERVER which will send it to the IPX virtual printer. ATPS must be configured and loaded if it is not currently in use on the NetWare server.

- 1) Load the Install NLM on the server.
- 2) Use the Alt-Esc keys to switch to the Install screen and select "Product Options".
- 3) Select the "NW-MAC" product.
- 4) Select the ATPS.CFG file.
- 5) If this file doesn't exist it will ask if you want to create it. Edit this file so it contains the following line;

```
-O "LW810 on IPX" -WB -L -F APPLWNTX
```

This example assumes the name you want to present in the Mac chooser for this queue is "LW810 on IPX". This name must match the queue name created in PCONSOLE.

Refer to the NetWare for Macintosh documentation for more information

on the ATPS.CFG options.

- 6) Press the Esc key to save changes and exit the Install NLM.
- 7) If ATPS is currently running unload and reload it at the System Console prompt.
- 8) Edit the AUTOEXEC.NCF file to auto load ATPS at boot time if you desire.

The queue will now be advertised in the Chooser, users can submit their print jobs to this queue via ATPS and the print job will be serviced by PSERVER.

#### Create a New Virtual Printer on the LaserWriter Pro 810

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A new LaserWriter Pro 810 Virtual Printer will need to be created because many Macintosh applications print in a BINARY form as opposed to DOS systems printing postscript in ASCII, and the Novell print server combination not being able to convert Binary to ASCII and vice versa. Not doing this last step will cause some (EPS) postscript print jobs to go into the Novell print Queue and then get flushed with no output to the printer.

- 1) Connect to the printer's command console through TelNet or serial connection through the command console connector. Login as the Super User. For more information on cable see Appendix A.
- 2) Issue these commands to create a new virtual Postscript Printer for Macintosh printing use. Select a name for the a new virtual printer that explains what it is like "MacIPX". This name is "(a name)" in the following steps.
- 3) CHANGE SERVICE (a name) COPY (Name of existing virtual Postscript printer. Begins with "PSL20Nxxxxxx".)
- 4) CHANGE SERVICE (a name) PORT 1
- 5) CHANGE SERVICE (a name) PROTOCOL NETWARE ENABLE
- 6) CHANGE SERVICE (a name) PROTOCOL LAT DISABLE
- 7) CHANGE SERVICE (a name) BINARY ENABLED
- 8) Print the Printer Status pages from the control panel on the front to verify the new Virtual Printer setup. It should appear the same as the original PostScript virtual printer except for a different name and the Binary Mode will be enabled.

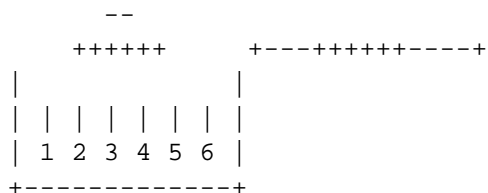
Add a new Queue and printer definition to the NetWare server's Pserver configuration just as the previous section details. The new queue you're setting up is only for use by Macintosh computers, it will not print DOS jobs correctly!

#### Appendix A.

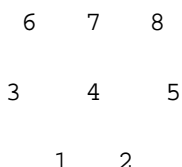
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The LaserWriter Pro 810 includes an RJ12 maintenance port that can be accessed via a standard DEC terminal or almost any terminal emulation software package. In order to connect a Macintosh to the port special cable needs to be constructed. The cable requires an RJ12 and a DIN-8 connector, along with suitable 6 wire cable.

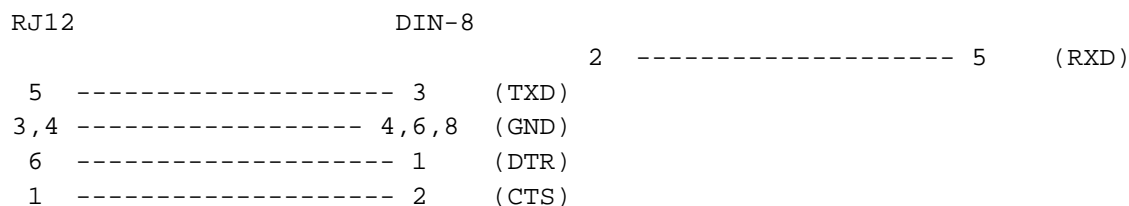
#### RJ12 Diagram



#### DIN-8 (male) Diagram



#### Maintenance port to Macintosh wiring diagram



Configure a terminal emulation package for 9600 baud, 8 data bits, 1 stop bit, and no parity. After turning the printer on the terminal should display a list of diagnostic information which will continue until the printer is ready to print.

In order to log into the remote Console Facility (RCF), wait until the message 'Server -993- Server ready for logins' appears and then press return. The terminal should prompt for a username. The default username is 'access.' Typing 'show server status' at the 'server>' prompt is one of many commands that can be entered in order to obtain status information about the printer.

In order to make changes to the print server you must have superuser status. Enter 'su' at the 'server>' prompt. The terminal will then ask for a password. The default password is 'system.' As long as the password is correct the prompt will change from 'server>' to 'server>>' indicating that the superuser mode is enabled. For additional information regarding the remote console facility (RCF) consult the network installation and configuration manual.

Article Change History:

01 Jul 1996 - Update for technical accuracy.  
14 Oct 1994 - Added Create a New Virtual Printer section.  
28 Jun 1994 - Included NetWare for Macintosh versions.

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