LANtastic ™ Network Operating System

Reference Manual

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ARTISOFT, Inc.
ARTISOFT Plaza
575 East River Road
Tucson, Arizona 85704
602-293-6363
Fax 602-293-8065

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Contents

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 network adapters and 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 (❶, ❷, ...). 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 NET 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 toggle between insert and overwrite modes

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

AIMOVE

AIMOVE is a Terminate and Stay Resident (TSR) utility used in conjunction with the LANtastic AI-LANBIOS program and the Remote Booting feature of network adapter cards. AIMOVE allows faster execution of the NETBIOS. It accomplishes this by transferring the portion of the NETBIOS which normally executes out of the BOOT ROM into RAM. This software is then kept resident and all further NETBIOS functions are performed out of RAM instead of ROM, thus yielding faster execution. In independent tests, using AIMOVE has improved performance by over 50% in networks using remote booting. AIMOVE uses about 7 Kbytes of resident memory.

Note: The AIMOVE program should not be used with Artisoft 2Mbps adapters.

Running AIMOVE

❶ Make sure the adapter card and ROM are correctly installed.

❷ Power on the diskless workstation to run the appropriate low-level driver and AI-LANBIOS from the ROM chip on the adapter.

❸ Run AIMOVE on each workstation using remote booting. The syntax of the utility is:

AIMOVE

Normally, AIMOVE is placed in the AUTOEXEC.BAT file of the boot image contained on the boot server. This allows automatic execution of AIMOVE whenever a station is brought up. No switches are required on the command line. The program will locate the address of the NETBIOS in ROM and transfer down it's contents from there. The AIMOVE utility cannot be installed more than once.

Refer to "Remote Booting" in this manual for more information on remote booting and sample batch files using the AIMOVE program.

ALONE

The ALONE program increases performance on a network server if you do not wish to use it as a workstation. That means you can temporarily (or permanently) use a LANtastic server as a stand-alone dedicated server. You run ALONE like any standard DOS-based application. While it's running, ALONE provides you with information on which users are making requests to the server and what requests they are making. You can enable a password requirement to exit ALONE, so you can leave the server running with no fear of anyone using the computer locally without proper authorization. When you wish to use the server for a local task, simply exit ALONE and use the computer as a LANtastic peer-to-peer server.

Running ALONE

❶ Run your network software on the server, including SERVER.EXE. (For more information on this subject, refer to "Bringing Up The Network Software" in Chapter 3 of the *LANtastic Network Operating System User's Manual.*

❷ From the DOS prompt, type:

ALONE then press **Enter**.

You will see a display similar to the following:

ID# Username/Time	Machine/Path	Command	IO Bytes	Requests	Privs
101 LASER	DOWN_LASER	LOGIN	0	1	-Q---L
104 !AL	TAMMI	GET QUEUE ENTRY	0	3	-----L
11D &JUDI	JUDI	FIND FIRST FILE	0	2	-----L
107 -FERN	ACCT4	FIND FIRST FILE	0	2	-----L
113 &CUST	PAT	FIND FIRST FILE	0	2	-----L
109 &BRENDA	BRENDA	CLOSE FILE	42310	49	-----L
10A -TINA	TINA	FIND FIRST FILE	0	2	-----L
10B @CAROL	CAROL	CLOSE FILE	19256	31	-----L
10E #KATHY	SALES2	CLOSE FILE	167017	190	-----L

The first line provides you with the same information as the NET *Display Server Activity* option. Refer to "User Account Management" in this manual for information on these fields.

The second line provides you with the number of minutes before the user will be forced to log off (if you've imposed any restrictions with time of day log-ins) and the pathname associated with the user's most recent file operation. These keys provide the following functions:

Esc	Terminates the ALONE program.
F1	Provides a display with help information. Pressing **Z** will then enlarge and shrink the help window.
F2	Toggles filename display on and off. Performance is improved slightly when this feature is turned off.
F3	Enables or disables password requirement to exit the ALONE program.

If you press **F3**, you will be prompted for a password, which you must then type once again to make sure it was keyed in correctly. Once this is done, no one can exit the ALONE program without entering the correct password. To turn off the password requirement, press **F3** then key in the password.

To terminate the program, press **Esc**. The computer can now be used as both a server and a workstation.

Audit Trails

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. This can greatly enhance security since you can keep track of every user request made to a server. You can also customize auditing to check for only certain types of access, such as when a user requests a device to which he or she is not allowed access. You can audit whenever a user logs in or logs out. You can track when users place items in the mail or print queues and how many characters are printed by the server.

Auditing also allows you to keep accurate records for billing if you charge users for LAN services. You simply set up an audit trail for the desired services, then check the log each billing period.

Finally, audit trails are a good way to analyze how well you've distributed the LAN workload among your servers and how well your server's software parameters are set up for its users. If one network server is performing a lot of user requests, you may want to move some of that computer's resources to a server that isn't so busy. You can also see how many users are making simultaneous requests to a server. This can help you set the appropriate values for the *Maximum Users* and *Network Tasks* in the NET_MGR *Server Startup Parameters* menu. Setting these values correctly can help performance and prevent you from dedicating too much or too little server memory to the network.

Note: Keeping audit trails can use up a lot of server disk space, so it is important to delete old entries. Also, any changes to the fields for audit trails will not take effect until after you reboot the server.

Enabling Audit Trails

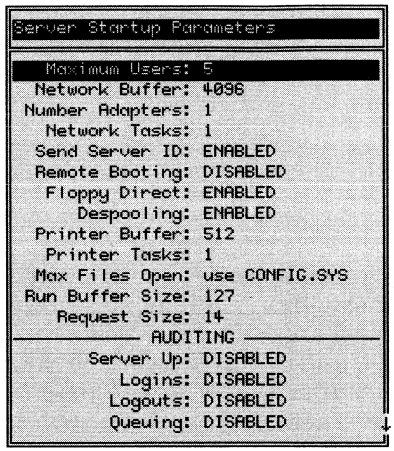
To enable audit trails.

❶ Type: **NET_MGR** then press **Enter**.

You will see the NET_MGR *Main Functions* menu.

❷ Select *Server Startup Parameters* 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 or shut down.

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 out 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.

Audit Printing

If you enable this function, an audit entry is made when a print job is finished. The log entry will contain the number of bytes sent to the printer.

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" in Chapter 7 of the *LANtastic Network Operating System User's Manual* 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 ACLs 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" in Chapter 7 of the *LANtastic Network Operating System User's Manual* 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 ACLs 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 (DIRs)	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. For information on using this type of access, refer to "Physical Access ACL" in this manual.

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

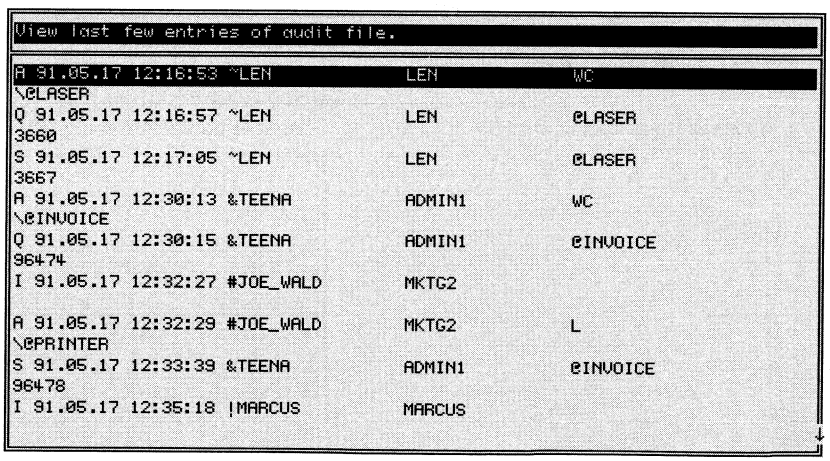
To see the log of user requests to the server:

❶ Type: **NET_MGR** then press **Enter**. You will see NET_MGR *Main Functions* menu.

❷ Use the arrow keys to select, *Audit Trail Maintenance*, and press **Enter**.

❸ 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 logged in to the server
O	User logged off or the server connection has been broken
A	Access allowed to a server resource
D	Access denied to a server resource
Q	Entry placed on the server's queue
S	Queue entry despooled to a printer
U	User request 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 entry was made.

Reason	Meaning
@DEVICE	Name of the printer where a print job was output.
TIMEOUT	User's time of day log-in session expired.
DISCON	Server disconnect.
NORMAL	User logged off of server.
SHUTDOWN	User logged off by server shut down by remote shut down feature.
UPS	User logged off by server being shut down by UPS support feature.

Variable For a request for a printer device, this field shows you with the number of bytes despooled to a printer. For any other operation it shows the number of input/output bytes performed and the number of requests that were made to the server for that operation.

Copying An Audit Trail To File

To save a log of audit entries for later reference:

❶ Type: **NET_MGR** then press **Enter**. You will see NET_MGR *Main Functions* menu.

❷ Use the arrow keys to select the option, *Audit Trail Maintenance*, and press **Enter**.

❸ Select the option *Copy Audit Trail To File* and press **Enter**.

❹ 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.

❶ Type: **NET_MGR** then press **Enter**. You will see NET_MGR *Main Functions* menu.

❷ Use the arrow keys to select the option, *Audit Trail Maintenance*, and press **Enter**.

❸ Select the option *Clear The Audit Trail File* and press **Enter**.

❹ Press **Enter** once again to confirm the deletion. This will delete all the entries in the audit log.

CD-ROM Drives

You can add Compact Disk - Read Only Memory (CD-ROM) drives to a LANtastic network to take advantage of their large information 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 drive will be treated as a physical drive, it is a good idea to check your LASTDRIVE= statement and make sure that it is set to at 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 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

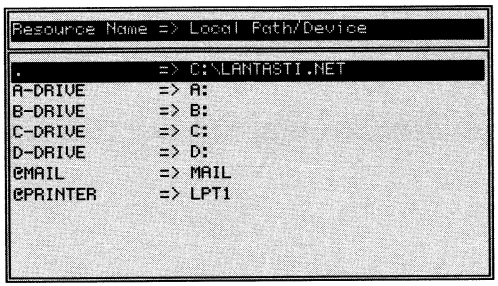
This documentation may be contrary to the CD-ROM manufacturer's instructions. Many recommend running the extension software after you bring up the network. With LANtastic, you must run the extension software after the redirector program and before the server program.

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

❶ Type: **NET_MGR** and press **Enter**. You will see the NET_MGR *Main Functions* menu.

❷ Select *Shared Resources*, and press **Enter**.

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



❸ 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

❹ 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 partitioned into drives C: and D:, you could assign the CD-ROM drive to E: . Enter this drive designation in the window provided. The new drive will now appear on the list of server resources.

❺ The new resource name should already be highlighted. Press **Enter**.

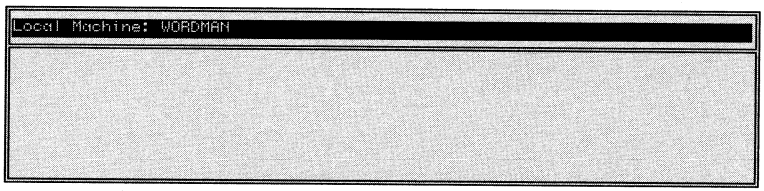
❻ Use the arrow keys to move the highlight bar to the field *CD-ROM Drive* and press **Enter** to toggle the selection from *No* to *Yes*.

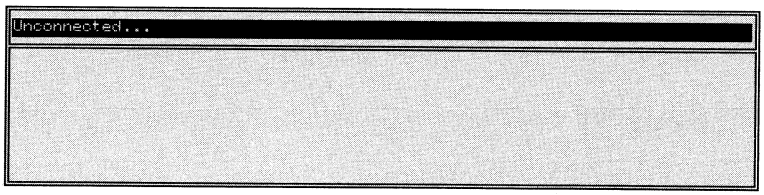
Chat

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:

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

❷ Select the *Chat With Another User* option and press **Enter**. You will see these two screens:





❸ Press the **Ins** key and in the window provided, enter the name of the network computer (not username) that you want to call.

❹ A pop-up message will inform the user at the destination node that you are trying to chat. To complete the connection, this user 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	Hangs up Returns you to the NET *Main Functions* menu
Del	Hangs up without exiting the Chat program

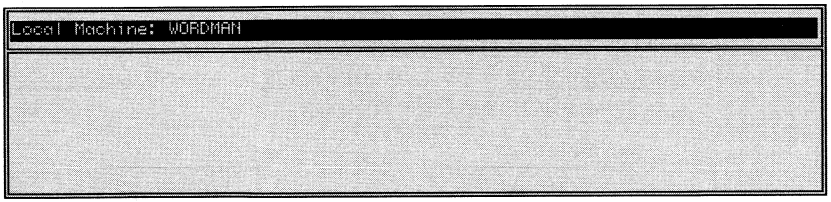
If you type more text than will fit in the screen, the display will scroll up to give you more space.

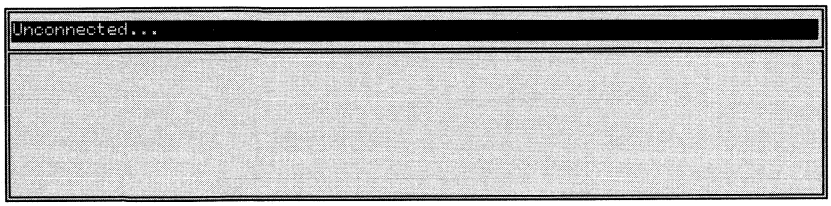
Voice Chat

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

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

❷ Select the *Chat With Another User* option and press **Enter**. You will see these two screens:





❸ Press the **Ins** key.

❹ 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 computer that you are trying to chat. To complete the connection:

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

If you have an Artisoft Sounding Board and the supporting software installed in both computers, you will see the message, "Voice Chat is disabled" at the bottom of the screen.

❻ 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 though 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.

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

❶ Select the *Control Directory Maintenance* option from the NET_MGR *Main Functions* menu and press **Enter**.

❷ 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.

❸ 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 Run the NET_MGR program and 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:

❶ Select the option, *Restore Control Directory*, and press **Enter**.

❷ In the window provided, enter the name of the file that you want to restore and press **Enter**. For example:

A:\DIR.OLD

❸ 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 and 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:

❶ Type: **NET_MGR** then press **Enter**. You will see the NET_MGR *Main Functions* menu.

❷ Select the option, *Password Maintenance* and press **Enter**. Another menu with the option, *Enable password access for NET_MGR* will appear. Press **Enter**.

❸ 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:

❶ Select the option *Change Password* from the *Password Maintenance* menu and press **Enter**.

❷ 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.

❸ 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.

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

❷ Select the *Display Server Activity* and press **Enter**.

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

ID#	Username	Machine	Command	IO 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	1156	-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	366519	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 on the opposite page:

AUDIT ENTRY	Create audit entry.
CHANGE PASSWORD	Change user password.
CLOSE FILE	Close file.
CONTROL QUEUE	Modify queue entry or control despooler.
COMMIT FILE	Commit file to disk.
COPY FILE	Copy file on the server.
CREATE DIR	Create directory.
CREATE FILE	Create file or overwrite an existing file with the same name.
CREATE INDIRECT	Create indirect file.
CREATE NEW FILE	Create new file.
DELETE DIR	Delete directory.
DELETE FILE	Delete file.
DISABLE ACCOUNT	Disable user account.
FILE READ	Read data.
FILE WRITE	Write data.
FIND DISK SPACE	Find information on the amount of free disk space.
FIND FIRST	Look up file.
FIND NEXT	Look up multiple files matching a wildcard.
GET ACCOUNT	Find account information.
GET INDIRECT	Retrieve contents of an indirect file.
GET LINK INFO	Find information on a directory or device Access Control List.
GET QUEUE ENTRY	Find queue entry information.
GET SERVERTIME	Obtain server's date and time.
GET STREAM	Find logical printer stream information.
LOCK RANGE	Lock a file region.
LOGIN	Log user in.
MULTI-MODE OPEN	Open multi-mode file.
OPEN FILE	Open file.
PRINTER STATUS	Find 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	Translate network pathname.
UNIQUE FILE	Create new file with a unique name.
UNLOCK RANGE	Unlock file region.
USER STATUS	Find user status information.

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 access to perform such tasks as remotely shutting down servers or issuing the NET RUN command.
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 or file at the same time. But there are other considerations as well. This section will deal with the following topics:

- The DOS SHARE program
- The DOS FASTOPEN program
- Copy protected programs
- 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."

The DOS SHARE Program

The SHARE.EXE program is included with DOS versions 3.0 and higher. Understanding SHARE can be vital to the success of your network, especially if you are running a multi-user database, or a similar application that works with several files at a time.

SHARE gives applications an easy, well-defined way to keep users from accessing the same files, or the same regions of files simultaneously. Once SHARE has been run, an application can use it to "lock" a file or region so that only one person at a time can make changes. Most multi-user and network software packages use SHARE to implement their file and record locking.

How SHARE Works

SHARE maintains two tables in memory. The first table, the FILES table, contains the complete pathname of each file that has been opened, plus other information. The second table, the LOCK table, contains a list of internal file handle numbers and corresponding information on the various areas of each file that are locked. SHARE checks these tables whenever an application asks to open or use a file or a region of a file, and lets the application know whether or not the file or region is available.

SHARE uses at least one entry in each table for each file that is opened. The more files your computer opens and locks, the more space SHARE needs for its internal tables. You can control the size of SHARE's internal tables with two command line options, /F and /L. The /F option controls the amount of space allocated for the FILES table and the /L option controls the number of simultaneous locks that SHARE will allow.

The /F Parameter

The /F parameter controls the size (in bytes) of the table that SHARE reserves for file names and file handles. The syntax for using the /F parameter is

SHARE /F:n

where n is any number from 0 to approximately 62,000. The default is /F:2048. You can find the maximum amount of space required by multiplying the number of files in your CONFIG.SYS by 71 (60 bytes for the longest possible DOS path + 11 bytes for other information). For a system with FILES = 255 in its CONFIG.SYS, that means that in the worst case, with all 255 files open, SHARE will require over 18,100 bytes for the FILES table.

On a network server, you will need to allocate enough space for all the files that will be opened by all the users on the network. The default value is 2048 bytes -- enough to hold the information for 66 files with paths averaging 20 characters, or about 28 files with maximum length DOS names and file paths. If you know that paths on your machine average more than 20 characters, or if you will be opening

many files, you may need to use the /F parameter to allocate more space for the SHARE FILES table.

The /L Parameter

The /L parameter controls the number of simultaneous locks that SHARE can make. The syntax for the /L parameter is

SHARE /L:n

where n is any integer between 1 and approximately 3800. The default is /L:20 -- that is, 20 locks. On a network like LANtastic, that can have up to 5100 files open on a server, it's easy to see that 20 locks may not be enough.

Opening a file on a server requires at least one lock. In addition, most network programs use several more locks per file. They lock individual records, and even individual fields within records. On a network, with several users opening each file, SHARE's default 20 locks can be used up almost instantly.

To resolve this problem, you should use the /L parameter to increase the number of locks allowed on your LANtastic servers. The /L setting should be set to at least the number of files you've specified in your CONFIG.SYS or in the NET_MGR Server Startup Parameters option (whichever is larger). If you're running a multi-user program that opens many files, you should consider setting /L to at least twice the number of open files allowed.

Using SHARE With DOS V4.00 And V4.01

If you are using DOS V4.00 or V4.01 with a logical drive larger than 32 Megabytes, SHARE must be run. These versions of DOS will generate a message to inform you that you must run SHARE when using a large logical disk. At this point, DOS V4.00 and V4.01 will run SHARE without providing the user with proper notification. Any attempts to run SHARE from the command line or a batch file such as STARTNET.BAT or AUTOEXEC.BAT will be ignored since SHARE is already loaded. When this occurs, the command line options for SHARE are also not implemented, so the version of SHARE may not

have the desired amount of environment space or file locks allocated. To resolve this, you must run SHARE from within the CONFIG.SYS. The syntax for running SHARE from within a CONFIG.SYS file is as follows:

INSTALL=C:\DOS\SHARE /L:xxxx /F:nnnn

where "xxxx" represents the amount of space you wish to allocate for SHARE, and "nnnn" represents the number of file locks you wish to allow. For example:

INSTALL=C:\DOS\SHARE /L:200 /F:4096

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 workstations. 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 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.

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. Make sure that sharing the application this way does not violate any licensing agreements.

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 attributes. 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 from which they read. A program cannot write to a file that has 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.

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 workstation, 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, a math coprocessor or COM ports.

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 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 setups without having to re-install the software. You can then use the different display setup 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 low-level 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 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. You are strongly encouraged to use these if you wish to run disk management software on a network computer.

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 server, 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 provide file and record locking and non-network versions do not. Using network versions of software also insures that you are not violating any licensing agreements.

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 created on a network drive and is linked to another file located on the same server. The file to which the indirect file is linked can reside on any resource on the same server. Any operation made on the indirect file will be 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 C-DRIVE on HOST1. You can perform these functions through either the NET program or by NET command line.

❸ Change to the directory on the network drive 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 resource name and DOS path 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  18:60p
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 create another indirect file called IND2.BAT in the APPS subdirectory and link it 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 the "NET" section of 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 print 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 buffer 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 place where data you might want soon is put. Since reading from RAM is faster than reading from disk, the CPU can get the data you request faster and thus performance is enhanced. 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 (Elevator seeking)
- 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 writes allow the cache 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 cache, you can specify how long the cache is to wait until it writes to disk.

Overlapped CPU and I/O functions mean that all cache flushes are performed as a background operation. This means that while the cache writes to disk, your computer 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 run the redirector program, REDIR, before running the LANcache software, but you should run LANcache before SERVER . 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.
- XMS: LANcache supports the XMS protocol as provided by HIMEM.SYS.

LANcache will use all available memory as specified by the TYPE= switch or all available extended memory if no type is specified. 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 XMS or extended memory on machines with 386 and 486 type processors.

Note: You cannot use LANcache to cache CD-ROM or Write Once Read Many (WORM) drives, or hard drives with sector sizes other than 512 byte or with a variable number of sectors per track.

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.

Using The AFTER_IO_DELAY= And LONG_WRITE_DELAY= Switches

To increase performance on network servers and workstations, LANcache can be set to delay writing to disk. This means that when a user or an application makes a request to write information to the disk that LANcache is caching, LANcache will store the information in RAM instead of immediately writing it to disk. This allows LANcache to make fewer accesses to the disk. It can write more information at a time, and it can write the data sequentially, so the information can be found faster when it has to be read from the disk again.

Delayed writing is a powerful feature: however, if a system or power failure occurs before LANcache has stored data to be written to disk, the data will be lost. To ensure that data is written to disk at regular and optimal times, LANcache has two switches you must use when caching write requests: the AFTER_IO_DELAY and LONG_WRITE_DELAY.

The AFTER_IO_DELAY switch sets the length of time in seconds that LANcache will wait to flush data to disk after disk requests stop. This allows LANcache to write to disk when the computer is idle. The AFTER_IO_DELAY interval is then reset each time a new read or write request is made. Since the AFTER_IO_DELAY will never expire as long as disk requests are being made, another timer needs to be set to make sure that information gets written to disk, and not stored perpetually in the cache. The LONG_WRITE_DELAY timer serves this purpose. AFTER_IO_DELAY and LONG_WRITE_DELAY are set the first time data is written to the cache. LONG_WRITE_DELAY,

however, is not reset by subsequent read or write requests as AFTER_IO_DELAY is. The example on the next page illustrates how AFTER_IO_DELAY and LONG_WRITE_DELAY work in unison to ensure both performance and safety. For this example, we'll set AFTER_IO_DELAY to 5 seconds and LONG_WRITE_DELAY to 15 seconds. Keep in mind that these values are used as an example and should not be considered optimal or recommended values. The command line for running LANcache with the same parameters as the example on the next page is:

LANCACHE/AFTER_IO_DELAY=5/LONG_WRITE_DELAY=15

Refer to "LANcache Switches" in this section for more information on the LANcache command line options.

Time in seconds	Event	AFTER_IO_DELAY timer	LONG_WRITE_DELAY timer
Timers not yet started	LANcache run (Cache empty)	0 (Not set)	0 (Not set)
Timers not yet started	Database sort begins with read requests	0 (Not set)	0 (Not set)
1-14	Continual read and write requests	Timer continually reset to 5 seconds by read or write requests	15 (Timer set) Counts down to 1
15	More read and write requests	5 (reset to 0 by flush when LONG_WRITE_DELAY timer expires)	0 (Timer expires, cache flushes)
16-29	Continual read and write requests	Timer continually reset to 5 seconds by read or write requests	15 (timer reset with first write request. Counts down to 1)
30	More read and write requests	5 (reset to 0 by flush when LONG_WRITE_DELAY timer expires)	0 (Timer expires, cache flushes)
31-35	More read and write requests. Database sort ends	Timer continually reset to 5 seconds by read or write requests	15 (timer reset with first write request. Counts down to 10)
36-40	No more read or write requests made	0 (Timer expires, cache flushes)	Counts down to 5 (Reset to 0 when AFTER_IO_DELAY expires)

AFTER_IO_DELAY And LONG_WRITE_DELAY Interaction During A 35-Second Database Sort (AFTER_IO_DELAY=5, LONG_WRITE_DELAY=15).

This example is given to demonstrate how the two timeout switches, AFTER_IO_DELAY and LONG_WRITE_DELAY work together to achieve fast, safe delayed writing to disk. The LONG_WRITE_DELAY allows you to set a regular interval for writing to the cache. However, between these cache flushes, there are often times when there are no read or write requests to the disk. It would be more advantageous to write during these periods, since flushing has less impact on system performance at these times. The AFTER_IO_DELAY allows you to flush data to disk during these idle intervals between disk accesses.

LANcache is first run: There have been no requests to read from or write to the disk, so there is no data in the cache.

Database sort begins: Information is requested from the disk and this data is stored in the cache. There is no need to flush the cache yet, because all the information contained in the cache is up to date on the disk.

1 to 14 seconds: The database program issues a series of read and write requests to the disk. Each of these requests resets the AFTER_IO_DELAY timer back to 5 seconds. The LONG_WRITE_DELAY timer, however, is only reset on the first write request. This ensures that there will be a cache flush at least every 15 seconds.

15 seconds: The LONG_WRITE_DELAY timer expires and LANcache flushes the data to disk. As this is done, the AFTER_IO_DELAY resets to 0 since there will be no need for another disk flush until LANcache receives another request to write data to disk.

16-29 seconds: The database program issues another series of read and write requests to the disk. Both the AFTER_IO_DELAY and LONG_WRITE_DELAY timers are reset with the first write request, but the AFTER_IO_DELAY timer is reset to five seconds with each new read and write request, while the 15 second LONG_WRITE_DELAY timer is only set once.

30 seconds: Once again the LONG_WRITE_DELAY timer expires and LANcache writes data to disk. The AFTER_IO_DELAY timer is reset to 0, and LANcache waits for the next write request to reset both timers. The database program issues more read and write requests and again AFTER_IO_DELAY is constantly reset while LONG_WRITE_DELAY is reset only once.

31-35 seconds: For the next five seconds, AFTER_IO_DELAY is continuously reset to 5, while the LONG_WRITE_DELAY timer counts down. The database sort ends and the steady stream of read and write requests ends. Both timers count down.

36-40 seconds: During this idle period, the AFTER_IO_DELAY timer expires first and data is flushed to disk. The LONG_WRITE_DELAY timer is set to 0 and once again, LANcache waits for a write request to reset both timers.

Using LANcache With Microsoft® Windows™

In order to allow Microsoft Windows to use as much memory as possible, when LANcache detects that Windows has been run in standard or 386 enhanced mode, it will automatically flush cached data to disk, disable caching, and then release its memory to Windows. As soon as Windows exits, LANcache will re-allocate its memory and begin caching once again. When you execute Windows, you must specify the mode in which you want it to run. If you do not instruct it to run in standard or 386 enhanced mode, and LANcache is running, Windows may determine that there is no extended, XMS or EMS memory available and run in real mode. To run Windows in standard mode type:

WIN/S then press **Enter**.

To run Windows in 386 enhanced mode type:

WIN/3 then press **Enter**.

By forcing Windows to run in standard or 386 enhanced mode, LANcache will be able to detect that Windows needs more memory and will temporarily halt caching and release its memory.

If you want to run Windows in real mode and are using LANcache's delayed write feature, you must first disable caching and release memory using the /RELEASE switch on the LANcache command line. For example:

LANCACHE/RELEASE

Once this is done you can run Windows in real mode, type:

WIN/R then press **Enter**.

After you exit Windows, you can re-enable caching using the /ENABLE switch. For example:

LANCACHE/ENABLE

Shutting Down LANcache

There are certain considerations to keep in mind when using a cache. Since the cache 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 cache will delay the reboot until LANcache has flushed its data to disk.

» Or issue the command for a cache flush:

LANCACHE/FLUSH

» Or flush and reset the cache. Type:

LANCACHE/RESET

» Or disable caching. Type:

LANCACHE/DISABLE

» Or use the RELEASE option to disable caching and release LANcache's memory for other applications. Type:

LANCACHE/RELEASE

» Or remove LANcache from memory. Type:

LANCACHE/REMOVE

LANcache will perform a cache flush before removing itself from memory:

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

When the cache 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 cache's performance using the STAT=INFO switch.
- Reset the cache's performance statistics using the STAT=RESET switch.
- Disable caching using with the DISABLE switch.
- Disable caching and release its memory using the RELEASE option.
- Disable caching and remove it from memory with the REMOVE switch.
- Re-enable caching (after it has been stopped using the DISABLE or RELEASE switches) with the ENABLE option.

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

Running LANcache With Command Line Switches

To run the LANcache 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

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. 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_IO_DELAY=dddd (3) 0-3600

This timer is set when LANcache receives the first request to write data to disk after LANcache is run or after the cache has already been flushed. Once this timer is set, every time LANcache receives a request to read or write to disk, this interval is reset. If the amount of time that you specify (in seconds) for AFTER_IO_DELAY expires, the cache flushes its data to disk. Setting the value to 0 will make the cache immediately write data to disk (no delayed writing). This field must be set to a smaller value than LONG_WRITE_DELAY or LANcache will use the LONG_WRITE_DELAY value. For more information on how the AFTER_IO_DELAY and LONG_WRITE_DELAY work together, refer to "Using the AFTER_IO_DELAY= and LONG_WRITE_DELAY= switches.

CACHE_SIZE=dddd (384Kbytes conventional, or all available EMS, extended or XMS memory as specified with the TYPE= switch) 16-16000 Kbytes

This switch sets the memory size of the cache. LANcache may round down the value you specify to account for its storage needs. If you do not set this switch, LANcache will use 384K of conventional memory or all available EMS, extended or XMS memory as specified with the TYPE= switch.

DISABLE

This option flushes the cache, then halts caching. You can use this switch to disable caching when running applications that cannot function while a cache is running. For example, Microsoft Windows will not work in real mode while LANcache is running with delayed writes. When you use the DISABLE switch, LANcache will remain resident in memory, and caching can be restarted by issuing a LANCACHE/ENABLE command.

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 all part of the same physical drive.

ENABLE

Use this switch to re-enable caching after it has been disabled with a LANCACHE/DISABLE command. You can also use this option to re-allocate memory and re-enable caching after you have issued a LANCACHE/RELEASE command.

FAST_IRQ= (None)

This switch is intended for advanced users who have specialized high-speed Interrupt Service Routines (ISRs) for hardware interrupts which they do not wish to be processed by LANcache. For normal applications you will not need to use this switch. The ISR associated with the specified IRQ (0-15) must execute quickly, must not invoke any BIOS or DOS functions, and must not re-enable interrupts before issuing an End-Of-Interrupt (EOI) command to the Programmable Interrupt Controller (PIC). The switch may be repeated for each desired IRQ. Problems associated with lost characters in some serial communication applications may be alleviated by using this switch with the IRQ corresponding to the serial port in question.

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 LANcache. To use this switch, these are the two valid formats:

LANCACHE/HELP
LANCACHE ?

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_IO_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_IO_DELAY. Setting the value to 0 will make the cache immediately write data to disk (no delayed writing).

RELEASE

This option will flush the cache, disable caching, then release all the extended, expanded or XMS memory that LANcache is using. LANcache will still remain resident in memory, but applications will be able to use the memory released by LANcache. When using LANcache with Microsoft Windows in standard and 386 enhanced mode, LANcache will automatically release its memory to Windows, then re-allocate that memory after Windows exits. You must first, however, instruct Windows run in either standard or 386 enhanced mode by using the /S or /3 switches on the Windows command line. For example, to run Windows in 386 enhanced mode, you would type, WIN/3. When using Windows in real mode, you must first issue this command and then run Windows (WIN/R). After you exit Windows, you can re-enable caching with the /ENABLE switch.

REMOVE

This switch flushes the cache, then removes LANcache from memory. You may not use this switch with any other command line switches. Further, You must remove Terminate and Stay Resident (TSR) programs in the opposite order they were loaded. For example, if you loaded LANcache and then SERVER, you must remove SERVER from memory before you can remove LANcache.

RESET

This switch 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.

SHUTDOWN_KEY= (Del) A, B, C, ... Del

You can use this option to assign the keystrokes for flushing the cache. The default keystrokes are **Ctrl+Alt+Del**. When you use this switch, the **Ctrl+Alt** will remain constant, but you can assign keys A through Z in place of the **Del** key. For example, the command line:

```
LANCACHE/SHUTDOWN_KEY=K
```

would assign the keystrokes **Ctrl+Alt+K** to flush the cache. This switch is useful when running software that traps **Ctrl+Alt+Del** commands and thus prevents you from shutting down LANcache.

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 cache has been running for a long time and you wish to gather statistics about the cache'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, XMS

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 cache. In order to use extended or XMS memory, you must have a driver such as HIMEM.SYS.

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 6.5K 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
```

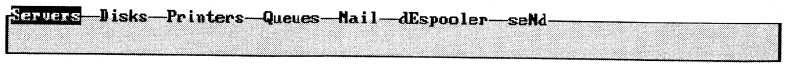
The program is now loaded into memory.

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:

❶ 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.

❷ Press the **Ins** key and type in the name of the server that you want to log in to and press **Enter**.

❸ Enter your username and password.

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

Logging Out Of A Server

To log out of a server:

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

❷ Press **Enter** to confirm that you want to log out. To cancel logging out, press **Esc**.

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

Redirecting Disk Drives With The LANPUP Program

❶ 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**.

❷ 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.

❸ Press the **Ins** key. The name of a server to which you are logged in 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**. The list will include the names of all the servers you have already logged in to. If you are not already logged in to the server with the drive you wish to use, complete the steps listed in "Logging In To A Server" in this chapter.

❹ From the list of network resources provided, select the desired device or resource and press **Enter**.

LANPUP displays the description of the network resource that was entered when it was created, so you can know more about the device to which you are redirecting.

Cancelling A Disk Drive Redirection With The LANPUP Program

To cancel a redirection:

❶ Select the *Disks* option from the LANPUP *Main Functions* menu, and press **Enter**.

❷ Use the up and down arrow keys to scroll to the 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.

❸ Press the **Del** key.

❹ Press **Enter** to confirm that you want to cancel the disk connection. If you do you do not want to cancel the disk connection, press **Esc**.

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

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 computer.

❶ 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**.

❷ Select the LPT or COM port that you want to connect to a server and press **Enter**.

❸ An available server's name will flash on the screen. If this is the desired server, press **Enter**. If not, use the up and down arrow keys to select a server and press the **Ins** key or **Enter**.

❹ 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.

Cancelling A Printer Port Redirection

To cancel a redirection:

❶ Select the *Printers* option from the LANPUP *Main Functions* menu, and press **Enter**.

❷ Use the up and down arrow keys to scroll to the printer port that you want to disconnect from the server.

❸ Press the **Del** key.

The printer port will now function as a local port.

Manipulating The Printer And Mail Queues With LANPUP

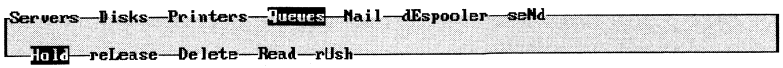
LANPUP allows you to look through the printer and mail queues and control the entries listed there. To enter a server's queue:

❶ 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**.

❷ 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:



❸ 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 despooled until released
L	reLeases 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

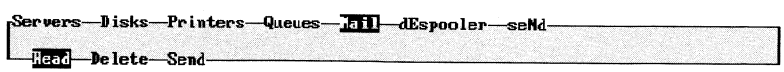
Electronic Mail is one of the most useful features of the LANPUP program. You can send messages or files to users across the network while still in an application program. You can even send notes to yourself to help you remember ideas or appointments.

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:

❶ Select the *Mail* option from the LANPUP *Main Functions* menu, and press **Enter**.

❷ 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**.



❸ Select the *Send* option and press **Enter**.

❹ Type in the username of the person to whom you are sending the message and press **Enter**.

❺ Enter any comment you have about the message (optional).

❻ If you are sending a voice file, type **Y** and press **Enter**. If you are sending a text file, press **Enter**.

❼ If you have already created the file, key in the full DOS path of the file and press **Enter**. If you would like to create the file using the text editor, press **Enter**, or type:

CON and press **Enter**.

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

❽ When you've finished creating the text, press **Enter**.

Reading Mail

To read mail sent to or by you:

❶ Select the mail item you wish to read and press **Enter**.

❷ Select the *Read* option and press **Enter**.

❸ If you want to copy the mail item to a file, enter the DOS path of the file where you would like it copied. To display the file line by line on the screen, type **CON** or press **Enter**.

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 the name of 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.

❶ 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**.

❷ An available server's name will appear 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:

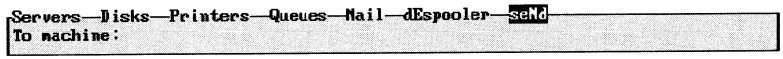
You can use these keys to perform the functions:

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 computer.

❶ 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:



❷ Key in the network name of the destination computer.

❸ 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 computer's monitor.

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.

REMOVE

This switch removes LANPUP from memory. You may not use this switch with any other command line switches. Further, You must remove Terminate and Stay Resident (TSR) programs in the opposite

order they were loaded. For example, if you loaded LANPUP and then SERVER, you must remove SERVER from memory before you can remove LANPUP.

STAND_ALONE

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

LANPUP/STAND_ALONE

The /STAND_ALONE 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/STAND_ALONE command to use LANPUP.

STACK

This option instructs LANPUP to allocate and use its own 512 byte stack for processing. Use this option if you will be popping up LANPUP over a program such as Microsoft Works™ that uses a stack that is smaller than 512 bytes.

Mail

One of the biggest advantages of having a LAN is the increased communication capabilities it provides. With LANtastic you can send text and Voice mail messages to any network user without leaving your desk. You won't need to tie up any phone lines, and you'll use less paper in your office. Further, E-mail messages won't get lost like memos and handwritten notes. And when you're finished with a message, you simply delete it -- there's no waste paper created. Electronic Mail is also secure. No one can read anyone else's messages unless they have the Q privilege. For this reason, the Q privilege should be reserved for system's administrators only. For more information on account privileges see chapter 6 of the *LANtastic Network Operating System User's Manual.*

With LANtastic Network Operating System, mail is sent to a server. The mail items are then placed in the server's mail queue (actually a directory on the server's disk). 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 or listen to the mail item(s).

You can also send voice messages across the a server's mail queue and play them back later. This allows you to communicate a wide range of emotions across the network. Users will be able to tell how important a message is by the sound of your voice.

To record and play messages, you must have Artisoft Sounding Boards installed in both the sending and receiving computers. You must also run the supporting software. Consult the *Artisoft Sounding Board User's Manual* for information on installing the adapter and supporting software.

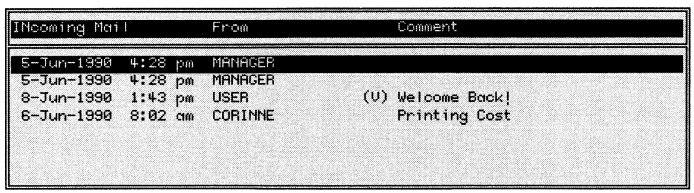
Using A Server's Mail Queue

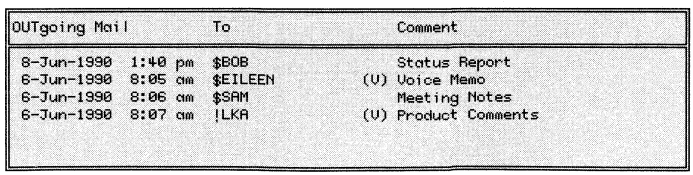
Before you can read, send or manipulate a mail message, you must first enter a server's queue.

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

❷ Select the *Mail Services* option and press **Enter**.

❸ Select a network server from the list provided and press **Enter**. Make sure you select a server where the recipient of your message has an account. The server's mail queue display will appear:



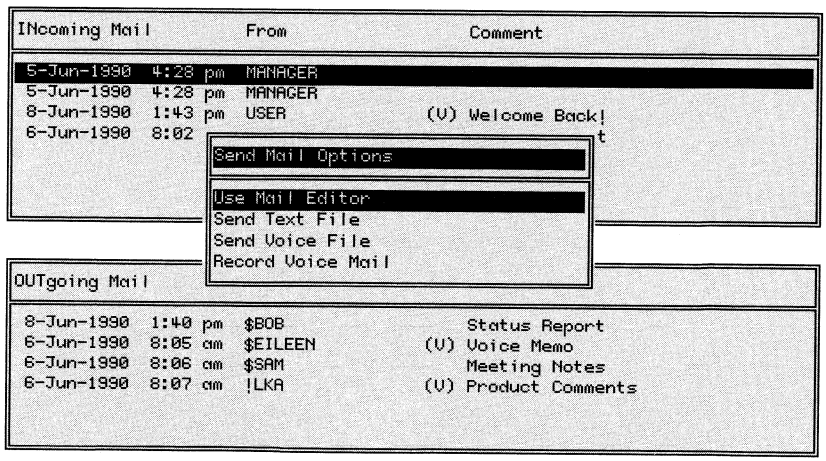


On the *INcoming Mail* queue you will see the names of mail items sent to you. The *OUTgoing Mail* queue shows items you've sent. Once you see the server's mail queue display, you are ready to either create a new mail item, or send an existing file (text or voice) as a mail item, or maniputate a message already in the queue. To move between the two queues, press the **Tab** key.

The next section "Sending A Mail Message" will provide you with information on creating and sending mail messages (both text and Voice). It will also show you how to send an existing text file as a mail message . The section "Manipulating Mail Items In The Server's Queue" will show the necessary steps to read or listen to a mail message and also how to forward a mail message that you have received to another user, copy a Voice or text mail message to file and how to delete a mail entry.

Sending A Mail Message

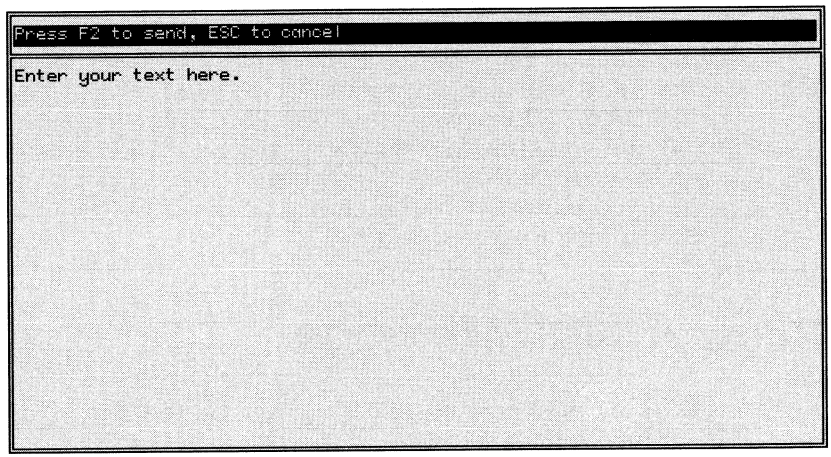
❶ In the mail queues display, press the **Ins** key. You will see the *Send Mail Options* menu.



Creating A File Using The Text Editor

❶ Select the *Use Mail Editor* option from the *Send Mail Options* menu and press **Enter**.

You will see this window:



❷ Type your message in the screen provided.

❸ Press the **F2** key to send your message.

❹ 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**.

❺ In the window provided, type in a comment (optional) and press **Enter**.

If the recipient's computer is currently running on the network, 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 Text Or Voice File

❶ Select the option *Send Text File* from the *Send Mail Options* menu and press **Enter**.

❷ Enter the full DOS path and name of the file you want to send. This can be either a text file or a Voice file.

❸ 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**.

❹ 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.

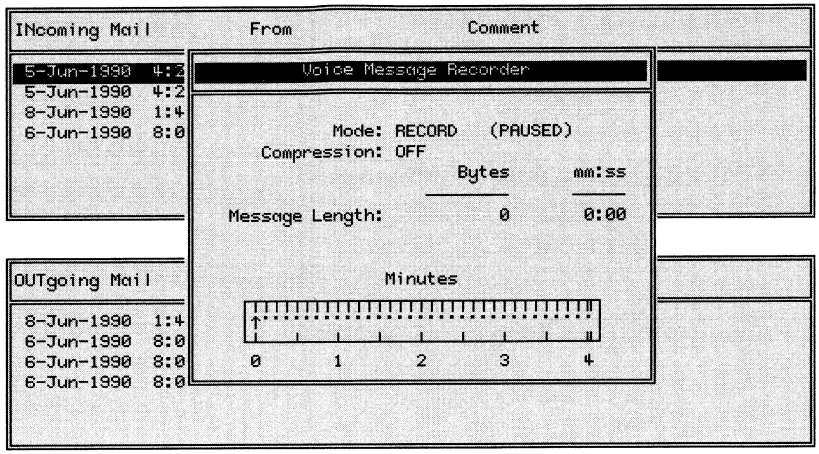
Recording Voice Mail

To use the LANtastic Voice mail feature, you must have an Artisoft Sounding Board and the supporting software installed in both the sending and receiving computers.

❶ Select the option *Record Voice Mail* from the *Send Mail Options* menu and press **Enter**.

❷ 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**.

❸ 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.) In non-compressed mode, Voice messages take up 8K of disk space per second of message length. In compressed mode, Voice mail entries take up 4K of disk space per second of message. To disable compression, press the **F2** key again.

❹ Press the **Space Bar** to start and pause recording. Press **Del** if you want to clear the message and start over.

❺ 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.

Manipulating Messages In The Mail Queue

To read, listen to, delete or forward a mail message, simply use the **Tab** key to move between the incoming and outgoing mail queues then move the highlight bar to the item you would like to manipulate and press **Enter**.

Reading A Mail Entry

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

❶ Select *Read Mail* from the *Mail Options* menu and press **Enter**. LANtastic NOS will display the contents of the mail item. You can use the up and down arrows keys as well as the **PgUp** and **PgDn** keys to scroll through the message.

Copying A Text Or Voice Mail Message To A File

LANtastic lets you copy both text and Voice mail messages from the server's queue to another disk. This allows you to save important messages without taking up too much of the server's disk space. To copy an existing mail entry to another file:

❶ Select *Copy Mail to File* from the *Mail Options* menu and press **Enter**.

❷ 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 ❷.

Printing A Text Message

Printing a text message is similar to copying one to a file. You will use *Copy Mail to File* used in the section above, except this time you

will specify the printer port where you want the file printed when you are prompted for a destination file.

❶ Select *Copy Mail to File* from the *Mail Options* menu and press **Enter**.

❷ In the window provided, type

LPT1 and press **Enter**.

Where LPT1 is the name of the printer port that is attached to a local or network printer.

Forwarding A Copy Of A Text Or Voice Mail Message To Another User

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:

❶ Select the option *Forward Copy Of Mail* from the *Mail Options* menu and press **Enter**.

❷ 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**.

❸ A window will appear 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 Text Or Voice Message From The Mail Queue

In order to save disk space on the server, You should delete old mail items from the mail queue. This is especially true with Voice mail messages, since in non-compressed mode Voice messages take up 8K of disk space per second. In compressed mode, Voice mail entries take up 4K of disk space per second of message. Because of this, you will want to periodically check the mail queue and delete old Voice mail items. Removing mail queue items consists of the following steps:

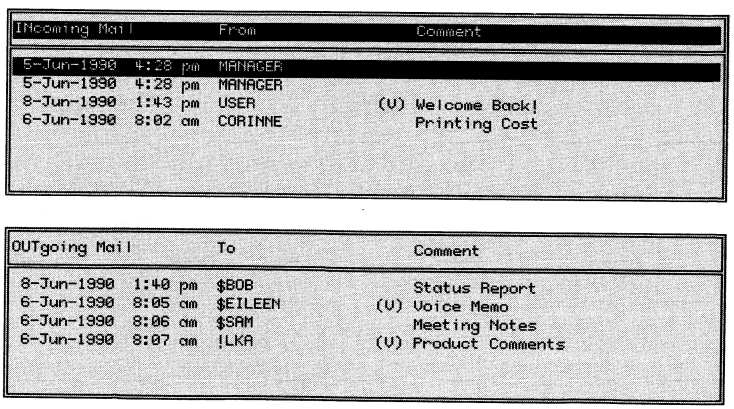
❶ Use the arrow keys to move the highlight bar to the mail item you want to delete and press **Del** or **Enter**. The **Tab** key will move you between the incoming and outgoing queues.

❷ 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.

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:

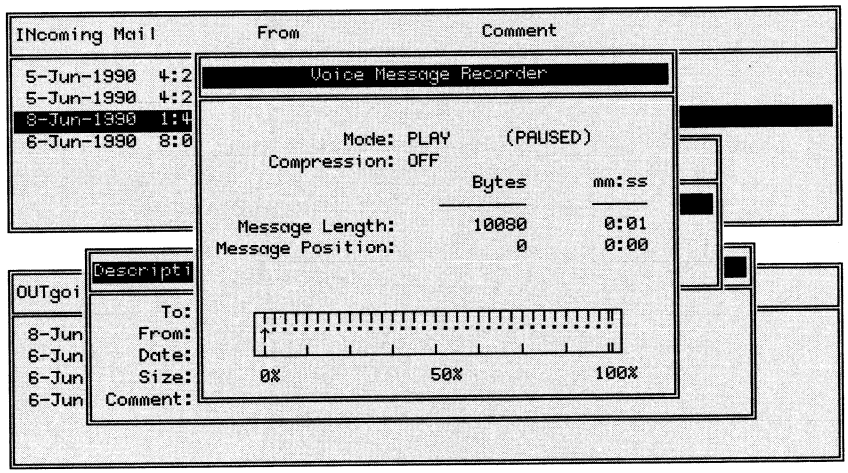
❶ On a server's mail queue, you will see that Voice mail messages will be preceded by a (V).



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.

❷ 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 would like to hear and press **Enter**. You will see the *Mail Options* menu.

❺ Select the option *Listen To Mail* from the menu and press **Enter**. You will see this display:



❻ 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:

Space Bar	Toggles between play and paused mode.
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.

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 installed in one computer, each will be part of a separate network. Computers connected to the independent networks running through that computer cannot communicate with each other unless they belong to the same network.

Server Startup Parameters

You must specify the number of network adapters installed in your computer. Use the NET_MGR *Server Startup Parameters* menu to set this value. The default setting the *Number Adapters* field is 1. 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 network 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

NBSETUP

The NBSETUP program is designed to allow a non-Artisoft NETBIOS to allocate more sessions and Network Control Blocks (NCBs) for NETBIOS applications and user log-ins. You will only need to use NBSETUP for a non-Artisoft NETBIOS that has no facility for altering the maximum number of configured sessions and NCBs.

A session is the logical connection between two computers for the exchange of data, such as when a user at a workstation logs in to a server. An NCB is a data structure that network programs use to issue commands to the NETBIOS. A NETBIOS has a finite number of sessions and NCBs that it can allow. If your NETBIOS cannot allocate enough sessions or NCBs, network users may not be able to log in to your server or NETBIOS applications may not operate properly.

Most types of NETBIOS conform to either the IBM PC Network adapter NETBIOS or the IBM Token Ring NETBIOS. For either type, the maximum number of sessions is set to 6 and the maximum number of NCBs is set to 12. This translates to 6 concurrent log-ins on a LANtastic server. The NBSETUP program is designed to change these default values.

NBSETUP must be run before any network software is started. It will not run if either REDIR or SERVER are running. This is because NBSETUP performs a NETBIOS reset to alter the default parameters which would cease network operations on that computer.

Note: NBSETUP will only function with adapter 0.

To run NBSETUP, use the syntax:

NBSETUP(/switches)

where "switches" represents any optional command line parameters. Switches may be separated by either spaces or forward slashes (/). Parameters which take values must be followed by either an equal sign (=) or a colon (:). You will find complete descriptions of all the command line switches in the next section.

You may mix several switches on the command line, in any order. NBSETUP performs the following actions sequentially before resetting the NETBIOS:

1. The number of NCBs and sessions are set to the values that the adapter currently has.
2. If the MAX parameter was specified, then the number of NCBs and sessions is set to the maximum that the NETBIOS can support.

3. If NCBS= or SESSIONS= parameters were specified, then the NCBs or sessions are set to the corresponding values.

Because NBSETUP uses the sequence above, you to mix the MAX switch with another switch such as NCBS=. For example, a NETBIOS can support up to 128 sessions and NCBs, the command line:

NBSETUP/MAX/NCBS=10

would give the same result as the command line:

NBSETUP/SESSIONS=128/NCBS=10

The sequence given above also means that if you do not include any switches to set the number of NCBs and sessions, then the NETBIOS is reset with the same parameters that it already has.

You can redirect NBSETUP's output to a file or device. This is useful if you want to log verbose information. For example:

NBSETUP MAX VERBOSE >NBSETUP.LOG

would redirect the verbose output from NBSETUP to the file NBSETUP.LOG. You can then read this file using an ASCII editor or the DOS TYPE command.

NBSETUP Switches

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. For example:

NBSETUP ?

MAX

MAX will set the number of NCBs and sessions to the maximum the NETBIOS will support. Many NETBIOS implementations support only 32 maximum sessions and 32 maximum NCBs (all versions of ARTISOFT NETBIOS support at least 128 sessions and NCBs). You can use MAX along with the VERBOSE option to determine the maximum number of NCBs 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 NCBs that the NETBIOS will recognize. The value you specify for NCBs 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

VERBOSE

VERBOSE displays detailed information about the values for the NBSETUP parameter settings. Examples of this would include the command line used to invoke NBSETUP and the maximum number of NCBs and sessions the adapter has been set to.

You can use VERBOSE to verify that the number of NCBs and sessions is set to the values that you want. See the "Messages" section of this manual for a sample NBSETUP VERBOSE output.

Example:

NBSETUP VERBOSE MAX

NET

Section Overview

This section provides an overview of the NET program as well as instructions on using the NET line commands. Since this is a task-oriented manual, you will find information on using the NET menu options in sections with names that describe a particular major task, such as "Mail," "Chat," and "Printing" in this manual. Using the NET program is also a major portion of the tutorial in the LANtastic Network Operating System User's Manual, where you will find information on such topics as "Connecting To A Server's Disk Drive" and "Connecting To A Server's Printer."

All the NET menu options will be described briefly below. Following each description, you will find references to where more information on that menu item can be found. After this you will find a reference section with a list of all the NET line commands as well as instructions on how to use them. In the last part of this section, you

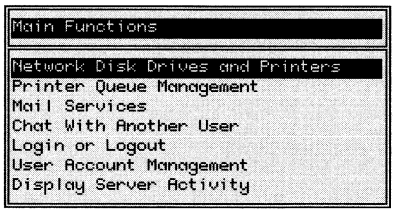
will find instructions on building network batch files, with tips on prompting users for information and using LANtastic's special string variables. The section also provides some sample batch files for bringing up networks of various sizes and configurations.

The NET Menu Options

The NET program is the user interface to the network. Using menus or the command line, you can log in to servers, attach network disk and printer devices to your workstation, use the mail or chat features, and many other functions. NET differs from NET_MGR in that NET_MGR is the program used to set up and maintain a server's accounts, network resources, audit trails, software settings and it lets you perform other system's manager tasks.

The menu-driven interface is a user-friends way of accessing network servers. When you issue the command line:

NET then press **Enter**, you will see the NET *Main Functions* menu.:



The options that you see perform these functions:

Network Disk Drives and Printers

Lets you select a server and then connect one of your local drives or printer ports to one of the server's disk or printer resources. For more information on using this function refer to "Connecting To A Server's Disk Drive" and "Connecting To A Server's Printer" in chapters 4 and 5 respectively in the *LANtastic Network Operating System User's Manual.*

Printer Queue Management

Brings up a display of printer queue activity on a server. If you have the Q privilege, you will see all the print jobs in the server's queue. If not, you will only see print jobs that you have sent. From here you can control individual print queue items, logical printer streams and the server's printer ports. For more information on this field, refer to "Printing" in this manual.

Mail Services

Lets you check a server's mail queue for messages and send mail items to other users. You can send text and voice files, or use the text editor or voice recorder to create mail messages. For more information on using the NET mail program, refer to "Mail" in this manual.

Note: To use Voice mail, you must have an Artisoft Sounding Board and the supporting software installed in both the sending and receiving computers.

Chat With Another User

Allows you to enjoy a real-time text or Voice conversation with a user at a remote network computer. When you select the *Chat With Another User* option, the chat screen will appear. Press the **Ins** key and select a remote computer. Once the connection is completed, you and the remote user can type messages to each other. If you have an Artisoft Sounding Board installed in each machine, you can talk to each other using the handsets provided with the adapter. You can even type while you Voice chat. For more information on this menu option, refer to "Chat" in this manual.

Login or Logout

Let's you log in to a server, provided you have a valid username and password. You can also log out of a server using this option. This is not the only way to log in to or out of a server, however; you can log in by net line command:

NET LOGIN \\server-name username password

You can also log in through any of the NET windows where you select a server. For example, when you select a server to look at it's mail queue, if you are not logged in to that server, you will be prompted

through the log in process, and if you provide a valid username and password, you will be allowed access to the server's mail queue. If you have the "*" account as set up by INSTALL, you can log in to the server using any username and no password. For more information on this subject, refer to "Logging In To A Server" in chapter 4 of the *LANtastic Network Operating System User's Manual.*

User Account Management

Allows you to change your password on a server, disable your account or view the current status of your account. For more information on this subject, refer to "User Account Management" in this manual.

Display Server Activity

Find out which users are logged in to a server and what requests they are making to the server. This is handy if you would like to select a network server that is not busy handling many user requests. You can also use this function to monitor the number of user requests so you can efficiently distribute the LAN workload among your servers. Refer to "Display Server Activity" in this manual for information on using this menu item.

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 software 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 portions of the command line 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 is 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 string variables in place of arguments. Refer to "NET Command Line Customizing" for information on prompting users for information. Refer to "STRING" and "Using Strings In Batch Files" for more information on LANtastic's string variable.

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

NET ATTACH allows you to redirect all the available drives on your local computer to every shared disk or directory resource on a server. This switch does not redirect printer ports. It lets users write more compact batch files by having a single NET ATTACH command rather than multiple NET USE commands.

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. For more information on privileges refer to "Accounts" in this manual.

NET AUDIT \\server-name reason "message text"

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 on a server. 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

If you do not want anyone to see the passwords as you enter them, use the command line:

NET CHANGEPW \\SERVER1 ^"Old: " ^"New: "

CHAT

This command allows you to go directly to the *Chat With Another User* menu of the NET program. Once there, you can initiate a Chat session or complete the connection when you receive pop-up notification that another user wants 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 for your own computers clock. You must already be logged in to the server.

Example:

NET CLOCK \\SERVER1

COPY

This command copies files directly on a server, thus reducing the amount of data that must be sent through the network. Both the original and destination file or directory 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 to which you have access. The advantage to using NET DIR command as opposed to the DOS DIR command is that NET DIR will display indirect file information and file attributes.

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 can be used if you go on vacation or will be away from the server 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 "Chapter 6: Setting Up User Accounts" in the *LANtastic Network Operating System User's Manual* 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

If you don't want the password to appear on the screen, use the command:

NET DISABLEA \\server-name ^"password: "

You will be prompted for the password and the text will not appear on the screen.

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 line 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   RUN       SHOW
        SEND      SHUTDOWN  STREAM    STRING    UNLINK    UNUSE
        USE       ?
```

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 workstation 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 time

time 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 the LPT timeout:

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, you will not hear the informative tone when messages arrive.
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

POSTBOX

This command searches the mail 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 use a network printer, you would issue 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 \\SERVER1\@DRAFT "Use less paper"
NET PRINT/BINARY x?.out  \\SERVER1\@CAD "Plotter files"
NET PRINT label.out lpt2  "Labels for Jill" 1000
```

QUEUE HALT

You can use this command to halt despooling on a server or a specific server printer device. If the server is despooling a print job when the NET QUEUE HALT command is issued, it will be placed back in the print queue when despooling is restarted. This print job will then start over from the beginning. 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 the same print job when despooling is restarted with the NET QUEUE START command. This is different from the NET QUEUE HALT command where the current print job is restarted from the beginning. 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. This differs from the NET QUEUE START command in that NET QUEUE START used re-enable printing after a NET QUEUE HALT, NET QUEUE PAUSE or NET QUEUE STOP command has stopped despooling on a server device.

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. This will not set *Despooling* in the *Server Startup Parameters* to "ENABLED." If despooling is disabled in the *Server Startup Parameters*,the NET QUEUE HALT command will only enable despooling until you reset the computer or issue a NET QUEUE HALT, NET QUEUE PAUSE or NET QUEUE STOP command. 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  CPS: 0     Read: 11808    Output: 11815    Copies left: 0
LPT2 DISABLED -- Not Despooling --
LPT3 ENABLED  -- Not Despooling --
COM1 PAUSED   -- 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)

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

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 pop-up message box will not appear, but the message text 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. From 0 to 65539 seconds

Examples:

NET RECEIVE
NET RECEIVE 15 7

RUN

This option allows you to issue a command to be executed on a remote server. The command will be executed as though a user at the remote server had entered the command at the keyboard. This can be useful for running system intensive operations such as database sorts and backups. You can also include the NET RUN command in a batch file, so you can set up automated methods for backing up your servers, compiling databases and other operations. In order to use the NET RUN command you must have the "S" System Manager privilege. For more information on this privilege, refer to "Chapter 6: Setting Up User Accounts" in the *LANtastic Network Operating System User's Manual.*

NET RUN(/NOCR) \\server-name "command-string"

NOCR	Instructs NET not to insert a carriage return at the end of the command string.
server-name	The server on which you would like the command executed.
command-string	The command you would like executed on the server.

Example:

NET RUN \\SERVER1 "BACKUP.BAT"

SEND

This command allows you to send an unsolicited, one line, text message to any network computer. 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 computer.
"message"	Message you wish to send.

Example:

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

SHOW

This command allows you to find out the network 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 V4.nn - (C) Copyright 1991 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 workstation.
- File and record locking have been enabled by running the DOS SHARE program.
- Pop-up messages will appear 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 (0) in PEER1.
- The local drives on PEER1, D: and E: are connected to C-DRIVE and A-DRIVE on the server PEER2.

The /BATCH option allows you to quickly create custom batch files to log in to network servers and use their resources. To use this option, simply use the NET menu or command line interface to set up the

log-ins, and disk and printer redirections that you will want to use on a daily basis. You must then redirect the output to the batch file you would like to create. The sample below uses the file LOGIN.BAT.

```
NET SHOW/BATCH >LOGIN.BAT
```

the NET program will build a list of the NET commands currently in use, and this output will be sent to a batch file you've previously created.

SHUTDOWN

This command allows you to remotely schedule the shutdown and/or reboot of a server. You can include a text message to warn any users logged in to this server that it is shutting down. Once this command is issued, you can continue local operations with your local computer including logging out of the server, shutting down your computer, delaying the shutdown of the remote server or finishing up any last minute details. You can also cancel the shutdown or reboot operation by using the /CANCEL switch. To issue this command, you must have the "S" System manager privilege for your user account on the remote server. For more information on this privilege, read Chapter 5 of the *LANtastic Network Operating System User's Manual.*

NET SHUTDOWN{/REBOOT}{/CANCEL/HALT/SILENT} \\server-name {{minutes} "message"}

/REBOOT	Reboots the computer after SERVER shutdown.
/CANCEL	Cancels a pending shutdown of a server.
/HALT	Stops processing on the server after shutting down.
/SILENT	Shuts down the server without sending notification to users logged in to the server.
minutes	Number of minutes before server shutdown. (The default is 0 minutes.)
message	Message to send to logged in users to warn them of impending shutdown. If no message is included on the command line, users logged in to the server will see the text: "Server is shutting down."

Examples:

```
NET SHUTDOWN \\SERVER1 5 "SERVER1 shut down in # minute$!"
NET SHUTDOWN/REBOOT \\SERVER1 10 "Server rebooted in # minute$!"
NET SHUTDOWN/CANCEL \\SERVER1 "Shutdown aborted."
```

Notice the pound sign "#" and the dollar sign "$" symbols in the first two examples. When the message is displayed on a user's screen the pound key will be replaced with the number of minutes until the server shuts down. The dollar sign variable will be replaced with an "s" if there is more than one minute left. The user will receive updated informative messages until the server is shut down. Using the first example above, this is the first message the user would see:

SERVER1 shut down in 5 minutes!

Four minutes later the user would receive this message:

SERVER1 shut down in 1 minute!

One minute later the user would receive the message:

Server is shutting down

Users will always receive this message just before the server shuts down.

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 server 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 Strings 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:

!"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 the next section.

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. Since you cannot unlink the same drive you are using, you must first change to another drive (local or redirected) to unlink the A: or B: drive.

NET UNLINK

Refer to "Remote Booting" in this manual for more information on using remote booting in a LANtastic network.

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 printer device to which you want to redirect your local port. You can also redirect printer output to a file. For more information on this subject, refer to "Printing" in this manual.

Examples:

NET USE F: \\SERVER1\C-DRIVE
NET USE LPT1 \\host\@laser
NET USE COM1 \\server1\@plotter

NET Command Line Customizing

You can customize the NET program to provide prompts for input. This is especially useful for networks with inexperienced users. By including these prompts in network batch files you can guide them through the process of logging in or any other task you would want them to perform.

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 next to 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.

In such cases you must 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

To create powerful batch files, LANtastic NOS allows you to manipulate environment string variables. These strings are just like DOS environment variables. An environment 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 as well as 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. For a complete list of the strings available, refer to "NET STRING" presented earlier in in the commands portion or this section.

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
```

NET_MGR

You will find information on using the NET_MGR program throughout the *LANtastic Network Operating System User's Manual* and the *LANtastic Network Operating System Reference Manual.* This section is included to present an overview of how to run the program and also to serve as a guide to finding more detailed information on using NET_MGR's many functions. In this section you will find a brief description of the NET_MGR *Main Functions* menu options as well as references to sections of the manual where more information can be found.

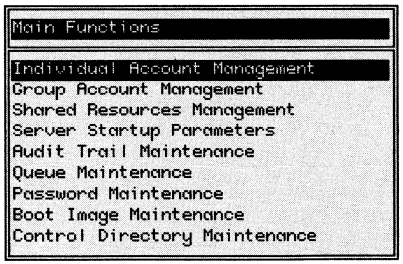
The NET_MGR program is the software responsible for performing such functions as managing user accounts and server resources, fine tuning the server's software settings and many other system manager tasks. To run NET_MGR, type:

NET_MGR then press **Enter**.

You must run the NET_MGR program from the same disk where you have installed the LANtastic Network Operating System files (usually your C: drive) or the NET_MGR program will appear with only the *Control Directory Maintenance* option showing. This is because the NET_MGR program must be able to find the network control directory, LANTASTI.NET, in order to provide account, resource and other server information. To run NET_MGR from a different drive, simply use the CONTROL= switch to specify where the network control directory is located. For example:

NET_MGR/CONTROL=C:\LANTASTI.NET

You will see this menu:



The options that you see perform these functions:

Individual Account Management

Lets you create and maintain individual user accounts. You can specify what types of access the user may have to server resources such as Mail and printer queues, disk drives and printers. You can also specify when the user can log in to the server, how long a user account or password will last, and how often a user must change his or her password. For information on using this option, refer to "Chapter 6: Setting Up User Accounts" in the *LANtastic Network Operating System User's Manual.*

Group Account Management

Allows you to set up and manage group accounts. Group accounts allow more than one user to log in through an account. The same restrictions can be set up for group accounts as individual accounts. For any user to log in through a group account, he or she must know the password (if any) for that account. On group accounts, users cannot change the password using the NET *User Account Management* option. For information on using this option, refer to "Chapter 6: Setting Up User Accounts" in the *LANtastic Network Operating System User's Manual.*

Shared Resources Management

Allows you to create, modify or remove resources that this computer shares with the network. You can also specify the types of access that individual users or user groups may have for each resource. Refer to "Chapter 7: Setting Up Shared Resources" in the *LANtastic Network Operating System User's Manual* for more information on this subject.

Server Startup Parameters

Provides a menu where you can set the software configuration for a server. Having these setting carefully matched to your network users' needs can greatly enhance performance. Refer to "Chapter 8: Configuring Your Server's Software Settings" in the *LANtastic Network Operating System User's Manual* for information on setting these fields. You can also use this option to set up audit trails. This allows you to keep an accurate log of server activity for security, billing or monitoring network efficiency. For more information on the subject refer to "Audit Trails" in this manual.

Audit Trail Maintenance

Lets you view the audit trail file if you've set up one. You can also save the audit trail file to another disk location or delete the audit trail file. For more information on using these options, see "Audit Trails" in this manual.

Queue Maintenance

Provides options to change the location where the printer files will be kept, and clear all the files out of the spool area. This allows you to move the spool location to a faster disk or even to a RAM disk to speed network printing. Refer to "Moving The Printer Spool Area"

and "Clearing The Printer Spool Area" in the "Printing" section of this manual.

Password Maintenance

Lets you set up a password requirement to enter the NET_MGR program on a server. This prevents users from changing account resource or any other server configuration information. For information on setting up a password requirement for NET_MGR refer to "Security" in this manual.

Boot Image Maintenance

Allows you to create a boot image for diskless workstations to use for remote booting. For more information on using this feature in your network refer to "Remote Booting" in this manual.

Control Directory Maintenance

Presents you with a menu of options for creating and maintaining network control directories. A network control directory is where server information for user accounts, disk and printer resources and other server configuration options are kept. By creating alternate control directories, you can have a network configuration for any situation. You can accommodate seasonal user account changes, temporary user group needs for increased or decreased access security or any other networking situation that calls for changing the server configuration at a moment's notice, and being able to change it back just as quickly. See "Control Directory Maintenance" in this manual for more information.

Running NET_MGR With Command Line Switches

To run the NET_MGR program with command line switches, use the syntax:

NET_MGR/switches

where "switches' denotes any of the optional command line switch described in the section below. 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 assign a control directory with the CONTROL= switch) the switch 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:

NET_MGR/MONO

You would use the third or fourth formats for the CONTROL= switch

NET_MGR/CONTROL=C:\LANTASTI.NET

NET_MGR Command Line Switches

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.

Physical Access 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 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 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.

You must also make sure the server port where the printer is attached is not redirected to another server's printer resource. For example, if a user at a workstation uses direct physical access to print to the printer attached to LPT1 on SERVER1, and SERVER1 has its LPT1 port redirected to LPT2 on SERVER2, the print job from the workstation will be output on LPT2 on SERVER2.

To use the P ACL:

❶ At the DOS prompt, create a shared directory. For example:

MD DIRECT

❷ Set up the directory as a shared resource and give it the P ACL. (For information on this subject, refer to "Chapter 7: Setting Up Shared Resources" in the *LANtastic Network Operating System User's Manual.*)

❸ To use the device directly, specify the full network path, including the shared directory and the device. For example:

```
COPY  FILE.TST  \\SERVER1\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!  >\\SERVER1\DIRECT\CON
```

will display the text "HELLO THERE!" on the server's monitor.

Printing

This section provides information on network printing in general and using a server's print queue from both the command line and menu interface. This section assumes you've already set up your network printer resources. If you have not done this yet, refer to "Chapter 7: Setting Up Shared Resources" in the *LANtastic Network Operating System User's Manual.*

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 compete, 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.

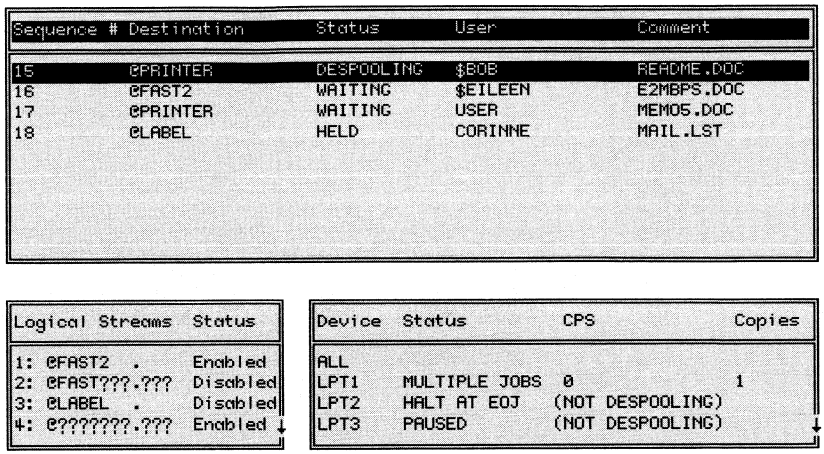
Manipulating Items In The Print Queue

When you send data to a server's 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.

❷ Select the *Printer Queue Management*, and press **Enter**.

❸ 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:



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 despooled to the printer.

HELD A user has stopped despooling this entry. Held entries can then be deleted or restarted.

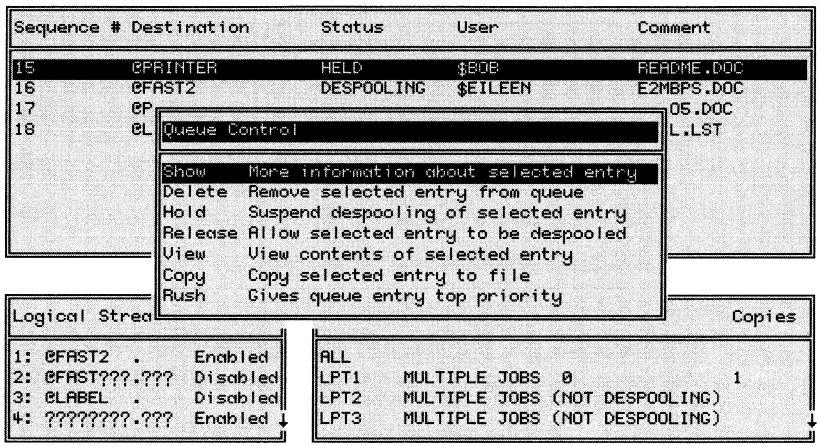
UPDATING A user is placing an item on the queue.

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:

❹ 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:



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.

Creating A Print Item Using The Text Editor

To create a text file and output it on a server's printer, complete the following steps:

❶ Complete steps ❶ through ❸ from the previous section.

❷ Press **Ins**.

❸ The *Make Queue Entry Options* menu will appear with the *Use Screen Editor* option highlighted. Press **Enter**.

❹ Select a server printer device and press **Enter**. The text editor will appear.

❺ Enter your text in the screen provided. These keys perform the following functions:

Arrow keys	Moves the cursor up, down, left and right.
Backspace	Deletes the character to the left of the cursor.
Del	Deletes the character the cursor is on.
Ins	Toggles between insert and overwrite modes.
F1	Provides help information. The help windows can be enlarged then reduced to their former size by pressing **Z**.
F2	Sends text to the printer.
F7	Inserts a blank line before the line the cursor is on.
F8	Deletes the line the cursor is on.
Esc	Exits the text editor without sending the text to the printer.

❻ Press **F2**.

❼ Type a comment for the print job (optional) and press **Enter**.

❽ Type in the number of copies you would like printed and press **Enter**.

The text will then be sent to the server's printer. If you don't see the print job appear on the server's queue, the print job may have been despooled to the printer before the display could be updated. Pressing the **Space Bar** will update the queue display.

Copying A Text File To A Server's Queue

If you have a text file that you would like to send to a server's printer, complete the following steps:

❶ Complete steps ❶ through ❸ from "Manipulating Items In The Print Queue."

❷ Press **Ins**.

❸ The *Make Queue Entry Options* menu will appear. Select *Copy Text File to Queue* and press **Enter**.

❹ Select a server printer device and press **Enter**.

❺ Type in the name and full DOS path of the text file that you would like to send and press **Enter**.

❻ Type a comment for the print job (optional) and press **Enter**.

❼ Type in the number of copies you would like printed and press **Enter**.

The file will then be sent to the server's printer. If you don't see the print job appear on the server's queue, the print job may have been despooled to the printer before the display could be updated. Pressing the **Space Bar** will update the queue display.

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 Chapter 7 in the *LANtastic Network Operating System User's Manual.* You will also need to set the number of printer tasks in the *Server Startup Parameters* to the number of printers installed in your computer. See Chapter 8 of the *LANtastic Network Operating System User's Manual.*

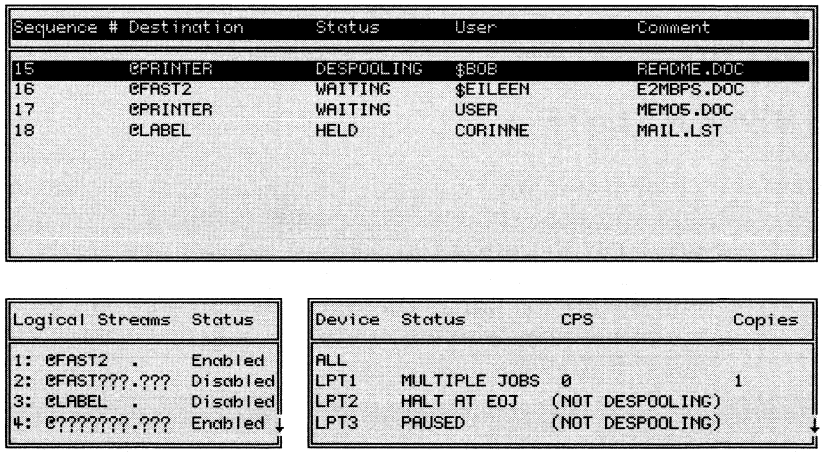
Controlling Multiple Printers

Once you've set up a server's printers as network resources as directed in Chapter 7 of the *LANtastic Network Operating System User's Manual*, you can control each one individually. This means that you can halt printing on the device attached to LPT2, but still use the rest of the printers.

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

❷ Select *Printer Queue Management* and press **Enter**.

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



❹ 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.

❺ 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*.

❻ Use the arrow keys to select the appropriate option from the *Printer Control* menu and press **Enter**.

❼ Repeat steps ❺ and ❻ for any of the other printers.

❽ Press the **Esc** key to exit each window until you are returned to the DOS prompt.

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 or cartridge. In these or any other circumstances where you want to stop despooling, you can use the following steps.

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

Stopping Despooling

To stop network printing after the current print job type:

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 of the server's printers. For information on controlling individual printers, refer to the *NET* section of this manual. To halt printing immediately, type:

NET QUEUE HALT \\SERVERNAME then press **Enter**.

Once despooling restarts, the print job will started over from the beginning.

To stop a print job, then start it again at the same place 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, type:

NET QUEUE RESTART \\SERVERNAME then press **Enter**.

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 port 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.

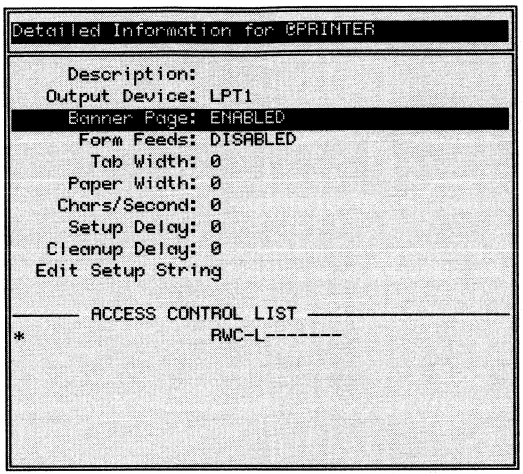
To enable banner pages:

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 yyy   yy            M  MM  MM   eeeee   m mmmm    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\C-DRIVE\OUTPUTS\FILE1

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

This is convenient when you want to send printer output to a file, rather than printing the file. For example, you can use this feature 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\C-DRIVE\OUTPUTS\FILE1
NET USE LPT1 \\SERVER1\C-DRIVE\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.

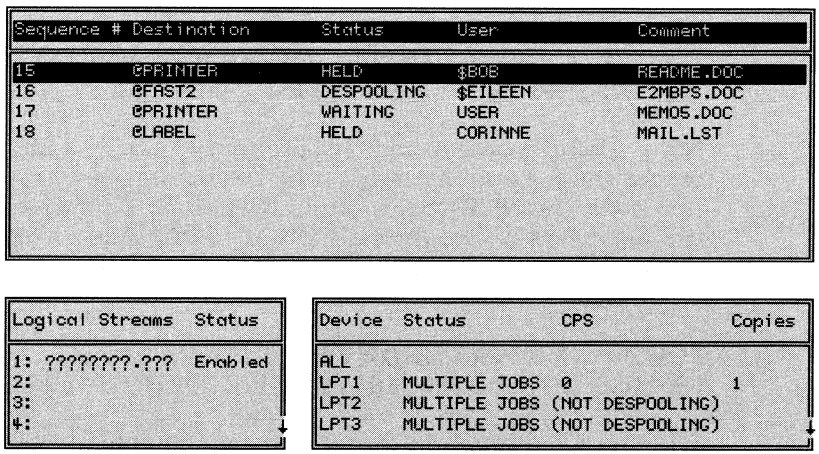
Controlling Multiple Printer Streams

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 *Printer Queue Management* and press **Enter**.

❸ Select a 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)		

❹ 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.

❺ 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**.

❻ 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

When you run the SERVER program, by default, network despooling is enabled. This means that if you are printing locally and a network print job is sent to the same printer, the local print job will be cancelled as soon as the network print job begins printing. In order to use the printer locally at the server, the user must log in to that server and connect the local printer port to the network device. Once this is done, the user's print jobs will be scheduled with the rest of the network print jobs. If you do not want to share this printer with the rest of the network, you can halt network despooling on all or individual printer ports, and then the port(s) will function as they did before you ran the SERVER program. The two options for allowing local printing are described in the two sections below.

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:

❶ Complete the steps listed in "Logging In To A Server" in chapter 4 of the *LANtastic Network Operating System User's Manual.* When

you select a server name, you will select the same machine you are using.

❷ Complete the steps listed "Connecting To A Server's Printer" in chapter 5 of the *LANtastic Network Operating System User's Manual.*

Halting Despooling

❶ 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.

❷ 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.

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* and press **Enter**.

❹ Select the first option, *Change Spool Location* and press **Enter**. You will see a window with the current location of the spool files.

❺ 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.

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* and press **Enter**. You will see the *Queue Maintenance* menu.

❹ Select *Clear Spool Area* as shown in the example below, and press **Enter**. A screen will appear.

❺ Type **YES** then press **Enter**.

This will delete all files within the printer spool area.

REDIR

REDIR.EXE is LANtastic's redirector program. It's purpose is to wait for DOS requests that are intended for network disk drives and printers, and redirect those requests to a network server. On the server, the SERVER.EXE program will then take these REDIR requests, check for proper access rights, and then if the user has proper authorization, SERVER will perform the necessary processing, and return the result.

Before you run REDIR, you must have NETBIOS software running. The NETBIOS software supports your network hardware (usually an adapter) and provides reliable communications across the network cable.

You must then run REDIR on any computer that you want to function as a workstation. You must also run REDIR on any computer that you

to use as a server, but on these machines you must then run the SERVER program as well.

For more information on how the various network programs work together, consult chapter 2: of the *LANtastic Network Operating System User's Manual.*

Running The REDIR Program

The REDIR program 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 REDIR program, use the syntax:

REDIR MACHINE_NAME /SWITCHES

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

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:

REDIR SERVER1 /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:

REDIR SERVER1 /VERBOSE

or

REDIR SERVER1 /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.

REDIR Command Line Switches

@indirect-file

This switch specifies that further switches are to be taken from an indirect file. 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= (4) Range 1 to 3600 decimal

This switch sets the interval in seconds between each beep tone. For example, you will receive these tones whenever a server is slow in processing your request Consult "Informative Tones" for more information on this 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 properly implement chain sends.

POPUP_DURATION= (10) Range 0 to 3600 decimal
This switch sets the length of time in seconds that pop-up informative messages (such as when a user wants to Voice Chat with you) will appear on the screen.

POPUP_LINE= (5) 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.

REMOVE
This switch removes the REDIR program from memory. You will be logged out of all servers, all network files will be closed and all network printer and drive connections will be cancelled. You may not use the REMOVE option with any other command line switches. Further, You must remove Terminate and Stay Resident (TSR) programs in the opposite order they were loaded. For example, if you loaded REDIR and then SERVER, you must remove SERVER from memory before you can remove REDIR.

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 32768 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.

Re-Enabling An Account

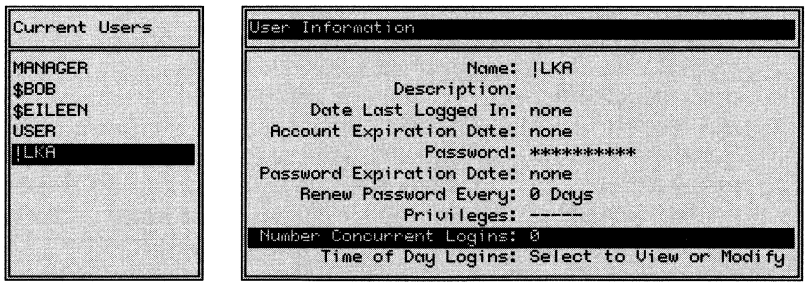
To re-activate an account disabled with the *User Account Management* menu's *Disable Account* option:

❶ Type: **NET_MGR** then press **Enter**. You will see the NET_MGR *Main Functions* menu.

❷ Select the first option, *User Account Information* and press **Enter**. A screen with the list of user accounts will appear.

❸ Use the arrow keys to select the account you want to enable and press **Enter**.

❹ You will see the *User Information* window. Move the highlight bar to the *Number Concurrent Logins* field and press **Enter**.



❺ Key in the number of concurrent log-ins you want this user to have and press **Enter**.

The user can once again use the account to log in to this server.

Remote Booting

The concept behind remote booting is simple: If you store a boot image on a network server, the workstations can use this software to boot up to the DOS prompt. Workstations don't even need to have disk drives since they can use network devices. This can save you money since you can buy less expensive diskless workstations for your networks rather than PCs with hard and floppy drives. This also allows you to set up a very secure network, since users can't use their workstations unless the network boot server is running. Users also can't take software home, since they have no local drives to copy it to a floppy.

The key to making this process work is to install a Read Only Memory (ROM) chip on the network adapter of each diskless workstation. You can purchase these ROM chips for Artisoft adapters. When the workstation is powered on, the software in the ROM chip will load the driver software for the adapter and the Remote Program Loading (RPL) code will search for the boot server. Once this server is found, the diskless workstation uses the image stored on the boot server to boot up to the DOS prompt. After this, the workstation can log in to any network server where the user has proper access rights or privileges and use network disk drives and printers. You can even include batch files in the boot image, which will be executed after the workstation boots up. All your network users need do is switch on their workstations, and their drive and printer redirections will be made for them.

The procedure for setting up your network for remote booting consists of these steps:

- Installing the ROM chips on your network adapters
- 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

Make sure you have the ROM chip installed in the workstation adapters before you attempt to use the remote booting feature.

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 of 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 Use the INSTALL program to place the necessary file for this computer to function as workstation. Refer to Chapter 3 of the *LANtastic Network Operating System User's Manual* for information on running the INSTALL program.

❹ Create a CONFIG.SYS and an AUTOEXEC.BAT file and copy them to the boot disk. You can create these file using any ASCII text editor such as EDLIN. In the two sections that follow, you will find sample CONFIG.SYS and AUTOEXEC.BAT files for use in a network using remote booting.

You can add any commands to the batch files on the boot image disk, but make sure that you only include commands you want executed on all the diskless workstations.

Sample CONFIG.SYS For A Diskless Workstation

The following is a sample CONFIG.SYS file for diskless workstations.

```
BUFFERS=16
FILES=20
LASTDRIVE=Z
FCBS=16, 8
```

The BUFFERS= command sets the number of DOS buffers to 16. FILES=20 means that DOS will allow up to 20 files open on this machine at a time. Setting LASTDRIVE equal to Z allows this machine to use drive letters A: through Z:, an extremely useful on a network where you may many logical drives connected to remote server disk drives. The last command sets the maximum number of File Control Blocks (FCBs) and the maximum number of FCBs that can be closed automatically . You may add any other commands to the CONFIG.SYS, but remember that this CONFIG.SYS will be used by all the diskless workstations. So if, for example, you want to include a device driver such as ANSI.SYS, make sure that all the diskless workstations have a monitor that uses this driver.

Sample AUTOEXEC.BAT For A Diskless Workstation

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
```

Unlinking Local Workstation Drives

If your workstations have A: floppy drive, you may want to unlink these drives after the workstations boot up. This will allow users at the diskless workstations to use their A: drives locally. 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 then be issued from the other drive.

The diskette should now have all the information necessary to create a boot image.

Boot Image Maintenance

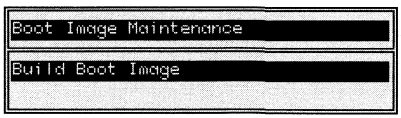
The NET_MGR *Boot Image Maintenance* option copies a floppy disk to a file on the hard disk called BOOT.IMG. Once this is done, the server that has this boot image will be the boot server for the diskless workstations. The boot server does not have to be the same server that they will log in to for network resources. To create a boot image on a server:

❶ Select the network boot server. Start the computer, if the SERVER program is already running, press **Ctrl+Alt+Del** then press **S** to shut down the server.

❷ Run NET_MGR on the network boot server. Type:

NET_MGR then press **Enter**.

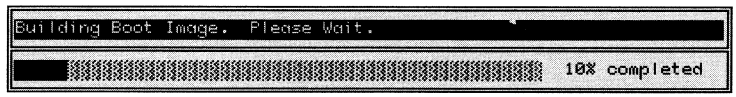
❸ Select the *Boot Image Maintenance* option from the NET_MGR *Main Functions* menu and press **Enter**. You will see this menu:



❹ Press **Enter**. You will see the following menu:

❺ 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. To a diskless workstations, it will be as if it had booted up using the bootable floppy disk.

❻ Store the floppy disk in a safe place so you will have a backup copy of your boot image.

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.

❸ Refer to your hardware manual for information on loading the NETBIOS for the specific network adapter you're using.

Booting Up Diskless Workstations

❶ Make sure the remote booting hardware is installed as instructed in your adapter manual.

❷ Make sure the boot server is running and that the NETBIOS and Network Operating System software is running. Refer to your hardware manual for information on loading the NETBIOS for the specific network adapter you're using. In a LANtastic 2Mbps network, you must designate this server as node number one in order for it to function as a boot server. You specify this on the LANBIOS2.EXE command line:

LANBIOS2/NODE=1

In a LANtastic Ethernet network, you do not need to specify a boot server as node number one.

❸ 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 19nn ARTISOFT Inc.

Once the NETBIOS is installed, the remote booting software will attempt to find a boot server. The boot utility will then attempt to boot from the floppy. If no floppy is present, it will begin the remote boot sequence on the network and you will see 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. If this occurs, recreate the boot image using the boot disk created earlier, then repeat the remote booting process. If the error persists, create a new boot disk and transfer the image to the boot server.

Security

The purpose of this section is to provide you with necessary information to set up a secure server. 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 server 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.
- Removing the default "*" group account or removing the account privileges from it.

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 want to keep users out of the NET_MGR program so they won't tamper with the user 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 Chapter 6 of the *LANtastic Network Operating System User's 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 "Chapter 7: Setting Up Shared Resources" 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
C-DRIVE	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	ADMIN-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 the ACL for 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 Chapter 7 of the *LANtastic Network Operating System User's 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 Trails."

Time Of Day Logins

In order to avoid after-hours use of computer resources, you can limit the time of day and the hours of the week when your users will have access to the server. For more information on enabling this feature, refer to chapter 6 of the *LANtastic Network Operating System User's Manual.*

SERVER

The SERVER.EXE program allows a computer to share its disk drives and printers with other network computers. When SERVER is run, part of it remains active in memory after it terminates. SERVER then works closely with DOS waiting for requests from the REDIR program. When a request is received, SERVER checks the access rights of the user who originally made the request and then either sends back a message informing the user that the request has been denied, or it performs the requested function and returns the desired result. For more information on how the various network software operate with each other, refer to "Chapter 2: Basic Networking Concepts" in the *LANtastic Network Operating System User's Manual.*

Running The SERVER Program

Before you run the SERVER program, you must first load the NETBIOS then REDIR.EXE then SERVER.EXE. The NETBIOS that you load will depend on the type of network hardware you are using. Consult your hardware user's manual for more information on running the correct NETBIOS.

The SERVER program 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 SERVER program, use the syntax:

SERVER CONTROL=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:

SERVER/LOGINS=8

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

Shutting Down Or Rebooting A 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:

❶ Press **Ctrl+Alt+Del**. LANtastic NOS will intercept the reboot command and present you with a display 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. Alternately, you can use the SHUTDOWN_KEY= switch to specify which key will be used in combination with **Ctrl+Alt** to shut down the server.

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

❷ If you want to remove the SERVER program from memory and not reboot the computer, press the **S** key. This will close all the open network files and remove the SERVER program from memory. However, if SERVER was not the last TSR loaded, you will see the "can't remove" message on the shutdown display.

When this occurs, you can still shut down the SERVER program, but it will remain in memory. To shut down the program and remove it from memory, you must remove any TSRs from memory

that were loaded after SERVER. You must remove them in the reverse order in which they were loaded. For example, if you loaded SERVER, then LANPUP and Sidekick™, you must first remove Sidekick, then LANPUP, and finally SERVER. You can remove SERVER from memory using the steps listed above, the NET SHUTDOWN command, or the SERVER/REMOVE switch described below.

Once SERVER is shut down, any users who are logged in to the server will be notified by a pop-up message that the server has shut down. Your computer will still function as workstation, so you can continue to use disks and printers attached to remote servers.

If you want to reboot the computer, press **Ctrl+Alt+Del**. If LANcache is running, it will flush the cache then the computer will reboot. To cancel shutdown and return to your program, press any other key.

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. 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 be 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 users to log in
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 or AE-3 Ethernet adapters, or six LANtastic NE-3 Ethernet adapters, or six LANtastic 2 Mbps adapters in a server. Each adapter will then 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 or 50-5100 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 network users 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 for the network users rather than those allocated through the CONFIG.SYS file. When this switch is set to 0 (the default) the network users and local user will use the FILES= value in the CONFIG.SYS file.

FLOPPY_DIRECT= (YES) Yes or No

This option allows you to either enable or disable direct access to a floppy disk. When this option is enabled, a remote user can issue DOS FORMAT and CHKDSK commands on the floppy. If you enable direct

access, make sure that no one reformats a floppy while it is being 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= (5) 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, 3K, 4K, 5K, 6K, 8K, 10K, 12K, 14K, 16K, 18K, 20K, 24K, 28K, 32K, 40K, 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 bytes, 1K, 2K, 3K, 4K, 5K, 6K, 8K, 10K, 12K, 14K, 16K, 18K, 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.

REQUEST_SIZE= (14 bytes) Range 14 to 2048 bytes
This option allows you to increase the size of the buffer the server uses when "listening" for a user request. If a request such as a directory lookup (DIR) or a find next file operation requires more space than the request buffer can hold, the request must be handled with two network operations instead of one. By increasing the size of this request buffer, you can allow more memory for user requests. This can improve performance for operations such as file lookups, and small random write requests. Increasing the size of the request buffer will also use more server memory. Remember that a request buffer is allocated for each of the *Maximum Users* value you have set in the *Server Startup Parameters* menu. So if you have *Maximum Users* set to 10, and allocate 50 bytes for the request buffer, the server will use 360 extra bytes of memory for request buffers (500 bytes minus the default 140 bytes).

REMOVE
This switch shuts the SERVER program down and removes it from memory. You may not use this switch with any other command line switches. Further, You must remove Terminate and Stay Resident (TSR) programs in the opposite order in which they were loaded. For example, if you loaded SERVER and then LANPUP, you must remove LANPUP from memory before you remove SERVER. If the server has not been shut down with the NET SHUTDOWN command, or by pressing **Ctrl+Alt+Del** then pressing **S**, the REMOVE switch will shut down SERVER before removing it from memory.

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 this option is set to READ-ONLY or READ-WRITE, 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.

RUN_BUFFER_SIZE= (127 bytes) Range 0 to 1024 bytes

This option allows you to specify the size of the buffer used for NET RUN commands. This buffer is similar to a type-ahead buffer used with keyboards. If you will be issuing multiple NET RUN commands to a server, this option can allow multiple commands to be queued up. If you will not be using the NET RUN command on your network, you can reduce the amount of memory required by the server by reducing the size of this buffer. If you set this field to 0, the NET RUN feature will be disabled on this server.

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.

SHUTDOWN_KEY= (Del) A-Z, Del

You can use this option to assign the keystrokes for shutting down the SERVER. The default keystrokes are **Ctrl+Alt+Del**. When you use this switch, the **Ctrl+Alt** will remain constant, but you can assign keys A through Z in place of the **Del** key. For example, the command line:

SERVER/SHUTDOWN_KEY=S

would assign the keystrokes **Ctrl+Alt+S** to shut down the server. This switch is useful when running software that traps **Ctrl+Alt+Del** commands and thus prevents you from shutting down the server.

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.

UPS Support

The LANtastic Uninterruptable Power Supply (UPS) support feature allows you to shut down a server when a UPS detects a blackout or brownout. When a shutdown is imminent, all the network users will receive messages telling them the number of minutes until the server shuts down. This allows users to close all open network files and save all data before the UPS batteries run out. If the power comes back on, the shutdown will be cancelled and the network users will be notified. You can also schedule the shutdown early to save the UPS batteries.

To use this feature, you must connect a cable from the serial port of the server to a serial port on the UPS. Refer your UPS manual or contact the manufacturer for serial cable requirements for this type of communication. You must then load the UPS support driver.

You will find information on the types of UPS supported and information on using this feature with specific UPS models in the README.DOC file provided on your LANtastic distribution diskette. Refer to this file for more information on using this feature.

User Account Management

This option allows you to either change your password on an individual account or disable an individual or group account if the number of concurrent log-ins for that account is set to one. 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 server 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

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

❷ Select *User Account Management* and press **Enter**.

❸ Select the server with your account and press **Enter**. You will see the NET *User Account Management* menu.

❹ Select the option *Change Password* and press **Enter**.

❺ Type in your old password and press **Enter**. This prevents another user from changing your password without your permission.

❻ 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.

❼ 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 disable 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, you must disable your account by setting the number of concurrent log-ins in the NET_MGR *Individual User Account Management* or *Group Account Management* options to zero.

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

❷ Select *User Account Management* and press **Enter**.

❸ Select the server with your account and press **Enter**. You will see the NET *User Account Management* menu.

❹ Select the option *Disable Account* and press **Enter**.

❺ Type your password in the window provided, and press **Enter**.

Your account is now disabled. In order to re-activate it, you must use the *Individual Account Management* or *Group Account Management* options of the NET_MGR program to set the number of concurrent log-ins to at least one.

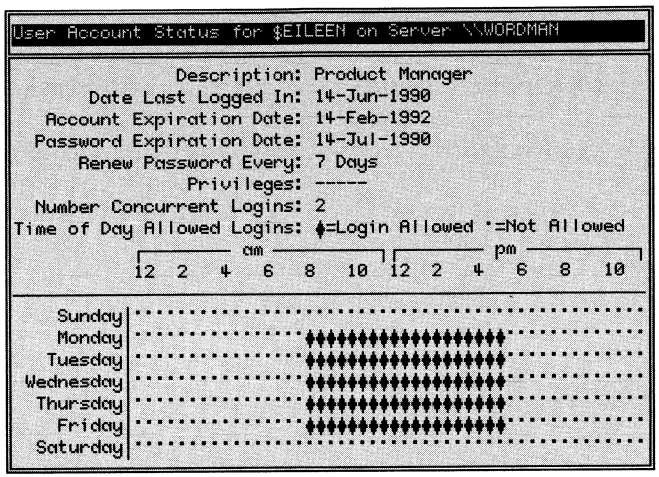
Show Account Status

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

❷ Select *User Account Management* and press **Enter**.

❸ Select the server with your account and press **Enter**. You will see the NET *User Account Management* menu.

❹ 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 every 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 network 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.

- Specify a larger request buffer size on the SERVER command line. A request buffer is allocated for each network user. This buffer is

used to listen for requests from that user. By having a larger request buffer, user requests can be handled at once instead of through multiple buffers. This can increase the speed at which functions such as directory lookups (DIRs) and small random writing operations are performed. Increasing the size of this buffer will also use more server memory.

- Increase the number 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. If you are running LANcache, setting the number of buffers to a value greater than eight will generally 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 "REDIR" 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 "REDIR" 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 an additional network buffer for each task you allocate. This will take more memory away from the server, and can 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 many 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 any network software.

- 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 this 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 about 8.

- If you will not be using a server as a workstation for any length of time, run ALONE, the server stand-alone program. When you need to use the server as a workstation again, simply press **Esc** to exit ALONE.

- 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 workstation 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 Artisoft 2 Mbps adapters) or increase the packet size (if you are using Artisoft AE-2 or AE-3 Ethernet Adapters) used by the NETBIOS. This will allow the server to process larger blocks of data.

- If you are not using the indirect files feature, remove the "I" ACL from server disk resources. This reduces the amount of checking that LANtastic NOS must perform when users open files and perform directory lookups.

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.

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 "Using Strings In Batch Files" you will find an additional sample batch file that uses some of LANtastic's special strings.

Sample CONFIG.SYS For A Server

```
BUFFERS=32
FILES=50
LASTDRIVE=Z
FCBS=16,8
```

Sample CONFIG.SYS For A Workstation

```
BUFFERS=16
FILES=20
LASTDRIVE=Z
```

Sample Server AUTOEXEC.BAT

```
PATH C:\;C:\DOS;C:\LANTASTI
LANBIOS2
SHARE
REDIR PEER1 logins=5
SERVER
NET LOGIN \\PEER1 USER1 PASS1
NET USE LPT1 \\PEER1\@PRINTER
NET SHOW
```

Sample AUTOEXEC.BAT For A Workstation That Boots From A Floppy

```
PATH A:\LANTASTI
LANBIOS2
REDIR WS1
NET LOGIN/WAIT \\PEER1 USER2 PASS2
NET USE C: \\PEER1\C-DRIVE
NET USE LPT1 \\PEER1\@PRINTER
PATH C:\;C:\DOS;A:\LANTASTI
NET LPT TIMEOUT 10
NET SHOW
```

Appendix C: Testing Network Adapters

The NETBIOS software does some simple testing of your network adapters. 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 adapters 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 computers simultaneously to ensure that they are evaluated for performance during the same period. LANCHECK evaluates each computer's performance from when it is first brought up on the network, not just from the time LANCHECK is executed. LANCHECK will test six adapters per computer and can display a maximum of 1000 computers. 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,

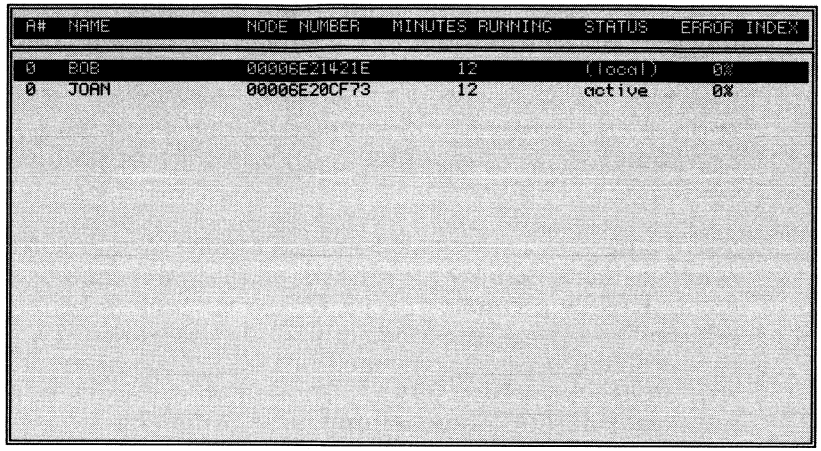
LANCHECK JOAN

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 adapters attached), the LANCHECK screen will appear as shown:



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 adapters 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.

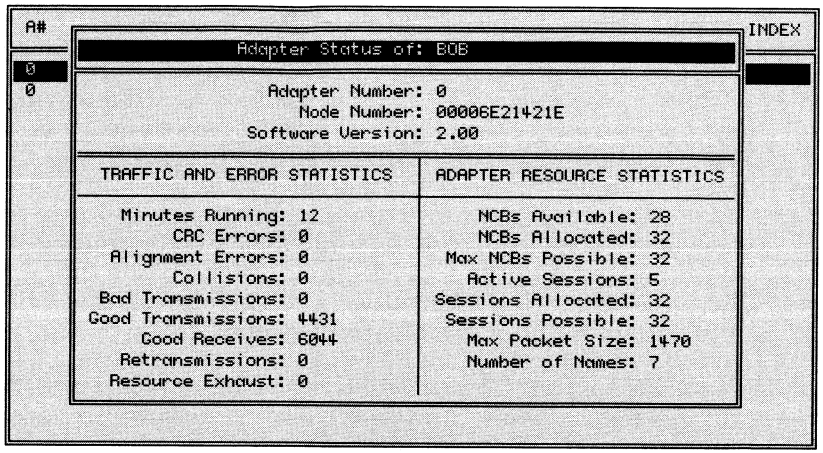
STATUS tells you whether the adapter being tested is active or inactive, and which adapters are local (located on your computer). If an adapter that is supposed to be active is listed as inactive, there may be a problem with the adapter or the cabling to that adapter. If you see an adapter with a status that keeps switching between Active and Inactive there is probably an intermittent problem with the cabling.

Make sure that two computers aren't using the same NETBIOS node number. This can occur when an adapter at a remote computer 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.

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 computer is able to receive data correctly, but is not properly transmitting data to the rest of the network. This will increase the other computers' *ERROR INDEX* scores because they will be receiving bad transmissions from the faulty adapter.

To further evaluate the efficiency of a network adapter, use the arrow keys to move the highlight bar to the desired adapter and press **Enter**. You will see this window:



The information at the top of the window tells you the name of the network computer, 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 the 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 computer 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 computer performs the same calculation on the data as it receives it then matches it against the results of the sending computer's evaluation. If the results don't

match, the receiving computer asks the sending computer 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 computer. 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 computers 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 adapters.

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 adapter with only a few other adapters and make sure this low value is not a result of poor transmissions from an adjoining network adapter.

Resource Exhaust: When a computer 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 computer 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 (NCBs), to process data and commands in and out of the adapter, network performance will suffer, or some network software will not run.

NCBs Available: If this field has a value less than eight, you should consider raising the number of NCBs allowed for this adapter. If you are using an Artisoft adapter, you can set this number with the LANBIOS and LANBIOS2 NCBS= switch or the AILANBIO MAX_NCBS= switch. If you are using a non-Artisoft NETBIOS that has no provision for setting the number of NCBs, use the NBSETUP program described in the "NBSETUP" section of this manual. A good way to estimate the number of NCBs you need is to take the number of log ins you will need and add eight.

NCBs Allocated: This field informs you how many are allocated. You may increase the number of NCBs by using the appropriate driver software switch.

Active Sessions: A session is created any time a connection between two computers 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. You should have at least one session for each user logged in to the server and one or more sessions for each NETBIOS application you are currently running.

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 adapter, press **Esc** to exit to the previous window then select the adapter you want to test and press **Enter**.

You can also check the adapter status of any network computer that is running REDIR by pressing **Ins** while in the first LANCHECK window. A screen will appear asking you for the name of the computer you want to test. Type in the name exactly as it is used by the computer, then press **Enter**. Normally you will use all capital letters. The *Adapter Status* window for the desired computer 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). If not, please complete the following steps before you call:

❶ 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.

❷ Position your phone as close to the computer as possible.

❸ Have your hardware and software manuals handy.

❹ Have your original distribution diskette nearby. 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

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 in your computer must have its own IRQ to interrupt the computer and make requests.

Specify a different IRQ when you run the adapter's NETBIOS. If you are using an Artisoft AE-2 or AE-3 adapter, make sure the IRQ jumper setting corresponds with the IRQ you specify on the command line.

For an XT type computer specify IRQ 2. For an AT type computer specify IRQ 5, 10 or 15 . All of the above IRQs may not be available.

2. You have an address conflict (the adapter 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 TSRs one a time until the problem re-occurs. Most TSR programs must be installed AFTER the network software.

3. You may have an adapter 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 uses, then select a non-conflicting range for the network adapter 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 TSRs 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 computer 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 adapters with an XT type computer you should try IRQ2. On an AT type computer, you should try IRQ 2, 10 or 15.

Logging In

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 log-ins 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.
Use the *Individual Account Management* option of the NET_MGR program to set the account or password expiration date to one in the future.

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 versions differ, upgrade all your network computers to the latest version.

Can only log in to two servers 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 workstations with the same username and password, you may need to specify a higher number of concurrent log ins.
Refer to Chapter 6 of the *LANtastic Network Operating System User's Manual* for information on setting this value.

Miscellaneous

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 NCBs and/or sessions to support your current server configuration.
If you are using an ARTISOFT adapter, increase the NETBIOS sessions and NCBs 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 NCBs.

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 mouse, modem or other device attached to COM port after network has accessed the port
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.

Printing

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 "Chapter 7: Setting Up Shared Resources" in the *LANtastic Network Operating System User's 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" in the "Printing" section of this manual 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 the "Printing" section of 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 IRQs, 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 you have the network adapter 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 network computers can communicate with one another.

LANCHECK supports up to 1000 computers 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 computers 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 LANtastic 2 Mbps adapters by simply removing the cabling.

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, AEX, NE3, AILANBIO, REDIR, SERVER, or NET commands.

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:

❶ Run 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.

❷ 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/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.

❸ 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.

❹ 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 TSRs 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 TSRs, and see if the network runs. If so, you can then run TSRs again, one at a time until the problem reoccurs. This will help you to pinpoint which TSR is causing the problem.

❺ 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 IRQs 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). TSRs can also cause lockups at this point; see ❹ above.

❻ 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. They are 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.
Use the NET_MGR *Individual Account Management* option to set the *Account Expiration Date* field for your account to a date in the future.

Adapter Independent (AI) LANBIOS Vn.nn - (C) Copyright 1990 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.

---- AEX DRIVER installed ----
This message is displayed after the low-level driver successfully installs.

---- AEX 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 occurs.

AEX is not loaded

You have issued the AEX/REMOVE command and do not have AEX.EXE loaded into memory.

Only issue this command after the program is loaded.

AEX on-board RAM failure

The AEX.EXE driver has detected an error in the on-board memory.

Call Technical Support to confirm the error. It may be necessary to service the adapter.

---- AEX removed ----

The AEX.EXE driver has been removed from memory.

---- AI-LANBIOS Installed ----

This message is displayed after the AI-LANBIOS is successfully installed.

AI-LANBIOS is not loaded

You have issued the AILANBIO/REMOVE command and do not have AILANBIO.EXE loaded into memory.

Only issue this command after the program is loaded.

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 not present
No NETBIOS was found to be installed either in RAM or in ROM.
This message is returned by the AIMOVE program. Make sure that the low-level driver and AI-LANBIOS are successfully installed when the Boot ROM executes.

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.

Cache memory can not be released until extended memory applications are unloaded
You have attempted to use the LANcache RELEASE switch when using LANcache in Extended memory. LANcache cannot release its memory until the applications that were loaded after it have been removed from memory.
Remove the extended memory applications that were loaded after LANcache, then attempt the RELEASE operation again.

Cache memory will not be released until extended memory applications are unloaded
You will receive this message when you use the LANcache REMOVE switch and LANcache is unable to release its memory. You will only receive this message if you are running LANcache in extended memory. LANcache cannot release its memory until any applications that were loaded after it have been removed from memory. Caching will still be disabled when you use this option, but other applications will not be able to use LANcache's memory.
To release LANcache's, remove the extended memory applications that were loaded after LANcache. This will automatically free up the memory that LANcache was using.

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 reallocate cache memory
LANcache returns this message when it cannot re-allocate the memory it release with the /RELEASE option. You will also see this message if LANcache cannot reallocate its memory after it has released it Microsoft Windows.
Reboot the computer and run LANcache.

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.

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 with the NET STRING command.

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-DIR

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 REMOVE -- AEX interrupts re-hooked
You have attempted to remove AEX.EXE and the interrupts are in use by another TSR, or AEX.EXE was not the last TST loaded.
Remove any TSRs loaded after AEX.EXE. For example, if you load AEX.EXE then AILANBIO.EXE , you must first remove AILANBIO.EXE, then you can remove AEX.EXE.

Can't REMOVE -- AI-LANBIOS interrupts re-hooked
You have attempted to remove AILANBIO.EXE and the interrupts are in use by another TSR, or AILANBIO.EXE was not the last TST loaded.
Remove any TSRs loaded after AILANBIO.EXE . For example, if you load AILANBIO.EXE then REDIR.EXE, you must first remove REDIR.EXE, then you can remove AILANBIO.EXE.

Can't remove -- interrupts have been re-hooked
You have attempted to remove REDIR and the interrupts are in use by another TSR, or REDIR was not the last TST loaded.
Remove any TSRs loaded after AILANBIO.EXE . For example, if you load REDIR then SERVER, you must first remove SERVER, then you can remove REDIR.

Can't remove -- ROM version installed
You have attempted to remove a copy of AILANBIO.EXE that was loaded from a ROM chip on the adapter..
You cannot use the REMOVE option with a ROM version of AILANBIO.EXE.

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.

Can't use FAST_IRQ with timer tick interrupt
You have attempted to use the FAST_IRQ= switch with the timer tick interrupt, IRQ 0.
You may not use IRQ 0 with the FAST_IRQ= switch.

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. If you are attempting to connect a local drive or port to a network device, you must cancel any existing connections on the local drive or port before making any new connections.

ERROR
This message is displayed in large letters when there is an error opening the spooled file for printing. You will also see this message if there is an error the file spooled by the despooler.
Make sure the network control directory (usually LANTASTI.NET) has not been deleted or tampered with (i.e. changed to read-only). Reissue the print job. If the error persists, you may need to allocate more files by increasing the FILE= statement in your CONFIG.SYS.

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 (FCBs) 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 AEX

```
Valid command line switches:
    HELP
    MPX= range C0 to FF hex
    PACKET_SIZE= range 570 to 1500 decimal
    REMOVE
    TRANSMIT_BUFFERS= range 2 to 80 decimal
    VERBOSE
    XEROX
    ?
    @ 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
REMOVE
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
XEROX
?
@ 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 size range for the indirect files is also listed. The low-level driver 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_IO_DELAY= Range 0 to 3600 decimal
CACHE_SIZE= Range 16 to 16000 decimal
DISABLE
DISK= One of the following choices:
0 1 2 3
ENABLE
FAST_IRQ= Performs special action
FLUSH
HELP
LONG_WRITE_DELAY= Range 0 to 3600 decimal
RELEASE
REMOVE
RESET
SHUTDOWN_KEY= One of the following choices:
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z DEL
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 cache is not installed when this switch is used.

Help Output For LANPUP

```
Valid command line switches
HELP
LINE= Range 0 to 20 decimal
STAND_ALONE
?
```

This is the output you would see if you included the HELP or ? switch in the LANPUP command line. It provides information on the valid switches for the LANPUP program as well as the valid range of values for each switch. LANPUP is not installed when you use the HELP switch.

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
    REMOVE
    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	Displays NETBIOS information after setting it
MAX	Sets maximum NCBs and sessions that NETBIOS supports
NCBS=n	Sets maximum NCBs to n
SESSIONS=n	Sets maximum sessions to n
CHECK	Displays current NETBIOS information but does not set it
? or HELP	Displays this help text

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 cache is not installed when this switch is used.

HELP Output For PPORT

Valid command line switches are:

```
ACK_TIMEOUT= Range 0 to 255 decimal
HELP
IOBASE= Range 0000 to 03FC 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
PORT= One of the following choices:
   LPT1 LPT2 LPT3 LPT4
REMOVE
RETRY_PERIOD= Range 0 to 255 decimal
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 cache 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
      POPUP_DURATION= Range 0 to 3600 decimal
      POPUP_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:
     ACK_TIMEOUT= Range 0 to 255 decimal
     BAUD= One of the following choices:
        9600 19200 38400 56000 115200 LOW HIGH
     HELP
     IOBASE= Range 0000 to 03FC 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
     PORT= One of the following choices:
        COM1 COM2 COM3 COM4
     REMOVE
     RETRY_PERIOD= Range 0 to 255 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.

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 computers 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 has malfunctioned or that the cable has been disconnected.*

Incompatible network node ???????
The remote computer's software is not compatible with the LANtastic Network Operating System.
Make sure you are running the same version of LANtastic NOS on all computers.

Incorrect response received from network node ???????
Computer ??????? has sent an invalid response to a network request or you have sent an invalid request to computer ???????.
Make sure you are running compatible networking software across the LAN. Also make sure you are running the same LANtastic NOS on all computers. This error may also indicate a faulty NETBIOS.

Installed AEX is different version
You have loaded a version of the AEX.EXE program and attempted to remove it from memory with the /REMOVE switch. The version with which you are attempting to remove AEX.EXE is not the same version that was loaded.
Remove AEX.EXE with the same version of the program that was loaded.

Installed AI-LANBIOS is different version
You have loaded a previous version of the AILANBIO.EXE program and attempted to remove it from memory with the /REMOVE switch. The version with which you are attempting to remove AILANBIO.EXE is not the same version that was loaded
Remove AILANBIO.EXE with the same version of the program that was loaded.

Installed redirector is different version
You have attempted to remove REDIR from memory using the REMOVE switch, however, the version of REDIR that is loaded is not the same version of the program that is trying to remove it from memory.
Use the same version of REDIR that was installed to REMOVE it.

Insufficient NETBIOS resources for this server configuration Restart NETBIOS with higher sessions and NCBs
The NETBIOS has been started with insufficient NCBs and sessions relative to the maximum number of log ins you allowed.
Restart your NETBIOS with a larger number of NCBs and/or sessions. Formulas for computing the number of NCBs and sessions are:

NCBs=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 NCBs and/or sessions you may want to use the NBSETUP program to allocate more NCBs 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.

Internal XMS error hhH
You are trying to install LANcache using XMS memory and an unexpected error was detected.
Reboot your system and try again. If the error persists, consult the manual for your XMS driver regarding the error value hhH

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, run NET_MGR on the server and use the *Individual Account Management* or the *Group Account Management* option to assign a new password.

LANCACHE is already installed
You have attempted to install the cache again.
If you want to install the cache with different parameters you must use the LANcache REMOVE option to remove the program from memory, or 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 DISABLED ----
LANcache displays this message when caching has been successfully disabled using the /DISABLE function.

---- LANtastic Cache ENABLED ----
You will see this message after LANcache has been successfully re-enabled using the /ENABLE switch.

---- 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 LANcache is successfully installed.

---- LANtastic Cache NOT ENABLED ----
You will see this message if LANcache is unable to reactivate caching after you have used the /ENABLE switch.
Reboot the computer, run the network software, including LANcache, again.

---- LANtastic Cache NOT Installed ----
This message is displayed if the cache is not installed. The cache will not be installed if help information is displayed or an error occurred.

---- LANtastic Cache NOT Removed ----
LANcache returns this message when it is unable to remove itself from memory after a LANCACHE/REMOVE command has been issued. LANcache cannot remove itself from memory if it is not the last TSR loaded and the software interrupts have been rehooked.
Remove any TSRs loaded after LANcache then retry the operation.

---- LANtastic Cache Removed ----

This message is displayed after the LANtastic cache has been removed from memory.

---- LANtastic Cache RELEASED ----

You will see this message when LANcache has successfully released its memory after the LANCACHE/RELEASE command has been issued.

---- 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) AIMOVE Installed ----

This message is displayed after AIMOVE is successfully installed.

---- LANtastic (tm) AIMOVE not installed ----

This message is displayed if AIMOVE is not installed. AIMOVE is not installed if an error occurs or the HELP switch is used.

LANtastic (tm) AIMOVE Vn.nn - (C) Copyright 1990 ARTISOFT Inc.

This message is displayed every time AIMOVE is invoked.

LANtastic (tm) Cache (LANCACHE) Vn.nn - (C) Copyright 1991 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 Vn.nn - (C) Copyright 1991 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 is not running
You have attempted to remove the REDIR program from memory and the REDIR is not loaded.
Only attempt to remove REDIR from memory when it is loaded.

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 Removed** ----
You will see this message when the REDIR program has been successfully removed from memory using the REMOVE switch.

LANtastic (tm) Redirector Vn.nn (C) Copyright 1991 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 is not loaded
You have attempted to remove the SERVER program and it has not been loaded.
Only try to remove SERVER after it has been loaded.

---- **LANtastic (tm) Server Removed** ----
You will see this message when the SERVER program has been successfully removed from memory using the REMOVE switch.

LANtastic (tm) Server Vn.nn (C) Copyright 1991 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 computer as LANCHECK runs. The message indicates which computer is local.

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.

More than 64K tracks; high tracks will not be cached
You are attempting to cache a drive that has more than 64K tracks.
You can run LANcache with this disk, but it will only cache the first 64K tracks.

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.

Must have XMS driver version 2.0 or above
You are trying to install LANcache using XMS memory but the driver version is not compatible with LANcache.
You must be running HIMEM.SYS version 2.00 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 computer 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 (NCBs) 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 then the default number of NCBs so this error usually means that another application program has used so many NCBs that none are available for LANtastic.
If you are running another NETBIOS application, make sure that sufficient NCBs 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 use a NET command that requires the network software to be installed.
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 computer ??????? has not started the Server program and therefore is not listening for log in requests. The remote computer may also be running incompatible network software.
Make sure you are running the Server program on the computer 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 computers 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 AI-LANBIOS present in ROM
The AI-LANBIOS was not located in ROM and thus cannot be transferred down into RAM.
Make sure that the Adapter card contains a Boot ROM and is setup for Remote Booting. If the AI-LANBIOS is run out of RAM, then this error message will appear. This message will also appear if more than one invocation of AIMOVE is attempted.

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 enough memory to move AI-LANBIOS
You have attempted to run AIMOVE when an insufficient amount of memory is remaining to install this program.

Remove any TSRs currently in memory and retry loading AIMOVE.

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)
This message is returned by LANcache, LANVOICE and SERVER. You requested the program to be removed from memory, but it was not the last Terminate and Stay Resident (TSR) program loaded into memory.
Remove any TSRs loaded into memory after the program, then attempt to remove it once more.

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.
Run NET_MGR on the server and use the *Individual Account Management* or the *Group Account Management* option to set the *Password Expiration Date* field to a date in the future.

Possible fatal use of FAST_IRQ with hard disk interrupt
You have attempted to use the FAST_IRQ switch with IRQ 14, the hard disk interrupt. This can lead to data being written to disk without notifying LANcache, which can lead to lost or corrupted data.
Do not use IRQ 14 with the FAST_IRQ switch.

PPORT 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.

Previous server must be REMOVEd
You have attempted to run the SERVER program, but previous version of SERVER is still resident in memory.
Use the SERVER REMOVE switch to remove SERVER from memory.

Previous SERVER unloaded from memory
A copy of SERVER that had been shut down but could not be removed from memory has now been successfully removed using the SERVER /REMOVE switch. This will occur if you shut down a server and the software could not be removed due its interrupts being re-hooked by another TSR. When this happens, you must remove any TSRs loaded after SERVER, then retry the REMOVE operation.

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.
Use the SERVER /REMOVE option to remove the program from memory or 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.

REDIR requires Artisoft NETBIOS and network hardware
*You have attempted to run the REDIR program while using a non-*Artisoft network hardware and/or a non-Artisoft NETBIOS.
You must purchase LANtastic/AI to use LANtastic Network Operating System with non-Artisoft hardware, and you must use an Artisoft NETBIOS.

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 number does not match that of REDIR
You have attempted to run a copy of SERVER that has a different serial number than the version of REDIR that is currently loaded in memory.
Make sure you run versions of REDIR and SERVER that have matching serial numbers.

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 been shutdown or turned off.*
2. *The cabling between you and the server may have been disconnected.*
3. *The networking hardware or NETBIOS is defective.*
4. *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 receive another "connection broken" message. If you do not want to be connected to the server at this point, you must perform a NET LOGOUT.

SERVER requires Artisoft NETBIOS and network hardware
You have attempted to run the SERVER program with a non-Artisoft NETBIOS and/or network hardware.
You must purchase LANtastic/AI to use LANtastic Network Operating System with a non-Artisoft NETBIOS or adapter.

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 workstations have logged in to your computer 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.

Shutting down server...
This message is sent to all logged in users when a server is going to be shut down with the NET SHUTDOWN command.

Server is shutting down
This message is sent to all logged in users when a server is shut down with the NET SHUTDOWN command.

SPORT 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.

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

This Driver only runs on Artisoft AEX Ethernet Adapters
The AEX.EXE Driver has determined that the Ethernet adapter is not an Artisoft AE-2 or AE-3.
Only run the AEX.EXE driver with Artisoft AE-2 or AE-3 adapters.

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.

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 computer 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.

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 you 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 account concurrent 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.

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 ???????
Computer ??????? 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 network computers. 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.

U.S.A. version only - NOT FOR EXPORT
You are using a version of the REDIR or SERVER program that is only licensed for use in the U.S.A.

Use of FAST_IRQ with keyboard interrupt not recommended
You have attempted to use the LANcache FAST_IRQ= switch with IRQ 1, the keyboard interrupt.
In most cases, you will not want to use the FAST_IRQ= switch with IRQ 1.

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.

Verbose Output For AEX

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	Network buffer size	16384
Packet type	IEEE 802.3	Transmit buffers	20
Bytes of memory used	2640		

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. .

Verbose Output For AI-LANBIOS

Command line	verbose		
Adapter number	0	Low-level MPX number	C7
Maximum number of NCBs	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 NCBs	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 NCBs	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 cache 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 NCBs 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 NCBs 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	Maximum logins	2
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		
Machine Name	SERVER1	Adapters in use	1
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	1
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 4.00
You are attempting to use the NET program with an older version of the REDIR program.
Upgrade all your network computers to NOS 4.00.

You have been denied access on network node ???????
Your request to remote server ??????? 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 LANBIOS before running LANCHECK. LANCHECK requires a NETBIOS to be present before it will run successfully. Run AILANBIO 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 computer 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 adapters. 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
6	No Micro Channel adapter found (Micro Channel only)
7	AE2 not loaded
8	Can't remove, different version loaded
9	Cannot remove, interrupts re-hooked
10	AE2 still active

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
5	Can't REMOVE -- ROM version installed
6	AI-LANBIOS not loaded
7	Can't remove, different version loaded
8	Cannot remove, interrupts re-hooked
9	AI-LANBIOS still active
10	AI-LANBIOS not last NETBIOS loaded
11	Incompatible driver installed

AIMOVE Error Code Levels

Code	Meaning
0	No error, AIMOVE installed.
1	Not enough memory to install AIMOVE.
2	No AI-LANBIOS located in ROM.
3	No NETBIOS has been installed

AEX Error Code Levels

Code	Meaning
0	No error, AEX.EXE driver installed
1	MPX number is in use
2	Switch error
3	No hardware present
4	Adapter on-board RAM failure
5	Non-Artisoft hardware detected
6	This error code not used with ISA adapters
7	AEX not loaded
8	Can't remove, different version loaded
9	Cannot remove, interrupts re-hooked
10	AI-LANBIOS still installed

LANBIOS2 Error Code Levels

Code	Meaning
0	No error, LANBIOS2 installed OK
1	Command line switch errors
2	NETBIOS with this adapter number already installed
3	No LANtastic hardware detected
4	Shared RAM did not pass tests
5	Timeout waiting for interrupt
6	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
12	LANBIOS2 not loaded
13	Can't remove, different version loaded
14	Cannot remove, interrupts re-hooked
15	LANBIOS2 not last NETBIOS installed
16	Can't REMOVE, LANBIOS2 ROM version installed

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
6	MPORT not loaded
7	Can't remove, different version loaded
8	Cannot remove, interrupts re-hooked
9	AI-LANBIOS still installed

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
5	DOS version 3.0 or earlier
6	PPORT not loaded
7	Can't remove, different version loaded
8	Cannot remove, interrupts re-hooked
9	AI-LANBIOS still installed

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 on the network
10	This software is licensed for use only with an ARTISOFT NETBIOS
11	Can't add network name - NETBIOS error ??H
12	Insufficient memory to load REDIR
13	Serial number already in use
14	This version for use in U.S. only
15	Not installed (REMOVE was requested)
16	Wrong REDIR version on REMOVE
17	Can't REMOVE, interrupts have been re-hooked

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

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 NCBs
12	This software is only licensed for use with an ARTISOFT NETBIOS
13	Switch error
14	LANtastic (tm) Server not installed, HELP information displayed.
15	Serial number doesn't match serial number on REDIR
16	Must use international version
17	Cannot install, previous shut down copy of SERVER still in memory
18	Can't REMOVE, interrupts re-hooked
19	Can't REMOVE, SERVER not running

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
4	Serial port failed loop back test
5	DOS version 3.0 or earlier
6	SPORT not loaded
7	Can't remove, different version loaded
8	Cannot remove, interrupts re-hooked
9	AI-LANBIOS still installed

DOS And NET Error Codes

The following is the list of the error codes returned by DOS and the NET program. 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.

Dos Error Codes

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

NET Error Codes

128 Invalid command. Type NET HELP for help
129 LANtastic (tm) Redirector (REDIR) must be installed
130 NETBIOS must be installed
131 Wrong REDIR version. NET requires version 4.00
132 Missing argument. Type NET HELP
133 No such help item. Type NET HELP
134 Unknown subfunction, Type NET HELP
135 Bad argument. Type NET HELP.
136 Can't find environment variable
137 No help information available for this command
138 Unknown macro expansion -
139 Can't locate NET menu module
140 Machine configuration requires international version of LANtastic (tm)

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