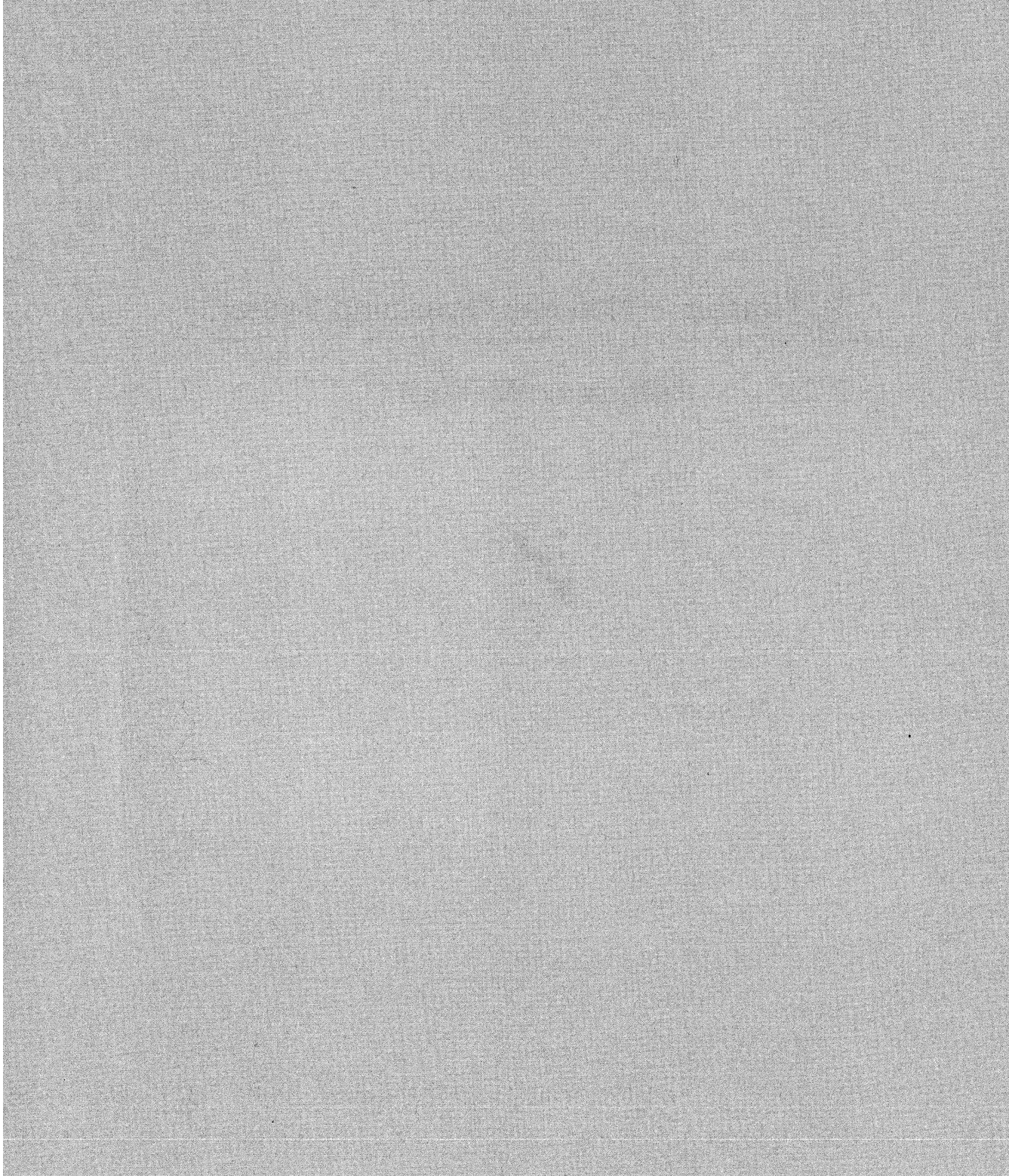


LANtastic™ Network Operating System

Reference Manual





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Introduction

This reference manual provides detailed information about utilizing LANtastic Network Operating System's many features. It is intended to complete the instruction process begun in the *LANtastic Network Operating System User's Manual*. At this point, you should have already installed the adapter cards and the network software as directed in the hardware manual for your adapter and the user's guide.

It is doubtful that you will read this manual from cover to cover. Most users will look for sections dealing with specific features and applications. In order to accommodate this, the manual has been organized alphabetically. Look under the task, topic, or command you need information on, just as you would in an encyclopedia. Each section is fact-filled and brief to provide you with the information you need to complete the desired task.

Topics that require more theoretical information or greater page length have been placed in the appendices at the end of the manual. The information presented there should prove valuable to users seeking information on the following topics:

- Improving network performance
- Sample batch files
- The LANCHECK diagnostic program
- Trouble shooting
- Error messages

If you have received an error message or are having a problem with the hardware or software, the last three appendices should be helpful.

Typeface Conventions

The commands that you will type in at the keyboard will be printed in this **bold font**. The text that you will see on the screen in response to those commands will be printed in this plain font. Block numbers are placed before steps that you are to perform (**1**, **2**, ...). If a procedure requires only one step, it will be preceded by a double arrow icon (»).

Throughout this text, LANtastic NOS and NOS refer to LANtastic Network Operating System.

Using LANtastic NOS Menus

When using the and NET_MGR menus, the term “select” means you will use the arrow keys to move the highlight bar to the desired option. You can also use the movement of a mouse to imitate the functions of the arrow keys, and the right and left mouse buttons to perform the same functions as the **Esc** and **Enter** keys respectively. If at any point you want more information about the fields displayed in a menu, press the **F1** function key for help information. The help windows can be enlarged then reduced to their former size by pressing **Z**.

Some windows will appear asking you for information. When entering data into these windows you can:

- Type over any previous text in the window
- Use the arrow keys to move the cursor left and right
- Use the backspace key to delete a character to the left of the cursor
- Use the **Del** key to delete a character the cursor is on
- Use the **Ins** key to place yourself in the insert mode

Special instructions for manipulating each field are found at the bottom of each screen.

Accounts

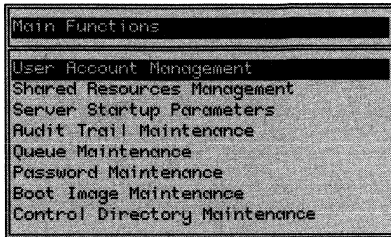
Setting Up A User Account

Creating a new user account is done with the NET_MGR program. For each account you must give the user a name and set the number of concurrent log ins for the account. You may also give the user a password, an account expiration date, set access privileges, or specify the days of the week and hours of the day that this user may have access to the server. To set up a new account complete the following steps.

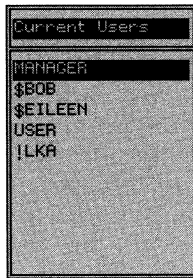
- 1 Type: **NET_MGR** then press **Enter**.

You will see the NET_MGR *Main Functions* menu.

- 2 Select the first option, *User Account Management*, and press **Enter**.



A screen with the list of user accounts (if you've set up any) will appear:

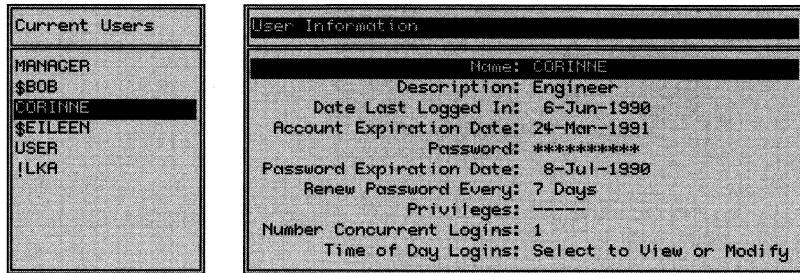


- 3 Press **Ins**.
- 4 Enter the new username and press **Enter**.
- 5 Enter a password (optional) and press **Enter**.

▲ **Caution:** Make sure you type the password in correctly. Once it is entered there is no way to see what password you typed.

- 6 Enter a description of the user (optional) and press **Enter**.
- 7 In the field *concurrent logins* enter the number of times that this user will be able to simultaneously log in to THIS server, and press **Enter**. For example, a user may want to be able to log in and use his or her account from more than one computer simultaneously.

The new username will appear on the list of current users. As soon as you exit the NET_MGR program, the user will have a valid account. To check the user account, select the username and press **Enter**. You will see the following screen:



The fields *Name*, *Description* and *Number Concurrent Logins*, should be the same as those you specified earlier. Since this is a new account, none of the other fields will have any values except for *Time of Day Logins*, which by default is set to allow the user access to the system at any hour and day of the week. If the account is set up correctly and you do not want to add any restrictions to the account, press the **Esc** key to exit each window until you return to the DOS prompt.

Account Expiration Date

For setting up temporary or guest accounts, you may want to assign the last date at which that account is valid. This will prevent former users from accessing the network. To accomplish this, complete these steps:

- ① Select the option *Account Expiration Date*, from the *User Information* menu and press **Enter**. A window will appear.
- ② Follow the directions in the window to set the expiration date. If you need help, press the **F1** key for more information.
- ③ To exit the window, press the **Esc** key.

Password Expiration Date

You can greatly enhance network security by forcing users to change their passwords more often. This will keep users from learning each other's passwords.

- ① Select the option *Password Expiration Date* and press **Enter**.
- ② Follow the directions in the window to set the expiration date. If you need help, press the **F1** key for more information.
- ③ To exit the window, press the **Esc** key.

You now have a date on which the user's password will expire. When a password expires, the user's account does not expire. You simply need to give the user a new password using the NET_MGR program as you did earlier. To put this user on a regular schedule of changing their passwords, complete the following tasks:

- ① Select *Renew Password Every* and press **Enter**.
- ② Enter the number of days you want this password to be valid after the expiration date.

Once you have entered this interval, LANtastic NOS will update the password expiration date for you. For example, if you set an interval of seven days, LANtastic NOS will set a new password expiration date seven days later than the previous one. This way the user must change passwords every week. LANtastic NOS warns the user when his or her password is about to expire when the user logs in through the menu. If the user did not log in on the day the password expired, he or she is still allowed to log in and change passwords.

Account Privileges

If you do not enable any of these privileges, the Access Control List for the network resources are enforced. Enabling these additional account privileges permits the user to make special types of access. You would normally give these kinds of access to the network manager.

A -- Super ACL Privilege

If this privilege is enabled, the user will have access to every shared resource on the server. ACL rights protecting subdirectories, printers

and network mail will not be checked. You may give this privilege to all user accounts if you are not concerned with network security.

Q -- Super Queue Privilege

Enabling this privilege allows the user to view and manipulate all jobs in the print queue. When the Q privilege is disabled the user can only see his or her own print jobs. This privilege also allows control over the server's despooler. You should give this privilege only to users that need to manipulate all jobs in the print queue and start and stop the despooler.

M -- Super Mail Privilege

With this type of access, the user can manipulate all the items in the mail queue. If disabled the M privilege is disabled, the user only has rights to mail that he or she sent or received. This is a particularly useful privilege for the network manager to check the queue and delete old mail.

U -- User Auditing Privilege

When this privilege is enabled, the user may issue AUDIT commands and create audit entries in the server audit log. You should be careful when giving this privilege to a user because it may result in the server's disk being filled up with audit entries.

S -- System's Manager Privilege

This Privilege is not available at this time. It will allow the user to perform system's manager functions. These functions are currently administered through the NET_MGR program.

▲ Caution: Do NOT enable the S Privilege. Even though it performs no function at this time, should you upgrade later, all users with the S privilege already enabled would be allowed this type of access.

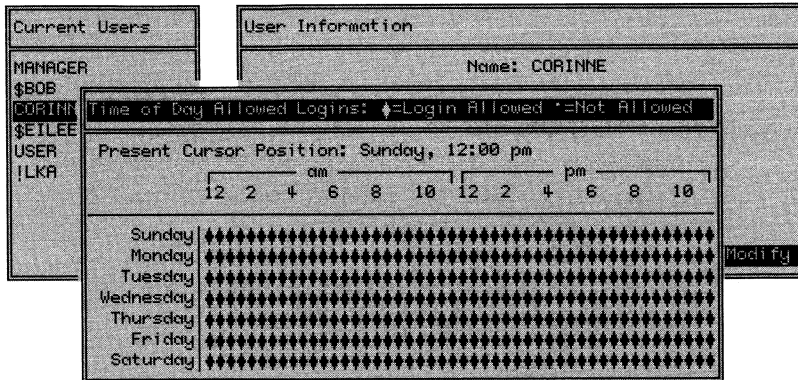
To allow any of the account privileges above, in the *User Information* window, move the highlight bar to *privileges* and enter the letters (A, Q, M, U) which correspond to the privileges you want to allow. To remove a privilege, type the letter again.

Time Of Day Logins

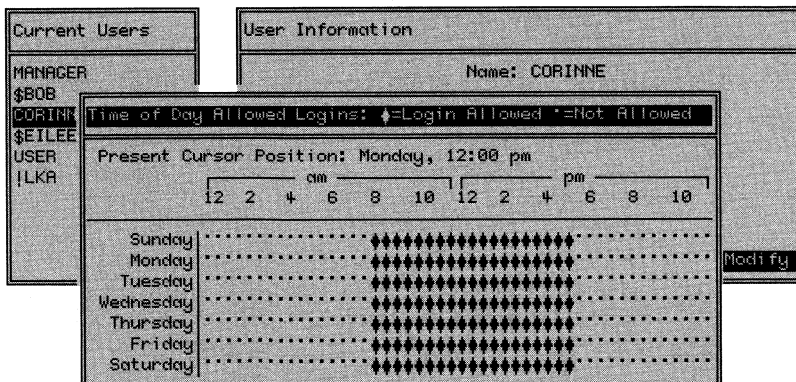
LANTastic NOS allows you to limit the hours of the day and days of the week that a user is allowed to log in to the server. This can help prevent after-hours use of the network for unauthorized purposes. It is also ideally suited for classroom applications, since students can

be limited to having access only during their class periods and not after school or on weekends. To set access times:

- 1 From the *User Information* window select the option, *Time of Day Logins* and press **Enter**. You will see this window:



- 2 By default, users are allowed access twenty-four hours a day, seven days a week. To change these settings, use the arrow keys to move to the various half-hour blocks of time and press the **Ins** key to allow the user access at that time or press the **Del** key to not allow access at that time. To quickly mark times press **B** and move the highlighted marker with the arrow keys until all the desired blocks are highlighted. You can then allow access for all the highlighted blocks by pressing the **Ins** key or prohibit access by pressing the **Del** key. Press the **Esc** key to exit the window. Here is a sample account setting:



In the example above, the user Corinne is allowed to log in to the system Monday through Friday, from 8:00 A.M. to 5:30 P.M.

As the user approaches the end of his or her network access time, LANtastic NOS provides an informative message. LANtastic NOS gives the first message fifteen minutes before the end of the user's allotted time and gives additional warning messages until the server logs the user off.

Changing User Accounts

To change any of the parameters in the user accounts, simply go back to the NET_MGR program.

- ① Select the option *User Account Information*, from the *Main Functions* menu, and press **Enter**.
- ② Select the user account you want to modify from the *Current Users* menu and press **Enter**.
- ③ Move the highlight bar to the field in the *User Information* screen that you want to change and press **Enter**. (Except for changing Privileges, where you would type the corresponding letter for each privilege you want to give this user. To remove a privilege, move the cursor to the desired letter and type that letter.)
- ④ Make any desired changes, and press **Esc** to exit each window.

CD-ROM Devices

You can add CD-ROM drives to a LANtastic network to take advantage of their large disk storage capabilities. There are various formats that these read-only devices use. The High Sierra Group (HSG) and devices that use Microsoft's CD extension software (MSCDEX) are the two most common types.

Since DOS was not originally designed to work with drives that can store so much data, extension software must be provided to make CD-ROM devices compatible with DOS. Extension software (such as Microsoft's MSCDEX) assigns a disk drive letter, translates CD-ROM data to the disk storage format DOS expects to see and controls the CD-ROM drive. Because of the relative slowness of these drives,

retrieval programs typically use temporary files on the user's hard disk to store data from user queries and database index files.

Preparing To Run CD-ROM Extension Software

- ❶ Install the CD-ROM drive as instructed in the manufacturer's hardware manual.
- ❷ Include a `DEVICE=` statement in your `CONFIG.SYS` file using the syntax:

`DEVICE= (device_driver)(switches)`

where `device_driver` represents the name of the CD-ROM extension software and `switches` represents any valid device driver software switches. For example:

`DEVICE=HITACHI.SYS /D:MSCD004`

Since the CD-ROM device will be treated as a physical drive, it is a good idea to check your `LASTDRIVE=` statement and make sure that it is set a least one higher than the number of physical drives currently installed in your computer. The default last drive is E:

- ❸ Include a command executing the CD-ROM support software in your `AUTOEXEC.BAT`.



Note: The command executing the supporting software must be placed **AFTER** the `REDIR` command, and **BEFORE** the `SERVER` command in your `AUTOEXEC.BAT`. For the supporting software you use the syntax:

`MSCDEX.EXE /D:DRIVER_NAME /M:## /V /E /L`

where:

`/D:` Represents the name of the device driver. The default name is `MDIHSDVR`

`/M:` Represents the number of sector buffers the extensions will use when it installs itself. The larger the number, the more sector entries are available and the extension software will have to read directly from the CD-ROM drive less often. Typically, each drive should have a

- minimum of 4-5 buffers. The larger the value, the better performance will be.
- /E** This switch tells the software to use expanded memory, if it is installed and available.
- /V** This switch tells the extension software to print additional information about memory usage during initialization.
- /L:** This switch assigns a drive letter to the CD-ROM device.

For example:

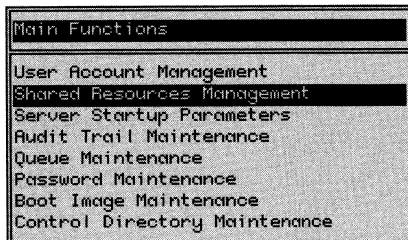
```
REDIR SERVER1
MSCDEX.EXE /D:MSCD004 /L:D
SERVER
```

In the above example, the extension software is loaded into the device driver MSCD004 and the CD-ROM device is assigned drive letter D:

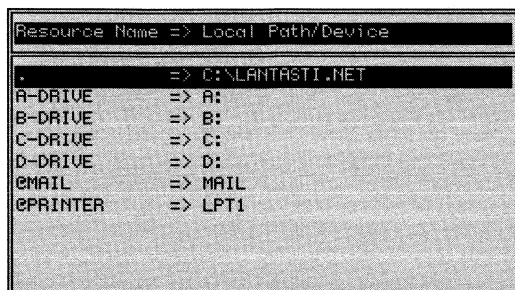
This documentation may be contrary to the CD-ROM manufacturer's instructions. Many recommend running the extension software after you bring up the network. With LANtastic, you must run the extension software after the redirector program and before the server program.

Setting Up A CD-ROM Drive As A Shared Network Resource

- 1 Type: **NET_MGR** and press **Enter**. You will see the *NET_MGR Main Functions* menu.
- 2 Select the second option, *Shared Resources*, as shown below and press **Enter**.



A screen with the list of your server's resources (if you've set up any) will appear:



- 3 Press the **Ins** key, and type in the network resource name that you want to give to the CD-ROM drive. For example:

CD_DRIVE

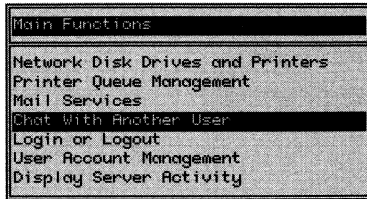
- 4 The CD-ROM extension software will assign the CD-ROM drive the first available drive designator it finds. For example, if you already have two floppy drives, A: and B: and a hard drive C:, DOS will name the CD-ROM drive D: Enter this drive designation in the window provided. The new drive will now appear on the list of server resources.
- 5 The new resource name should already be highlighted. Press **Enter**.
- 6 Use the arrow keys to move the highlight bar to the field *CD-ROM Drive* and press **Enter** to toggle the selection from *No* to *Yes*.

Chat

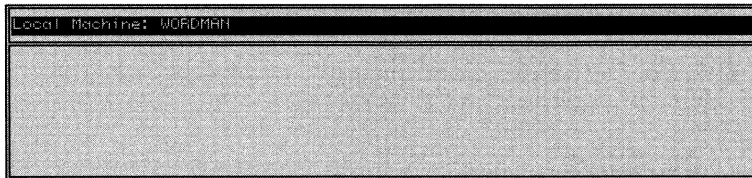
LANTastic NOS allows two or more network stations to conduct a real-time, on-screen conversation across the network. Users may communicate with any node on the network running the server and/or redirector program. To use the Chat program:

- 1 Type **NET** and press **Enter**. You will see the *NET Main Functions* menu.

- ② Select the *Chat With Another User* option and press **Enter**.



You will see these two screens:



- ③ Press the **Ins** key and in the window provided, enter the name of the network computer (not username) that you want to call.
- ④ A pop-up message will inform the user at the destination node that you are trying to chat. To complete the connection, the user at the destination node must select *Chat With Another User*, from the *NET Main Functions* menu, or type **NET CHAT** then **Enter**.

The users may now type messages to each other. Text typed by the local user appears in the top screen, while messages entered by the other user appear in the lower screen. Both users may type simultaneously, using the following screen editing functions:

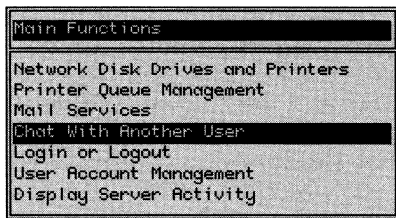
| | |
|--------------|---|
| ← | Deletes the character to the left |
| Home | Erases the screen |
| Enter | Takes you to the next line |
| Esc | Returns you to the <i>NET Main Functions</i> menu |
| Del | Hangs up without exiting the Chat program |

If you type more text than will fit in the screen, the display will scroll up to give you more space.

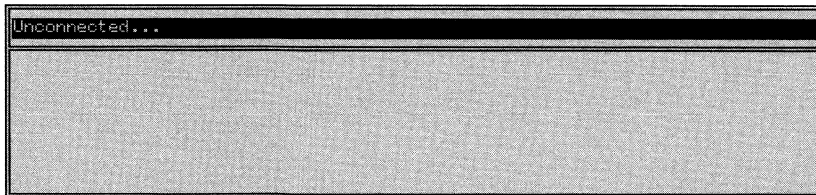
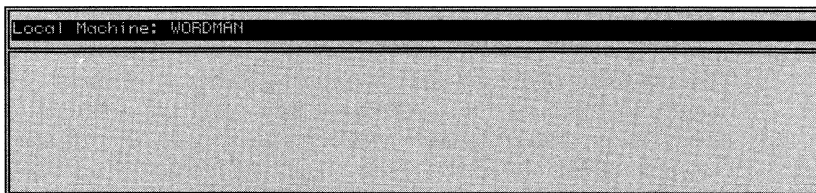
Voice Chat

In order to use the LANtastic Voice Chat feature, you must first install LANtastic Voice cards set for full-duplex (2-way) operation in the sending and receiving computers. Consult the *LANtastic Voice Adapter User's Manual* for information on installing the Voice Adapter and supporting software. Initiating Voice Chat is similar to starting a Text Chat session:

- 1 Type **NET** and press **Enter**. You will see the NET Main Functions menu.
- 2 Select the *Chat With Another User* option and press **Enter**.



You will see these two screens:



- 3 Press the **Ins** key.

- ④ Type the name of the network computer you want to call and press **Enter**.

A pop-up message will inform the user at the destination node that you are trying to chat. To complete the connection:

- ⑤ The user at the destination node must select *Chat With Another User*, from the NET Main Functions menu, or type **NET CHAT** then **Enter**.

If you have a LANtastic Voice card and the supporting software installed in your computer, you will see the message, "Voice Chat is disabled" at the bottom of the screen.

- ⑥ Press the **F2** key to toggle the message to "Voice Chat is enabled." When you've enabled Voice Chat, a new option using the **F3** key will appear at the bottom of the screen.

Pressing the **F3** key will bring you to a window where you can adjust the threshold level at which the receiver will interpret low volume sounds as background noise and not transmit them through the network. By not transmitting this background noise, the amount of data transmitted through the network can be greatly reduced. The default threshold level is 32, which should be sufficient for most applications. If you will be using the Voice Chat feature in a noisy environment, you may want to increase the threshold level. Decreasing the threshold level will send more background noise when you Chat, but may help if the default threshold is cutting off speech at your regular volume.

You and the other user can now engage in a station-to-station conversation just as if you were speaking via a telephone line. You can also type text into the screens while you Voice Chat. To end the session, press the **Esc** key to return to the DOS prompt, or if you want to call someone else, press the **Del** key to hang up without leaving the Chat program.

Command Line Switches

The LANPUP, NET, NET_MGR, REDIR and SERVER Programs may be configured in several ways to allow more flexibility and enhance performance. Optional configuration parameters may be specified on the command line when you run each program. The configuration switches are shown below.

To run the LANPUP, NET and NET_MGR programs with command line switches use the syntax:

PROGRAM_NAME(switches...) (; comment)

where PROGRAM_NAME denotes the program you are running. SWITCHES denotes any optional command line switches. If you are using more than one switch in a command line, use a space or a (/) to separate the arguments. If a switch takes a value (such as when you set the buffer size) the switch name must be followed by an equal sign (=) or a colon (:). All switch values are checked to make sure they are valid. Illegal values produce error messages and prevent the programs from loading.

To run the REDIR program, use the syntax:

REDIR MACHINE_NAME /SWITCHES

where MACHINE_NAME represents the network name that you want to give to your computer.

To run the SERVER program, use the syntax:

SERVER(CONTROL DIRECTORY) /SWITCHES

where CONTROL DIRECTORY represents any control directory that you want to use. The default control directory is LANTASTI.NET. For information on control directories, refer to "Control Directory Maintenance" in this manual.

These are valid switch formats:

**SWITCH
/SWITCH
SWITCH:VALUE
/SWITCH=VALUE**

You would use one of the first two formats for a switch that does not take a value. For example:

SERVER/HELP

You would use the third or fourth formats for a switch that takes a value. Such as:

REDIR SERVER1 /LOGINS=20

The optional command line switches are given below. Values enclosed in the brackets “()” indicate default values for the switch. Values after the brackets “()” denote the valid range of the switch.

You may abbreviate switch names down to as few letters as will keep that switch distinct from any others. For example, to use the VERBOSE switch you could type:

SERVER/VERBOSE

or

SERVER/V

But you could not abbreviate the REDIR program switch BEEP_DELAY down to BEEP or B because there is also the BEEP_CYCLE switch in the REDIR program. You could however, abbreviate BEEP_DELAY down to BEEP_D.

LANPUP Command Line Switches

HELP or ?

This switch displays information about the valid command line switches, but does not execute the LANPUP program. For example,

LANPUP/help

LANPUP ?

See “Appendix E: Messages” for a sample HELP display output.

LINE= (4) Range 0 to 20 decimal

This switch sets the position on the screen where the LANPUP display will appear. For example setting this value to 10 would position the informative messages in the middle of the screen.

STAND_ALONE

The /S switch makes LANPUP operate in stand alone mode, and not remain resident in memory. LANPUP will only be in memory when you use the program. Once you've exited the program, you must reissue the LANPUP/S command to use LANPUP.

NET Command Line Switch

MONO

This switch instructs NET to use a monochrome (two color) display. This is especially useful for computers that do color emulation on a monochrome screen.

NET_MGR Command Line Switches

@indirect-file

This switch specifies that further switches are to be taken from an indirect file. The indirect file names must begin with the "@" sign to distinguish them from regular files. Any switches after @indirect-file will be discarded. You may invoke indirect files from within indirect files as many times as you wish.

The indirect file should contain valid switches. You may also include comments for each line of the indirect file. Comments must be preceded by a semicolon (;) at the beginning of each line or after switches. For example:

NET_MGR@setup

The file SETUP contains

```
; NET_MGR setup file
;
MONO                               ;Use two color display
CONTROL=DIR.NEW                    ;Use DIR.NEW as the control directory
```

CONTROL= (C:\LANTASTI.NET)

This switch allows you to specify which control directory the NET_MGR program will use. A control directory is where user account information is kept. Refer to "Control Directory Maintenance" for more information on this subject.

HELP or ?

This switch displays information about the valid command line switches, but does not execute the NET_MGR program. For example,

```
NET_MGR/HELP
NET_MGR ?
```

See “Appendix E: Messages” for a sample HELP display output.

MONO

This switch instructs NET_MGR to use a monochrome (two color) display. This is especially useful for computers that do color emulation on a monochrome screen.

REDIR Command Line Switches

@indirect-file

This switch specifies that further switches are to be taken from an indirect file. The indirect file names must begin with the “@” sign to distinguish them from regular files. Any switches after @indirect-file will be discarded. You may invoke indirect files from within indirect files as many times as you wish.

The indirect file should contain valid switches. You may also include comments for each line of the indirect file. Comments must be preceded by a semicolon (;) at the beginning of each line or after switches. For example:

REDIR Machine_name @setup

The file SETUP contains

```
; REDIR setup file
;
LOGINS=10                ;Allow 10 log ins
BEEP_DELAY=10           ;Wait 10 sec before beeping
VERBOSE                  ;Display verbose information
```

BEEP_CYCLE (3) Range 1 to 3600 decimal

This switch sets the interval in seconds between each beep tone. Usually you will receive these tones whenever a server is slow in processing your request. Consult “Informative And Error Tones” for more information on the subject.

BEEP_DELAY= (4) Range 1 to 3600 decimal

This switch sets the amount of time in seconds that the REDIR program will delay before emitting a beep tone.

BUFFERS= (1) Range 1 to 64 decimal

This switch sets the number of buffers allocated for the REDIR program. Allocating more buffers will use more memory, but can improve performance, depending on the application program.



Note: The total amount of buffer space (SIZE * BUFFERS) cannot be more than 32768 bytes.

HELP or ?

displays information about the valid command line switches, but does not install the REDIR program. For example,

REDIR/HELP

REDIR ?

See "Appendix E: Messages" for a sample HELP display output.

LOGINS= (2) Range 1 to 255 decimal

This switch specifies the number of concurrent log ins you can have on the network. This will also determine the number of servers that you will see on the available servers list in the NET menus. For example, if you set the number of logins to 10, and your network has 15 available servers, you will see a list of only ten of them when you try to log in through the NET menus. and you will only be able to log in to ten servers at a time.

NOCHAIN

This command instructs the REDIR program not to use the NETBIOS chain send command (sending two pieces of data together). Some adapters use a NETBIOS that does not correctly implement chain sends properly.

POPUP_DURATION= (10) Range 0 to 3600 decimal

This switch sets the length of time that pop-up informative messages (such as when a user wants to Voice Chat with you) will appear on the screen.

POPUP_LINE= Range 0 to 24 decimal

This switch sets the position on the screen where pop-up informative messages will appear. For example setting this value to 12 would position the informative messages in the middle of the screen.

SIZE= (1024) Range 512 to 16384 decimal

This switch sets the size of the buffers that the REDIR program will use. Setting larger buffers will use more memory, but should improve performance.



Note: The total amount of buffer space (SIZE * BUFFERS) cannot be more than 16384 bytes.

VERBOSE

This switch causes the REDIR program to be installed and detailed information about its configuration to be displayed. See “Appendix E: Messages” for a sample Verbose display output.

SERVER Command Line Switches

The server command line switches allow you to perform most of the functions found in the *Server Startup Parameters* option in the NET_MGR program. Any switches set in the SERVER command line, will override the settings in *Server Startup Parameters*.

@indirect-file

This switch specifies that further switches are to be taken from an indirect file. The indirect file names must begin with the “@” sign to distinguish them from regular files. Any switches after @indirect-file will be discarded. You may invoke indirect files from within indirect files as many times as you wish.

The indirect file should contain valid switches and may contain comments preceded by a semicolon (;) at the beginning of each line or after switches.

For example,

SERVER @setup

The file SETUP contains

```
; SERVER setup file  
;  
LOGINS=10      ; Allow 10 concurrent log ins  
ADAPTERS=2     ; There are two adapters installed in the PC  
VERBOSE       ; Display verbose information
```

ADAPTERS= (1) Range 1 to 6 decimal

This switch tells the SERVER program the number of adapters installed in your computer. Normally a server will have only one NETBIOS adapter installed. You may, however, install up to four LANtastic AE-2 Ethernet adapters, or six LANtastic NE-3 Ethernet adapters, or six LANtastic 2 Mbps adapters in a server. Each adapter then can service an independent network.

DESPOOLER_STOPPED= (NO) Yes or No

This switch allows you to start and stop the despooling of print jobs to the server's printer(s). When set to YES, despooling will not begin until the NET QUEUE START or the NET QUEUE SINGLE commands are given.

FILES= (0) Range 0 to 5100 decimal

Normally the number of files that can be open simultaneously is controlled by your CONFIG,SYS file with the FILE= statement. Due to DOS limitations, the maximum number of open files you can specify in a CONFIG.SYS is 255. If you want to be able to open more files for the network or if you will need more open files for local functions, you can set this switch to allow from 50 to 5100 open files. This causes the server to allocate its own separate files rather than those allocated through the CONFIG.SYS file. When this switch is set to 0 (the default) the computer will use the files= value in the CONFIG.SYS file.

FLOPPY_DIRECT= (YES) Yes or No

You can set the SERVER program to protect network floppy disks from potentially dangerous commands such as the DOS FORMAT and CHKDSK commands. The default value is enabled. When issuing a FORMAT command on a floppy disk that is shared with the rest of the network, you must make sure that no one formats it while it is accessed by another user.

HELP or ?

Displays information about the valid command line switches, but does not install the SERVER program. For example,

SERVER/HELP SERVER ?

See "Appendix E: Messages" for a sample HELP display output.

LOGINS= (8) Range 1 to 300 decimal

This switch specifies the maximum number of users that can be logged in to the server simultaneously. Increasing the value in this field will increase the amount of memory the server must dedicate to the network.

NETWORK_BUFFER_SIZE= (4K) One of the following choices: 2K, 4K, 6K, 8K, 10K, 12, 14K, 16K, 20K, 24K, 28K, 32K, 40, 48k, 56k

This switch sets the buffer size the server uses for network communications. Setting larger buffers will increase performance, but will also use more memory.

NETWORK_TASKS= (1) Range 1 to 32 decimal

This switch specifies how many concurrent user requests the server can perform. Each network task requires a buffer, so increasing the value in this field will increase the amount of memory the server will use.

PRINTER_BUFFER_SIZE= (512) One of the following choices: 512, 1K, 2K, 4K, 6K, 8K, 10K, 12K, 14, 16K, 20K, 24K, 28K, 32K

This switch sets the buffer size for each printer task. You can speed network printing allocating larger buffers, but this will use more server memory.

PRINTER_TASKS= (1) Range 0 to 5 decimal

This switch sets the number of simultaneous print jobs that the server will be able to perform. Each printer task will require a printer buffer, so the more tasks you allow the more server memory you will use. When the value is set to 0, despooling is disabled.

RPL= One of these choices: (DISABLED) DISABLED, READ-ONLY, READ-WRITE

This switch allows you to set up the server as a boot server. If enabled, remote workstations can use a boot image stored on this server to boot up to the DOS prompt. You must first create the boot image in order for workstations to utilize remote booting. If this

switch is set to READ-WRITE you can write to the boot image. You cannot write to the boot image if it is set to READ-ONLY. For more information on this subject, refer to "Remote Booting" in this manual.

SEND_SERVER_ID= (Yes) Yes or No

If this switch is set to YES, the server's name will appear on the users' list of available network servers. If the field is set to NO, a user must know the name of the server in order to log in.

VERBOSE

This switch causes the SERVER program to be installed and detailed information about its configuration to be displayed. See "Appendix E: Messages" for a sample Verbose display output.

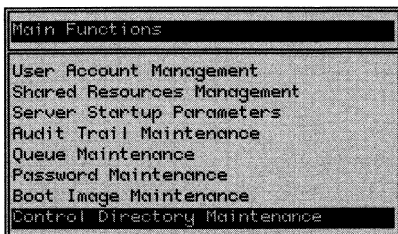
Control Directory Maintenance

The network control directory is where information about user accounts and server resources is kept. The default directory is LANTASTI.NET. LANTastic NOS allows you to create multiple control directories to set up completely different user accounts and resources. This can be useful for fine tuning server parameters for different network applications. For example, a teacher could set up a different network control directory for each class, so the Physics, Computer Science and Business classes are run with a different control directory set up with different resources, accounts and access rights for each class.

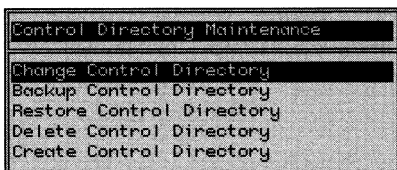
This feature also lets you back up and restore the control directory should you ever need to make a copy of this directory or reformat or replace your hard disk.

Creating A New Control Directory

- ① Select the *Control Directory Maintenance* option from the NET_MGR *Main Functions* menu as shown in the example below, and press **Enter**.



This window will appear:



- 2 Select the *Change Control Directory* option, and input the name and full DOS path for the control directory you want to create and press **Enter**.



Notice that now this menu has only three options. This is because NET_MGR is now using an empty control directory. You must now create this directory.

- 3 Select the last item, *Create Control Directory*. You will see the name of the control directory currently in use in a window. Press **Enter**.

The NET_MGR program creates the necessary network control files. With this new directory you can set up an entirely different set of user accounts, privileges, and network resources.

Changing Control Directories From The Command Line

To specify that you want to use a control directory other than LANTASTI.NET:

» At the DOS prompt type the command:

```
NET_MGR /CONTROL=(DIRECTORY-NAME)
```

or you can specify a control directory when you run the SERVER program.

```
SERVER DIRECTORY-NAME
```

For example, to use DIR.NEW, you would type:

```
NET_MGR /CONTROL=DIR.NEW
```

or

```
SERVER DIR.NEW
```

Backing Up A Network Control Directory

In order to back up a network control directory including its hidden files:

- ❶ Change to the directory you want to back up using the *Change Control Directory* option from the *Control Directory Maintenance* menu and press **Enter**.
- ❷ Select the *Backup Control Directory* option and press **Enter**.
- ❸ Type in the name you want this directory saved under and press **Enter**. For example entering:

```
A:\DIR.OLD
```

would save the currently selected control directory on a floppy disk in the server's A: drive under the name DIR.OLD.

At this point you should have a copy of the control directory stored on the disk.

Restoring A Network Control Directory

To restore a control directory once it has been backed up:

- ① Select the option, *Restore Control Directory*, and press **Enter**.
- ② In the window provided, enter the name of the file that you want to restore and press **Enter**. For example:

A:\DIR.OLD

- ③ The NET_MGR program provides you with a default directory in the window. Press **Enter** if this is the desired directory or type the name for the restored control directory and press **Enter**. For example:

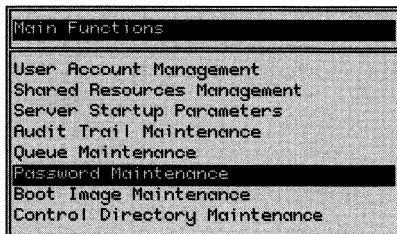
C:\DIR.ALT

Once restored, this control directory can be used any time you want to use it instead of LANTASTI.NET or any other control directory.

Password Maintenance

LANTastic Network Operating System allows you added security for the network control directory. By using the *Password Maintenance* option from the NET_MGR program, you can require users to give a password to enter the NET_MGR program. The NET_MGR program manages the control directory is where information on user accounts, passwords, privileges and access to network resources is stored. Controlling the access to this program prevents users from changing their privileges without proper authorization. The following steps are required for enabling this function:

- ① Type: **NET_MGR** then press **Enter**. You will see the NET_MGR *Main Functions* menu.
- ② Select the option, *Password Maintenance* and press **Enter**.



Another menu with the option, *Enable password access for NET_MGR* will appear. Press **Enter**.

- 3 Type the desired password and press **Enter**. The *Password Maintenance* menu will now have a second option, *Change Password*.

Changing The Control Directory Password

To change the password for the control directory:

- 1 Select the option *Change Password* from the *Password Maintenance* menu and press **Enter**.
- 2 Type in the old password then the new password as prompted.

▲ **Caution:** Make sure you type the new password in correctly. Once you enter it, there is no way to see what password you typed.

- 3 Retype the new password. (This is to confirm that it was entered correctly before.)

Once password access for NET_MGR has been set, anyone trying to gain entry to the NET_MGR program must provide the correct password before entry is given.

Disabling Password Access For The Control Directory:

- » Select *Disable password access for NET_MGR* from the *Password Maintenance* menu, and press **Enter**.

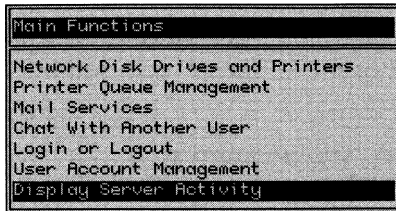
You will now be able to access the NET_MGR program without using a password.

Display Server Activity

You can use the NET menu to find out which users are logged in to a server and what types of requests they have made. You must be logged in to the server to see this list.

- 1 Type **NET** and press **Enter**. You will see the *NET Main Functions* menu.

- ② Select the *Display Server Activity* as shown below and press **Enter**.



- ③ Use the arrow keys to select the appropriate server and press **Enter**. You will see a display similar to this:

| ID# | Username | Machine | Command | IQ Bytes | Requests | Privs |
|-----|----------|------------|-------------------|----------|----------|--------|
| 001 | JUST | TECH_LASER | GET QUEUE ENTRY 0 | | 153 | -QM--L |
| 119 | BRIAN | BRIAN | CLOSE FILE | 64282 | 74 | -QM--L |
| 104 | LKA | LKA | CLOSE FILE | 1086K | 1158 | -QM--L |
| 10E | AL | AL | FIND FIRST FILE 0 | | 2 | -QM--L |
| 10A | SAM | SAM | GET QUEUE ENTRY 0 | | 6 | -QM--L |
| 11B | LLOYD | LLOYD | CLOSE FILE | 1614 | 6 | AQMU-L |
| 10C | KEN | KEN | CLOSE FILE | 2052 | 23 | -QM--L |
| 004 | MARCUS | MARCUS | CLOSE FILE | 2054 | 7 | -QM--L |
| 114 | J | J | CLOSE FILE | 2052 | 15 | -QM--L |
| 110 | JOHN | JOHN | CLOSE FILE | 2545 | 7 | -QM--L |
| 118 | VAN | VAN | FIND FIRST FILE 0 | | 2 | -QM--L |
| 00A | EILEEN | EILEEN | GET QUEUE ENTRY 0 | | 3 | ----L |
| 11A | ROD | ROD | CLOSE FILE | 4108 | 12 | -QM--L |
| 113 | MARK | MARK | CLOSE FILE | 368519 | 381 | -QM--L |
| 00C | MONICA | MONICA | FIND FIRST FILE 0 | | 2 | ----L |
| 00B | BOB | WORDMAN | USER STATUS 0 | | 19 | AQMU-L |
| 008 | ERNIE | ERNIE | CLOSE FILE | 114297 | 244 | ----L |
| 009 | DEBBIE | MKTG2 | FIND FIRST FILE 0 | | 2 | ----L |

Each entry on the menu represents a user accessing the server. The screen provides information about the server at the time the screen is brought up. To update the screen, press the space bar. The fields in the display provide the following information:

ID#

This is the user's unique identification number for this server, derived from the user's adapter and session numbers.

Username

The name this user logged in under. A "?" in this field indicates a user in the process of logging in.

Machine

The network name of the user's computer.

Command

The last server request the user made. Even though a command is listed, it does not mean that it was executed. A server operation may fail due to insufficient access rights or privileges. The names and descriptions of the user requests are listed below:

| | |
|------------------------|--|
| AUDIT ENTRY | Create an audit entry was created. |
| CHANGE PASSWORD | The user changed his or her password. |
| CLOSE FILE | Close a file. |
| CONTROL QUEUE | modify a queue entry or control the despooler. |
| COMMIT FILE | Commit a file to disk. |
| COPY FILE | Copy a file on the server. |
| CREATE DIR | Create a directory |
| CREATE FILE | Create a file or overwrite an existing file with the same name. |
| CREATE INDIRECT | Create an indirect file. |
| CREATE NEW FILE | Create a new file. |
| DELETE DIR | Delete a directory. |
| DELETE FILE | Delete a file. |
| DISABLE ACCOUNT | The user has disabled his or her account. |
| FILE READ | Data has been read. |
| FILE WRITE | Data has been written. |
| FIND DISK SPACE | The user requested information on the amount of free disk space. |
| FIND FIRST | Look up a file. |
| FIND NEXT | Look up another file. |
| GET ACCOUNT | Account information was requested. |
| GET INDIRECT | Retrieve contents of an indirect file. |
| GET LINK INFO | The user requested information on a directory or device Access Control List. |
| GET QUEUE ENTRY | Provide information about a queue entry. |
| GET SERvertime | Obtain the server's date and time. |
| GET STREAM | The user requested information on a logical printer stream. |
| LOCK RANGE | Lock a file region. |
| LOGIN | The user is logging in. |
| MULTI-MODE OPEN | Open a multi-mode file. |
| OPEN FILE | Open a file. |
| PRINTER STATUS | The user requested information as to the current status of the print queue. |
| RENAME FILE | Rename a file. |
| SEEK POSITION | Seek to place within a boot image. |
| SET ATTRIBUTE | Change a file's attributes. |
| SET QUEUE ENTRY | Modify detailed queue information. |
| SET STREAM | Modify a printer stream. |
| TERMINATE | Exit a program. |

TRANSLATE PATH

The user requested that a network pathname be translated.

UNIQUE FILE

Create a new file with a unique name.

UNLOCK RANGE

Unlock a file region.

USER STATUS

The user requested information about a user's status.

IO bytes

This represents the amount of data input and output (in Kilobytes, Megabytes or Gigabytes) that the server has performed for the user.

Requests

This represents the number of requests the user has issued to the server.

Privs

This field gives the user's privileges for that server. These are the possible privileges:

A Super ACL

The server will perform all of this user's requests without checking any ACL rights.

Q Super Queue

This user can manipulate the despooler and all printer queue entries.

M Super Mail

The user can manipulate any item in the server's mail queue.

U User Audit

The user may place an entry in the audit trail.

S System's Manager

The user will have system's manager type of access. (This type of access is not available at this time.)

L Logged In

The user is logged in to the server. If the "L" is not displayed, the user is in the process of logging in.

R Remote boot Log in

The user can log in through a remote boot.

DOS And Application Program Considerations

This section provides information about some of the differences between using a computer on a network and using a computer in stand-alone mode. The most obvious difference is that in a network there may be more than one user trying to access a program at the same time. But there are other considerations as well. This section will deal with the following topics:

- Copy protected programs
- The DOS SHARE program
- The DOS FASTOPEN program
- Programs designed for a single user environment
- Programs which make a direct reference to hardware
- Programs which only work on a specific disk
- Rebooting your server

For information on setting up your AUTOEXEC.BAT files, consult "Appendix B: Sample Batch Files." For more information on setting up your CONFIG.SYS file, consult "Appendix A: Improving Network Performance."

Copy Protected Programs

Defeating the copy protection mechanism of a program is a violation of most licensing agreements. It is also illegal. We strongly recommend that you abide by the constraints of your application program licensing agreements.

Many copy protected programs can be run on networks if you transfer the copy protection device or disk to the machine from which it will be run. This has the effect of allowing you to run only one copy of the program at a time. Check to make sure that sharing the application this way does not violate your licensing agreement.

The DOS SHARE Program

The DOS SHARE program implements file locking to keep users from accessing the same file simultaneously. It also allows application programs to implement record locking. Most network versions of software have built in file and record locking which you can use once the SHARE program is run. We recommend that you utilize this protection on any programs that will be shared with the rest of the network.

Since the DOS SHARE program must be run before any application program's file and record locking can be used, we recommend that you include a command to execute SHARE in your AUTOEXEC.BAT or any other batch file that executes when the server is brought up. You will be asked if you want to include SHARE the batch file.



Note: If you are using DOS V4.0 with a hard disk larger than 32 Megabytes, you must run SHARE.

Programs Designed For A Single User Environment

There are many programs that were designed to be accessed by one user at a time. This can lead to problems when you try to share them across the network. The DOS SHARE program will keep two users from accessing a program if their requests are entered at the same time.

This can be advantageous, since it keeps two users or programs from simultaneously writing to the same file created with an application program. The disadvantage is that when two users only want to read the same file, they are also denied access. Since they would not be writing to the file, there would be no harm in their accessing it at the same time. Presented below are two schemes for allowing concurrent reading of a file.

Making A File Read-Only

You can use the DOS ATTRIB command to give the file read-only status. The SHARE program will then allow access to more than one user. The command:

ATTRIB +R PROG.EXE

would allow read-only access to the executable program PROG.EXE.

When setting up files as read-only, it is a good idea to create a common directory for programs that are frequently run. You can then give users only the R, L, and E (Read, Look-up, and Execute) access privileges to the directory.

There are times when this first method will not work. Some programs write data to the same directory that they read from. Any file that a program will write to can't have read-only access. Also, some programs use specific temporary files when reading data. If this file has already been opened by another user, the second user is denied access. But if the program writes to files that do not conflict with any other invocation of the program, this first scheme should work fine.

Making A Second Copy Of An Executable Program

The second method is to make a separate directory for each invocation of the program and copy the program or data to each directory. That way the users would each access a unique copy of the program.

This second option is less preferable since it requires file duplication and uses up more server disk space.

This also may be a violation of the software's licensing agreement.

Programs Which Make A Direct Reference To Hardware

Some programs make direct reference to hardware ports or devices which may not exist on a remote node, but which do exist on the server where the software is installed. The most common examples are programs which are configured for a specific type of monitor or a math coprocessor.

For example, a server may have a VGA monitor and an application program that is configured to work with that type of monitor. If you were to try to execute that application program from a workstation with a monochrome monitor, you would probably get an error message or the program might not execute.

Many application programs allow you to specify different display set ups without having to re-install the software. You can then use the different display set up to execute the application program from your workstation.

Programs which are non-configurable and which make requests to hardware ports or devices not installed in your computer, will not run unless you install the corresponding hardware. Some modem communications packages fall into this category since they directly interface to the communications port hardware.

There are also many programs which bypass DOS and address disk software directly. This software cannot be effectively controlled by the network. DOS provides a mechanism for seeing if a disk can be addressed at this level. Such software should make inquiries to determine if the disk is being used on a network. The DOS CHKDSK command is a good example of this. When it detects that a network disk is being referenced it refuses to run and returns an error message.

Some disk management programs assume they are not running on a network. These programs will not run on a network drive. If you do try to run these programs on a network drive, they will usually not do any harm other than locking up your computer. Many disk management companies sell special network versions of their software.

Programs Which Work Only On Specific Disks

There are some programs which are hard coded to use certain disk drives. You may need to make some adjustments to your disk organization when running these programs in a network environment.

For example, some programs will always access the C: drive to read and write to files. If you're located on a workstation that already has a C: drive, you would have to redirect your C: drive to the server's C: drive in order to use any of these programs. If you attach your local C: drive to the server's C: drive then your local files will no longer be available.

The solution is to re-map your C: drive to another drive letter, and then redirect your C: drive to the network. To accomplish this, you would use the DOS SUBST command. For example:

SUBST D: C:

You've now remapped the C: to drive D:

You can then attach the C: drive to the network, using the command:

NET USE C: \\SERVER\PROGRAM

You may also need to change your PATH command to specify D: instead of C: For example if your previous path statement was:

PATH C:\;C:\DOS;C:\APPS;C:\LANTASTI

You would now change it to:

PATH D:\;D:\DOS;D:\APPS;D:\LANTASTI

If you need to perform this substitution on a daily basis, you may want to include the SUBST and PATH commands given above in your AUTOEXEC.BAT file.

Network Versions Of Application Programs

Many network versions of application programs require you to install both the software and its data files to a network drive. You can then share it with the rest of the network. You should use network versions of software, as they handle file and record locking more efficiently than non-network versions. Using network versions of software also insures that you are not violating any licensing agreements.

The DOS FASTOPEN Program

The FASTOPEN program allows you to open files more quickly. This program is available with DOS version 3.3 or higher. You can run FASTOPEN on both servers and redirectors. This program is especially useful on servers since network requests to open files can be performed much more quickly.



Note: FASTOPEN should be run BEFORE installing the network software.

You may want to run FASTOPEN from within a batch file, so you don't have to enter the FASTOPEN command every time your computer boots up. For more information on the FASTOPEN program, consult your DOS manual.

Shutting Down Or Rebooting Your Server

Because a user might be accessing your server remotely, you should never just shut off the computer or press the reset button. If you need to shut down or reboot a server, follow these steps:

- ① Press **Ctrl-Alt-Del**. LANtastic NOS will intercept the reboot command and present you with a menu informing you of the number of users currently logged in to your server and the number of files open through the network. This suspends all processing on the server.

You will hear two quick informative tones if you have any active log ins or if remote users have any files open.

- ② Inform the users that you want to shut the server down.
- ③ Press the **S** key to close all the open files and shut down the server. If you are using a PS/2 computer or a BIOS that supports disk parking, LANtastic will park the disk for you. If you want to reboot the server, press and hold the **Ctrl-Alt-Del** keys. To cancel rebooting, press any other key.

Indirect Files

Indirect files allow you to have access to a file without explicitly referencing its directory or changing your PATH statement. An indirect file is linked to another file on a network drive. Any operation on the indirect file is actually made on the file to which it points.

For example, suppose you have a file you reference often, such as a batch or an INCLUDE file. We'll use the file ORIGINAL.BAT which resides in the root directory of the server HOST1 as an example. The physical path of this file is as follows:

C:\ORIGINAL.BAT

Using this information, we would do the following to create an indirect file:

- ❶ Make sure the network drive where you will create the indirect file has the indirect file (I) access right enabled. For information on setting ACL rights refer to "Shared Resources" in this manual.
- ❷ Log in to the server and redirect one of your drives to the network resource C-DRIVE on HOST1. You can perform these functions through either the NET program or by NET command line.
- ❸ Change to the directory where you would like to place the indirect file. In this example UTIL:

CD UTIL

- ❹ Create the indirect file using the syntax:

NET INDIRECT PATHNAME ACTUAL-NAME

where PATHNAME represents the name of the indirect file you would like to create and ACTUAL-NAME represents the name of the file to link with the indirect file. We'll name the indirect file INDIRECT.BAT:

NET INDIRECT INDIRECT.BAT \C-DRIVE\ORIGINAL.BAT

If you use the DIR command for the subdirectory, you will see the indirect file INDIRECT.BAT listed with the other files there.

```

.           <DIR>          5-29-90   8:35p
..          <DIR>          5-29-90   8:35p
BOOT      BAT       1096   4-24-90  10:04a
BOOT      RTF       3054   4-24-90   2:32p
BOOTLONG  BAT       1478   4-24-90  10:05a
STRING    BAT       2910   4-23-90   4:16p
INDIRECT  BAT        128  15-00-0107 18:50p
SAM       <DIR>          8-01-90  11:07a
          8 File(s)  4571136 bytes free

```

Notice that the date and month of the indirect file cannot possibly exist. Indirect files will have this date and time to help distinguish them from regular DOS files. The NET DIR command will also help distinguish indirect files.

```

.           --D-----          29-May-1990  20:35:40
..          --D-----          29-May-1990  20:35:40
BOOT.BAT   -A-----          1096  24-Apr-1990  10:04:26
BOOT.RTF   -A-----          3054  24-Apr-1990  14:32:26
BOOTLONG.BAT -A-----          1478  24-Apr-1990  10:05:46
STRING.BAT -A-----          2910  23-Apr-1990  16:16:52
INDIRECT.BAT IA-----          \C-DRIVE\ORIGINAL.BAT
SAM        --D-----          1-Aug-1990  11:07:54

```

Notice that the NET DIR command displays the "I" in the file attributes display as well as the name of the file to which INDIRECT.BAT points.

You may now access ORIGINAL.BAT from the UTIL subdirectory. If you want to see the contents of ORIGINAL.BAT simply issue a TYPE command for INDIRECT.BAT:

TYPE INDIRECT.BAT

Since INDIRECT.BAT is a batch file, you can execute it by typing:

INDIRECT

The result would be the same as if you had typed:

C:\ORIGINAL



Note: The DELETE, RENAME and SET ATTRIBUTE functions are always performed on the indirect file, not the file to which it points.

You can link other indirect files to INDIRECT.BAT, and have access to ORIGINAL.BAT from other subdirectories. For example, you could link the file IND2.BAT in the APPS subdirectory to INDIRECT.BAT. To do this, simply change to the APPS subdirectory and type the command:

NET INDIRECT IND2.BAT \C-DRIVE\UTIL\INDIRECT.BAT

Any requests to IND2.BAT would be performed on ORIGINAL.BAT.

When using indirect files, the NET EXPAND is useful to keep track of which file an indirect file finally references. It will also give you the network or physical path to either the indirect file, or the file referenced. Refer to "NET Line Commands" in this manual for information on using the NET EXPAND command.

Informative Tones

This table describes the various tones that your computer will emit when using LANtastic:

| Tone(s) | Meaning |
|---------------|---|
| 1 beep | Your print job has been sent to the print queue, or you pressed Ctrl-Alt-PrtScr to flush your printer job. |
| 2 beeps | You pressed Ctrl-Alt-Del to reboot and users are logged in to your server. |
| 3 beeps | A user sent you a message using the NET SEND command. |
| Low-high beep | You made a request to a server and it did not respond within the allotted time. You will receive these tones until the server responds or is shut down. |

LANcache

LANcache is a disk caching system designed for optimal performance with the LANtastic Network Operating System. A cache (pronounced "cash") is a temporary memory location used to store information sent between your hard disk and your central processing unit. To use LANcache, you must have an 80286, 80386, or 80486 type computer. running PC or MS DOS version 3.1, 3.3 or higher.

The idea behind caching is that you are more likely to need the most recent data read from the disk than any other data. Therefore this information is loaded into a temporary RAM location. Think of it as a memory location where data you might possibly want soon is put. This is especially useful with Local Area Networks, as it can be used to speed up access to data stored on the server's disk.

LANcache performs these advanced caching features:

- Read ahead buffering with quick cache look-up algorithms
- Write behind operations
- Variable delayed writes
- Sequential track writing
- Overlapped CPU and I/O operations
- Multiprocess accessible caching

Read ahead buffering allows the cache to anticipate which data you will need and read it before you request the data. This reduces the number of physical accesses to the hard disk, thus improving server performance.

Writing data to a disk is usually much slower than reading data from a disk. This is because DOS must also update the directories and File Allocation Tables. These updates cause substantial disk head movement which can slow a server's performance. LANcache is designed to minimize this disk head movement.

When LANcache flushes data and writes this information to disk, the data is written in a sequential track order. This reorganization minimizes head movement and allows randomly organized data to be written much more quickly.

Delayed cache writes allow the cacher to delay writing to disk so that more data can be placed in the cache before this information is sent to disk. This reduces the number of physical accesses to the disk.

LANcache allows you to set the interval at which data is written to disk with its variable delayed write function. When you install the cacher, you can specify how long the cacher is to wait until it writes to disk.

Write behind operations mean that all cache flushes are performed as a background operation. This means that while the cache writes to disk, your server can perform other CPU operations. During flushes, LANcache also allows you to retrieve data from the cache. The cache is thus able to retrieve cached data even as it writes to disk.

LANcache Requirements

To run LANcache, your computer must have a 80286, 80386 or 80486 type processor. You must also run the redirector program,

REDIR.EXE before running the LANcache software. You must also decide which type of memory you want LANcache to use:

- Conventional memory: This is the base memory of your computer, usually shared by DOS and application programs.
- Expanded Memory (EMS): This memory requires that you install an EMS driver. This EMS driver must be compatible with LIM 4.00 or higher.
- Extended memory: Most 286, 386 and 486 type computers have this type of memory. These machines will usually have 1 Mbyte of memory installed, some of which will be conventional memory and the rest will be extended memory.

LANcache will use all available EMS or extended memory by default. You can change this by using the command line switches when you invoke LANcache. The amount of conventional memory LANcache uses will be determined by the cache memory size and the type of disk you have.

If you have a choice between using EMS or extended memory, you should probably use EMS memory on machines with 286 type processors and extended memory on machine with 386 and 486 type processors.



Note: You cannot use LANcache with CD-ROM or Write Once Read Many (WORM) drives.

Running LANcache

To run the LANtastic cache without any command line switches:

» Type: **LANCACHE** and press **Enter**.

You will see a message informing you if the installation was successful.

Shutting Down LANcache

There are certain considerations to keep in mind when using a cache. Since the cacher delays writing data to disk, simply turning off your computer will result in losing any data stored in the cache. Before shutting down your computer, you should perform ONE of the following precautionary steps:

» Press **Ctrl-Alt-Del**

If you are running the SERVER program, press the **S** key to perform a normal system shut down. If you are not running the server program, the cacher will delay the reboot until LANcache has flushed its data to disk.

» Or you can type: **LANCACHE/FLUSH**

This will flush the cache.

» Or type: **LANCACHE/RESET**

To flush and reset the cache.

» Or simply wait until the cache has been flushed. The cacher will flush at the interval set in the **AFTER_WRITE_DELAY** switch. The default setting for this switch is three seconds.

When the cacher is running, you can instruct it to perform any of these functions:

- Flush the cache using the **FLUSH** switch to write data to disk.
- Reset the cache using the **RESET** switch to write data to the disk and remove any “read” data from the cache.
- Display statistics about the cacher’s performance using the **STAT=INFO** switch.
- Reset the cacher’s performance statistics using the **STAT=RESET** switch.

refer to the next section for information on using these command line switches.

Running LANcache With Command Line Switches

To run the LANtastic cacher with command line switches use the syntax:

LANCACHE(switches...) (; comment)

where “switches” denotes any optional command line switches. If you are using more than one switch in a command line, use a space or a (/) to separate the arguments. If a switch takes a value (such as when

you set the cache size) the switch name must be followed by an equal sign (=) or a colon (:). All switch values are checked to make sure they are valid. Illegal values produce error messages.

These are valid switch formats:

SWITCH
/SWITCH
SWITCH:VALUE
/SWITCH=VALUE

You would use one of the first two formats for a switch that does not take a value. For example:

LANCACHE/HELP

You would use the third or fourth formats for a switch that takes a value. Such as:

LANCACHE/CACHE_SIZE=384

Using LANcache Switches

The LANcache optional command line switches are given below. The letters “ddd” denote that you must give a decimal value for that switch. Values enclosed in the brackets “()” indicate default values for the switch. Values after the brackets “()” denote the valid range of option for the switch.

@indirect-file

This switch specifies that further switches are to be taken from an indirect file. The indirect file names must begin with the “@” sign to distinguish them from regular files. Any switches after @indirect-file will be discarded. You may invoke indirect files from within indirect files as many times as you wish.

The indirect file should contain only valid switches. It may also contain comment characters (which follow a semicolon) at the beginning of each line or after switches.

For example,

LANCACHE @SETUP

The file @SETUP contains

```
; LANCACHE setup file
;
type=EMS           ; Use EMS memory
cache_size=1000    ; Use 1000K of EMS memory
verbose           ; Display verbose information
```

AFTER_WRITE_DELAY=dddd (3) 0-3600

Every time LANcachel writes to disk, this interval is reset. If the amount of time that you specify (in seconds) for AFTER_WRITE_DELAY expires, the cache flushes its data to disk. Setting the value to 0 will make the cache immediately write data to disk. This field must not be set to a smaller value than LONG_WRITE_DELAY of LANcachel will use the write delays set with the LONG_WRITE_DELAY value.

CACHE_SIZE=dddddd (384K extended, or all available EMS or conventional memory) 16-16000

This switch sets the memory size of the cache. LANcachel may round down the value you specify to account for its storage needs. If you do not set this switch, LANcachel will use 384K of expanded memory or all available EMS or conventional memory.

DISK=d (0) 0-3

This switch specifies the physical disk unit that will be cached. You may cache only one disk at a time. Disk 0 would be the first hard disk in your computer. If this disk is partitioned into multiple logical disks such as C:, D: and E:, they will all be cached since they are part of the same physical drive.

FLUSH

This argument causes the cache to flush its data to disk. You can use this command for an orderly shut down of the cache.

HELP or ?

This switch displays information about the valid command line switches, but does not install LANcachel. To use this switch, these are the two valid formats:

LANCACHED/HELP

LANCACHED ?

See "Appendix E: Messages" for an example of the HELP output.

LONG_WRITE_DELAY=dddd (12) 0-3600

This switch specifies the length of time in seconds that LANcache will wait before flushing its data to disk. This value is independent of the AFTER_WRITE_DELAY value. The LONG_WRITE_DELAY is used to guarantee that data is written to disk no later than the length of time that you specify for LONG_WRITE_DELAY. Usually you will set this value to be greater than the value for AFTER_WRITE_DELAY.

NOBACKGROUND

This switch allows you to disable LANcache's background writing feature. When you use this switch, the cacher must finish writing to disk before it can perform any other functions.

RESET

This argument instructs LANcache to flush all data to disk and reset the cache system by removing any other cached data from memory. You can use this command for an orderly shut down of the cache. You can also use this switch to initialize the cache to gather performance statistics. LANcache must already be installed to use this switch.

STAT= () INFO, RESET

This switch executes LANcache's performance statistics program. The INFO option provides you with statistical information about LANcache, including a summary of cache effectiveness.

The RESET option resets statistical information to its initial state. This is useful if the cacher has been running for a long time and you wish to gather statistics about the cacher's current performance. See "Appendix E: Messages" in this manual for an example statistical display.

You must run LANcache before using this switch.

TYPE= (EXTENDED) CONVENTIONAL, EMS, EXTENDED

This argument specifies the type of memory that LANcache will use. To use EMS memory you must install an EMS driver. You can always use conventional memory, but make sure there is enough available to make effective use of the cacher.

VERBOSE

This switch installs LANcache and displays detailed information about its configuration. See "Appendix E: Messages" for a sample Verbose display output.

LANPUP

LANPUP is a Terminate-and-Stay-Resident (TSR) version of the NET program. With it you can perform most of the functions of the NET program without exiting the application program you are currently using.

LANPUP allows you to perform the following functions:

- Logging in and out of servers
- Redirecting disk drives
- Redirecting printer ports
- Managing the printer queue
- Sending and receiving electronic mail

In keeping with LANtastic's philosophy of low memory requirement networking, the LANPUP program requires only 5K of RAM.

Installing The LANPUP Program

The LANPUP program is provided with your distribution diskette. Once you've installed the system software, it will reside in the LANTASTI subdirectory.

» To execute the program type:

```
CD \LANTASTI  
LANPUP
```

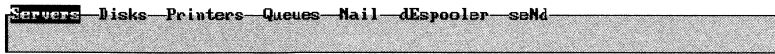
The program is now loaded into memory.

Bringing Up The LANPUP Program

To activate the LANPUP program:

» Press and hold down the **Ctrl**, **Alt**, and **L** keys.

This will bring up the LANPUP *Main Functions* screen with the *Servers* option highlighted.



Logging In To A Server With The LANPUP Program

To log in to a network server:

- 1 Use the **Space Bar** or the right and left arrow keys to move the highlight bar to the *Servers* option. You can also press the **S** key to select this option. Press **Enter**.

You will see the name of the network server(s) that you are currently logged in to. If you are logged in to more than one server, you can see the other server names by pressing the up and down arrow keys. For help information, press any other key.

- 2 Press the **Ins** key and type in the name of the server that you want to log in to and press **Enter**.
- 3 Enter your username and password.

If the attempt was successful, you will see the server listed with the other other network servers you are currently logged in to.

Logging Out Of A Server

To log out of a server:

- » Use the arrow keys to select the name of the server you want to log out of, and press the **Del** key.

To exit the server selection, press the **Esc** key.

Redirecting Disk Drives With The LANPUP Program

- 1 Use the **Space Bar** or the right and left arrow keys to move the highlight bar to the *Disks* option. You can also press the **D** key to select this option. Press **Enter**.

- ② Use the arrow keys to scroll through the list of local disk drives until you've selected the one you wish to connect to a server's disk drive. You can also type the letter that corresponds to the drive you want to select. For example, you can type **D** to select the D: drive.
- ③ Press the **Ins** key. An available server's name will appear in flashing text on the screen. If this is the desired server, press **Enter**. If not, use the arrow keys to select a server and press **Enter**.
- ④ From the list of network subdirectories provided, select the desired device or resource and press **Enter**.

LANPUP displays the description of the server's resource that was entered by the system manager, so you can know more about the device you are redirecting to.

Canceling A Redirection With The LANPUP Program

To cancel a redirection:

- ① Select the *Disks* option from the LANPUP *Main Functions* menu, and press **Enter**.
- ② Use the up and down arrow keys to scroll to the redirected drive that you want to disconnect from the server. You can also type the letter that corresponds to the drive letter. For example, you can type **D** to select the D: drive.
- ③ Press the **Del** key.

The redirection should now be cancelled.

Redirecting A Printer Port

You can redirect printer ports as easily as redirecting disk drives. This allows you to use a server's printer as though it were attached to your own PC.

- ① Use the **Space Bar** or the right and left arrow keys to move the highlight bar to the *Printers* option. You can also press the **P** key to select this option. Press **Enter**.

- ② Select the LPT or COM port that you want to connect to a server and press **Enter**.
- ③ An available server's name will flash on the screen. If this is the desired server, press **Enter**. If not, use the arrow keys to select a server and press the **Ins** key or **Enter**.
- ④ An available printer device will flash on the screen. If this is the desired device, press **Enter**. If not, use the up and down arrow keys to select a printer resource and press **Enter**.

Any print commands given to the local printer port will now be sent to the server's printer.

Canceling A Printer Port Redirection

To cancel a redirection:

- ① Select the *Printers* option from the LANPUP *Main Functions* menu, and press **Enter**.
- ② Use the up and down arrow keys to scroll to the printer port that you want to disconnect from the server.
- ③ Press the **Del** key.

The printer port will now function as a local port.

Manipulating The Printer And Mail Queues With LANPUP

LANPUP allows you to look through the printer and mail queues and control the entries listed there. To enter a server's queue:

- ① Use the **Space Bar** or the right and left arrow keys to move the highlight bar to the *Queues* option. You can also press the **Q** key to select this option. Press **Enter**.
- ② Use the up and down arrow keys to select the desired server and press **Enter**.

If the server's name does not appear on the list, press the **Ins** key and type the name of the desired server, then press **Enter**. Key in your username and password, and press **Enter**.

You will see the following menu:

```
Servers Disks Printers Queues Mail dEspooler send
  hold reLese Delete Read rUsh
```

- ③ Use the up and down arrow keys to select the printer or mail queue entry you want to control. You can use these keys to perform the following functions:

| | |
|----------|---|
| H | Holds entry. The item is not despoiled until released |
| L | reLeseS held item for despooling |
| D | Deletes the queue entry |
| R | Read file in queue |
| U | rUshes the item. Prints or sends a queue entry first |

Sending And Receiving Electronic Mail With LANPUP

Electronic Mail is one of the most useful features of the LANPUP program. You can send messages or files to users across the network while still in an application program. You can even send notes to yourself to help you remember ideas or appointments.

With LANtastic NOS, mail is sent to a server. The mail items are then placed in the server's mail queue (actually a file on the server). The recipient is informed by a pop-up message when he or she has mail waiting. The user can then enter the server's queue and read the mail item(s). If the user is not at his or her computer when a message arrives, the NET POSTBOX command allows the user to find out if he or she has any mail waiting. To send a message:

- ① Select the *Mail* option from the LANPUP *Main Functions* menu, and press **Enter**.
- ② Use the up and down arrow keys to select the destination server mail queue and press **Enter**.

If the server's name does not appear on the list, you can log in by pressing the **Ins** key and typing the name of the desired server, then press **Enter**. Key in your username and password, and press **Enter**.

```
Servers Disks Printers Queues Mail dEspooler send
  Read Delete Send
```

- ③ Select the *Send* option and press **Enter**.
- ④ Type in the name of the person to whom you are sending the message and press **Enter**.
- ⑤ Key in the full DOS path of the file you would like to send or type:

CON

To input the message from your keyboard.

When entering mail from the keyboard you may use these text editing functions:

| | |
|------------|---|
| ← | Moves the cursor one character to the left |
| ⇒ | Move the cursor one character to the right |
| Ins | Inserts text before the current character, and takes you out of insert mode |

Reading Mail

To open mail sent to or by you:

- ① Select the *Read* option and press **Enter**.
- ② Select the mail item you wish to read and press **Enter**.
- ③ Provide the full DOS path of the file you want the mail item sent to, or type:

CON

to display the file line by line on the screen. Saving the file to disk is especially useful for saving long messages or receiving binary files such as application programs or database entries.

You can also print out the mail entry by typing in a printer port, such as LPT1 instead of a DOS path or CON.

Controlling A Server's Despooler With LANPUP

If you have the Super Queue (Q) privilege, you can control a server's queue.

- ① Use the **Space Bar** or the right and left arrow keys to move the highlight bar to the *dEspooler* option. You can also press the **E** key to select this option. Press **Enter**.
- ② An available server's name will flash on the screen. If this is the desired server, press **Enter**. If not, use the arrow keys to select a server and press the **Ins** key or **Enter**. You will see this display:

```
Servers Disks Printers Queues Mail dEspooler seNd
[Ins] Stop Pause single start Restart
```

You can use these keys to perform the functions:

| | |
|----------|---|
| H | Halt all despooling |
| S | Stop despooling at the end of the current print job |
| P | Pause despooling |
| I | despool a single job, then stops |
| T | sTart Despooling all ready jobs |
| R | Restart a print job from the beginning. |

Using The LANPUP Send Feature

The LANPUP seNd feature allows you to send a one line (64 character) mail message to any network node.

- ① Use the **Space Bar** or the right and left arrow keys to move the highlight bar to the *seNd* option. You can also press the **N** key to select this option. Press **Enter**. You will see this display:

```
Servers Disks Printers Queues Mail dEspooler seNd
To machine:
```

- ② Key in the network name of the destination computer.
- ③ Type the message you want to send and press **Enter**.

If the destination computer is running on the network, The message will appear on the destination node's monitor.

Using LANPUP In Stand Alone Mode

If you wish to use LANPUP only when you need it and not keep it resident in memory:

» Type: **LANPUP/S**

The /S switch makes LANPUP operate in stand alone mode. LANPUP will only be in memory when you use the program. Once you've exited the program, you must reissue the LANPUP/S command to use LANPUP.

Mail

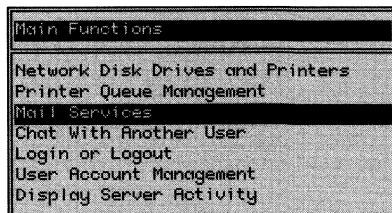
You can avoid having a paper trail in your office by sending messages with electronic mail. You can also send messages to yourself as helpful reminders of important tasks or dates.

With LANtastic NOS, mail is sent through a server. The mail items are then placed in the server's mail queue (actually a file on the server). The recipient is informed by a pop-up message when he or she has mail waiting. The user can then enter the server's queue and read the mail item(s).

Creating A Mail Entry Using The Mail Editor

To send mail to another user:

- 1 Type **NET** and press **Enter**. You will see the *NET Main Functions* menu.
- 2 Select the *Mail Services* option as shown and press **Enter**.



- ③ Select the intended recipient's network server from the list provided and press **Enter**. The server's mail queue will appear:

| Incoming Mail | From | Comment |
|--------------------|---------|-------------------|
| 5-Jun-1990 4:28 pm | MANAGER | |
| 5-Jun-1990 4:28 pm | MANAGER | |
| 8-Jun-1990 1:43 pm | USER | (U) Welcome Back! |
| 6-Jun-1990 8:02 am | CORINNE | Printing Cost |

| OUTgoing Mail | To | Comment |
|--------------------|----------|----------------------|
| 8-Jun-1990 1:40 pm | \$BOB | Status Report |
| 6-Jun-1990 8:05 am | \$EILEEN | (U) Voice Memo |
| 6-Jun-1990 8:06 am | \$SAM | Meeting Notes |
| 6-Jun-1990 8:07 am | !LKA | (U) Product Comments |

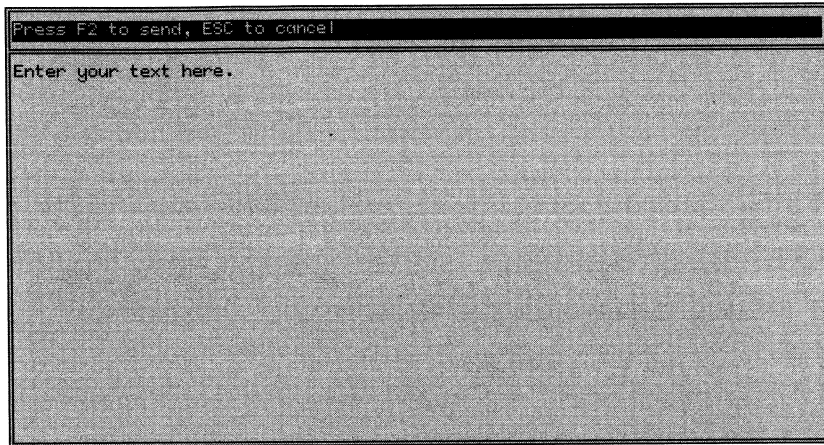
On the *INcoming Mail* queue you will see the names of mail items sent to you. The *OUTgoing Mail* queue shows items you've sent.

- ④ Press the **Ins** key. You will see the *Send Mail Options* menu.
- ⑤ Select the *Use Mail Editor* option from the menu as shown and press **Enter**.

| Incoming Mail | From | Comment |
|--------------------|---------|-------------------|
| 5-Jun-1990 4:28 pm | MANAGER | |
| 5-Jun-1990 4:28 pm | MANAGER | |
| 8-Jun-1990 1:43 pm | USER | (U) Welcome Back! |
| 6-Jun-1990 8:02 | | t |

| OUTgoing Mail | To | Comment |
|--------------------|----------|----------------------|
| 8-Jun-1990 1:40 pm | \$BOB | Status Report |
| 6-Jun-1990 8:05 am | \$EILEEN | (U) Voice Memo |
| 6-Jun-1990 8:06 am | \$SAM | Meeting Notes |
| 6-Jun-1990 8:07 am | !LKA | (U) Product Comments |

You will see this window:



- ⑥ Type your message in the screen provided.
- ⑦ Press the **F2** key to send your message.
- ⑧ Type in the recipient's username and press **Enter**, or press the **F10** key for the server's mailing list. If you use this option, select a user from the list and press **Enter**.
- ⑨ In the window provided, type in a comment (optional) and press **Enter**.

If the recipient is currently logged in to the server, a pop-up message will inform the user of the mail entry. If not, the user will see the entry the next time he or she checks the mail queue or issues the NET POSTBOX command.

Sending An Existing File

If you're sending a file that you've already created:

- ① Type **NET** and press **Enter**. You will see the *NET Main Functions* menu.
- ② Select the *Mail Services* option as shown and press **Enter**.

| Main Functions |
|----------------------------------|
| Network Disk Drives and Printers |
| Printer Queue Management |
| Mail Services |
| Chat With Another User |
| Login or Logout |
| User Account Management |
| Display Server Activity |

- ③ Select the intended recipient's network server from the list provided and press **Enter**. The server's mail queue will appear:

| INcoming Mail | From | Comment |
|--------------------|---------|-------------------|
| 5-Jun-1990 4:28 pm | MANAGER | |
| 5-Jun-1990 4:28 pm | MANAGER | |
| 8-Jun-1990 1:43 pm | USER | (U) Welcome Back! |
| 6-Jun-1990 8:02 am | CORINNE | Printing Cost |

| OUTgoing Mail | To | Comment |
|--------------------|----------|----------------------|
| 8-Jun-1990 1:40 pm | \$BOB | Status Report |
| 6-Jun-1990 8:05 am | \$EILEEN | (U) Voice Memo |
| 6-Jun-1990 8:06 am | \$SAM | Meeting Notes |
| 6-Jun-1990 8:07 am | !LKA | (U) Product Comments |

On the *INcoming Mail* queue you will see the names of mail items sent to you. The *OUTgoing Mail* queue shows items you've sent.

- ④ Press the **Ins** key. You will see the *Send Mail Options* menu.

- ⑤ Select the option *Send Text File* as shown in the example below and press **Enter**.

| INcoming Mail | From | Comment |
|--------------------|---------|-------------------|
| 5-Jun-1990 4:28 pm | MANAGER | |
| 5-Jun-1990 4:28 pm | MANAGER | |
| 8-Jun-1990 1:43 pm | USER | (U) Welcome Back! |
| 6-Jun-1990 8:02 | | t |

| OUTgoing Mail | To | Comment |
|--------------------|----------|----------------------|
| 8-Jun-1990 1:40 pm | \$BOB | Status Report |
| 6-Jun-1990 8:05 am | \$EILEEN | (U) Voice Memo |
| 6-Jun-1990 8:06 am | \$SAM | Meeting Notes |
| 6-Jun-1990 8:07 am | !LKA | (U) Product Comments |

| Send Mail Options |
|-------------------|
| Use Mail Editor |
| Send Text File |
| Send Voice File |
| Record Voice Mail |

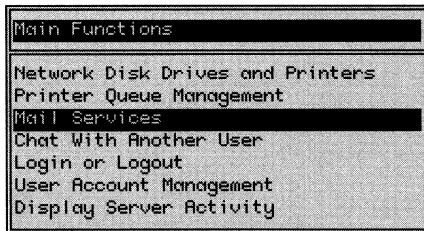
- ⑥ Enter the full DOS path and filename of the file you want to send.
- ⑦ Type in the recipient's username and press **Enter**, or press the **F10** key for the server's mailing list. If you use this option, select a user from the list and press **Enter**.
- ⑧ In the window provided, type in a comment (optional) and press **Enter**.

If the recipient is currently logged in to the server, a pop-up message will inform the user of the mail entry. If not, the user will see the entry the next time he or she checks the mail queue or issues the NET POSTBOX command.

Reading A Mail Entry

To read mail items sent to you or that you've sent to other users:

- ① Type **NET** and press **Enter**. You will see the NET *Main Functions* menu.
- ② Select the *Mail Services* option as shown and press **Enter**.



- ③ Select the appropriate network server from the list provided and press **Enter**. The server's mail queue will appear:

| Incoming Mail | From | Comment |
|--------------------|---------|-------------------|
| 5-Jun-1990 4:28 pm | MANAGER | |
| 5-Jun-1990 4:28 pm | MANAGER | |
| 8-Jun-1990 1:43 pm | USER | (U) Welcome Back! |
| 6-Jun-1990 8:02 am | CORINNE | Printing Cost |

| OUTgoing Mail | To | Comment |
|--------------------|----------|----------------------|
| 8-Jun-1990 1:40 pm | \$BOB | Status Report |
| 6-Jun-1990 8:05 am | \$EILEEN | (U) Voice Memo |
| 6-Jun-1990 8:06 am | \$SAM | Meeting Notes |
| 6-Jun-1990 8:07 am | !LKA | (U) Product Comments |

On the *INcoming Mail* queue you will see the names of mail items sent to you. The *OUTgoing Mail* queue shows items you've sent.

- ④ To move between the two queues, press the **Tab** key. Use the arrow keys to select the item you wish to read from the *INCOMING* or *OUTgoing Mail* queues and press **Enter**. You will see the *Mail options* menu.
- ⑤ Select *Read Mail* from the *Mail Options* menu as shown in the example below and press **Enter**.

The screenshot shows the mail interface with the 'Incoming Mail' queue. The item '6-Jun-1990 8:02 am CORINNE' is selected. A 'Mail Options' menu is open, with 'Read Mail' highlighted. Below it, a 'Description of Mail' window is displayed, showing the details of the selected mail item.

| Incoming Mail | From | Comment |
|--------------------|---------|-------------------|
| 5-Jun-1990 4:28 pm | MANAGER | |
| 5-Jun-1990 4:28 pm | MANAGER | |
| 8-Jun-1990 1:43 pm | USER | (U) Welcome Back! |
| 6-Jun-1990 8:02 am | CORINNE | |

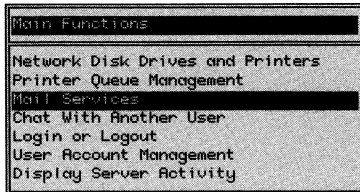
| OUTgoing | To | From | Date | Size | Comment |
|----------|----------|---------|--------------------|------|---------------|
| 8-Jun | \$EILEEN | CORINNE | 6-Jun-1990 8:02 am | 16 | Printing Cost |
| 6-Jun | | | | | |
| 6-Jun | | | | | |
| 6-Jun | | | | | |

LANtastic NOS will display the contents of the mail item.

Copying A Mail Item To A File

To copy an existing mail entry to another file:

- 1 Type **NET** and press **Enter**. You will see the *NET Main Functions* menu.
- 2 Select the *Mail Services* option as shown and press **Enter**.



- 3 Select the appropriate network server from the list provided and press **Enter**. The server's mail queue will appear:

| Incoming Mail | From | Comment |
|--------------------|---------|-------------------|
| 5-Jun-1990 4:28 pm | MANAGER | |
| 5-Jun-1990 4:28 pm | MANAGER | |
| 8-Jun-1990 1:43 pm | USER | (U) Welcome Back! |
| 6-Jun-1990 8:02 am | CORINNE | Printing Cost |

| OUTgoing Mail | To | Comment |
|--------------------|----------|----------------------|
| 8-Jun-1990 1:40 pm | \$BOB | Status Report |
| 6-Jun-1990 8:05 am | \$EILEEN | (U) Voice Memo |
| 6-Jun-1990 8:06 am | \$SAM | Meeting Notes |
| 6-Jun-1990 8:07 am | !LKA | (U) Product Comments |

On the *INcoming Mail* queue you will see the names of mail items sent to you. The *OUTgoing Mail* queue shows items you've sent.

- 4 To move between the *INcoming Mail* queue and the *OUTgoing Mail* queue, press the **Tab** key. Use the arrow keys to move the highlight bar to the mail item you want to save and press **Enter**.
- 5 Select the option *Copy Mail to File* and press **Enter**.

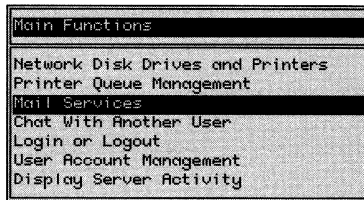
- 6 In the window provided, type the full DOS path and filename of the destination file and press **Enter**.

The mail queue entry should now reside in the file and directory you specified in step 6

Forwarding A Copy Of A Mail Message

Any mail item that you've sent or received can be forwarded to another user. This allows you to pass along messages without having to re-type them. To forward a message:

- 1 Type **NET** and press **Enter**. You will see the *NET Main Functions* menu.
- 2 Select the *Mail Services* option as shown and press **Enter**.



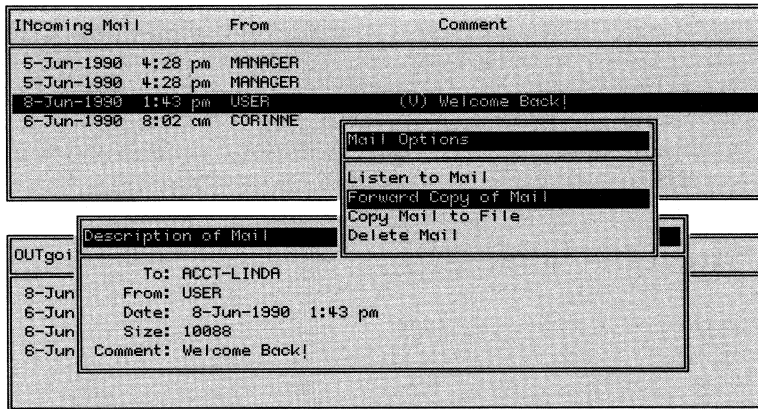
- 3 Select the intended recipient's network server from the list provided and press **Enter**. The server's mail queue will appear:

| Incoming Mail | From | Comment |
|--------------------|---------|-------------------|
| 5-Jun-1990 4:28 pm | MANAGER | |
| 5-Jun-1990 4:28 pm | MANAGER | |
| 8-Jun-1990 1:43 pm | USER | (U) Welcome Back! |
| 6-Jun-1990 8:02 am | CORINNE | Printing Cost |

| OUTgoing Mail | To | Comment |
|--------------------|----------|----------------------|
| 8-Jun-1990 1:40 pm | \$BOB | Status Report |
| 6-Jun-1990 8:05 am | \$EILEEN | (U) Voice Memo |
| 6-Jun-1990 8:06 am | \$SAM | Meeting Notes |
| 6-Jun-1990 8:07 am | ILKA | (U) Product Comments |

On the *INcoming Mail* queue you will see the names of mail items sent to you. The *OUTgoing Mail* queue shows items you've sent.

- ④ To move between the *INcoming Mail* queue and the *OUTgoing Mail* queue, press the **Tab** key. Use the arrow keys to move the highlight bar to the mail queue item you want to forward and press **Enter**. You will see the *Mail Options* menu.
- ⑤ Select the option *Forward Copy Of Mail* from the menu as shown below and press **Enter**.



- ⑥ Type in the recipient's username and press **Enter**, or press the **F10** key for the server's mailing list. If you use this option, select a user from the list and press **Enter**.
- ⑦ The window will provide you with the current comment for the mail item. If the comment is still satisfactory press **Enter**. If not, type in a new comment and press **Enter**.

If the recipient is currently logged in to the server, a pop-up message will inform the user of the mail entry. If not, the user will see the entry the next time he or she checks the mail queue or issues the NET POSTBOX command.

Deleting An Item From The Mail Queue

In order to save disk space on the server, You should delete old mail items from the mail queue. Removing mail queue items consists of the following steps:

- ① To move between the *INcoming Mail* queue and the *OUTgoing Mail* queue, press the **Tab** key. Use the arrow keys to move the highlight bar to the mail item you want to delete and press **Del** or **Enter**.
- ② If you press **Del**, press **Enter** to confirm the deletion. If you press **Enter**, Select the option *Delete Mail* and press **Enter** twice. The item will disappear from the mail queue.

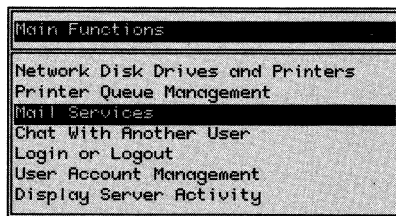
Voice Mail

LANtastic NOS allows you to send voice messages across the network and play them back later. To record and play messages, you must have LANtastic Voice Adapters installed in both the sending and receiving computers. You must also run the supporting software. Consult the *LANtastic Voice Adapter User's Manual* for information on installing the Voice Adapter and supporting software.

Sending A Voice Message:

To record a voice message:

- ① Type **NET** and press **Enter**. You will see the *NET Main Functions* menu.
- ② Select the *Mail Services* option as shown and press **Enter**.



- ③ Select the recipient's network server from the list provided and press **Enter**. The server's mail queue will appear:

| Incoming Mail | From | Comment |
|--------------------|---------|-------------------|
| 5-Jun-1990 4:28 pm | MANAGER | |
| 5-Jun-1990 4:28 pm | MANAGER | |
| 8-Jun-1990 1:43 pm | USER | (U) Welcome Back! |
| 6-Jun-1990 8:02 am | CORINNE | Printing Cost |

| OUTgoing Mail | To | Comment |
|--------------------|----------|----------------------|
| 8-Jun-1990 1:40 pm | \$BOB | Status Report |
| 6-Jun-1990 8:05 am | \$EILEEN | (U) Voice Memo |
| 6-Jun-1990 8:06 am | \$SAM | Meeting Notes |
| 6-Jun-1990 8:07 am | !LKA | (U) Product Comments |

On the *INcoming Mail* queue you will see the names of mail items sent to you. The *OUTgoing Mail* queue shows items you've sent.

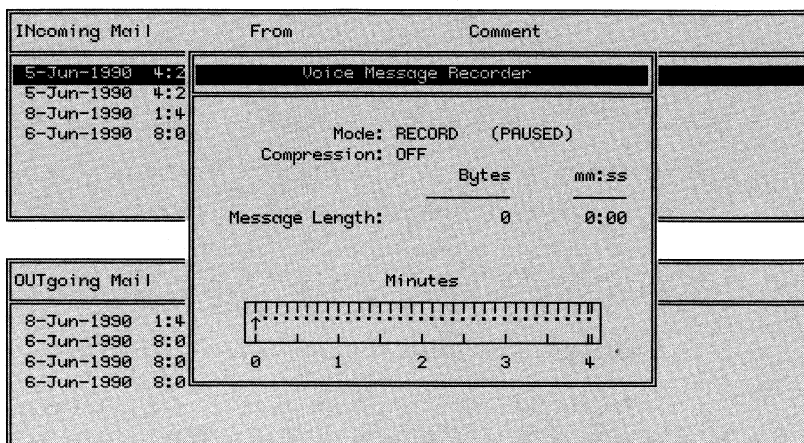
- ④ Press the **Ins** key. You will see the *Send Mail Options* menu.
- ⑤ Select the option *Record Voice Mail* from the menu and press **Enter**.

| Incoming Mail | From | Comment |
|--------------------|---------|-------------------|
| 5-Jun-1990 4:28 pm | MANAGER | |
| 5-Jun-1990 4:28 pm | MANAGER | |
| 8-Jun-1990 1:43 pm | USER | (U) Welcome Back! |
| 6-Jun-1990 8:02 | | t |

| OUTgoing Mail | To | Comment |
|--------------------|----------|----------------------|
| 8-Jun-1990 1:40 pm | \$BOB | Status Report |
| 6-Jun-1990 8:05 am | \$EILEEN | (U) Voice Memo |
| 6-Jun-1990 8:06 am | \$SAM | Meeting Notes |
| 6-Jun-1990 8:07 am | !LKA | (U) Product Comments |

- ⑥ Type in the recipient's username and press **Enter**, or press the **F10** key for the server's mailing list. If you use this option, select a user from the list and press **Enter**.

- ⑦ In the window provided, type in a comment (optional) and press **Enter**. You will see the following display:



Pressing the **F2** key will enable compression for voice communications. This option will save server disk space by compressing messages into half as many bytes as in non-compressed mode. (This will slightly reduce sound quality.) To disable compression, press the **F2** key again.

- ⑧ Press the **Space Bar** to start and pause recording. Press **Del** if you want to clear the message and start over.
- ⑨ Press **Enter** to save the message and exit or press **Esc** to exit without sending the message.

If the recipient is currently logged in to the server, a pop-up message will inform the user of the mail entry. If not, the user will see the entry the next time he or she checks the mail queue or issues the **NET POSTBOX** command.

Sending A Voice File

To send a voice message that has already been copied to a file, complete the following steps:

- ① Type **NET** and press **Enter**. You will see the *NET Main Functions* menu.
- ② Select the *Mail Services* option as shown and press **Enter**.

| Main Functions |
|----------------------------------|
| Network Disk Drives and Printers |
| Printer Queue Management |
| Mail Services |
| Chat With Another User |
| Login or Logout |
| User Account Management |
| Display Server Activity |

- ③ Select the recipient's network server from the list provided and press **Enter**. The server's mail queue will appear:

| INcoming Mail | From | Comment |
|--------------------|---------|-------------------|
| 5-Jun-1990 4:28 pm | MANAGER | |
| 5-Jun-1990 4:28 pm | MANAGER | |
| 8-Jun-1990 1:43 pm | USER | (U) Welcome Back! |
| 6-Jun-1990 8:02 am | CORINNE | Printing Cost |

| OUTgoing Mail | To | Comment |
|--------------------|----------|----------------------|
| 8-Jun-1990 1:40 pm | \$BOB | Status Report |
| 6-Jun-1990 8:05 am | \$EILEEN | (U) Voice Memo |
| 6-Jun-1990 8:06 am | \$SAM | Meeting Notes |
| 6-Jun-1990 8:07 am | !LKA | (U) Product Comments |

On the *INcoming Mail* queue you will see the names of mail items sent to you. The *OUTgoing Mail* queue shows items you've sent. Use the **Tab** key to move between the two queues.

- ④ Press the **Ins** key. You will see the *Send Mail Options* menu.
- ⑤ Select *Send Voice File* from the menu as shown below, and Press **Enter**.

| INcoming Mail | | From | Comment |
|---------------|---------|---------|-------------------|
| 5-Jun-1990 | 4:28 pm | MANAGER | |
| 5-Jun-1990 | 4:28 pm | MANAGER | |
| 8-Jun-1990 | 1:43 pm | USER | (U) Welcome Back! |
| 6-Jun-1990 | 8:02 | | t |

| OUTgoing Mail | | | |
|---------------|---------|----------|----------------------|
| 8-Jun-1990 | 1:40 pm | \$BOB | Status Report |
| 6-Jun-1990 | 8:05 am | \$EILEEN | (U) Voice Memo |
| 6-Jun-1990 | 8:06 am | \$SAM | Meeting Notes |
| 6-Jun-1990 | 8:07 am | !LKA | (U) Product Comments |

- ⑥ Enter the full DOS path and name of the file you want to send.
- ⑦ Type in the recipient's username and press **Enter**, or press the **F10** key for the server's mailing list. If you use this option, select a user from the list and press **Enter**.
- ⑧ In the window provided, type in a comment (optional) and press **Enter**.

If the recipient is currently logged in to the server, a pop-up message will inform the user of the mail entry. If not, the user will see the entry the next time he or she checks the mail queue or issues the NET POSTBOX command.

Playing A Voice Mail Message:

Once you've recorded a Voice Mail message, you or the recipient can play it back. To listen to a Voice Mail message:

- ① Type **NET** and press **Enter**. You will see the NET *Main Functions* menu.

- ② Select the *Mail Services* option as shown and press **Enter**.

| |
|----------------------------------|
| Main Functions |
| Network Disk Drives and Printers |
| Printer Queue Management |
| Mail Services |
| Chat With Another User |
| Login or Logout |
| User Account Management |
| Display Server Activity |

- ③ Select the appropriate network server from the list of servers provided and press **Enter**. The server's mail queue will appear. Voice items will be preceded by a (V).

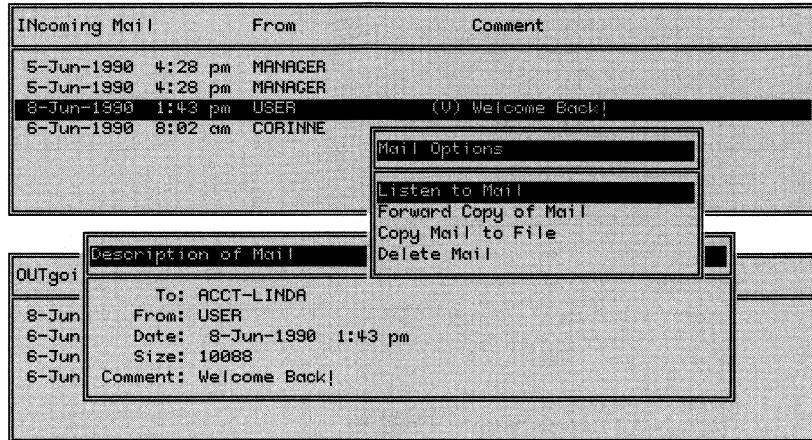
| Incoming Mail | From | Comment |
|--------------------|---------|-------------------|
| 5-Jun-1990 4:28 pm | MANAGER | |
| 5-Jun-1990 4:28 pm | MANAGER | |
| 8-Jun-1990 1:43 pm | USER | (V) Welcome Back! |
| 6-Jun-1990 8:02 am | CORINNE | Printing Cost |

| OUTgoing Mail | To | Comment |
|--------------------|----------|----------------------|
| 8-Jun-1990 1:40 pm | \$BOB | Status Report |
| 6-Jun-1990 8:05 am | \$EILEEN | (V) Voice Memo |
| 6-Jun-1990 8:06 am | \$SAM | Meeting Notes |
| 6-Jun-1990 8:07 am | !LKA | (V) Product Comments |

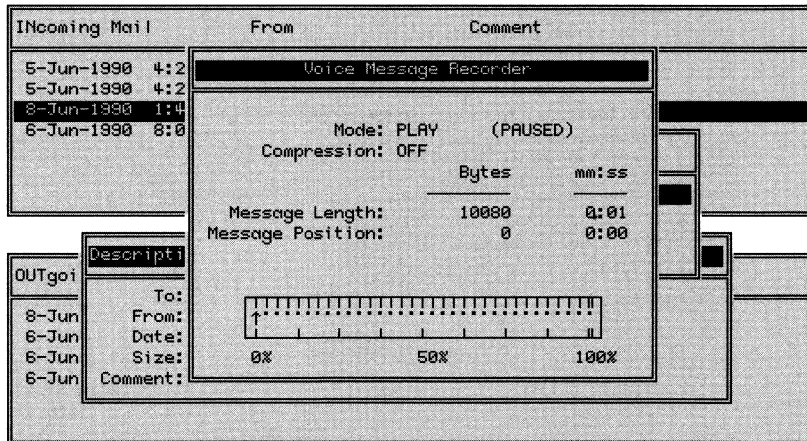
On the *INcoming Mail* queue you will see the names of mail items sent to you. The *OUTgoing Mail* queue shows items you've sent.

- ④ To move between the *INcoming Mail* queue and the *OUTgoing Mail* queue, press the **Tab** key. Use the arrow keys to move the highlight bar to the Voice Mail item you want to listen to and press **Enter**. You will see the *Mail Options* menu.

5 Select the option *Listen to Mail* from the menu and press **Enter**.



You will see this display:



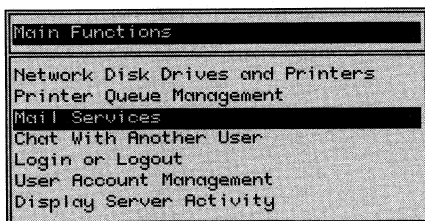
6 Press the **Space Bar** to toggle from *PAUSED* to *PLAY* mode. The *Compression* field indicates whether compression was used when the message was originally recorded. The length of the message in bytes and also minutes and seconds is displayed in the *Message Length* field. The *Message Position* field displays the number of minutes, seconds and bytes played back. Below this is a graph representing the total length of the message. The arrow pointer indicates the current place in the message. These keys perform the following functions:

| | |
|-------------|---|
| Esc | Terminates playback and returns you to the previous window. |
| Home | “Rewinds” the message to the beginning. |
| ⇒ | Advances the message two seconds. |
| ⇐ | Backs up the message two seconds. |
| ⇓ | Advances message one small increment on the scale. |
| ⇑ | Backs up the message one small increment on the scale. |
| PgDn | Advances the message one large increment on the scale. |
| PgUp | Backs up the message one large increment on the scale. |

Copying A Voice Mail Item To A File

To copy an existing Voice Mail message to a different location:

- 1 Type **NET** and press **Enter**. You will see the *NET Main Functions* menu.
- 2 Select the *Mail Services* option as shown and press **Enter**.



- 3 Select the appropriate network server from the list of servers provided and press **Enter**. The server’s mail queue will appear.

| INcoming Mail | From | Comment |
|--------------------|---------|-------------------|
| 5-Jun-1990 4:28 pm | MANAGER | |
| 5-Jun-1990 4:28 pm | MANAGER | |
| 8-Jun-1990 1:43 pm | USER | (U) Welcome Back! |
| 6-Jun-1990 8:02 am | CORINNE | Printing Cost |

| OUTgoing Mail | To | Comment |
|--------------------|----------|----------------------|
| 8-Jun-1990 1:40 pm | \$BOB | Status Report |
| 6-Jun-1990 8:05 am | \$EILEEN | (U) Voice Memo |
| 6-Jun-1990 8:06 am | \$SAM | Meeting Notes |
| 6-Jun-1990 8:07 am | !LKA | (U) Product Comments |

On the *INcoming Mail* queue you will see the names of mail items sent to you. The *OUTgoing Mail* queue shows items you've sent.

- ④ To move between the *INcoming Mail* queue and the *OUTgoing Mail* queue, press the **Tab** key. Use the arrow keys to move the highlight bar to the mail item you want to copy to file and press **Enter**.
- ⑤ Select the option *Copy Mail To File* as shown in the example below, and press **Enter**.

| INcoming Mail | From | Comment |
|--------------------|---------|-------------------|
| 5-Jun-1990 4:28 pm | MANAGER | |
| 5-Jun-1990 4:28 pm | MANAGER | |
| 8-Jun-1990 1:43 pm | USER | (U) Welcome Back! |
| 6-Jun-1990 8:02 am | CORINNE | |

Mail Options

- Listen to Mail
- Forward Copy of Mail
- Copy Mail to File
- Delete Mail

Description of Mail

To: ACCT-LINDA
From: USER
Date: 8-Jun-1990 1:43 pm
Size: 10088
Comment: Welcome Back!

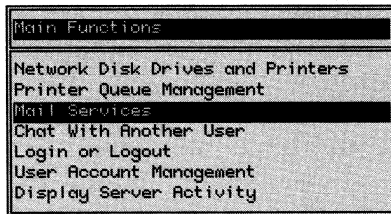
- ⑥ In the window provided, type the full DOS path to the destination file and press **Enter**.

The Voice Mail entry should now be saved in the file and directory you specified in step ④

Forwarding A Voice Mail Message

You can forward Voice Mail items just like text files. If someone sends you an important voice message, you can forward it to the rest of the network. To send a Voice Mail item:

- ① Type **NET** and press **Enter**. You will see the *NET Main Functions* menu.
- ② Select the *Mail Services* option as shown and press **Enter**.



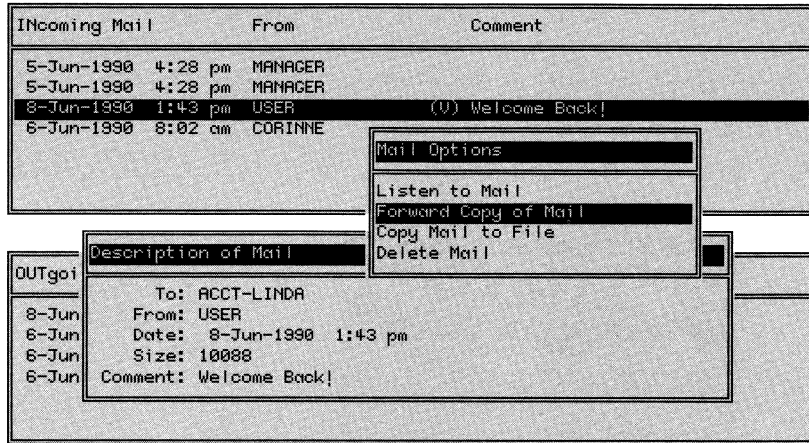
- ③ Select the intended recipient's network server from the list provided and press **Enter**. The server's mail queue will appear:

| Incoming Mail | From | Comment |
|--------------------|---------|-------------------|
| 5-Jun-1990 4:28 pm | MANAGER | |
| 5-Jun-1990 4:28 pm | MANAGER | |
| 8-Jun-1990 1:43 pm | USER | (U) Welcome Back! |
| 6-Jun-1990 8:02 am | CORINNE | Printing Cost |

| OUTgoing Mail | To | Comment |
|--------------------|----------|----------------------|
| 8-Jun-1990 1:40 pm | \$BOB | Status Report |
| 6-Jun-1990 8:05 am | \$EILEEN | (U) Voice Memo |
| 6-Jun-1990 8:06 am | \$SAM | Meeting Notes |
| 6-Jun-1990 8:07 am | !LKA | (U) Product Comments |

On the *INcoming Mail* queue you will see the names of mail items sent to you. The *OUTgoing Mail* queue shows items you've sent.

- ④ To move between the *INcoming Mail* queue and the *OUTgoing Mail* queue, press the **Tab** key. Use the arrow keys to move the highlight bar to the Voice Mail item you want to forward and press **Enter**. You will see the *Mail Options* menu.
- ⑤ Select the option *Forward Copy Of Mail* from the menu as shown in the example below, and press **Enter**.



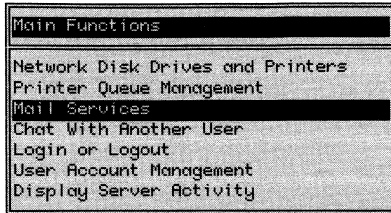
- ⑥ Type in the recipient's username and press **Enter**, or press the **F10** key for the server's mailing list. If you use this option, select a user from the list and press **Enter**.
- ⑦ The window will provide you with the current comment for the mail item. If the comment is still satisfactory press **Enter**. If not, type in a new comment and press **Enter**.

If the recipient is currently logged in to the server, a pop-up message will inform the user of the mail entry. If not, the user will see the entry the next time he or she checks the mail queue or issues the NET POSTBOX command.

Deleting A Voice Mail Item From The Mail Queue

Even in compressed mode, Voice Mail entries can take up a lot of the server's disk space. Because of this, you may want to check the mail queue and delete old Voice Mail items.

- 1 Type **NET** and press **Enter**. You will see the *NET Main Functions* menu.
- 2 Select the *Mail Services* option as shown and press **Enter**.



- 3 Select the appropriate server from the list provided and press **Enter**. The server's mail queue will appear:

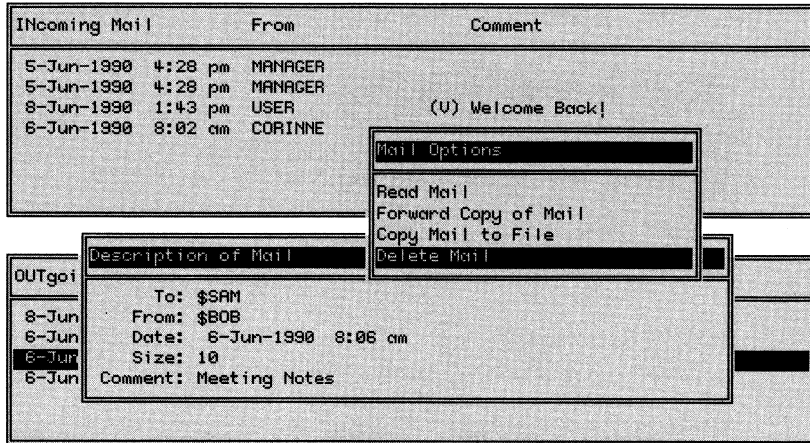
| Incoming Mail | From | Comment |
|--------------------|---------|-------------------|
| 5-Jun-1990 4:28 pm | MANAGER | |
| 5-Jun-1990 4:28 pm | MANAGER | |
| 8-Jun-1990 1:43 pm | USER | (U) Welcome Back! |
| 6-Jun-1990 8:02 am | CORINNE | Printing Cost |

| OUTgoing Mail | To | Comment |
|--------------------|----------|----------------------|
| 8-Jun-1990 1:40 pm | \$BOB | Status Report |
| 6-Jun-1990 8:05 am | \$EILEEN | (U) Voice Memo |
| 6-Jun-1990 8:06 am | \$SAM | Meeting Notes |
| 6-Jun-1990 8:07 am | !LKA | (U) Product Comments |

On the *INcoming Mail* queue you will see the names of mail items sent to you. The *OUTgoing Mail* queue shows items you've sent.

- 4 To move between the *INcoming Mail* queue and the *OUTgoing Mail* queue, press the **Tab** key. Use the arrow keys to move the highlight bar to the desired mail item and press **Del** or **Enter**. If you press **Del** you must then press **Enter** to confirm the deletion. If you press **Enter**, You will see the *Mail Options* menu.

- 5 Select the option *Delete Mail* as shown in the example below, and press **Enter**.



- 6 Press **Enter** once again.

The item will disappear from the mail queue.

Multiple Adapters

There are certain considerations when using more than one network adapter in a computer. The following are simple guidelines for these applications.

Bridging Adapters

If you have two adapters in one computer each will belong to a different network. At this time you cannot bridge between adapters and use them on the same network.

Server Startup Parameters

You must specify the number of adapters in the *Server Startup Parameters* menu. Refer to the "Server Startup Parameters" section for more information on setting this value.

NETBIOS Requirements

You must load the NETBIOS for each adapter. For each adapter, you must specify a unique adapter number on the NETBIOS command line. For instructions on how to do this, refer to the hardware manual for your adapter.

Logging In through Specific Adapters

For some network functions, you must log in through adapter #0 (the first recognized adapter in your computer). This is true when using LANtastic's Chat and Voice Chat features. To log in through a specific adapter, use the syntax:

```
NET LOGIN \\SERVER-NAME USERNAME PASSWORD (ADAPTER#)
```

For example, to log in to adapter #1:

```
NET LOGIN \\SERVER1 USER SECRET 1
```

The NBSETUP Program

The NBSETUP program is used to setup (alter) NETBIOS session and NCB parameters so that more users can log in to a server. If you have an ARTISOFT NETBIOS, you will be able to perform this function when you install the NETBIOS software (LANBIOS or AILANBIOS).

Primarily, you will use NBSETUP if your NETBIOS has no facility for altering the maximum number of configured sessions and NCB's, although you may run it with any NETBIOS.

The NETBIOS uses Network Control Blocks (NCB's) to control the adapter card. They are used for name and session support as well as other types of support. A session is the logical connection between two network stations for the exchange of data.

Although there is no NETBIOS standard, most NETBIOS manufacturers conform to either the IBM PC Network Adapter NETBIOS or the IBM Token Ring NETBIOS. When you run either type of NETBIOS, the maximum number of configured sessions is set to six and the maximum number of configured NCB's is set to twelve. This default translates to six concurrent log ins on a LANtastic server.

You can run NBSETUP to change these default values. NBSETUP must, however, be run before any network software is started. NBSETUP will not run if either REDIR or SERVER are running. The reason for this is that NBSETUP performs a NETBIOS reset to alter the default parameters which would cause the network software to stop working.

To run the NBSETUP program use the syntax:

NBSETUP(/switches)

where "switches" represents any optional command line parameters which specify values that sessions and NCB's should be set to. Parameters may be separated by either spaces or slashes (/). Parameters which take values must be followed by either = or :

The command line parameters are given in the following section.

NBSETUP Switches

VERBOSE

VERBOSE displays detailed information about what values the NBSETUP parameters are set to. Examples of this would include the command line used to invoke NBSETUP and the maximum number of NCB's and sessions the adapter has been set to.

You can use VERBOSE to verify that the number of NCB's and sessions is set to the values that you want.

Example:

NBSETUP VERBOSE MAX

MAX

MAX will set the number of NCB's and sessions to the maximum the NETBIOS will support. Many NETBIOS implementations support only 32 maximum sessions and 32 maximum NCB's (all versions of ARTISOFT NETBIOS support at least 128 sessions and NCB's). You can use MAX along with the VERBOSE option to determine the maximum number of NCB's and sessions your NETBIOS interface supports.

You may mix the MAX option with other options such as NCBS= or SESSIONS=.

Examples:

NBSETUP VERBOSE MAX
NBSETUP MAX NCBS=45

NCBS=

NCBS= will set the maximum number of NCB's that the NETBIOS will recognize. The value you specify for NCB's must be in the range that your NETBIOS supports. Most types of NETBIOS will reset to both their default NCB and session values when either value is not in range, or either value is 0.

Examples:

NBSETUP NCBS=34
NBSETUP NCBS=0

SESSIONS=

SESSIONS= will set the maximum number of sessions that the NETBIOS will recognize. The value you specify for sessions must be in the range that your NETBIOS supports. Most types of NETBIOS will reset to both their default NCB and session values when either value is not in range, or either value is 0.

Examples:

NBSETUP SESSIONS=100
NBSETUP/NCBS:32/SESSIONS:32
NBSETUP SESSIONS=0

CHECK

CHECK will not alter any NETBIOS parameters but will display the same items as the VERBOSE command. You can use this switch to check the current NETBIOS parameters. For example:

NBSETUP CHECK

HELP or ?

HELP or ? will display a short description of all the command line parameters.

Example:

NBSETUP ?

You may mix several parameters on the command line. The order of the parameters is not important. NBSETUP performs the following actions sequentially before resetting the NETBIOS:

1. The number of NCB's and sessions are set to the values that the adapter currently has.
2. If the MAX parameter was specified, then the number of NCB's and sessions is set to the maximum that the NETBIOS can support.
3. If NCBS= or SESSIONS= parameters were specified, then the NCB's or sessions are set to the corresponding values.

The above sequence, for example, implies that you can mix MAX with NCBS=10 and, if the maximum number of sessions were 128, then that would be equivalent to specifying NCBS=10 SESSIONS=128. The above sequence also implies that if no options are present then the NETBIOS is reset with the same parameters that it already had. Here are some example command lines:

```
NBSETUP
NBSETUP SESSIONS=40 NCBS=40
NBSETUP SESSIONS=40 NCBS=40 VERBOSE
NBSETUP MAX VERBOSE SESSIONS=10
NBSETUP VERBOSE
```

You can also redirect NBSETUP's output to a file or device. This may be useful if you want to log verbose information. For example,

```
NBSETUP MAX VERBOSE >NBSETUP.LOG
```

NET Line Commands

You can perform many of the NET menu functions directly from the command line. This can be useful if you're bringing up the network from within a batch file or if you've become familiar with LANTastic and want to bypass the menu method. The following section contains a list of all the NET keyboard commands with an explanation of each command and its usage. Also included is a section on how to use the NET line commands to create batch files.

In the list of NET commands, the following conventions apply:

- Lower case letters denote arguments you supply.
- Arguments in brackets “()” are optional.
- Ellipses “...” denote an argument that may be repeated.

For each command, the name will be given, followed by a brief explanation of the command, the proper syntax for using the command and finally examples of its use.

The correct syntax for using NET commands is as follows:

NET(/SWITCHES) COMMAND ARGUMENTS...

where SWITCHES represents any of these three switches:

| | |
|-------------------|--|
| /MONO | Instructs the net program to use display menus in monochrome (two colors). |
| /NOERROR | This instructs the NET program to not display error messages. You can then use advanced error handling techniques. This is especially useful in batch files. |
| /HELP or ? | Provides you with a list of the valid NET line commands. |

COMMAND refers to any valid NET line command. ARGUMENTS refers to any switches or values that you want the command to use. You can separate them with either spaces or commas. For example:

NET LOGIN \\SERVER1 USER SECRET

The arguments \\SERVER1, USER and SECRET instruct the NET program that a user is trying to log in to the server computer \\SERVER1 under the account name USER with the password SECRET.

You can use these prompt characters and special strings in place of arguments:

| | |
|------------------|---|
| ?“prompt” | Prompts user for input and displays what the user types on the screen. The string then expands to the typed input. |
| ^“prompt” | Prompts user for input and doesn't display what the user types on the screen. The string then expands to the typed input. |
| !“DATE” | Expands to the current date. |

| | |
|-------------------------|---|
| !“DIRECTORY” | Expands to the current disk and directory you are using. |
| !“ETEXT=n” | Expands to the error text associated with error number n. |
| !“FILE=pathname” | Expands to the first line of a file. |
| !“INSTALLED” | Expands to characters corresponding to installed programs. N=NETBIOS, R=REDIR, S=SERVER, L=LANPUP, -=Not installed. |
| !“LOGIN=server” | Expands to TRUE if logged in to a specified server, FALSE if not. |
| !“NODEID” | Expands to the current 12 digit NETBIOS node number. |
| !“MACHINEID” | Expands to the name of the machine being used. |
| !“PROGRAM” | Expands to the full DOS path of the NET program. |
| !“TIME” | Expands to the current time. |

For example:

NET/NOERROR LOGIN !“MACHINEID” USER ^“Password:”

The above example would be useful in a batch file. The NOERROR switch instructs the NET program to not display error messages. The !“MACHINEID” string expands to the name of the machine being used, and the carat ^ prompt instructs the NET program to ask the user for his or her password.

For more information on error handling, and using strings in batch file refer to “NET Command Line Customizing,” in this manual.

You may abbreviate switch names down to as few letters as will keep that switch distinct from any others for the same command. For example, to use the BINARY switch for the NET PRINT command you could type:

NET PRINT/BINARY

or

NET PRINT/B

NET Commands

ATTACH

This command redirects all available drives on your local computer to every shared resource on the server. This command can reduce the number of NET USE commands that you must give.

NET ATTACH(/VERBOSE) \\server-name

server-name The name of the server computer to which you want to attach your drives.

VERBOSE Displays information about redirections made with the NET ATTACH command.

Examples:

```
NET ATTACH \\SERVER1
NET ATTACH/VERBOSE \\MAINSERVER
```

AUDIT

The NET AUDIT command places an audit entry in the server's audit file. You may want to place audit entries to mark the progress of your programs or log significant events. You must have the U privilege to issue this command.

NET AUDIT \\server name reason variable-string

server-name The name of the server computer where you want to place the audit entry.

reason A string of up to eight characters giving the reason for the entry.

variable-string A string of up to sixty-four characters which gives detailed information about the audit. If you want to include blanks and commas in this field, you must enclose the variable string in quotes.

Examples:

```
NET AUDIT \\server1 start "sorting procedure"  
NET AUDIT \\server1 stop "sorting procedure"  
NET AUDIT \\host *error* parity
```

CHANGEPW

This command allows you to change your password. You must first enter your old password (this prevents unauthorized changing of your password) then enter the new password.

```
NET CHANGEPW \\server-name old-password new-password.
```

| | |
|---------------------|---|
| server-name | The name of the server where password is to be changed. |
| old-password | Your current password. |
| new-password | The new password you wish to use. |

Example:

```
NET CHANGEPW \\server1 secret hidden
```

CHAT

This command allows you to initiate a text or Voice Chat. You can also use this command to complete the connection when someone calls to Chat with you.

Example:

```
NET CHAT
```

CLOCK

This command sets your computer's system clock to the date and time of a server's clock.

```
NET CLOCK \\server-name
```

| | |
|--------------------|--|
| server-name | The name of the server whose date and time you wish to use. You must already be logged in to the server. |
|--------------------|--|

Example:

NET CLOCK \\server1

COPY

This command copies files directly on a server, bypassing network data transfers. Both from-path and to-path must reside on the same server.

NET COPY from-path to-path

from-path The complete network path of the source files. You can use wild card characters such as "*".

to-path The complete network path of the destination file or directory.

Example:

NET COPY \\SERVER1\C-DRIVE\MEMOS.OLD \\SERVER1\C-DRIVE\MEMOS.NEW

DETACH

This command allows you to cancel all disk redirections made to a server without having to issue a NET UNUSE command for each redirection.

NET DETACH \\server-name

server-name The name of the server with which you will cancel all disk redirections.

Example:

NET DETACH \\SERVER1

DIR

This command displays directory and file information on any network directory you have access to.

NET DIR(/ALL) (pathname)

/ALL Includes system and hidden files in the directory listing. You can abbreviate this switch to **/A**.

pathname Full DOS path to the directory.

Example:

```
NET DIR
NET DIR C:\LOTUS
NET DIR \\SERVER1\C-DRIVE\LOTUS\ACCOUNTS
```

This displays directory information in the following format.

FILENAME ATTRIBUTES SIZE DATE TIME

| | |
|-------------------|--|
| FILENAME | Name of the file |
| ATTRIBUTES | file's attributes I-Indirect file A-Archive flag D-Directory flag V-Volume label S-System file H-Hidden file R-Read only file |
| SIZE | The size of the file in bytes |
| DATE | The date the file was created |
| TIME | The time the file was created |

Here is a sample NET DIR output:

```
.          --D-----      29-May-1990  20:35:40
..         --D-----      29-May-1990  20:35:40
BOOT.BAT  -A-----      1096  24-Apr-1990  10:04:26
BOOT.RTF  -A-----      3054  24-Apr-1990  14:32:26
BOOTLONG.BAT -A-----      1478  24-Apr-1990  10:05:46
STRING.BAT -A-----      2910  23-Apr-1990  16:16:52
INDIRECT.BAT IA-----      \C-DRIVE\ORIGINAL.BAT
SAM       --D-----      1-Aug-1990  11:07:54
```

DISABLEA

This command disables your account from further log ins. This is a good idea if you go on vacation or will be away from the network for an extended period. This function sets the number of concurrent log ins for your account to 0. You must have your account set for 1 concurrent log in to use this feature. Refer to "Accounts" for

information on setting the number of concurrent log ins. Refer to the “Re-Enabling User Accounts” section of this manual for information on re-enabling the account.

NET DISABLEA \\server-name password

server-name The server on which to disable the account.

password The password of your account.

Example:

NET DISABLEA \\SERVER1 SECRET

ECHO

This command allows you to display the current value of a string. Unlike the DOS ECHO command, NET ECHO allows you to use LANtastic’s special strings.

NET ECHO “Start of batch file”
NET ECHO !“TIME”

In the first example, the text “Start of batch file” would be printed. In the second example, “TIME” is LANtastic’s special string to return the value for the current time. Refer to “Net Command Line Customizing” for a complete list of LANtastic’s special strings and information on using them.

EXPAND

This switch allows you to find the physical or network path of any file. When using indirect files, the NET EXPAND command will help you keep track of which file will finally be accessed. This is especially useful if you have multiple layers of indirect files. Use the /PHYSICAL switch to find the server’s physical path to just the indirect file; or use the /RECURSE switch to find the network path to the final referenced file.

NET EXPAND/SWITCHES filename

SWITCHES One of the following two switches:

PHYSICAL Displays the full physical path on the server to the file.

RECURSE

Displays the full network path to the file the indirect file finally references.

For the examples below, the indirect file, INDIRECT.BAT, is linked to ORIGINAL.BAT. The indirect file, IND2.BAT, is linked to INDIRECT.BAT, creating two layers of indirect files. If you type:

NET EXPAND IND2.BAT

you would see the output:

```
\\HOST1\C-DRIVE\APPS\IND2.BAT
```

This output tells you where the file exists relative to the network. In this case the file is located on the server HOST1, on the resource C-DRIVE in the subdirectory APPS.

If you use the Recurse (/R) switch for IND2.BAT:

NET EXPAND/R IND2.BAT

you will see this output:

```
\\HOST1\C-DRIVE\ORIGINAL.BAT
```

This switch instructs the NET program to recursively search through all the levels of indirect files until it arrives at the final file referenced. Once again, the information given is relative to the file's location on the redirected drive. To find the actual physical location of IND2.BAT on the server, you would use the Physical (/P) switch:

NET EXPAND/P IND2.BAT

You would see the output:

```
C:\APPS\IND2.BAT
```

To find out the physical location of the file to which IND2.BAT finally resolves, you would use both the /R and /P switches:

NET EXPAND/P/R IND2.BAT

You will see the output:

```
C:\ORIGINAL.BAT.
```

the physical location of the file to which IND2.BAT finally resolves.

HELP

This command provides you with the list of valid NET keyboard commands. Commands are listed in alphabetical order.

NET HELP NET ?

You can get help information about any of the NET line commands by using the syntax:

NET HELP **command-name**

command-name The NET line command you want information about.

The following is a sample HELP output:

Help is available for the following commands:

| | | | | | |
|----------|--------|----------|----------|--------|---------|
| ATTACH | AUDIT | CHAT | CHANGEPW | CLOCK | COPY |
| DETACH | DIR | DISABLEA | ECHO | EXPAND | HELP |
| INDIRECT | LOGIN | LOGOUT | LPT | MAIL | MESSAGE |
| POSTBOX | PRINT | QUEUE | RECEIVE | SHOW | SEND |
| STREAM | STRING | UNLINK | UNUSE | USE | ? |

Type "NET HELP **command-name**" to see help on an individual command.

INDIRECT

This command allows you to create an indirect file. An indirect file contains a reference to a file in another directory. When a request is made for the indirect file, the contents of the indirect file are replaced with those of the referenced file. This allows you to access files without changing directories. For information on creating an indirect file refer to the "Indirect Files" section in this manual.

NET INDIRECT **pathname actual-name**

pathname The name of the indirect file you want to create. You must create the indirect file on a network drive .

actual-name The network path of the file the indirect file references.

Example:

NET INDIRECT AUTO.BAT \C-DRIVE\AUTOEXEC.BAT

LOGIN

This command allows you to log in to a server.

NET LOGIN(/WAIT) \\server-name username password (adapter#)

| | |
|--------------------|---|
| /WAIT | Optional switch to continue log in attempt until server is available. You can abbreviate this switch to /W . |
| server-name | The name of the server you want to log in to. |
| username | Account name on the server. |
| password | Valid password used to access server. |
| adapter# | Optional switch to set which server adapter to log in through. |

Examples:

```
NET LOGIN/WAIT \\SERVER1 BRUCE SECRET
NET LOGIN \\HOST MARY LAMB 1
```

LOGOUT

This command logs you out of the server and cancels all drive and printer redirections.

NET LOGOUT \\server-name

server-name The name of the server you want to log out of.

Example:

```
NET LOGOUT \\SERVER1
```

LPT COMBINE

This command is designed for use in a batch file to combine redirected printer output. For example, this option would allow you to print the output from three programs with no breaks. You must issue the command in your batch file as soon as you want the printer output combined. When the batch file is complete, DOS will

automatically disable the combining function and close your printer output.

NET LPT COMBINE

The following are two sample batch files. The first example creates two print jobs. One containing the text "A directory follows" and another containing the directory.

```
echo A directory follows >lpt1  
dir/w >lpt1
```

The second batch file accomplishes the same task, except it creates only one print job by using the NET COMBINE command.

```
NET LPT COMBINE  
echo A directory follows >lpt1  
dir/w >lpt1
```

LPT FLUSH

This command is designed for use in a batch file to flush a printer after the NET LPT COMBINE has been given.

NET LPT FLUSH

The following is a sample batch file using both the LPT COMBINE and the LPT FLUSH commands to create two print jobs instead four:

```
NET LPT COMBINE                (Combine printer output.)  
echo First print job >lpt1      (Display text message.)  
dir/w >lpt1                    (Print a directory.)  
NET LPT FLUSH                 (Flush printer output.)  
echo Second print job >lpt1    (Display text message.)  
dir/w >lpt1                    (Print a directory.)
```

LPT SEPARATE

This command is designed for use in a batch file to disable the LPT COMBINE function. This command disables redirected printer combining enabled in the batch file. You would not issue this command unless you have previously given the LPT COMBINE command.

NET LPT SEPARATE

The following is a sample batch file using the using both the LPT COMBINE and the LPT SEPARATE commands.

```
NET LPT COMBINE                (Combine printer output.)
echo First print job >lpt1      (Print text.)
dir/w >lpt1                     (Print directory along with text.)
NET LPT SEPARATE                (Separate output.)
echo Second print job >lpt1     (Print text.)
echo Third print job >lpt1      (Print text.)
```

This batch file creates three different print jobs since the first two print items were combined into one print job and the last two print items were printed separately.

LPT TIMEOUT

You can use this command to specify the length of time in seconds that LANtastic NOS will wait before it assumes a print job is finished. If no data is sent, the timeout expires and the printer will flush all data. This has the same effect as pressing **Ctrl-Alt-PrtScr**. You will get a confirming beep, when the printer has flushed the data.

NET LPT TIMEOUT †

† The amount of time in seconds that LANtastic NOS will wait for a print job to close. A value of 0 disables this function. If you want to set this value, it is recommended that you start with a value between 5-10 seconds. If your printer output is separated when you print, you may need to increase this value. The valid range for this field is from 0-3600 seconds.

Example:

NET LPT TIMEOUT 5

To disable LPT timeouts:

NET LPT TIMEOUT

MAIL

You can use this command to send a mail file to a user on a server. The file will be placed on the server's mail queue where the user can have access to it.

NET MAIL(/VOICE) filename \\server-name (recipient) (comment)

| | |
|--------------------|--|
| /VOICE | Denotes a Voice Mail file. You can abbreviate this switch to /V . |
| filename | The complete DOS path of the file to send. |
| server-name | The name of the server whose queue the file is to be sent to. |
| recipient | The user to receive the file. You may use wildcard characters to send the mail file to an entire user group. |
| comment | Comment associated with mail queue item. You must place comments in quotation marks (“”) |

Examples:

```
NET MAIL C:\MAY_RPT.TXT \\SERVER1 !ERNIE "Sales report for May"  
NET MAIL/VOICE C:\VOICE.MEM \\HOST $SAM "Voice memo"
```

MESSAGE

Use this command to allow or prevent pop-up messages from appearing. The BEEP argument enables or disables the informative tone that accompanies pop-up messages, and the POP argument enables or disables just the pop-up messages. The default is for pop-up messages and informative tones to be enabled.

NET MESSAGE(/ENABLE /DISABLE) (BEEP POP)

| | |
|-----------------|---|
| /ENABLE | Enable messages and informative tones if the BEEP and POP arguments are omitted, or enable only the argument specified. |
| /DISABLE | Disable messages and informative tones if the BEEP and POP arguments are omitted, or disable only the argument specified. |
| BEEP | When enabled, informative tones will accompany messages. When this function is disabled, messages will not beep. |
| POP | When enabled, messages will pop up when received. When this function is disabled, messages will not appear. |

Examples:

NET MESSAGE /DISABLE
NET MESSAGE /ENABLE POP
NET MESSAGE /ENABLE BEEP

MONO

This command converts screen output to two color mode. This is useful for PC's that emulate color on a monochrome screen.

NET/MONO

POSTBOX

This command searches the queues of all the servers you are logged in to for any waiting mail. You will receive a message only if you have mail waiting.

NET POSTBOX

Sample output:

You have 1 message on Server \\PEER1
You have 2 messages on Server \\PEER2

PRINT

To send data to a network printer, you would use this command in place of the DOS PRINT command.

NET PRINT(/BINARY/VERBOSE) filename device (comment) (copies)

| | |
|-----------------|---|
| /BINARY | Prints file in binary mode. You can abbreviate this switch to /B . |
| /VERBOSE | Displays file names as they are queued. |
| filename | Full DOS path of file to be printed. Wildcard characters such as "*" are acceptable. |
| device | Network printer name. You can use network paths or redirected printer names. |
| comment | Comment associated with the print job. If no comment is given, the file name is used. You must place comments in quotation marks ("") |

copies Number of copies to print. If omitted one copy is printed.

Examples:

```
NET PRINT report.txt lpt1
NET PRINT C:\WP\MEMO @DOT "Use less paper"
NET PRINT/BINARY x?.out \\SERVER1\@graphics "Plotter files"
NET PRINT label.out lpt2 "Labels for Jill" 1000
```

QUEUE HALT

You can use this command to halt despooling and not finish the current print job. The current print job is then placed back in the print queue when despooling is restarted. You must have the Q privilege to use this command.

NET QUEUE HALT \\server-name (LPTn COMn ALL)

| | |
|--------------------|--|
| server-name | The name of the server where you want despooling to halt. |
| LPTn | The name of the parallel printer device. |
| COMn | The name of the serial printer device. |
| ALL | This switch stops despooling on all the server's printers. This is the default value. If you issue a NET QUEUE HALT, it automatically stops despooling on all the server's printers. |

Examples:

```
NET QUEUE HALT \\SERVER1
NET QUEUE HALT \\SERVER1 LPT1
NET QUEUE HALT \\SERVER1 COM2
NET QUEUE HALT \\SERVER1 ALL
```

QUEUE PAUSE

This command will temporarily stop despooling to the printer. The current print job will cease despooling, but the print job is not closed. This job will resume when despooling is restarted with the NET QUEUE START command. You must have the Q privilege to use this command.

NET QUEUE PAUSE \\server-name (LPTn COMn ALL)

| | |
|--------------------|--|
| server-name | The name of the server where you want despooling to pause. |
| LPTn | The name of the parallel printer device. |
| COMn | The name of the serial printer device. |
| ALL | This switch pauses despooling on all the server's printers. This is the default value. |

Examples:

```
NET QUEUE PAUSE \\SERVER1
NET QUEUE PAUSE \\SERVER1 LPT1
NET QUEUE PAUSE \\SERVER1 COM2
NET QUEUE PAUSE \\SERVER1 ALL
```

QUEUE RESTART

You can use this command to restart the current print job from the start of the file. RESTART is useful when paper jams and other printer errors occur and you want to restart a printer job from the beginning. You must have the Q privilege to use this command.

NET QUEUE RESTART \\server-name (LPTn COMn ALL)

| | |
|--------------------|--|
| server-name | The name of the server where you want despooling to restart. |
| LPTn | The name of the parallel printer device. |
| COMn | The name of the serial printer device. |
| ALL | This switch restarts despooling on all the server's printers. This is the default value. |

Examples:

```
NET QUEUE RESTART \\SERVER1
NET QUEUE RESTART \\SERVER1 LPT1
NET QUEUE RESTART \\SERVER1 COM2
NET QUEUE RESTART \\SERVER1 ALL
```

QUEUE SINGLE

You can use this switch to despool a single print job then stop despooling. This is useful when a printer needs manual intervention between each print job. To execute successive print jobs you must reissue the NET QUEUE SINGLE command for each job. If you issue this command while the server is despooling, the server will finish

the current job then stop. You must have the Q privilege to use this command.

NET QUEUE SINGLE \\server-name (LPTn COMn ALL)

| | |
|--------------------|--|
| server-name | The name of the server where you want to despool a single print job. |
| LPTn | The name of the parallel printer device. |
| COMn | The name of the serial printer device. |
| ALL | This switch despools a single print job on all the server's printers. This is the default value. |

Examples:

```
NET QUEUE SINGLE \\SERVER1
NET QUEUE SINGLE \\SERVER1 LPT1
NET QUEUE SINGLE \\SERVER1 COM2
NET QUEUE SINGLE \\SERVER1 ALL
```

QUEUE START

This command starts printer despooling on a server. You would issue this command if despooling has been disabled. You must have the Q privilege to use this command.

NET QUEUE START \\server-name (LPTn COMn ALL)

| | |
|--------------------|--|
| server-name | The name of the server where you want to enable despooling. |
| LPTn | The name of the parallel printer device. |
| COMn | The name of the serial printer device. |
| ALL | This switch enables despooling on all the server's printers. |

Examples:

```
NET QUEUE START \\SERVER1
NET QUEUE START \\SERVER1 LPT1
NET QUEUE START \\SERVER1 COM2
NET QUEUE START \\SERVER1 ALL
```

QUEUE STATUS

You can use this command to find out the status of a network printer.

NET QUEUE STATUS \\server-name (LPTn COMn ALL)

| | |
|--------------------|--|
| server-name | The name of the server where the printer(s) is/are located. |
| LPTn | The name of the parallel printer. |
| COMn | The name of the serial printer. |
| ALL | This switch allows you to check the status of all the server's printers. |

Examples:

```
NET QUEUE STATUS \\SERVER1
NET QUEUE STATUS \\SERVER1 LPT1
NET QUEUE STATUS \\SERVER1 COM2
NET QUEUE STATUS \\SERVER1 ALL
```

Here is a sample NET QUEUE STATUS:

```
LPT1 ENABLED -- Despooling --
LPT2 ENABLED -- Halted --
LPT3 ENABLED -- Despooling --
COM1 DISABLED -- Not despooling --
COM2 ENABLED -- Not despooling --
```

In the example above, LPT1 and LPT3 are currently despooling data to printers. Despooling has been halted on LPT2, so no print jobs are being performed. COM1 does not have despooling enabled, so no print jobs will be performed until despooling is enabled with the NET QUEUE START command. Despooling is enabled for COM2, but no jobs are currently being printed.

QUEUE STOP

With this command you can stop despooling at the end of the current print job. If there are no jobs printing, the NET QUEUE STOP command stops despooling immediately. To resume despooling, you must use the NET QUEUE START command.

NET QUEUE STOP \\server-name (LPTn COMn ALL)

Examples:

```
NET QUEUE STOP \\SERVER1
NET QUEUE STOP \\SERVER1 LPT1
NET QUEUE STOP \\SERVER1 COM2
NET QUEUE STOP \\SERVER1 ALL
```

RECEIVE

You can use this command to display the last unsolicited message you received. You can also use this command to set the position on the screen where informative messages will pop up and how long they will appear. If you do not set values for position and delay, the informative message will not appear, but the mail message will be displayed.

NET RECEIVE (position) (delay)

| | |
|-----------------|---|
| position | The position on the screen where informative messages will appear. The line numbers range from 0 to 24. |
| delay | The length of time in seconds that informative that messages will appear on the screen. |

Examples:

```
NET RECEIVE
NET RECEIVE 15 7
```

SEND

This command allows you to send an unsolicited, one line, text message to any network node. If pop-up message notification has been enabled then the message will pop-up on the user's screen.

NET SEND machine-name "message"

| | |
|---------------------|---------------------------|
| machine-name | Destination node. |
| "message" | Message you wish to send. |

Example:

```
NET SEND SALLYS-PC "Meeting at 2:00"
```

SHOW

This command allows you to find out the configuration of your computer, what servers (if any) you are logged in to, and the list of available servers.

NET SHOW(/BATCH

/BATCH

Display user status information suitable for use in a batch file. This information would include NET LOGIN, NET USE and other commands previously issued. You can abbreviate this switch to **/B**.

Sample output:

```
LANtastic (tm) Connection Manager V3.00 - (C) Copyright 1990 Artisoft Inc.  
Machine PEER1 is being used as a Redirector and a Server  
File and record locking is currently ENABLED  
Unsolicited messages will BEEP and POP-UP  
LPT timeout in seconds: 0  
Logged into PEER1 as USER on adapter 0  
Logged into PEER2 as USER on adapter 0  
Disk D: is redirected to \\PEER2 \C-DRIVE  
Disk E: is redirected to \\PEER2 \A-DRIVE
```

In the above display the text tells you:

- PEER1, the computer the NET SHOW command was issued from, is both a server and a redirector.
- File and record locking have been enabled by running the DOS SHARE program.
- Pop-up messages will appear to inform the user when E-Mail arrives or another user utilizes the NET Chat or NET SEND features.
- Print jobs have not been set to close after a set wait interval.
- A network user with the account name USER has logged in to the servers, PEER1 and PEER2, using the first adapter (adapter 0) in PEER1.
- The local drives on PEER1, D: and E: are connected to C-DRIVE and A-DRIVE on the server PEER2.

STREAM

This command is used to get or set a logical printer stream on a server. For example, if you have two printer resources @LETTER and @FAST which print to the same physical device (a dot-matrix or laser printer) you could disable printing on @LETTER and still allow printing on @FAST. This way, to disable a mode of printing, you don't have to disable the entire printer.

NET STREAM(/ENABLE /DISABLE) \\server-name ! ((stream-index) (stream-value))

| | |
|---------------------|--|
| ENABLE | Enables the printer stream. |
| DISABLE | Disables the printer stream. |
| server-name | The server whose printer stream you want to get or set. |
| stream-index | The optional stream index to get or set stream information on. |
| stream-value | The new value to assign to the stream index. |

You can use this command to find out the status of the logical printer streams. To do this, simply leave off the name of the printer device. For example:

NET STREAM \\SERVER1

would produce the output:

```
0: @LABELS .      ENABLED
1: @LASER .       ENABLED
2: @GRAPHIC .     DISABLED
3: @DRAFT .       DISABLED
4: @LANDSCP .     DISABLED
5: @PLOTTER .     ENABLED
6: @FEED1 .       ENABLED
7: @FEED2 .       ENABLED
8: @FAST1 .       ENABLED
9: @FAST2 .       ENABLED
10: @SLOW1 .      ENABLED
11: @SLOW2 .      ENABLED
12: @LETTER .     DISABLED
13: @CONDENS .   DISABLED
14: @CAD .        DISABLED
15: @COLOR .     DISABLED
16: @WIDE .       DISABLED
17:               DISABLED
18:               DISABLED
19: ??????????.??? ENABLED
```

Here the server is set up for many print modes, including form feeds, condensed printing, various print speeds and other print parameters. To enable a stream you would type:

NET STREAM/ENABLE \\SERVER1 3

This would enable string number 3: (@landscp) from the list above. To disable a stream you would type:

NET STREAM/DISABLE \\SERVER1 8

which would disable the logical printer stream @FAST2. To set a value to a printer stream you might type:

NET STREAM/DISABLE \\SERVER1 17 @PRINTER

to create the printer stream @PRINTER in stream number 17:



Note: When you reset or reboot your computer the logical printer streams' settings are lost.

STRING

This command assigns a string of characters to a pre-existing environment variable that is either typed in by the user or extracted from one of LANtastic's special strings. You can use these strings, just like DOS environmental variable strings. They are useful for prompting users to enter their passwords, usernames or any other information. In batch files, you can use special strings to extract the date, time, the name of the machine that you're using and other useful information. If you specify two strings, they will be linked together (concatenated) first, and then extracted. For more information, refer to, "Using NET Line Commands In Batch Files."

NET STRING (/LEFT=n)(/RIGHT=n) variable string1 (string2)

/LEFT

The first character from the left that will be extracted from a string. Negative numbers denote backward (from the right) indexing. Numbers greater than the length of the string refer to the end of the string.

/RIGHT

The last character that will be extracted from the string. Negative numbers denote backward (from the right) indexing. Numbers greater than the length of the string refer to the end of the string.

| | |
|-----------------|--|
| Variable | Pre-existing environment variable to receive string. |
| string1 | String to replace environment variable. |
| string2 | Optional string to be linked with string1. |

The following is a list of LANtastic's special strings:

| | |
|-------------------------|---|
| ?“prompt” | Prompts user for input and displays what the user types on the screen. The string then expands to the typed input. |
| ^“prompt” | Prompts user for input and doesn't display what the user types on the screen. The string then expands to the typed input. |
| !“DATE” | Expands to the current date. |
| !“DIRECTORY” | Expands to the current disk and directory you are using. |
| !“ETEXT=n” | Expands to the error text associated with error number n. |
| !“FILE=pathname” | Expands to the first line of a file. |
| !“INSTALLED” | Expands to characters corresponding to installed programs. N=NETBIOS, R=REDIR, S=SERVER, L=LANPUP, -=Not installed. |
| !“LOGIN=server” | Expands to TRUE if logged in to a specified server, FALSE if not. |
| !“NODEID” | Expands to the current 12 digit NETBIOS node number. |
| !“MACHINEID” | Expands to the name of the machine being used. |
| !“PROGRAM” | Expands to the full DOS path of the NET program. |
| !“TIME” | Expands to the current time. |

For more information on this subject, refer to “Net Command Line Customizing” in this manual.

UNLINK

This command is used to disconnect a redirected drive from a boot server. This command is usually used to allow workstations to use their A: or B: drive locally after remote booting. You cannot unlink the same drive you are using. You must therefore, change to another drive (local or redirected) to unlink the A: or B: drive.

NET UNLINK

UNUSE

Use this switch to cancel a drive or printer redirection.

NET UNUSE (D: LPTn COMn)

| | |
|-------------|--|
| D: | The redirected disk drive (A:-Z:) you wish to disconnect from the server. |
| LPTn | The redirected parallel printer port (LPT1, LPT2, or LPT3) you wish to disconnect from the server. |
| COMn | The redirected serial port (COM1 or COM2) you wish to disconnect from the server. |

Examples:

```
NET UNUSE F:  
NET UNUSE LPT1  
NET UNUSE COM1
```

USE

This command allows you to redirect a disk drive or printer port to use one of the server's resources instead. The following demonstrates the correct syntax for redirecting a disk drive and a printer port.

```
NET USE D: \\server-name (path)  
NET USE (LPTn COMn) \\server-name (path)(@device)
```

| | |
|--------------------|--|
| D: | The disk drive you wish to redirect (A:-Z:). |
| LPTn | The parallel printer port you wish to redirect (LPT1, LPT2, or LPT3). |
| COMn | The serial port you wish to redirect (COM1 or COM2). |
| server-name | The server where the disk or printer resides. |
| path | The full network path of the server disk or printer to which you want to redirect. |
| @device | Server device to which you want to redirect your printer port. |

Examples:

```
NET USE F: \\server1\root  
NET USE LPT1 \\host\@laser  
NET USE COM1 \\server2\@plotter
```

NET Command Line Customizing

You can customize your NET commands to automatically provide prompts for input. This is especially useful for networks with inexperienced users. This way you can guide them through the process of logging in or any other task you would want them to perform. You can place several special characters on the command line to assist you in prompting for data.

Prompting With Echo

You can prompt for input by preceding an element on the NET command line with a question mark (?). Anything that the user types appears on the screen and replaces the text that prompts them. For example, if you placed the following lines in a user's batch file:

```
NET LOGIN \\SERVER1 ?"Username: " ?"Password: "
```

The user would receive these two prompts:

```
Username:  
Password:
```

The user would then enter the requested data to log in.

Prompting Without Echo

The problem with the above example is that anyone looking on could see the user's password. To avoid this, use the ^ prompt, so the user's password will not appear on the screen. For example:

```
NET LOGIN \\SERVER1 ?"Username: " ^"Password: "
```

Now the username will appear when it's typed, but not the password.

Separating Arguments

Normally you will use spaces to separate arguments in a NET command line. There are times, however, when you may want to omit an argument. For example, you may want to omit the comment argument from a NET PRINT command but still specify the number of copies. Separating arguments using spaces would look like this:

```
NET PRINT FILE.TXT LPT1 10
```

The printer would have no way of knowing whether 10 was the comment for the print job or the number of copies printed. In this case, it would assume that 10 was a comment and print only one copy by default.

The way to resolve this problem is to separate arguments with commas:

```
NET PRINT,FILE.TXT,LPT1,,10
```

or

```
NET PRINT FILE.TXT LPT1,,10
```

The printer will now make ten copies of FILE.TXT, and there will be no comment for the print job.

You cannot, however, place a comma between the NET command and the subcommand. For example typing:

```
NET,PRINT FILE.TXT LPT1
```

would bring up the NET *Main Functions* menu since only the first part of the command line "NET" would be seen.

Using Strings In Batch Files

For creating even more powerful batch files, LANtastic NOS allows you to manipulate environmental string variables. These strings are just like DOS environmental variables. An environmental variable is a string of characters that is assigned to a pre-existing environment variable which is either typed in by the user or extracted from one of LANtastic's special strings. These are useful for prompting users to enter their passwords, or any other information. They are especially handy in batch files, where you can use special strings to extract the date, time, the name of the machine that you're using and other information.

The following example uses some of the NET STRING commands. Refer to the remarks (text after the lines beginning with "REM" for information on how the strings are being used and what functions they are performing.

Sample Batch File Using Strings

```
@echo off
```

```
REM    Sample batch file to demonstrate some of the NET STRING
REM    commands, remember that you have to allocate enough
REM    space for an environment variable by using the SET command.
REM    These REMarks are only here to describe what is going on, they do not
REM    need to be included in the batch files you write.
REM    Environment variables use the space allocated by the SHELL=
REM    command in your CONFIG.SYS file on your boot disk.
REM    Last but not least, remember that you have to include the variable in
REM    within %% to have it 'expand' to its current value.
```

```
REM    Create test string
set str=12345678901234567890
```

```
REM    Create temp string for examples
set temp=???
```

```
REM    Get the first four characters of test string
net string/left=1/right=4 temp %str%
```

```
echo First four chars of %str% are %temp%
```

```
REM    Get the last four characters of test string. Note how the negative
REM    number tells NET to count from right end of the string
net string/left=-4/right=-1 temp %str%
```

```
echo Last four chars of %str% are %temp%
```

```
REM    Get the date string
net string str !"DATE"
```

```
echo Date is %str%
```

```
REM    Get the current path
net string str !"DIRECTORY"
```

```
echo Current path (default directory) is %str%
```

```
REM    Extract the Drive
net string/left=1/right=2 temp %str%
```

```
echo Current drive: %temp%
```

```
REM    Extract the Directory, note that /right=-1 is used to specify the
```

```

REM    rightmost character in the string
net string/left=3/right=-1 temp %str%

echo Current directory: %temp%

REM    Find out what software is installed!
REM    First create the dummy variable
set tn=?

REM    Next extract each character out the installed message then test
REM    and print if it is installed
net string/left=2/right=2 tn !"INSTALLED"

if !%tn%==!R echo REDIR is installed

net string/left=3/right=3 tn !"INSTALLED"

if !%tn%==!S echo SERVER is installed

REM    Done with examples, so we need to cleanup the environment
REM    variables we used. (i.e. delete them)
set temp=
set str=
set tn=

```

Advanced Error Handling Techniques

When creating batch files, it is often a good idea to use the NET /NOERROR= switch as an environment variable to handle error messages. The error message won't appear, but you can use the pre-existing variable NET_ERROR to expand to the current error level and then use this value in your batch files. You can use this feature to accommodate for any error values that you think might appear. For example, you could include the following lines in a batch file:

```

REM          Allocate three characters for the
REM          environment variable NET_ERROR=
SET NET_ERROR=???

REM          Use the NET/NOERROR switch when you
REM          log in so you won't see any error messages.
NET/NOERROR LOGIN \\SERVER1 BILL SECRET

REM          If there is no error, proceed with the NET USE
REM          commands. Remember that you have to
REM          include the variable within %% to have it
REM          "expand" to its current value.
IF %NET_ERROR%==51 go to OK

REM          If the server is not listening, tell the user and try
REM          to log in to the next server.
IF %NET_ERROR%==0 go to NEXTLOGIN

```

Network Printing

There are several factors involved in network printing that aren't involved when you print locally. Multiple workstations may contend for a single printer simultaneously, and certain application programs send data to a printer differently than others.

There are many advantages, however, with network printing. You can send data to any network printer you have access to. You can also set up different print modes and give each print mode a different resource name. This allows you to select which mode of printing you wish to use without having to manually set the printer each time.

This section will deal with the following topics:

- Controlling network printing from the command line
- Forced printing
- Manipulating items in the print queue
- Printing banner pages
- Redirecting printer output to files
- Setting different print modes
- Using a network printer locally
- Using the Physical ACL right
- Changing the spool location
- Clearing the printer spool

Controlling Network Printing From The Command Line

There are many times when you will want to control the despooling of data to the printer. If the paper jams, or if you have to resupply the printer with paper, you will have to stop the printer and attend to these problems. You might also notice that the print is getting faint and decide to change the ribbon. In these or any other circumstances where you want to stop despooling, you can use the following steps.



Note: To control the server's queue, you must have the `Q` privilege. More information on this subject, refer to "Accounts" in this manual.

Stopping Despooling

To stop network printing AFTER the current print job:

» Use the syntax: **NET QUEUE STOP \\SERVERNAME** then press **Enter**.

Where `SERVERNAME` represents the name of the server where you want to stop despooling. The above syntax will stop despooling on all the server's printers. To control individual printers, refer to the *NET Command Line* section. To halt printing immediately:

» Type: **NET QUEUE HALT \\SERVERNAME** then press **Enter**.

Once despooling restarts the print job will continue where it left off.

To stop a print job, then start it again later:

» Type: **NET QUEUE PAUSE \\SERVERNAME** then press **Enter**.

Re-Enabling Despooling

To resume despooling if you used the `NET QUEUE STOP`, `NET QUEUE HALT` or the `NET QUEUE PAUSE` commands:

» Type: **NET QUEUE START \\SERVERNAME** then press **Enter**.

Where `SERVERNAME` represents the name of the server where you want to stop despooling, and `printer` represents the name of the

printer device on which you want to stop printing, or you can use the syntax:

NET QUEUE SINGLE \\SERVERNAME

to despool a single job. To resume despooling and start the current print job over from the beginning:

» Use the syntax: **NET QUEUE RESTART \\SERVERNAME** then press **Enter**.

Forced Printing

Some programs open and close a printer as if it were a file. When these programs close the print job, they indicate that they are done using the printer. LANtastic uses this message to allow the printer job to begin despooling. All DOS commands treat printers in the same fashion. You do not have to take any special actions when using DOS commands.

Many programs, however, send data directly to the low-level printer BIOS, bypassing DOS. When this happens, these programs don't indicate when they are finished using the printer. When they send data to a local printer, it is obvious when the print job is complete, but when they send data to a redirected network printer, there is no guaranteed way to know that the print job is finished. LANtastic provides several mechanisms for resolving this problem:

- LANtastic automatically closes redirected printers when your program exits.
- You can press and hold the **Ctrl-Alt-PrtScr** keys to close the print job.
- Instruct the application program to print to a filename.
- You can specify a printer timeout period after which LANtastic will automatically close your print job.

Whenever a program finishes executing, LANtastic NOS will automatically close any redirected printer jobs. If the jobs are already closed, no action is taken. You may notice that some of your print job is not printed until you exit your application program. This is due to LANtastic closing the print job when the program terminates.

If you don't want to exit your application program to print a file:

- ❶ Enter the print command from your application program.
- ❷ Press and hold down the **Ctrl-Alt-PrtScr** keys. This closes the print job, and any accumulated printer data is flushed. You will receive a confirming beep when the print job has been closed. You must wait until your program has sent all its data to the printer, or else your print data will be split into two jobs.

Some application programs allow you to send printer output to a file. This allows the program to “open” and “close” the printer like a file. Choose the option in your application program which allows you to print to a file. Specify that the output be sent to a file named PRN, LPT1, LPT2, LPT3, COM1 or COM2 or the full path to the printer resource. For example:

```
\\SERVERNAME\@PRINTER
```

You can also instruct LANtastic NOS to automatically close print jobs. To do this, use the NET LPT TIMEOUT command to set the timeout period for redirected printer data. If no data is sent to the printer during the duration of the timeout period, LANtastic NOS will close the print job. You will get a confirming beep to inform you when the print job has been closed. You may choose a timeout period from one second to an hour, but ten seconds is usually adequate. To set the timeout period use the syntax:

» **NET LPT TIMEOUT ss**

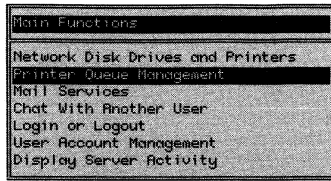
Where “ss” represents the time in seconds that a printer will wait before flushing printer data.

Manipulating Items In The Print Queue

When you send data to a network printer, the file is placed in a temporary storage location on the server. This location is called the printer spool area. Here files wait in the order they were received until the printer is available. But once you’ve sent an item to a server’s print queue you can still control the print job. If you have the Q (Super Queue) privilege you can control any item in the print queue. If not, you can only control print jobs you have sent. To manipulate a queue item, perform the following:

- ❶ Type **NET** and press **Enter**. You will see the *NET Main Functions* menu.

- ② Select the *Printer Queue Management* option as shown in the example below, and press **Enter**.



- ③ Select the network server from the list provided and press **Enter**. A display showing all the items in the server's print queue will appear:

| Sequence # | Destination | Status | User | Comment |
|------------|-------------|------------|---------|------------|
| 15 | @PRINTER | DESPOOLING | BOB | README.DOC |
| 16 | @FAST2 | WAITING | EILEEN | E2MBPS.DOC |
| 17 | @PRINTER | WAITING | USER | MEMOS.DOC |
| 18 | @LABEL | HELD | CORINNE | MAIL.LST |

| Logical Streams | Status |
|-----------------|----------|
| 1: @FAST2 . | Enabled |
| 2: @FAST???-??? | Disabled |
| 3: @LABEL . | Disabled |
| 4: @???????-??? | Enabled |

| Device | Status | CPS | Copies |
|--------|---------------|------------------|--------|
| ALL | | | |
| LPT1 | MULTIPLE JOBS | 0 | 1 |
| LPT2 | HALT AT EOJ | (NOT DESPOOLING) | |
| LPT3 | PAUSED | (NOT DESPOOLING) | |

This display shows you the sequence number, the device the print job was sent to, the status of the order, the user who sent the print job and any comment the user included. An item's queue status can be one of the following:

- DESPOOLING** The data for this print job is being sent to the printer.
- WAITING** The entry is waiting in the print queue to be despoiled to the printer.
- HELD** A user has stopped despooling this entry. Held entries can then be deleted or restarted.
- UPDATING** A user is placing an item on the queue.
- DELETED** A user is deleting the queue entry. An entry is marked as deleted only if it is in the process of being printed.
- RUSH** The entry has been placed at the front of the printing order. You must have the Q (Super Queue) privilege to rush print orders.

To manipulate an item in the queue:

- 4 Use the arrow keys to move the highlight bar to the item you want to control and press **Enter**. You will see a display similar to the one below:

| Sequence # | Destination | Status | User | Comment |
|------------|-------------|------------|---------|------------|
| 15 | PRINTER | HELD | BOB | PRFORM.DOC |
| 18 | QFAST2 | DESPOOLING | SEILEEN | E2MBPS.DOC |
| 17 | EP | | | 05.DOC |
| 18 | EL | | | L.LST |

| Logical Stream | Enabled | Copies |
|-------------------|----------|-------------------------------------|
| 1: QFAST2 | Enabled | ALL |
| 2: QFAST???.??? | Disabled | LPT1 MULTIPLE JOBS 0 1 |
| 3: ELABEL | Disabled | LPT2 MULTIPLE JOBS (NOT DESPOOLING) |
| 4: ??????????.??? | Enabled | LPT3 MULTIPLE JOBS (NOT DESPOOLING) |

| Queue Control |
|--|
| Show None Information about selected entry |
| Delete Remove selected entry from queue |
| Hold Suspend despooling of selected entry |
| Release Allow selected entry to be despoiled |
| View View contents of selected entry |
| Copy Copy selected entry to file |
| Rush Gives queue entry top priority |

The options in the menu provide you with the following functions:

- Show** Provides you with detailed information about the entry.
- Delete** Removes the item from the queue.
- Hold** Stops despooling of selected entry.
- Release** Allows a held queue entry to despool.
- View** Allows you to view the contents of an entry.
- Copy** Allows you to copy the contents of the print item to a file.
- Rush** Gives queue entry top priority. You must have the Q (Super Queue) privilege to rush print orders.

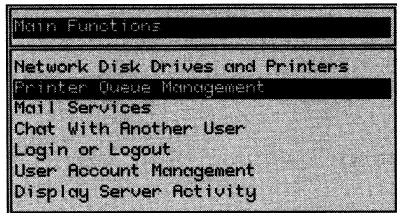
Using Multiple Printers

LANTASTIC NOS will simultaneously despool to each printer attached to your server. To use this feature, you must first set up each printer as a shared resource. For information on this subject, refer to "Shared Resources" in this manual. You can also set up each printer to print in various modes. Each print mode can then be set up as a network resource. For information on this subject, refer to "Setting Up Different Print Modes As Server Resources."

Controlling Multiple Printers

Once you've set up a server's printers as network resources, you can control each one individually through LANtastic NOS. This means that you can halt printing on the device attached to LPT2, but still use the rest of the printers.

- 1 Type **NET** and press **Enter**. You will see the *NET Main Functions* menu.
- 2 Select the *Printer Queue Management* option as shown in the example below, and press **Enter**.



- 3 Select the appropriate network server from the list provided and press **Enter**. You will see a display similar to the one below:

| Sequence # | Destination | Status | User | Comment |
|------------|-------------|------------|----------|------------|
| 15 | @PRINTER | DESPOOLING | \$BOB | README.DOC |
| 16 | @FAST2 | WAITING | \$EILEEN | E2MBPS.DOC |
| 17 | @PRINTER | WAITING | USER | MEMOS.DOC |
| 18 | @LABEL | HELD | CORINNE | MAIL.LST |

| Logical Streams | Status |
|-----------------|----------|
| 1: @FAST2 . | Enabled |
| 2: @FAST???-??? | Disabled |
| 3: @LABEL . | Disabled |
| 4: @???????-??? | Enabled |

| Device | Status | CPS | Copies |
|--------|---------------|------------------|--------|
| ALL | | | |
| LPT1 | MULTIPLE JOBS | 0 | 1 |
| LPT2 | HALT AT EOJ | (NOT DESPOOLING) | |
| LPT3 | PAUSED | (NOT DESPOOLING) | |

- 4 Use the **Tab** key to move to the window in the bottom right corner. The window informs you as to the physical printers attached to the server, the status of each device, the characters per second (if any) that this device is currently printing and the number of copies of

the current print job that are being printed. The status of a printer can be any one of the following:

| | |
|----------------------|--|
| DISABLED | The printer has not been enabled for despooling. |
| MULTIPLE JOBS | The printer has been enabled to despool more than one job. |
| HALT AT EOJ | The device will print one job, then stop. |
| PAUSED | The printer has been paused. |

- ⑤ Use the arrow keys to select the printer that you want to control and press **Enter**. To control all the server's printers, select *ALL*.
- ⑥ Use the arrow keys to select the appropriate option from the *Printer Control* menu and press **Enter**.
- ⑦ Repeat steps ⑤ and ⑥ for any of the other printers.
- ⑧ Press the **Esc** key to exit each window until you are returned to the DOS prompt.

Printing Banner Pages

Banner pages are very useful with network printing. They allow you to easily determine the contents of a print file and the print file's ownership. This is very helpful when multiple users are sending data to the same printer. Each banner page has these lines:

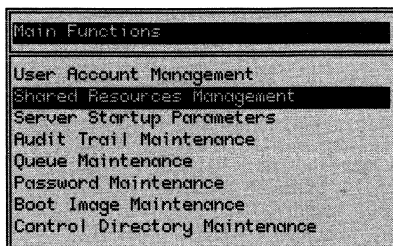
- The sender's username.
- The name of the machine the user sent the print job from.
- Any comment the user included.

After these lines, LANtastic NOS provides this information

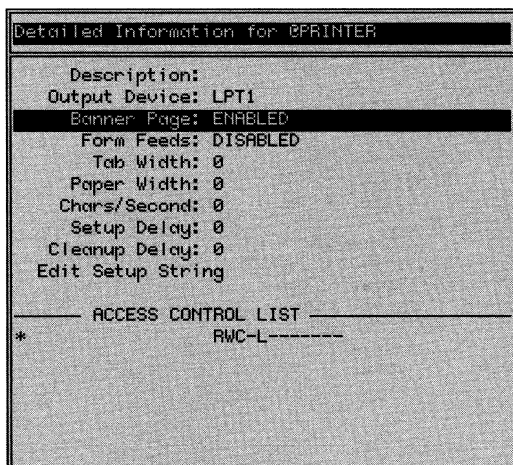
- The date, month and year the file was printed.
- The time the file was printed in hours, minutes and seconds.
- The resource name of the printer.
- The physical device name of the printer.
- The paper width of the print job and banner page.
- The tab position. If the tab is set to zero then no tab expansion is done.
- The number of copies that follow.
- The name of the file.

To enable banner pages:

- ❶ Type: **NET_MGR** then press **Enter**. You will see the **NET_MGR Main Functions** menu.
- ❷ Select the option, *Shared Resources Management*, and press **Enter**.



- ❸ A screen with the list of server resources will appear. Select the printer device that you want to enable banner pages on and press **Enter**.
- ❹ Use the arrow keys to move the highlight bar to the field *Banner Page* and press **Enter** to toggle the option to *ENABLED*.



- ❺ If you are using paper of a different size than 8 1/2 by 11 inches, specify a page width for the banner page. The default width is 80.

When you print a job on this network printer resource, you will see a banner page at the start of each job. For example:

```
UUUU UU  SSSSSS EEEEEEE RRRRRR
UU  U SS  SS  EE  EE  RR  RR
UU  U SSS  EE  RR  RR
UU  U  SSSSS EEEEE  RRRRR
UU  U    SSS  EE  RR  RR
UU  UU SS  SS  EE  EE  RR  RR
UUUU  SSSSSS EEEEEEE RRR  RR
```

```
SSSSSS EEEEEEE RRRRRR VVV  VV EEEEEEE RRRRRR 11
SS  SS EE  EE  RR  RR VV  V  EE  EE  RR  RR 1111
SSS  EE  RR  RR VV  V  EE  RR  RR 11
SSSSS EEEEE  RRRRR  VV  VV EEEEE  RRRRR 11
SSS  EE  RR  RR VV  V  EE  RR  RR 11
SS  SS EE  EE  RR  RR  VVV  EE  EE  RR  RR 11
SSSSSS EEEEEEE RRR  RR  VV  EEEEEEE RRR  RR 111111
```

```
MM  MM          MM  MM
MMM MMM        MMM MMM
M MM MM yy  yy  M MM MM  eeeee  m mmmmm  ooooo
M  M MM  yy  y  M  M MM ee  ee mm m mm oo  oo
M  MM  yy  y  M  MM eeeeeee mm m mm oo  oo
M  MM  yy  M  MM ee  mm m mm oo  oo
MM  MMM  y  MM  MMM eeeee  mm m mm ooooo
yyy
```

Username USER
Machine SERVER1
Comment My Memo

Date 90.04.23
Time 17:41:22
Printer @COM1
Device COM1
Width 80
Tabs 0
Copies 1
File \spool.net\0._SP

Redirecting Printer Output To Files

Normally, if you redirect a printer port, you would redirect it to a shared printer device. For example, the command:

```
NET USE LPT1 \\SERVER1\@PRINTER
```

Would redirect any data sent to your LPT1 printer port to @PRINTER attached to SERVER1.

You can also redirect a printer port to a file on the server. For example, the command:

```
NET USE LPT1 \\SERVER1\ROOT\OUTPUTS\FILE1
```

Would redirect any data sent to your LPT1 port to FILE1 in the server's ROOT\OUTPUTS subdirectory.

This can be convenient when you want to capture printer output to a file, but don't want to print the file. For example, you can use this feature to save **Shift-PrtScr** images to file for later use.



Note: Before you can redirect printer output to a file, you must first create the file you are redirecting the printer output to. If the file does not exist, the NET USE command will fail. One way to make sure that the file exists before the NET USE command is invoked is to execute the NET USE command with a redirected ECHO command. For example.

```
ECHO>\\SERVER1\ROOT\OUTPUTS\FILE1  
NET USE LPT1 \\SERVER1\ROOT\OUTPUTS\FILE1
```

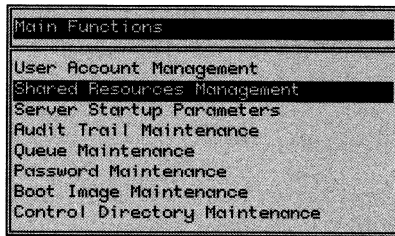
The ECHO command assures you that the file already exists before the NET USE command is issued. Each time you print to the file, the previous contents of the file are replaced with the new printer output.

Setting Up Different Print Modes As Server Resources

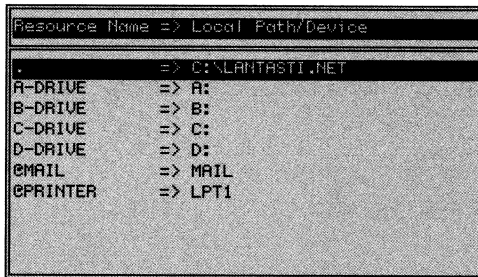
The same server printer can be set up to print in different modes. You can give each of these print modes a different resource name and each print mode can functionally be a different destination printer. LANtastic NOS keeps track of which physical printer corresponds with the resource names for the different print modes

You can change printer parameters such as speed, banner pages, setup strings, tab expansion for each print job by sending the print job to a different printer resource name. The server will then set up the printer according to the specifications for that resource name and print the file for you. To set up a print mode as a shared resource:

- 1 Type: **NET_MGR** and press **Enter**. You will see the *NET_MGR Main Functions* menu.
- 2 Select the second option, *Shared Resources* as shown in the example below, and press **Enter**.



A screen with the list of your server's resources (if you've set up any) will appear:



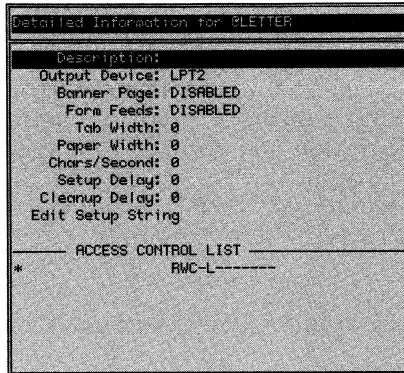
- 3 Press the **Ins** key, and type in the network resource name that you want to give to this print mode, then press **Enter**. For example:

| | |
|----------|-----------------------------------|
| @LETTER | For a letter quality print mode |
| @DRAFT | For a draft quality print mode |
| @PLOTTER | For a plotter-type serial printer |
| @LANDSCP | For landscape printing mode |



Note: You must use the "@" sign to distinguish printer and mail resources from disk drives and directories.

- ④ Use the arrow keys to move the highlight bar to the device that will be used for this shared resource, and press **Enter**.
- ⑤ The resource should now appear highlighted in the list of server resources. Press **Enter**. If you are setting up a parallel printer device, you will see this menu:



These fields provide the following functions:

| | |
|----------------------|--|
| Description | Allows you to include a brief description for this shared resource. |
| Output Device | The LPT port this mode of printing will use. |
| Banner Page | Places a banner page before each print job. |
| Form Feeds | Instructs the printer that a form feed will be used at the end of the job. |
| Tab Width | Sets the number of spaces that the printer will indent each time a tab is found in a print job. This is very useful when using printers which do not support tabs. |
| Paper Width | The paper size for the banner page. Typical values are 80 and 132 characters. If you are using standard letter size paper, you do not need to set this field. |
| Chars/Second | The minimum number of characters per second that the despooler will send to the printer. If the server is performing other network tasks, it will give higher priority to the print job in an effort to print the number of characters per second that you set. If you set a value higher than the computer or the printer can perform, the job will be printed at the highest possible speed. |

Setup Delay

The number of seconds the despooler will wait between sending the setup string to the printer and sending the actual data to be printed. This is useful for printers that need time to initialize the setup string.

Clean Up Delay

The number of seconds the printer will wait between sending the cleanup string to re-initialize the printer, and printing new jobs.

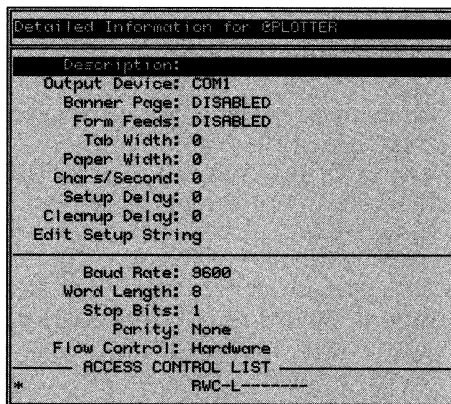
Edit Setup String

This option allows you to edit the setup string that the despooler will send to the printer at the start of a print job. You can include any valid parameters for your printer. You can also specify a setup or clean up file with this option.

Access Control List

This option allows you to set the types of access that you want users to be able to have for this device. Press the **F1** key for a list of the ACL rights and their meanings.

If you are setting up a serial printer, you will see this menu:



You will see all the fields given for a parallel printer above, plus the following fields:

Baud Rate

Selecting this field will provide with a list of baud rates (bits per second) that you can set for this printer resource.

Word Length

This option allows you to select either a seven or an eight bit word length. Most devices use an eight bit word length.

Stop Bits

This option allows you to set one or two as the stop bits.

Parity

This option allows you to select "NONE," "ODD," "EVEN" and "MARK" parity.

Flow Control

This options allows you to select "NONE," "HARDWARE," and "XON/XOFF."

Consult your printer manual for more information on setting the values for these fields.

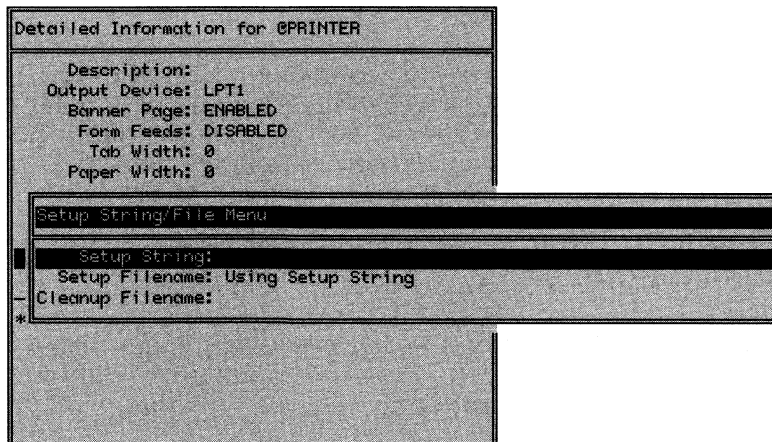
- ⑥ Set any of the values for the fields by moving the highlight bar to the desired selection and pressing **Enter**. This will either toggle the field between *ENABLED* and *DISABLED* or present you with a window asking you to input information.

Creating A Setup String

A setup string is a file containing characters that a printer accepts as instructions for how it will print. A clean up file is another file containing characters that set the printer back to previous print mode (re-initializing the printer) that it used before the codes from the setup string were entered.

You may wish to initialize your printer before each job. You can set it to print in letter or draft quality, use condensed type, or use special tabs. The modes of printing that you can set up depends on the type of printer you have. To create the setup string, you will need to refer to your printer manual for the codes for initializing your printer.

- ① Use the arrow keys to move the highlight bar to the option *Edit Setup String* and press **Enter**. You will see this display:



② Press **Enter**.

③ Press the **Ins** key, then input any valid control code your printer accepts. Press **Enter**. Repeat this process until the setup string is finished. (Consult your printer manual for more information on this subject.)

The printer will use these variables for any print jobs requested with this resource name. When you are using setup and clean up files you cannot use the setup string.

Using Setup Files

To use longer setup strings, you can store print control codes in a file. LANtastic NOS will then use these print specifications when a user requests the corresponding printer resource. To set a printer resource to use a specific setup file:

① Use the arrow keys to move the highlight bar to the option *Setup Filename:* and press **Enter**.

② Type in the full DOS path of the setup string file. For example:

C:\STRINGS\DRAFT.STR



Note: When you use the setup and clean up files, you cannot use the setup string.

Using Clean up Files

A clean up file is a setup string that re-initializes the printer after the print job is complete. Creating a clean up file similar to creating a setup file. You simply include any print control codes you want the printer to use, after a job has been printed using the setup string. To set the clean up file:

① Use the arrow keys to move the highlight bar to the option *Cleanup Filename:* and press **Enter**.

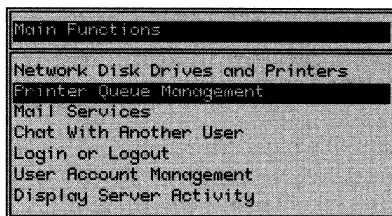
② Type in the full DOS path of the clean up file. For example:

C:\STRINGS\CLEANUP.STR

Controlling Multiple Printer Streams

One of the advantages of setting up your printers for different print modes (also known as logical printer streams) is that you can control each mode individually. You can enable and disable any printer stream without having to halt the entire print queue. You can also accomplish most of the operations listed below with the NET STREAM command.

- ❶ Type **NET** and press **Enter**. You will see the *NET Main Functions* menu.
- ❷ Select the *Printer Queue Management* option as shown in the example below, and press **Enter**.



- ❸ Select the appropriate network server from the list provided and press **Enter**. You will see this display:

| Sequence # | Destination | Status | User | Comment |
|------------|-------------|------------|----------|------------|
| 15 | @PRINTER | HELD | \$BOB | README.DOC |
| 16 | @FAST2 | DESPOOLING | \$EILEEN | E2MBPS.DOC |
| 17 | @PRINTER | WAITING | USER | MEMOS.DOC |
| 18 | @LABEL | HELD | CORINNE | MAIL.LST |

| Logical Streams | Status |
|------------------|---------|
| 1: ?????????.??? | Enabled |
| 2: | |
| 3: | |
| 4: | |

| Device | Status | CPS | Copies |
|--------|--------------------------------|-----|--------|
| ALL | | | |
| LPT1 | MULTIPLE JOBS | 0 | 1 |
| LPT2 | MULTIPLE JOBS (NOT DESPOOLING) | | |
| LPT3 | MULTIPLE JOBS (NOT DESPOOLING) | | |

- ④ Use the **Tab** key to move to the bottom left screen. Here each logical printer stream that has been entered is listed, along with it's status. When You first bring up this menu, it will only display the @???????.??? stream. This stream contains only wildcard characters (the stream is entered with the characters *.*) to represent all printer streams. When this stream is enabled, and no other logical streams appear on the list, all printer streams are enabled.

- ⑤ If you want to control individual streams you must place them BEFORE the stream @???????.???. This is because of the scanning order LANtastic uses. If while scanning through the list it reaches @???????.??? LANtastic will assume that you want all the logical printer streams enabled and stop scanning the list. To control an individual entry, you must first use the arrow keys to select @???????.???, and press **Enter**.

- ⑥ In the window provided, type in the name of the stream you want first in the list. Repeat this process with the rest of the streams, placing each one on a different line.

You can also use wildcard characters such as "*" For example, if you have three printer resources named @FAST1, @FAST2 and @FAST3 you can control them all by creating @FAST*. The scanning order would be as follows:

| | |
|---------------|----------|
| @FAST* | Enabled |
| @FAST1 | Disabled |
| @FAST2 | Enabled |
| @FAST3 | Disabled |

In the above example, all three of the @FAST streams would be enabled. Once @FAST* is scanned, any of the other streams beginning with @FAST will be ignored, because LANtastic NOS assumes you want them all enabled.

If you wanted to enable @FAST2 but not @FAST1 and @FAST3 you can also use the scanning order to your advantage. Simply place @FAST2 above @FAST* in the scanning order. For example:


| | |
|---------------|----------|
| @FAST2 | Enabled |
| @FAST* | Disabled |

Now any printer streams that begin with @FAST below @FAST* will be disabled, but @FAST2 will be enabled.

If you want to enable only the printer streams that begin with @FAST and @DRAFT but not any others, you could place these streams above the @?????????.??? printer stream and disable the rest. For example:

| | |
|----------------|----------|
| @FAST* | Enabled |
| @DRAFT* | Enabled |
| @?????????.??? | Disabled |

Now any printer streams after @?????????.??? will be disabled. The above example would be useful if @FAST* and @DRAFT* used one type of paper, but the rest of the streams used a letterhead or labels. Whenever you wanted to print on a letterhead, you could disable @FAST* and @DRAFT* and enable the print modes set up to use letterheads.

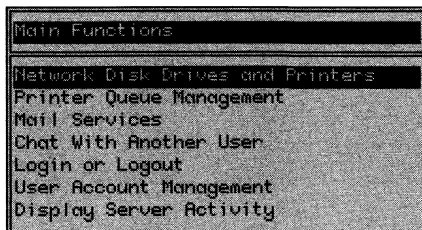
 Note: When you reset your computer, the logical printer streams settings are lost. If you want to set the streams each time you bring up the server, include the corresponding NET STREAM commands in the batch file you use to bring up your network software.

Using A Network Printer Locally

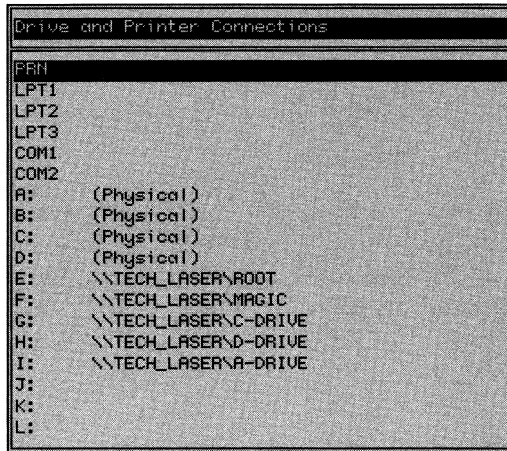
Logging In To Your Own Computer

If you want to make your printer available as a network resource and use it locally, you should log in to your computer as if you were accessing it from a remote workstation. Then redirect your printer port to a network printer device located on your computer. To do this:

- 1 Type **NET** and press **Enter**. You will see the *NET Main Functions* menu.
- 2 Select *Network Disk Drives And Printers* and press **Enter**.



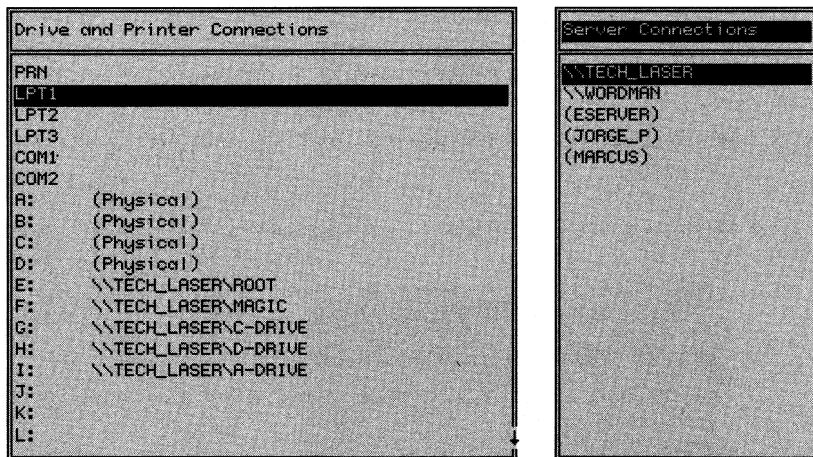
You will see the *Drive And Printer Connections* menu:



This menu displays which redirections have already been made, which drives and printer ports are available for redirection, and which resources are physically attached to your computer.

③ Use the arrow keys to move the highlight bar to the printer port you want to redirect and press **Enter**.

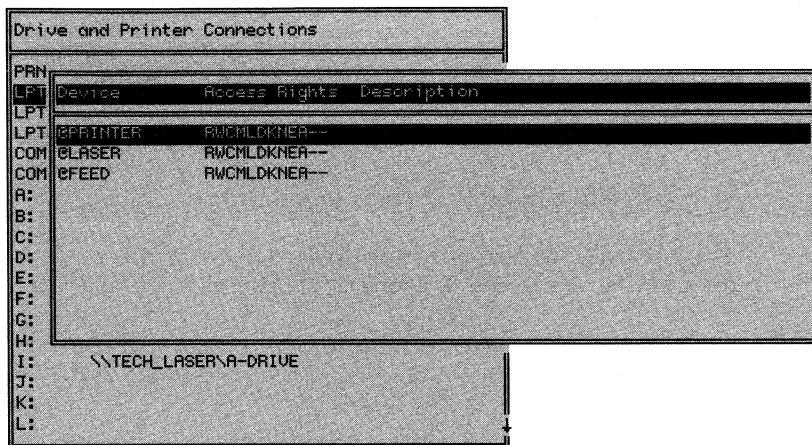
④ You will see a list of available servers:



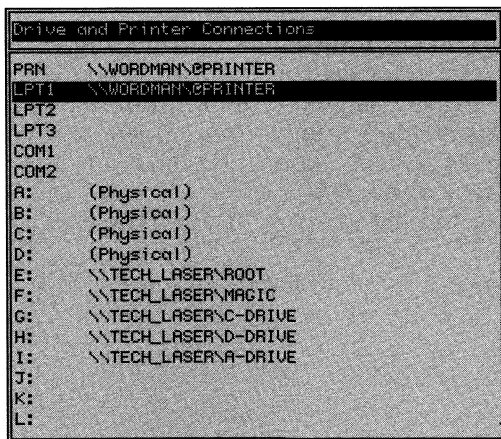
⑤ Use the arrow keys to move the highlight bar to an available server and press **Enter**. If you are not logged in to the server, you will be

prompted for your username, password, and asked if you want to set your computer's clock to the server's clock. You will then see a list of your computer's shared printer resources.

- 6 Move the highlight bar to the device you would like to connect to your computer and press **Enter**.



The *Drive and Printer Connections* menu will appear again with the new redirection highlighted.



- 7 Press the **Esc** key to exit out of each window until you return to the DOS prompt.

Halting Despooling

- ① Use the syntax: **NET QUEUE STOP \\SERVER PRINTER** to halt despooling after the current print job then press **Enter**, or Use the syntax: **NET QUEUE HALT \\SERVER PRINTER** to stop despooling immediately.

Where SERVERNAME represents the name of the server where you want to stop despooling, and printer represents the name of the printer device on which you want to stop printing.

You also need to cancel any redirection of your printer port.

- ② Type: **NET UNUSE LPT1** then press **Enter**.

Your printer will now function as a local printer. It will still be listed as a server resource, but no network print jobs will be printed.

Using The Physical ACL

The Physical ACL (P) allows you direct physical access to any DOS device such as a printer. To use this type of access, you do not apply the P ACL right to the printer device, but to a special directory. You can then reference the device through the directory and have direct physical access.

Devices referenced this way allow you to send and receive data directly from the device across the network. Information is not sent to the spool area, and the server or program may pause while waiting waiting for data. Therefore, it is recommended that you give physical access only in special applications where you can afford delays. You should not give physical access to directories on servers that will only be used for normal file sharing. To use the P ACL:

- ① At the DOS prompt, create a shared directory. For example:

```
MD DIRECT
```

- ② Set up the directory as a shared resource and give it the P ACL. (For information on this subject, refer to "Shared Resources" in this manual.)
- ③ To use the device directly, specify the full network path, including the shared directory and device. For example:

```
COPY FILE.TST \\PEER1\DIRECT\LPT1
```

The above command would send FILE.TST to the server's directory DIRECT where physical access is allowed, and finally the data is sent to the server's LPT1 port.

You can use the Physical Access ACL right to directly access any DOS device. You can even have direct access to a remote server's console. For example:

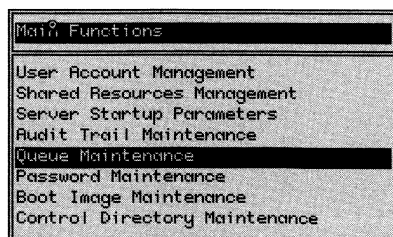
```
ECHO ^GHELLO THERE! >\\PEER1\DIRECT\CON
```

will display the text "HELLO THERE!" on the server's monitor.

Moving The Printer Spool Area

The printer spool area is where the server places files before printing them. The files wait in this area until the printer is available. You may want to move the printer spool area to another location on the server to improve network printing performance. If you have a faster disk in your server computer, or if you want to move the printer to spool to faster RAM memory, you would do the following:

- ❶ Make sure that the server program is not running.
- ❷ Type **NET_MGR** then press **Enter**. You will see the *NET_MGR Main Functions* menu.
- ❸ Select *Queue Maintenance* as shown in the example below, and press **Enter**.



You will see this menu:



- ④ Select the first option, *Change Spool Location* and press **Enter**.
You will see a window with the current location of the spool files.
- ⑤ Type in the full DOS path of the location where you would like the print files to be kept and press **Enter**.



Note: You may not move the spool area to a drive on another computer. Also make sure that the location you select is large enough to hold the files that will be kept there AND the print queue control file. You should always set the RAM disk larger than the largest file you will want to print.

To spool to a location in RAM you will have to create a RAM disk using the `DEVICE=` command in your `CONFIG.SYS` file. Use the syntax:

```
Device= C:\DOS\RAMDRIVE.SYS (MEMORY_SIZE) (SECTOR_SIZE) (MAX_FILES) (MEMORY_TYPE)
```

For example:

```
DEVICE=C:\DOS\RAMDRIVE.SYS 256 512 64 /E
```

In the example above the size of the RAM drive is 256 Kbytes. The sector size 512 bytes, represents the smallest size file that you can read or write to the RAM disk. Users may place up to 64 files into the root directory of this drive, and this RAM drive is located in extended memory. DOS then assigns the first available drive letter (usually D:). You would then enter this drive letter into the field asking for the new location of the printer spool.



Caution: If there is any system failure in your server while print files are kept in RAM disk, the files will be lost. The RAM drive is a temporary location. Each time the server is turned off, all data is lost.

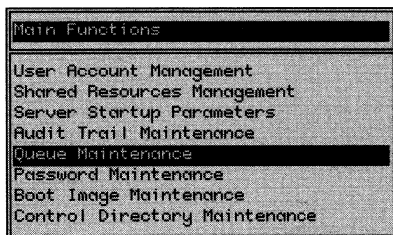
For more information on setting up a RAM disk, consult your DOS manual.

Clearing The Printer Spool Area

If you want to clear the entire spool area without having to delete each entry individually:

▲ **Caution:** Clearing the spool area will delete all the mail and print files stored there.

- 1 Make sure that the server program is not running.
- 2 Type **NET_MGR** then press **Enter**. You will see the *NET_MGR Main Functions* menu.
- 3 Select *Queue Maintenance* as shown in the example below, and press **Enter**.



You will see the *Queue Maintenance* menu.

- 4 Select *Clear Spool Area* as shown in the example below, and press **Enter**.



A window will appear.

- 5 Type **YES** then press **Enter**.

This will delete all files within the printer spool area.

Network Security

The purpose of this section is to provide you with necessary information to set up a secure network. Many of the security features mentioned here are documented elsewhere in this manual, so to avoid repetition, you will be referred to those sections.

LANtastic NOS has many security features built in. For setting up the most secure network possible, we suggest using a combination of the following security precautions:

- Enabling a password requirement to enter the NET_MGR program
- Making network users change their passwords at regular intervals
- Organizing your server's hard disk to protect important files
- Physically locking up the server computer
- Setting up audit trails
- Setting up time of day log ins

You may not necessarily want to add all of these options to your network. The following is a description of each of these security precautions.

Enabling A Password Requirement For The NET_MGR Program

The NET_MGR program is where user account information including user access rights is stored. Even if you've given network users full privileges and ACL rights to network resources, you may still need to keep users out of the NET_MGR program so they won't tamper with each other's accounts. If you are limiting access, it is a good idea to enable a password requirement to enter the NET_MGR program. That way users can't change the privileges and ACL rights that you've set. For information on enabling the password requirement refer to, "Password Maintenance" in this manual.

Making Network Users Change Their Passwords Often

LANtastic NOS allows you to put network users on a regular schedule for changing their passwords. This can help keep users from learning each other's passwords, or former users from having access to the system. LANtastic NOS will warn a user when his or her password is about to expire, and will allow the user to log in once and change passwords if he or she didn't log in the day a password

expired. To enable this feature, refer to “Password Expiration Date” in this manual.

Organizing Your Server's Hard Disk

For a completely secure server, you should NEVER give full access to the entire server's disk. If you want to give some level of access, you should allow L (file look-ups) access only. You should not allow R (read access) as this may allow a determined user to have access to information you don't want to share with the rest of the network.

What is recommended then, is to create directories for the various user groups. For example, you may want to set up a separate directory for all application programs. If you have more than one hard disk on the server, you may want to allocate an entire disk for a particular function. At this point, you may want to review “Access Control Lists (ACL's)” in the *LANTastic Network Operating System User's Manual*.

The following table illustrates a sample server configuration:

| Shared Resource Name | Actual Name Of Directory On the Server | User Accounts And ACL rights To The Directory |
|----------------------|--|---|
| ROOT | C: | *L |
| APPS | C:\APPS | Manager, RWCMLDKNEAI, *,L |
| DOS | C:\APPS\DOS | *, RLE |
| BASIC | C:\APPS\BASIC | *, RLE |
| USERS | C:\USERS | *,_ |
| AMY | C:\USERS\AMY | AMY,RWCMLDKNEAI, ADMIN-*, RLE, *,,_ |
| JORGE | C:\USERS\JORGE | JORGE, RWCMLDKNEAI, ADMIN-*, RLE, *,,_ |
| MANAGER | C:\USERS\MANAGER | MANAGER ,RWCMLDKNEAI, *,,_ |
| ADMIN | D:\ADMIN | MANAGER ,RWCMLDKNEAI, *,,_ |
| PROGS | D:\ADMIN\PROG | ADMIN-*, RLE, *,,_ |
| DATABASE | D:\ADMIN\DATA | ADMIN-*, RWCLDN, *,,_ |

In the above table the asterisk “*” denotes all network users. The term ADMIN-* denotes all users with the ADMIN- prefix at the start of their usernames. For example, for the shared directory AMY, the user ADMIN-AMY has all ACL rights to this drive except for the P (physical access right). The rest of the users who have the ADMIN- prefix in their can only read, perform file look-ups and execute

programs from this directory. The rest of the users have no access rights to this directory, and won't be able to use it.



Note: The ACL rights set for a shared directory also apply to all of its subdirectories.

Refer to "Setting Up Access Control Lists For Network Resources" in this manual for information on setting ACL rights.

Physically Locking Up Your Server Computer

Not allowing access rights to network resources won't stop a determined user from gaining access to your server if the user has physical access to the computer itself. Placing the server in a locked room is an excellent way of protecting the server from tampering or accidental damage.

Setting Up Audit Trails

By monitoring the kinds of access that users are making you can keep track of how your server's resources are being used. You can also find out which users have tried to use directories and devices that they are not allowed access to. For more information on setting up audit trails refer to "Audit Trail Maintenance."

Time Of Day Logins

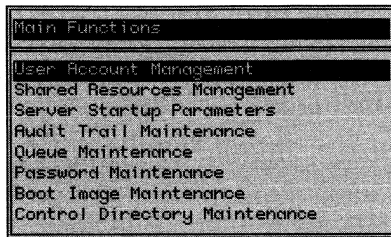
In order to avoid after-hours use of computer resources, you can limit the times of day and the hours of the week when your users will have access to the network. For more information on enabling this feature, refer to "Accounts" in this manual.

Re-Enabling An Account

To re-activate an account disabled with the *User Account Management* menu's *Disable Account* option:

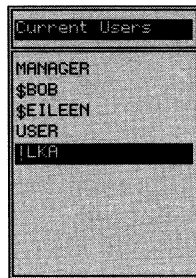
- 1 Type: **NET_MGR** then press **Enter**. You will see the *NET_MGR Main Functions* menu.

- 2 Select the first option, *User Account Information* as shown in the example below, and press **Enter**.

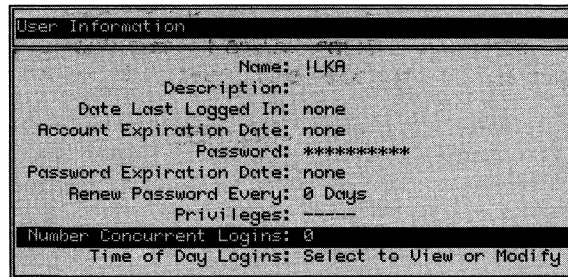
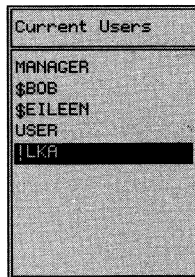


A screen with the list of user accounts will appear.

- 3 Use the arrow keys to select the account you want to enable and press **Enter**.



- 4 You will see the *User Information* window. Move the highlight bar to the *Number Concurrent Logins* field and press **Enter**.



- 5 Key in the number of concurrent log ins you want this user to have and press **Enter**.

The user's account is now enabled.

Remote Booting

LANTastic Network Operating System allows you the flexibility of adding diskless workstations to your Local Area Network. A diskless workstation is a computer without a disk drive, so it has no way to store the software necessary to boot up to the DOS prompt. A network server stores this software and any batch files to be executed after the workstation boots up and provides it for the diskless workstation to boot up. This file is called a Boot Image. The procedure for creating a boot image consists of these steps:

- Preparing a bootable floppy disk
- Creating CONFIG.SYS, AUTOEXEC.BAT and any batch files for the diskless workstations
- Building the boot image with the NET_MGR program

Preparing A Bootable Floppy Disk

The first step is to format a floppy disk with the DOS system files, the COMMAND.COM file, and any other programs you want the workstations to use. You may want to format the diskette single-sided to save space on the server's hard disk. To create a bootable disk

❶ Type: **FORMAT A:/S** then press **Enter**.

or to format the disk single-sided,

Type: **FORMAT A:/1/S** then press **Enter**.



Note: The above command is for a 360K floppy disk (Double-sided, double-density in a 360K floppy disk drive. If you have another type drive, consult your DOS manual for the appropriate syntax.

❷ Copy the DOS COMMAND.COM file by typing:

COPY COMMAND.COM A: then press **Enter**.

❸ Copy any additional programs that you want your diskless workstations to run, such as REDIR, NET or the NETBIOS for your adapter.

Creating Batch Files For The Diskless Workstations

You will need to create the necessary batch files with the commands you want executed when the workstation boots up.

The following is sample CONFIG.SYS file for a diskless workstation. If you choose to use this example in your workstations' CONFIG.SYS, you must NOT include the comment characters in the parentheses:

```
BUFFERS=16      (Set DOS buffers to 16)
FILES=20        (Set number of files that DOS can open concurrently to 20)
LASTDRIVE=Z     (Allocate drive letters up to Z)
```

The following is a sample AUTOEXEC.BAT file for a diskless workstation:

```
@ECHO OFF

REM      Sample autoexec.bat batch file for remote boot station,
REM      assumes that all stations will log in to same server, but
REM      each station has some unique options in another batch
REM      file named after its node number (the last 8 digits)

REM      Load REDIR, the 2 large buffers will help decrease
REM      the load on the server since this station has no
REM      local storage

REDIR # buffers=2 size=2048
NET LOGIN/WAIT \\SERVER2 ?"Username: " ^"Password: "
NET USE C: \\SERVER2\C-DRIVE
NET USE D: \\SERVER2\D-DRIVE
C:
PATH C:\;C:\DOS;C:\LANTASTI;C:\UTIL

REM      Note that this must be the same version of DOS

SET COMSPEC=C:\COMMAND.COM

PROMPT $P$G
```

```
REM    Now get and store our machine name (ID)

SET NAME=AAAAAAAA
NET STRING/LEFT=-8/RIGHT=-1 NAME !"NODEID"

REM    Now I can call another batch file unique to
REM    the machine's name, that is stored on the server
```

```
CALL C:\BATCH\%NAME%
```

```
REM    All done
```

```
VER
```

You can add any commands or batch files to the boot image, but make sure that you only include commands you want executed on ALL the diskless workstations.

In order for the AUTOEXEC.BAT file to execute the REDIR program or any NET commands, you must place the REDIR.EXE and NET.EXE programs onto the diskette as well.

- » From the A: prompt, copy the files from the LANTASTI directory using the syntax:

```
COPY C:\LANTASTI\REDIR.EXE
COPY C:\LANTASTI\NET.EXE
```

Using The NET UNLINK Command

You may want to unlink the workstations' A: drive after they boot up. This will allow users at the diskless workstations to use their A: drives locally.



Note: You cannot enter the NET UNLINK command from within your AUTOEXEC.BAT file because you would be trying to disconnect the same drive you are issuing the command from. In order to disconnect this drive, you must create a batch file to change from the A: drive to another drive (such as C:) and then execute the batch file. The NET UNLINK command can be then issued from the other drive.

The diskette should now have all the information necessary to create a boot image.

Boot Image Maintenance

The NET_MGR *Boot Image Maintenance* option copies a floppy disk to a file on the hard disk called BOOT.IMG. Once this is done, the server that has this boot image will be the boot server for the diskless workstations. The boot server does not have to be the same server that they will log in to for network resources. To create a boot image on a server:

- 1 Select the network server that you want the diskless workstations to boot from.



Note: To create a boot image, The SERVER program cannot be running.

- 2 Select the *Boot Image Maintenance* option from the NET_MGR *Main Functions* menu and press **Enter**. You will see this menu:

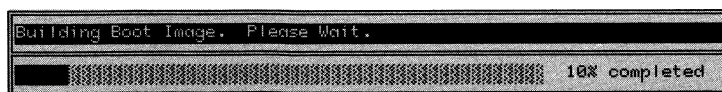


- 3 Press **Enter**. You will see the following menu:



- 3 Select the A: or B: drive and place the bootable floppy disk in the corresponding drive and press **Enter**.

LANTastic NOS creates a file called BOOT.IMG in the LANTASTI.NET\SYSTEM.NET directory. While it creates the file, you will see this display:



When the program is finished, the boot server will have a boot image for the diskless workstation(s) to use.

Adding Diskless Workstations To The LANtastic Network:

Once the server has a boot image, you are almost ready to boot up your diskless workstation on the network. Before you can do this, however, these conditions must be met:

- Remote Booting from the *Server Startup Parameters* menu must be set to *READ-WRITE* or *READ-ONLY*.
- The NETBIOS must be running.

Enabling Remote Booting

- ❶ Select the *Server Startup Parameters* option from the NET_MGR *Main Functions* menu and press **Enter**.
- ❷ Select the option, *Remote Booting* and press **Enter** to toggle the option to either *READ-ONLY* or *READ-WRITE*. Select *READ-WRITE* if you want to be able to write to the boot image later. Select *READ-ONLY* if you are sure that the boot image is correctly set up and you will not need to make any changes.

To exit the NET_MGR program, press **Esc** in each window to return you to the DOS prompt.

- ❸ Refer to your hardware manual for information on loading the NETBIOS for your specific network adapter you're using.

Booting Up Diskless Workstations

Install the remote booting hardware as instructed in the adapter manual.

- » Turn on the diskless workstation. Depending on the type of adapter and NETBIOS you are running, an informative message may appear when the NETBIOS loads across the network

LANtastic (tm) Network Boot Utility Vn.nn - (C) Copyright 1990 ARTISOFT Inc.

Once the NETBIOS is installed, the remote booting software will attempt to find a boot server. This will be the first network server with remote booting enabled.

The boot utility will then attempt to boot from the floppy. If no floppy is present, it will attempt to boot from the network and you will get the following message:

Network boot in progress - Please stand by...

Any time during the booting sequence you can press the **F1** key to abort network booting and attempt to boot from a local drive. If the initial network boot fails, the network boot utility will keep trying.

If you have a bad boot image, you will get a standard DOS boot failure message, or the remote machine will lock up.

Server Startup Parameters

The *Server Startup Parameters* option from the *NET_MGR Main Functions* menu allows you to customize server options which take effect whenever you start the server. The functions in this menu can be divided into two categories: Audit trail maintenance and server software configuration.

Audit trails are used to keep a log of what server disk drives and devices were accessed by network users and what types of access were allowed or denied. It is important to note, however that keeping audit trails can use up a lot of server disk space, so it is important to delete old entries.

Server software configuration refers to the software resources of the server computer. This would include the size of the buffers this server will use for printing and performing user requests, the number of user requests the server can handle simultaneously and other functions.



Note: Any changes to the fields for server software configuration or audit trails will not take effect until you reboot the server.

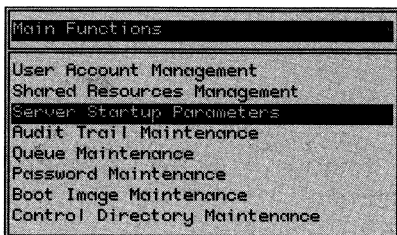
Enabling Audit Trails

To enable audit trails.

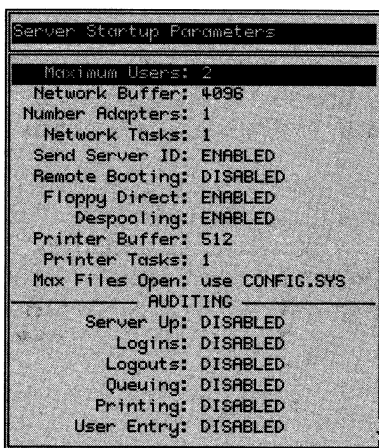
❶ Type: **NET_MGR** then press **Enter**.

You will see the NET_MGR *Main Functions* menu.

- 2 Select the third option, *Server Startup Parameters* as shown in the example below and press **Enter**.



You will see this display:



At the bottom of the menu under *AUDITING*, you will see fields for setting up audit trails. The following is a list of the kinds of user activity you can log. Enable the types of auditing you want kept by moving the highlight bar to the desired field and pressing **Enter**.

Audit Server Up

If you enable this function, an audit entry is made when a server is started.

Audit Logins

If you enable this function, an audit entry is made when a user logs in to the server.

Audit Logouts

If you enable this function, an audit entry is made when a user logs off from the server.

Audit Queueing

If you enable this function, an audit entry is made when the user places an entry in the server's mail or print queues. Placing an entry in the queue is different from printing an entry from the queue. (See below.)

Audit Printing

If you enable this function, an audit entry is made when a print job is finished.

Audit User Entry

If you enable this function, an audit entry is made when a user issues a NET AUDIT command.

Access Allowed

If you enable this function, an audit entry is made when a user is allowed a certain type of access. For example every time a user is allowed to read a file (R access) an audit entry will be made. Refer to the section "Setting Access Control For Network Resources" for more information on the types of network access.

To set this function:

- ❶ Use the arrow keys to move the highlight bar to the field *Access Allowed*.
- ❷ Type the letter that corresponds to the privilege(s) you want audited.

You can use the **F3** key to quickly set auditing for all the ACL's or press the **F4** key to remove all the ACL letters.

Access Denied

If you enable this function, an audit entry is made when a user is denied a certain type of access. For example every time a user requests to write to a file (W access) and is denied, an audit entry will be made. Refer to "Setting Access Control For Network Resources" for more information on the types of network access.

To set this function:

- ❶ Use the arrow keys to move the highlight bar to the field *Access Denied*.
- ❷ Type the letter that corresponds to the privilege(s) you want audited.

You can use the **F3** key to quickly set auditing for all the ACL's or press the **F4** key to remove all the ACL letters.

For setting the *Access Allowed* and the *Access Denied* fields, here is a list of the types of access allowed by LANTastic NOS:

| | |
|----------------------------------|---|
| R--Read Access | The user can open files for reading. |
| W--Write Access | The user can write to files. |
| C--Create A File | The user can create files. The user will not be able to write to these files if you do not enable the W (Write access) privilege. |
| M--Make Directory | The user can create new subdirectories. |
| L--File Lookups (DIR's) | The user can display or search through directories or subdirectories. |
| D--Delete Files | The user can delete files. |
| K--Delete Directories | The user can delete subdirectories. |
| N--Rename Files | The user can rename files. |
| E--Execute Program | The user can execute programs. |
| A--Change File Attributes | The user can change the attributes of files in a shared directory. |
| I--Indirect File | Indirect files are supported within this shared directory. |
| P--Physical Access | The user can use a special directory to connect to DOS devices directly and not go through the server's spooler. Enabling this type of access can result in network users having a prolonged wait for printer or other device requests to be performed. |

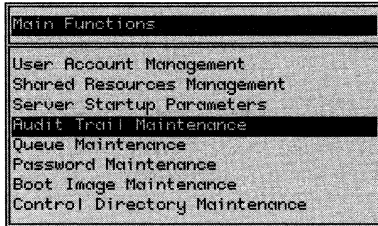
Audit Trail Maintenance

Once you've created the audit trail, you can use the *Audit Trail Maintenance* Option from the NET_MGR program to view the audit trail entries, copy them to file or clear the audit trail file.

Viewing An Audit Trail

To see the log of user requests to the server:

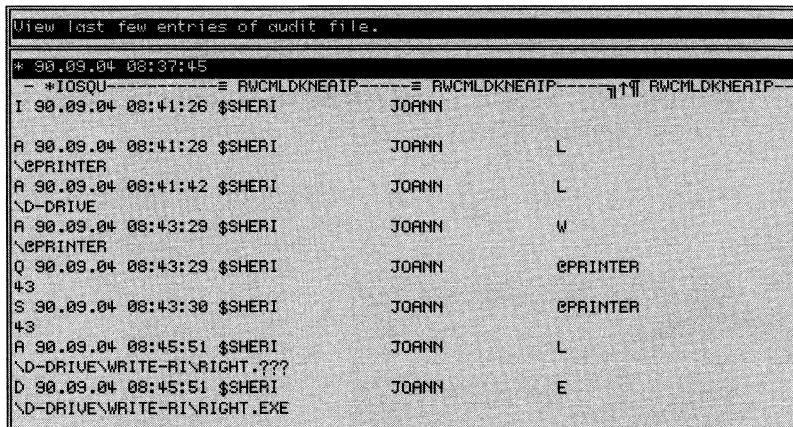
- 1 Type: **NET_MGR** then press **Enter**. You will see *NET_MGR Main Functions* menu.
- 2 Use the arrow keys to select the fourth option, *Audit Trail Maintenance*, and press **Enter**.



- 3 Use the arrow keys to select *View Last Few Audit Entries* and press **Enter**.



You will see a display similar to the one below:



The audit trail display uses the following format:

Type date Time Username Machine Reason
Variable

Type The table below lists the types of entries logged.

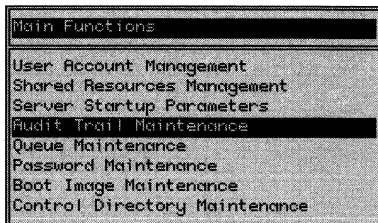
| Symbol | Meaning |
|--------|--|
| * | Server started |
| ! | Server shut down |
| I | User has logged in to the server |
| O | User has logged off or the server connection has been broken |
| A | Access has been allowed to a server resource |
| D | Access has been denied to a server resource |
| Q | An entry has been placed on the server's queue |
| S | A queue entry has been despoiled to a printer |
| U | A user has requested to write an audit entry |

Date The date the entry was made.
Time The time the entry was made.
Username The network name of the user who made the request.
Machine The network name of the computer the user made the request from.
Reason The reason the user made the entry.
Variable Specific information about the entry such as the server resource requested, or the number of bytes sent to the server's print queue or printer.

Copying An Audit Trail To File

To save a log of audit entries for later reference:


- 1 Type: **NET_MGR** then press **Enter**. You will see *NET_MGR Main Functions* menu.
- 2 Use the arrow keys to select the fourth option, *Audit Trail Maintenance*, and press **Enter**.



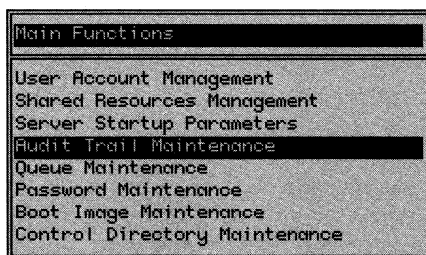
- 3 Select the option *Copy Audit Trail To File* and press **Enter**.
- 4 Type in the full DOS path of the file you want to copy the log to, and press **Enter**.

Clearing The Audit Trail File

Since audit logs can take up a lot of space on your server's disk, it's a good idea to delete old audit entries.

 Note: Using this option will delete ALL the entries in the log. If you have entries that you want to save, you should copy the log to a file first, and then clear the audit trail file.

- 1 Type: **NET_MGR** then press **Enter**. You will see *NET_MGR Main Functions* menu.
- 2 Use the arrow keys to select the fourth option, *Audit Trail Maintenance*, and press **Enter**.



- 3 Select the option *Clear The Audit Trail File* and press **Enter**.



- 4 Press **Enter** once again to confirm the deletion. This will delete all the entries in the audit log.

Server Software Configuration

To change any of the values in these fields, use the arrow keys to move the highlight bar to the desired field and press **Enter**. In some fields this will toggle the selection between *ENABLED* and *DISABLED* and in others you must provide a value. For more information on configuring your server, refer to "Appendix A: Improving Network Performance." The following is a description of the various fields:

Maximum Users

The maximum number of users that can simultaneously log in to the server. The larger the value in this field, the more memory the server will use when running.

Network Buffer

The buffer size the server uses for network communication. Setting larger buffers can increase performance, but this will also use more memory.

Number Adapters

This field tells the SERVER program the number of adapters installed in your computer. Normally a server will have only one NETBIOS adapter installed. You may, however, use up to six adapters with LANtastic NOS. When using more than one adapter, make sure that each adapter has its own unique IRQ, I/O base or any other requirements necessary for its operation. Each adapter can then service an independent network.

Network Tasks

This field specifies how many concurrent user requests the server can perform. Each task requires a network buffer, so increasing the number in this field will increase the amount of memory the server will use.

If you have multiple adapters in a server, you should specify a network task for each adapter.

You may want to increase the number of tasks if the server will have a large number of users logged in simultaneously. A good formula for setting the network tasks is:

$$1/4 * \text{the number of users} + 1.$$

If you have a large number of simultaneous users and multiple adapters, use this formula to compute the number of network tasks:

$$\text{Number of adapters} + (1/4 * \text{the number of users} + 1).$$

Send Server ID

If this field is set to *ENABLED*, the server's name will appear on the list of available network servers. If the field is set to *DISABLED*, a user must know the name of the server in order to log in.

Remote Booting

When enabled, this function allows this server to boot up other computers to the DOS prompt. For example, you might want to add diskless workstations to your network. The server would store the necessary software for these machines to boot up, then they can use network drives and devices. Prior to enabling this function, you must create a Boot Image. Refer to "Remote Booting" for more information on this subject.

Floppy Direct

This function allows a user to issue the DOS FORMAT and CHKDSK commands on the server's floppy disks. If this type of access is enabled, and the floppy disk is shared with the rest of the network, you must make sure that no one formats a floppy disk at the same time it is accessed by another user.

Despooling

When despooling is enabled, print jobs will automatically despool to printers. When this function is disabled, despooling to a printer will not begin until the NET QUEUE START or the NET QUEUE SINGLE commands are given.

Printer Buffer Size

This is the buffer size that the server will use for each printer task. You can speed network printing by allocating larger buffers. This will reduce the number of physical accesses to the disk when printing a file. Increasing the size of the printer buffer will use more server memory.

Printer Tasks

This is the number of printers located on a server that the network can use to print at one time. Each printer task will require a printer buffer, so the more tasks you allow, the more server memory you will use.

Max Files Open

Normally the number of files that users can open simultaneously is controlled by your CONFIG.SYS file with the FILES= statement. Due to DOS limitations, the maximum number of open files you can specify in your CONFIG.SYS is 255. If you want to be able to open more files or you need more open files for local functions, you can set

this field to allow from 50 to 5100 open files. This causes the server to allocate its own separate files rather than those allocated through the CONFIG.SYS file. Setting this field to 0 instructs your server to use the FILES= value given in the CONFIG.SYS.

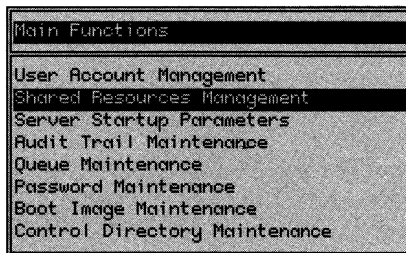
Shared Resources

In order for users to access disk drives, subdirectories and printers on a server, you must first set up links between these server resources and the network. Every user account has full access to a shared resource when you first create it. In order to provide better network security, you may decide to limit user access to server drives and devices. You will do this by setting the Access Control List (ACL) for each user or group of users. You will use the NET_MGR program to perform this function.

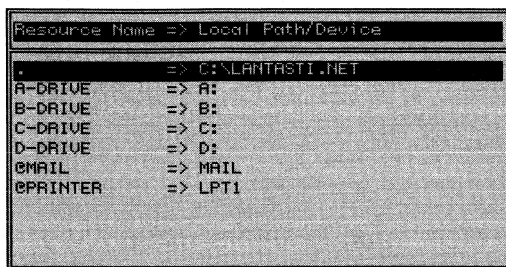
Creating A Network Resource

To allow users at remote stations to use a disk drive, subdirectory or printer:

- ❶ Type: **NET_MGR** then press **Enter**. You will see *NET_MGR Main Functions* menu.
- ❷ Select the second option, *Shared Resources Management*, and press **Enter**.



You will see this display:



Displayed in the window are all the server resources set up previously. To create a new resource:

- 3 Press the **Ins** key and type the name that the user will give to request this subdirectory or device. Press **Enter**. For example, you might give:

| | |
|-----------------|---|
| ROOT | As the name for your C: drive. |
| A-DRIVE | As the name for your A: drive. |
| @MAIL | As the name for your mail queue. (LANtastic NOS requires you to use this name for a mail resource.) |
| @PRINTER | As the name for the printer attached to your LPT1 port. |



Note: Mail and printer resource names must begin with the @ sign to distinguish them from disk drives and subdirectories.

- 4 Type in the local name of the server directory or device and press **Enter**. For example entering:

| | |
|-----------------|--|
| C: | Would allow access to your entire C: drive. |
| C:\LOTUS | Would allow access to only the LOTUS subdirectory on your C: drive and all its subdirectories. |
| LPT1 | Would allow access to printers connected to your LPT1 printer port. |

The new network resource should now appear on the list. All the access rights are allowed for this new resource. To limit the kinds of access users will have, refer to the next section.

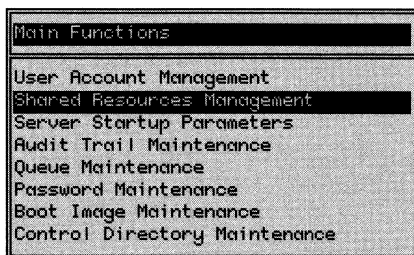
Setting Access Control Lists For Network Resources

Access Control Lists (ACL's) allow you to specify the types of access a user or group of users will have for each network resource. To set an ACL for a user or user group:

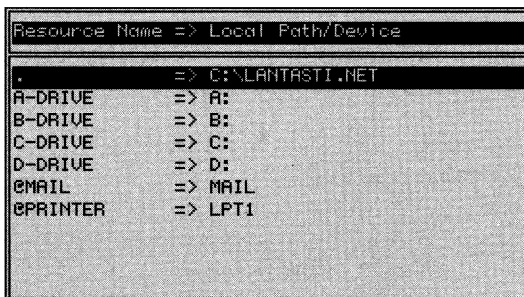
❶ Type: **NET_MGR** then press **Enter**.

You will see NET_MGR *Main Functions* menu.

❷ Select the second option, *Shared Resources Management*, and press **Enter**.

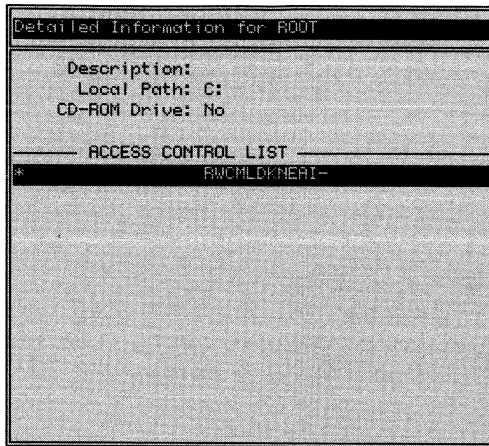


You will see a display similar to the one below:



Displayed in the window are all the resources this server allows access to.

- ③ Select the directory or device you want change access for and press **Enter**. You will see this display:



- ④ Move the highlight bar below the line *ACCESS CONTROL LIST* and press the **Ins** key.
- ⑤ Type in the name of the user or user group that you want to set the ACL for. You can set access privileges for an entire group of users by entering a template name followed by an asterisk (*). The asterisk denotes that any number of characters may follow. Examples of user group templates might look like this:

```
ADMIN-*
$*
```

Any user whose username begins with either ADMIN- or \$ (such as ADMIN-SALLY or \$NED) will have that group's access rights. This way, you can set an entire user group's access rights without having to individually enter the ACL for each user.

You can also take advantage of the top to bottom scanning order to set ACL rights for any users who belong to a user group, but who need different privileges. For example, If you wanted to assign more ACL rights to the username ADMIN-ROSIE, all you would need to do is place her username before the account prefix in the list of user accounts. You could then allow her more access rights than the other users in her group:

```
ADMIN-ROSIE      RWCM LDKNEAI-
ADMIN-*          RWCM L--NEA--
```

In the above example, ADMIN-ROSIE has all access rights excepts for P (physical access privilege). All the usernames with the ADMIN- prefix, such as ADMIN-ROD or ADMIN-TAMRA would only be allowed to read, write to, create, look up, delete, rename and execute files, as well as change file attributes and make new directories.

- ⑥ Type in the letters which correspond to any access privileges you want to enable or disable.

The ACL privileges are as follows:

| | |
|----------------------------------|--|
| R--Read Access | The user can open files for reading. |
| W--Write Access | The user can write to files. |
| C--Create A File | The user can create files. The user will not be able to write to these files if you do not enable the W (Write access) privilege. |
| M--Make Directory | The user can create new subdirectories. |
| L--File Lookups (DIR's) | The user can display or search through directories or subdirectories. |
| D--Delete Files | The user can delete files. |
| K--Delete Directories | The user can delete subdirectories. |
| N--Rename Files | The user can rename files. |
| E--Execute Program | The user can execute programs. |
| A--Change File Attributes | The user can change the attributes of files in a shared directory. |
| I--Indirect File | Indirect files are supported within this shared directory. |
| P--Physical Access | The user can use a special subdirectory to connect to DOS devices directly and not go through the server's spooler. Enabling this type of access can result in network users having a prolonged wait for printer or other device requests to be performed. |



Note: Unless you are an experienced LANtastic user, you should not enable the physical access right.

To set the ACL privileges, these keys perform the following functions:

| | |
|------------|---|
| Ins | Create new ACL. |
| Del | Remove ACL. |
| F3 | Set full privileges for selected ACL. |
| F4 | Remove all privileges for selected ACL. |
| F9 | Save the ACL. |
| F10 | Restore the ACL to last saved version. |
| F1 | Provide help information. |

Once you've set the ACL rights for the user or user group, press the **Esc** key to exit.

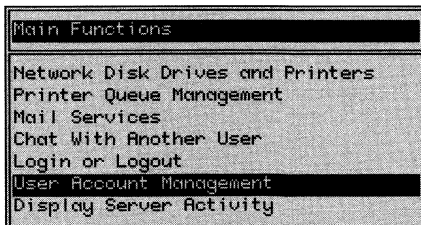
User Account Management

This option allows you to either change your password or disable your account. Changing your password is important for network security because it can help keep other users from finding out your password. Disabling your account is also a good security precaution if you plan to be away from the network for an extended period.

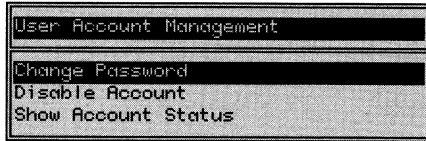
This feature also lets you find out the configuration of your account, what privileges you have, when you can access the system and other information.

Changing Your Password

- 1 Type **NET** and press **Enter**. You will see the *NET Main Functions* menu.
- 2 Select *User Account Management* as shown in the example below and press **Enter**.



- 3 Select the server with your account and press **Enter**. You will see the *NET User Account Management* menu.
- 4 Select the option *Change Password* and press **Enter**.



- 5 Type in your old password and press **Enter**. This prevents another user from changing your password without your permission.
- 6 Type in the new password and press **Enter**.

▲ **Caution:** Make sure you type the new password in correctly. Once you enter the password, there is no way to see what you typed.

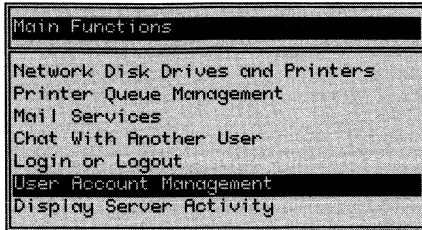
- 7 Type in the new password again to make sure that it was keyed in correctly and press **Enter**.

To enter your account, you must now use the new password.

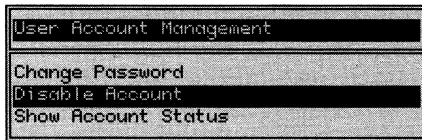
Disabling Your Account

To use the disabling function, the number of concurrent log ins for your account on the server must be set to one. You can find out the number of concurrent log ins by using the *Show Account Status* function from the *User Account Management* option. If your account is set to allow more than one concurrent log in, the network manager must disable your account by setting this field to zero.

- 1 Type **NET** and press **Enter**. You will see the *NET Main Functions* menu.
- 2 Select *User Account Management* as shown in the example below and press **Enter**.



- 3 Select the server with your account and press **Enter**. You will see this menu:

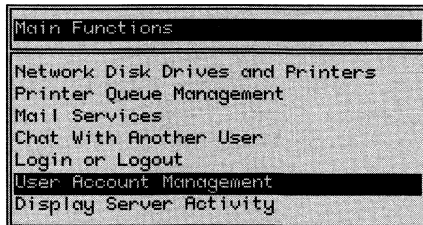


- 4 Select the option *Disable Account* and press **Enter**.
- 5 Type your password in the window provided, and press **Enter**.

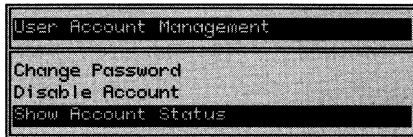
Your account is now disabled. In order to re-activate it, The system's manager must use the NET_MGR program.

Show Account Status

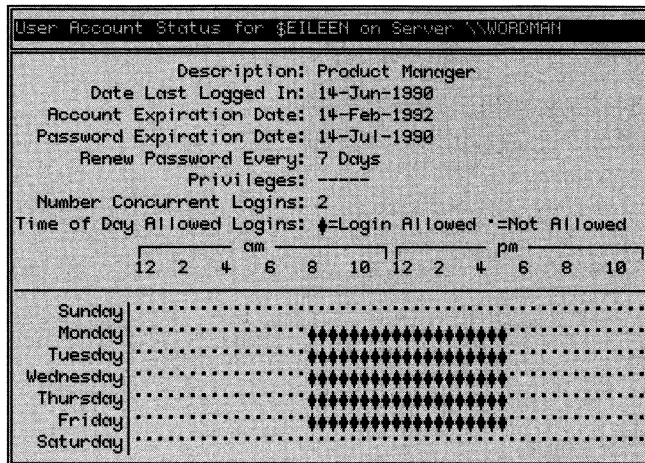
- 1 Type **NET** and press **Enter**. You will see the *NET Main Functions* menu.
- 2 Select *User Account Management* as shown in the example below and press **Enter**.



- ③ Select the server with your account and press **Enter**. You will see this menu:



- ④ Use the arrow keys to select the option *Show Account Status* and press **Enter**. The following display will appear:



You will now see fields giving information about your account. This display will tell you:

- The description of your account
- The date you last logged in
- The date (if any) your account expires
- The date (if any) your password expires
- How often you must change your password
- Your access privileges (if any)
- The number of times you can simultaneously log in to the server with the same username
- The days of the week and hours of the day you are allowed to log in to the server.

Appendix A: Improving Network Performance

It is beyond the scope of this manual to provide specific guidelines for configuring each network for optimal performance. This appendix can, however, give some general suggestions as well as some effective strategies for improving network performance,

Finding A Benchmark

One of the best strategies for configuring your server is to find a specific application that you want to optimize. You can then measure the amount of time that it takes the network to perform that task. For example, if you frequently read information from a data base, find a fairly large file and measure how long it takes to open it through the network. Avoid using an application that only takes five or ten seconds to perform, as it is harder to gauge improvement in network performance. Find an application that takes from about thirty seconds to two minutes to perform.

Once you've found your benchmark, use any combination of the suggestions given below and measure how long it takes for the network to perform the benchmark task. This way you can objectively gauge improvement in performance.

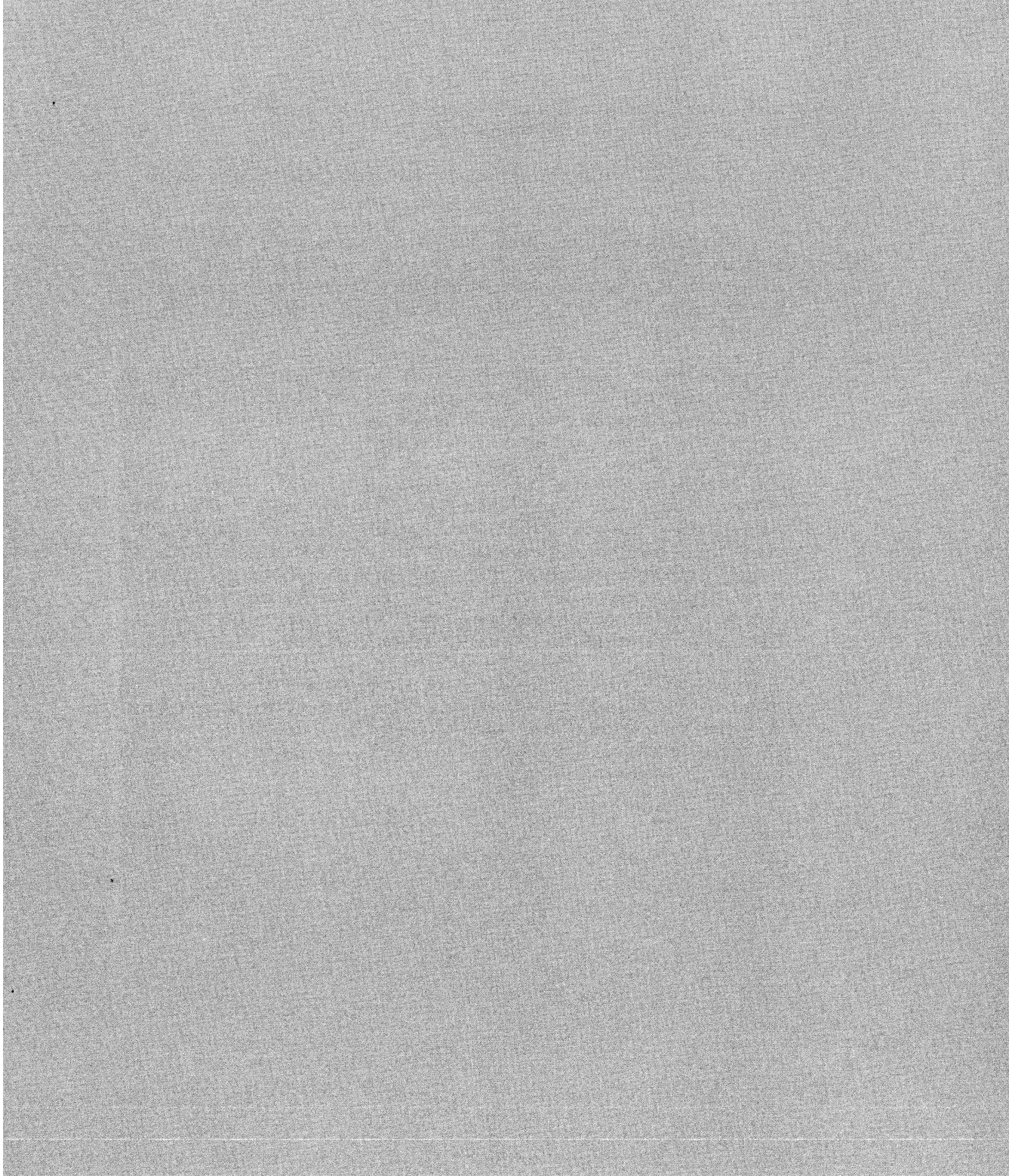
General Suggestions

You can usually improve your server's network performance by using any of these methods:

- Specify a larger buffer size with the *Server Startup Parameters* option from the NET_MGR program. This will allow the server to transfer larger amounts of data. This will also take more memory away from the server's local functions.
- Increase the size of the buffers in the server's CONFIG.SYS file with the BUFFERS= command. However, allocating more than fifty buffers in this field can actually degrade performance.
- Increase the size of the workstations' buffers by using the REDIR SIZE= command line switch. For more information on this subject refer to "Command Line Switches" in this manual.

- Increase the workstations' number of network buffers by using the REDIR BUFFERS= command line switch. For more information on this subject refer to "Command Line Switches" in this manual.
- Increase the size of the buffer that the server uses to print. Printer speed will increase because it will take fewer disk accesses to read the file. Making this buffer larger will take more memory away from the computer's local functions.
- Increase the number of printer tasks. The server can then print to more than one printer simultaneously. This will only help if you have more than one printer attached to the server. Increasing the number of printer tasks will also use more server memory.
- Increase the number of network tasks with the *Server Startup Parameters* option from the NET_MGR program. This will increase the number of concurrent user requests that the server can perform. It will also require additional network buffers which will take more memory away from the server, and slow local functions.
- If you have an application program that opens a large number of files, increase the number of maximum files open in the *Server Startup Parameters* option in the NET_MGR program. You can allow up to 5100 open files with this option. This may also help local performance if network users open a lot of files.
- Run the DOS FASTOPEN program on the server if you have DOS 3.3 or higher. This will reduce the amount of time that it will take the server to open files for network users. FASTOPEN should be run after LANCACHE (if you're using the LANtastic disk caching software) and before the SERVER program.
- Use the LANtastic disk caching program LANcache, provided with your distribution diskette. LANcache is designed specifically to work with the LANtastic network. It will speed up both reading and writing to disk. It also allows the server to perform user requests while it writes to disk, making it a valuable multi-tasking tool. Refer to the "LANcache" section in the reference manual for more information on the LANtastic disk caching system. If you use LANcache, you should decrease the number of DOS buffers in your CONFIG.SYS file to the smallest value your version of DOS will allow.
- Install a faster disk drive on the server. Even if you have disk caching software, a faster drive will always improve performance.

- Use faster computers (286, 386 and 486 type machines) for your network servers and workstations.
- Set up a dedicated server for often used application programs or printers.
- Running programs locally on the server places you in contention with all the network users. If you must execute a program, log in to the server as if you were accessing from a remote node and then run the program. This will schedule you along with the rest of the network users.
- Increase the number of buffers used by your adapter's NETBIOS. If you are using LANtastic 2 Mbps adapters, you will do this through the LANBIOS2 command line using the BUFFERS= switch. If you are using LANtastic AE-2 or NE-3 Ethernet adapters, you will reduce the packet size by using the PACKET_SIZE= switch. Even though this will reduce the size of the buffers, it will allow user requests to be more easily processed in a busy network. This will also decrease the size of the packet of data that your adapter will send. Just as a smaller car can enter traffic more easily than a larger car, smaller packets of data will can fit in between larger network packets and get to the server more easily. Be careful, however, not to set the number of buffers too high, as this makes the buffers too small to efficiently transfer data.
- If your network doesn't have a lot of contention, decrease the number of buffers (if you are using LANtastic 2 Mbps adapters) or decrease the packet size (if you are using LANtastic NE-3 or AE-2 Ethernet Adapters) used by the NETBIOS. This will allow the server to process larger blocks of data.



Appendix B: Sample Batch Files

Listed below are sample AUTOEXEC.BAT and CONFIG.SYS files for a server and a workstation. It is assumed that in these examples that SERVER.EXE and REDIR.EXE have been installed on the server's hard disk, C: and that the network software for the workstation (REDIR.EXE) is installed on a diskette. It is also assumed that a printer is attached to the server's physical port LPT1. These files are designed for a network in which the server boots before the workstation or at the same time.

The NET_MGR program must be used on the server to create USER1 and USER2 as valid accounts with the passwords PASS1 and PASS2 respectively. The NET_MGR program must also be used to make the root directory of the server's hard disk and the printer available as shared resources for the network, called C-DRIVE and @PRINTER respectively.

In these sample batch files, lines beginning with "REM" are comment lines. These lines may be omitted from the batch file. In the sample CONFIG.SYS files, parentheses enclose comments. These comments should be omitted from the actual file.

In "NET Command Line Customizing" you will find an additional sample batch file that uses some of LANtastic's special strings.

Sample CONFIG.SYS For A Server

| | |
|-------------|---|
| BUFFERS=32 | (Set DOS buffers to 32) |
| FILES=50 | (Set number of files that DOS can open concurrently to 50) |
| LASTDRIVE=Z | (Allocate drive letters up to Z) |
| FCBS=16,8 | (Set maximum number of File Control Blocks to 16 and the maximum number of File Control Blocks that can be closed automatically to 8) |

Sample CONFIG.SYS For A Workstation

| | |
|-------------|--|
| BUFFERS=16 | (Set DOS buffers to 16) |
| FILES=20 | (Set number of files that DOS can open concurrently to 20) |
| LASTDRIVE=Z | (Allocate drive letters up to Z) |

Sample Server AUTOEXEC.BAT

```
REM Set PATH to ROOT, \DOS and \LANTASTI subdirectories.  
PATH C:\;C:\DOS;C:\LANTASTI
```

```
REM Start NETBIOS interface. Make sure you run the right NETBIOS  
REM for your adapter.  
LANBIOS2
```

```
REM Implement file locking.  
SHARE
```

```
REM Run the redirector program. Name the machine PEER1. You  
REM can use any name. This machine can log in to 5 servers.  
REDIR PEER1 logins=5
```

```
REM Run the SERVER program.  
SERVER
```

```
REM Log in to server PEER1.  
NET LOGIN/WAIT \\PEER1 USER1 PASS1
```

```
REM Attach LPT1 to server's printer through the network.  
NET USE LPT1 \\PEER1\@PRINTER
```

```
REM Display current status on the network.  
NET SHOW
```


Sample AUTOEXEC.BAT For A Workstation That Boots From A Floppy

```
REM   Set PATH to LANTASTI directory
PATH A:\LANTASTI

REM   Start NETBIOS interface. Make sure you run the right NETBIOS
REM   for your adapter.
LANBIOS2

REM   Run the redirector program. Name the machine WS1. You
REM   can use any name.
REDIR WS1

REM   Attempt to log in to server PEER1
NET LOGIN/WAIT \\PEER1 USER2 PASS2

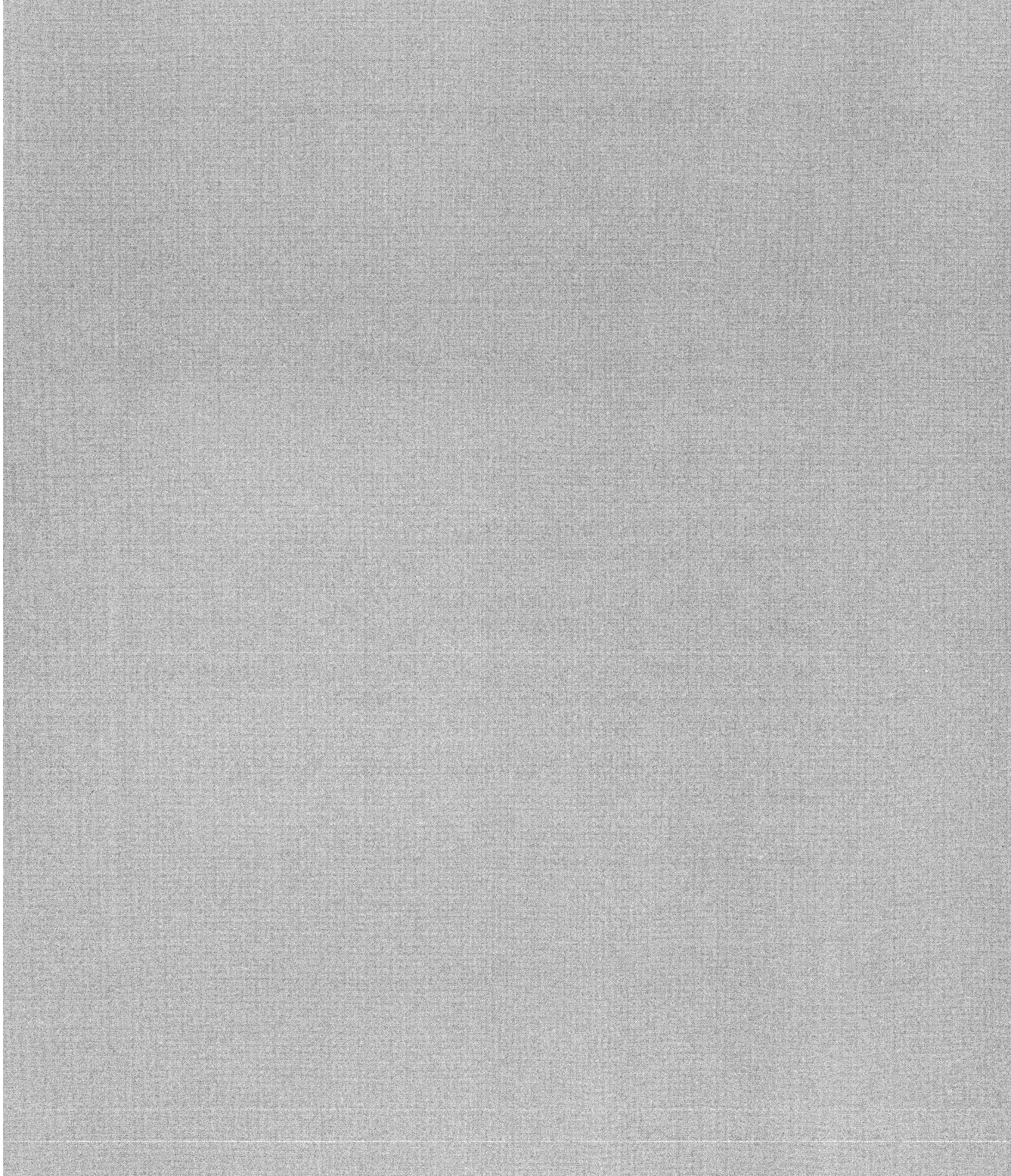
REM   Attach C: to server's hard disk C:
NET USE C: \\PEER1\C-DRIVE

REM   Attach LPT1 to server's printer
NET USE LPT1 \\PEER1\@PRINTER

REM   Set PATH to C-DRIVE'S ROOT and and \DOS directories and
REM   also to workstation's \LANTASTI directory
PATH C:\;C:\DOS;A:\LANTASTI

REM   Set LPT TIMEOUT to close print jobs after 10 seconds.
NET LPT TIMEOUT 10

REM   Display current status on the network.
NET SHOW
```



Appendix C: Testing Network Adapters

The NETBIOS software does some simple testing of your network adapter cards. If the NETBIOS installs, you can be sure that the adapters are functioning. You cannot, however, be assured that each adapter can communicate with the network.

There may be several reasons why an adapter doesn't communicate with the rest of the network. The most obvious cause is that the cabling is faulty or not connected correctly. Another reason may be that there has been a hardware failure on the adapter in the circuitry responsible for communication on the network.

The distribution floppy disk that comes with your LANtastic adapter contains a LAN diagnostic program (LANCHECK) which may be used to make sure that all the network adapter cards are functioning and connected together on the network. The LANCHECK program appears as LANCHECK.EXE on the distribution diskette.

To run the program type:

LANCHECK a-unique-name (/MONO)

where a-unique-name is a unique name (up to 16 characters) that you wish your PC to be known by on the network. This name should appear on the display of each computer running LANCHECK. This allows you to monitor which computers are running LANCHECK.

You should bring up all your network nodes simultaneously to ensure that they are evaluated for performance during the same period. LANCHECK evaluates each node's performance from when it is first brought up on the network, not just from the time LANCHECK is executed. LANCHECK will test six adapter cards per computer and can display a maximum of 1000 nodes. You can run LANCHECK any time after bringing up the NETBIOS, even after other LAN software is running.

The most important test for the adapters is whether each machine running LANCHECK appears on the screen. If an adapter is not listed

on the LANCHECK screen, it is probably not communicating with the rest of the network.

The optional switch /MONO forces the screen to run the LANCHECK program in monochrome (2 color) mode. This is especially useful for computers that do color emulation on a monochrome screen.

Testing Network Adapters

After you've installed the NETBIOS, type the following command:

LANCHECK a-unique-name

For example,

LANCHECK JOAN

or

LANCHECK BOB

would be typical unique names.

After an initialization message and a short pause (Note: the pause may take a few moments if you have multiple adapter cards attached), the LANCHECK screen will appear as shown:

| A# | NAME | NODE NUMBER | MINUTES RUNNING | STATUS | ERROR INDEX |
|----|------|--------------|-----------------|---------|-------------|
| 0 | BOB | 00006EA00045 | 12 | (local) | 2% |
| 0 | JOAN | 00006EA0003D | 12 | active | 4% |

At any time while the LANCHECK program is running, you may press the **F1** key to receive more information about the fields presented in

the screen. You can make the help window double in size by pressing the letter **Z** on the keyboard. Pressing **Z** a second time will change the help screen back to its original size. Use the arrow keys to scroll the text up and down, or use the **PgUp** or **PgDn** keys to move the text up or down a page.

The screen updates itself every ten seconds, or when you press the **SPACE BAR**.

A# tells you which adapter you are receiving information on. The first adapter is numbered "0," the second "1" and so on. These numbers are assigned when you run the NETBIOS. You may test up to six adapters per computer.

NAME refers to the unique node name you specified with the LANCHECK command. Check to make sure that all the adapter cards you are running LANCHECK on are listed in this table. If any are missing, you may have a cabling problem or a faulty adapter.

NODE NUMBER denotes the unique network number assigned to the adapter. *Minutes Running* shows how long the adapter has been running since you installed NETBIOS software. The *Status* field tells you whether the adapter being tested is active or inactive, and which adapters are local (located on your computer). If an adapter that is supposed to be active lists as inactive, there may be a problem with the adapter or the cabling to that adapter. If you see an adapter with a status that keeps switching between Active and Inactive there is probably an intermittent problem with the cabling.

Make sure that two computers haven't been assigned the same node number by the NETBIOS. This usually occurs when an adapter at a remote node isn't recognized by the software, or when a cabling problem causes an adapter to appear intermittently on the network. You can remedy this problem by assigning each node a unique number, if your NETBIOS allows this option. Consult your hardware manual for more information on assigning node numbers.

The field *ERROR INDEX* presents you with a statistic to help you deduce the relative performance of each adapter in the sending and receiving of network data. The values given in the example above should not be considered an average or ideal value for the adapters you are evaluating. Look instead for adapters that have *ERROR INDEX* values that are either much higher or lower than the other adapters in your network.

An adapter with a much higher *ERROR INDEX* might have a cabling problem or other hardware problem. Low values might indicate the

node is able to receive data correctly, but is not properly transmitting data to the rest of the network. This will increase the other nodes' *ERROR INDEX* scores because they will be receiving bad transmissions from the faulty adapter.

To further evaluate the efficiency of a network node, use the arrow keys to move the highlight bar to the desired node and press **Enter**. You will see this window:

| A# | Adapter Status of: B0B | | INDEX |
|----|------------------------------|-----------------------------|-------|
| 0 | Adapter Number: 0 | | |
| 0 | Node Number: 00006EA00045 | | |
| | Software Version: 2.13 | | |
| | TRAFFIC AND ERROR STATISTICS | ADAPTER RESOURCE STATISTICS | |
| | Minutes Running: 12 | NCBs Available: 26 | |
| | CRC Errors: 28 | NCBs Allocated: 32 | |
| | Alignment Errors: 264 | Max NCBs Possible: 128 | |
| | Collisions: 0 | Active Sessions: 4 | |
| | Bad Transmissions: 0 | Sessions Allocated: 32 | |
| | Good Transmissions: 4656 | Sessions Possible: 128 | |
| | Good Receives: 9590 | Max Packet Size: 1303 | |
| | Retransmissions: 0 | Number of Names: 7 | |
| | Resource Exhaust: 1009 | | |

The information at the top of the window tells you the name of the node, adapter number and node number being tested as well as the version of the NETBIOS software you are using. The bottom left portion of the screen provides you with *Traffic and Error Statistics* which may help you diagnose a hardware problem with your network. To the right of this are the *Adapter Resource Statistics* which provide information on your NETBIOS configuration.

Once again, do not assume that the values presented in the example above are the same values that you should see. What you should look for instead are values that are out of the average range for the rest of your adapters.

Traffic and Error Statistics

The field *Minutes Running* refers to the length of time since the NETBIOS was run.

Cyclical Redundancy Check (CRC) errors occur when a packet of data arrives at a node in a corrupt form. Before a computer sends a packet,

it mathematically evaluates the contents of the packet and places this information in it. The receiving node performs the same calculation on the data as it receives it then matches it against the results of the sending node's evaluation. If the results don't match, the receiving node asks the sending node to retransmit the packet.

A high value in the CRC field could indicate that an adapter is not correctly transmitting data. It might also indicate faulty cabling or electrical noise is corrupting the data in transit.

Alignment errors occur when bits of data arrive out of the 8-bit group they were sent in. These bits must then be regrouped into their original bytes by the receiving node. While this does not usually degrade network performance, a high value in this field could indicate cabling or hardware problems.

Network collisions occur when two or more nodes attempt to access the network simultaneously. A high value here will usually indicate a busy network. In rare cases, however, a malfunctioning adapter will continuously transmit noise resulting in a higher number of collisions.

Good Transmissions and *Bad Transmissions*: These fields provide you with statistics for successful and unsuccessful transmissions. Busier networks will have more unsuccessful transmissions than networks with less frequent use. A high number of Bad Transmissions could indicate a faulty adapter. *Retransmissions* occur after unsuccessful transmissions. Once again, look for values that are significantly higher than the rest of the nodes.

Good Receives: A low number here could indicate that an adapter is not receiving network data well. In such cases, it is best to test this node with only a few other adapters and make sure this low value is not a result of poor transmissions from an adjoining network node.

Resource Exhaust: When a node exhausts its supply of buffers, it can no longer receive data from the network. The field *Resource Exhaust* keeps count of each time this happens. If your node is continually running out of buffers, You may want to set your NETBIOS buffers higher to better accommodate network traffic.

If you suspect that there is a hardware problem and an adapter has a higher than average value in one or more of the above categories, remove the node from the network and see how network performance changes. If performance goes up dramatically the adapter could be at fault.

Adapter Resource Statistics

The values given in this field can help you evaluate how well your software configuration meets your network needs. For example, if you don't have enough Network Control Blocks (NCB's), to process data and commands in and out of the adapter, network performance will suffer, or some network software will not run.

NCB's Available: If this field has a value less than eight, you should consider raising the number of NCB's allowed for this adapter. You can set this with the high or low level driver command line switches. A good way to estimate the number of NCB's you need is to take the number of log ins you will need and add eight.

NCB's Allocated: This field informs you how many are allocated. You may increase the number of NCB's by using the appropriate driver software switch.

Active Sessions: A session is created any time a connection between two nodes is made or attempted. If the number given in the *Active Sessions* seems out of proportion with what you feel it should be, check your software to make sure it is configured for the proper number of sessions.

Max Packet Size: This refers to the largest size data packet that this adapter can either send or receive. Some types of NETBIOS allow you to directly set the maximum size of a data packet. Other types set the packet size by setting the buffer size.

Number of Names: This refers to the number of network names currently being used. An adapter with a much larger value than the other adapters may be running a program that is erroneously creating a large number of names.

To check a second node, press **Esc** to exit to the previous window then select the node you want to test and press **Enter**.

You can also check the adapter status of any network node that is running LANCHECK by pressing **Ins** while in the first LANCHECK window. A screen will appear asking you for the name of the node you want to test. Type in the name exactly as it is used by the node, then press **Enter**. Normally you will use all capital letters. The *Adapter Status* window for the desired node will appear. Repeat this process for each adapter you want to evaluate. To exit the LANCHECK program from the main window, press the **Esc** key.

Appendix D: Trouble Shooting

Before You Call Technical Support

Read through this section and see if your problem is described. If it is, follow the recommended problem solving procedure(s) for the problem. If not please complete the following steps before you call:

- ① Write down any error messages you've received, and a brief description of the problem. Include information on operations you were performing and/or what applications you were using.
- ② Position your phone as close to the computer as possible.
- ③ Have your hardware and software manuals handy.
- ④ Have your original distribution diskette handy. You will need the serial number located on the label.

Common User Problems

Problems with installation and operation can occur for a variety of reasons. It is not within the scope of this manual to discuss every conceivable problem that can arise, but it can cover some of the more common installation and operation difficulties as well as provide some good strategies for troubleshooting.

Lock Up Problems

Machine locks up (keyboard does not respond.) while loading the REDIR program

1. You may have an IRQ conflict with other hardware in your computer. Each adapter card in your computer must have its own IRQ to interrupt the computer and make requests.

Specify a different IRQ when you run the adapter card's NETBIOS. For an XT type computer specify IRQ 2. For an AT type computer specify IRQ 5, 10 or 15. All of the above IRQ's may not be available.

2. You have an address conflict (the adapter card and some other software are trying to use the same section of memory). This is especially common with disk controller cards, VGA cards and Expanded Memory (EMS) cards.

Find a memory address that is not being used. To find out what locations are already in use you can purchase memory mapping software, refer to the manuals that came with your hardware, or call the manufacturer(s) of your components for the locations in memory their products use.

If the Expanded Memory manager is mapping over the address that LANtastic NOS is using, you will have to tell the Expanded Memory manager software to ignore this address. This is usually done by placing a switch on the driver's command line which tells the driver to exclude a range from being mapped. With ARTISOFT adapters you will want to exclude the RAMBASE address your adapter is using.

Machine locks up (keyboard does not respond) AFTER loading the REDIR program

1. You may have a conflict with an Expanded Memory (EMS) card.
If the Expanded Memory manager is mapping over the address that LANtastic NOS is using, you will have to tell the Expanded Memory manager software to ignore this address. This is usually done by placing a switch on the driver's command line which tells the driver to exclude a range from being mapped. With ARTISOFT adapters you will want to exclude the RAMBASE address your adapter is using.

2. You may be running a Terminate and Stay Resident (TSR) program such as Sidekick and it is in conflict with LANtastic NOS.
Remove all TSR programs, run the network software and see if the lock up problem is solved. If so, you can then re-install the TSR's one a time until the problem re-occurs. Most TSR programs must be installed AFTER the network software.

3. You may have an adapter card that conflicts with the memory location LANtastic NOS uses only when the adapter performs certain functions. For example, you may have a VGA card that uses part of its full address range when in text mode, but then requires the whole range when in graphics mode, making it conflict with your adapter.
Find out the full address range that the VGA or other adapter card uses, then select a non-conflicting range for the LAN card to use.

Machine locks up (keyboard does not respond) while loading the SERVER Program

You may be running a Terminate and Stay Resident (TSR) program such as Sidekick and it is conflicting with the memory address that LANtastic NOS uses.

Remove all TSR programs and see if the lock up problem is solved. If so, you can then re-install the TSR's one a time until the problem re-occurs.

Machine locks up (keyboard does not respond) while running an application program

You may be running out of memory because you have allocated too many network tasks, too many network buffers or set the network buffers too large. As a result the SERVER program is taking up a lot of memory.

Refer to "Server Startup Parameters" in this manual for information on setting these values.

Machine locks up (keyboard does not respond) after a remote node attempts to use a printer or access a disk

If the server has an Expanded Memory manager, it may be trying to access the same memory location that LANTastic NOS is using.

If the Expanded Memory manager is mapping over the address that LANTastic NOS is using, you will have to tell the Expanded Memory manager software to ignore this address. This is usually done by placing a switch on the driver's command line which tells the driver to exclude a range from being mapped. With ARTISOFT adapters you will want to exclude the RAMBASE address your adapter is using.

Machine locks up (keyboard does not respond) while loading the LANCHECK Program

You may have an IRQ conflict with other hardware.

Specify a different IRQ on the NETBIOS command line. Refer to your hardware manual for information on this subject. If you are using ARTISOFT adapter cards with an XT type computer you should try IRQ2. On an AT type computer, you should try IRQ 2, 10 or 15.

Logging In Problems.

Can't log in to ANY servers

1. Maximum Users in the NET_MGR Server Startup Parameters option may be set to 0.

Refer to "Server Startup Parameters" in this manual for information on setting the number of log ins.

2. Concurrent LOGINS in the NET_MGR User Account Management may be set to 0.

Refer to "Accounts" in this manual.

3. Your computer or the server may have a cabling problem and/or a bad adapter. In such cases you may see the message "Cannot locate network name."

Check all cabling and make sure that you have not mixed any types of cable in your network (even approved cable types). Also make sure

that you've placed terminators at the end of each cable segment for LAN adapters that use a bus topology. If the problem persists, run the LANCHECK diagnostic program. For information on this program refer to "Appendix C: Testing Network Adapters."

4. The server that you want to log in to may not be running the SERVER program. In such cases you will see the message "Network node not listening..."

Make sure the server is powered up and running the SERVER program. You cannot log in to a computer that is only running REDIR. For information on executing the network software, refer to "Bringing Up The Network" in the *LANTastic Network Operating System User Manual*.

5. Your password or account may have expired. In such cases you will usually receive a message informing you that your account or password is out of date.

Have your system's manager re-enable your account.

6. You may already be logged in to the server. If such is the case, you will receive the message "Duplicate redirection or log in to the network node ?????, LOGIN has failed."

7. Your computers may be running different versions of the network software. In these cases you will see the message, "Invalid network version"

At the DOS prompt, type **REDIR** and press **Enter**. This will give you the version number of the network software. If the version differ, upgrade all your network computers to the latest version.

Can only log in to two nodes at a time

1. You may need to increase the LOGINS= switch on the REDIR command line.

Refer to "Command Line Switches" in this manual.

2. If you are logging in to a server from multiple nodes with the same username and password, you may need to specify a higher number of concurrent log ins.

Refer to "Accounts" in this manual for information on setting this value.

Miscellaneous Problems

Keep getting the message "Program too big to fit in memory." .
You may have allocated too many network tasks and/or buffers or set the network buffers too large. As a result the SERVER program is taking up a lot of memory.
Refer to "Server Startup Parameters" in this manual for information on setting these values.

Keep getting message "insufficient NETBIOS resources"
The NETBIOS for your adapter does not have enough NCB's and/or sessions to support your current server configuration.
If you are using an ARTISOFT adapter, increase the NETBIOS sessions and NCB's on the NETBIOS command line. Refer to your adapter hardware manual for more information on this subject. If you are using another manufacturer's adapter, refer to "NBSETUP" in this manual for information on increasing the number of network sessions and NCB's.

Keep getting message "Internal stack failure"
You are probably running DOS version 3.2. This version has errors in the internal stack handler.
Upgrade to DOS version 3.3 or higher.

Can't use COM port while network is running
The SERVER program is controlling the serial port since it is one of the server's devices.
Issue a NET QUEUE HALT for the COM port. This will allow you to use the port locally while SERVER is running.

Printer Problems

Can't delete item from the print queue
Before you can delete an item, you must first halt the queue. You can then delete the item. To resume despooling you must then issue the NET QUEUE START or NET QUEUE RESTART commands.
Refer to "Manipulating Items In The Print Queue" in this manual for more information on this subject.

Can't print on a server's printer

1. You may not be logged in to the server whose printer you are trying to use.

Log in to the server and redirect one of your printer ports to a printer device on the server. For information on this subject refer to "Chapter 5: Sharing Network Printers" in the *LANtastic Network Operating System User's Manual*.

2. You may be logged in to the server, but you may not have redirected one of your printer ports to the server printer device.

Redirect one of your printer ports to a printer device on the server.

3. You may not have Despooling in the NET_MGR Server Startup Parameters enabled.

Refer to "Server Startup Parameters" in this manual for information on enabling despooling.

4. The link path to the server printer device may not be set up correctly. For example, the printer may be attached to LPT1, but you may have specified LPT2 instead.

Refer to "Shared Resources" in this manual for information on setting up a server resource.

I Just upgraded to the latest version of LANtastic NOS and now I can't print locally

When you installed the new version of NOS, it enabled despooling for your computer.

Refer to "Using A Network Printer Locally" for information on this subject.

My computer prints all of the workstation's print jobs, but won't print my own jobs

If you are using your printer as a shared resource you must either halt despooling or log in to your own computer as a network user and redirect one of your printer devices to the shared resource. For More information refer to "Using A Network Printer Locally" in this manual.

My printer won't print until I exit my application program

Most DOS programs open and close a print job just like a file. When the print job is finished, the application closes the printer. Some applications, however, bypass DOS and communicate with the printer at the BIOS level. Since no end of file marker is received, LANtastic NOS doesn't know when a print job is finished and waits for notification. When the application program quits, LANtastic NOS is notified, and knows that it can then close the print job.

Refer to "Forced Printing" for information on flushing the printer.

STRATEGIES FOR PROBLEM SOLVING

Hardware

Carefully note error messages and try the suggestions in the hardware manual pertaining to the adapter you are installing. If after trying various combinations of IRQ's, RAMBASE, IOBASE settings and different expansion slots, etc; the errors persist, be sure to try another adapter in the same machine, preferably one that works in a different machine

LANCHECK

Once the you have the network adapter card installed in the PC, you will want to know if it is working or not. LANCHECK was designed to help you find out if all the nodes can communicate with one another.

LANCHECK supports up to 1000 nodes running at the same time. It also does some simple diagnostics of the adapter by querying the NETBIOS for the adapter status. This is a report of the current configuration of the NETBIOS and the traffic statistics for the adapter. It can be used to effectively pinpoint some very specific problems that the adapter or LAN may be having. LANCHECK will also display statistics for up to 6 adapters (0-5) in each machine that is running it.

If nodes are locking up when running LANCHECK [must cold or warm boot the computer to exit] first check for any IRQ conflicts. Run the LANCHECK program on each station without attaching the cabling to determine which adapter is failing or configured incorrectly. [Assuming hardware and software conflicts have been eliminated]. You can do this with ARTISOFT 2 Mbps adapters by simply removing the cabling. With ethernet adapters, you must use a T-Connector with the terminators on each side of the T and check each station in this manner.

Software

Always note error messages exactly. Concentrate on the *first* error message and trouble shoot it before any others that may have occurred. Carefully try to reproduce the error and note exactly where it occurs; e.g. after loading LANtastic program(s) LANBIOS2, WD8003, AE2, NE3, AILANBIO, REDIR, SERVER, or NET commands. If the errors are DOS errors, note exactly what produced the error

[combination of program execution, exiting or functions within a program]. This information is the first step in determining what has gone wrong.

Rename the CONFIG.SYS and AUTOEXEC.BAT files and go through the loading of the appropriate network software, with the correct switches if changes in jumpers have been made, and try to reproduce the error after each step.

Standard Problem-Solving Procedure For The LANtastic Network

When trying to find the cause of any sort of error on the network, the first task to undertake is to isolate the cause of the problem. The following procedure will help you locate the source of problems, and in rule out some possible sources of problems:

- ① Invoke the NET_MGR program and choose the *Shared Resources Management* selection. For each directory that you have created, check the access control list (ACL) and make sure that none have the 'P,' or physical access right, enabled (if it is enabled, a P will appear at the end of the ACL list). The physical access ACL is to be used only by experienced users in special situations.
- ② Are you running expanded memory? If so, you must confirm that the expanded memory manager (EMM) does not map over the adapter memory location in the 640K to 1Megabyte range. Most EMM drivers allow you to specifically exclude a region of that memory by adding an exclude switch to the "command line" in the CONFIG.SYS file. The syntax would be something like this:

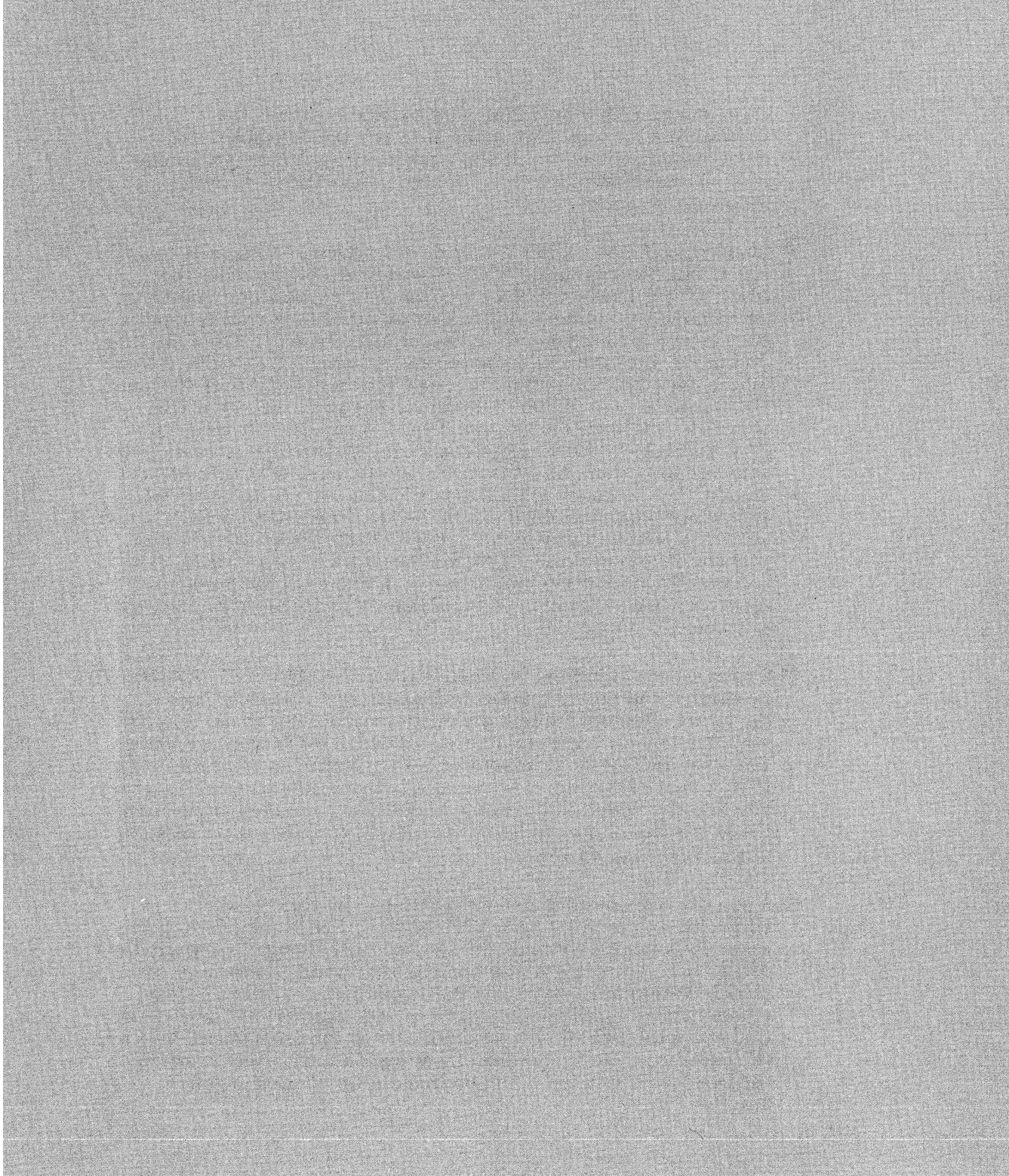
device=EMM.SYS /exclude:D800-DFFF

to exclude the default LANtastic 2 Mbps memory setting. If you are running LANtastic NOS/AI on another manufacturer's adapter, you need to find out if that adapter uses an address location in the reserved memory area and exclude that address range.

- ③ If you are running a disk caching program other than LANtastic LANcache there are some considerations to keep in mind. If your caching software allows for "delayed disk writes" you need to disable this feature in order for it to work correctly with LANtastic NOS. See your manual for the specific syntax. For example, for the Golden Bow Systems VCACHE program, the switch is '/t=0' on the command line. If you are running a cache in extended (not

expanded) memory on a 286 machine and experiencing intermittent lockups, first make sure you have disabled the delayed disk writes. If you still have lockups, remove the cache from extended memory. If the problem persists, refer to the following sections.

- ④ Check your CONFIG.SYS file for device drivers. These will have a line such "device=xxxxx.SYS"). If you have drivers other than ANSI.SYS or DMDRVR.BIN (or other disk partitioning software), try removing or commenting out those other lines and rebooting the system. Before you reboot, go through the AUTOEXEC.BAT file and see if you have any memory resident programs that load there (other than the NOS software). Most Terminate and Stay Resident (TSR) software should be compatible. The order in which TSR programs are loaded is also important. Only caching programs, FASTOPEN and MODE should be loaded before the LANtastic NOS software is loaded. All other TSR's should load AFTER the NOS. One further exception is the MSCDEX.EXE (Microsoft CD ROM extension) program, which should be loaded BETWEEN REDIR and SERVER. The best way to find out if a TSR is the source of your problem is to remove all TSR's, and see if the network runs. If so, you can then run TSR's again, one at a time until the problem reoccurs. This will help you to pinpoint which TSR is causing the problem.
- ⑤ If your system is locking up when you run the REDIR or LANCHECK programs, you probably have an IRQ conflict. Check all the hardware adapters (and/or the documentation for them) that are installed in your computer to find out which IRQ's they are using. Then set the LANtastic adapter (or other manufacturer's adapter) to an unused IRQ. If you are using LANtastic adapters, make sure you add the switch IRQ=x to the LANBIOS2 command line (where x is the number of the available IRQ). TSR's can also cause lockups at this point; see ④ above.
- ⑥ If you are experiencing disconnect problems; e.g. "Server connection to network node ???? broken.." after the network has apparently loaded correctly, make sure the cabling is supported by ARTISOFT. You should also make sure that all connections are soldered and not crimped and that cabling is not mixed [even recommended types should not be mixed together]. Finally check that the total cable length does not exceed the recommend limit for the cable type. Refer to your hardware manual for information on the correct cabling types and the maximum allowed segment lengths.



Appendix E: Messages

The following is the list of error and informative messages returned by all of LANtastic's programs. This is organized alphabetically to help you find messages more easily. For each entry, you will see the message text, an explanation of the message in italics, and finally, any steps you should take in response to the message.

Account has expired

The expiration date for your account on the server has expired. Contact your system's manager to re-enable your account.

Adapter Independent (AI) LANBIOS Vn.nn - (C) Copyright 1989 ARTISOFT Inc.

This message is displayed every time AILANBIO.EXE is invoked. If a low level driver is present information about the low level driver is displayed immediately after the AI-LANBIOS salutation.

---- AE-2 DRIVER installed ----

This message is displayed after the low level driver successfully installs.

---- AE-2 driver NOT installed ----

This message is displayed if the low level driver does not install. The driver will not install if help information is displayed or an error occurred.

AE-2 onboard RAM failure

The AE-2 driver has detected an error in the onboard RAM memory. Call Technical Support to confirm the error. It may be necessary to service the adapter.

---- AI-LANBIOS Installed ----

This message is displayed after the AI-LANBIOS is successfully installed.

AI-LANBIOS low level driver is already in use by another NETBIOS

You are trying to use a low level driver that is in use by another AI-LANBIOS. Most low level drivers do not allow sharing between multiple copies of AI-LANBIOS. You may have specified the wrong MPX number.

Run another low level driver or specify another MPX number that corresponds to the driver to which you wish to interface.

AI-LANBIOS Modem Port Driver Vn.nn - (C) Copyright 1990 ARTISOFT
This message is displayed each time the low-level driver is invoked.

---- AI-LANBIOS NOT installed ----

This message is displayed if the AI-LANBIOS is not installed. The AI-LANBIOS will not be installed if help information is displayed or an error occurred.

AI-LANBIOS Parallel Port Driver Vn.nn - (C) Copyright 1989 ARTISOFT Inc.
This message is displayed each time the low-level driver is invoked.

AI-LANBIOS Serial Port Driver Vn.nn - (C) Copyright 1989 ARTISOFT Inc.
This message is displayed each time the low-level driver is invoked.

All eligible MPX numbers are being used.

All 2F multiplex interrupt codes (C0-FF) are being used by non-voice drivers. This message is displayed by the LANVOICE program. Remove one of the other programs and reinstall the LANVOICE software.

Bad argument. Type NET HELP command

You have specified an invalid argument in the NET command line. Type NET HELP and then the name of the command for the correct syntax, then reissue the command using the correct syntax. Specify only valid arguments on the NET command line.

Bad .EXE file

This message is returned by the RUNHIGH program. The program you are trying to execute is either corrupted or invalid. Make sure that the program is a valid .EXE file. Run the program in base memory before loading it into high memory.

Badly formatted partition table

The disk partition table is not in a correct format and LANcache cannot determine disk information from the table. You may need to reformat the disk or repartition it using FDISK.

Badly formatted queue control file

The LANTASTI.NET directory may have become corrupted. Re-install the network software or create a new network control directory using the NET_MGR program.

Badly formatted server configuration file - Run NET_MGR

The LANTASTI.NET directory has become corrupted. This message is returned by the SERVER program.

Create a new network control directory using the NET_MGR program.

Can't add network name - NETBIOS error ???H

An error has occurred with the NETBIOS and it has been unable to add the network name. Your NETBIOS may be incompatible or you may have a hardware problem. This message is returned by the REDIR program

Make sure that your NETBIOS is compatible with LANtastic NOS software. If it is compatible, you may need to allocate more network names.

Can't find environment variable

You have specified an environment variable that does not exist. Make sure you use the SET= command to create variables before attempting to use them.

Can't find server configuration file

The network configuration file cannot be located. This message is returned by the SERVER program

Re-install the network software, or create a new network control directory using the NET_MGR program.

Can't locate network control directory D:\directory

The network control directory (usually LANTASTI.NET) has either been deleted or placed in a subdirectory, the SERVER program can't see. When you run SERVER it looks for directory named LANTASTI.NET in the root directory of the current disk.

Look for the network control directory. If it has been deleted, create a new one with the NET_MGR program. If it still exists, run SERVER from the disk the directory is on, or use an alternate control directory. Use the syntax:

SERVER (CONTROL_DIRECTORY_NAME)

to specify a different control directory

Can't locate NET menu module <pathname>

The NET program cannot find the software necessary to operate in menu mode.

Make sure that the program NET.MNU is in the same path as the NET program NET.EXE. If the file is missing, re-install the software.

Can't run program

The program does not execute properly. This message is returned by the RUNHIGH program.

Make sure the program will run in base memory before loading it into high memory.

Cannot automatically configure hardware

The automatic configuration program did not find a hardware combination that works. This message is returned by the LANBIOS2 program. This error only occurs when using the AUTO switch.

Consult the scanning order lists for I/O address, RAM address and IRQ to determine if you have a conflict with other hardware in your computer. You can also manually specify the I/O base address, RAM address and IRQ on the command line. Consult the *LANtastic 2 Mbps Adapter User's Manual* for more information on command line switches. If you are using remote booting hardware, then you must make sure that no other hardware conflicts with the LANtastic card.

Cannot install group name.

LANCHECK attempts to install an internal name which may be in use by another adapter. The most likely cause is other LAN software running concurrently with LANCHECK. You must bring down all other LAN software before running LANCHECK.

Cannot locate network name

You attempted to log in to or chat with a Server which is not running the network software or you specified a Server in a network path that you are not logged in to.

If you are attempting a log in, make sure that the remote Server is running the network software. If you are specifying a network path such as in a NET USE command, make sure that you are logged in to the server name (\\name).

Cannot open indirect file - @file

The file "@file" cannot be opened as an indirect file.

The file must exist before it can be used as an indirect file.

Cannot perform special action - SWITCH-NAME

This error is extremely rare.

Recopy the file from the distribution disk. If the error persists, contact Artisoft.

Cannot read boot sector

The boot sector of the disk is not readable and LANcache cannot determine the sector size of the disk.

You may need to reformat the disk or repartition it using FDISK.

Cannot reset coprocessor

This message is returned by the LANBIOS2 program. The coprocessor was not able to perform its hardware assurance tests and reset itself properly.

Turn your computer off and on then reissue the LANBIOS2 command. If the error message persists, reload all LANBIOS2 files from the distribution disk and try the LANBIOS2 command again. Check the I/O port address DIP switch setting to make sure that it is correct and that it matches the LANBIOS2 command line option. If the error persists, the LANtastic hardware may need service.

Coprocessor can't access network

This message is returned by the LANBIOS2 program. The part of the network adapter responsible for network communication has malfunctioned.

Call Technical Support for verification of the error. The adapter may need repair.

Coprocessor can't interrupt PC Check IRQ command line switch

The coprocessor has been prevented from using an IRQ to interrupt the PC. This message is returned by the LANBIOS2 program.

Make sure the IRQ you specified in the LANBIOS2 command line does not conflict with another adapter in your computer. Check the documentation for other adapters in your computer and specify an unused IRQ in the LANBIOS2 command line.

Coprocessor RAM did not pass tests - Pattern hhH, Address hhhhH.

LANBIOS2 checks the coprocessor memory during installation. If the memory tests fail, this error message is generated. "Pattern" refers to the test pattern that was being used when the test failed. The "Address" refers to the address in RAM that has failed. This message is returned by the LANBIOS2 program.

Make sure the RAMBASE setting does not conflict with any other cards in the PC. If this error persists, the LANtastic card may need service.

Disk sector size not 512 bytes - Disk cannot be cached

LANcache can only cache disks with 512 byte sectors. Larger sectors are usually created by specialty programs such as Golden Bow's Vfeature.

Disk space has been exceeded on network node ????

You have run out of disk space on the server.

Free up some disk space on the server, then retry the disk operation

Duplicate redirection or login to network node ????????

You are either attempting to log in to a server you already logged in to or you are attempting to redirect a disk that is already redirected. If you are attempting a log in, then you must log out of the server before you can log back in.

Existing voice driver on another MPX

This message is returned by the LANVOICE program. You have requested an MPX number that is different than the one currently in use by another voice driver. All voice drivers must share the same code.

Reinstall the voice driver without the MPX= switch.

FCB unavailable

Your program and it has used more file control blocks (FCB's) than are currently available.

Select Abort to exit your program, then edit your CONFIG.SYS file and increase the value of the FCBS= line. If you don't have a FCBS= line in your CONFIG.SYS file, then you will need to add one. For example, **FCBS=24,8**.

HELP Output For AE-2

Valid command line switches:

HELP

IOBASE= One of the following choices:

AB AX XB XX 300 320 340 360

IRQ= one of the following choices:

2 3 4 5 6 7 10 15

MPX= range C0 to FF hex

PACKET_SIZE= range 570 to 1500 decimal

VERBOSE

?

@ range 0 to 2048 byte file

This message is displayed when the HELP or ? switch is used. Each valid switch is listed with the acceptable range of values (if any) and the base (hex or decimal) that the numbers must be entered in. The acceptable file size range for indirect files (@) is also listed. The low level driver is not installed when this switch is used.

HELP Output For AI-LANBIOS

Valid command line switches:

ACK_TIMEOUT= range 0 to 254 decimal
ADAPTER= range 0 to 255 decimal
HELP
MAX_NCBS= range 1 to 255 decimal
MAX_SESSIONS= range 1 to 254 decimal
MAX_NAMES= range 1 to 253 decimal
MPX= range C0 to FF hex
NCBS= range 1 to 255 decimal
RETRY_PERIOD= range 0 to 254 decimal
RUN_BURST= range 0 to 254 decimal
SESSIONS= range 1 to 254 decimal
TIMEOUT= range 1 to 254 decimal
VERBOSE
?
@ range 0 to 2048 byte file

This message is displayed when the HELP or ? switch is used. Each valid switch is listed with the acceptable range of values (if any) and the base (hex or decimal) that numbers must be entered in. The acceptable file size range for indirect files (@) is also listed. The AI-LANBIOS is not installed when this switch is used.

HELP Output For LANBIOS2

Valid command line switches:

ADAPTER= Range 0 to 255 decimal

BUFFERS= Range 0 to 255 decimal

CHECK

HELP

IOBASE= One of the following choices:

220 240 260 280 2A0 320 340 360 DDDU

DDUD DDUU DUDD DUDU UDDU UDUD UDUU 0001

0010 0011 0100 0101 1001 1011

IRQ= One of the following choices:

2 3 4 5 6 7 10 15

NAMES= Range 0 to 253 decimal

NCBS= Range 1 to 128 decimal

NODE= Range 0001 to FFFE hex

RAMBASE= One of the following choices:

A000 A800 B000 C000 C800 D000 D800

E000 A0000 A8000 B0000 C0000 C8000

D0000 D8000 E0000

SESSIONS= Range 1 to 128 decimal

STACK

TIMEOUT= Range 1 to 255 decimal

VERBOSE

?

@ Range 0 to 4096 byte file

This message is displayed when /HELP or ? is specified on the command line. LANBIOS2 is not installed when help is displayed.

HELP Output For LANcache

Valid command line switches:

AFTER_WRITE_DELAY= Range 0 to 3600 decimal
CACHE_SIZE= Range 16 to 16000 decimal
DISK= One of the following choices:
0 1 2 3
FLUSH
HELP
LONG_WRITE_DELAY= Range 0 to 3600 decimal
NOBACKGROUND
RESET
STAT= One of the following choices:
INFO RESET
TYPE= One of the following choices:
CONVENTIONAL EMS EXTENDED
VERBOSE
?
@ Range 0 to 1000 byte file

This message is displayed when the HELP or ? switch is used. Each valid switch is listed with the acceptable range of values (if any) and the base (hex or decimal) that the numbers must be entered in. The acceptable file size range for indirect files (@) is also listed. The cacher is not installed when this switch is used.

HELP Output For LANVOICE

LANtastic Voice Driver Vn.nn - (C) Copyright 1990 ARTISOFT Inc.

Valid command line switches:

ADAPTER= Range 0 to 255 decimal
DMA= One of the following choices
1 3 BOTH
HELP
MPX= Range C0 to FF hex
REMOVE
VERBOSE
?
@ Range 0 to 3000 byte file

This is the output you would see if you included the HELP or ? switch in the LANVOICE command line. It provides information as to the

HELP Output For LANVOICE

Valid command line switches:
ADAPTER= Range 0 to 255 decimal
DMA= One of the following choices
1 3 BOTH
HELP
MPX= Range C0 to FF hex
REMOVE
VERBOSE
?
@ Range 0 to 3000 byte file

This is the output you would see if you included the HELP or ? switch in the LANVOICE command line.

Help Output For MPORT

Valid command line switches:
ACK_TIMEOUT= Range 0 to 255 decimal
BAUD= One of the following choices:
1200 1800 2000 2400 3600 4800 7200 9600 19200 38400 56000
FLOW_CONTROL= One of the following choices:
NONE HARDWARE SOFTWARE
HELP
IOBASE= Range 0001 to 03ff hex
IRQ= One of the following choices:
2 3 4 5 6 7 9 10 11 12 14 15
MPX= Range C0 to FF hex
NODE= Range 0001 to FFFF hex
NOTEST
PARITY_BITS= One of the following choices:
NONE EVEN ODD MARK SPACE
PORT= One of the following choices:
COM1 COM2 COM3 COM4
RETRY_PERIOD= Range 0 to 255 decimal
STOP_BITS= One of the following choices:
1 2
TIMEOUT= Range 1 to 255 decimal
TRANSLATE= One of the following choices:
NONE CONTROL
VERBOSE
?
@ Range 0 to 2048 byte file

This message is displayed when the HELP or ? switch is used.

HELP Output For NBSETUP

Valid command line switches:

VERBOSE
MAX
NCBS=n
SESSIONS=n
CHECK
? or HELP

This message is displayed when the HELP or ? switch is used. Each valid switch is listed with the acceptable range of values (if any) and the base (hex or decimal) that the numbers must be entered in. The acceptable file size range for indirect files (@) is also listed. The cacher is not installed when this switch is used.

HELP Output For PPORT

Valid command line switches are:

HELP
IRQ= One of the following choices:
2 3 4 5 6 7 9 10 11 12 14 15
MPX= Range C0 to FF hex
PORT= One of the following choices:
LPT1 LPT2 LPT3 LPT4
VERBOSE
?
@ Range 0 to 3000 byte file

This message is displayed when the HELP or ? switch is used. Each valid switch is listed with the acceptable range of values (if any) and the base (hex or decimal) that the numbers must be entered in. The acceptable file size range for indirect files (@) is also listed. The cacher is not installed when this switch is used.

HELP Output For REDIR

Valid command line switches

BEEP_CYCLE= Range 1 to 3600 decimal
BEEP_DELAY= RANGE 0 TO 3600 decimal
BUFFERS= Range 1 to 64 decimal
HELP
LOGINS= Range 1 to 255 decimal
NOCHAIN
POPOP_DURATION= Range 0 to 3600 decimal
POPOP_LINE= Range 0 to 24 decimal
SIZE= Range 512 to 16384 decimal
VERBOSE
?
@ Range 0 to 1000 byte file

This message is displayed when you use the /HELP switch on the REDIR command line.

Help Output For SERVER

Valid command line switches

ADAPTERS= Range 1 to 6 decimal
DESPOOLER_STOPPED= One of the following choices:
YES NO
FILES= Range 0 to 5100 decimal
FLOPPY_DIRECT= One of the following choices:
YES NO
LOGINS= Range 1 to 32 decimal
NETWORK_BUFFER_SIZE= One of the following choices:
512 1K 2K 4K 6K 10K 12K 14K 16K 20K 24K 28K 32K
PRINTER_TASKS= Range 0 to 5 decimal
RPL= One of the following choices:
DISABLED READ-ONLY READ-WRITE
SEND_SERVER_ID= One of the following choices:
YES NO
HELP
VERBOSE
?
@ Range 0 to 1000 byte file

This message is displayed when you use the /HELP switch on the SERVER command line.

HELP Output For SPORT

Valid command line switches:

BAUD= One of the following choices:

LOW HIGH

HELP

IRQ= One of the following choices:

2 3 4 5 6 7 9 10 11 12 14 15

MPX= Range C0 to FF hex

PORT= One of the following choices:

COM1 COM2 COM3 COM4

VERBOSE

?

@ Range 0 to 2048 byte file

This message is displayed when the HELP or ? switch is used. Each valid switch is listed with the acceptable range of values (if any) and the base (hex or decimal) that the numbers must be entered in. The acceptable file size range for indirect files (@) is also listed. The low-level driver is not installed when this switch is used.

Illegal character after switch name - ??????xnnnn

The switch ?????? is followed by a character other than "=" or ":" or the switch cannot take a value. This error is returned by any program that uses command line switches.

Use only the characters "=" or ":" to specify switch values and do not place characters after switches that do not take values.

Illegal digit in switch value - ??????=nnnn

A character was used instead of a digit in the numeric switch value. This error is returned by any program that uses command line switches.

You must restrict numeric decimal values to the numbers 0-9. You must restrict hexadecimal values to the numbers 0-9 and the letters A-F.

Illegal switch - ??????=nnnn

The switch ??????=nnnn is not a recognized switch. This error is returned by any program that uses command line switches.

You may only specify legal switches on the command line.

Inactive

*This message is displayed next to any nodes that have become inactive while LANCHECK is running. The most likely cause is that LANCHECK stopped running on the computer displaying the *inactive* message. Other causes may be that the remote adapter card has malfunctioned or that the cable has been disconnected.*

Incompatible network node ????????

The remote node's software is not compatible with the LANTastic Network Operating System.

Make sure you are running compatible networking software across the LAN. Also make sure you are running the same LANTastic NOS on all nodes.

Incorrect response received from network node ????????

Node ???????? has sent an invalid response to a network request or you have sent an invalid request to node ????????

Make sure you are running compatible networking software across the LAN. Also make sure you are running the same LANTastic NOS on all nodes. This error may also indicate a faulty NETBIOS.

Insufficient NETBIOS resources for this server configuration Restart NETBIOS with higher sessions and NCB's

The NETBIOS has been started with insufficient NCB's and sessions relative to the maximum number of log ins you allowed.

Restart your NETBIOS with a larger number of NCB's and/or sessions. Formulas for computing the number of NCB's and sessions are:

NCB's=MAX. LOG INS+8,
Sessions=MAX. LOG INS+8

If you are using another company's NETBIOS that does not allow you to allocate more NCB's and/or sessions you may want to use the NBSETUP program to allocate more NCB's and sessions. Refer to "NBSETUP in the *LANTastic Network Operating System Reference Manual* for information on using the NBSETUP program.

Internal EMS error hhH

You are trying to install LANcache using EMS memory and an unexpected EMS error was detected.

Reboot your system and try again. If the error persists then you may have a problem with your EMS hardware. Consult your EMS manual regarding the error value hhH

Internal switch entry type is bad

This error rarely occurs. It is returned when an executable file is corrupt.

Recopy the file from the distribution disk. If the error persists, contact ARTISOFT.

Interrupt request in use by other software. Check IRQ command line switch

Some other software is using the interrupt request. This message is returned by the LANBIOS2 program.

Use another interrupt request by specifying a corresponding IRQ= switch.

Invalid command. Type NET HELP for help

You have included a command or character that the NET program doesn't recognize in your command line.

Use only valid commands and switches when running the NET program.

Invalid network version

You are attempting to log in to a server whose network version is not compatible with yours.

Make sure your network version is the same as the server's.

Invalid path or path not found

This message is returned by the RUNHIGH program. The path to the program you wanted to load into high memory was either incomplete or not a valid DOS file path.

Give the complete path to the file.

Invalid username or password

You are attempting to log in to a server with a username or password which is not valid.

Make sure that you have an account created on the server with the username and password that you are specifying. If you have forgotten your password, then the Network Manager for the server needs to run NET_MGR and assign you a new password.

LANCACHE is already installed

You have attempted to install the cacher again.

If you want to install the cacher with different parameters you must reboot the computer.

LANCACHE is not installed

You attempted to perform a LANcache operation that required LANcache to be installed first (i.e. /RESET, /FLUSH or /STAT=).

LANcache will not run on this type of machine or CPU

*You attempted to run LANcache on computer that does not have a 286, 386 or 486 type processor.
Make sure your PC has the right type of processor to run LANcache.*

LANPUP is already installed

You have tried to run the LANPUP program but it is already resident in memory.

---- LANtastic Cache FLUSHED ----

This message is displayed as a confirmation that the LANtastic cache has been flushed. (See the /FLUSH switch)

---- LANtastic Cache Installed ----

This message is displayed after the low level driver is successfully installed.

---- LANtastic Cache NOT Installed ----

This message is displayed if the cacher is not installed. The cacher will not be installed if help information is displayed or an error occurred.

---- LANtastic Cache RESET ----

This message is displayed as a confirmation after the LANtastic cache is reset. (see the /RESET switch)

---- LANtastic Cache Statistics reset ----

This message is displayed as a confirmation after the LANtastic cache statistic are reset. (see the /STAT=RESET switch)

---- LANtastic NETBIOS installed ----

This message is displayed when LANBIOS2 has been successfully installed. If you do not wish to see this message displayed you can redirect the output.

---- LANtastic NETBIOS NOT installed ----

This message is displayed after an error is encountered or you have used the CHECK or HELP switches. If you do not wish to see this message displayed, you can redirect the output.

**LANtastic(tm) AE-2 AI-LANBIOS driver Vn.nn - (C) Copyright 1990
ARTISOFT Inc.**

This message is displayed each time the low level driver is invoked.

**LANtastic (tm) Cache (LANCACHE) Vn.nn - (C) Copyright 1990
ARTISOFT Inc.**

This message is displayed each time LANcache is run.

LANtastic (tm) LANcache statistics

| | | | |
|--------------------------|------|-----------------------------|------|
| Minutes cache active | 8 | Cache size in K bytes | 1386 |
| After-write delay | 3 | Long-write delay | 12 |
| Total read requests | 177 | Total write requests | 64 |
| Actual disk reads | 104 | Actual disk writes | 38 |
| Actual disk sectors read | 1240 | Actual disk sectors written | 87 |
| Number of track flushes | 38 | Number of cache flushes | 3 |
| Read cache hits | 588 | Write cache hits | 86 |
| Read cache misses | 56 | Write cache misses | 14 |
| Read cache hit rat | 91% | Write cache hit rate | 86% |

This message is displayed after the LANtastic cache statistics are requested via the /STAT=INFO switch. LANcache must already be installed before this switch will work.

**LANtastic (tm) Connection Manager V3.00 - (C) Copyright 1990
ARTISOFT Inc.**

This message is displayed whenever you run the NET program.

LANtastic (tm) NBsetup Vn.n - (C) Copyright 1990 ARTISOFT Inc.

This message is displayed whenever NBSETUP is invoked. The version number may vary from the above version number.

LANtastic (tm) Redirector Installed

This message is displayed each time the REDIR program is successfully installed.

**LANtastic (tm) Redirector is already started with machine name
???????**

You have tried to run the REDIR program, but it is already loaded in

**LANtastic (tm) Redirector must be run with DOS version n.nn or
above**

*You are using an older version of DOS that is not compatible with
LANtastic NOS.*

Upgrade your DOS software to version 3.1, 3.3 or above.

LANtastic (tm) Redirector must be started first CD-ROM or other network redirector present

You have tried to run CD-ROM extension software before the redirector program REDIR.EXE has been run.

Run the extension software AFTER the REDIR program, but BEFORE the SERVER program.

LANtastic (tm) Redirector NOT Installed

This message is displayed after an error is encountered or you have used the CHECK or HELP switches.

LANtastic (tm) Redirector Vn.nn (C) Copyright 1990 Artisoft Inc.

This is the greeting text that the redirector program displays whenever it is invoked.

---- LANtastic (tm) Server Installed ----

This message is displayed each time the SERVER program is successfully installed.

LANtastic (tm) Server is already started with machine name ??????

You have attempted to run the SERVER program when it is already loaded into memory.

LANtastic (tm) Server Vn.nn (C) Copyright 1990 Artisoft Inc.

This is the greeting text that the SERVER program displays whenever it is invoked.

local

This message is displayed next to the local node as LANCHECK runs. The message indicates which computer is the local node.

Lock violation

You are attempting to access data which has been locked from access. This usually indicates that some application program has locked a region of a file to prevent concurrent updates to the file. This error may occur when you attempt to copy a database file which is currently being updated.

This error indicates that you are accessing a file which you should not normally access. In most cases, you should specify A for abort. If you are doing a file copy, you can try R to retry the operation.

Missing argument. Type NET HELP command

An argument is missing from a NET line command. Some arguments require a minimum number of arguments.

Type **NET HELP** and then the name of the command for the correct syntax, then reissue the command using the correct syntax. Specify the minimum number of arguments on the NET command line.

---- Modem port driver installed ----

This message is displayed after the low-level driver is successfully installed.

---- Modem port driver NOT installed ----

This message is displayed if the low-level driver is not installed. The driver will not be installed if help information is displayed or an error occurred.

MPORT must be run with DOS 3.1 or above

Networking software is not supported by DOS 3.0 or earlier. Install DOS 3.1, 3.3 or above.

MPX number hh is already in use - Try another number

Multiplex (MPX) interrupt number hh is being used by another application or low level driver.

Try another MPX number.

Must have EMS driver version 4.0 or above

You are trying to install LANcache using EMS memory but the EMS driver version is not compatible with LANcache.

You must be running an EMS driver that conforms to LIM version 4.00 or higher.

Name is already in use by someone else on the network

On the REDIR command line, you have specified a name for the node which is not unique on the network.

Reissue the command with a unique name for your computer.

The NETBIOS command limit has been exceeded

The NETBIOS may be started (or reset) with a specific number of concurrent network command blocks (NCB's) that it can process. If the number of concurrent commands is exceeded while the network is being accessed, then this message is displayed. The LANtastic Network Operating System uses far less than the default number of NCB's so this error usually means that another application program has used so many NCB's that none are available for LANtastic.

If you are running another NETBIOS application, make sure that sufficient NCB's have been allocated when the NETBIOS is started. If

you are running LANtastic hardware or an ARTISOFT NETBIOS, you can specify this on the command line with the NCBS= option.

NETBIOS interface is in use - cannot be set up now

You have already started software which is currently using the NETBIOS interface. NBSETUP will not change NETBIOS parameters while other software is using the NETBIOS.

You should run NBSETUP right after you bring up the NETBIOS interface. In particular, you should run NBSETUP before REDIR or SERVER.

NETBIOS is not present

You have tried to run the REDIR program without first loading the NETBIOS for your adapter.

Run the NETBIOS for your adapter, then reissue the command to run the REDIR program.

NETBIOS must be installed

You have tried to run the NET program without first installing the NETBIOS required for your network adapter.

Make sure the NETBIOS and redirector programs are running, then reissue your command.

---- NETBIOS parameters have been altered ----

This message is returned by the NBSETUP program. This message is displayed after the NETBIOS parameters have been successfully altered.

---- NETBIOS parameters have NOT been altered ----

This message is returned by the NBSETUP program. This message is displayed if the NETBIOS parameters have not been altered. The message may appear after an error or when the CHECK parameter is used.

A NETBIOS with this adapter number HAS ALREADY been installed

You are trying to run LANBIOS2 again and LANBIOS2 is trying to use the same adapter again, or another manufacturer's NETBIOS is installed and is using the same adapter number.

Reissue the command with the VERBOSE options to determine which adapter number is being referenced. Then reissue the LANBIOS2 command with another adapter number. Remember that you can have only eight LANtastic 2 Mbps adapters installed in one computer.

A NETBIOS with this adapter number is already installed

Another invocation of AILANBIO.EXE already has this adapter number in use.

Specify another adapter number using the ADAPTER=ddd switch.

The network adapter has malfunctioned.

You specified an adapter number with the NET LOGIN command that is not valid or is not an operating network adapter.

Make sure that the adapter you specify exists or is operational.

Network buffer size will be increased to accommodate remote booting

Your network buffer size is not large enough to accommodate remote booting. The buffer size has been automatically increased to accommodate remote booting.

Network data fault

You had open files on the server and were disconnected, and then reconnected to the server.

Specify Abort or Fail.

The network is busy

Your network request was not processed due to heavy network activity. If this message persists, you may have faulty network hardware.

Retry the network operation.

The network name has been deleted

An application program has deleted the network name with which the network was started. The network cannot function if its network name is deleted.

Don't allow application programs to delete NETBIOS names which they have not created.

The network name was not found

You have not logged in to the server whose name you are using in a network path.

Make sure you are logged in to the server you are attempting to access.

Network node ??????? is not listening

The node ??????? has not started the Server program and therefore is not listening for log in requests. The remote node may also be running incompatible network software.

Make sure you are running the Server program on the node to which you are attempting to log in. Also make sure that the Server is running the same version of the network operating system.

Network request not supported

A request has been made to the network which is not supported by this version of the software.

Make sure that all network nodes are running the correct version of the network operating system.

No AI-LANBIOS low level driver installed

You have attempted to run AILANBIO.EXE before installing a low level hardware driver or the MPX number of the low level driver does not match the AI-LANBIOS number.

Run the low level driver first. Make sure that the MPX numbers between the low level and the AI-LANBIOS match.

No EMS driver found

You are trying to install LANcache using EMS memory but no EMS driver is installed.

Install an EMS driver (version 4.00 or higher) before running LANcache.

No help information available for this command

This message is displayed if no HELP information is available, but the command is valid.

No LANtastic hardware present at this address. Check RAMBASE or IOBASE command line switch

LANBIOS2 was not able to address its shared RAM and thus it cannot detect the LANtastic hardware.

The most likely cause is that the IOBASE switch setting does not match the IOBASE= command line switch. Another cause may be that another card is using this part of memory. Try another RAMBASE software option by reissuing the command with a corresponding RAMBASE= command line switch. If the error persists then there may be no free windows of memory above 640K, or the LANtastic hardware needs service.

No network hardware found at I/O base address hhhhH

Your hardware cannot be addressed at address hhh

You may not have hardware present, or you specified an incorrect IOBASE= value.

No such help item. Type NET HELP

You have requested help information on a command that the NET program does not recognize.

Type **NET HELP** for a list of the valid NET line commands.

Node number must not be ??00 or ??FF

This message is returned by the LANBIOS2 program. You have specified a node number with the NODE= switch that has been reserved for internal use.

Reissue the LANBIOS2 command with a node number that does not contain 00 or FF as the least significant bytes of the node number.

Not enough available cache memory

LANcache did not have enough available cache memory to be installed.

Confirm that the type of cache memory you are using is available on your system. You can specify the type of memory using the /TYPE= switch.

Not enough conventional memory

LANcache did not have enough conventional memory to install.

Check the amount of available memory and install LANcache before other TSR programs. If you are attempting to load LANcache into high memory, make sure that there is enough high memory available.

Not enough high memory to load program

There is not enough space in the Daughter Board's RAM for the program you are trying to load. This message is returned by the RUNHIGH program.

Try changing the loading order of the programs. If this does not help, load smaller or fewer programs.

Not enough memory - Reduce files, tasks or buffer size

You have a server configuration that uses too much memory.

You must change the configuration of the server using the NET_MGR program's *Server Startup Parameters* option. You should reduce the number of open files, tasks or the size of the buffers, or any combination of the three.

Not logged in to network node ????

You are attempting to redirect a local drive or device to a server that you haven't logged in to yet.

Log in to the server, then attempt the redirection again.

Not safe to remove driver (Interrupts re-hooked)

You requested LANVOICE to be removed from memory, but it was not the last Terminate and Stay Resident (TSR) program loaded into memory.

Remove any TSR's loaded into memory after LANVOICE, then remove LANVOICE.

Parallel port cannot be accessed.

Your parallel port hardware is defective or non-standard.

Make sure you have a standard parallel port available. Most video boards contain one standard parallel port.

---- Parallel port driver installed ----

This message is displayed after the low-level driver is successfully installed.

---- Parallel port driver NOT installed ----

This message is displayed if the low level driver is not installed. The driver will not be installed if help information is displayed or an error occurred.

Parallel port LPTx is not present

The parallel port you specified with the PORT= switch is not installed in your machine, or you have no parallel ports installed.

Try another PORT= switch value.

Password has expired

The expiration date for your password has expired.

Contact your system's manager to give you a new password.

Program file not found

This message is returned by the RUNHIGH program. The program you wanted to load into the Daughter Board's RAM was not found.

Make sure that this program exists, and be sure you give the correct path to that program.

Queue cannot be maintained with server running. Press ENTER to continue.

You attempted to use the NET_MGR Queue Maintenance option while the SERVER program is running.

Reboot your computer and retry the operation while the SERVER program is NOT running.

Queue control file does not exist - automatically created

Your queue control file (QCONTROL in SPOOL.NET directory) cannot be found. An empty queue control file has been created. You will get this message whenever you place your SPOOL.NET directory on a RAM disk since the QCONTROL file will not be present when you first boot your computer.

REDIR must be run before LANCACHE is started

You have attempted to run LANcache before you have run REDIR.

Run REDIR before LANcache.

REDIR must be run before SERVER is started

You have attempted to run the SERVER program without first loading the REDIR program.

Load the REDIR program, then reissue the command loading SERVER.

Redirector is not installed

This message is displayed when you try to run the NET or LANPUP programs without first installing the redirector program (REDIR.EXE).

Run REDIR.EXE, then reissue the command.

Redirector version does not match server version

You are using a different version of the redirector program REDIR.EXE with this version of SERVER.

Upgrade all your network computers to the latest versions of the SERVER and REDIR programs.

Requested adapter number already supported

A voice driver has already been installed which supports the voice adapter number specified on the command line (the default value is ADAPTER=0).

Remove the existing driver or install a new one with a different adapter number.

Requested MPX number in use

This message is returned by the LANVOICE program. You have requested an MPX code that is in use by another non-voice driver.

Select another MPX number or reinstall the voice driver without the MPX= switch.

Serial port COMx is not present

The serial port you specified with the PORT= switch is not installed in your machine, or you have no serial ports installed.

Try another PORT= switch value.

Serial port COMn failed loop back test

The serial port could not receive the data that was transmitted during the loop back test. The serial port needs repair.

Repair the serial port.

---- Serial port driver installed ----

This message is displayed after the low-level driver is successfully installed.

---- Serial port driver NOT installed ----

This message is displayed if the low-level driver is not installed. The driver will not be installed if help information is displayed or an error occurred.

Server cannot be installed after PRINT

You cannot bring up the server after you have installed the DOS PRINT program. If you need to print, then you should use the NET PRINT command.

Reboot your system and do not run PRINT before starting the server.

Server connection to network node ??????? broken

You have been disconnected from the server. You may be disconnected for one of several reasons:

- 1. The server may have gone down (crashed).*
- 2. The server may have been shutdown or turned off.*
- 3. The cabling between you and the server may have been disconnected.*
- 4. The networking hardware or NETBIOS is defective.*
- 5. An application program on the server or your computer has restarted the NETBIOS.*

If the server is no longer running, restart the server and then type R (Retry) to attempt to reconnect to the server. If the server is still running, make sure that the cabling is not disconnected. If you specify Abort or Fail, you will not be automatically reconnected to the server. Your redirected drives and printers, however, will still be referencing the disconnected server. You may elect to reconnect to the server when you get another "connection broken" critical error. If you do not want to be connected to the server at this point, you must perform a NET LOGOUT.

The session limit has been exceeded

The NETBIOS is configured for a certain number of sessions at startup time or when it is reset. Each log in corresponds to 1 session. You have either logged in to too many servers, too many remote nodes have logged in to you or an application program has used up all available sessions.

You must specify a larger number of sessions at NETBIOS startup time. If you are using LANtastic hardware or an ARTISOFT NETBIOS you can increase the number of sessions with the SESSIONS= command line option.

Sharing buffer overflow

The buffer space allocated to the SHARE program has been exceeded. When starting the SHARE program specify a larger file space. For example, SHARE /F:4096.

Sharing violation

You are attempting to access data or a program concurrently with another user on the network.

There are many possible causes for this error and therefore a general remedy does not exist. However, here is a list of common remedies:

1. Press R to retry the operation.
2. Change the file attribute for all shared files to read-only. You can use the DOS ATTRIB command for this. Generally, you should make any programs that you are going to share on the network read-only.
3. Don't run SHARE on the server. You should only do this if the programs you are running are not going to be writing to the same files.

This software is licensed for use only with an ARTISOFT NETBIOS

This version of the software will only run with an ARTISOFT NETBIOS.

Use an ARTISOFT NETBIOS or purchase an Adapter Independent version of the NOS software, then run the REDIR program.

Switch is ambiguous - SWITCH-NAME

The abbreviation you used for a switch is not unique enough to distinguish it from another switch for that program or command. Reissue the command using as many letters for the command line switch as will keep it unique from the rest of the program's or command's switches.

Switch value not in range - ??????=nnnn Valid range is ssss to eeee or Valid range is one of the following choices: C1 C2 C3 ... Cn

The value "nnnn" is not in proper range. The value ssss represents the lowest acceptable value and the value eeee represents the highest acceptable value. When a list is given (i.e. C1 C2 C3 ... Cn) then the value must be one of the choices. This message is returned by any program that uses command line switches.

Limit your range of values to the acceptable range.

Switch value not in range - ??????=nnnn Valid range is ssss to eeee

The value nnnn is not in proper range. The value ssss represents the lowest acceptable value and the value eeee represents the highest acceptable value. This message is returned by any program that uses command line switches.

Limit your range of values to the acceptable range.

This Driver only runs on Artisoft AE-2 Ethernet Adapters

The AE-2 Driver has determined that the Ethernet adapter is not an Artisoft AE-2.

Use only Artisoft AE-2 adapters

Timeout waiting for Coprocessor Coprocessor Status XXXXH

A reset is performed to get the coprocessor running. The coprocessor did not interrupt the PC to tell it that the reset is done. This message is returned by the LANBIOS2 program.

Call Technical Support for verification of the error. The adapter may need repair.

Timeout while waiting for network boot

The LANBIOS2 remote software tried to locate node number 1 so that it could remotely load the LANBIOS2 software. The following are possible errors:

- 1. LANBIOS2 could not locate node 1. This node may not be running.*
- 2. Node 1 may be running old network software. It must be running version 2.10 or above.*
- 3. Node 1 is not a LANtastic Enhanced 2 Mbps Adapter.*
- 4. Heavy network traffic or network errors prevented the reception of the network boot data.*

Make sure that node 1 is running version 2.10 or higher and that it contains an enhanced 2 Mbps adapter card.

Too many open files

The computer has too many files open at the same time. This message is returned by the RUNHIGH program.

Increase the FILES= value in your CONFIG.SYS file to accommodate more open files. You can also allocate more files in *Server Startup Parameters*.

Too many redirections or logins to network node ????????

Your log in attempt to server ??????? cannot be processed because:

- 1. The server's maximum log in limit has been exceeded.*
- 2. Your Redirector's maximum log in limit has been exceeded.*
- 3. Your username maximum log in limit has been exceeded.*

For each of the above possible errors, perform one of the following corresponding actions:

- 1. Run the NET_MGR program to change the maximum logged in users.*
- 2. Run the redirector program with a larger LOGINS= value specified on the command line.*
- 3. Run NET_MGR and set a larger number of concurrent logins for the account. If you are running a starter kit version of the networking software, increasing the above limits may have no effect.*

Total buffer space (BUFFERS*SIZE) may not exceed 32768

You have specified a buffer configuration that exceeds 32K of buffer space. This occurs when you specify a number of REDIR buffers which when multiplied by the size of the buffers equals a value higher than 32768 bytes.

Reissue the REDIR command and specify a buffer configuration that does not exceed 32K.

Unexpected network error from network node ????????

Node ???????? has returned an unexpected error for a network request.

Make sure you are running compatible networking software across the network. Also make sure you are running the same LANtastic software on all nodes. This error may also be caused by a faulty NETBIOS.

Unknown macro expansion - !"?????"

You have used the !"?????" construct on a command line but ?????? is not a special command such as !"NODEID."

Unknown subfunction, Type NET HELP command

You have specified an unknown subcommand, for example NET LPT subcommand (timeout, flush combine) Some commands take a second argument that further specifies what the NET program is to do. These second arguments are called subcommands.

Type NET HELP and then the name of the command for the correct syntax, then reissue the command using the correct syntax.

Verbose Output For AE-2

| | | | |
|-------------------------|--------------|----------------------|------|
| Command line | /verbose | | |
| IEEE 802.3 node address | 00006e20000c | Network packet size | 1500 |
| MPX interface number | C7 | I/O base address | 300 |
| Interrupt request (IRQ) | 3 | Bytes of memory used | 1800 |

This message is displayed if the VERBOSE switch is specified. The values displayed specify how the low level driver is configured. Some values may not agree with switch values you specified on the command line. This will happen when you specify an IOBASE or RAMBASE switch value that is not a proper multiple of the allowed value.

Verbose Output For AI-LANBIOS

| | | | |
|----------------------------|---------|-------------------------------|-------|
| Command line | verbose | | |
| Adapter number | 0 | Low level MPX number | 07 |
| Maximum number of NCB's | 32 | Run burst time in ticks | 2 |
| Maximum number of sessions | 32 | System timeout in 1/2 seconds | 8 |
| Maximum number of names | 16 | Retry period in ticks | 1 |
| Default number of NCB's | 32 | ACK timeout in ticks | 1 |
| Default number of sessions | 32 | Bytes of memory used | 11776 |

This message is displayed if the VERBOSE switch is specified. The values displayed specify how AI-LANBIOS is configured. Some values may not agree with switch values you specified on the command line. If this happens, then either the low level driver has changed some of the values (e.g. ACK_TIMEOUT) or you specified inconsistent values (e.g. /MAX_SESSIONS=10/SESSIONS=20) and the AI-LANBIOS has made them consistent. The bytes of memory used will vary for each invocation of AILANBIO.EXE, since each AILANBIO.EXE invocation shares code with the first invocation.

Verbose Output For LANBIOS2

| | | | |
|----------------------------|----------|----------------------|--------|
| Command line | /verbose | | |
| Node address | 0001 | Adapter number | 0 |
| Interrupt request | 3 | RAMbase | (D800) |
| Maximum number of names | 16 | Number of buffers | 3 |
| Default number of sessions | 32 | System timeout | 0 |
| Default number of NCB's | 32 | I/O base address | 280 |
| Local interrupt stack | DISABLED | Bytes of memory used | 1504 |

This message is displayed when the VERBOSE switch is used. The above numbers may vary some from your message.

Verbose output for LANcache

| | | | |
|--------------------------|----------|--------------------------|-------|
| Command line | /verbose | | |
| Cache memory type | EXTENDED | Cached disk drive number | 0 |
| After-write delay | 3 | Long-write delay | 12 |
| K byte cache memory size | 1386 | Conventional memory used | 21340 |

This message is displayed if the VERBOSE switch is specified. The values displayed specify how the cacher is configured and how much memory it is occupying.

Verbose Output For LANVOICE

| | | | |
|-----------------------|---------|-------------------|-------------|
| Command Line | verbose | | |
| DMA Play channel: | 3 | I/O mode= | Full-duplex |
| DMA Record channel | 1 | Voice Adapter | number 0 |
| MPX interface number: | C0h | Bytes memory used | 5072 |

----VOICE driver installed ----

This is the type of display you will see when you include the VERBOSE switch when installing the LANVOICE software. This message informs you which channels are used to play and record messages, the multiplex interrupt code used by the software, and the number of bytes of memory used.

Verbose Output For MPORT

| | | | |
|-------------------------|--------------|----------------------|----------|
| Command line | verbose | | |
| Communications port | COM1 | Baud rate | 9600 |
| Interrupt request (IRQ) | 4 | | |
| ACK_timeout | 30 | RETRY_PERIOD | 15 |
| SYSTEM_timeout | 16 | Bytes of memory used | 5344 |
| MPX interface number | C7 | Flow Control | HARDWARE |
| Data bits | 8 | Parity bits | NONE |
| Stop bits | 1 | Translate | NONE |
| Node Number | 00006ED512B5 | | |

---- Modem port driver installed ----

This message is displayed if the VERBOSE switch is specified. The values displayed specify how the low-level driver is configured.

Verbose Output For NBSETUP

Command line:
ccc cccc ccccc
NETBIOS parameters:
Configured maximum sessions sss
Configured maximum NCB's nnn

This message is displayed when you specify the VERBOSE command line option. The "ccc cccc ccccc" denotes the command line you invoked NBSETUP with. The number sss is the number of sessions that the NETBIOS currently supports. The number nnn is the number of NCB's the NETBIOS currently supports.

Verbose Output For PPORT

| | | | |
|-------------------------|----------|----------------------|------|
| Command line | /verbose | | |
| MPX interface number | C7 | Parallel port | LPT1 |
| Interrupt request (IRQ) | 7 | Bytes of memory used | 4448 |

This message is displayed if the VERBOSE switch is specified. The values displayed specify how the low-level driver is configured.

Verbose Output For REDIR

| | | | |
|-------------------|-----------------|----------------------|-------|
| Command line | SERVER1 verbose | | |
| Machine name | SERVER1 | Adapters in use | 1 |
| Number of buffers | 1 | Buffer size | 1024 |
| Beep cycle | 4 | Beep delay | 4 |
| Pop-up duration | 15 | Pop-up line | 6 |
| Chain sends | ENABLED | Bytes of memory used | 12208 |

Verbose Output For SERVER

| | | | |
|----------------------|------------|---------------------|----------|
| Command line | /verbose | | |
| Maximum open files | CONFIG.SYS | Maximum logins | 2 |
| Initial despooling | ACTIVE | Remote program load | DISABLED |
| Floppy direct access | YES | Send server ID | YES |
| Network buffer size | 4096 | Network tasks | 2 |
| Printer buffer size | 512 | Printer tasks | 1 |
| Bytes of memory used | 24800 | | |

Verbose Output For SPORT

| | | | |
|-------------------------|----------|-----------|------|
| Command line | /verbose | | |
| Communications port | COM1 | Baud rate | HIGH |
| Interrupt request (IRQ) | 4 | | |
| MPX interface number | C7 | | |
| Bytes of memory used | 3648 | | |

This message is displayed if the VERBOSE switch is specified. The values displayed specify how the low-level driver is configured.

Voice adapter not present for this adapter #

The REMOVE option was requested, but no voice driver is installed for the specified adapter (the default is adapter #0).

Reissue the request with the proper adapter number specified.

Voice adapter not present on DMA channel ? - Check board jumpers

The DMA channel "?" has failed the simple self-test. The most likely cause is that the jumpers on the voice board J1 and J2 do not correspond with the DMA= switch setting on the command command line. (The default setting is DMA=BOTH.)

Check the jumpers and the command line you issued, then reinstall the software.

Wrong REDIR version. NET requires version 3.00

You are attempting to use the NET program with an older version of the REDIR program.

Upgrade all your network nodes to NOS 3.0.

You have been denied access on network node ????????

Your request to remote node ??????? has been denied because you lack sufficient privileges for the request.

Make sure you are logged in to the server with a username that has the appropriate privileges. For example, you must have the Q privilege to control the despooler.

You must first run LANBIOS before attempting to run this program.

You did not run AILANBIOS before running LANCHECK. LANCHECK requires a NETBIOS to be present before it will run successfully. Run AILANBIOS and then run LANCHECK.

You must specify a local machine name

On the command line, you failed to specify the unique network name for this computer.

Reissue the command, giving this node a unique name. Use the syntax:

REDIR MACHINE-NAME (/SWITCHES)

when running the REDIR program.

You must specify a unique name on the command line.
You started LANCHECK without specifying a unique name on the command line. Start LANCHECK with a unique name on the command line. For example,

LANCHECK Peer1

is the correct syntax to enter the LANCHECK command.

Your name is not unique on network - try a new name.
The name you specified is in use by another adapter on the network. The most likely reason is that another computer used the same name on the LANCHECK command line. You will also see the message if you are running LANCHECK with other LAN software and that software has the same name in use.
Reissue the LANCHECK command with another name.

Your NETBIOS is incompatible, NETBIOS error ??H
You are using an incompatible NETBIOS with your adapter cards. This may be an older version of an ARTISOFT NETBIOS or another company's NETBIOS.
Upgrade to a compatible NETBIOS.

Testing For Errors In Batch Files

When executed from batch files, most of LANtastic's Programs allow you to test the error codes returned by the program using the IF ERRORLEVEL batch command. The different codes and their meanings are shown in the tables below:

AE-2 Error Code Levels

| Code | Meaning |
|-------------|---------------------------------|
| 0 | No error, AE-2 driver installed |
| 1 | MPX number is in use |
| 2 | Switch error |
| 3 | No hardware present |
| 4 | AE-2 onboard RAM failure |
| 5 | Non-Artisoft hardware detected |

AI-LANBIOS Error Code Levels

| Code | Meaning |
|-------------|---|
| 0 | No error, AI-LANBIOS installed. |
| 1 | No low level driver present. |
| 2 | Command line switch error. |
| 3 | Low level device driver already in use. |
| 4 | Adapter number already in use. |

LANBIOS2 Error Code Levels

| Code | Meaning |
|-------------|---|
| 0 | No error, LANBIOS2 installed OK |
| 1 | Command line switch errors |
| 2 | A NETBIOS with this adapter number has already been installed |
| 3 | No LANtastic hardware detected |
| 4 | Shared RAM did not pass tests |
| 5 | Timeout waiting for interrupt |
| 6 | Software not installed (CHECK or HELP switch specified) |
| 7 | IRQ in use by other software |
| 8 | Coprocessor can't access network |
| 9 | Coprocessor can't interrupt PC |
| 10 | Cannot reset coprocessor |
| 11 | Cannot automatically configure |

LANcache Error Code Levels

| Code | Meaning |
|-------------|---------------------------------------|
| 0 | No error, LANcache installed Ok |
| 1 | Switch error in the command line |
| 2 | LANcache already installed |
| 3 | REDIR not installed |
| 4 | Wrong version EMS driver |
| 5 | EMS driver not installed |
| 6 | Error occurred while initializing EMS |
| 7 | Not enough caching memory available |
| 8 | Not enough conventional memory |
| 9 | LANcache not installed |
| 10 | PC not 286, 386 or 486 |
| 11 | Badly formatted partition |
| 12 | Cannot read boot sector |
| 13 | Disk sector size not 512 bytes |

LANPUP Error Code Levels

| Code | Meaning |
|-------------|-------------------------------|
| 0 | No error, LANPUP installed OK |
| 1 | Switch error |
| 2 | Illegal switch |
| 3 | Redirector not installed |
| 4 | LANPUP already installed |

LANVOICE Error Code Levels

| Code | Meaning |
|-------------|---|
| 0 | No error, LANVOICE installed OK |
| 1 | All Available MPX codes in use by non-voice drivers |
| 2 | Illegal switch |
| 3 | For REMOVE command, no voice driver installed on specified adapter |
| 4 | For REMOVE command, not the last TSR loaded (interrupts re-hooked) |
| 5 | LANVOICE already installed for specified adapter |
| 6 | MPX interrupt code already in use |
| 7 | An existing voice driver is installed with an MPX code other than the one requested on the command line |
| 8 | Self-test failed on one or both of the requested DMA channels. |

MPORT Error Code Levels

| Code | Meaning |
|-------------|---|
| 0 | No error has been encountered. MPORT driver installed |
| 1 | MPX number is in use |
| 2 | Switch error |
| 3 | Serial port is not present |
| 4 | Serial port does not function |
| 5 | DOS version 3.0 or earlier |

REDIR Error Code Levels

| Code | Meaning |
|-------------|---|
| 0 | No error, REDIR installed OK |
| 1 | LANtastic (tm) Redirector must be run with DOS version 3.1, 3.3 or above |
| 2 | NETBIOS is not present |
| 3 | LANtastic (tm) Redirector must be started first. CD-ROM or other network redirector present |
| 4 | You must specify a local machine name |
| 5 | Switch error |
| 6 | Software not installed |
| 7 | Total buffer space (BUFFERS*SIZE) may not exceed 32768 |
| 8 | LANtastic (tm) Redirector is already started with machine name ???????? |
| 9 | Name is already in use by someone else on the network |
| 10 | This software is licensed for use only with an ARTISOFT NETBIOS |
| 11 | Can't add network name - NETBIOS error ??H |

RUNHIGH Error Code Levels

| Code | Meaning |
|-------------|--|
| 0 | No error, RUNHIGH installed OK |
| 1 | Command line switch errors |
| 2 | Program file not found |
| 3 | Invalid path or path not found |
| 4 | Too many open files |
| 5 | Not enough high memory to load program |
| 6 | Bad .EXE file |
| 7 | Can't run program |

PPORT Error Code Levels

| Code | Meaning |
|-------------|---|
| 0 | No error has been encountered. PPORT driver installed |
| 1 | MPX number is in use |
| 2 | Switch error |
| 3 | Parallel port is not present |
| 4 | Parallel port cannot be accessed |

SERVER Error Code Levels

| Code | Meaning |
|-------------|--|
| 0 | No error, SERVER installed OK |
| 1 | REDIR must be run before SERVER is started |
| 2 | LANTastic (tm) Server is already started with machine name ????? |
| 3 | Can't locate network control directory D:\directory |
| 4 | Badly formatted server configuration file - Run NET_MGR |
| 5 | Badly formatted queue control file |
| 6 | Server cannot be installed after PRINT |
| 7 | Your NETBIOS is incompatible, NETBIOS error ??H |
| 8 | Not enough memory - Reduce files, tasks or buffer size |
| 9 | Redirector version does not match server version |
| 10 | Insufficient NETBIOS resources for this server configuration |
| 11 | Can't add network name - NETBIOS error ??H. Restart NETBIOS with higher sessions and NCB's |
| 12 | This software is only licensed for use with an ARTISOFT NETBIOS |
| 13 | Switch error |
| 14 | LANTastic (tm) Server not installed, HELP information displayed. |

SPORT Error Code Levels

| Code | Meaning |
|-------------|---|
| 0 | No error has been encountered, SPORT driver installed |
| 1 | MPX number is in use |
| 2 | Switch error |
| 3 | Serial port is not present |

DOS Error Codes

The following is the list of the error codes returned by DOS. This information is especially useful if you are using the NET /NOERROR switch in batch files. For more information on advanced error handling techniques, refer to "NET Line Command Customizing" in the *LANTastic Networking Operating System Reference Manual*. For more information on the DOS critical error messages, refer to your DOS manual.

- 1 Invalid function number
- 2 File not found
- 3 Path not found
- 4 File open limit has been exceeded or no handles left
- 5 Access denied
- 6 Invalid handle
- 7 Memory control blocks destroyed
- 8 The memory limit has been exceeded
- 9 Invalid memory block address
- 10 Invalid environment
- 11 Invalid format
- 12 Invalid access code
- 13 Invalid data
- 14 Reserved
- 15 Invalid drive was specified
- 16 Attempt to remove current directory
- 17 Not same device
- 18 No more files
- 19 Attempt to write on write protected disk
- 20 Unknown unit
- 21 Drive not ready
- 22 Unknown command
- 23 Data CRC error
- 24 Bad req stuc length
- 25 Seek error

- 26 Unknown media
- 27 Sector not found
- 28 No paper
- 29 Write fault
- 30 Read fault
- 31 General failure
- 32 Sharing violation
- 33 Lock violation
- 34 Invalid disk change
- 35 FCB unavailable
- 36 Sharing buffer overflow
- 37 Reserved
- 38 Cannot complete file operation
- 39 Reserved
- 40 Reserved
- 41 Reserved
- 42 Reserved
- 43 Reserved
- 44 Reserved
- 45 Reserved
- 46 Reserved
- 47 Reserved
- 48 Reserved
- 49 Reserved
- 50 Network request not supported
- 51 Network node ????? is not listening
- 52 The name already exists on the network
- 53 Cannot locate network name
- 54 The network is busy
- 55 Server connection to network node ????? broken
- 56 The NETBIOS command limit has been exceeded
- 57 The network adapter has malfunctioned
- 58 Incorrect response received from network node ?????
- 59 Unexpected network error from network node ?????
- 60 Incompatible network node ?????
- 61 Print queue full on network node ?????
- 62 No room for print file on network node ?????
- 63 The print file has been deleted on network node ?????
- 64 The network name has been deleted
- 65 You have been denied access on network node ?????
- 66 Invalid network device
- 67 The network name was not found
- 68 The network name limit has been exceeded
- 69 The session limit has been exceeded
- 70 Network node ????? has been temporarily paused
- 71 The network request to network node ????? was denied
- 72 Print or disk redirection is paused on network node ?????

- 73 Invalid network version
- 74 Account has expired
- 75 Password has expired
- 76 Login attempt invalid at this time
- 77 Disk limit has been exceeded on network node ?????
- 78 Not logged in to network node ?????
- 79 Reserved
- 80 The file already exists
- 81 Reserved
- 82 Cannot make directory entry
- 83 Failure on critical error
- 84 Too many redirections or logins to network node ?????
- 85 Duplicate redirection or login to network node ?????
- 86 Invalid username or password
- 87 Invalid parameter
- 88 Network data fault
- 89 Function not supported on network
- 90 Required system component not installed

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