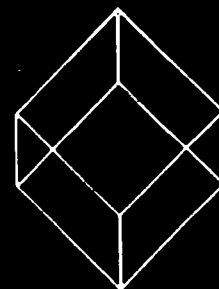


LE 92 00

Ethernet  
and  
Token Ring  
Printservers



BLACK BOX<sup>®</sup>



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BOX

## IBM Interface

for SPX/IPX-Protocol  
and TCP/IP-Protocol

For matrix printers, laser printers and plotters.

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# 1. Introduction

This guide provides all the information you need to install the LAN Client between your ETHERNET system and your laser, matrix or band printer.

**IMPORTANT:** For trouble-free installation, please read through this entire manual once before starting the job!

## WHAT DOES THE LAN INTERFACE DO?

The LAN Interface emulates a Client on the network. Printer output from the Printserver is converted into the format that is used by the printer for which the text has been formatted. This therefore offers the opportunity to select the printer that meets your printing requirements.

Once installed, you can produce documents on the LAN system which will make use of the high quality image, layout and speed advantages of the printer of your choice.

For example, files and documents can be printed in portrait or landscape mode, with a selection of fonts and using text enhancement features such as italics, emboldening, underlining, superscript and subscript, or the printout of drawings with graphics.

## INTRODUCTION

The Interface also auto detects different protocols such as **ICP/IP, NETBEUI, NCP, UDP** and **SPX/IPX** and communicates with any of these protocols simultaneously allowing the user to send prints from a number of different platforms.

When the Interface is installed, read Chapter 2 on how to print documents from Novell with the Interface acting like a remote printer.

Chapter 3 describes how to print documents from Novell with the Interface acting like a print server.

Chapter 4 describes how to setup and use the Interface in a UNIX environment under TCP/IP.

Chapter 5 describes how to setup and use the Interface in a LANManager/LANServer OS/2 environment.

Chapter 6 describes how the Interface is used with the Apple.

Chapter 7 describes setup for DEC LAT operation.

Chapter 8 describes setup for Workgroups Printing System.

Chapter 9 describes printing documents from Windows NT.

Chapter 10 describes PRINTSET.

Chapter 11 describes Windows '95 Printing System.

Chapter 12 describes the reprogramming of Flash EPROM.

Appendix C describes how to use the constant memory option to reprogram the Interface settings from the LAN system setup parameters to satisfy individual users' requirements.

## 2. Printing Documents with Novell as Remote Printer

### OVERVIEW

The Interface functions as a Remote Printer on the Novell Netware network. It effectively takes the place of a workstation running the "RPRINTER" program. It will be of benefit to users who are unfamiliar with the Novell printing environment to obtain the Novell flip-guide entitled "Novell Quick Access Guide". This guide forms part of the documentation supplied with the Novell system, and should be available from the System Supervisor. Read the section entitled "PRINTING".

Once the LAN system, the Interface and the printer have been set up, you are ready to print documents.

When installing the Interface on the LAN system, first print a straightforward ASCII file before you attempt to print documents from your WP package.

### PRINTING A FILE ON THE NOVELL SYSTEM

Print a file from the LAN system in the usual way, e.g.:

```
NPRINT FILENAME.TXT
```

### Printing from Novell

Except for a one-time setup procedure to 'tell' the interface which server and printer to attach to, the Interface uses the same servers, queues and print procedures as with any other standard network printer. If your network does not already have print queues and printservers configured, this must be done. Use the Novell "Quick Access Guide" to assist. For each Interface unit, a remote printer needs to be defined on any print server. When defined, the remote printer may have its print port defined (LPT1, COM2, etc.). The Interface currently ignores this setting, but to maintain compatibility, it is advised that a remote printer with port "LPT1" be defined. It is possible for the fileserver to act as a printserver. Type "LOAD PSERVER [name]" at the fileserver command line prompt. This is often the most convenient place to put the printserver. Network performance is enhanced if the fileserver is also the printserver, as queue queries and output data do not then need to be sent over the network, reducing congestion on a busy network.

### ATTACHING TO THE PRINTSERVER

The operation of the Interface is analogous to a workstation running "RPRINTER". At power-up, the interface will attempt to attach to a printserver (elsewhere on the network) and act as a particular printer of that printserver. In order to be able to do this, it needs to 'know' which printserver to attach to, and which printer of that printserver to use. This is similar to the need to specify these parameters in the "RPRINTER" command line (or to interactively choose them from the "RPRINTER" program).

These parameters are set up very easily on the Interface by using the 'Printset' utility. (See Chapter 10). Once set up, the Interface will 'remember' the settings, and so this procedure will normally only need to be done once at the time of installation, unless a change is needed at a future date.

In the case that the specified printer number of the designated printserver is already attached (say, to another interface), it may either be set up to stop at this point, and re-attempt connection to that specific printer from time to time, or connected to the next (higher) available printer. This is useful where it is desired to have a 'pool' of printers serving one print queue. Several continuous printers on one printserver are assigned to the same queue. The interfaces are all set up to attach to the first available printer after the first of the group. A job sent to this print queue will then be serviced by the first available printer of the group.

### Netware 4 Set up

In Network printer mode where the Printserver is an NLM on the Server, Bindery Emulation is not required, and configuration is carried out entirely in Directory Services mode. Up to 255 printers can now be attached to one Printserver.

### Configuring the Interface as a Remote Printer

To configure the Network Interface as a network printer (remote) follow these steps:

1. LOGIN as ADMIN on a Netware 4 Workstation (to get the full NDS featured supported).
2. Run PCONSOLE. The following screen is displayed

#### Available Options

Print Queues  
Print Servers  
Quick Setup  
Change Current Network Server

3. If the current context is not the one you wish the printer to be in, use 'Change context' to choose another.
4. Select 'Quick Setup'. This allows configuration of Printserver printer and queue all on one screen.
5. Enter details of printserver, printer and queue.
6. For 'Printer type', press ENTER and select 'Other/Unknown'. This removes NPRINT options)
7. Press F10 to save changes; a new Printserver etc will be created.
8. Use PRINTSET to change the Printserver name to the Advertising Printserver name entered above, and select 'REMOTE printer only' along with printer number 0-254.

9. On the File server, enter the following command.  
LOAD PSERVER <Printserver name>
- This starts the Printserver running, and gives a menu for accessing printer status and Printserver status.
10. Cycle power on the Network Interface and get a status page, which should indicate the Rprinter number logged.

### 3. Printing Documents with Novell (as Print Server)

#### INSTALLING THE INTERFACE ON THE NETWORK

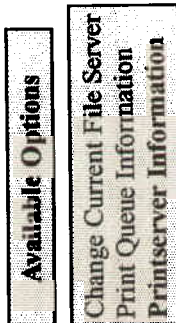
To get your interface working on your network you can use the Printset Utility or PCONSOLE utility program supplied with the Novell NetWare system.

NOTE: You must have "Supervisor" privileges on the network.

#### Installation on the Network

Log on as a Supervisor under Novell NetWare.  
At the screen prompt type PCONSOLE. This will bring up the

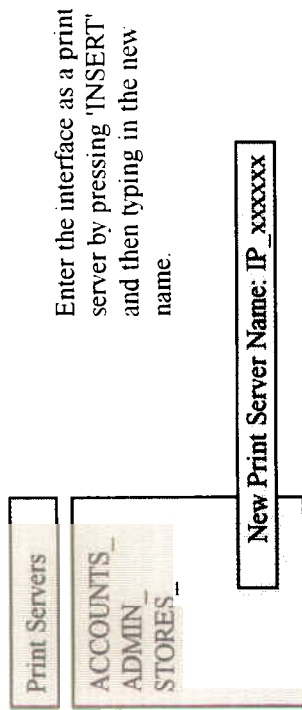
#### AVAILABLE OPTIONS MENU



Under the Available Options menu, select Printserver Information using the cursor keys. Press ENTER to select.

N.B. Menu screens will differ slightly on NETWARE 4.0 and BINDERY EMULATION has to be selected, (press F4 to switch between DIRECTORY SERVICES and BINDERY EMULATION).

This calls up a list of available printers.



The factory default name of the interface is "NP\_XXXX" where XXXX is part of the units Node address. You can assign a new name to the device if you wish.

Each interface on the network which is configured as a printserver must be set up with a different, unique name.

Note: If you assign a new name to your interface unit under PCONSOLE, you also need to change its name in the interface using PRINTSET utility, supplied on accompanying diskette.

**NOTIFY**

It is possible to define who to notify if the interface encounters problems during a print (paper out, paper jam etc.). The interface uses the standard PCONSOLE NOTIFY list for printer 0 of the printserver. After defining a printer 0 for the Printserver, setup the desired notify list for that printer.

From the New Printserver Name field, select the name that you used to identify the interface as a new printserver. With the name selected, press ENTER to go to the Print Server Information menu. Choose the Full Name option, and press ENTER again.

PCONSOLE will display an entry box for a name up to 20 characters long (see below). Type the name that you wish to appear in NetWare's notification message, then press the ENTER key. You won't see a visual confirmation of your entry, but NetWare will remember the name.

To return to the Available Options menu, press the ESCAPE key twice.

**PRINT QUEUES**

Select the Print Queue Information from PCONSOLE MAIN MENU and press ENTER. This calls up a list of existing print queues.

If you wish to create a new print queue to be served by the interface, press INSERT. Type the name of the new queue, press ENTER, and the new name will appear in the queue list. Repeat this process if you wish to create additional print queues.

Under the Print Queue Information menu, choose a queue from the Print Queue list. Then select Queue Servers from the Print Queue Information menu. Press INSERT to bring up the Queue Server Candidates entry box. Choose the queue server you wish to add. The selected server name will appear on the list of servers (see below). Repeat the procedure as often as you wish, keeping in mind that your interface can manage a maximum of 16 different queues.

**EXITING PCONSOLE**

When you have completed the entry procedures, you may press the ESCAPE key three times and select YES to exit NetWare's PCONSOLE utility.

**PCONSOLE INSTALLATION SUMMARY**

Call up NetWare's PCONSOLE printer utility program. (You must have "Supervisor" privileges.)

From the Available Options menu, go to the Printserver Information menu and then press INSERT. Enter the name NP\_xxxxx as a printserver.

If you wish to use the "Notify" function in NetWare, go to the Printserver Information menu and select the Full Name option.

Then enter a name.

From the Available Options menu, select Print Queue Information. (Press INSERT to create one or more new print queues to be served by the interface.)

Under the Print Queue Information menu, use the Queue Servers and Queue Server Candidates menus to identify the print queues your interface will serve. Each interface will manage up to 16 queues.

It is possible to print a test file under PCONSOLE when selecting the Current Job Entries option under the Print Queue Information menu. You may also print test files using NetWare's NPRINT or CAPTURE utilities.

Note: After altering any of the interface's parameters with PCONSOLE, the affected interface must be powered off, then on again, for any changes to take effect.

**Netware 4 Set up**

For Printserver operation, the definition is created in 'Bindery Emulation' mode which makes the print server object compatible with Netware 3.1x. This does not have an effect on NDS operation as the printserver will still display as a leaf object, etc.

**Configuring the Network Interface as a Printserver**

To configure the Network Interface as a Printserver, follow these steps.

1. LOGIN as ADMIN on a Netware 4 or Netware 3.1x workstation.
2. Run PCONSOLE.
3. If you are using a Netware 4 workstation press F4 to select Bindery Emulation. On a Netware 3 workstation PCONSOLE defaults to Bindery Emulation.
4. Use 'Quick Setup' to configure the Printserver, printer and queue all on one screen.
5. Set 'Printer Type' = Other/Unknown.
6. Use PRINTSET to configure the Network Interface if a different Printserver name and other details are required.
7. Power the Printserver off/on to configure the Network Interface and obtain a status page to ascertain that it has logged in and is servicing Netware 4 queues.



## 4. Printing Documents with TCP/IP in UNIX

### INTERFACE OPERATION WITH TCP/IP PROTOCOL

The interface is able to function as a remote printer on systems using TCP/IP transfer with 'lpd' (lpr protocol), standard 'ftp' (file transfer protocol), or TCPF (Raw Socket Printing).

#### Setting up IP Address

Note: All devices operating with TCP/IP have to be assigned a unique "IP Address".

There are conventions surrounding how to make up an IP Address, which are discussed later. In the most complex case, where a network is capable of communicating with other networks worldwide, it is necessary to have some of the numbers assigned by an international body which co-ordinates the numbering.

There are three methods of assigning the IP Address to the interface;

1. Use PING
  - a) Obtain status page of interface (for NODE addr).
  - b) Enter command ARP-S IP ADDR NODE Addr

e.g. ARP-S 133.200.3.181 00:02:21:10:45:93

- c) PING the new IP address  
e.g. PING 132.200.3.181

and the interface will be set to this IP address.

Note: If you are using Windows NT or Workgroups then 'arp -s' command will only work if the Arp Table is NOT empty. Therefore PING another workstation or IP device, check with ARP -a that the table has an entry, and then try Arp -s command.

## 2. PRINTSET

For UNIX, or DOS PRINTSET from DOS W/S with IPX loaded (PSDOSI.EXE).

## 3. Shell script

On the Utility diskette supplied with the interface, there are two scripts for setting up the IP address in the interface and adding an entry to the system's configuration files.

BSDPRINT.SH For use on BSD Systems  
SYSTEM5.SH For System 5 UNIX.

## Updating Hosts File

Once the IP address is defined, the file /etc/hosts need to have this IP address and host name added

e.g. 132.147.69.4 LAN\_PRINTER

## Testing the Connection

Use PING to test if the interface is responding

e.g. PING LAN\_PRINTER

If it is you can carry on and print. If not, check IP address on status page and details in /etc/hosts file.

Note: If your host does not support any devices where the first three numbers of the internet address are different to the network you are working with then you may temporarily change the Net Sub Mask in your file 'hosts' which is located on the fileserver as well as on the workstation you are sending the print from. After you have set up the network interface set the Net Sub Mask back to its previous setting. A Net Sub Mask of 000.000.000 will allow any internet address on the system.

## Printing via lpr

Once the IP address has been assigned to the interface, all the host computers which will be using it to print through, need to have its address added to their "ETC/HOSTS" file. The method for achieving this differs from system to system, and so the Systems Administrator should be consulted.

After the host has had the interface entered as a valid network object, it is necessary to setup the remote printer details. Here, the 'lpr' protocol program is given the name of a remote printer, and a host name on which it resides. It is looking for 3 names to link together:

- i) The name of the local printer which will henceforth be redirected to the interface. The default printer name is often used here (e.g. 'lp').
- ii) The name of the remote printer. This may be any name, as the interface will always honour a print request. See 'filters' for more information.
- iii) The host name to which the printing is to be sent. This must be the name assigned to the interface IP address (above).

**Setup Summary**

- 1) Give the interface a unique IP address using a Shell Script or PRINTSET.
- 2) Enter its address into the host computer, and give it a host name, automatically entered when a script is used.
- 3) Use the system's set up utility, e.g. lpadmin to configure a remote printer, or use an ftp script.

**Operation**

Once the setting up as above has been done, lp or lpr may be used from any host to direct a print file to the interface. If carriage returns are missing from the printout refer to 'Filters'. Host filters like Banners are not implemented on the interface. To print Banners, print locally and redirect to network.

**Printing a file**

At the prompt type (example) 'lpr' -PLAN-PRINTER filename or lp -d LAN-PRINTER filename.

**Checking Printer Status**

To check printer status, use lpq or lpstat -t and this will return printer and job information

**Technical**

For programmers' information, the interface TCP/IP mode responds only to ARP packets and to TCP/IP connections made to port (socket) 515, 9100, and 'ftp' socket. Connection attempts to other port addresses will meet with no response. All data arriving at 515 is assumed to be following valid 'lpr' protocol, i.e. you cannot just send data to this port. However data can be sent to 9100 directly e.g. Telnet.

Instead of 'lpr', which may strip control characters, (use - l to avoid this), 'ftp' may be used to print. Enter 'ftp', then 'open' the interface, by entering its host name (e.g. "open bandprinter"). A file may be printed simply by sending it (e.g. "send filename"). Console commands may be used, or Scripts exist to automate this process, and create 'ftp' spool queues.

**FILTERS for FTP and LPR**

If you experience problems with print staggered across a few lines, or the page not ejecting, then you may need to use filters.

Both LPR and FTP have output filters available, which are capable of

- i) translating a UNIX line-end to a normal line-end by inserting a carriage return byte
- ii) sending a formfeed at the end of a file in order to eject a page.

PRINTING DOCUMENTS WITH TCP/IP

The means of invoking these filters differs between FTP and LPR as follows:

FTP (Line ending)

As default, FTP runs with binary file transfer. This may be changed to ASCII file transfer by simply entering the command "ASCII" on the FTP command line. When in ASCII mode, the interface will convert incoming UNIX line-ends to include a carriage return. To change back to BINARY mode, enter the command "BINARY" on the FTP command line.

FTP (Formfeed)

The interface will append a formfeed to the end of the print job if the destination file is given the name of "FEED" or "feed". E.g. to send a text file called "txtfile" to the interface in ASCII mode, and append a formfeed, the following FTP commands are used:

```
ascii
send txtfile feed
```

LPR - Filters

Filters for LPR are controlled by the name given to the remote printer parameter e.g. rp = lpaf entry in Printcap.

Many printers may be set up with different remote printer names all directed to the same interface remote host. Different types of print jobs may thus be sent to different printer names, which will then all print out on the same printer.

Note: It is the name of the local printer that is used in the LPR entry on the LPR command line to direct the print.

The remote printer names used to invoke the different filters are as follows:

- lpb - Binary files (no filters)
- lpa - ASCII files (Carriage returns at line ends)
- lpbf - Binary file with formfeed at file end
- lpaf - ASCII file with formfeed at file end

All other printer names will be treated the same as "lpb"

Setting up various TCP/IP Systems

1. Setup for Windows NT Ver 3.5 using TCP/IP

The Windows NT server must have the TCP/IP protocol installed and a valid IP address configured. Using PRINTSET, configure the interface with a suitable IP address and obtain a status page to confirm the settings.

- Double Click on 'Print Manager'.
- Click on 'Printers'.
- Select 'Create Printer'.

We must now enter the 'printer name', select a suitable 'driver' and enter a 'description'.

The box marked 'Print to:' must be opened and the option 'Other....' can be selected.

The 'Print Destinations' box shows available print monitors. Select 'LPR Port'. A box 'Add LPR Compatible Printer' requires the 'Name or address of host providing lpd.', enter the interface's IP address. 'Name of the printer on the machine.' enter the printer's name. Click on 'OK' to exit 'Add LPR compatible printer' box. Click on 'OK' to exit 'Create Printer' box.

Select the newly-created printer as the 'Default' printer and submit a test print to confirm the setup is correct.

## 2. SET UP FOR SCO UNIX AND OTHER SYSTEMS USING FTP SCRIPTS

Some UNIX systems, such as SCO, do not support the Berkeley 'lpr' print function, and using the 'rip' process is not recommended. The following scripts allow you to print from within some applications using FTP, which is supported on most TCP/IP systems. The two scripts have been tested for SCO UNIX, but may require modification for other systems. Either script can be used.

In SCO UNIX the original printer model scripts are located in directory `usr/spool/lp/model`.

The process of creating a printer using the SCO administration program (SYSADMSH) copies these files to `/usr/spool/lp/admins/lp/interfaces`. (You could place the script directly into your interface directory). Alternatively use `/usr/lib/lpadmin -p Printer -v/dev/null -i/etc/INTERFACE SCRIPT` where PRINTER is Printer name used in `lp -qPRINTER and INTERFACE SCRIPT` is the name of the file containing the ftp script.

### Script 1. General Interface program file

```
NETPRINTER="basename $0"
copies=$4
shift;shift;shift;shift;shift;
files="$*"
i=1
while [ $i -le $copies ]
do
  for file in $files
  do
    echo binary > /tmp/ftp.$$
    echo put $file >> /tmp/ftp.$$
    echo quit >>/tmp/ftp.$$
    /usr/bin/ftp -n $NETPRINTER < /tmp/ftp.$$
    /bin/rm /tmp/ftp.$$
  done
  i=`expr $i+1`
done
exit 0"
*end of script *"
```

### Script 2.

```
TEMPFILE=/tmp/ftpprint.$$
printer='kyocera'
/usr/spool/lp/model/standard "$@" >$TEMPFILE
ftp -n $printer <<EOF
send $TEMPFILE
quit
EOF
rm $TEMPFILE
exit
```

This script intercepts the print command and runs another printer interface script, in this case the printer "standard", using the same options (`$(@)`), redirecting the output to a temporary file. The script then opens an FTP session with the printer, sets binary mode and sends the temporary file to the printer. The temporary file is then removed.

Note: The name of the model and interface directories used by your UNIX system may differ from SCO.

### 3. Solaris 2.x

The procedure for setting up the Interface on a Solaris 2.x host is as follows:

1. Update Host's files with Interface's Hostname.
2. Type: `LPSYSTEM - t bsd Hostname`.
3. Then type: `lpadmin - pPrinterName - s Hostname\lpaf`
4. Type: `accept Printername`.
5. Type: `enable Printername`.
6. Print by typing: `lp -d Printername filename`.
4. SET UP FOR IBM AIX SYSTEMS (e.g. RS/6000)

AIX implements the 'lpr' function, which is set up using the utility called 'smit'.

- a) Set up the printserver as detailed in the manual. To set the IP address you can use ARP and PING
- b) Modify the `\etc\hosts` file to include the printserver, and verify network operation using `ftp` to copy a file to the printserver.
- c) Invoke `SMIT` as the super user and follow the sub menus as below:

```
select "DEVICES"
"PRINTER/PLOTTER"
"MANAGE REMOTE PRINTER SUBSYSTEM"
"CLIENT SERVICES"
"REMOTE PRINTER QUEUES"
"ADD REMOTE QUEUE"
```

You will finally see a screen as below. Fill in the data as required.

Name of Queue	Yes	First come first serve
Activate the Queue		
Will this become the default Queue		
Queue discipline		
Accounting Pathname		/USR/LP/LP
Destination Host for remove jobs		/USR/LP/AIXSHORT
Pathname for Short Filter		/USR/LP/AIXLONG
Pathname for Long Filter		LPAF Name of Device to Add
Name of Queue for Remote Printer		USR/LP/REMBAK
Backend program Pathname		

- d) Filters: specify `lpa`, `lpaf` or `lpbf` in 'NAME of QUEUE ON REMOTE PRINTER', to invoke filter.

## 5. BSD SYSTEMS (e.g. SUNOS)

On BSD Systems, information regarding Remote Host and Remote Printer is stored in the `/etc/Printcap` file, examples of which are shown below:-

```
Printer1:
```

```
: lp= : rm = LAN_PRINTER : rp = lpb : sd =/var/spool/printer1:
```

The 'BSDPRINT.SH' script will make the required entry.

## 6. SET UP FOR HP-UX SYSTEM

There are two methods of printing from HP UX. FTP and `rip` (`lpr`). Both are set up using SAM. Enter the IP and Host name in the `/etc/hosts` file before starting SAM

### FTP SCRIPT

```
Type:
lpshut
lpadmin-p{spoolername}-m{modelscript}-v/dev/null
accept {spoolername}
enable {spoolername}
lpsched
```

Then create a model script:

```
vi /usr/spool/lp/model/lan.model
```

and enter:

```
MODEL="basename $0"
REALMODEL=echo $0 /sed -e "s%$MODEL %model.lan
/$MODEL%"
```

# This variable may be initialised when the script is installed in the spooler.

```
# If not use the name:
PERIPH= if ["$PERIPH"=""]
```

```
then
```

```
PERIPH=$MODEL
```

```
fi
```

```
# Path for output of the original model
```

```
TMPPATH=/tmp/$MODEL.data
```

```
# invoke original model and write to temporary file
$REALMODEL "$@"TMPPATH
```

```
# Login to peripheral switch to binary and send temporary file
```

```
( echo user xx
```

```
echo binary
```

```
echo put $TMPPATH
```

```
echo bye
```

```
) ftp -i -n $PERIPH
```

```
ERRSTAT=$?
```

```
/bin/rm $TMPPATH
```

```
exit $ERRSTAT
```

```
* End of Script *
```

**RLP SET UP**

On the remote printer definition page of SAM use the following settings:  
(N.B. Not Network Printer)

Printer Name:	Any name
Remote system name:	Use the host name in /etc/hosts
Remote Printer name:	nothing or 'lpa' , 'lpaf' etc if using filters.
Remote Cancel Model:	/bin/true
Remote status Model:	/bin/true
Make system default:	Enter as appropriate
Printer Class:	Leave out
Restrict Cancel:	Leave out
Remote Printer on BSD system:	Leave out

Use 'lp - d printer name' to print or rlp.

**7. PRINTING TO RAW DATA SOCKET**

The interface can also print directly to Socket 9100 (decimal). This can be used in some Unix Systems which allow direct printing to a socket, or which use TCP/F (e.g. ICL Systems).

Below is a 'C' Program for Unix which prints data to Socket 9100.

```
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
#include <sys/types.h>
#include <sys/socket.h>
#include <netinet/in.h>

const char *usage="<filename> <address> [<port>]";

int main(int argc, char *argv[])
{
    unsigned short port;
    unsigned long addr;
    struct sockaddr_in inaddr;
    FILE *fp;
    int sock;
    char c;

    switch(argc)
    {
        case 3:
```

```
case 4:
    if(argc > 3)
        port=htons(9100);
    else
        port=htons(atoi(argv[3]));

    if((addr=inet_addr(argv[2]))==0)
    {
        fprintf(stderr,"%s: address must be in the forma.b.c.d\n",
            argv[0]); return 1;
    }
    if((fp=fopen(argv[1], "r"))==NULL)
    {
        perror(argv[1]);
        return 1;
    }
    inaddr.sin_family=AF_INET;
    inaddr.sin_port=port;
    inaddr.sin_addr.s_addr=addr;
    if((sock=socket(AF_INET, SOCK_STREAM, 0))<0)
    {
        perror("socket");
        return 1;
    }
    if(connect(sock, (struct sockaddr*)&inaddr, sizeof(inaddr))<0)
    {
        perror("connect");
        return 1;
    }
    while(!feof(fp))
    {
        c=fgetc(fp);
        write(sock, &c, sizeof(c));
    }
    shutdown(sock, 2);
    close(sock);
    fclose(fp);

    break
default
    fprintf(stderr, "usage: %s %s\n", argv[0], usage);
    return 1;
}
return 0;
```

## 5. Printing Documents from OS/2 LANManager and LANServer

Installing on Microsoft LANManager, 3com+ or IBM LANServer

**Requirements:**

OS/2 LANManager installed using TCP/IP or NETBEUI protocol  
HBM OS/2 Driver Software:

**NETBEUI**

1. REMPRT3, REMSTAT3 - pipe support.
2. RPRINT3, RSTAT3 - LPT redirection.

**TCP/IP**

3. REMPRT, REMSTAT - pipe support.
4. RPRINT, RSTAT - redirection of LPT.



**Introduction**

There are two methods of printing from LANManager/LANServer. Print Redirection and pipes. 'Redirection' redirects LPT1, LPT2 or LPT3 on the File Server to a Printserver. 'Pipes' allows any number of pipes on the File Server to be directed to a Printserver. Where possible choose to use the 'pipes' option as it is more flexible.

**Installation: Redirection Software**

- Copy the driver software files RPRINT3.EXE and RSTAT3.EXE to the root directory on the LANManager or LANServer file server. (RPRINT.EXE if using TCP/IP).
- Edit the file STARTUP.COM in the file server root directory and insert the following command as the last line :

```
RPRINT3 <remotename> [/portname]
```

where <remotename> is the default printserver name or the name setup using PRINTSET.

optional [/portname] designates the port that will be re-directed to the remote printer with the name <remotename>. If no optional port name is defined the program assumes LPT1.

Example lines in STARTUP.COM file:

```
RPRINT3 ACCOUNTS /LPT1
RPRINT3 SHIPPING /LPT2
RPRINT3 PLOTTER /LPT3
```

- line 1 will cause prints directed to LPT1 to be received by the interface with the remote name ACCOUNTS.
- line 2 will cause prints directed to LPT2 to be received by the interface with the remote name SHIPPING.
- line 3 will cause prints directed to LPT3 to be received by the interface with the remote name PLOTTER.

or RPRINT3 PRINTERONE

- this will cause prints directed to LPT1 to be received by the interface with the remotename PRINTERONE.

- Re-Boot the LANManager file server and check that the driver starts successfully.

All printed output spooled to this file server will be redirected to this remote printer interface.

The status of the remote printer may be obtained by typing RSTAT3 at the file server's DOS prompt.

**GETTING PRINTER STATUS INFORMATION**

To see if the remote printers are working, type the command:

```
RSTAT3
```

at the OS/2 command line.

RSTAT will return a one line status for each printer served i.e.

ITC Remote Print Servers active for LPT1 - Printer Ready  
or if the printer is busy:

ITC Remote Print Servers active for LPT1 - Printer Busy  
if one port only is redirected. If several ports i.e. LPT1, LPT2 and LPT3 are redirected RSTAT will return:

```
ITC Remote Print Servers active for LPT1 - Printer Busy
ITC Remote Print Servers active for LPT2 - Printer Ready
ITC Remote Print Servers active for LPT3 - Printer Ready
```

**Printing through Pipes**

Installing the Software

1. Place the HBM Remote print service distribution disk in drive A of your server.
2. Open an OS/2 Full Screen Command Session and create a directory for Remote Print Services on your hard disk:  
MDC:\HBMREM
3. Select TCP/IP or NETBEUI directory on A.: e.g. cd NETBEUI, and select pipes directory: cd PIPE.
4. Copy all files to the new directory from the distribution disk in drive A.

COPY A:\\*.\* C:\HBMREM

**SOFTWARE COMPONENT**

You should now have the following list of files in the C:\HBMREM directory:  
(For NETBEUI TCP/IP files are REMPRT, REMDRV and REMSTAT).

- ADDPRT.CMD - To add ports on the server
- DELPORT.CMD - To remove unused ports from the server
- PORTCHG.EXE - Program used by the above commands
- REMPRT3.EXE - Remote Print Service program
- REMBEU.EXE - Remote Print Service driver
- REMSTAT3.EXE - Printer status program

**Configuring new Printers**

This section explains how to configure new printers on a LAN Manager Server for use with the remote print service.

**Note:** You will need Administrator rights on the server to configure printers and queues.

The following pages will give you a step by step guide how to set up a new printer.

At your server, using an OS/2 full screen command session proceed as follows:

1. Change to the remote print service directory:  
CD \HBMREM
2. Create a device for your new printers using the ADDPORT command. choose a name that will help to identify the printer, maximum length 7 characters (e.g. HPLASER, SALESPR).  
ADDPORHPPLASER  
ADDPORHPSALESPR  
...
3. Follow the OS/2 procedure for installing printers and creating queues attached to the server.

**Note:** You must install and select either the IBMNULL or MSNULL printer driver. For the DEVICE to connect to, choose a port name added in step 2 above (e.g. HPLASER).

**Command Line Switches**

The REMPRT process continues to retry any connection to the Printserver by default.

/Q Quiet Mode.

This switch disables the beep warning when the printer is busy.

/H Hide Errors.

This switch disables the pop-up windows.

4. In the Remote Print Service directory 'HBMREM' create an initialisation file called REMPRT.INI. This file is used by the remote print service at startup time and assigns the remote printer names to the device port names. The format of the file is as follows:

<Printer name> <Device Port> </Q> </H>

Example:

```
NP_123456 HPLASER /Q /H
NP_654321 SALESPR /Q /H
....
```

5. Edit your STARTUP.COMD file and add the following line at the end:

```
\\HEM\REMPRT3@REMPRT3.INI
```

This will ensure that the remote print service is initialised each time you start the server. If you wish to start the print service manually, you can execute the REMPT3.EXE file from the OS/2 command prompt.

6. Using the LANManager Administration facility (NET ADMIN) add newly created printers to your list of shared resources.

7. REMSTAT3

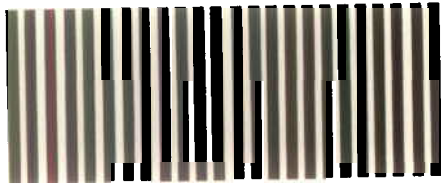
This program provides status on the REMPT3 processes.

e.g. ITC Remote Printers active for SALESPR - Printer Ready  
ITC Remote Printers active for HPLASER - Printer Busy.

It is also possible to kill the REMPT process. The command syntax is REMSTAT3 /K.

This then asks "Kill Y/N" for each REMPT process listed.

Note: Cannot kill process while it is printing.



## 6. Printing from the Apple

Note: This printserver only supports printers for which an Apple driver has been provided by the printer manufacturer or which is already supported by a standard configuration of the Apple system, i.e. when using the Apple Laserwriter driver. Standard Adobe Postscript level 1 printers will work in conjunction with the particular printserver if it has EtherTalk protocol implemented.

Epson printers have various drivers for the Apple system, most of which will be supported by the printserver but not necessarily all of them due to the use of different types of protocols in those particular drivers. You should contact your Epson dealer if you find incompatibilities.

### EtherTalk Zoning

New from factory, or after being reset to factory defaults, the LAN printer interface will be seen on all EtherTalk zones, with a printer name of "NPxxxxxx", where xxxxxx is a 6 digit number, unique to every interface.

### Setting a zone for the printer

Zoning and naming of the printserver may be carried out by means of the ITC PRINTSET utility which may be used from any Apple Mac attached to the network, operating system 7.x.x.

An Apple Mac formatted disk is supplied with the unit. Install this disk onto an Apple Mac System connected to the Network.

**Installation of MPSET (PRINTSET)**

To install the software, simply copy the folder on the disk on to your hard disk on the Mac.

**Running the Network Printer Management Software**

Click the MPSET folder and run the MPSET Program by clicking it.

The first screen will give you a list of printers found by the Management Software on your Network. Use the Mouse to select the printer you require. Then press the Apple button to configure printer name and zone.

**Selecting your Printer**

1. Activate the Chooser from the Apple menu.
  2. Select the icon which represents your printer driver (LaserWriter).
- If the appropriate printer icon does not appear in the Chooser, the printer resource files are not correctly installed. See the Apple documentation for instructions on installing the printer resource files on your Macintosh.
3. If EtherTalk is not active, an alert dialog box appears on your screen. Choose OK. The Active button will turn it ON.

If your network is linked to other networks the AppleTalk Zones list box appears in the Chooser. Zones are groups of users, machines and devices. They can be grouped by physical location (for example zone A may contain all the printers on the network in building A), but may also be grouped by logical zones (for example, all printers used in the Finance Department).

4. If applicable, choose the zone in the AppleTalk Zones box where your printer is located. (You may need to scroll through the zones to locate the one you want). By default, the Interface will appear in the default zone. Use Printset to change zones.
5. Select the printer name you want to use in the peripheral names list.

If the printer's name does not appear in the peripheral names list, make sure that your printer is turned ON and that the printer cable connections are secure. Ensure EtherTalk is selected in the Networks menu. NB: NOT LocalTalk. A READY message should appear if the printer has a control panel display. See the Troubleshooting chapter for more information.

If your printer is the only name listed in the box you must still select it. Your printer will remain selected until you choose a different printer with the Chooser.

For System 6.x users, if you would like to display your user name on the network when you are printing documents, enter your user name in User Name in Chooser. The user name identifies the Macintosh that sent the print job; entering a user name does not affect your printer selection.

For System 7.x users, go into the Control Panel on your Macintosh, select sharing Setup, then enter your owner name.

6. Click the Close box to exit the Chooser.
7. Print your document.

**To Verify the Configuration**

1. Select one of the following from the file menu (the selection depends upon your configuration):
  - for System 6.x, choose Print Director
  - for System 7.x choose Print Window or if no window is open, choose Print Desktop
2. Click Print.

If your printer prints the job, you have connected your printer to your network correctly.

**Replacing an Internal Network Option Card**

If it is necessary to replace the internal Network option card on the EtherTalk network, follow these procedures:

1. Replace the internal Network option card following the installation instructions supplied with the interface.
2. Rename the printer, refer to the manual section 'Constant Memory Option'.
3. Use the Chooser to reselect your printer, refer to the 'Selecting Your Printer' section earlier in this chapter.

**Removing Printers from Ethernalk Networks**

1. Ensure the printer is not servicing a job.
2. Turn off the printer.
3. Disconnect the network cable from the back of the printer.
4. Notify the users that a new printer must be selected in the Chooser.  
You have removed the printer from the network.

## 7. DEC LAT

**Overview of Operation**

The printserver supports the DEC LAT (DEC LOCAL AREA TRANSPORT) protocol. When the protocol is correctly configured it will allow printing from any VMS system on the network. Most users who are familiar with the general principles employed in setting up a port on a DEC terminal server will be able to configure the printserver with ease.

Before configuring the DEC host have the printserver name available, this can be obtained by printing a status sheet after installing the device with your printer.

**Set up of Printserver**

Every printserver will be supplied with a unique name; either use this name or change it to reflect your site's node naming convention.

To set the printserver name use the NOVELL management utility supplied or, if a NOVELL client is not available, refer to the Constant Memory chapter for more information on setting this parameter.

**Configuring the DEC host**

In order to print to a printserver the LAT protocol must be installed and running on the host machine you wish to print from.

DEC LAT

Create a LAT port using the following VMS and LATCP commands (for example):

```
$ MC LATCP or $ run sys$system:latcp
> create port lta500:/application>
set port lta500:/node=np_141516/port=Port_1>
exit
$
```

where:

```
$ = VMS Prompt>
= LATCP Prompt
500 = LAT PORT number of your choice
np_141516 = Printserver name
```

Edit the file `lat$sysstartup.com` to ensure the port is recreated at boot time. For versions of VMS before 5.5.x the file may be called `LTLOAD.COM`. Check with your System Manager for more details.

#### Set terminal characteristics

Use the following VMS command to set the characteristics, generally these settings allow most files to print correctly.

```
$ set term LTA500:/passall/pasthru/tab/form/perm
```

#### Initialise a VMS queue

```
$ init/queue/start/proc=latsym/on=lta500: TESTQUEUE.
```

This VMS command will create and start a queue named `TESTQUEUE`. Other options such as `/retain=error` or a specific printer form may be required; ask your System Manager for details. You can look at the queue using the VMS command:

```
$ show/queue TESTQUEUE /full
```

You should now be able to print to the queue `TESTQUEUE`

```
$ print/queue=TESTQUEUE anyfile.txt
```

## 8. Workgroups Printing System

### Before you start

This guide takes you through the various steps necessary to install and configure the HBM Workgroup Printing System. By installing and configuring this software you will be able to access your printer over your network cabling system. Workgroups Printing System is designed for stand alone Windows for Workgroups Systems or Workgroups connected via TCP/IP to other Networks.

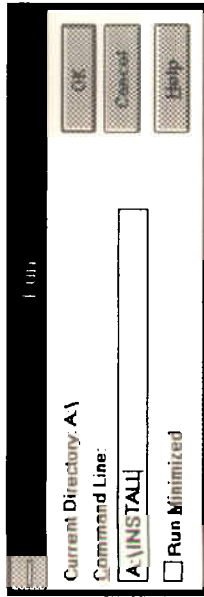
*! Do not install Workgroups Printing System if you are using a second Network, for example NOVELL. You can easily print by redirecting LPT ports to a NOVELL QUEUE.*

There are three parts to loading the Workgroup Printing System. Part 1 requires you to load all the software from the distribution disk supplied with the HBM network interface. Part 2 requires you to install the TCP/IP-32 software that was copied to your hard disc during Part 1 of the installation. Part 3 requires you to configure Workgroups for your printer. At the very least we recommend you read the section entitled IP address and how to use them. This small section discusses IP addresses and how they work.

### PART 1

- Start your Windows for Workgroup software by typing WIN at your DOS prompt.

- Once Windows has started Click on "File" at the top of the Program Manager screen.
- Now click on "Run" and type in A:\INSTALL. Once you've done that, click on the "OK" button.



At this point your computer will look at your floppy diskette drive for the install program. Once it has located it you will have to wait a few seconds before the screen clears and the following appears:



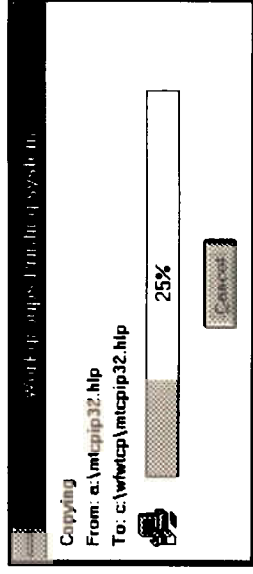
You now have two options, you can install the ITC Workgroups Printing System by clicking on the "Install" button, or alternatively, you can cancel the software installation by clicking on the "Don't Install" button.

- As we wish to install the Workgroup Printing System software we will click on the Install button. This will produce the following screen:

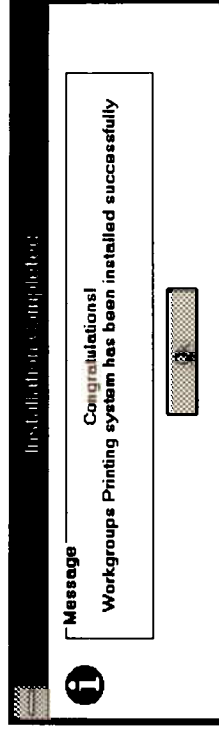


We must now tell the installation software where we wish to install the software. The default directory that we recommend you use is WFWTCP. You can change the directory name if you wish.

- Once you are happy with the directory name that the Workgroup printing System software will reside in click on the "OK" button.



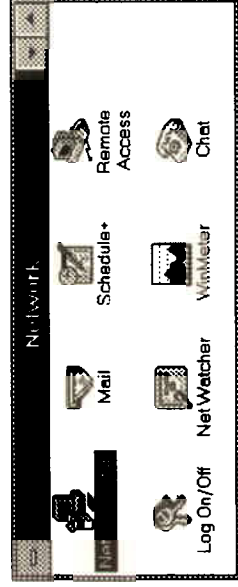
A screen similar to the one above will be displayed. As the software is installed the percentage readout will increase. Once all of the software has been copied onto your computer the following screen will appear:



- You have now completed Part 1 of the installation process. Click on the "OK" button to continue with Part 2.

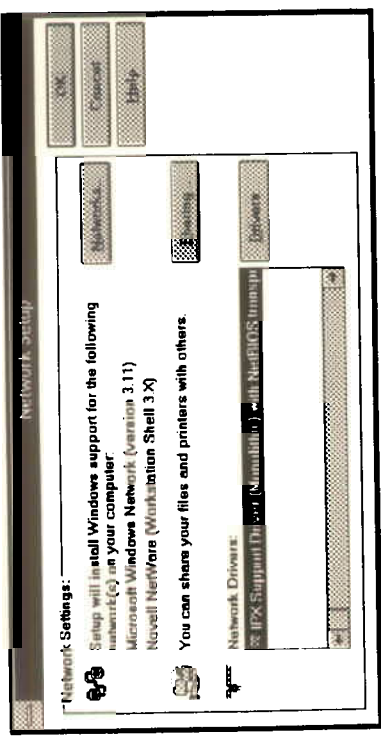
**PART 2**

We must now configure your Workgroup system to use the TCP/IP software that is now on your hard disc drive. To do this we must run the Network Setup program that resides in your Network Folder.



If you already have a version of TCP/IP running on your system, skip this part and reboot your PC. Workgroups Printing System should still operate, providing the TCP/IP is Winsock.dll compatible.

- Double click on the Network Setup Icon to display the following screen:



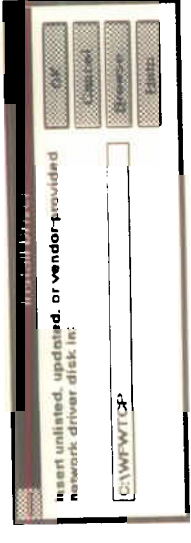
- We must now tell Workgroups to use the Microsoft TCP/IP protocol. To do this we must click on the "Drivers" button.

By clicking on the drivers button a screen similar to the one below will be displayed:

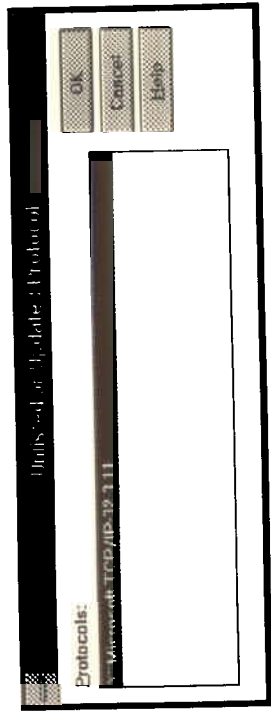


As the Microsoft TCP/IP protocol isn't supplied with Workgroups for Windows as standard we must select the "Unlisted or Updated Protocol" option. By selecting this option we can force Workgroups to look at either the floppy diskette or hard disc drive for additional protocols.

- Click on the "OK" button to select the Unlisted or Updated Protocol option, and enter the name of the directory that you specified at the beginning of this installation.

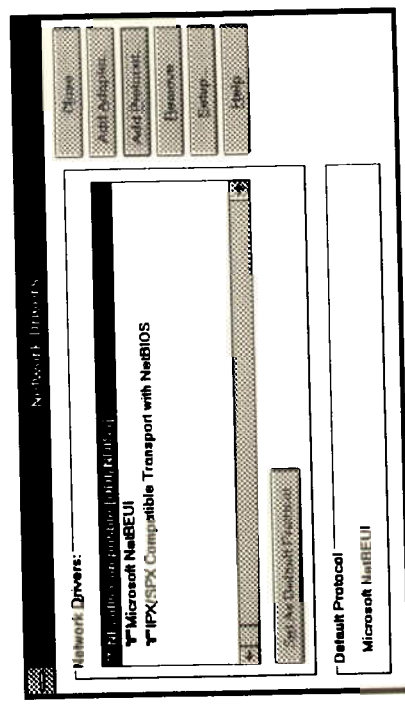


- This will force the installation software to look in the directory name that we have specified. Once you click on "OK" the following screen will be displayed:



The installation software is telling us that it has found a protocol driver called "Microsoft TCP/IP-32 3.11" in the directory that we specified.

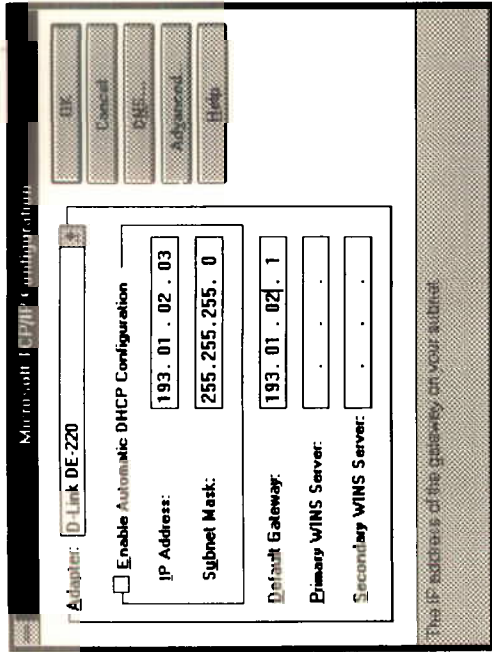
- As this is the protocol that we wish to use we simply click on the "OK" button.



After a few seconds (depending on the speed of your computer) the Network Drivers screen will be displayed. As you can see from this screen, we have gained a protocol, namely the Microsoft TCP/IP protocol.



We must now configure the protocol so that it can work with our computer. To do this, highlight the Microsoft TCP/IP-32 3.11 line and click on the "Setup" button. This will display the following screen:



As we are using the TCP/IP protocol we must supply an IP address. The IP address must be unique to your computer. At this point we strongly recommend that you talk to your System Administrator for a valid IP address. If you use an IP address that is already being used by another person on your network, you will cause problems for your Network Administrator.

Do not type in the IP address shown. The computer IP address 193.01.02.03 is there only for illustration purposes.

- If your Workgroup is not connected to any other IP System, use an IP address in the range 11.22.33.1 to 11.22.33.250 (not 11.22.33.44!)
- Once you have obtained and entered a valid IP address, click on "OK".
- You will then go back to the Network Drivers screen. Click on the "Close" button which will take you back to the main Network Setup screen. Now click on the "OK" button to exit the Network Setup options.

As you have changed the way that Workgroups works, your computer must now modify some of its system files. This will happen automatically, however you will be warned that various files are being modified.



This screen tells us that the SYSTEM.INI, WIN.INI and PROTOCOL.INI files are all being modified. As Workgroups modifies the files it creates backup copies of all files that it changes. In this case a backup of the SYSTEM.INI file is created called SYSTEM.002; a backup of the WIN.INI files is created called WIN.001 and a backup of the PROTOCOL.INI file is created called PROTOCOL.002. If you encounter problems with the TCP/IP software then you can always put your system back to its original state by renaming the various backup files back to their original state.

Once Workgroups has finished telling you which files it is making backup copies of, you will have to re-boot your Workgroups software. This will happen automatically:

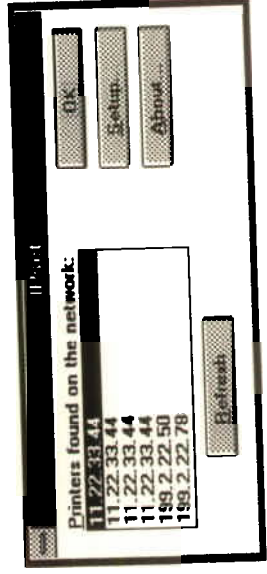
- Click on "Restart Computer" and watch your PC re-boot Windows.

**PART 3**

All we have to do now is tell Workgroups that there are some printers out there to be serviced. The first step is to give the Printer an IP address. If your computer has an address 11.22.33.xx then you can use the IPSET utility, otherwise refer to the TCP/IP chapter for details of setting an IP address from a UNIX host etc. (ARP, PING). IP Set Utility is located in the Control Panel program which is in the Main group.

- Double click on the "IP set" Icon.

After a few seconds a screen similar to the one below will be displayed:



This screen tells us that the IP set software has found some networked printers. As four interfaces have the same IP address, these have to be set up one at a time i.e. power up only one of them, configure, and power off.

N.B: The units with 199.2.22.xx can only be configured by a computer with address 199.2.22.xx.

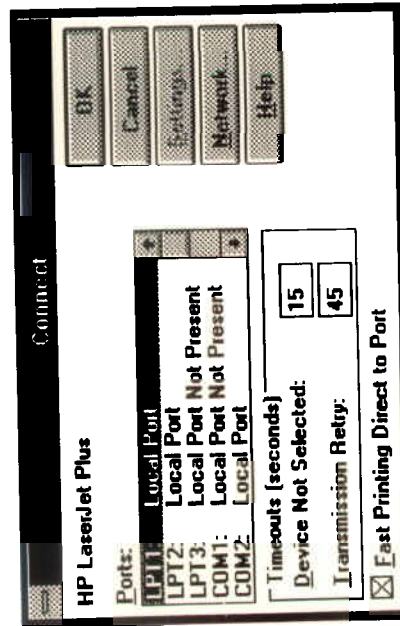
- To setup an IP address, highlight the current IP address, and click on 'setup'.
- This displays the current IP address and a box to type in the new IP address. Then click OK.

Once you have finished registering your IP address click on the "OK" button. This will return you back to the Control Panel screen.

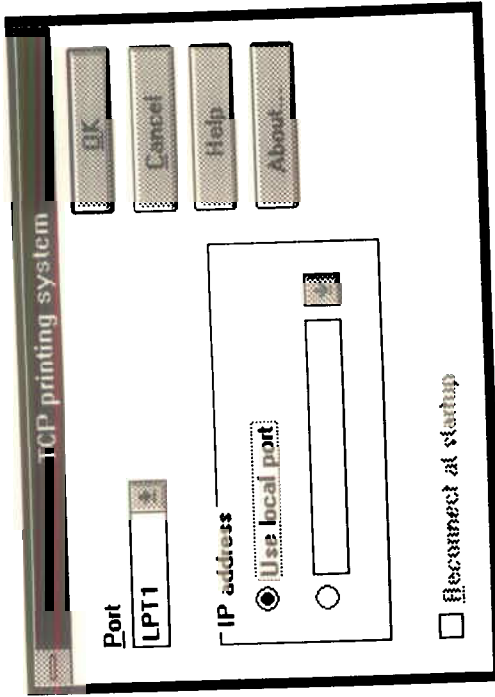
All we have to do now is configure our printer to use the IP address that we have setup on the Interface. To do this we will have to double click on the Printers icon which you'll find in the Control Panel.

Workgroups Printing System works by redirecting LPT1, LPT2 or LPT3 to an IP address of a Printer. Therefore we have to tell Workgroups which LPT port is to be redirected to which IP address.

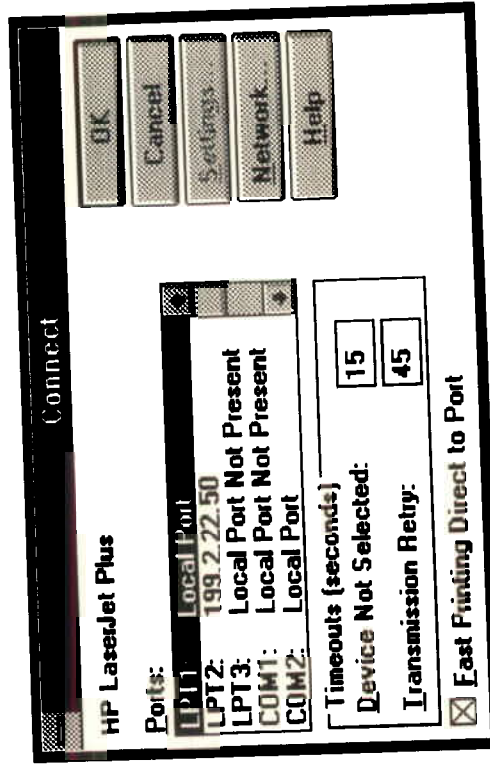
By clicking on the 'Connect' button the following screen will be displayed:



At the moment LPT1-3 are local ports. Select 'Network' button to set them up for IP address from the next screen, select the 'Other' and the TCP/IP printing system dialogue box will be displayed.



Select the LPT port you wish to redirect and then select 'IP address' to view a list of network printers. Highlight the IP address and click 'OK' until you are back to the 'Connect' screen. This now displays LPT2 and IP address as below:



Your Workgroup System is now configured. Printing is in the normal way - select a driver, connect to LPT2 and the print will appear on the network printer.

## 9. Printing Documents from Windows NT

### Installing on Microsoft Windows NT

#### Requirements:

Windows NT installed with DLC protocol and HP Network Monitor Program.

**Installation for Windows NT:**

- Run Windows NT.
- Double click on the Control Panel icon.
- Double click on the Networks icon.
- Click on the Advanced box
- Install the DLC Transport and Driver by choosing Install Software whilst in the Advanced Network screen.
- Reboot your system for the installation to take effect

Note: To verify that the DLC protocol is installed correctly you can look at the list box of installed Network Software of the Networks dialogue box.

Note: "32 Bit Disk Access = OFF" must be set in SYSTEM.INI & CMOS Set up, for correct operation.

**How to Configure a Printer for NT**

- Select Print Manager from the Main group.
- Choose Create Printer from the Printer menu at the top of the screen. The Create Printer dialogue box appears.
- Enter a name for the printer in the Printer Name field.
- Select the print driver from the Driver pull down menu.
- Select Other from the Print to pull down menu. The Print Destination dialogue box appears.
- Choose the HP Network Port from the Available Print Destinations list. The Add an HP Network Peripheral Port dialogue box appears.

Note: If HP Network Port does not appear as a choice in the dialogue box, then the DLC Transport Protocol and Driver are not installed. Go to the Installation for Windows NT section above for detailed installation instructions.

- Enter a name for the port in the Name field (Caution! The name must not be identical to an existing port, such as LPT1, or any other existing DOS device).
- Select the LAN Hardware Address (Node Address) from the Card Address pull down menu. This address matches the one listed under node number on the Status Page.

Note: Only unconfigured or unassociated printservers will display their node number, so once it has been configured it will disappear from the list.

- Click OK to exit the Add a Network Peripheral Port dialog box.

Note: You may share the new printer if you wish. To do so, click Share the Printer on the Network box. The share name defaults to the printer name and can be changed if necessary.

- Click OK to exit the Create Printer dialogue box. A dialogue box from the selected model's device driver appears.
- Set any printer-specific options, and click OK.
- You are now ready to print.



### Setting up various TCP/IP Systems

#### 1. Setup for Windows NT Ver 3.5 using TCP/IP

The Windows NT server must have the TCP/IP protocol installed and a valid IP address configured. Using PRINTSET, configure the interface with a suitable IP address and obtain a status page to confirm the settings.

- Double Click on 'Print Manager'.
- Click on 'Printers'.
- Select 'Create Printer'.

We must now enter the 'printer name', select a suitable 'driver' and enter a 'description'.

The box marked 'Print to:' must be opened and the option 'Other....' can be selected.

The 'Print Destinations' box shows available print monitors. Select 'LPR Port'. A box 'Add LPR Compatible Printer' requires the 'Name or address of host providing lpd.', enter the interface's IP address. 'Name of the printer on the machine.' enter the printer's name. Click on 'OK' to exit 'Add LPR compatible printer' box. Click on 'OK' to exit 'Create Printer' box.

Select the newly-created printer as the 'Default' printer and submit a test print to confirm the setup is correct.

## 10. PRINTSET

### INTRODUCTION

PRINTSET is a set of programs that run on a DOS/WINDOWS PC, UNIX host, Windows NT, or an Apple Macintosh. It allows the viewing and configuration of the LAN Printer Interface.

The DOS/Windows PRINTSET programs use IPX/SPX to communicate between workstations and Interfaces, so they are ideally suited to Novell networks, although they can be used on any other network providing IPX is loaded on the Workstation running PRINTSET. UNIX PRINTSET uses UDP, and the AppleMac version uses EtherTalk.

### SET UP UTILITY DISKETTE

A Setup Diskette is distributed with every LAN Printer Interface. This contains the following software:

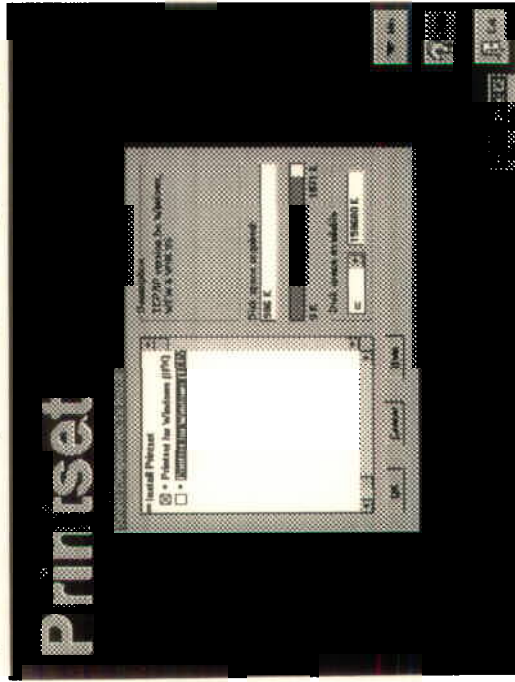
Directory	Contents
DOS	Dos PRINTSET
LanMan OS2	LANManager/Lan Server OS/2 drivers
Windows	Windows PRINTSET (for Win 95, WFW/NT and UNIX PRINTSET)
UNIX	UNIX Install Scripts
Docs	Various support documents

Apple Mac PRINTSET is distributed on a Mac formatted disk.

**PRINTSET FOR WINDOWS**

To install the Windows version of PRINTSET follow these steps:

- Step 1 - Insert 'setup utilities diskette' in drive A.
- Step 2 - Install by typing a: windows\install in the Run option from the file menu of Program manager.
- Step 3 - Wait while setup initialises, and then gives a configuration screen.



Select PRINTSET files and if you haven't got them, ODI files for Network Card.

Step 4 - You can change the installation directory from the default c:\PSET as well as the installation options below:

Step 5 - Install copies of all the necessary files to the installation directory (default c:\PRINTSET).

Step 6 - Setup then creates a new Group, PRINTSET for Windows (IPX or TCP/IP), and places the PRINTSET icon within it.

Step 7 - Run PRINTSET.

• Tips:

- It is important to use IPXODI for IPX PRINTSET, especially on a Token Ring Workstation.

Example of Autoexec.bat entry for using IPXODI drivers.

```
C:\printset\Lsl.com
C:\printset\Token.com
C:\printset\IPXODI.com
```

- If, when using WFWG, you experience problems seeing printservers in networks other than your 'local' one, then set the frame type for IPX/SPX using Network Setup. This is done by highlighting the IPX/SPX protocol and selecting 'setup', then choosing 'frame type' from the list and entering the correct type, e.g. Ethernet II.

- You may experience problems using VLMs and WFWG, with PRINTSET. This is due to NWLINK not supporting all APIs used by PRINTSET. To overcome this Novell recommend using the IPX Monolithic driver instead. For more information refer to 'ISSUES.DOC' on the set up diskette.

**INSTALLING PRINTSET FOR DOS**

To install Dos PRINTSET, TYPE A: INST\_DOS C:  
The appropriate files will be copied to C:\PRINTSET. To run PRINTSET, TYPE 'PSDOSN'.

**INSTALLING APPLE MAC PRINTSET**

To install on the Apple Macintosh, insert the Mac disk into the drive.  
Copy the Mac PRINTSET folder onto your hard disk. Run PRINTSET by double clicking the icon.

**INSTALLING UNIX PRINTSET**

This is supplied in TAR format, as source code, and has to be built for each system.

System requirements are: C++ compiler

See documentation accompanying disks for full installation procedure.

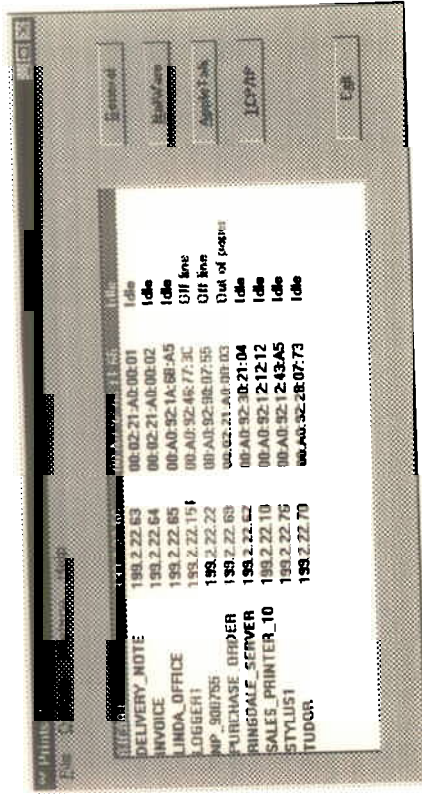
**INSTALLING THE PRINTSERVER TO THE NETWORK**

The Interfaces should be installed onto the network as follows:

1. Connect the printserver to the correct network topology.
2. Power on the printserver and allow one minute for the unit to stabilise (external units).
3. Connect the parallel or serial cable from the printer to the printserver.
4. For internal printserver cards power the printer on.
5. Obtain a status sheet.
6. The status page gives you the required information for the IPAddress, Novell printserver name, and operating mode.
7. The PRINTSET program will list the printserver name, its IP number and the printer's status. This information appears in the main PRINTSET Windows Screen. You should allow a few minutes for the initial information to be presented on the screen.

**PRINTSET MAIN MENU**

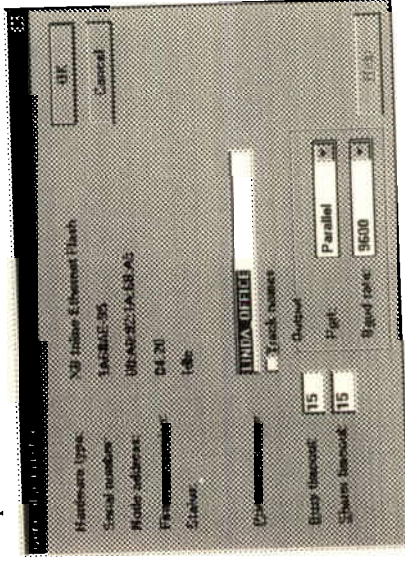
On the main printserver summary screen the **current printserver configuration** information will be shown as below:



The printserver information is updated every five seconds and will display the current printer status.

**CONFIGURING THE PRINTSERVER FROM THE PRINTSET MAIN MENU**

On the main screen there are four Windows buttons in the configuration mode. When the general parameter button is selected the following screen will appear. From the general printset screen the following information can be viewed:



PRINTSET

**Hardware Type:** The printserver hardware type. e.g. Ethernet Inline. will be displayed in this field.

**Serial Number:** The printserver has a unique serial number which will appear in this field.

**Version:** The printserver's firmware level is displayed in this field.

**Node:**The Ethernet/Mac address of the printserver.

These settings can be changed:

**Printserver name:** The general printserver name, used for DEC LAT and LANManager systems.

**Busy Timeout:** Time in seconds before printer busy signal is notified as an 'off line' state.

**Sharer Timeout:** Timeout between sharer port inactive and switching to the network port (where applicable).

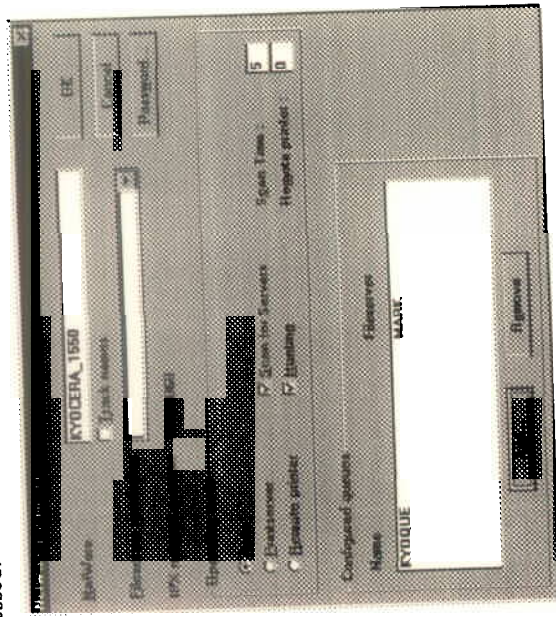
**Output:** On external boxes, either serial or parallel (default) printer ports can be selected.

**Baud Rate:** Serial port baud rate (input or output).

Once you have made any changes within the printserver general parameters the information should be saved. Any changes will be updated to the printserver and the main menu will show new information, a few refreshes later.

CONFIGURING NETWORK PARAMETERS (IPX Version)

By selecting the Network button the printserver Novell configuration screen will be accessed.



PRINTSET can automatically add printservers and queue information on the file server, avoiding the need to run PCONSOLE.

PRINTSERVER NOVELL CONFIGURATION

**Printserver name:** Current Novell printserver name which can be modified to any name up to 32 characters. This will be used to update the file server.

**Network Number:** For information only.

**Track printserver name:** This links the general printserver name with the Novell name (as they can be different). The general name is displayed on the main screen.

**Restrict file server:** This limits the file servers that the printserver can log on to, to one particular server - useful if there are more than fifty file servers.

**Scan for servers:** This enables/disables a regular search of file server binderies for printserver presence, allowing automatic logging in as soon as a change is made.

**Scan interval:** This sets an interval for the automatic search in minutes.



**OPERATING MODE**

**Auto:** Auto switches between printserver mode and remote printserver mode. (if a printserver of the same name is already present).

**Printserver:** Printserver only.

**Remote printer:** Powers up as remote printer only

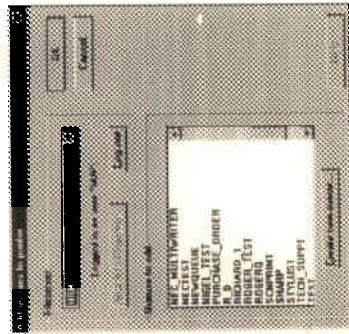
**Remote printer Number:** Number = 0 to 15.

**Hunting:** On = Find next free printer if specified remote printer number is not available.

Off = only logs into specified printer number.

**Configuring queues:**

Select the Add button to assign specific file servers/printservers to various queues.



Select file server to attach to selected queue or add new queue and queue priority.

ADD - Add Queue  
CLOSE - Cancel.

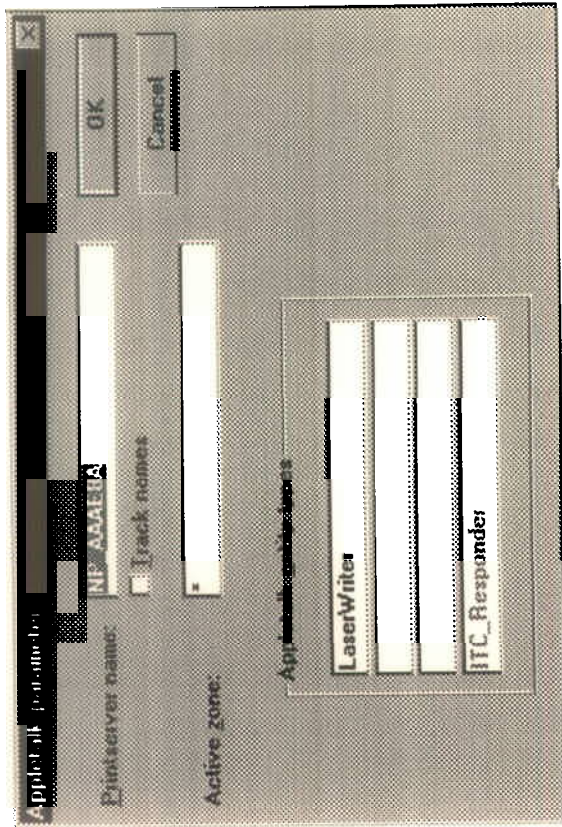
Use 'Login Server', if highlighted, to login in to Selected Server.

**PASSWORD**

Password is defined in PCONSOLE. i.e. login password for printserver, no configuration will be allowed unless passwords match. The default is equal to no password enabled.

**CONFIGURING APPLTALK PARAMETERS**

By selecting the AppleTalk button the printserver Apple configuration screen will be accessed.



**PRINTSERVER APPLE CONFIGURATION**

**Printserver name:** Apple name (as appears in Chooser) can be separate from Novell and General name.

**Active Zone:** Enter specific zone that the printserver is to operate in. \*On the Mac PRINTSET, this box lists active zones and the specific zone is selected from the list.

**AppleTalk Entity Types:** Laserwriter and ITC responder are fixed entities. Laser Shared entity can be added for Apple share printserver support etc.

Any changes that are made in the printset Apple configuration must be saved.

**CONFIGURING TCP/IP PARAMETERS**

By selecting the TCP/IP button the printserver TCP/IP configuration screen will be accessed. The following screen will appear:



**PRINTSERVER TCP/IP CONFIGURATION**

IP Address: Enter new IP Address.

Subnet mask:

This allows the Interface's subnet mask to be set to match that of the network that it is located in; particularly important if the 'local' part of the mask is not 0.

Auto IP Address: When this facility is set to OFF you are unable to automatically change the IP Address utilising the PING or ARP facility.

Example of PING and ARP commands:

- a. Enter command ARP-S IP ADDRESS Ethernet address  
e.g. ARP-S 133.200.3.181 00:02:21:10:45:93
- b. PING the new IP address  
e.g. PING 133.200.3.181

**MENU ITEMS**

**File:**

This menu has an 'Exit' option to end the program.

**Options:**

This menu has 3 options, select networks, setup alert sounds and preferences.

Select Networks ...

**SELECTING NETWORK SEGMENTS (NOVELL)**

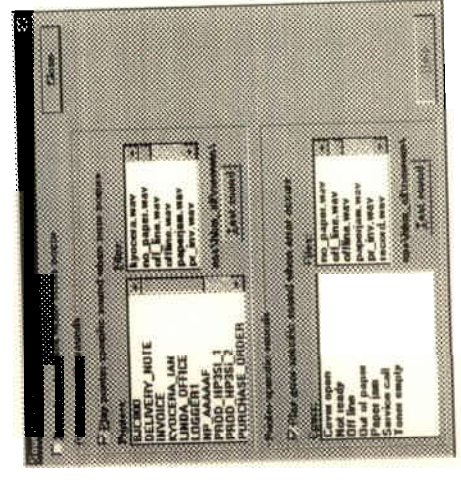
By default, only the Printservers in the local segment will be displayed. To select other network segments to view, go to the Options Menu. Then select 'Networks' and highlight selected network segments to view.

For selection of Networks, 'Select All' will select all listed networks, and 'Clear All' will clear all current selections.

Click OK to save changes, CANCEL to exit without modification. The screen should refresh and show Printservers in the selected segments.

Setup Alert Sounds ...

This item displays a dialogue box, as below, which allows a variety of sound to be mapped to different printer states and also to different printer names. Therefore, if a printer goes offline, for instance, it is possible to sound a specific alert for that printer, followed by an alert for the offline condition. Any WAV file can be used, including speech (WAV files with the printer states spoken are included).



## PRINTSET

if both Printer Sound and Error Sounds are enabled then error sounds will only be played if a Printer Sound has been specified for the printer in error. This prevents error sounds being played without associated printer sounds.

### Preferences ...

This allows the screen refresh rate to be adjusted. Normally it is 6 seconds.

### Interface

This menu item allows the user to Download New Firmware to the PRINTSET Interface. Thus it is possible to upgrade the Interface in-situ and from within PRINTSET. Firmware updates are supplied in the form of .DLD files and are printed to the Interface via Novell queues. The Interface must already be configured as a Novell printserver or Remote Printer, for the download to work. Once the download is completed, the printer will have to be power cycled to continue.

### Help

#### About ...

This provides version information for PRINTSET.

### CONFIGURING PRINTSET NT TCP/IP Version

Although fundamentally the same as IPX/WINDOWS PRINTSET, the TCP/IP version has a few differences, as follows:

1. Netware menu doesn't configure queries etc on Novell File Servers.
2. Printservers with default IP address (11.22.33.44) can not be configured. Use ARP and PING to configure initially.
3. Download feature is not available.

## 11. Windows 95 Printing System

### Before you start

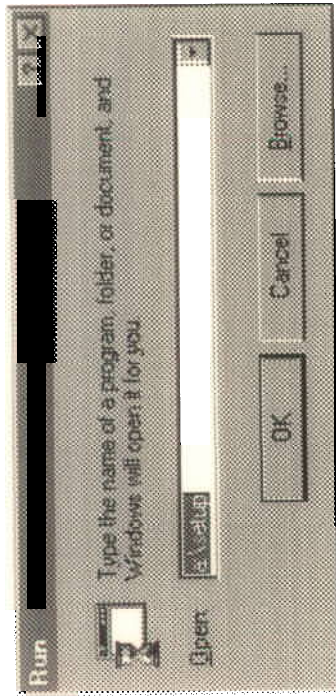
This guide takes you through the various steps necessary to install and configure the IBM Windows Printing System. By installing and configuring this software you will be able to access your printer over your network cabling system. Windows 95 Printing System is designed for stand alone Windows 95 Systems or Workgroups connected via TCP/IP to other Networks.

There are two parts to loading the Windows 95 Printing System. Part 1 requires you to load all the software from the distribution disk supplied with the IBM network interface. The second part requires you to configure Windows 95 for your printer. At the very least we recommend you read the section entitled IP address and how to use them. This small section discusses IP addresses and how they work.

### PART 1

- Start your Windows 95 software.

- Once Windows has started Click on "START"
- Now click on "Run" and type in A:\SETUP. Once you've done that, click on the "OK" button.

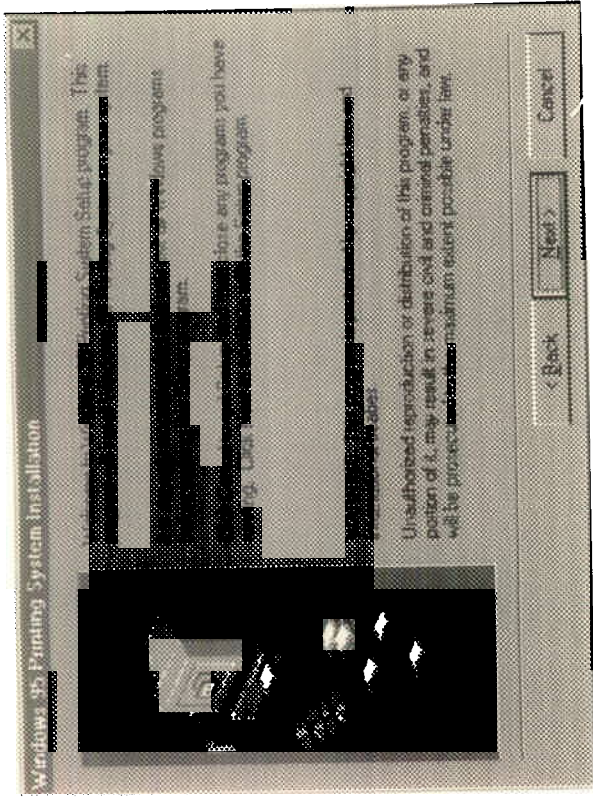


At this point your computer will look at your floppy diskette for the setup program. Once it has located it you will have to wait a few seconds before the screen clears and the following appears:

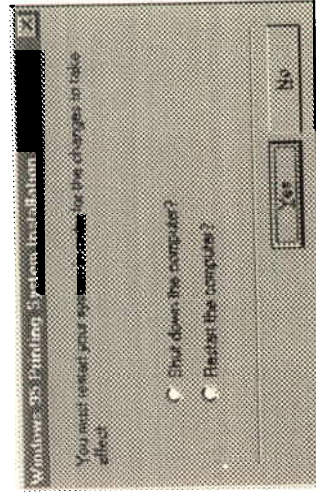


You now have two options, you can install the ITC Workgroups Printing System by clicking on the "NEXT" button, or alternatively, you can cancel the software installation by clicking on the "CANCEL" button.

As we wish to install the Workgroup Printing System software we will click on the NEXT button.



Now you will see different indicators of your system performance. As the software is installed the percentage readout will increase. Once all of the software has been copied onto your computer the following screen will appear:



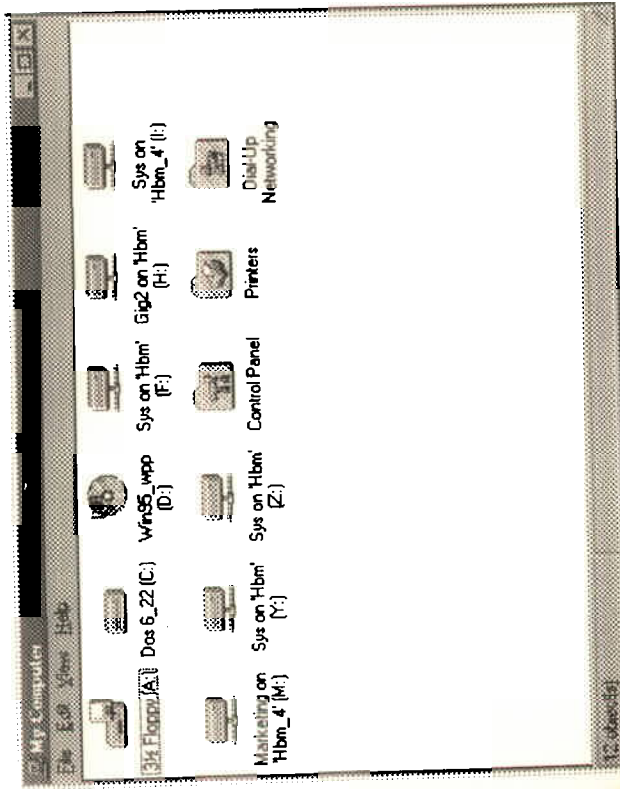
Now you have to restart the computer. Click on the restart field.

- You have now completed Part 1 of the installation process. Click on the "YES" button to continue with Part 2.

**PART 2**

After restarting the computer click on the "My Computer" icon.

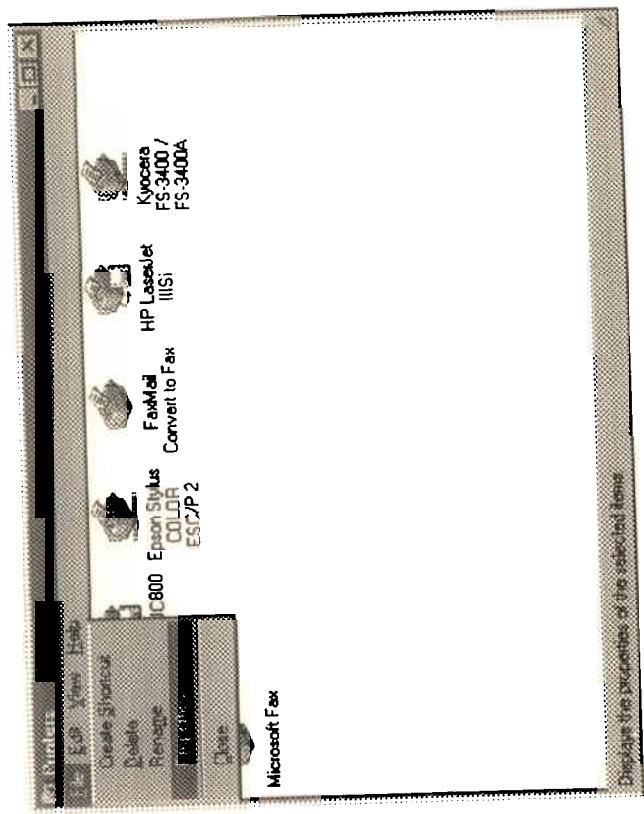
By double clicking on the icon button a screen similar to the one below will be displayed:



Select the **PRINTERS** icon and by double clicking a screen similar to the following will be displayed. Select the printer you want to configure, and choose under **FILE** the option **PROPERTIES**.

**!! TIP !!**

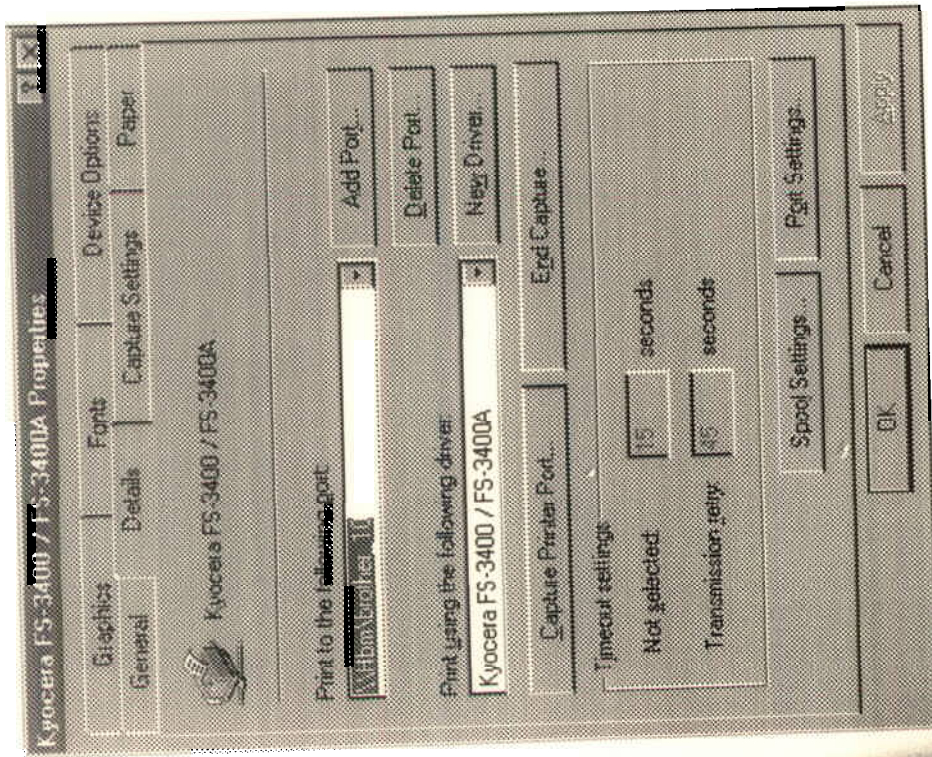
By clicking on your right mouse button the same display can be produced.



All we have to do now is tell Windows 95 that there are some printers out there to be serviced. The first step is to give the Printer an IP address. If your computer has an address 11.22.33.xx then you can use the DETAIL utility.

- Click on the "DETAILS" icon.

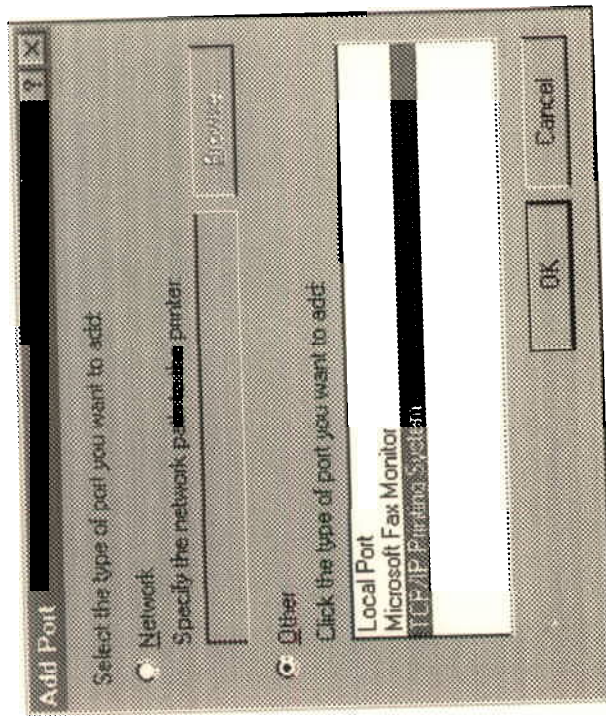
A screen similar to the one below will be displayed:



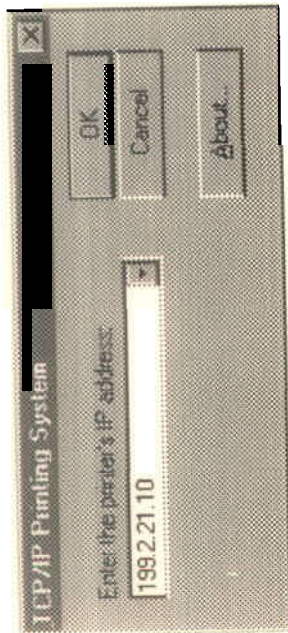
This screen tells us that the IP set software has found the networked printer.

- Click on 'Add Port...'
- This displays the 'NETWORK' or 'OTHER' version. Click on the 'OTHER' and highlight TCP/IP Printing System.

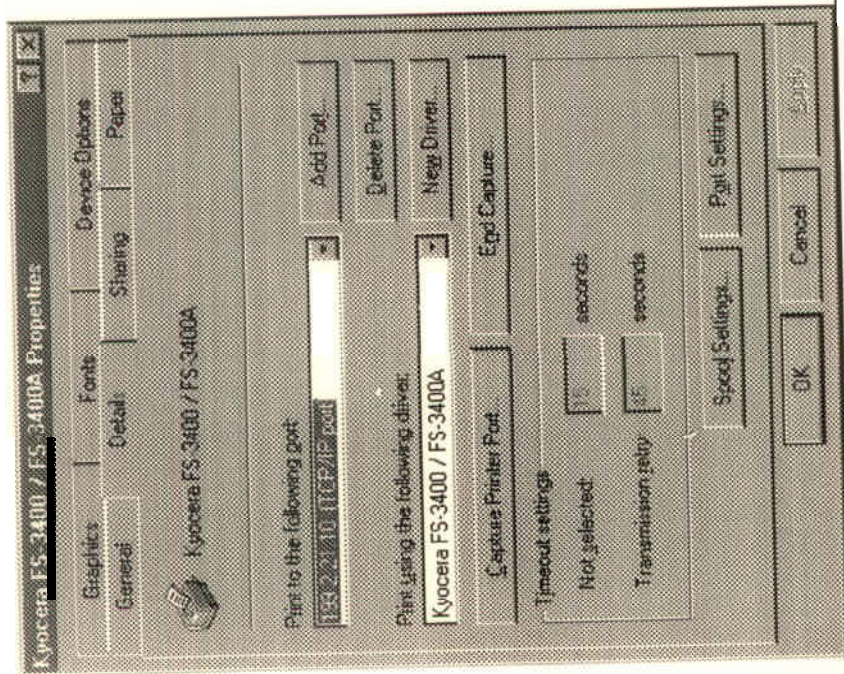
Once you have finished registering your IP address click on the "OK" button.



All we have to do now is configure our printer to use the IP address that we have setup on the Interface. To do this we will have to write in the printers IP address. Ensure the printer is switched on and accessible from the network.



Your Windows 95 system is now configured.



## 12. Reprogramming of Flash EPROM

### How to update the program for LAN products using Flash EPROM

HBM Flash LAN printserver products have an on-board reprogramming capability. The following technique should be used whenever the firmware is to be updated.

1. Obtain the new firmware in the form of a computer file. The latest firmware may be found on the HBM dial-up bulletin board. This will be found under the main section "LAN". From there, choose either the Token Ring or Ethernet subsection, and then select "FLASH PRODUCTS". The "Information" choice will give the current firmware revision level, and the filename to get the product in question. The filename file has a "DLD" extension. For the benefit of customers with a DOS PC, each file is also available as a self-extracting compressed file (with a "EXE" extension). These must be "run" to obtain the "DLD" file.
2. The interface to be downloaded should now be power cycled. Ensure that the printer is ready and able to accept a print job.
3. Using any protocol, send the "DLD" file to print through the interface. The file is completely ASCII, so should have no problems using any method to print.

## HARDWARE SPECIFICATIONS

4. Power cycle the interface. **CAUTION:** the next power-up is the one which causes the FLASH to erase. Do not, under any circumstances, power down the interface during the first minute following power-up, otherwise all program may be lost, and the interface will need to be returned to factory for re-programming.
5. If after 3 minutes the interface is not ready (e.g. status page will not print), power-cycle the interface again, as above.
6. Pull a status page from the interface. If the version number does not show the correct (new) version, power-cycle the interface twice more, allowing 2 minutes of power-up each time, and try again. If the unit consistently does not program, check that the ".DLD" file is the correct one for the interface type (e.g. it is not a Token Ring download being sent to an Ethernet unit, or an In-line sent to an MIO).

## C. Constant Memory Option

### SETUP MODE COMMANDS FOR THE LAN INTERFACE

To get into setup mode the box should be turned on with the Select button held in for approximately 5 seconds. The box is ready to receive a setup file through the serial input port or from the network.

If the button is not released for a further 20 seconds, it will enter RESET mode at which point any existing user setups will have been reset to the default values. A page will be sent to the active printer port warning that either setup mode is active, or that the unit has been reset.

**Note:** A printer capable of printing ASCII text will need to be connected to view this page.

In order to communicate setup instructions to the Interface via its serial port, a serial (RS232) cable needs to be connected to it from any P.C. or workstation with a serial output (COM) port.

**Note:** For In-Line and Professional interfaces whilst in Setup Mode, the serial port is always set to 1200 baud, 8data bits, 1 stop bit and no parity.



CONSTANT MEMORY OPTION

FOR BOX-VERSION AND BUILT-IN INTERFACES WITH SETUP BUTTON

Use the following procedure to set up the unit:

- 1) Turn off the interface (or printer).
- 2) Press and hold in the front panel button.
- 3) Turn on the unit. Keep the button held in for about 5 seconds.
- 4) Release the button.
- 5) After releasing the button a warning page will be printed if there is a printer connected and it is online.

Note: The COM port must be set up with the following parameters prior to sending data: 9600 baud, no parity, 8 data bits, 1 stop.

FOR BUILT IN INTERFACES WITH PRINT SHARER INPUT

Use the following procedure to set up the unit:

1. Switch the printer on.  
During the first 100 characters after the printer has been powered up the sharer input is in setup mode and expecting the "START." command. If any other data is received it switches automatically to normal sharer mode and does not alter the setup.

2. Send the setup file from a PC through the PC sharer port on the interface.

The Interface will now accept setup commands sent to it through its PC sharer port or through the network. There are a number of ways of generating the appropriate commands on the workstation. The commands may be set up in a small file using any text editor and the file copied to the serial port, or a communications program may be run, and the commands typed in directly from the keyboard. Any control characters sent to the interface are ignored.

Note: The Interface ignores all data prior to the "START." command, and will print out the settings and reset after receipt of the "EXIT." command. This latter fact gives a clear indication that the commands have been accepted.

The recognised setup commands currently implemented are as follows: All commands must be uppercase:

- START:  
 # FILESERV: ssssssss+00  
 + PRINTSERV: ssssssss+00  
 # NUMBER: nn  
 # MATCH:  
 # NOMATCH:  
 # SOUTPUT:  
 # POUTPUT:  
 # BAUD: nnnn  
 # BITS: n  
 # STOP: n  
 # PARITYOFF:  
 # PARITYODD:  
 # PARITYEVEN:  
 # SHARETIME: nn  
 \* NETTIME: nn  
 \* INTERNET: nnn. nnn. nnn. nnn  
 # REMOFF:  
 # REMON:  
 # REMAUTO: \*  
 # AUTOIPON: \*  
 # AUTOIPOFF:  
 # RESET:  
 # EXIT:

- # Novell Systems only
- \* TCP/IP Systems only
- + Lan Manager, Ethernalk

Note: All the above commands are case sensitive.

The following pages explain the above commands in detail.

## CONSTANT MEMORY OPTION

**START:**

- this is the required starting command. All data prior to this will be ignored.

**POUTPUT:**

(Default)

- selects the PARALLEL OUTPUT.

**SOUTPUT:**

- selects the SERIAL OUTPUT.

**REMON: (NOVELL REMOTE PRINTER ONLY)**

- this command enables remote printing mode in Novell.

**FILESERV: (NOVELL ONLY)**

- this may be followed by the name of a preferred fileserver to be used. The name must be terminated with the characters '+00'. Usually, a fileserver is not defined, as the Interface will attempt to connect to all fileservers on the network which have the defined print server running. This is particularly usefull if only one file server is to be used with the Interface.

**NUMBER: (NOVELL REMOTE PRINTER ONLY)**

- this command is followed by a 1 or 2 digit number between 0 and 15. It determines the first printer that the unit will attempt a connection to on the designated printserver. This printer number should be defined as a 'remote printer' on the printserver.

**MATCH: and NOMATCH: (NOVELL REMOTE PRINTER ONLY)**

- these commands determine whether the Interface will connect only to the specified printer ("MATCH") or to the next available printer number, should the designated printer be unavailable ("NOMATCH").

**REMOFF: (NOVELL PRINT SERVER ONLY)**

- this command allows the unit to log on to Novell systems only as a printserver.

**REMAUTO: (NOVELL ONLY)**

(Default)

- The unit will log on to a Novell system as a print server if PSERVER.EXE or PSERVER.NLM is not already running as the designated print server. Otherwise, it will attempt to attach to the already running print server as a remote printer.

**PRINTSERV:nnn (NOVELL & Lan Manager ONLY)**

- where "nnn" is the name you wish to assign to the print server; if not specified "NP\_xxxxxx" will be the default name. The name must be terminated with the characters '+00'. A valid printserver must be defined in order to print from Novell or Lan Manger.

**Example:****START:**

PRINTSERV:RP21\_PSERVER+00

**REMOFF:****EXIT:**

**Note:** Use NetWare's PCONSOLE printer utility program configure a print server, and any print queues that the print server will service. Remember to insert the new print server name if it was specified in the Interface setup file, or insert the default name "NP\_00A899".

**AUTOIPON:**

This command allows the automatic setup of the IP address using ARP and PING (see chapter 6).

**AUTOIPOFF:**

This command disables the automatic setup of IP address with ARP.

## CONSTANT MEMORY OPTION

### INTERNET: (TCP/IP ONLY)

- this command is followed by 4 decimal numbers interspaced with full stops. It specifies the internet address for the unit.

### SHARETIME: (WHERE APPLICABLE)

- this specifies the number of seconds that must elapse following the end of data on the share port, before network printing may begin. Default 15 seconds.

### RESET:

- this command resets all parameters to their factory default setting. It may be used as the first command after START: in the setup command string to set everything to a known state. Thereafter, only the parameters which need altering need be sent. RESET: will NOT change the node address of the device.

### EXIT:

- this must be sent as the last command. As soon as it is received, the Interface will print out its current settings and then reset. If this does not happen, it indicates that the setup commands have not been recognised

- either due to errors in the commands, or to bad serial communication.

Note: After receiving this command & printing its settings, the Interface checks to see if any LAN parameters have been changed (e.g. internet address, server name etc.) If so, there will be a delay followed by the unit re-setting, so as to reinsert onto the network with the modified settings.

### Novell Example:

The following is an example setup file, which also configures the unit to act like a remote printer.

```
START:
REMON:
FILESERV:+00
PRINTSERV:NETPRINTERS+00
NUMBER:0:
NOMATCH:
BAUD:9600
BITS:8
STOP:1
PARITYOFF:
SHARETIME:15
EXIT:
```

After this setting, should a printserver named "NETPRINTERS" be configured for the network, and set running, the Interface will connect itself to the first available remote printer configured on that printserver.

### TCP/IP Example:

```
START:
INTERNET:11.22.33.44
EXIT:
```

For Kyocera built in interfaces the setup is performed through the printers parallel port. All instructions must be preceded by the Kyocera Prescribe Command 'SIOP' and print server/file server names do not end with "+00".

### Example:

```
IRI SIOP 'START:;SIOP':INTERNET:11.22.33.44';
SIOP 'PRINTTIME:15';EXIT
```

**WARNING**

Equipment generates, uses, and can radiate radio frequency energy if not installed and used in accordance with the instruction manual. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a residential environment. Operation of this equipment in a residential environment is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to prevent the interference.

**NOTICE**

This digital apparatus does not exceed the Class A limits for radio emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

**NOTICE**

Cet appareil numérique n'émet pas de bruits radioélectriques au-delà des limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le Département des Communications du Canada.

**des Herstellers**

Es wird bescheinigt, daß die Geräte in Übereinstimmung mit den Bestimmungen der VFG 1046/1984 funk entstörrt sind.

Bundespost wurde das Inverkehrbringen dieser Geräte genehmigt. Die Berechtigung zur Überprüfung der Serie auf die Bestimmungen eingeräumt.

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